

EXECUTIVE SUMMARY

NALCO is planning to set up the **5th Stream** in its Alumina Refinery at Damanjodi, Dist Koraput, Odisha, as a part of the expansion programme (**3rd Phase expansion**). The capacity of this Stream will be **1.0 MTPA** (Million Tonne per Annum). The total expansion capacity will increase from **2.275 MTPA to 3.275 MTPA**. The processing technology will be based on **Medium Pressure Digestion**, as it is found more economical compared with the existing atmospheric pressure digestion system. **Rio-Tinto-Alcan** Medium Pressure (MP) digestion process has been considered for Alumina refining.

The proposed 5th stream of the Refinery will come up on the land owned by NALCO, adjacent to the existing four refinery streams. NALCO's captive bauxite mine (Centre & North block Mining Lease and South block Mining Lease) at Panchapatmali hill is located at a distance of about 14 km. towards the North-East of the Refinery at Damanjodi, Dist: Koraput, Odisha.

Alumina and caustic lye storage and handling facilities have been envisaged at NALCO's port facility at Visakhapatnam Port Trust (VPT) area, Visakhapatnam, Andhra Pradesh.

The implementation period for the project has been considered as **48 months** from the zero date i.e. grant of EC by MoEF & CC.

Bauxite is the major raw material for the refinery and will be obtained entirely from Central & North Block mining lease and South Block mining lease of Panchapatmali mine. Annual requirement of bauxite for production of 1 MTPA alumina is about 3.20 MTPA (Million Tonne per Annum). Necessary details pertaining to mining expansion project at Panchapatmali will be presented in a separate Pre Feasibility Report. Caustic soda in the form of lye will be received by ship at Visakhapatnam Port, stored in storage tanks at port facilities, and then transported to refinery by rail. Slaked Lime is used for Causticisation of the caustic digestion liquor, and also for coating the filter media, shall be obtained from nearby external source or from Madhya Pradesh and Rajasthan. Coal required for steam & power generation at the co-generation plant of additional capacity of 1 MTPA alumina refinery, is proposed to be obtained from Talcher & IB Valley coalfields of Western Odisha through linkage arrangement and also by e-auction procurement. Coal will be transported by rail up to the alumina refinery. Fuel oil required for Calciner & boiler start up, will be purchased from any one of the existing refineries at Visakhapatnam and will be transported by rail to the refinery site.

The major units of the alumina refinery will comprise the following:

- Bauxite storage and handling system
- Grinding unit
- Pre-desilication unit
- Digestion unit
- Settler and washer unit
- Causticisation unit
- Security filtration unit
- Precipitation unit
- Hydrate classification and seed filtration unit

- Calcination and product filtration unit
- Alumina handling unit
- Caustic, acid, flocculent & fuel oil storage and handling unit
- Compressor house
- Evaporation unit
- Raw water intake
- Cooling towers
- Co-Generation Plant
- Coal Handling System
- Electrical systems and power distributions
- Water supply systems

The estimated power requirement of the proposed 5th stream refinery with cogeneration steam & power plant auxiliaries is given below:

Annual energy consumption (kWh x 10 ⁶)	-	316
Average demand (MW)	-	43

The total additional water requirement for proposed 5th stream refinery expansion and co-generation steam & power plant will be 572 Cum/hr. and will be sourced from Kerandi River or back water of upper Kolab reservoir or Muran river, Koraput District, for which necessary application to Department of Water Resource has been submitted to Department of Water Resource, Govt. of Odisha.

The auxiliary facilities required for the proposed plant include air compressors, laboratory and administrative buildings at their respective locations.

The proposed refinery will generate pollutants such as fugitive dusts, emission from boiler & Calciner, ash, red mud, etc. The required red mud storage/disposal pond and other pollution control measures for the proposed refinery including the cogeneration plant will be designed to achieve the desired level of cleanliness without affecting the plant productivity and operational economics of the plants.

Implementation of various major activities has been scheduled in a progressive manner in order to ensure integrated execution of the project. Commissioning schedule for Alumina refinery would be 48 months from the 'Go-Ahead'. It is estimated that the total manpower requirement for 5th stream alumina refinery different facilities will be about **462** persons.