

AREA AND VOLUME CALCULATION OF PROPOSED URANIUM TAILINGS POND, SERIPALLY, NALGONDA DISTRICT, ANDHRA PRADESH, INDIA

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Uranium mill tailings may cause hydrogeological contamination by its radioactive ore residue and the chemicals added during the ore processing. Radium, present in the tailings, is leached out along by the atmospheric water, and toxic chemical rich water added during milling. This can contaminate the surface and ground water in the neighboring tailings pond area. Substantial uranium reserves have been identified at Lambapur-Peddagattu region in Nalgonda district of Andhra Pradesh and UCIL is in the process of obtaining clearances for construction of three underground and one open pit mines in the area and a processing plant at Seripally, 52 km away from the mine site. The design of tailings pond choice is primarily dependent upon natural topography, site conditions, and economic factors. The design of the proposed tailings dam depends on the geomorphology of the Valley. Because costs are often directly related to the amount of fill material used in the dam or embankment (i.e., its size), major savings can be realized by minimizing the size of the dam and by maximizing the use of local materials, particularly the tailings themselves. In this study, the purpose is to calculate the surface area and volume of proposed tailings with digital terrain models analyses derived from geographical information systems in order to reduce costs. Topography map (1:25,000) surveyed by GSI and high resolution remote sensing image (LISS IV) are the main and basic data resource for this research. Area of Interest (AOI) of proposed tailings pond is derived from remote sensing image, which contains 2 dimension (2D) information, and therefore calculation of 2D area of proposed tailing pond can be acquired. The proposed tailings pond is estimated to occupy about 80 hector in the vicinity of Mudigonda forests. The valley surface elevation starts from 305m to 410m. The slurry volume was estimated to ranged from 140975.62 to 8818455.38 cubic meters, and surface area was estimated to ranged from 156282.040 to 890137.040 square meters based on one meter to 18 m bund construction. Calculating area and volume, and using these calculations in the phase of determining various choices within the planning process, considerably reduces the expenses and the time spent on the plans and projects of waste disposal. These calculations should be taken into consideration before the tailings pond is constructed.

Keywords: area and volume calculation, uranium tailings pond, Seripally, India