

Application of high resolution 2D marine seismic technique for geological and geotechnical objectives at Paterson Lake South Triple R Uranium Deposit

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ABSTRACT

Patterson Lake South is located in Canada's Athabasca Basin, home to the world's richest uranium mines. The project is host to the Triple R deposit - the most significant high-grade, near-surface project in the region. For the pre-feasibility study stage of the proposed open pit and dyke a better understanding of the sediments above the basement was needed. A 2D marine seismic survey was acquired in 2016 to help on geological and geotechnical aspects of the project.

The geophysical challenge was to adapt a marine type survey to a lake's constraints. Also the shallow depth of the objective was a limitation. A 2D marine seismic survey grid was designed with lines 50m apart. A streamer was also designed with 24 single receivers 2m apart. Distance between shots used was 1m. The source used was a bubble gun able to send a 20-600Hz signal with the central frequency at 350Hz.

The data acquired is of outstanding quality and resolution – both vertically and horizontally. The interpretation of the data created a very detailed model of the sediments above the basement and provided answers to several geotechnical issues and also identified areas where additional drill-hole data was needed.

The presentation will detail every step of the survey from design to interpretation and also will show examples on how the seismic data was used for geological and geotechnical purposes.