

W.A. No.

NAME

171. WASHINGTON; DOWNER

SUBJECT

EXTERIOR PUBLICATIONS

92F116-04
PROPERTY FILE

007195



BETTER RESOURCES LIMITED

Mt. Washington 92 F/14

COMPANY DESCRIPTION

92F 116

.117

High \$0.80
Low \$0.27
Recent Range \$0.47-\$0.80
Average for 1983 \$0.89

PRICE RANGE

CORPORATE PROFILE

CAPITALIZATION

COMPANY OFFICE

3431 Bowen Drive
Richmond, B.C. V7C 4C6
(604) 277-1405

DATE OF INCORPORATION

May 14, 1981

DATE OF LISTING (VSE)

March 29, 1983

AGENT FOR PUBLIC OFFERING

Canarim Investment Corporation Ltd.
P.O. Box 10337, Pacific Centre
700 West Georgia Street
Vancouver, B.C. V7Y 1H2

Odlum Brown Limited
Stock Exchange Tower
1800-609 Granville Street
Vancouver, B.C. V7Y 1A3

SHARE DISTRIBUTION

Float (sold for cash)	600,000
Property Acquisition	750,000
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	1350,000

TRADING EXCHANGE

Vancouver Stock Exchange
P.O. Box 10333
609 Granville Street
Vancouver, B.C. V7X 1H1
(604) 689-3334

TRADING SYMBOL

BRZ - Vancouver Stock Exchange

PROPERTY FILE

92F116-05

COMPANY DESCRIPTION

BETTER RESOURCES LIMITED was incorporated under the laws of the Province of British Columbia by registration of its Memorandum and Articles. The Company is primarily engaged in the exploration and development of mining properties.

PRICE RANGE

High	\$0.80
Low	\$0.27
Recent Range	\$0.47-\$0.60
Average for 1983	\$0.59

CAPITALIZATION

Shares Authorized	10,000,000
Par Value	no par value
Free Trading Shares	600,000
Shares Issued for Properties	750,000
Number of Shares Pooled	none
• Restricted Shares	815,000

* Restricted Shares

Escrow	750,000
Directors incentive option	65,000
Reserved for future property payments	100,000

OFFICERS AND DIRECTORS

James F. Bristow, P.Eng.
President and Director
3431 Bowen Drive
Richmond, B.C. V7C 4C6

William R. Bacon, PhD., P.Eng.
Vice President and Director
R.R. #1
Saltspring Island, B.C.

Dennis W. Milburn, C.A.
Secretary-Treasurer and Director
20460 - 46A Avenue
Langley, B.C.

Richard E. Kucera, PhD.
Director
6339 Stores Road
Vancouver, B.C.

COMPANY ADVISORS

McInnes and Neumann,
Solicitors and Legal Advisors
Deloitte, Haskins & Sells
Auditors

Pacific Corporate Services Limited
Transfer Agents

R.H. Seraphim, Ph.D., P.Eng.
K.E. Northcote, Ph.D., P.Eng.
Geological Consultants

CONDENSED BALANCE SHEET

ASSETS

Cash in Bank	\$25,701
Term Deposits	5,467
Accounts Receivable	21
Mineral Claims	12,503
Deferred Exploration and Development Costs	100,510
TOTAL ASSETS	\$144,202

LIABILITIES AND SHAREHOLDERS' EQUITY

Accounts Payable	\$ 1,000
Shareholders Equity	143,202
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	\$144,202

Note: All figures in Canadian Dollars as at
October 31, 1983

COMPANY PHILOSOPHY

BETTER RESOURCES LIMITED intends to:

1. Explore for economically viable mineral properties.
2. Create opportunities for investment by major resource companies and individuals.
3. Direct the development of properties with economic potential.
4. Carefully control all company finances.

PROPERTIES

BETTER RESOURCES LIMITED has acquired two mineral properties with exceptional potential: the Key claim group, a copper prospect near Merritt, B.C., and the Mt. Washington gold-silver prospect near Courtenay, B.C., on Vancouver Island.

The Key claim group is 100% owned by Better Resources Limited and lies immediately west of the Craigmont Mine. The claim group has a geological environment similar to that at the Craigmont Mine. To date three diamond drill targets have been identified which may contain high grade copper ore. The Craigmont Mine produced over 870,000,000 lbs. of copper with ore grades as high as 6% Cu., and the company paid \$110,000,000 in dividends before closing in 1982.

The Mt. Washington property is held under option. Better Resources Limited will earn a 90% interest in this property by completing the current work commitment. Work completed to date suggests that high grade gold mineralization occurs in a gently dipping horizon underlying the north spur of Mt. Washington. This structure is partially outlined by a large open-ended soil geochemical anomaly with values up to 6200 p.p.b. gold. Samples from limited trenching and diamond drilling range in value from 0.002 to 1.16 oz./ton gold and 0.03 to 10.70 oz./ton silver. A portion of this will be amenable to open pit mining.

PROPOSED PROGRAMS

Both properties are at the diamond drilling stage.

R.H. Seraphim, PhD., P.Eng., recommends drilling the three target areas identified on the Key group at an estimated cost of \$183,000. On the Mt. Washington property, Dr. K.E. Northcote, P.Eng., recommended a two stage exploration program. The first stage has been completed and the results reviewed. Commencement of the second stage consisting of diamond drilling at an estimated cost of \$250,000 has been recommended.

Both programs will commence as soon as snow conditions and financing permit.

THE FUTURE

BETTER RESOURCES LIMITED will seek public financing to carry out the above proposed programs, and acquire other properties which will attract additional shareholder interest. Joint venture offers and private placements will be considered to enable Better Resources Limited to make the best use of its expertise in recognizing and developing quality resource ventures.

The 1000-ton Cumberland Mining Co. mill was moved from the former Woodgreen operation and is now working 4½ miles from new pit.



B.C.'s latest copper operation — The Mt. Washington-Cumberland joint venture

By C. MAMEN, Editor

Inter company co-operation is successful in bringing in a new metal producer on Vancouver Island. A brief preliminary report prepared by the editor based on his attending the official opening ceremony in December.

CANADA'S NEWEST COPPER MINE officially commenced production in December 5, 15 miles east of Courtenay on Vancouver Island. This is the joint venture of the Mt. Washington Copper Co. Ltd., and Cumberland Mining Co. Ltd. — the first contributing the orebody and the latter the milling plant. The operating company is called Mount Washington Milling Co. Ltd. The unique arrangement between the two companies was the logical answer to the problem of bringing the Mount Washington property into production.

Interest in the area goes back over 20 years when Malcolm MacKay first staked it. It has since been investigated by such groups as the H. K. Springer and Associates in 1941, Cominco in 1944, and Noranda in 1951. It is however due to the firm belief and persistent efforts of a veteran prospector Gordon C. Murray, who in 1956 formed Mt. Washington Copper Co., that the property finally achieved the status of a producer. Extensive exploration work was subsequently performed in partnership with Noranda Exploration Ltd. under the jointed owned Qualicum Mines; by Mt. Washington itself; and finally last year in partnership with Cominco. Mt. Washington under terms of a revised agreement with Cominco acquires sole rights on the main showings and went ahead with plans to go into production. Having proved up some

Greenwood?

600,000 tons of 1.4 per cent copper ore with gold and silver values, it was logical to invite participation by Cumberland Mining Co. to supply the 1000-ton mill from their former Woodgreen operation. An agreement was entered into by Cumberland with the Japanese firm of Furukawa Mining Co. for the sale of the entire output of copper concentrates, and to advance sufficient funds to move the mill from its location 400 miles inland to its new site and to re-erect it 4½ miles from the pit area.

Geology

The Mount Washington workings are located between 4200 and 4400 feet above sea level on the shoulder of a 5000-foot high mountain which bears the same name.



The Japanese Ambassador to Canada, His Excellency Hisanga Shimadzu and B.C. Minister of Mines, the Honourable Donald Brothers "cut the ribbon".

Cylinder Operated Accessories

Racking Back: It is a distinct advantage to be able to move the drill back from the hole. The swivel head then does not have to be removed or opened during hoisting, driving or other operations. A hydraulic cylinder is the simplest means of moving the machine from or to the drilling, or hoisting position.

Derrick Raising: The safest and most convenient method for raising or lowering masts, or swinging swivelring type masts is with a hydraulic cylinder.

Swivel head Opening and Closing: When it is not desirable to move the drill while hoisting, the swivel head is usually opened, moving the feedscrew rod and water-swivel out of the way. With the larger swivel heads, especially on angle holes, a cylinder provides the safest and easiest method.

Levelling Jacks: On truck, tractor or trailer mounted drills, independently controlled hydraulic jacks offer a quick convenient method for levelling the unit. Present designs are such that no additional blocking is required and the complete outfit may be supported entirely on the jacks during the time on the hole.

Rod Joint Uncoupling: The increased use of larger size drill rods and drill pipe, especially when used with rock bits, has created a demand for a means of breaking out rod joints. A simple device is a cylinder connected to a large pipe wrench via a cable. Hydraulically powered "Spinning Tongs" common to oil field drilling are now frequently used on diamond drills. These power tongs use a high torque, low speed ratio to loosen the joint and can be shifted to a higher speed to "spin out" the joint. As they are reversible they can also be used to make up a joint to a predetermined torque.

Foot-Clamps: A hydraulically operated foot-clamp, whether operated by a powered or foot operated pump, offers convenience of control location and removes all hazard to the operator.

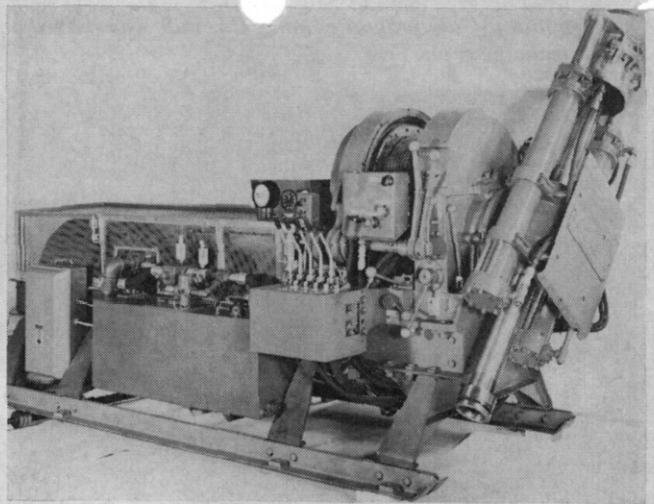
Power-Brakes: Power operated or assisted hoist brakes are as much an advantage on a drill as they are in your car. Their controls can be mounted anywhere on the drill, to suit the operator's convenience.

Swivel Heads

The most important component of any drill is, of course, the swivel head. On surface drills, during the past few years, our own experience shows that the hydraulic swivel head is becoming more popular than the gear feed type. This to a certain extent, is probably caused by the increased use of the diamond drill on construction projects for foundation testing, grouting, etc. where the majority of the work is through overburden.

Additionally, the use of hydraulic swivel heads for underground work is becoming quite common. These underground drills usually consist of a standard hydraulic head, that will accommodate "BX" Wireline rods, mounted on a single or twin mining bar set-up. They are powered with a high torque piston type air motor or a high speed vane type dependent on their job application. The hydraulic supply unit is a vane-motor driven pump on a skid mounted tank.

Although the hydraulic swivel head is more versatile than the gear feed this generally is of benefit only with a skilled operator. There are available, in addition to the standard needle valve type, various controls and accessories for the hydraulic swivel head which can simplify its operation for either the semi-skilled or experienced runner. Some of these are:



Model BBS-3 drill driven by 75 H.P. electric motor through constant torque, variable speed fluid coupling for speed control. "HW" size hydraulic swivelhead with hydraulic chuck, automatic feed pressure control, bit load and speed indicator, hydraulic swivelhead opener. Additional accessories not shown include hydraulic machine positioner, hydraulic derrick raising cylinders, hydraulic rod spinning tongs, hydraulic wireline hoist.

Float Control: This interconnects both ends of the feed cylinder so the drive tube can move freely in either direction. This will allow a "chucked" rod to follow the threads of a mating rod when making up or breaking out joints by rotating the head. It also allows one to drill utilizing only the weight of the rod string, similar to using a Kelly.

Feed Pressure controls are available which will control the drilling load and yet leave full system pressure instantly available for quick feed reversal.

Quick Return controls which, by use of regenerative circuits, can run the drill head back at twice the speed of normal circuitry.

Combination Control valves are available which combine these preceding three functions in one valve body plus a standard needle type control. A single lever selects any of the four control methods.

Bit Weight Indicator: This shows the exact weight on the bit, at all times, regardless of the feed rate or formation resistance. This is a "must" to obtain maximum bit performance and life, especially with inexperienced operators.

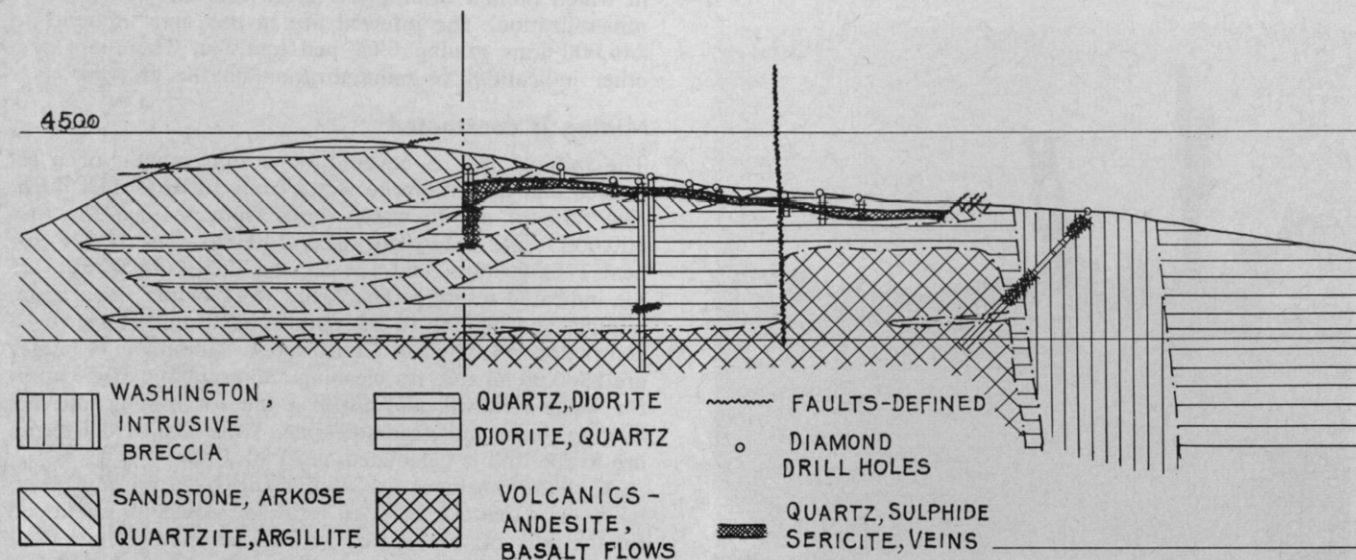
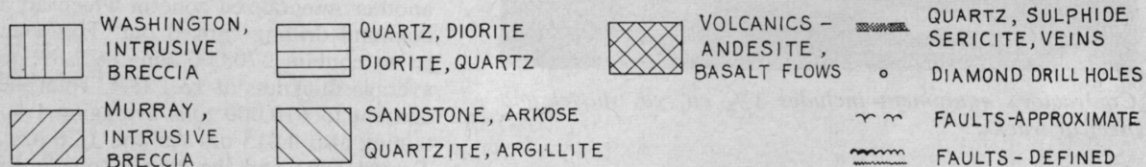
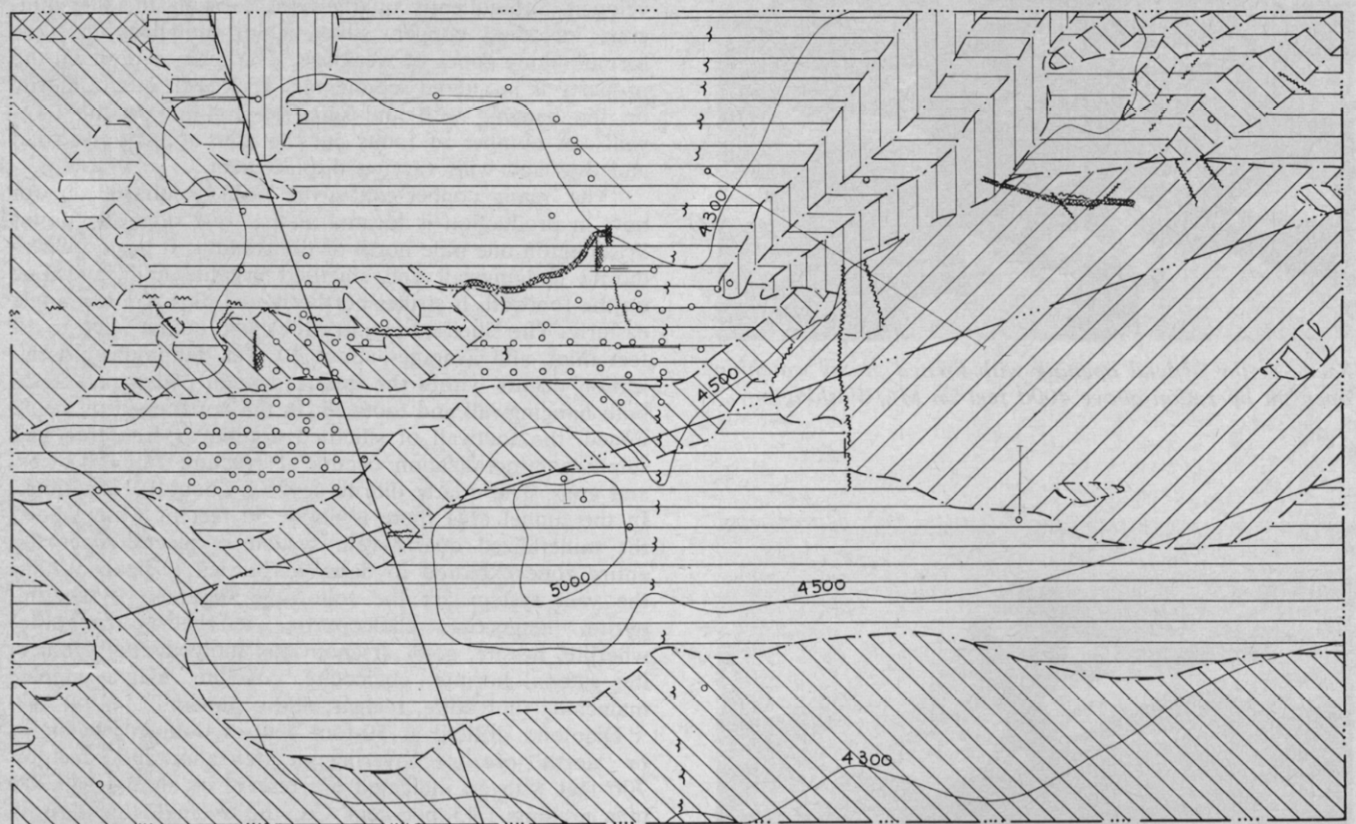
Hydraulic Chucks: Open or close as fast as the control lever can be moved. The automatic self centering action ensures freedom from vibration and reduces rod wear caused by off-centre manual chucking.

Although this discussion has been confined to standard hydraulic circuits and the use of stock components there are many further applications of hydraulics. For example, the bit feed rate can be modulated by the drill pump pressure stopping the feed, if the pressure should rise suddenly indicating a mudding or blocked bit, or if the pressure should drop suddenly through loss of circulation.

The application of Fluid Power to the diamond drill is just an extension of time-proven principles used to great benefit in the automotive, aircraft, marine and machine tool industries. There is no reason why it should not result in the same benefits to the diamond drill operator.

The regional and local geology has been described in a report by A. R. Allen. The general area is underlain by volcanics and sediments of Permian and Triassic ages intruded by granitic rocks of the Coast Range batholith in the Jurassic and Cretaceous ages. These are overlain by

sediments comprising sandstones, siltstones, shale, coal, conglomerate, breccia, quartzite, and argillite of late Cretaceous age. These in turn have been intruded by later Cretaceous or early Tertiary granodiorite, quartz diorite, quartz diorite porphyry, and breccia. Glacial till, sand,



Plan and longitudinal section showing Mount Washington copper ore deposits.



Scene at the official opening with invited guests watching open pit operation above 4000 feet on Mt. Washington.



Contractor's equipment includes 1½ cu. yd. shovel and fleet of trucks.



Air Trac machines drilling blast holes to take the top off copper orebody.

clay, gravel, silt, and peat of Pleistocene to recent age lie above the previous consolidated rocks.

"A quartz diorite stock appears to have had a doming effect on the Triassic volcanics and Upper Cretaceous sediments, and dykes and sill-like intrusive bodies have penetrated the older rocks adjacent to the stock. During the later stages of intrusion, pipe-like breccia zones developed. Subsequently quartz veins carrying metallic minerals including copper, silver, gold, molybdenum were formed along zones of weakness. The main deposit on the property is in altered sedimentary rock with quartz diorite on the hanging wall and silicified argillite on the footwall". A number of faults cut the area at various strikes and dips and with varying displacement."

"The main copper-gold-silver bearing quartz deposit now in production is located at the west ridge of Mount Washington one mile north of the summit. It has a quartz-diorite hangingwall and silicified argillite and sandstone on the footwall. It strikes northerly and dips at a low angle easterly. The silicified country rock and quartz is up to 20 feet thick and averages about 10 feet. Sulphide mineralization occurs within the quartz, and in places penetrates both hangingwall and footwall. In the north open pit being mined, the footwall of silicified argillite is fractured and sulphide mineralization occurs at fracture fillings, blebs, and gobs. The quartz diorite cover is about 10 feet thick. In the tunnel area there is about 50 feet of waste above the mineralized quartz vein system in places. Over the entire zone explored to date overburden is light. Within the vein system are the following minerals: pyrrhotite, pyrite, magnetite, chalcopryite, tetrehdrite-tennantite, wherlite, hessite, gold, arsenopyrite, molybdenite, sphalerite, galena, bornite, chalcocite, covellite, native copper, malachite, molybdate, realgar, and orpiment."

Diamond drilling at 50-foot centres outlined the main or "north" orezone covering an area about 400 feet by 700 feet with an indicated ore reserve of almost 240,000 tons grading 1.43 per cent Cu; the average thickness is 10.3 ft. Some 700-800 feet to the south of this zone is another mineralized zone in which an adit was driven and diamond drilling carried out. This area has been estimated to contain 370,000 tons of 1.39 per cent Cu with an average thickness of 13.1 feet. Total indicated ore reserves amount to 610,000 tons averaging 1.40 per cent Cu, containing also 0.015 ozs Au and 1.20 ozs Ag. In between the Tunnel Zone and the North Zone is an intermediate zone of about the same surface area as the North Zone and in which limited drilling has given indications of weaker mineralization. The inferred ore in this area amounts to 146,000 tons grading 0.65 per cent Cu. There are also other indications of mineralization on the property.

Mining is contracted

The mining area is covered by a thin mantle of overburden and quartz diorite waste from 10 to 50 feet thick. The ratio of ore to waste varies from 1:1 for the first 100,000 tons, 1:1½ for next 140,000 tons, 1:2½ for next 170,000 tons, and 1:4 for the final 200,000 tons of the indicated reserves. The entire work of pit preparation, mining, and hauling to the mill, is being undertaken by a contractor — Tymac Construction Company. Charges are \$300.00 an acre for cleaning and grubbing, \$0.50 a ton for waste removal, and \$1.20 a ton for mining and delivering to the mill feed stockpile. Total cost of delivering ore to the mill is calculated at \$2.50 a ton.

Air Trac machines are used to drill 2¾ in. and 3 in. holes on a pattern of 6 ft. × 6 ft. Amex is employed for the bulk of the blasting with 75 per cent Forcite used for wet holes. Loading of broken material is carried out with a 1½-cu. yd. North West shovel and a Lima shovel of similar capacity. A fleet of trucks of various makes

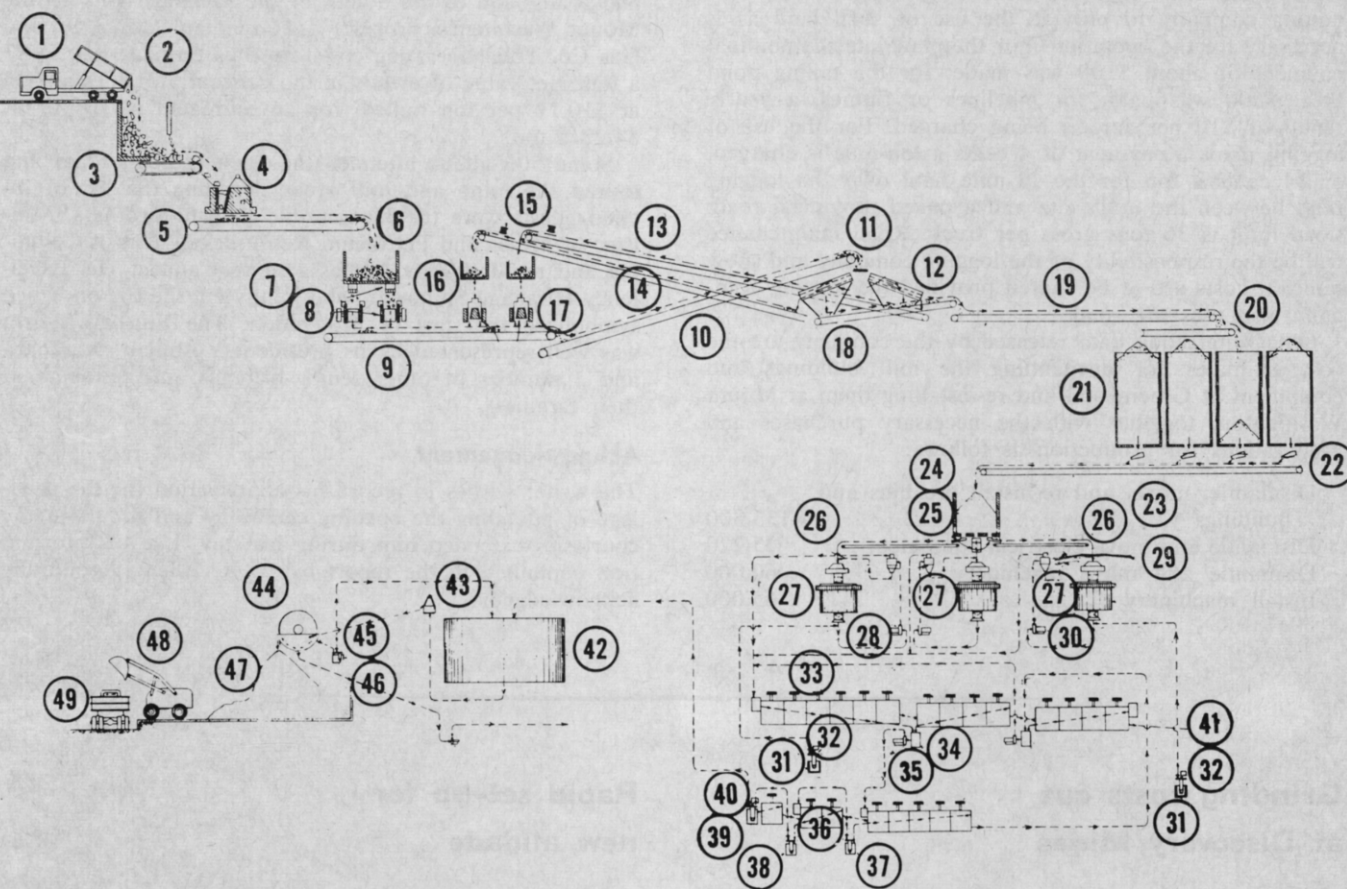
and capacities haul from the shovels to the mill stockpile. These include units owned by outside sub-contractors as well as three 17 cu. yd. Kenworth Darts by the Tymac Construction. Bulldozers are used for stripping, and general clean-up and maintenance of pit floor and roads. With an annual precipitation of 40 inches at the 4,000 foot pit elevation and snow up to 20 feet deep during winter, it is the intention to mine and haul to the mill only during the snow-free season. A sufficient stockpile is already on hand to permit this for the current winter.

Woodgreen Mill serves again

Milling is a straightforward flotation operation using the former Woodgreen concentrator of 800 to 1000 ton daily

capacity. Crushing is first done in a 42 in. × 30 in. Kue-Ken jaw crusher fed by a 36 in. × 10 ft. Lippmann pad feeder followed by two 36 in. × 10 in. Kue-Ken jaw crushers. The product is screened on two 4 ft. × 12 ft. Overstrom vibrating screens and the oversize further reduced in two No. 36 Kue-Ken gyratory crushers. Fine ore storage is provided in four 20 ft. × 20 ft. wood stave bins of 200-ton capacity each.

Grinding to 60 per cent minus 200 mesh is done in three 8 ft. × 6 ft. Marcy ball mills with 12 in. Dorrclone classifiers. The flotation circuit comprises 14 Wemco Fagergren No. 66 rougher cells, and eight Fagergren No. 62 cleaner and re-cleaner cells. Concentrates are thickened in a 30 ft. × 12 ft. Dorr thickener and dried to 8



Mill flowsheet

- | | | |
|--|--|---|
| 1 — Off-highway trucks mine run | 19 — Conveyor no. 7 — 18" | 33 — 14 — Rougher cells Fagergren no. 66 |
| 2 — Truck dump hopper 50 ton capacity | 20 — Shuttle conveyor no 8 — 18" x 46'-0" | 34 — Sump box |
| 3 — 36" x 10'0" Lippman pan feeder | 21 — Fine ore bins 250-ton capacity each | 35 — 8 — Cleaner and recleaner cells Fagergren no. 62 |
| 4 — 42' x 30' Kue-Ken Jaw Crusher | 22 — F44-DT Syntron vibrating feeders | 36 — Sump box |
| 5 — Conveyor no. 1 — 36" | 23 — Conveyor no. 9 — 18" | 37 — Galigher vertical pump 2 1/2" |
| 6 — Surge bins 30-ton capacity | 24 — Mill fine ore bin 100-ton capacity | 38 — Galigher vertical pump 1 1/2" |
| 7 — 30" x 60" Syntrol vibrating grizzly feeders | 25 — Hardinge Weightometer feeders 24" x 5' 0" | 39 — Sump |
| 8 — 36" x 10' Kue-Ken jaw crushers | 26 — Conveyor no. 10 — 18" and Conveyor no. 11 — 18" | 40 — Galigher vertical pump 2 1/2" |
| 9 — Conveyor no. 2 — 30" | 27 — No. 1 ball mill 8' x 6' Marcy No. 2 ball mill 8' x 6' Marcy No. 3 ball mill 8' x 6' Marcy | 41 — Final tailings to settling ponds |
| 10 — Conveyor no. 3 — 30" | 28 — Sand pumps SRL 5 x 5 | 42 — Dorr thickener 30'-0" dia x 12'-0" |
| 11 — Feed distributor | 29 — Type FR 12" Dorrclones | 43 — Dorrco duplex diaphragm pump — 4" |
| 12 — 4'-0" x 12'-10" double deck Overstrom vibrating screens | 30 — Sand Pump Vacseal 4 x 6 | 44 — Oliver filter 8'-0" dia x 10'-0" |
| 13 — Conveyor no. 4 — 18" | 31 — Floor wash sump | 45 — Sump box |
| 14 — Conveyor no. 5 — 18" | 32 — Galigher vertical pump 1 1/2" | 46 — Galigher vertical pump 1 1/2" |
| 15 — Suspended magnets | | 47 — Concentrate storage |
| 16 — Surge bins | | 48 — Front end loader |
| 17 — No. 36 Kue Ken gyratory crushers | | 49 — Truck |
| 18 — Conveyor no. 6 — 18" | | |

per cent moisture on an 8 in. \times 10 ft. Oliver filter. A front end loader picks up the concentrate from the storage area floor and trucks haul 120 miles to the dock and ship loading facilities of Cowichan Copper Co. at Hatch Point.

Mill water supply is drawn through an 8 in. wood stave pipeline from a dam 3,300 feet from the mill and 380 feet above it. Water is stored at the mill site in a wood stave tank and is drawn from it at the rate of 600 g.p.m., estimated adequate to mill 1000 tons per day at 30 per cent solids. Mill tailings are piped 8,000 feet in a 6-in. plastic line to a tailings pond below the concentrator.

Costs

Of interest where logging companies operate and have control of surface rights, is the arrangement made by this mining company to provide the use of such land as is necessary for the operation. For the plant site the nominal payment of about \$100 was made; for the tailing pond area, \$500 was paid; for pipelines or flumes, a yearly rental of \$10 per acre is being charged. For the use of logging roads a payment of 4 cents a ton-mile is charged, or 44 cents a ton for the 11-mile haul over the logging road between the mill's site and a paved provincial road. Load limit is 36 tons gross per truck. Road maintenance will be the responsibility of the logging company and snow removal costs are to be shared provided the logging company also uses the road.

Other interesting data released by the company are the cost estimates for dismantling the mill buildings and equipment at Greenwood and re-installing them at Mount Washington, together with the necessary purchases and preparations for production as follows:

Dismantle, move, and re-install ore bins and buildings	\$133,300
Dismantle and move electrical equipment	25,220
Dismantle and move machinery	60,000
Install machinery	65,000

Grinding costs cut at Discovery Mines

IN LOCATIONS where transportation costs are high such as at the Discovery Mine in the Yellowknife area of Northwest Territories, scrap steel has been used successfully and at savings to replace part of the grinding media. Grinding balls cost approximately \$300.00 a ton landed at this property and 110 tons are required a year; the scrap steel can be prepared for \$125 a ton. Grinding does not seem to be affected. Experiments have been carried out during the past year using Throwaway rock drill bits, drill steel, scrap shafting, etc., cut to three-inch lengths and used ball mill liners blasted to approximately 4 in. \times 4 in.

Although the Discovery mill was long believed to have a capacity of 165 to 175 tons per day, it is now running at about 215 tons per day, and without capital expenditure. This has been made possible due to the combined efforts of the consulting metallurgist, Professor F. B. O'Brien and the mill superintendent H. Werner. Simple adjustments were made to the existing equipment and the mill crew was placed on an incentive plan involving both output in ounces of gold and on recovery. The incentive arrangement is reported to be working quite satisfactorily.

Warehouse and office building	\$15,000
Water supply and tailings disposal system	15,000
Engineering and supervision	15,000
Equipment repairs, small tools, operating supplies	20,000
Power line and installation	100,000
Total	\$448,520

Mill operating costs based on 20,000 tons of feed per month have been estimated at \$1.25 per ton. Other costs include \$2.50 per ton for mining and hauling; \$1.40 for transportation, smelter, and treatment; \$0.25 for property taxes, head office, insurance, and overhead; \$0.10 for exploration; and \$0.33 for royalty payments including those made to the logging company for the use of plant site and roads, and to the holder of the mineral rights on the Mount Washington property — Canadian Pacific Oil and Gas Co. Total operating costs are thus estimated at \$5.83 a ton. Net value of metals in the concentrates is estimated at \$10.11 per ton milled, for an estimated net profit of \$4.28 a ton.

Some 500 guests attended the opening ceremonies and toured the mine and mill areas. Heading the list of invited guests were the Honourable Donald Brothers, Minister of Mines and Petroleum Resources of British Columbia and the Japanese Ambassador to Canada, His Excellency Hisanaga Shimadzu who jointly cut the ribbon which symbolized the start of production. The Furukawa firm was well represented by its president Yoshinara Narahara and a number of other senior officials and members of their families.

Acknowledgement

The writer wishes to record his appreciation for the privilege of attending the opening ceremony and for the many courtesies extended him during his stay. Use of information contained in the report by A. R. Allen is gratefully acknowledged.

Rapid set-up for new alidade

NEW AUTOMATIC THEODOLITE, the K1-A, manufactured by Kern of Switzerland, is being sold by the Survey & General Instrument Co. Ltd., of Fircroft Way, Edenbridge, Kent. This instrument employs an extendable aluminum rod which replaces the function of a plummet on conventional theodolites. Since the aluminum legs of the tripod can be quickly adjusted to bring a bubble incorporated in the rod into the latter's centre, it is claimed that the instrument can be set up, made plumb and level in under 45 seconds even in a high wind and on rough ground. In addition, the height of the instrument can be directly read off the rod for the purpose of tacheometry. The procedure for subtracting angles from 360 deg. when working counter-clockwise, has been considerably simplified by enabling the window of the horizontal circle to be turned so that the reading of the circle is reversed.

An important feature of this instrument is that the vertical circle index is automatically levelled by means of a 45 deg. prism set in the optical path of the vertical circle, thereby eliminating the need for an alidade bubble.