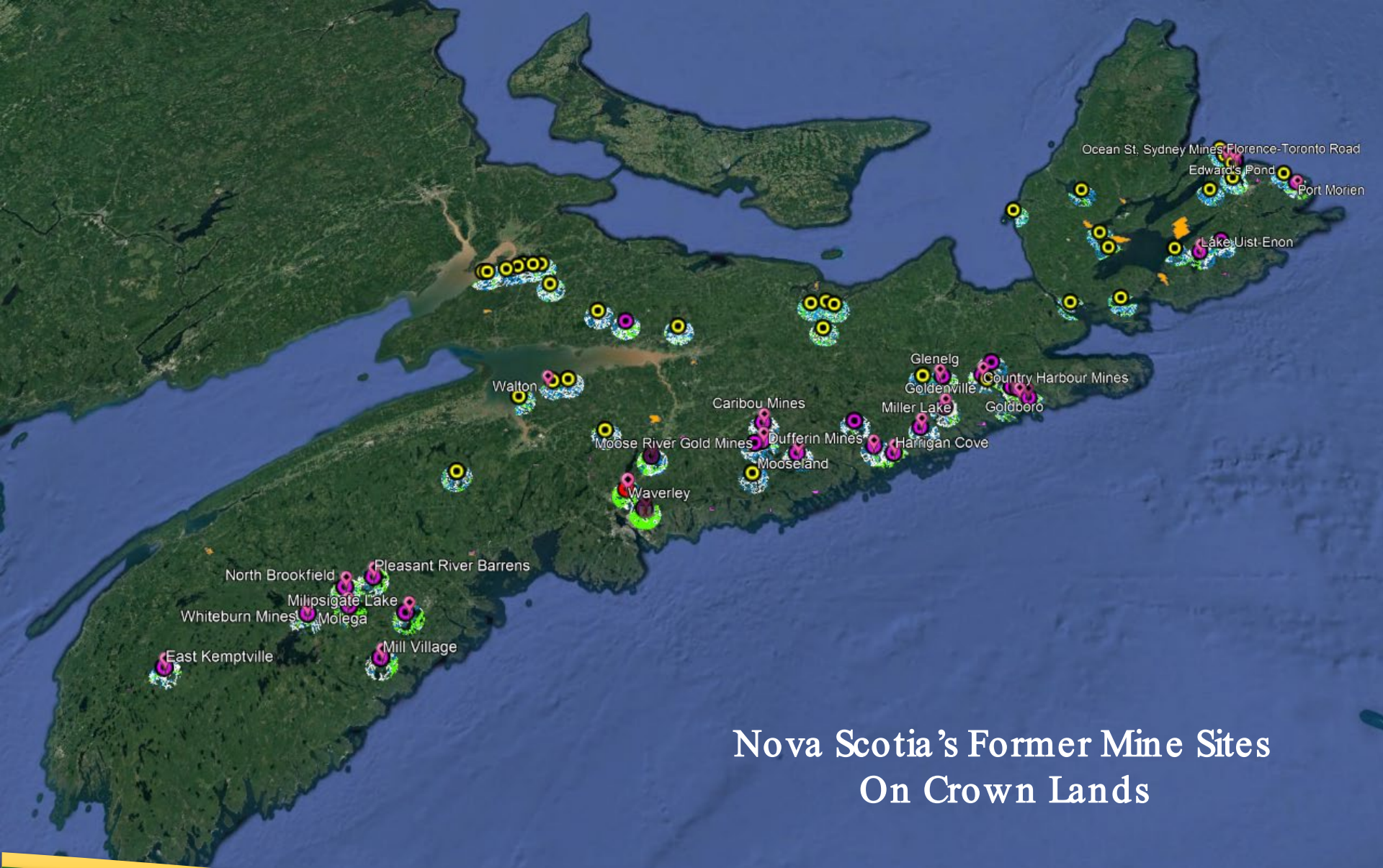


Nova Scotia's Former Mine Sites On Crown Lands

NS Lands
nova scotia lands

NOVA SCOTIA

History of Our Project

- Fall of 2017, Nova Scotia Department of Natural Resources (DNR) engaged Nova Scotia Lands Inc. (NSLI) to assess and provide an estimate on the Closure of the Tailings area in Montague Mines and Goldenville, Nova Scotia

- Both sites were former gold mine sites that were considered two of the largest in the province. Both came from a list of 69 former mine sites identified by DNR as having the potential of being contaminated disclosed to Nova Scotia Department of Finance in 2010 under new Financial Accounting practices.

- Spring 2018, an RFP was issued namely "Former Gold Mine Sites – Montague & Goldenville Request for Proposal for Closure Concepts and Costs".

- A Consulting Group (Intrinsik, Wood, Eco Metrix, Klohn Krippen Berger) led by Intrinsik were successful in the tendering process

- Assessments began and in March 2019 a Class D Estimate was released for the closure options for the two sites.

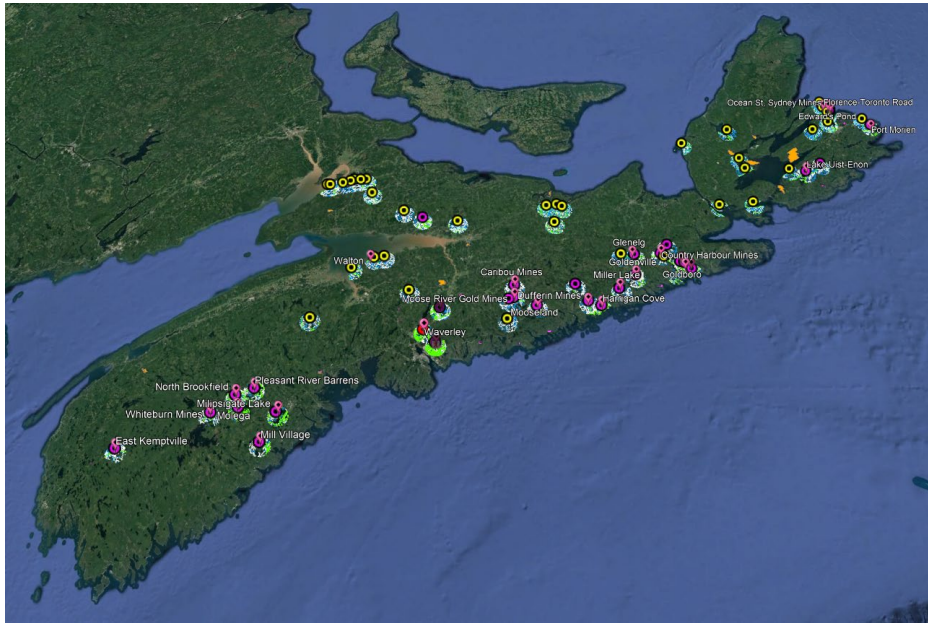
History of Our Project

- Spring 2019, NSLI was asked to begin the prioritization, assessment and remedial options assessments, where necessary, on the 67 remaining mine sites on Crown Land.

- A site prioritization matrix was created to assess all mine sites from historical reviews, human health effects, tailings knowledge, environmental effects, site size and logistics.

- We are presently field truthing site conditions and finalizing the matrix to facilitate government prioritization to address these sites.

- Close to a dozen of the 69 sites are situated within the HRM



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Montague Mines

- ✓ Preliminary Closure Plan for the Tailing on the Former Montague Mines mine site
- ✓ Barry's Run Human Health Risk Assessment
- ✓ Phase 1 ESA for Montague
- ✓ Field Sampling Programs for Montague
  - ✓ Wetland Delineation & Sampling
  - ✓ Geotechnical Sampling
  - ✓ Environmental Sampling and Site Delineation
  - ✓ Surface & Groundwater Flow/Quality
- ✓ Lake Charles Human Health Risk Assessment Report
- • Ecological Risk Assessments are in draft review for the Former Montague Mines site and Barry's Run

Montague Mines

- Phase 2 ESA for the Former Montague Mines mine site
- Detailed design of the project
- Logistics around Barry's Run and Lake Charles and the boundaries for the project
- Former Public participation and outreach
- Regulatory Approval
- Remedial Efforts

Risk Based Approach

- Have to have a hazard present
- Have to have exposure pathways
- Have to have people present
- If these three items are present, there is a POTENTIAL for risk – issue requires further assessment

Findings to Date

- Arsenic is present in surface waters and sediments in Barry's Run & Lake Charles at levels that are higher than those associated with natural background conditions. This was consistent with findings from previous studies.

- These sediments have arsenic levels that appear to be related to historical releases from the former Montague mines site. The largest concentrations of arsenic are in deeper sediment layers that were deposited in the lake many decades ago, likely during the active mining in the early 1900s. These deeper sediments are now covered by sediments with lower concentrations of arsenic in many parts of the lake, which suggests that the shallow lake sediments are slowly returning to pre-mining conditions. The area with the highest sediment concentrations corresponds to the area where Barry's Run flows into the lake, and some parts of this area continue to be influenced by the former mines site. Many areas with sediment containing the higher levels of arsenic are in deep water, where human contact is unlikely.

- The study found that exposures to arsenic while swimming in and consuming fish from, Barry's Run & Lake Charles were so low that health risks were considered to be negligible, or insignificant.

Lake Charles Human Health Risk Assessment (HHRA) Findings

- The public beach at Shubie Park does not have elevated arsenic levels, and risks from swimming or using the beach in this area are considered to be insignificant.

- The study concluded that mercury is not a concern for human health in residents or visitors to Lake Charles who chose to consume fish from the lake. Consumption of fish from the lake was not associated with elevated risk levels for mercury, as long as people respect the Provincial fish consumption guidelines (Province of Nova Scotia, 2019).

- While the study attempted to be all-encompassing for Lake Charles residents and visitors, sediment samples were not collected from areas close to or on private properties near Barry's Run, due to property access issues. In addition, the frequency that people swim in or use the lake may be different from that considered in the assessment. Therefore, there may be some uncertainties in the risk assessment results for specific situations.

Lake Charles Human Health Risk Assessment (HHRA) Findings

Based on the understanding of sediment and surface water arsenic concentrations, the closure and reclamation plan of the historical mines site is important to implement in order to reduce the movement of arsenic from the former mine site downstream into Lake Charles. The closure and reclamation planning project underway for the Montague Mines site is expected to further reduce concentrations of arsenic (and mercury) in the water and sediment in areas downstream, including Lake Charles. No specific risk management is recommended for Lake Charles.

As indicated in the recently completed Barry's Run human health risk assessment, it is important that sediments in upstream areas not be disturbed while the closure studies are being completed. Disturbing sediments through activities such as ATV use or dirt biking on the main tailings area, or other activities such as walking through Mitchell's Brook or Barry's Run can result in sediments being transported downstream towards Lake Charles. Sediment disturbance in upstream areas should be minimized until the closure plan for the mines site is completed.

Reports: www.nslands.ca

Questions?