Application of Satellite Survey Technology at Mt Keith TSF

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ABSTRACT
Critical to safe operations of the Central Discharge Tailings Storage Facility (CDTSF) is maintaining operational freeboard to prevent overtopping in the event of extreme rain weather. Recent improvements in survey technology and surface water runoff modelling have enabled a more frequent, more accurate determination of the operational freeboard requirements of a continuously raised embankment. The ideal survey technology is a balance between precision, accuracy, consistency and the speed of obtaining the results. The frequently used Aerial Drone Survey technology imposed issues with accuracy and consistency over large target areas and a slow speed of obtaining final results.

The Mt Keith Nickel concentrator in Western Australia has a large CDTSF with a footprint area of approximately 1600 ha (1.67 m²). The biggest risk associated with management and operation of the CDTSF is overtopping of the perimeter embankment wall during a storm event. To maintain the required operational freeboard in the event of a 1 in 100 year 72-hour rain event, regular storm water runoff modelling on the surface of CDTSF must be completed. Aerial Drone survey technology has been implemented at Mt Keith CDTSF to provide survey data to aid modelling and determine freeboard requirements. However, due to the large surface area of the CDTSF, Aerial Drone survey is limited in coverage and can only complete full surface area survey in multiple segments resulting in inconsistent break lines, patching errors and large turnover time. The processing and use of this data provides errors in storm water runoff modelling and hence errors in calculated freeboard requirements.

Satellite survey technology is the preferred optimum technology as it has the required precision, maintains survey integrity across the full surface of the CDTSF and results can be obtained within 24-48 hours of request and at any frequency required. This allows for a greater confidence in maintaining a safe operational freeboard.