

For minerals industry management worldwide

Eskay Cr. p. 38

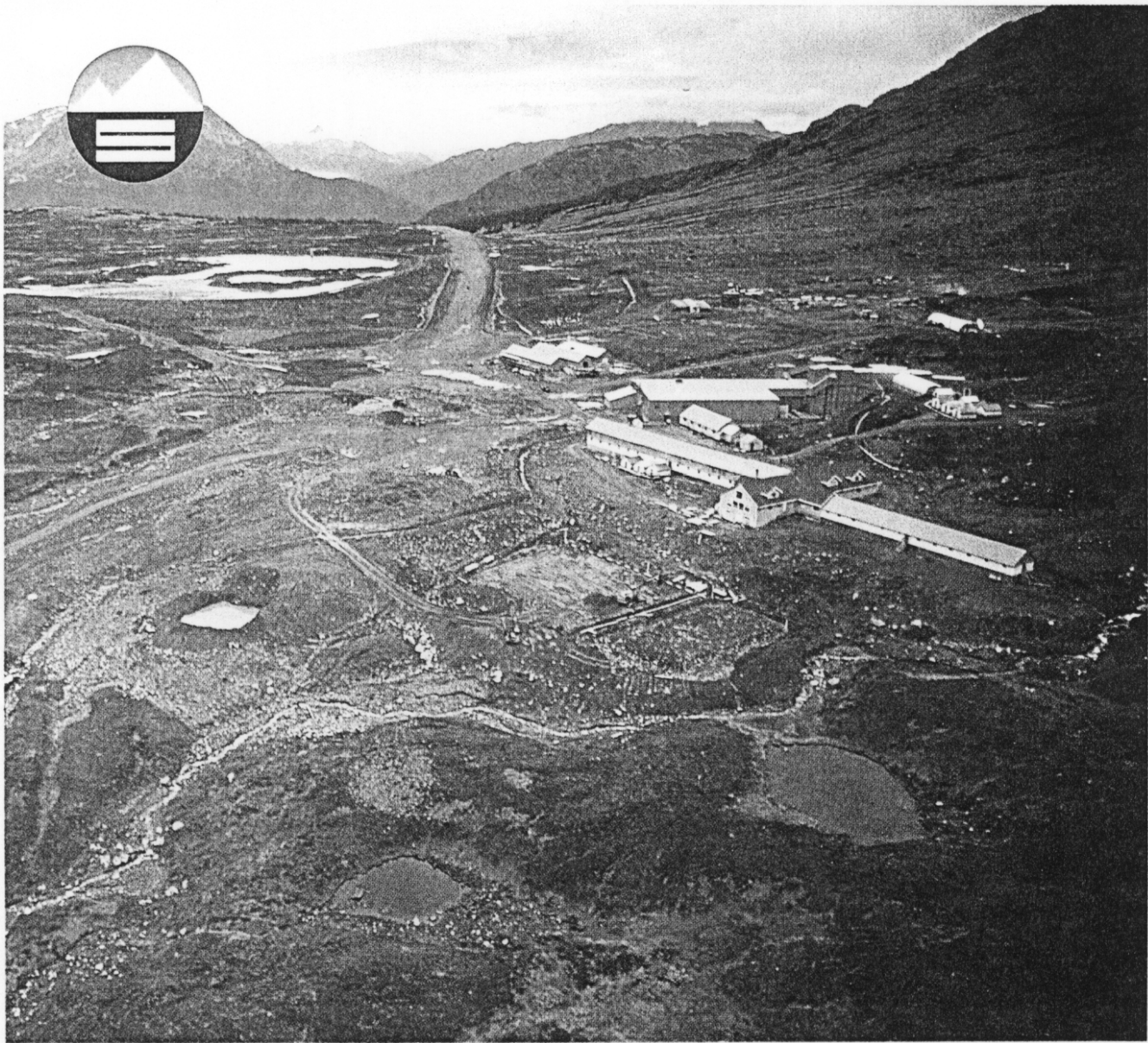
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MINING

Magazine



An aerial view of Skyline's Johnny Mountain gold mine in the Eskay Creek/Iskut River region of northwestern British Columbia, Canada, scene of much excitement in the precious metals industry. The company that led the way into the modern era in the Iskut gold belt was Skyline Gold Corporation.

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Skyline Gold's Johnny Mountain

The company that led the modern era in the Eskay Creek/Iskut River gold belt region of northwestern British Columbia is Skyline Gold Corporation with its Johnny Mountain mine.

The Johnny Mountain mill has two principal products: doré bars and a copper concentrate containing high values of gold and silver. In its first nine months of production, Skyline's Johnny Mountain has yielded 33,747 oz of gold, 59,452 oz of silver and 947,731 lb (430 t) of copper.

Meanwhile, although more than 100 companies have stakes in the Iskut gold belt, 175 miles (280 km) northwest of Terrace, B.C., there may have been more activity on stock exchange trading floors in the south. In less than three months this summer, the stock value of companies exploring the area rose \$C682 million.

Skyline Gold has 100% ownership of the Reg claim group, which covers an area of approximately 15,150 acres (6,131 ha) in the Iskut River region. A portion of these claims was the subject of an intensive exploration programme by Skyline, then known as Skyline Exploration, starting in 1980. A decision to bring the Johnny Mountain operation into production was made in 1987, with output commencing in 1988.

The property is at present accessible by aircraft using a 4,800 ft (1,465 m) airstrip on the Reg Claim Group. The property is serviced from Wrangell,

Alaska, and Terrace, B.C. Regularly scheduled flights to Johnny Mountain are made five times a week from Terrace. Plans have been developed to provide government-assisted road access, which will have a significant, favourable impact on production costs.

The mine is based on a vein-type gold deposit. The gold, silver and copper mineralization is associated with quartz/sulphide veins that occupy a series of northeast trending fracture zones. To date, underground development has been concentrated on three veins, 16, Discovery and Zephim, which are separated by cross-cutting faults.

Geology

The company's property lies within the Northern Boundary Ranges of the western Canadian Cordillera at the northwest corner of the Stewart Complex, a geologic terrain noted for major gold, silver, copper, lead, zinc and molybdenum mines.

Country rocks hosting the Johnny Mountain mine comprise a deformed thick sequence of early Lower Jurassic clastic and volcanic rocks trending east northeast and dipping steeply north. These are overlaid unconform-

ably by a thick sequence of gently dipping Late Jurassic to early Middle Jurassic volcanoclastic and volcanic strata to the south and east.

Early potassium feldspar alteration of the mixed host country rock sequence produced an extensive, irregular porphyry-like body in which veins, lenses and pods of pyrite and chalcopyrite form 3%-5% of the mass. Several episodes of quartz and carbonate veins and veinlets have also cut the porphyry, forming weak stockworks.

The porphyry and country rocks show abundant evidence of periodic cataclastic deformation prior to late major northeast-southwest fracturing, which formed channelways for further potassium feldspar alteration, and subsequent sulphide rich material, which formed the various Discovery, 16, Pick-Axe and Gold Rush vein systems. These extensive veins include approximately 20% to 25% pyrite, 2% chalcopyrite and some galena and sphalerite, as well as a variety of other sulphides, sulphosalts and rarer tellurides. Microcline and quartz along with calcite, ankerite, biotite and sericite form the bulk of the vein gangue component. The ankerite provides a buffering effect that assures basic mine drainage — an environmental plus.

Visible native gold is common in all these veins and forms the main economic mineral. Structural evidence, extensive potassium feldspar metasomatism and mineralogy suggest that the Stonehouse deposit on which Johnny Mountain mine is located represents a relatively high temperature type of staged mineralization related to early Lower Jurassic syenitic plutonism.

Reserves

The reserve estimate, as of April 30, 1989, verified by David S. Robertson, an independent Toronto geological consultant, is summarized in Table 1. Proven, probable and possible reserves are undiluted and uncut. A cut-off grade of 0.3 oz/s. ton of gold was used to develop the estimate.

Mining and production

The Johnny Mountain operation is an underground mine which currently processes about 300 t/d of ore. Average annual production is estimated at 50,000 oz of gold, 70,000 oz of silver and 1.4 Mlb (635,000 t) of copper.

The operation utilizes the conventional shrinkage stope method of mining. Development and haulage is by way of diesel-powered LHDs and underground trucks. The mine operates two 10 h shifts daily.

The mill produces two products, a doré bar and a copper concentrate containing high values of gold and silver.



Drilling in a development heading underground.

PRINCIPAL FEATURES & BENEFITS

- **13,200 Lbs. (6,000 Kg) Tramming Capacity**
 - ✓ Can carry material weighing 3,300 lbs/yard³ (1.95 T/m³) in the standard 4 yard³ (3.1 m³) bucket.
 - ✓ Can be equipped with larger or smaller buckets to match its tramming capacity to different material weights.
- **Modulated Shift Transmission**
 - ✓ Can save up to three seconds on each directional change. Full throttle can be maintained when changing directions in first and second gear.
 - ✓ Reduces stresses on drivelines, axles, transmission & bearings. Can increase component life by 15%.
- **Service Brakes Are Fully Enclosed, Multiple Wet Disc Brakes In All 4 Wheels**
 - ✓ Protected against entry of abrasive dirt, water, rocks, etc.
 - ✓ Can save up to 80% on parts and labor over the life of the machine, compared to other brakes.
 - ✓ Brake life has exceeded 10,000 hours.
 - ✓ Brakes are applied hydraulically, with dual circuits for front and rear axle brakes.
- **Adjustable, self-aligning, spherical thrust bushings and replaceable steel inserts in the articulation**
 - ✓ Life of thrust bushings is twice that of roller bearings or solid bronze bushings.
 - ✓ Any wear can be easily compensated for by adding shims and retorquing four bolts.
 - ✓ Replaceable inserts protect pin bores and eliminate need for re boring.
- **Centralized Lubrication**
 - ✓ All grease points, except drivelines and dump cylinder, have been plumbed to two centralized lubrication panels in the articulation area where they are conveniently serviceable.

MAJOR OPTIONS

- **Moog Radio Remote Control.**

The Radio Remote Control System consists of a transmitter or pendant, which is carried by the operator, and a receiver, which is mounted on the vehicle. The Radio Remote Control System controls machine operation by encoding and transmitting switch actuations to the machine mounted receiver. The receiver decodes the switch command and actuates a specific electrical driver. These electrical drivers actuate electro-hydraulic valves and solenoid valves to activate the desired machine functions.

The operating range of the vehicle is 150 - 300 feet (45 - 90m) line-of-sight. A radio remote controlled vehicle can be operated manually by simply switching from remote to manual on the vehicle. The vehicle is fully operational in the conventional mode with the manual/remote switch in the manual position.
- **SAHR™ Brakes.**

Wagner's all new, patent pending **Spring Applied Hydraulically Released** brakes rely on spring pressure to apply the brakes. SAHR Brakes are safe, simple, and reliable. With Wagner's SAHR brakes each wheel end is an independent brake system. Energy to apply the brakes is stored in the springs at each wheel. The SAHR Brake system is a FAIL-TO-SAFE system. This means that if the vehicle loses hydraulic pressure for any reason, the wheel end brakes come on. Back up systems have become redundant, as are multiple tanks, split circuit systems, pressure reducing valves, dual treadle valves, etc. etc.
- **ECS Purifiers**

Although catalytic purifiers are very efficient in converting unburnt fuel (hydrocarbons) and carbon monoxide to harmless gasses, they provide no protection from "black" smoke (or particulates).

The ECS Purifier virtually eliminates the carbon smoke problem. Laboratory tests have shown filtering efficiencies of soot in excess of 95%.

The Purifier also retains most of the catalytic function of the standard ECS purifier.

ST-3¹/₂ APPLICATIONS

- Suitable drift widths: 3.20 m (10'6") to 4.00 m (13').
- Right angle turn around pointed corner requires 3.5 m (11'3") wide drifts.
- Suitable drift heights: 2.50 m (98") or higher.
- Bucket dump height @ 40° dump angle is 1.50 m (59"); requires minimum back height in unloading area of 3.85 m (150").
- Is a match for 16 to 20 ton dump trucks.
- Loads heavy ores (i.e. pyrites, lead/zinc) weighing up to 3300 lbs/yd³ (1.95 T/m³) in standard 4.0 yd³ (3.1 m³) bucket.
- Loaded vehicle speed on 15% up grade is 3.7 mph (6.0 km/h).

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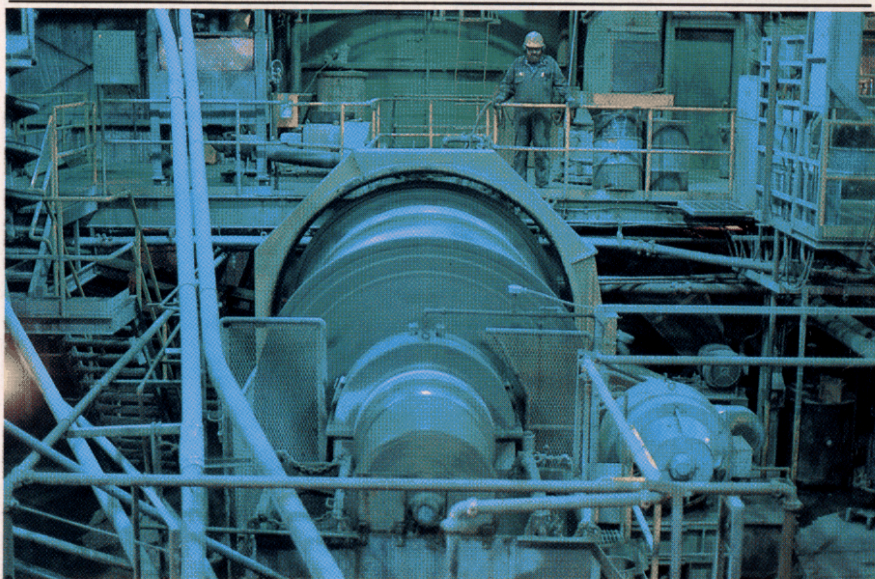


WAGNER MINING EQUIPMENT CO.

A company in the Atlas Copco Group
Circle RSC No. 116

Table 1: Reserves as of April 30, 1989

Category	Short Tons	Grade (oz/ton)	Gold (oz)
Broken Ore	54,000	0.50	27,000
Proven	51,000	0.84	42,840
Probable	91,000	0.82	74,620
Possible	680,000	0.50	340,000
	<u>876,000</u>	<u>0.55</u>	<u>484,460</u>

*A view of the milling section.*

The doré bars contain approximately 25% of the gold produced from the Johnny Mountain mine.

The original mill process at the Johnny Mountain mine involved a cyanide circuit. Problems were encountered involving filtration operations, resulting in downtime and lost production. Earlier this year, the operation was converted to a simple gravity and flotation circuit and the cyanidation circuit was shut down.

As a result, downtime was reduced, gold recovery increased and production costs lowered substantially.

Average cash production costs during the three months ended July 31, 1989, were approximately \$US202 of gold and gold equivalents. A major cost incurred in the operation of the Johnny Mountain mine is for the transportation of fuel, parts, supplies and copper concentrate. From May 1 to July 31, 1989, the cost of transportation of fuel, parts and supplies to the mine site was \$0.8 million or 20% of total operating costs. In addition, the cost of moving the concentrates from the Johnny Mountain mine to tidewater amounted to \$0.4 million during the same period.

A regrind mill is currently being installed. This will help to increase gold recovery from 85% to 90%, raise mill tonnage from 320 s.tons/d to 350, and lift the proportion of gold produced as doré bars from 25% to 35-45%.

The company has actively pursued proposals with the government and the

private sector to construct a road from Highway 37 to the Johnny Mountain mine. This road would result in savings to the company of approximately \$C200,000/month.

Exploration and future mining

The company's 1989 exploration programme has been prepared with two objectives in mind. The first is to locate and determine the extent and quality of additional ore reserves in the vicinity of the Stonehouse deposit. The second objective is to establish the existence and location of the extension of the adjacent Snip deposit into the company's property in the Bronson Creek/Sky Creek area.

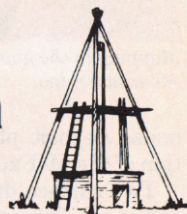
Stonehouse exploration programme

The programme consists of diamond drilling along strike from the mineralized zones in the vicinity of the Stone-



A Bristol aircraft takes on a load of concentrates for air freight to Wrangell, Alaska, en route to a smelter in Japan.

Talk about
efficient
exploration!
Now we even
use the hole



The ultimate test in an exploration program has always been the diamond drill. This provided core that made or broke prospectors' dreams, geological theories and geophysical anomalies. It also left a hole right through the most favourable area. Now we use that hole to locate possible ore up to 200 metres away. Make your exploration program a hole lot better.

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TORONTO TELEX 06-961260
FAX (416) 270-3472

Circle RSC No. 117



Mapping in the geology room at Johnny Mountain mine.

house deposit plus a detailed evaluation of the McFadden zone.

Two surface drills are being used to define the Discovery, 16, Pick-Axe and Gold Rush veins. A total of approximately 10,000 m will be drilled.

The programme has been successful in identifying reserves in an ore shoot of the Pick-Axe vein similar to one now being mined in the parallel 16 vein. Seven holes have intercepted Pick-Axe between two faults believed to be those forming the structural control for the 16 vein. A decision has been made to cross-cut to the Pick-Axe vein from present mine workings at the 11 and 12 levels. The significance of the Pick-Axe development is an increase in ore reserves, to be updated later this year, and deferral of costlier mining at lower levels of the Discovery and 16 veins.

A new vein, christened Homestake, has been located by surface prospecting of the Stonehouse deposit, source of the Johnny Mountain mine. Surface trenching, mapping and sampling are intended to develop a drill target for late-season exploration.

Part of the programme was directed at the McFadden zone, approximately



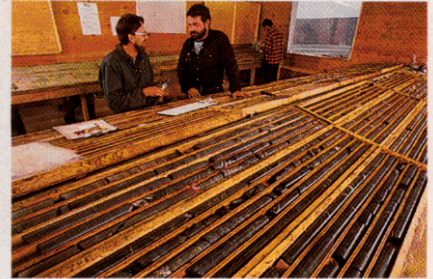
Current exploration drilling, Pick-Axe vein.

600 m south of the Johnny Mountain mine. A long flat hole drilled from Gold Rush intercepted a highly mineralized quartz-sulphide vein, identical to veins in the Johnny Mountain system. A large gossanous outcrop, up ice from the McFadden zone, will be investigated by rock sampling and mapping. Other areas of interest are being examined.

There are several unexplored areas to the south of the Johnny Mountain mine indicated as anomalous by widely spaced sample sites. A total of 870 soil samples will be taken to fill in the grid around these anomalous sites. Follow-up diamond drilling is expected towards the end of the year.

Bronson/Sky Creek exploration programme

Prospecting, soil sampling, and geophysics are being used to locate the existence and possible extension of the Snp deposit onto the company's property. A geophysical survey commenced in June in order to take advantage of the ease of travel afforded by snow cover. Approximately 120 km of survey is being carried out.



Drill core samples.

A new discovery in this area is the Windsock vein, a mineralized structure 1.4 km northeast of the current mine area. Surface stripping, trenching and mapping have established a zone of heavy sulphide mineralization, 15 m wide and 80 m long, in three parallel shears, coincident with a strong geophysical anomaly 500 m in length. This mineralization shows similarities to the main Johnny Mountain production area.

A review of all geophysical, geochemical and geological data from the Sky Creek/Bronson area, including Road Show and Mike's Showing, is in progress. Conclusions will determine drill targets for later exploration. □

Putzmeister

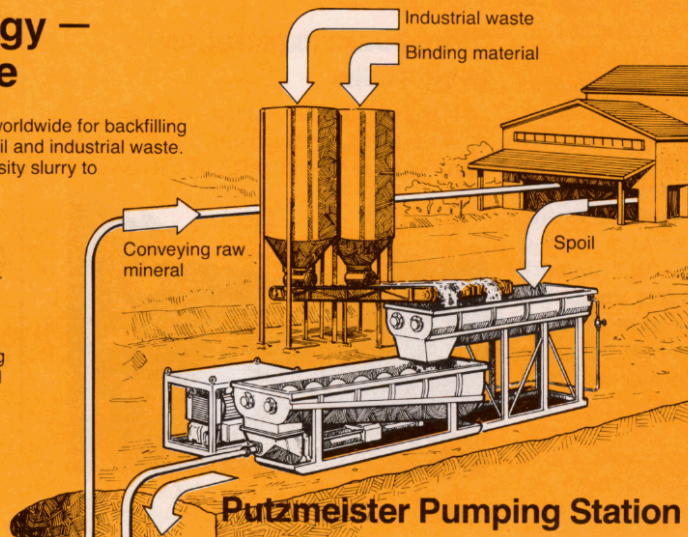
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Putzmeister-Werk
Maschinenfabrik GmbH
P. O. Box 21 52
D-7447 Aichtal 2
Tel. (0 71 27) 5 99-0
Telex 7 266 113
Fax (0 71 27) 5 99-5 20



Montanbüro GmbH
4630 Bochum 6
Sevinghauser Weg 100
Tel. (0 23 27) 5 50 14-15
5 59 17-18
Telex 8 20 458
Fax (0 23 27) 5 10 52