

Short Narrative of the Proposal and Project

Vedanta Ltd. Lanjigarh has set up one red mud pond for storage of red mud. Total surface area of the developed red mud pond is 780000sqm (192.74acres) against the available land of 1325842(327.62acres). Existing pond is divided into two ponds i.e. West Cell (74.131acres) and East cell (118.61acres). Balance area is utilized for the development of embankment, red mud filtration unit, toe drain, catchment pond, diversion of channel in Southern side of existing pond.

Background of the Proposal & Project (RED MUD POND)

From the initial years of operation till 2011 only the west cell was utilized and TTD wet disposal method was followed. The decanted water was transferred by gravity to Process Water Lake which was subsequently recycled back to the process. Profile of the pond was kept in slope to take the advantage of wet disposal so that solid part will be deposited at higher elevation and liquid part will get collected at the north western corner of the pond. The profile of the pond varies from RL 457 to RL 436 (North West corner).

The initial height of the west cell dyke was 16m in the North West corner. Dyke of the west cell was subsequently increased four times in four years for enhancement of holding capacity of red mud. The first dyke height raising was done by downstream method and the subsequent dyke height rising was done by upstream method. Last dyke height raising was done in the year 2011-12 which was done using Geo Cell & Geo Grid. The present dyke height of west cell is 24 meters in the North West corner and now RL of the dyke top is RL 460m.

The west cell got filled up in the year 2011. and is currently not used for any disposal. The same is only used to transport the decanted water to Process Water Lake. Though for the last 4 years the red mud disposal has been stopped, only the top layer for about 500 mm is dried up and beneath that, the red mud is still in the slurry form.

To continue and sustain the refinery production, in the year 2012 part of the east cell was commissioned and TTD wet disposal method was followed. Parallel to it, the concept of dry disposal system of red mud was envisaged in which the disposal of red mud was through conveyors. Hence a part of east cell was bifurcated with intermediate dyke to commence dry disposal. Applying the same concept of sloping to ensure easy decantation of liquor from wet mud, the east cell was also constructed in sloped area where the difference of the ground from one side to the other is about 43m. The profile of the pond varies from RL 493 to RL 450 (North West corner of east cell). The present RL of the red mud in the east cell is 463m (equivalent to dyke height) in the northern side of the pond and the dyke top varies from RL 463(Northside of pond) to RL495 (Southside of pond).

Over the period of operation with wet disposal, the portion of east cell which was demarcated for wet disposal got filled up. Wet disposal in east cell continued till the red mud filtration system was completely established i.e. up to Apr 2014, post which wet disposal was completely stopped.

The dry disposal commenced from then in the bifurcated portion of the red mud pond (East cell) and is continuing till date.

For disposing of dry red mud we are utilizing the East cell leaving the conveyor area and water collection area.

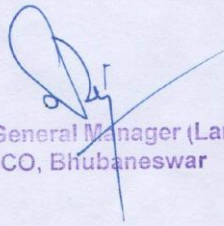
Currently the red mud filtered from the press filters is transported to the pond via conveyors. There is a provision of tripper conveyor which goes up to a distance of 200m inside pond. The travel span of tripper covers a distance of around 150m inside the pond.

The conveyor deposits the mud at various location within the span from which the mud is transported to the stockyard within the pond for deposition by means of dumpers. The transported mud is leveled with the help of dozers.

The leveling and compaction is done by means of separate dozers and rollers. This enables the ease of deposition of mud when the deposition cycle is to be repeated. This also ensures the movement of vehicle (dumpers) without any hindrance and obstruction, otherwise especially during the rainy season, it becomes very difficult to transport mud and deposit it in the specified zones.

The total surface area available for disposal in the east cell is 480000 sq.m (leaving the dyke). Out of this, approximately 130000sqm of the pond was used for TTD disposal which now acts as catchment area for collection of rain water. In this area slurry is already filled up to 462m. 70500sqm is kept for the discharge of red mud via conveyors and for transportation / movement of red mud dumpers. To ensure effectiveness during rainy season, it is mandatory to construct a garland drain around the periphery of the dyke. On calculation, the land requirement comes to 77500 sq.m. Hence, the effective deposition area available for dry stacking of red mud is 202000 sq.m

In both the West & the East cell (part in which TTD disposal was done), no space is left for any further wet / TTD disposal of mud. Also, since only the top most layer has dried up, no dry stacking will be possible as no vehicular movement will be possible. Moreover, since the deposited wet mud would have a very high hydrostatic pressure and high flow ability, any further dry stacking on the top of these cells, the red mud dyke may experience heavy seepage and ultimately may lead to collapsing of the same.


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