



MINING ENGINEERING SOCIETY
NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA
MINARE 2K17

ENVIRO CASESTUDY

A chromite mine has a lease hold area of 520 hectares. The leasehold area is in a valley with two hill ranges on its Northern and Southern sides. A small nallah is flowing from east and is at a distance of 700m from the mining lease finally ending up in a major river running at a distance of about 15 Km from the lease area. Prevalent rock types in the lease area include quartzite, serpentinized dunite peridotite, pyroxenite, dolerite, laterite and limonite. The mine is more than 50 years old and comprises of two quarries. Quarry I has been completely excavated, and production is currently being carried out from quarry II (Fig. 1). The area covered by quarry I and Quarry II are 150 hectares and 130 hectares respectively. It has a beneficiation plant for processing the chrome ore. However, the tailing pond is almost full. The average annual rainfall in this mining area is 1740mm. The water quality studies reveal the concentration of Cr^{+6} in Quarry I sump, Quarry II sump and Tailing pond to be 1.56 mg/l, 3.85 mg/l and 13.36 mg/l in respectively. The overburden dumps inside the mine has been benched and plantation has been carried out in some part of the dump. Even though terracing has been carried out in the OB benches, still the dumps fail in many parts.

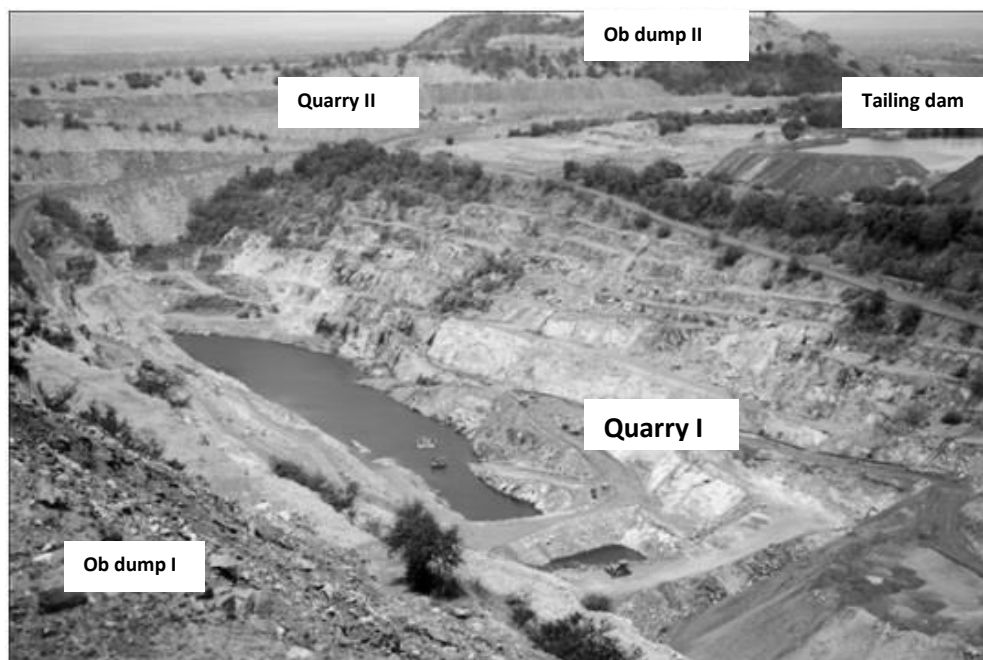


Figure.I: A photographic view of the mine

You are required to suggest appropriate measures for sustainable mining as per the provisions of Mineral Conservation and Development Rules, 2017, with particular reference to utilization of top soil, storage of overburden and waste rock, discharge of toxic liquid, management of surface runoff, rainwater harvesting and recharge of ground water.

Assume any other conditions with suitable justifications.