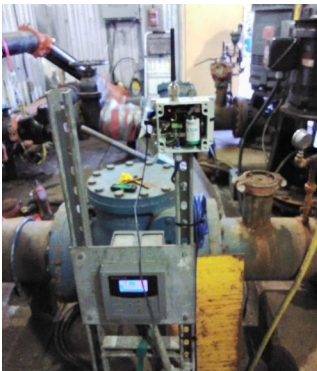


Remote inactive mine Tailings Storage Facility (TSF) ***risk management | Quebec***



Integration of old and installation of new automated piezometers



Automated water level acquisition in pump house



RDMS - Gateway



Partially remediated inactive TSF

Tailings storage facilities (TSF) are critical infrastructures related to any mine site and are an integral part of mining resource beneficiation. Risks to TSF physical (geotechnical) and chemical (environmental) stability vary greatly from one mine site to another based on several site-specific variables. One method for TSF owners to manage risk is the implementation of a structural health monitoring (SHM) program. GKM Consultants was mandated to integrate existing and install new instrumentation into one coherent TSF monitoring solution for two remote inactive and partially remediated mining sites overseen by the same operator in northern Canada. The program consists of both geotechnical and environmental components described below. As both sites are remote, isolated, and inactive this client opted for a remote SHM.

For this first geotechnical phase (physical stability), the instruments chosen include piezometers and tiltmeters along with ShapeArrays (SAA) that are scheduled for future installation. To optimize costs, solutions were researched to allow the reuse of older devices in conjunction with the installation of new equipment. The sites can now be remotely monitored for the structural health of the TSF confinement dams and basin water levels from anywhere in the world with automated alarm levels sent by SMS and

email as required, greatly reducing the labor costs associated with visiting each site.

In parallel, an environmental phase (chemical stability) is currently being developed, including the addition of instrumentation for the tailings remediation cover and a weather station that will be added to the final integrated monitoring solution. These instruments comprise the measurement of soil water content and soil matric suction potential, as well as pH and flow for the site effluent.

Complementary to the above installations, GKM Consultants cleaned, verified, and added all historical instrumentation data into the database as part of their data science services (DSS). High-quality data help the owner and engineer of record (EOR) to analyze site trends throughout the entire life of the project from initial construction, through operation, and finally into remediation and closure.

GKM Consultants is pleased to assist the owner and the site EOR with an integrated solution for both the chemical and physical stability of both remote inactive mine sites under one remotely accessible dashboard to help manage and mitigate risk.