

# Eastern Shore Compilation Project

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## Introduction

A wealth of information exists in the Nova Scotia Department of Natural Resources (DNR) databases, private research files, and in internal company reports on the numerous gold districts located along the Eastern Shore of Nova Scotia. The first documented gold discovery was in 1858 (Malcolm, 1929). By 1861, several gold-bearing areas (Mooseland, Tangier) were officially declared gold districts and gold had been discovered in a large number of important mining districts throughout the eastern shore. Geological maps were produced early in the twentieth century by E. R. Faribault, and Malcolm wrote a classic memoir on the gold districts in 1929. Since that time, there has been considerable work undertaken by various mineral exploration companies, prospectors, universities and other parties.

As a result, the Eastern Shore Compilation Project was initiated to (1) compile all pre-existing geoscientific information on the gold districts and surrounding areas of the Eastern Shore, (2) incorporate all relevant information on a digital base map with attached databases, and (3) write site-specific deposit reports.

Work thus far on the project has involved deposits on NTS map sheets 11F/03, 04, 05 and 06 (Fig. 1). Field visits were undertaken to the gold districts of Country Harbour, Upper and Lower Seal Harbour, Isaacs Harbour, Wine Harbour (11F/04), Forest Hill and Mile Lake (11F/05) and the tungsten showing at Lazy Head (11F/06; Fig. 2). In addition, numerous smaller showings and occurrences of various commodities were visited. To date, NTS map area 11F/03 has no significant mineral showings reported.

Work in 2000 primarily involved digitizing the early work of Faribault (Faribault map series 25, 26, 27, 29 and 30, Fletcher and Faribault, 1886) and correcting and referencing the work on to the digital bases. The initial work was done in AutoCad® 14 with Fieldlog® 3.4 (for the database component) and then incorporated in ArcView® 3.1 with other information (NSDNR mineral occurrence and drillhole databases) and included with other information currently in digital form (i.e. geophysics). An example of this work is illustrated in Figure 3 and depicts maps 29 and 30 of the Faribault series; the maps have been simplified considerably for

the purposes of this report. The other three maps (Faribault maps 25, 26 and 27) that have been digitized and used with this project will be available in the near future. Geological information from other work and sources (e.g. Hill, 1991; Ham, 1988; O'Reilly, 1988; Haynes *et al.*, 1986) was also digitized in AutoCad® and overlain on the information from Faribault. Other geological information, including cross-sections, mine plans and other relevant information, will be incorporated in the digital base maps and databases in the near future. Recent work by the branch's GIS group digitized the individual gold districts and relevant cross-sections from those districts, and this work will also be incorporated.

Highlights of the project and the information found on those maps follow.

## Geology

### General Geology

The map areas are underlain by metasedimentary rocks of the Goldenville and Halifax formations, with the Goldenville rocks forming anticlines and the Halifax rocks lying in the troughs of synclines (Figs. 2 and 3). The structure of these formations, particularly in the gold district areas, is very complex. Some of the more important geological features in the area include domed anticlines and numerous faults. The majority of anticlines are approximately parallel and vary a great deal in length (from several kilometres to 150 km). In some cases, two anticlines unite to continue as one; others die out but are continued with another anticline formed a short distance away in the same general direction. Anticlines are commonly doubly plunging, have tight to open geometry with steeply dipping fold limbs, and are commonly overturned. Outcrops commonly line up in a series of concentric ellipses or portions of ellipses dominated by meta-sandstone.

### Faults

Faults occur both locally and as cross-country faults. Faults generally trend northwest at angles cross-cutting the strike of strata. In gold districts along the Eastern Shore, displacement is to the left (left-hand faults; Malcolm, 1929), whereas in the western portion of the

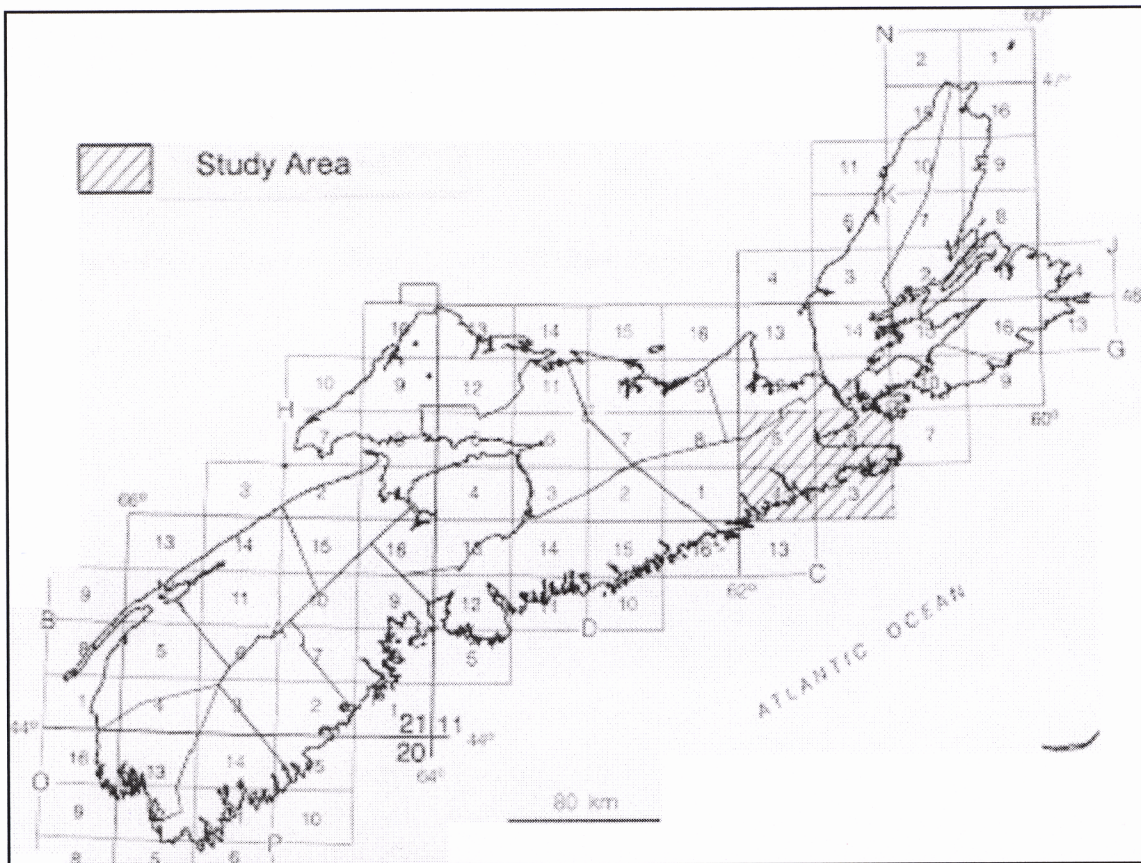


Figure 1. NTS index map of Nova Scotia showing the four NTS areas that were the focus of activity in 2000.

province displacement is to the right. Local faults are found in all gold districts and believed to be related mainly to late-stage doming of the anticlines. These northwest-trending cross-country faults occur on a larger scale, can be traced several kilometres across successive folds, and form a series of breaks that are approximately parallel. Some of the more important faults on these sheets are the New Harbour Fault, with a displacement of ~ 300 m, and the Country Harbour Fault, with a displacement along strike of ~ 2 km (Fig. 3).

### ***Nature of Gold Deposition***

Since the discovery of gold and mapping of the gold districts, there has been controversy of the origin of the gold (i.e. whether it was deposited before, during or after regional folding). Today there is still no agreement on the genesis of the gold deposits and the origin of the mineralizing solutions. The location of the gold appears to be determined by some irregularity of rock structure (i.e. it has been suggested that gold occurs where there is a "structure on a structure"; Chatterjee, personal communication). Gold occurs mainly in quartz veins,

which generally lie in bedding planes, but gold is also found in veins cross-cutting strike. Quartz veins are found on domes and plunging anticlines and some veins have been traced around the arches of domes from one limb of the anticline to another. Such veins have been mined in the past and current underground work at Dufferin is following some of these 'saddle' veins.

### **Gold Districts**

The individual gold districts that have been the focus of research, in order of production, are: Upper Seal Harbour, Wine Harbour, Isaac Harbour, Lower Seal Harbour, Forest Hills, and Country Harbour. Brief descriptions of each of these districts are included below, and much of these descriptions has been condensed from Malcolm (1929) and other information available in assessment files. All production figures were taken from Bates (1986). Locations for the individual districts is found on Figure 2. Gold districts in Country Harbour, Forest Hill, and Wine Harbour are illustrated on Figure 3.

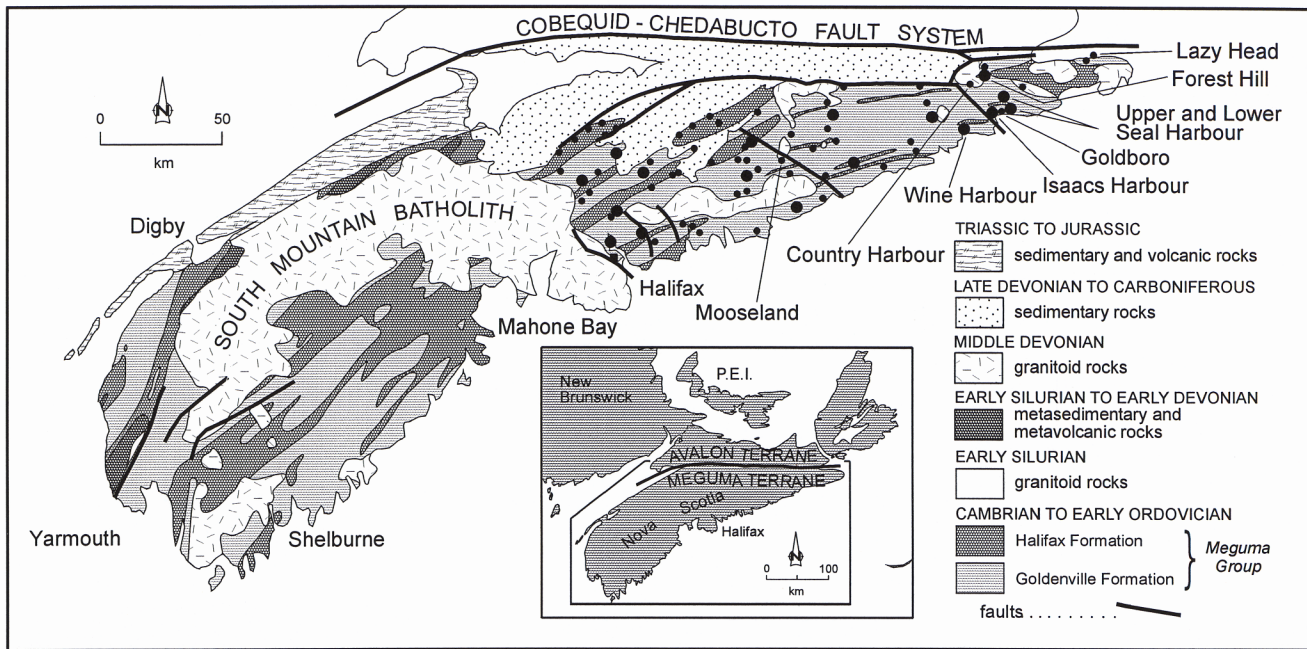


Figure 2. Simplified geological map of the Meguma Terrane of Nova Scotia, modified after Keppie (2000), showing former gold districts and locations of specific districts discussed in the text.

### Upper Seal Harbour

The Goldenville Formation is exposed at this district and folded into a tight anticline that has been affected by three main faults: the eastern, middle and western faults. The veins are interbedded and some attain thicknesses of up to 10 m. The deposit is characterized by large amounts of low-grade ore. Underground workings have uncovered a succession of saddle veins and the richest ore is found in zones on either limb of the anticline close to the anticlinal axis. The Richardson belt was more extensively worked and consists of a belt of quartz and slate lying between walls of quartzite. At the apex of the fold, numerous quartz veins cross-cut the sediments. Total production for this area (1893-1958) was 57,845.7 troy ounces of gold.

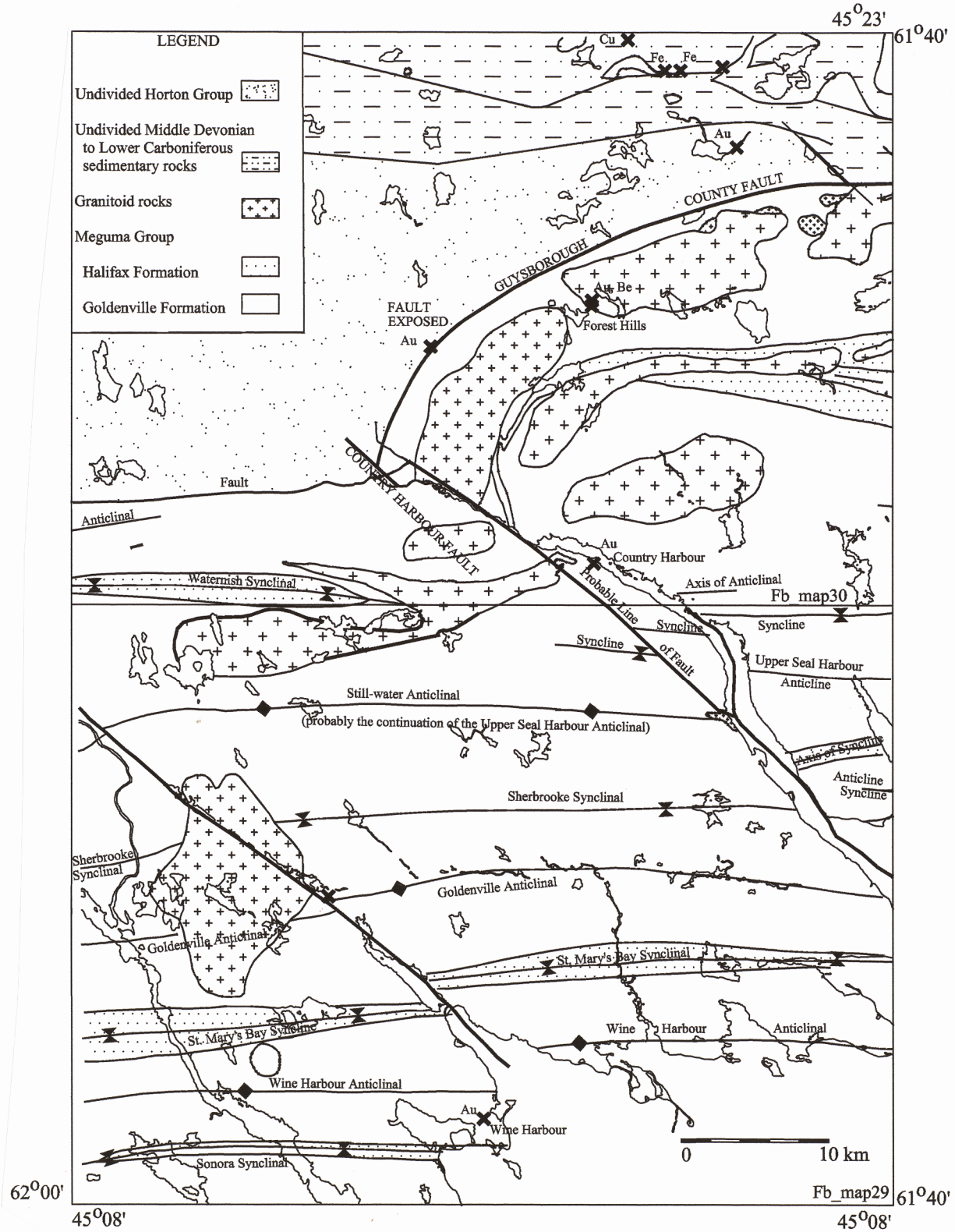
### Wine Harbour

Gold was first discovered in this district in 1860. The deposit is located on NTS area 11F/04 (Faribault series map 27). The Goldenville Formation at this locality is folded into two anticlines, termed the north anticline and the south anticline (the Wine Harbour anticline; Fig. 3), which converge towards the west. The centre of the dome lies in the west end of the gold district. The south anticline is considered the main anticline, and the north fold is thought to be a crumple on its north limb. A series of radiating faults are found in the southwestern portion of the district. The veins are interbedded and

most occur on the south limb of the south anticline. Leads which were initially explored were the Smith, Middle, Major Norton, Barachois, Halliday, Wiscassett and Gillespie leads and other leads developed over time included the Creighton, Hog, Halliday, Desbarres (or Middle), Washington, Air-shaft, Plough, Caledonia, Romkey, Twin, Hamilton, Charlotte, Eureka, Hattie-Mitchell, Moore, McKenzie, Gillis, Mundie, Little South, and McDonald leads. Production at Wine Harbour was reported from 1862-1939 and totalled 42,346.5 troy ounces of gold.

### Isaacs Harbour

This deposit is located on NTS map area 11F/04 (Faribault map 27) and was discovered in 1861 by several prospectors who noted similarities in the rocks of this area to the gold-producing rocks area of Wine Harbour. At Isaacs Harbour, the Goldenville Formation is exposed and folded into three parallel anticlines running east and west across Isaacs Harbour (north, middle and south anticlines). The original structure of the fold has been offset by a major northwesterly-trending fault. Several minor faults branch off in a northeasterly direction. The most important leads mined were the Mulgrave, Victoria, Burke and Fraser leads (other leads include the North Star, Grant, Saddle, Little Saddle, McPherson, Hurricane Point, Hattie, Goldfinch leads) on the north anticline. Rich, conformable auriferous veins with gold concentrated in shoots are



**Figure 3.** Simplified geological map of Fletcher and Faribault (1886) maps 29 and 30. All information on the original maps is completely digitized and this map illustrates the main geological information. For clarity, all geological symbols and information have been removed.

best developed where the anticline and the syncline converge, forming a crumple. The most profitable portions of the veins can extend over 1 km, are well defined and confined to the crumple. A fault in the eastern portion of the district crosses the anticline and led to the development of the Mulgrave and Mundic leads on the middle anticline; however, the middle and south anticlines were not as well explored or developed. A rich belt (~7 m wide; the Hattie belt) of leads was also developed 300 m south of the middle anticline. This belt is unusual in the respect that the strata curve into a synclinal fold, and is one of the few instances where rich veins have been found in a syncline in Nova Scotia. Production at Isaacs Harbour occurred from 1862-1958 and totalled 39,694.3 troy ounces of gold.

### **Lower Seal Harbour**

This deposit was first worked in 1862, is ~ 4 km east of Isaacs Harbour (Faribault map 27), and lies on the continuation of the Victoria and Goldfinch zone of fissures from that deposit. The Goldenville Formation is exposed and the deposit consists of a wide belt of rock in which numerous quartz veins trending roughly parallel to the bedding are found. Quartz veins also cross-cut bedding in many directions, forming a stockwork of veins. Individual veins are not extensive in either width or depth, and appear to form in an en echelon pattern. Production was reported from 1894-1949 and totalled 34,188.2 troy ounces of gold.

### **Forest Hill**

The Forest Hill deposit was discovered in the early 1890s, and differs from many Meguma deposits because the gold-bearing rocks of this district are adjacent to granite bodies. The Goldenville Formation rocks form a narrow neck with granite to the north and south (Fig. 3). Numerous granitic dykes intrude into the metasediments. The anticline is folded and gently plunging, and the fold axis curves and probably continues into the complexly folded area of the Country Harbour gold district. The richest gold-bearing veins are found on the south limb of the anticline and the most productive leads were the Salmon River, Mill-shaft, Ophir, and Schoolhouse leads (others included the Barrel, McConnell, Fraser, Hudson, Hard, and Camp leads). The production for Forest Hill (1895-1957) was 25,102.4 troy ounces of gold.

### **Country Harbour**

The Country Harbour gold district was one of Nova Scotia's initial discoveries in 1861. The Goldenville Formation rocks are exposed at this locality, and, like

the Forest Hill deposit, the district lies in proximity to granite bodies to the east and west, and other granitic bodies occur in the south and southwest (Fig. 3). Numerous granitic dykes intersect the metasediments and numerous faults are apparent. The metasedimentary rocks display an unusual north strike, believed to be related to drag on the Country Harbour Fault. The location of the anticline is outlined in outcrop. All the significant ore veins have interbedded geometry and the richest veins lie on the west limb of the anticline. The most important leads of this deposit are the Mason belt and the Prince lode. Production at Country Harbour (1871-1951) was 9959.7 troy ounces of gold.

### **Further Work**

The initial geological base maps are now digitized, corrected and in two separate systems, AutoCad® and ArcView®. The final ArcView® product will be digital maps connected to databases and other information, including cross-sections and photographs. This work will be undertaken in the very near future.

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