

# Remediation of Abandoned Mine Openings in 2015

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## Introduction

There are more than 7,500 abandoned mine openings in Nova Scotia, many of which are located on Crown land. Since 2001, the Abandoned Mine Opening (AMO) Remediation Program, managed jointly by the Geoscience and Mines and the Regional Services branches of the Department of Natural Resources, has invested about \$810,000 to remediate the most hazardous of these openings on Crown land. In 2015, about \$50,000 was invested in this program to remediate AMOs on four sites.

## Background

The AMO Remediation Program is overseen by a steering committee comprising the executive directors of the Geoscience and Mines, Regional Services and Land Services branches of the Department of Natural Resources. Implementation of the program has, historically, been managed by a working group consisting of Geoscience and Mines staff, three regional geologists and one regional resource manager. However, staff changes over the years have resulted in regional geologist vacancies in all three regions. Therefore, as of the end of 2015, the working group has been reduced to the exploration monitor, a regional resource manager and Geoscience and Mines staff.

The Department of Transportation and Infrastructure Renewal (TIR) and the Department of Internal Services also play major roles in the AMO Remediation Program, both in carrying out work with their own crews (specifically TIR) and in tendering and managing contracted work.

The Geoscience and Mines Branch conducts field programs to inspect the AMOs on Crown land on a regular basis. Operating on a three-year cycle, almost every AMO on Crown land in the province is inspected, and the degree of hazard assessed. Warning signage and flagging are upgraded as needed.

The Geoscience and Mines Branch maintains a database of the known abandoned mine openings in the province (both on private and Crown lands). This database is available online at <http://novascotia.ca/natr/meb/geoscience-online/about-database-amo.asp>.

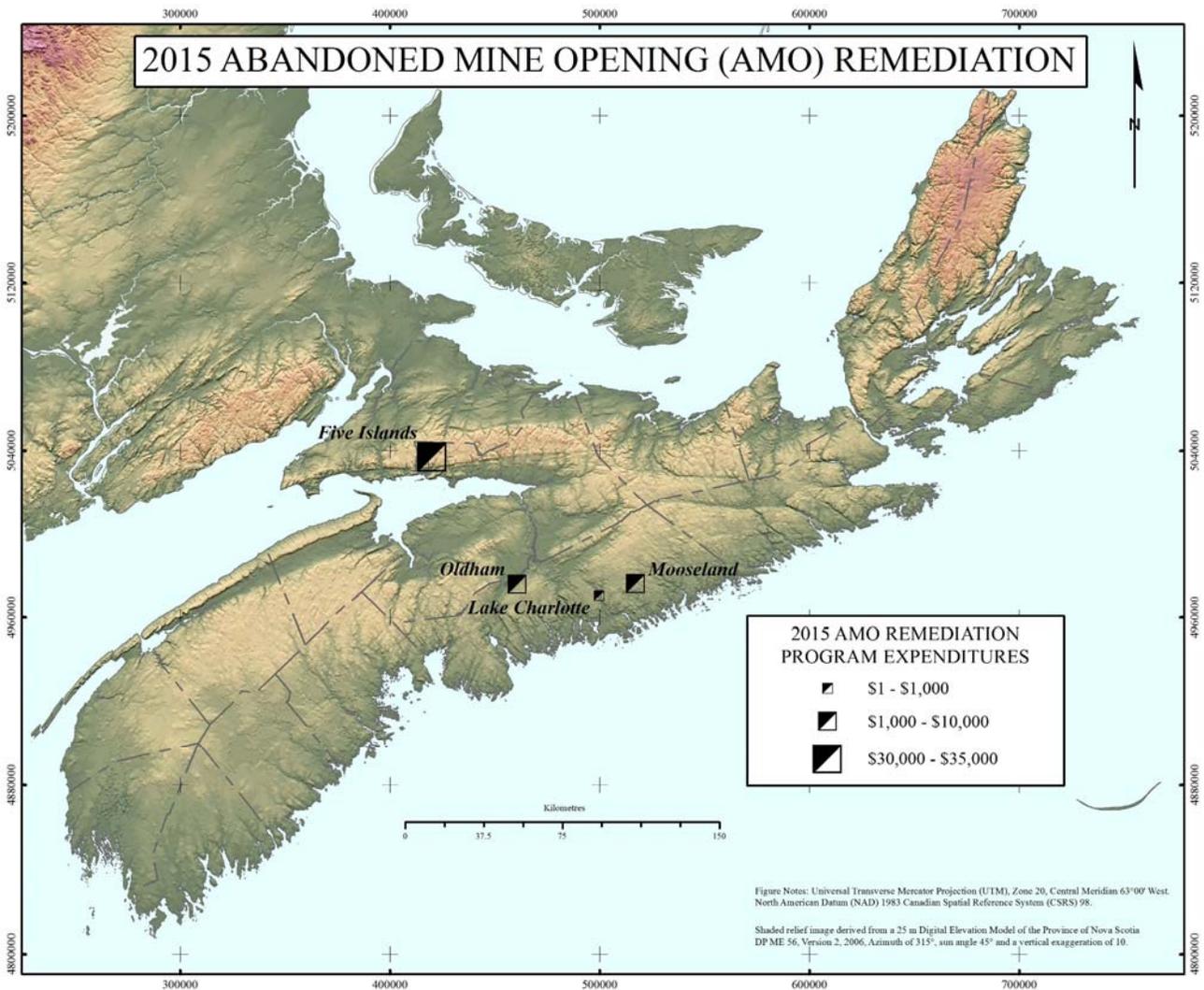
In November 2013, version 5 of the Nova Scotia Abandoned Mine Openings Database was released. This is an update to the 2009 version 4 and contains an additional 329 mine openings not previously documented. With the utilization of GPS and GIS technology over the past number of years, updates to the AMO database are ongoing, and version 6 is expected to be released in 2016.

## Methods

The methods used to remediate AMOs on Crown land include excavating, backfilling, fencing, and placement of concrete caps and steel grates over mine openings. In the past 14 years the program has backfilled about 600 AMOs, fenced 50, capped 7 mine openings and placed 4 grates to protect bat habitat. In addition, about 150 AMOs on Crown lands have been addressed through partnerships with private operators. Work has been carried out at 41 different sites throughout the province. Remediation work completed in 2015 is provided in Figure 1 and Table 1.

## National Orphaned and Abandoned Mines Initiative

In July 2015, staff of the Geoscience and Mines Branch attended the annual general meeting on the National Orphaned and Abandoned Mines Initiative (NOAMI), which was held in Halifax in conjunction with the 2015 Energy and Mines Minister's Conference (EMMC). At the EMMC, the ministers discussed how NOAMI addresses issues associated with orphaned and abandoned



**Figure 1.** Locations of abandoned mine openings on Crown land that were part of the remediation program in 2015.

mines, including the prevention of future abandoned mines and NOAMI’s recommendations for improvements.

NOAMI was formed in March 2002 at the request of Canadian mines ministers. They requested that a multi-stakeholder advisory committee be set up to study various issues and initiatives relating to the development of partnerships in the implementation of mine remediation programs across Canada. This advisory committee takes direction from mines ministers and reports back to them via the Intergovernmental Working Group on the Mineral Industry (IGWG).

Various task groups have been established by NOAMI to undertake in-depth analysis of a variety

of issues and to provide recommendations and advice to the advisory committee. One such task group was assigned the responsibility for information gathering and had the mandate to develop capacity for a national inventory of orphaned and abandoned mine sites. To make this national inventory a reality, this task group is developing partnerships that include provinces, territories, and several federal departments and agencies. The inventory will be publicly available.

In December of 2015, the Geoscience and Mines Branch released a database of abandoned mine sites in Nova Scotia to NOAMI. The same information sources used to compile the AMO database of more than 7,500 mine openings was utilized to compile a database of about 700 abandoned underground

**Table 1.** Location and remediation work completed in 2015.

Central Region	Work performed in 2015
Five Islands (Bass River of Five Islands)	A contractor secured the Baynes and Soley adit with a concrete-encased dual bat grate (see Fig. 2). The mine opening was extremely difficult to access, and a zip line was used to transport materials down a valley slope and across a river.
Mooseland	A contractor backfilled 33 AMOs and 6 prospect pits.
Oldham	TIR backfilled 30 AMOs and topped up 2 others that had previously been filled. Approximately 270 m of historical trenching dating from the early 1970s, much of it flooded, was also backfilled, as were 13 prospect pits.
Lake Charlotte	Repairs to a bat grate, originally installed in 2004, were carried out by staff from the DNR Shubenacadie and Middle Musquodoboit offices.



**Figure 2.** Baynes and Soley Adit July 2013 (left) and September 2015 (right).

mining sites and 125 abandoned surface mining sites. The Nova Scotia data have been incorporated into a national database and is included on the interactive map of sites across the country available at [http://noami.org/choosemap\\_e.php](http://noami.org/choosemap_e.php).

## **Conclusions and Recommendations**

All forty Type I (inescapable) AMOs and about 40% of the Type II (escapable, but very hazardous) AMOs known to exist on Crown land in Nova Scotia have now been remediated. Approximately 750 potentially hazardous mine openings on Crown land remain to be remediated; however, 55% of those are either located in very remote areas or are in such a condition that they pose little or no risk to public safety at this time.

It is recommended that the Geoscience and Mines and the Regional Services branches of the

Department of Natural Resources continue to remediate abandoned mine openings on Crown land in the province and monitor those that have already been remediated.

Public interest in abandoned mine sites and mine openings is increasing, possibly due to the popularity of reality television series and online videos related to gold mining and treasure hunting. Many of the mine openings currently thought to pose little risk to the general public may prove to be of interest to a small percentage of the population due to the lack of activity around these sites for the past century or more. Many of the mine openings currently thought to be of low risk to public safety may require remediation work if activity around these sites occurs. It is recommended that DNR assess this activity during the three-year cycle of site visits.