From the Mineral Inventory Files

Kaiser Celestite: Fireworks and Colour TV Screens

It's a reasonable argument that at one time the largest tonnage strontium (Sr) deposit in the world was found at Lake Enon in southeast Cape Breton Island (Fig. 1). The deposit of celestite (strontium sulphate) and lesser strontianite (strontium carbonate) was discovered by Avard Hudgins and Lura Corporation in 1962. Lura developed the deposit over the subsequent years, and the Kaiser Celestite Mining Company purchased it from them in 1969, operating the Kaiser Celestite Mine from 1970 to 1976. Kaiser also built and operated a chemical plant at Point Edward, 60 km away near Sydney, to convert the ore to the market products $SrCO_3$, $Sr(NO_3)_2$, and Na_2SO_4.

In the 1970s, strontium was mainly used for the coating on picture tubes of colour TVs, for Sr salts that make fireworks and flares glow brilliant red, and for the manufacture of military ordnance. In 1976, competition from higher grade Sr deposits in Mexico and changes in the Sr market resulted in closure of the mine. During its mine life, 272,000 short tons of celestite ore grading 50-55% $SrSO_4$ were produced from three sites separated by about 2 km (Fig.1): the Enon site at the southeast end of Lake Enon; the MacRae site 2 km to the northeast; and to a lesser extent, the Almac site opposite the intersection of the Loch Lomond and Salmon River roads. Mining was predominantly an open-pit operation, but some underground mining was carried out from a 135 m long decline at the Enon workings. A resource of 1.9 million tons of ore remains in the deposit.

The Kaiser Celestite deposits, or Lake Enon deposits as they are also known, occur as beds and lenses of celestite up to 3 m thick in limestone beds within the lower units of the Carboniferous Windsor Group. These deposits have been termed manto deposits, manto being Spanish for blankets or cloaks, which reflects the bedded form of the mineralized rock. In strict terms, manto deposits are formed where the host beds are replaced by mineralizing fluids. Most of the Kaiser Celestite deposits, however, did not originate in that way. Although the deposits clearly occur as lenses or beds within the limestone units, they are believed to have formed by direct precipitation of strontium sulphate from the ancient Windsor sea, along with the $CaCO_3$ that formed the limestone beds. As such, they are not true replacement deposits. Minor amounts of celestite also occur as euhedral and subhedral crystals in veins and vug fillings throughout the host Windsor Group. In addition, minor occurrences of galena, pyrite, chalcopyrite, sphalerite, manganite, realgar, orpiment, and native sulphur have all been reported in the Windsor Group carbonates by previous workers.

As is obvious, a considerable resource of Sr remains on this property. Perhaps someday, when Sr markets improve, or if new applications develop that require Sr, then the province has a deposit of the metal waiting for another opportunity to shine, brilliant red of course.

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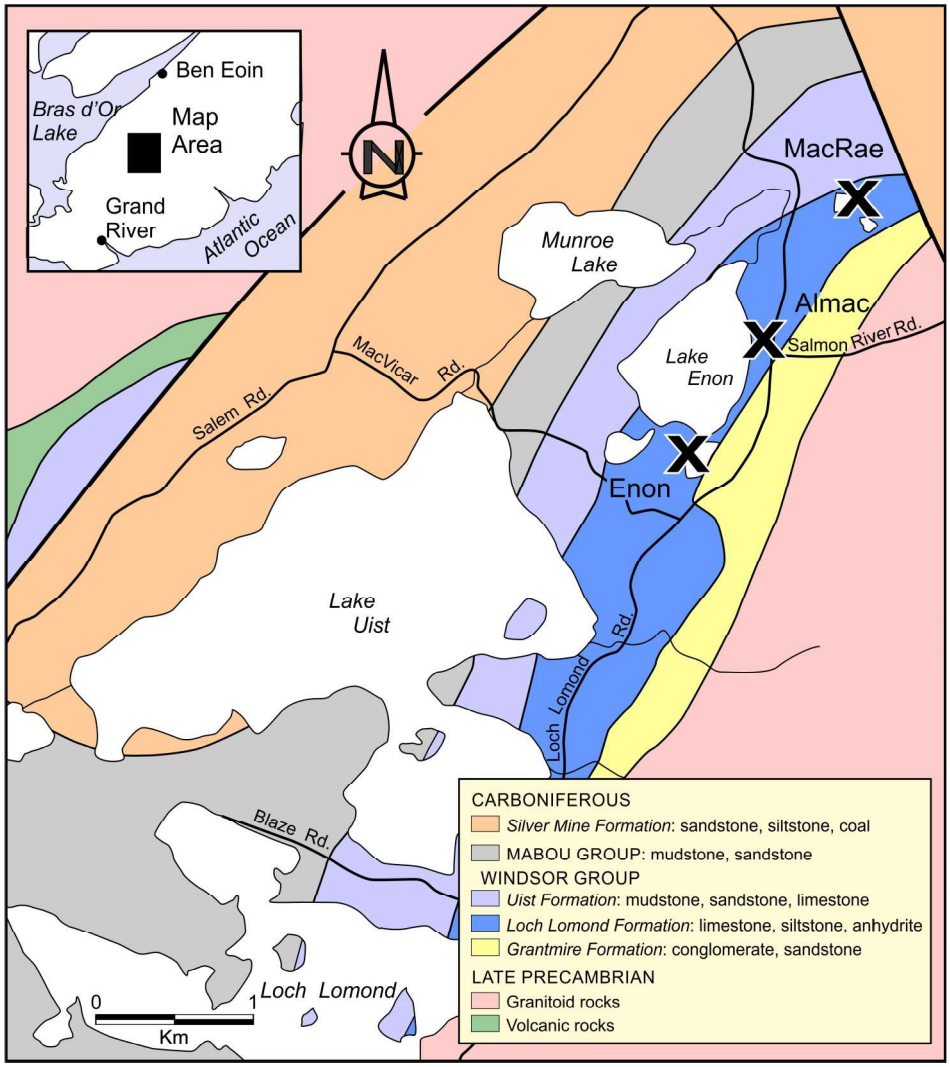

Figure 1. Geology of the Lake Enon area in southeast Cape Breton Island, Nova Scotia, showing the location of the three producing sites of the former Kaiser Celestite Mine.