240 x 10^3 / 6 / 1440 x 10^6 lbs. / 2240. / .6428 x 10^6 / 642800 mT = large size.

240 M tons : 30% Mo. (Mining Review May/June 1981 p $33)

Paper 6-5—4:00 p.m.

The Quinsam Coal Project.

D. BARNSTABLE, Project Engineer, Luscar Limited, Edmonton.

Quinsam Coal Ltd., a joint venture of Weldwood of Canada and Luscar Ltd., is assessing the potential of developing a thermal coal deposit near Middle Quinsam Lake on Vancouver Island. The coal reserve outlined is classified as a high-volatile, bituminous "A" steam coal and is composed of four separate seams of varying quality within the Late Cretaceous Comox Formation.

Open-pit mining methods will utilize a walking dragline and a truck/shovel module as the primary stripping tools. Following washing and mechanical drying in a Baum jig preparation plant, the coal will be transported to the proposed dock at Campbell River for shipment via 55,000-DWT vessels to world markets.

The paper will outline the development and status of the project to date.

Session 7: GEOLOGY, Vancouver Island Room, "Molybdenum-Tungsten-Tin in the Northern Cordillera", with ALVIN JACKSON, Amoco Canada Petroleum Co. Ltd., Vancouver, and ROY C. McMICHAEL, Cominco American Inc., Spokane, Washington, Session Chairmen

Paper 7-1—2:00 p.m.

Geology of the Kitsault (Lime Creek) Molybdenum Deposit, Alice Arm.

ROGER C. STEININGER, Climax Molybdenum Company, Golden, Colorado.

The Kitsault molybdenum deposit is about 90 miles northeast of Prince Rupert, B.C. It is genetically related to the composite Lime Creek intrusive complex, which includes Jurassic Bowser Lake Group graywacke and argillite units, about 3 km east of the Coast Range Crystalline Complex. The stock is surrounded by an aureole of biotite hornfels.

The Lime Creek intrusive complex is composed of at least five phases that form small stocks and related dykes. The apparent sequence of intrusion begins with the east lobe and marginal phases, continues through the southern and central phases, and culminates with the northeast porphyry and related intramineral dykes. These intrusives have compositions that vary from quartz diorite to quartz monzonite and are approximately 54 million years in age. A swarm of lamprophyre dykes postdates both the Lime Creek complex and mineralization. The most recent igneous event is represented by a series of olivine basalt flows that are approximately one million years in age. Intense glaciation removed significant portions of the mineralized intrusive complex.

Molybdenite occurs as disseminated grains in late magmatic aplites, and in three distinct ages of veining. Each vein age consists of a triplicate initiated by quartz veins, followed by quartz-molybdenite veins and terminated by quartz-pyrite veins. The first triplicate appears to be related to the central phase of the Lime Creek intrusive complex. These veins are cut by intramineral dykes related to the northeast porphyry. The second triplicate appears related to the northeast porphyry itself. A source for the third triplicate has yet to be identified. The last hydrothermal event consists of polymetallic quartz veins that are post-main-stage molybdenum mineralization, but contain rare molybdenite. The gross outline of the mineralized zone is annular in plan and arcuate in section (before glaciation).

Hydrothermal alteration is directly related to each vein triplicate. Potassium silicate alteration as secondary alkali feldspar selvages along vein margins and rare secondary biotite are associated with the initial quartz veining. Quartz veins in the barren interior of the annular molybdenite zone are most abundant and produce a highly silicified zone. Phyllic alteration, though rare, is associated with the quartz-pyrite veins. Argillic alteration is common throughout the deposit and appears to be related to all phases of mineralization.

The similarity of chemistry, mineralogy and age between the Lime Creek intrusive complex and the intrusives of the eastern part of the Coast Range Crystalline Complex suggests that they are all genetically related.

Paper 7-2—2:30 p.m.

Mt. Ogden Molybdenum Deposit.

MICHAEL J. BELEY, Berma Industries Limited, Langley, B.C., B. TAYLOR and W. VANDERPOLL, G.A. Noel and Associates, Vancouver, and F. ONUCKI, Vancouver.

A molybdenum deposit noted 20 years ago by J.G. Souther during his work in the Tulsequah map-area appears to be significant, based on the collection of 96 large samples in 1978. The deposit is located at 58°27N and 133°22'W, 1 km east of the Alaska-B.C. border at Mt. Ogden. It is exposed in the headwall and sidewalls of an active cirque.

Molybdenite is present mainly in quartz veins in a stock of alaskitic granite. Quartz, sericite and minor fluorite comprise alteration selvages on veins. The host alaskite is a fine- to medium-grained equigranular rock which is exposed discontinuously over an area of 1800 by 1500 m. The stock is one of the numerous younger phases of the Coast Plutonic Complex which intrude marine metasediments as old as 900 Ma in this region.

The paper will present some of the results of a major exploration program carried out on the property in 1979 by Omni Resources Inc.

Paper 7-3—3:00 p.m.

Geostatistical Solutions to Ore Estimation Problems for Porphyry Molybdenum and Vein-Type Deposits

M. DAVID, M. DAGBERT and D. FRANCOIS-BONGARCON, Department of Mineral Engineering, Ecole Polytechnique, Montreal, Que.

Over the past 10 years, several applications of geostatistics have provided useful solutions for exploration and reserve calculation problems in B.C. porphyry molybdenum or vein-type deposits. This paper will present several actual examples in which geostatistical concepts are explained and simple solutions developed. Problems covered will include those of sample preparation, validation of surface drilling culminating in complete ore reserve estimations, and grade control. Several simple "how-to" methods only requiring a pocket calculator will be presented so that organizations not having access to a large computer or not having computerized their data base can gradually develop in-house geostatistical grade control methods. In addition, an example of an interactive programming stage to predict at the exploration stage whether additional drilling may change the average grade of a deposit will be shown as an example of more sophisticated methods.

Paper 7-4—3:30 p.m.

Geochemistry of Molybdenum, Tungsten and Tin in the Canadian Cordillera.

S.B. BALLANTYNE, Resource Geophysics & Geochemistry, Geological Survey of Canada, Ottawa, Ont.

The trace-element content in stream sediments is depicted in the form of colour-contoured computer plots of data acquired during provincial and federal-provincial regional geochemical surveys. Dispersion patterns and the partitioning of tin and tungsten concentrations in different mesh fractions from stream sediments and heavy mineral panned concentrates are examined for several types of mineralization and stream drainage systems. The trace-element concentrations and whole-rock geochemistry of some possible stanniferous granitoids are discussed.

Lake-sediment sampling of cirque and finger lakes within batholiths and in kettle lakes in till-covered terrain shows higher contrasts in molybdenum content than obtained in streams in the same drainages, as demonstrated in the Atlin area and the Glundeberry batholith of northern British Columbia.

Mike Braly Al + Ogden.

Pierce Treman [illegible] + [illegible] intruded by light colored QM + [illegible], volc dykes

[illegible] + [illegible] Up to volcs [illegible].

[illegible] [illegible] out, [illegible] up into [illegible].

4 [illegible] / m. dry in N zone.

1 Kspar alter inward in [illegible].

Rut. gets c.s. with depth.

Y zone may be cut at places with deeper [illegible].