

## From the Mineral Inventory Files

### The Pearl Lake Sn-Zn-Cu-In Prospect and its Magnetic Personality

In 1977, the first year of Nova Scotia's tin (Sn) exploration boom, a consortium of Kerr Addison Mines Ltd., Esso Minerals Canada, and Dome Exploration acquired a large claim holding in southwest Nova Scotia. The consortium contracted an airborne magnetic survey, which turned up dozens of targets. Contractor Geoterrex highlighted one anomaly above all and reported: "*The best prospect in the survey is considered to be S-18, an isolated, fairly deep looking conductor near Pearl Lake. We think this zone has excellent potential and we recommend it on a high priority basis.*" Kerr Addison tested the anomaly with trenching and three diamond-drill holes, which revealed many 0.5-3 m thick sulphide-rich zones.

The Pearl Lake property is underlain entirely by metasilstone and metawacke of the Cambro-Ordovician Goldenville Group, the lower unit of the Meguma Supergroup. About 1.5 km to the southeast is the Davis Lake Pluton, a highly evolved, late stage plutonic centre of the Devonian-Carboniferous South Mountain Batholith (SMB). The SMB is host to numerous Sn-W and related element occurrences, as well as the greisen-hosted, East Kemptville Sn-Cu-Zn-Ag deposit and former mine (see *Minerals Update*, v. 29, no. 4).

In 1978, Kerr Addison asked Dr. A. K. Chatterjee of the Department of Mines and Energy to examine the company's Pearl Lake drill core. He reported the widespread presence of cassiterite in the polysulphide veinlets. Esso Minerals soon took over as the joint venture's explorer of the property and continued exploration until 1983. A till geochemical survey was carried out as well as 17 additional diamond-drill holes (Fig. 1). By the end of 1982, an area 750x165 m had been defined, within which numerous zones up to 3 m thick of massive chlorite and/or silica alteration occur. These alteration zones commonly contain veinlets of chlorite-sulphides ± quartz, with most veinlets 0.1-0.5 cm thick, although some reach up to 5 cm. The most abundant sulphide present is

pyrrhotite with lesser pyrite, chalcopyrite, sphalerite and arsenopyrite. Cassiterite is also common. Typical grades are 0.1-0.5% Sn (up to 2.1%). Fewer samples were analyzed for Zn and Cu, but the limited data collected suggest grades of Zn in the 0.1-0.5% range, up to 5%. Levels of Cu are typically in the 0.1-0.2% range. The widespread presence of pyrrhotite is thought to be the source of the well developed magnetic anomaly at Pearl Lake.

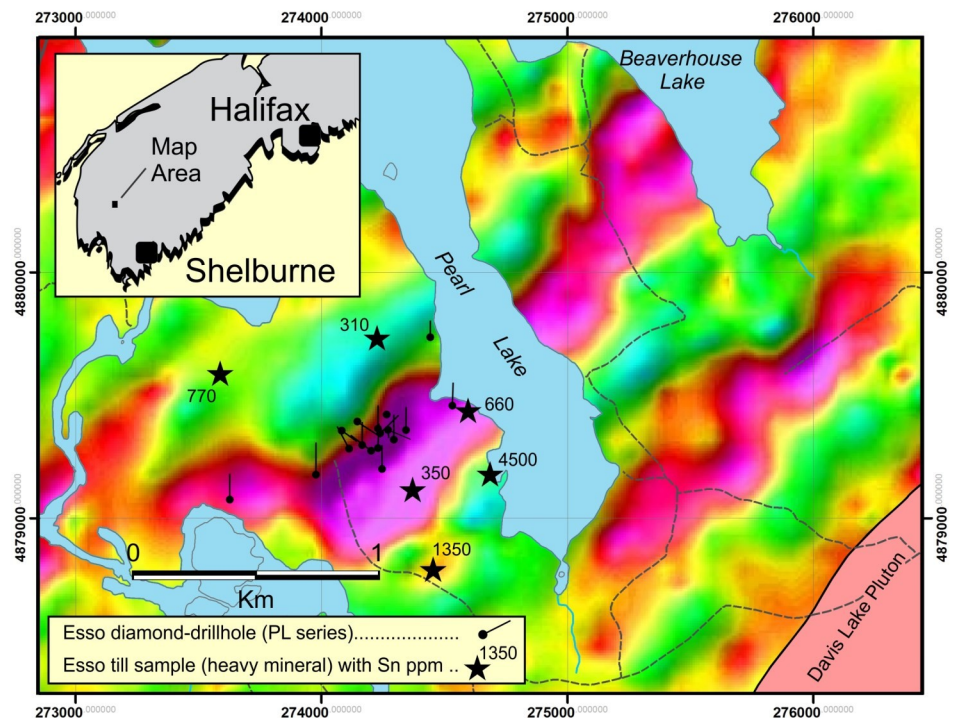
In 1982 Dr. Chatterjee determined that Zn-rich zones within the alteration at Pearl Lake also contained elevated levels of In. This would normally have been a significant finding with important exploration implications for Pearl Lake, and the many other granite- and metasediment-hosted Sn deposits of the Southwest Nova Scotia Tin Domain (*The Geological Record*, v. 3, no. 3). The finding faded into obscurity, however, and by 1984 Esso Minerals Canada decided to abandon all their Sn holdings, including Pearl Lake. Likewise, the 1985 collapse of the global Sn cartel and a

three-fold drop in the global Sn price essentially ended all Sn exploration in the province.

Recent years have seen a rise in the price of strategic commodities like Sn and W, and a more promising outlook. In addition, the 'Green Economy' and its need for commodities like In, Ta and other rare metals is resulting in renewed interest in the deposits of Nova Scotia's Tin Domain. Avalon Advanced Materials Inc. is currently evaluating the feasibility of exploiting the remaining Sn-Zn-Cu-Ag resource at East Kemptville, in part due to its content of In. Alpha Resources Inc., current mineral rights holder of Pearl Lake, has determined Zn-rich zones there contain In up to 68 ppm.

The 1980s Esso exploration only tested the northern flank of the prospect's strong magnetic anomaly (Fig. 1). The deposit remains open along strike to the northeast, southwest and, most importantly, the south. Clearly, there's more to be done.

G. A. O'Reilly



**Figure 1.** The Pearl Lake Sn-Zn-Cu-In prospect, showing second derivative aeromagnetic anomalies, Esso Minerals Canada diamond-drill holes, and till samples.