The historic Bralorne-Takla mercury mine is located ~150 km north of Fort St. James, B.C. within the traditional territory of the Takla Lake First Nation (TLFN). Cinnabar ore was roasted to extract liquid mercury during World War II. The mine wastes, processing equipment, and other materials remained abandoned until B.C.’s Crown Contaminated Sites Program (CCSP) began investigations in 2005. Working in partnership with TLFN, remediation in 2015 and 2016 was followed by reclamation in 2017. Investigation and risk assessment of mercury contamination in mine waste, environmental media, abandoned infrastructure and biological tissues confirmed the presence of unacceptable risks to human health and ecological receptors. CCSP and TLFN collaboratively identified remedial objectives including protection of human health and the environment and returning the site to forest ecosystem suitable for limited traditional use.

The remedial approach combined physical remediation and risk management. Implemented in 2015/2016, this approach included capping mine openings, abatement and demolition of structures containing mercury and asbestos, off-site disposal of hazardous waste; consolidation of non-hazardous waste (soil, mine waste, demolition debris) into two landfills constructed on site; recontouring of the site to manage surface water and shallow groundwater, re-vegetation of the site and landfill covers, and implementation of administrative risk controls to protect future site users. The cover design included innovative elements to support forest growth while limiting long term risks to the covers. Selection of native species for replanting focused on returning the site to a forest ecosystem and supporting traditional use of the land. TLFN community members were actively involved in clean-up and environmental monitoring prior to and during remediation.

The strength of the established relationship was reflected in closure-related activities including collaboration in a documentary film (https://www.youtube.com/watch?v=wveuqfL1-c4), an information kiosk, and a Bahlats (potlatch) hosted in Takla Landing, where project team members were invited guests, all helping to bring closure to the site.

Long term monitoring and maintenance for the site includes routine inspection of the covers and drainage systems, landfill gas and water quality monitoring, evaluation of vegetation performance, and verification that administrative (land use) risk controls are maintained. Additional monitoring to satisfy CCSP and TLFN objectives includes ambient mercury vapour monitoring and biomonitoring in the vicinity of the site for mercury in recent growth of two target species. At least one TLFN community member is included in the staff for each monitoring event.

This presentation will highlight some of the innovative approaches adopted and challenges faced in implementing investigation, remediation, reclamation and long term monitoring at this remote mine site to address CCSP and TLFN objectives.

Joanna Runnells, MEnvSc, PGeo, EP
Joanna is a Professional Geoscientist in BC with over 16 years of experience in investigations and remediation of contaminated sites. Since 2006, she has been a Senior Program Geoscientist with B.C.’s Crown Contaminated Sites Program. The bulk of Joanna’s practice involves leading expert consultants and contractors in risk management, remediation, and monitoring of high-risk historic mine sites. She has expertise in geology, geochemistry, and acid rock drainage/ metal leaching and a broad knowledge of many other disciplines. Joanna’s ability to community complex scientific information to non-technical audiences, such as stakeholders, First Nations, and decision makers, is critical in the successfully delivery her projects.

Beth Power, MSc, RPBio, CSAP
Azimuth Consulting Group Partnership
Beth is a Registered Professional Biologist in BC with over 26 years of consulting experience related to toxicology and risk assessment of contaminated sites. She has a Masters degree in Zoology from the University of BC. Beth is appointed to the Roster of Approved Professionals in BC (for Risk Assessment, through the Contaminated Sites Approved Professional Society). Since 2003 she has been a Partner at a niche consulting firm, Azimuth Consulting Group. Beth’s practice sits at the interface between site owners, managers, developers, the regulatory community, engineers, lawyers and First Nations community members. She focuses on environmental risk assessment, management, and risk communication.

Trevor McConkey, MSc, PAg
Trevor has 19 years of experience in the environmental consulting industry and is a Registered Professional Agrologist. He has managed projects from a wide range of industries including mining, upstream and downstream oil and gas, and forestry over his career. In 2008, Mr. McConkey obtained a M.Sc. degree related to his research on soil reclamation techniques and reforestation at disturbed sites. He is responsible for the technical oversight of remediation and reclamation projects and staff working in the oil and gas and mining sectors in northern British Columbia. Trevor manages projects with teams undertaking human health and ecological risk assessment, hydrogeological, reclamation and geotechnical studies. He also has worked collaboratively with various First Nations in northern British Columbia; leading and facilitating engagement strategies both at the community level and with technical working groups formed on behalf of proponents and First Nations leadership.

Tony Gillett, PEng, CSAP
Tony has 27 years of environmental consulting experience in Western Canada. His project experience includes investigation and remediation activities for organic and inorganic contaminants in all environmental media as well as management of hazardous materials and wastes during facility decommissioning. Tony has completed investigation and remediation projects at a wide variety of active and idled commercial and industrial facilities with complex development and operating histories including mines, smelters, rail yards, power stations, landfills, petroleum storage facilities and refineries, and marine facilities. He has participated in or managed multi-disciplinary teams involving hydrogeological assessments, human health and ecological risk assessments, facility decommissioning, various contamination management and remediation strategies, hazardous materials assessment and abatement, construction environmental management and monitoring.