

From the Mineral Inventory Files

The East Kemptville Tin Deposit: Jewel of the Southwest Nova Scotia Tin Domain

Discovery of the East Kemptville Sn, Zn, Cu and Ag deposit in Yarmouth County was born of a happy time for mineral exploration in Nova Scotia. Starting in 1976, when respected prospector Merton Stewart first discovered tin (Sn) and base metals near Wedgeport, a 10-year exploration boom ensued over much of southwestern Nova Scotia. Almost all of the southern mainland was staked and several companies mounted huge exploration programs, employing hundreds of workers and spending millions of dollars. The companies discovered several granite- and metasediment-hosted Sn, W, Mo, Zn, Pb, Cu, Ag and In prospects, which collectively became known as the Southwest Nova Scotia Tin Domain (Fig. 1).

Most notable is the East Kemptville Sn deposit, which was discovered in 1979 by Shell Canada Resources Ltd. Developed as a mine by Rio Algom between 1982 and 1985, it produced until 1992. The mine was North America's first and only primary Sn producer, more analogous to sites in Europe, where similar greisen-hosted deposits have been mined for centuries.

East Kemptville was first thought of as a large (56 Mt of 0.17% Sn) greisenized, quartz-topaz leucogranite formed by autometasomatism by pooled mineralizing fluids trapped against the enclosing, impermeable country rocks. It was pegged as something similar to a large, porphyry-style deposit, with evenly disseminated mineralization. Once mining began, however, it became apparent that there was a strong structural control of the mineralization along northeast-trending shear and fault zones and along country rock contacts (see inset in Fig. 1). It was also realized that these shear zones are regional and played a genetic role in formation of all of the granite- and metasediment-hosted Sn occurrences in the tin domain.

Tin (cassiterite), sphalerite and chalcopyrite) at East Kemptville occur in greisens of two main styles. Most spectacular are zoned greisen veins, ranging from 20-50 cm wide, that consist of a core of massive cassiterite (1-3 cm thick) enveloped by massive topaz grading progressively out-

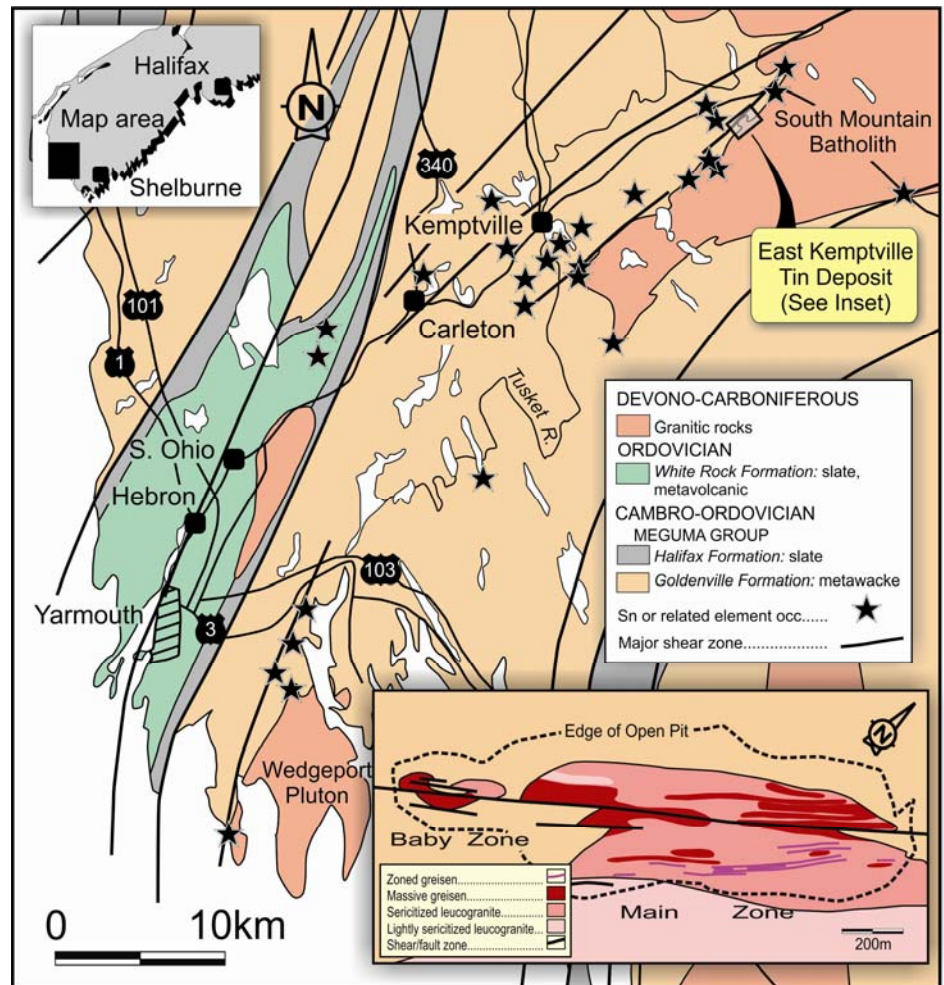


Figure 1. Geology of the Southwest Nova Scotia Tin Domain. Inset is a plan map of the East Kemptville Sn-Zn-Cu-Ag deposit modified from Halter, W. E., Williams-Jones, A. E. and Kontak, D. J. 1996: *Economic Geology*, v. 91, p. 368-385.

ward through quartz-topaz greisen and quartz sericite greisen. However, most of the tin and base metals in the deposit are contained within 1-10 m wide zones of massive quartz-topaz-sericite-muscovite greisen. Heavily mineralized with cassiterite, it is thought that these zones were formed by the coalescing of a number of separate greisen zones into large, massive, mixed greisens.

Even though East Kemptville was the lowest grade hard rock producer in the global tin industry, the mine and mill performed famously with 75% recoveries, excellent for such a low grade ore. The mine's demise was the result of poor

economic circumstances. When mining began in 1985 tin sold for over \$9/lb. but within a month the global tin market had collapsed, Sn dropped to less than \$3/lb. and it remained so until the mine closed in 1992.

Who knows for sure what the future holds for East Kemptville, which has since been reclaimed. However, some 12-15 Mt of low grade Sn ore remains there and recent years have seen a strong rebound in Sn prices (\$13.94/lb. in March 2012). Might the crown jewel of the Southwest Nova Scotia Tin Domain shine once again?

G. A. O'Reilly