REXSPAR URANIUM DEPOSIT

(82M/12W)

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INTRODUCTION

Consolidated Rexspar Minerals & Chemicals Limited holds mineral rights to approximately 2 830 hectares of ground centred on the original Rexspar fluorite-uranium showings on Red Ridge, approximately 5 kilometres south of Birch Island. This property has received intermittent attention since 1918, initially for fluorite and silver-lead, then for manganese and since 1949, for uranium.

Extensive work in the early and mid 1950's outlined three zones of commercial-grade uranium mineralization and one contiguous zone of fluorite mineralization. Considerable drilling since 1969, augmenting the earlier work, has indicated that the three zones, known as the A, B, and BD, contain an estimated 1 202 550 tonnes of material averaging 0.565 kilograms U_3O_8 per tonne amenable to open-pit mining methods. The company is presently finalizing plans for a 1 380-tonne-per-day, five days a week mining operation and for a 985-tonne-per-day beneficiation plant that is to operate continuously.

GEOLOGY

The rocks in the vicinity of the Rexspar deposit are greenschists of the Eagle Bay Formation of probable Mississippian age (Campbell and Okulitch, 1976) which dip moderately to the north and northwest. Chlorite schist and chlorite-sericite schist are the most common rock types within unit 1 (Figs. 3 and 4) but conspicuous exposures of recognizable dacitic and andesitic volcanic breccia indicate that the schists were mainly derived from volcanic rocks. Interlayers of grey phyllite, slate, and sericitic quartzite also indicate that part of the succession is of sedimentary origin. Carbonate rocks are absent near the deposits, but are widespread on both sides of the Thompson River near Vavenby, 13 kilometres to the east.

Uranium mineralization occurs in unit 3 which consists of alkali feldspar porphyry (McCammon, 1954), porphyry breccia, lithic-crystal tuff, and tuff breccia of trachytic composition and, at some localities, pyritic schist of rhyolitic composition. Most rocks in the 'trachyte' unit are rich in potash feldspar and sericite, with lesser amounts of albitic plagioclase, and are virtually lacking in quartz and mafic minerals. The pyritic schists of rhyolitic composition contain abundant quartz as well as feldspar, but only form a small part of unit 3 (Fig. 3). Rocks of the 'trachyte' unit are light grey in colour and are usually stained rusty brown or yellow due to widespread pyrite. They may be massive, brecciated, or markedly schistose and lineated. Most thin sections studied show a fine-grained groundmass of feldspar and sericite containing large, fractured, and sheared crystals of potash feldspar and albitic plagioclase and rock chips of trachytic composition. Fracturing and shearing of groundmass, phenocrysts, and rock clasts are ubiquitous but vary greatly in intensity. Some specimens are truly mylonites with an intensely sheared and granulated matrix and crushed phenocrysts while others show only some fracturing.

Parts of the 'trachyte' unit, and particularly the relatively massive feldspar porphyry found on the B zone, are probably of intrusive origin, while breccias found on the A, BD, and fluorite zones and south of the BD

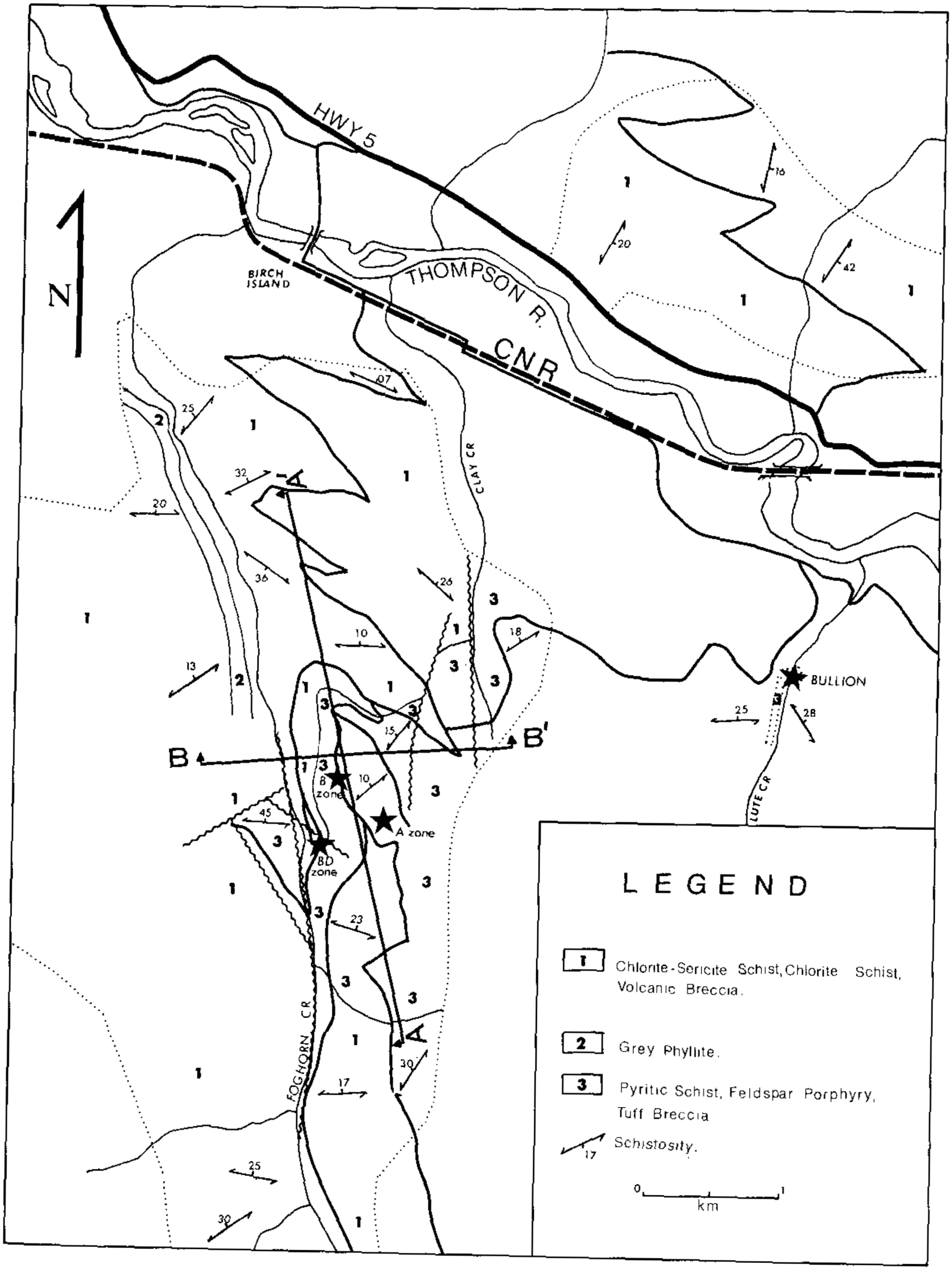

Figure 3. Generalized geology of the Rexspar property.

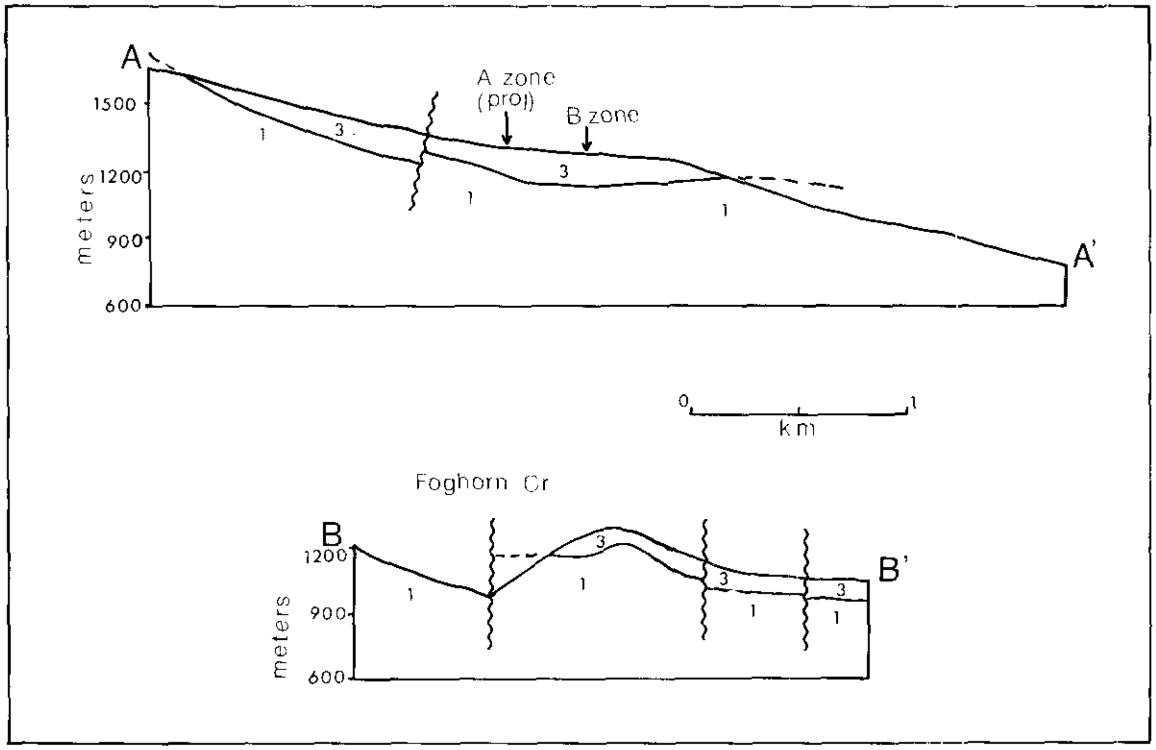

Figure 4. Cross-sections to accompany Figure 3.

zone appear to be mainly of extrusive origin. Although conformable with the schists above and below it, the 'trachyte' unit is apparently a mixture of intrusive porphyry and its extrusive equivalent tuffs and tuff breccias. If a crosscutting feeder system to this highly differentiated volcanic-intrusive pile has been preserved, it is probably in the vicinity of the B zone or between the B and BD zones, where most of the massive feldspar porphyry occurs.

The main radioactive zones occur in darker coloured areas of the 'trachyte' unit which are extensively replaced by silver-grey fluorphlogopite and pyrite. Recent drilling indicates that ore-grade material occurs in a series of discontinuous lenses generally less than 20 metres thick and conformable with the schistosity. Fluorphlogopite-pyrite replacements, commonly with lesser amounts of fluorite and minor calcite range from a few centimetres to several metres in size, and generally occur as coarse-grained segregations which show both conformable and crosscutting relationships. All phases of the 'trachyte' unit, including the zones of fluorphlogopite-pyrite replacement and uranium-fluorite mineralization, display some evidence of deformation, ranging from nearly massive to markedly schistose and lineated. They appear to have been subjected to most or all of the deformation that affected the surrounding rocks of unit 1, although their response was not uniform.

The fluorite zone lies immediately north of the A zone. As previously described (McCammon, 1954), this zone is tabular, strikes northeast, and dips gently to the northwest parallel to the schistosity of the host rocks. Mineralization consists of fluorite and celestite with pyrite, in lithic tuff and tuff breccia of the 'trachyte' unit. Radioactivity is weak to moderate in this zone.

Previous work by officers of the Geological Survey of Canada and British Columbia Ministry of Mines and Petroleum Resources indicates that the principal radioactive minerals at Rexspar are uraninite, uranothorite, bastnaesite, torbernite, and metatorbernite. Analyses done at the British Columbia Ministry of Mines and Petroleum Resources (McCammon, 1954) consistently indicate appreciable amounts of thorium oxide and traces of rare earths in all three radioactive zones. The close relationship between fluorphlogopite-pyrite replacement and uranium-fluorite mineralization and the commonly deformed nature of the mineralized rock indicate that mineralization occurred during the development of a high-level intrusive-extrusive system of highly differentiated trachytic rocks. The fluorphlogopite, pyrite, fluorite, and uranium-bearing minerals were probably deposited during a late stage in the evolution of this igneous system by deuteric, volatile-rich fluids. The considerable amount of thorium and widespread rare earths associated with the uranium tend to support the thesis that this element is of primary origin rather than secondary.

The structure of the Rexspar area is complex and further complicated by poor and widely scattered outcrops. A few key exposures along Highway 5 and on the slopes north of the Thompson River show that the prominent schistosity, which is parallel to the compositional layering and was probably produced during the first phase deformation, is deformed by tight, recumbent, east-trending second phase folds. These structures are in turn refolded by upright third phase structures which trend northerly to northeasterly. Late kinks and prominent tension fractures trend northerly and represent a fourth and last set of structures.

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