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Aley
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GEOLOGY SESSION I

2:00 p.m., NEWCOMBE AUDITORIUM - PROVINCIAL MUSEUM

Session Chairmen: Mr. Dani Alldrick and Mr. Gerry Ray, Ministry of Energy, Mines and Petroleum Resources

Paper No. 5 -- 2:00 p.m.

"GEOLOGY AND MINERALOGY OF THE ALEY CARBONATITE, OSPIKA RIVER AREA, B.C.

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The Aley carbonatite is located in the Rocky Mountains east of Williston Lake. The complex is roughly circular in plan, up to four km in diameter and intruded Cambrian and Ordovician sedimentary rocks in Mississippian time. It is composed of three major units: a two km diameter core of dolomite carbonatite with minor calcite carbonatite, an intermittent amphibolite annulus, and altered sedimentary host rocks of the Kechika Group and Skoki Formation.

Niobium zones occur in the carbonatite core: niobium-bearing minerals are mainly fersmite, a relatively unusual calcium niobate, as well as pyrochlore and minor columbite. Preliminary trenching and drilling show that these zones are large enough to warrant exploration attention. Apatite is 5 to 10 per cent of the carbonatite, and biotite, phlogopite, pyrite and magnetite are common accessory minerals. Minor concentrations of rare earth minerals, mainly bastnaesite, burbankite and monazite occur, primarily in altered sedimentary host rocks.

Two features of the Aley carbonatite that are not common to most carbonatites are the widespread alteration of pyrochlore to fersmite and the lack of aluminous syenitic rocks.

The complex may have been emplaced at relatively shallow depths, perhaps along major cratonic fractures such as the MacDonald Fault. It has been tilted and deformed somewhat by later folding and thrusting.

Alyx Creek contd

RB dykes in ophiolite belt
Fe⁺² dolomite, 11 bedded Ce Sr Ba F enriched
pyroxene amphibole calcite

RB masses
Ce/La carbonates
Ce/La phosphates

Discovered 1980, staked 1982, 1983 map,
1984 cat roads 1985 drill cable drill

Nb zones.
pyroxene → altd to perovskite (iron mineral
of Nb at Alyx) it honeycombed vs dk brown
pyroxene. Columbite (black)

Nb grades throughout around perimeter of carbonate

Central zone - (up to 30% Nb) mag/py/calcite/pyroxene

Summary

1. amount carbonate
2. Fe-O host
3. carbonate mineralogy & variable occurrence
of altd of carbonate ore
4. Carb core ophiolite mag, altd host
5. defined art by textures
6. leucite saturated - ~~P, RBE, Nb~~ (also 25% Nb)

Nb Fe (REE, P)
(magnetite)

- may be economic re P₂O₅
- depending on road, power, etc.
- late phase dolomite dyke/vein - No data re RBE enrichment