

**BENEATH YOUR FEET:
A WOODLAND OWNER'S GUIDE TO
MINERAL AND GEOLOGICAL RESOURCES**

Lesson 3: Ownership and Regulation of Geological Resources

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Overview

Minerals, designated geothermal areas and all water resources are owned by the province. These resources are managed through legislated acts and regulations – any other resources are owned by the landowner. Development or use of geological resources is regulated by a number of acts, by-laws, regulations and government policies.

Ownership and regulation: Aggregate Resources

Aggregate resources are owned by the landowner. As some of the most important and widely used geological resources in the province, owners may develop aggregate pits up to 2 ha (5 acres) in area provided no blasting is undertaken for the extraction of the aggregate. Larger pits and all

quarries must be approved by Nova Scotia Environment. Proposed pits and quarries that are greater than 4 hectares in area require an environmental assessment. Detailed information and/or guidelines about pit and quarry can be found at: novascotia.ca/nse/dept/docs.policy/Guidelines-Pit-and-Quarry.pdf

Slate, a rock type common to southern Nova Scotia, has been used extensively for road construction. It is easy to access as no blasting is required, and it compacts well.

On some sites, slate contains minerals (sulphides) that are harmful to the environment. Some road construction materials and bedrock that is visible adjacent to highways leading to Halifax are stained dark red or rust brown, indicating oxidation of sulphide and potential for acid rock drainage (ARD).

Anyone interested in developing a slate pit should ensure the material does not contain sulphide minerals.



Figure 32. Slate pit.

Ownership and Regulation: Industrial and Metallic Minerals

Ownership and regulation of industrial and metallic minerals is more complex than aggregate resources. The definitions of minerals in Nova Scotia have changed over the years, and the geological definition and the legal definition of a mineral are not the same.

The Mineral Resources Act (*MRA*) defines a mineral as a natural solid inorganic or fossilized organic substance. Minerals do *not* include:

- construction stone
- sand and gravel
- peat and peat moss
- topsoil
- gypsum
- non-Crown limestone
- oil and natural gas

Although these resources may be privately owned, some are still regulated under the *Mineral Resources Act*, the *Environment Act*, environmental regulations and other legislation such as municipal by-laws.

All metallic minerals and many industrial minerals are included in the province's legal definition of a mineral. There are a few exceptions to what might otherwise be strict definitions. These include:

- **Coal** - While coal is not a mineral by geological definition, it is regulated by the *MRA* as a mineral. Coal has been mined in the province for over 300 years and has had an important role in the industrial and cultural history of Cape Breton and northern Nova Scotia.



Figure 33. A coal seam and old exposed underground workings.

- **Gypsum** - By geological definition, gypsum is a mineral, but is not classed as a mineral in provincial law.
- **Limestone** - Several areas of limestone occurrence in Nova Scotia have been designated as Crown resources and are managed under the *MRA*. On private land, limestone is not considered a mineral.

Industrial minerals that can be privately owned include gypsum, non-Crown limestone, aggregate, soil, sub-soil (till), peat and building stone. However, development of these resources is still regulated under the Mineral Resources Act and requires approval from Nova Scotia Environment. To mine these materials, a company or individual must apply to NSDNR for a Non-mineral Registration and conduct an environmental assessment. The company must either own the land where the resource is located or have permission from the landowner to mine these resources.

Anyone interested in exploring for, or mining, Crown-owned minerals (defined under the *MRA*), must first obtain the mineral rights from the Crown. Lesson 4 of this module, *Mineral Rights and Landowners*, discusses mineral rights, staking claims and the mineral exploration process in more detail.



Figure 34. Gypsum mine at Milford, N.S.

Ownership and Regulation: Topsoil, Sub-soil and Peat

Topsoil, sub-soil and peat are all owned by the landowner. As discussed earlier, the practice of removing topsoil is being replaced by using manufactured topsoil. Nova Scotia Environment requires an approval for topsoil removal on areas greater than one hectare.

The removal of topsoil dramatically alters the functioning of healthy ecosystems and landscapes. Topsoil takes thousands of years to form and once it is removed, wind and water erosion of the site may cause sediment to find its way into aquatic habitats. Airborne dust from these sites can also be an annoyance.

Woodland owners considering topsoil removal should reflect on the negative consequences to woodland health and forest development. During construction of fire ponds, topsoil removal is unavoidable

and consideration should be given to relocating the topsoil to an area where it could be used for woodland restoration. See *NSDNR Home Study Module 16: Wildfire and Your Woodland* for more information about fire ponds.

Where quarries are excavated, topsoil from the excavations should be stored nearby and used to reclaim the sites once quarry activities end.

Excavation of sub-soil for fill is regulated in the same way as sand and gravel extraction. Operations larger than two hectares require provincial approval.

Peat development is regulated and all peat mining operations require Provincial Government approval.

Ownership and Regulation: Water Resources

Water resources include rivers, streams, lakes, wetlands and groundwater. All water resources belong to the province and are regulated by the *Nova Scotia Environment Act*.

Both surface water and ground water resources can be impacted by human activities. Contamination of surface water negatively influences ecosystems and organisms. If ground water becomes contaminated, individual or community drinking water supplies may be ruined. The withdrawal, use, diversion or alteration of water requires approval from Nova Scotia Environment.



Figure 35. An access road bridge crossing on a restored stream.

Ownership and Regulation: Geoheritage and Geotourism

The term “geoheritage” is relatively new, but the concept is as old as human history. People have been appreciating and visiting natural geological sites, including sacred sites, for many hundreds of years.

Several significant geoheritage sites have been protected under the provincial *Special Places Protection Act*. These sites include the Joggins Fossil Cliffs, the Parrsboro Fossil Site, the Debert Palaeo-Indian Site and the Port Morien Old French Coal Mine.

Geoheritage is also indirectly protected in many Protected Areas, Municipal Parks, Provincial Parks and National Parks. These areas often have landscapes and geological features that are unique.

Geoheritage includes the preservation of history and social tradition. Identification and promotion of cultural

geoheritage sites is often initiated by a local community. In contrast, natural geoheritage sites, which educate us about our vibrant natural history, can be developed both publicly and privately.



Fig 36. A tree trunk preserved in the fossil cliffs at Joggins, N.S.

The potential for geoheritage development in Nova Scotia is strong, due to the province’s colourful history and unique geology.

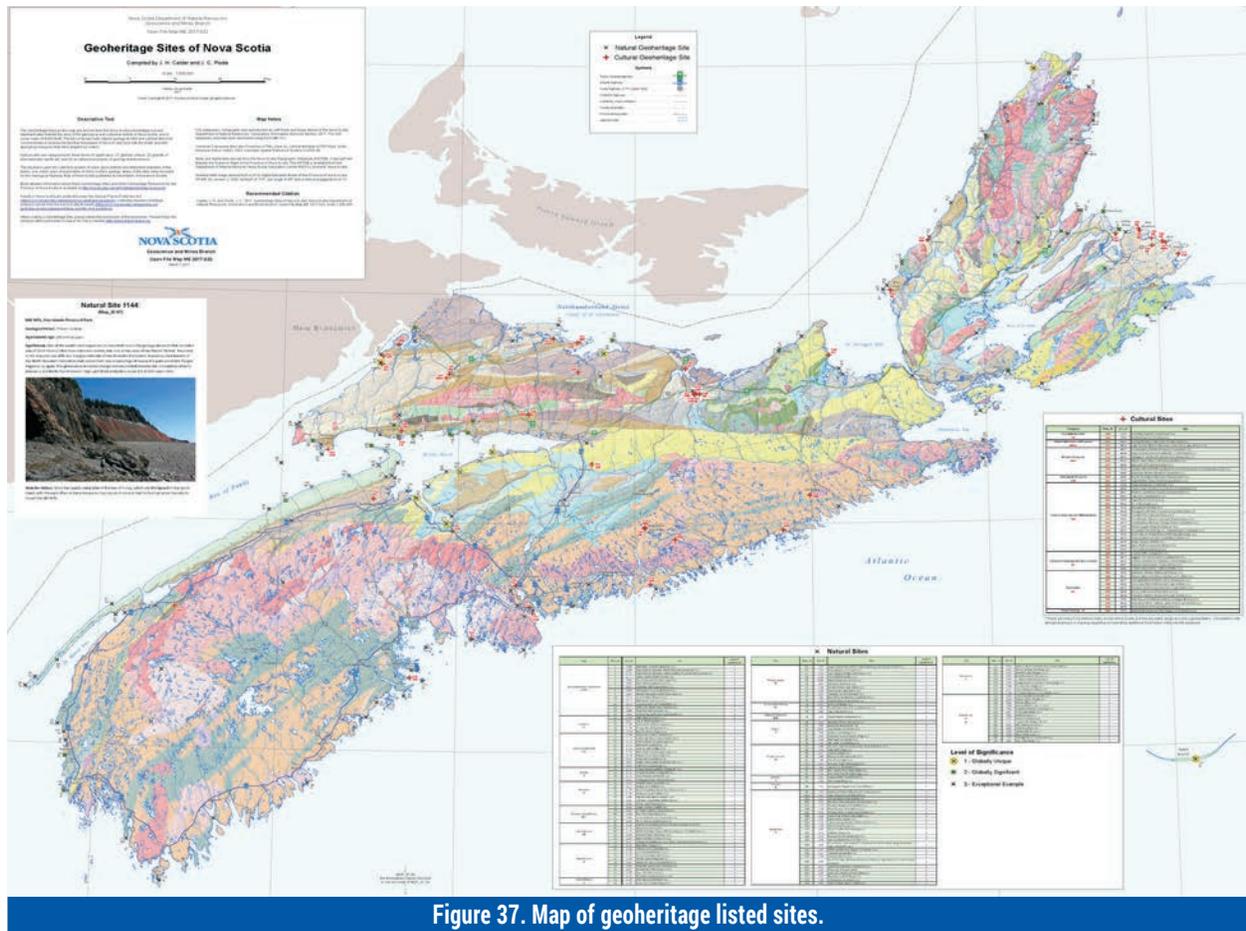


Figure 37. Map of ge heritage listed sites.

Many extraordinary natural geology sites known to scientists are not formally recognized or protected. A primary objective of ge heritage is to share information about the Earth's history and increase public participation, including tourists to the province. This is the goal of geotourism.

The Geological Services division of the Nova Scotia Department of Natural Resources (NSDNR) is the principal conduit for the recognition of ge heritage resources. This division works with other scientists, First Nations and communities to identify potential sites for inclusion in the province's ge heritage network.

As a woodland owner, you may be able to identify significant sites on your property for

geotourism or ge heritage. Many towns and villages in Nova Scotia have built a successful cultural connection to mining and mineral exploration. A visit with the Department of Natural Resources or to their website may help you identify potential opportunities to develop a source of income as part of your woodland stewardship strategy.

Ownership and Regulation: Geothermal Energy

Ownership and regulation of geothermal energy is determined by the location of the resource. The *Mineral Resources Act* allows the government to identify or designate an area as a Designated Geothermal Resource Area. Such Declared Geothermal Resources

are managed similar to minerals under the *Mineral Resources Act*.

Presently, three Designated Geothermal Resource Areas are located in the historical coal mining areas of Springhill, Stellarton, and Thorburn. These sites have extensive underground workings that could be suited to geothermal energy.

Individual landowners are permitted to develop geothermal energy resources *outside* Declared Geothermal Resource Areas. You may be able to utilize geothermal energy to heat your house or woodland operation.

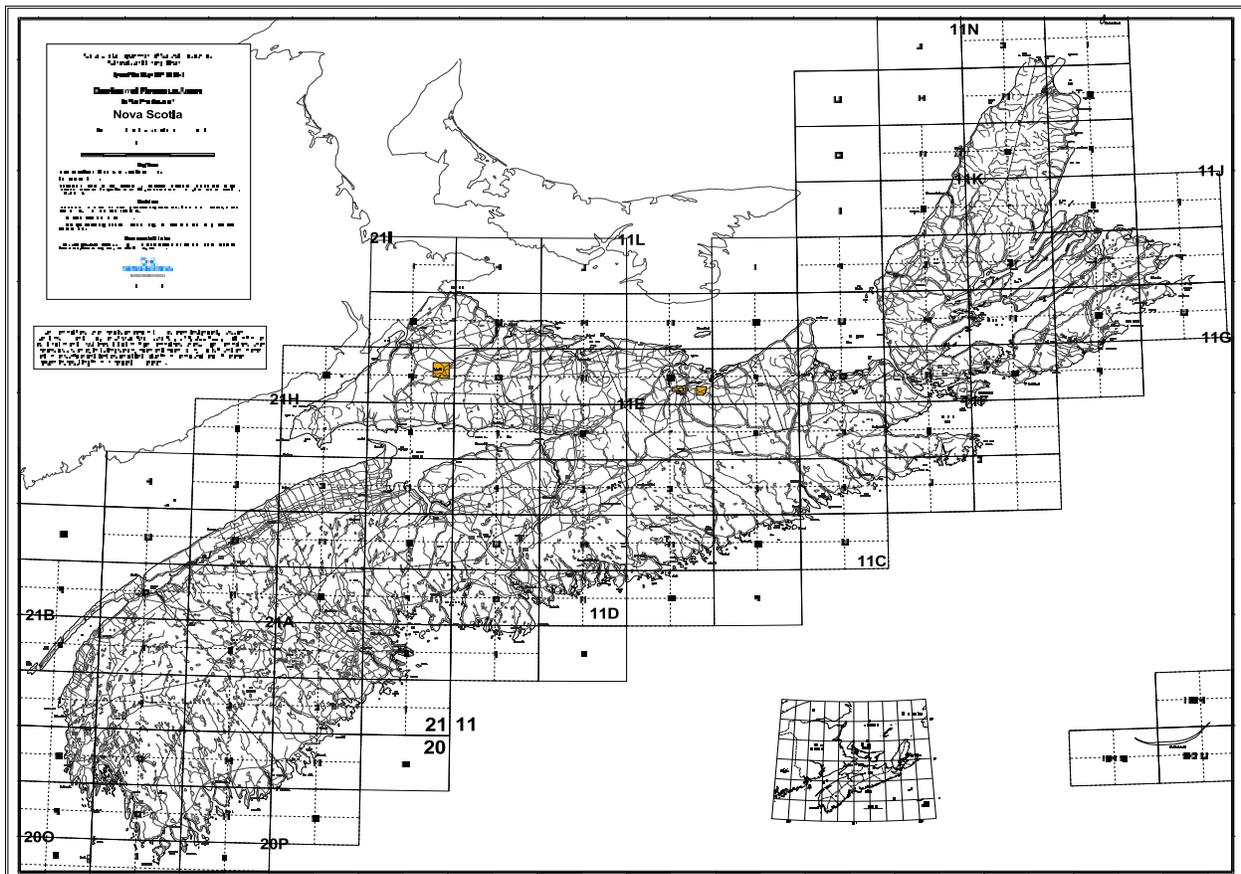


Figure 38. Declared Geothermal Areas.

There is a growing interest in utilizing heat stored in underground workings for community (district) heating and for small commercial applications. Are old underground workings present under your land? If so, might there be an opportunity for sharing the heat energy with other community members, including local businesses? It could be worthwhile

exploring these possibilities.

The Department of Natural Resources, Geoscience and Mines Branch, has maps of the locations of former mine sites in the province. These maps, together with information from provincial staff, can direct you to further advice about potential geothermal energy on your land.

Quiz 3

- 1 All aggregate resources are owned by the landowner. **True** **False**
- 2 Development of all industrial minerals are regulated under the Mineral Resources Act. **True** **False**
- 3 All coal resources are owned by the Province. **True** **False**
- 4 Gypsum is not considered a mineral under the Mineral Resources Act. **True** **False**
- 5 All minerals defined under the Mineral Resources Act belong to the Province. **True** **False**
6. All geoheritage sites are owned by the province. **True** **False**
- 7 Geothermal energy can be developed in old mines by landowners. **True** **False**
- 8 Most rural residents use groundwater for their drinking water. **True** **False**
- 9 Anyone can develop a geoheritage site in Nova Scotia. **True** **False**
- 10 It is a good idea to save and protect topsoil for reclaiming your site, rather than selling it. **True** **False**

Case Study – Part 2

Mattie received a call one day from a geologist working for a mineral exploration company. They were interested in talking to her about exploring for gold on her land.

Mattie knew the history of gold exploration in the area of her woodland, and was not sure about granting permission for North Star to initiate any kind of activities. What kind of exploration was being considered? Were they going to dig up the whole property? And what if they found something? Would she receive any compensation? She kept these questions to herself and told Sam she would talk things over with her son who was quite interested in developing the forest resources on the property.

After Sam explained a bit about his company's approach to mineral exploration, he left his business card and a map showing landowner boundaries and the location of North Star's mineral claims. He also suggested that the Department of Natural Resources could answer questions about mineral exploration and regulations. He indicated he would return in a few days.