

A Caterpillar 627B scraper is one of the three in use at Copperfields' Sulpher Creek placer operation. The No 8 dredge abandoned by Yukon Consolidated Gold Corporation in 1963 is in the background

New enthusiasm for placer mining

The truckloads of heavy construction equipment arriving in Whitehorse this summer heralded the beginning of another placer mining season as the gold fever of the late 1970s continued on a spectacular scale into the 1980 season.

'Every creek that has any placer mining potential has a bulldozer on it. There are now no more claims to be staked in the Klondike', says Paul White, a placer miner for over 25 years and president of the newly-formed Dawson Eldorado Gold company.

The much higher prices for gold, a well

organized and better financed placer industry and the use of large construction machinery to improve economies of scale resulted in a bonanza year in the Yukon in 1980, he says.

Dave Horner, branch manager for Finning Tractor and Equipment Company in Whitehorse agrees there has been a substantial increase in placer activity in the Territory.

For many of the operations which had planned to start-up this season, the increase in gold prices early in 1980 was an added bonus, he told the *Western Miner*.

Finning's staff at Whitehorse has grown from 20 people in 1977 to around 90 people in 1980, an indication of growth not only in the placer field but in hardrock mining exploration and construction as well.

Placer miners are no strangers to the creeks of the Yukon. Dating back to the discovery of gold on Rabbit Creek in 1896, the Klondike has attracted literally thousands of gold seekers.

Claim staking activity today matches the feverish days at the turn of the century. Since 1 Jan 1980 there have been 3300 placer claims staked in the Yukon and 895 leases to prospect. Total placer ground in good standing now equals 37 16 miles, the equivalent of 39,250 placer claims in area. Activity is concentrated on the Klondike, Luane, Clear Creek, Mayo and Ladue rivers, although higher prices have enabled people to mine in more remote areas, spreading the activity across the territory.

Placer operations have reported retrieval of 67,942 troy oz of gold so far in 1980 and estimated production will be around 100,000 oz for the calendar year, according to the Department of Indian Affairs and Northern Development in Whitehorse.

NEW AND OLD METHODS

Placer mining attracts colourful individuals — innovative and interesting. And their operations are the same. No two sluice boxes or sets or riffles look alike.

Aerial view of Territorial Gold Placers' operation



Placer mining

Yukon. Using a bucket-line dredge, the company started production in September 1980 after a \$1.5-million renovation program.

Powered by a diesel electric plant mounted on board, the chain of buckets scoop the gravel into the sluice box behind. The waste rock is discarded at the back.

Instead of using one long trough, the old dredges are being renovated using multi-run sluice boxes for more efficient operation. Queenstake recruited the original crew members who had worked on the property in the late 1950s to refurbish the dredging equipment which had been left on the site. The assembly job required new electric motors, diesel engines and rebuilding mechanical parts. The company expects to be producing approximately 5000 oz annually starting early in 1981.

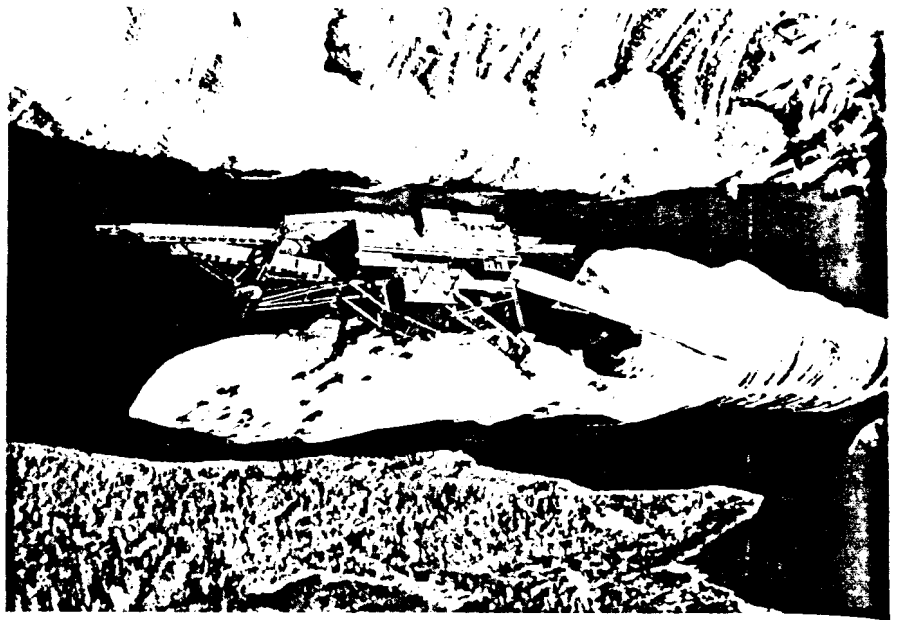
Plans for 1981 include production from a second placer property, either on Big Creek or Canadian Creek. An option to acquire two additional dredges may be exercised at that time, according to Ian Brown, vice-president, finance. These will need to be trucked to the new site.

EXPLORATION STRONG

Although the Yukon has been the centre of placer mining activity, several other regions have not gone unnoticed.

In BC, Atlin is once again bustling with placer mining activity and the creeks around Barkerville, Likely and in the Caribou are also being re-examined.

Probably the largest operator in Atlin is Bill Thachuk, whose Gold Run Creek mine sluices 1500 to 1800 yds/day using a conventional 70ft long sluice box and a 40in wide dump box.



Alaska: gold dredge near Fairbanks

'Some of the boxes that work in the Dawson area are not suited to conditions around Atlin', explains Mr Thachuk.

Several Canadian operators have concentrated their search in Alaska and, on a smaller scale, the Northwest Territory is also attracting some attention.

Prospectors are moving into more remote areas, bringing helicopters into the search for placer claims and drill rigs are back in the business of placer exploration and evaluation.

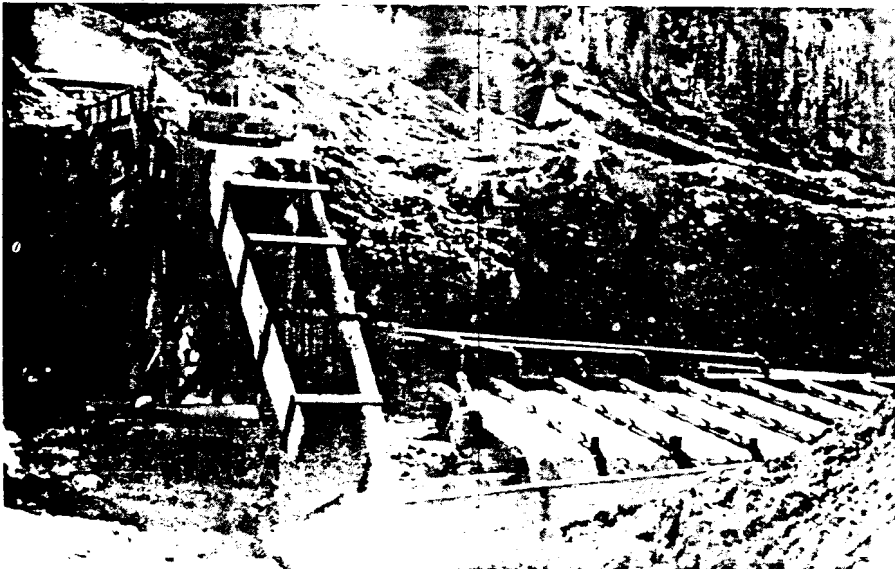
A new exploration tool in 1980 was the Superdrill 150, a resonant vibratory drilling system developed by the Sound Dynamics Group of Hawker Siddeley Canada Limited. It was used for the first time in placer sampling on Dease Valley Resources' claims on the Upper Bonanza and Eldorado Creeks near Dawson City. A

second unit was operated by Kikanni Oilfield Construction Limited in the same area.

Samples are taken through frozen gravels, sands, organic deposits and schist bedrock without the assistance of air or other fluid and are usually undisturbed and intact. The samples taken were 6in diameter. Between 20ft to 50ft deep and drilling rates averaged 2ft/minute.

A romantic and exciting business when successful, placer mining also has its share of failures. As in the early gold rush days, many operators start up without carrying out extensive exploration work, often to be disappointed with results at the season's end. Whatever the size or the method used, it seems that luck still plays a big part in the success of many placer mining ventures in the north. W/M

Arctic Rim Operators' hydraulic project at Jackson Hill, 300ft above the valley floor

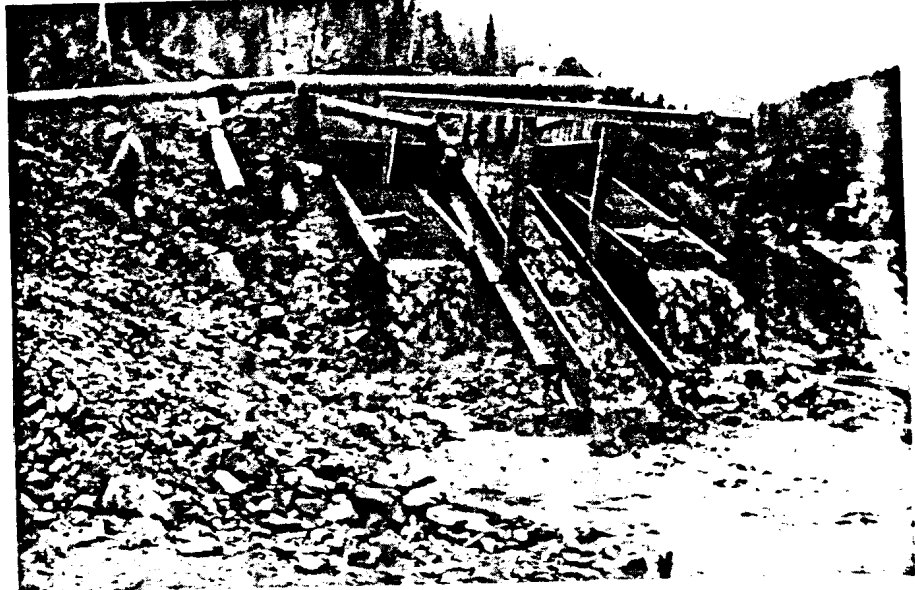


Arctic Rim Operators' hydraulic project





Arctic Rim Operators' hydraulic project



Arctic Rim's Bear Creek project

The technology for the most part remains the same as that used 85 years ago. The sluice box, which hinges on the principle that gold is heavier than gravel and so settles to the bottom while the gravel is washed away, is still the main recovery method. Here, the pay dirt is washed through the sluice box with water, the lighter particles are carried away, while the heavy ones are caught in a system of riffles or traverse struts on the bottom of the box.

Several companies, seeking to improve recovery rates, have modified the sluice box design to get greater volume and improved performance.

Territorial Gold Placers Limited, a private Whitehorse-based company, has been mining placer gold since the summer of 1975. Its operations have expanded steadily since then and total gold production in 1980 was 8300 oz.

The company currently mines two creeks south of Dawson City, Blackhills and

Henderson Creek, and plans to expand its operations in 1981 to include three new mining areas on Upper Dominion, Scroggie and Miller Creeks. It mines the gold-bearing gravels using 12 Caterpillar D8 dozers, washing the gravel to recover the gold in five advanced design sluice boxes manufactured by Rosedale Machinery Sales Limited in Langley, BC.

Named the Ross Box after its designer Lorne Ross, the sluice box operates on a tri-channel concept which separates the fine material into two side channels and collects fine and coarse material in the centre run. The box has been in the field for four years now and is being used in 75 placer operations in Alaska, Yukon and western US. There are five different models ranging in capacity from 100 yd/hour to 700 yd/hour and plans are being made to build a 1000 yd/hour box. The latter will use about 14,000 gallons/minute of water.

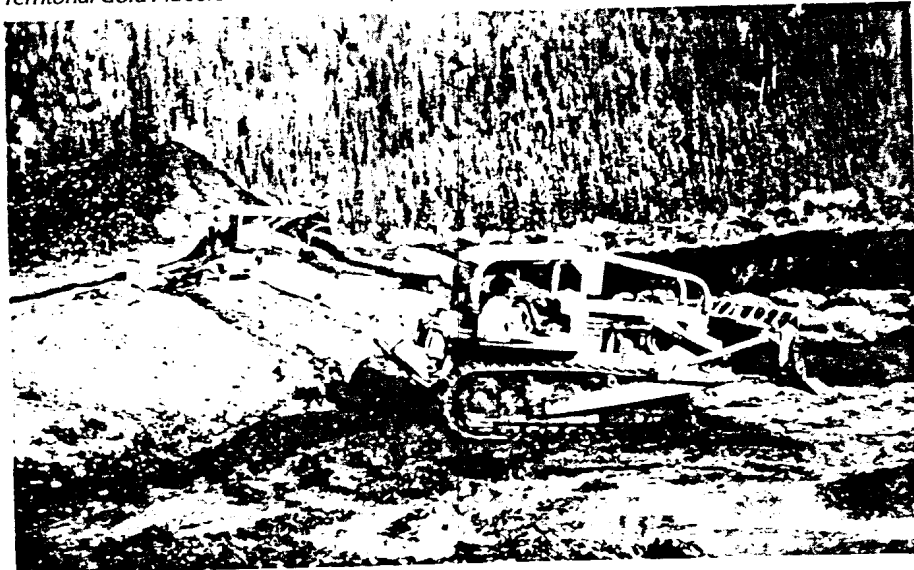
Vancouver-based Crescent Mines and its

associate Sundance Gold Limited started two placer operations on Clear Creek, 60 miles east of Dawson City in 1980. Crescent was processing around 2250 yd/day on a 15 hour/day basis and plans to increase this to 3000 yd/day.

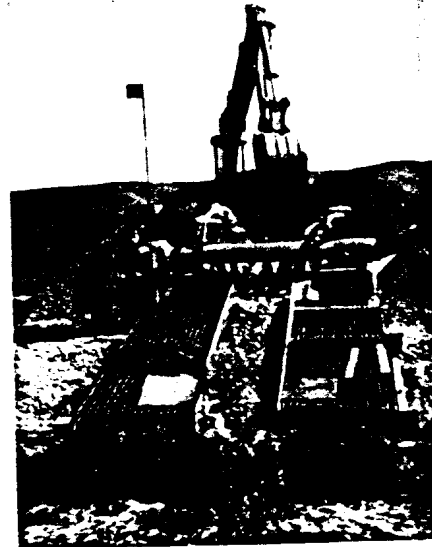
The company uses a sluice box known as the Rock Box, which has been in production for the past two years. Designed by Gary Crawford and Norm Pearson, the Rock Box is built by Pearson Distributors Limited of Richmond. This box also has three runs with the two side runs being adjustable, making it possible to change the slope. The unit is segmented for easy transportation and can handle 300 to 500 yd/hour, requiring 2500 to 4500 gallons/minute of water.

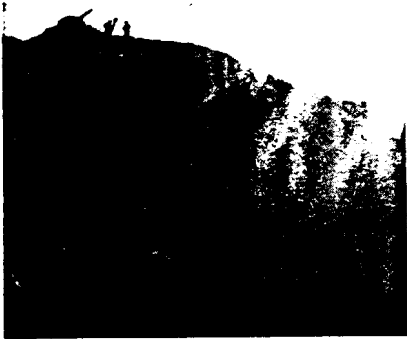
Several of these boxes were used in the Yukon this season, four of them used by Mr Crawford's company Arctic Rim Operators, a large private mining venture in the Klondike.

Territorial Gold Placers: a D8 is used to push tailings from the bottom of the box

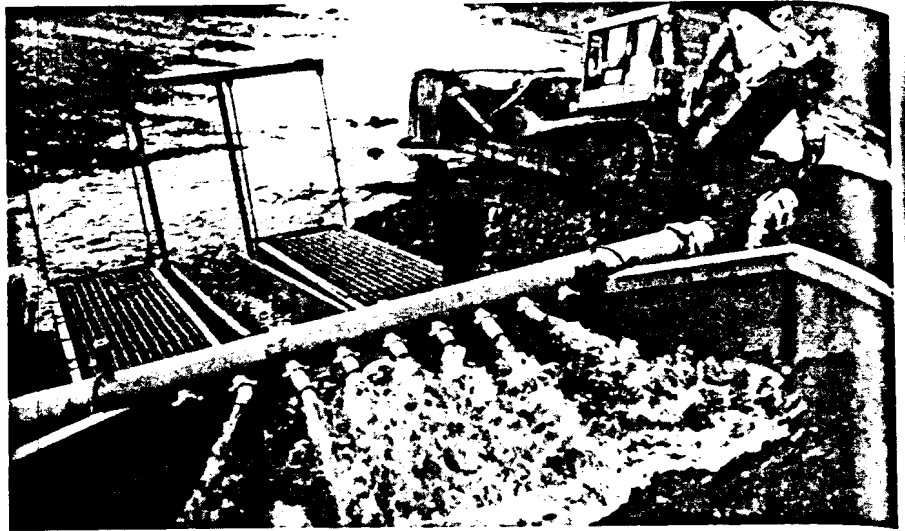


The Ross sluice box in action





Arctic Rim Operators' hydraulic project at Jackson Hill



A Rock box at Crescent Mines. The water manifold pushes gravel into the dump box, separating the fine and coarse material

Arctic Rim employs about 60 people on three properties: Bear Creek, Courts Creek and Jackson Hill. Bear Creek, the site of Yukon Consolidated Gold Corporation's former main camp, used three Rock Boxes to process about 400,000 yd this season. Production was around 4500 oz gold. At Courts Creek, three scrapers and a dozer were used along with a Rock Box and washing plant. The operation moved around 600,000 yd to get 3500 oz gold.

The third property on Jackson Hill, operated in a joint venture with Universal Explorations Limited of Calgary uses hydraulic mining methods, replacing the bulldozer with a monitor. Water is pumped

up to the site, situated on an ancient river bed 300ft above the valley floor, and sprayed out of the monitors, moving the pay dirt through a screening plant and down eight 4ft conventional-type sluice boxes. Start-up this season involved moving about 1-million yds, pumping 5000 gallons/minute of water. Production amounted to 1,000 oz and is projected to increase to 5000 oz in following seasons.

Miben Mining also operates a hydraulic placer mine on Dago Hill, proving it to be a relatively low cost, efficient method of moving gravel.

Many other innovative devices can be seen on the Yukon creeks and rivers.

Among them are the oscillating sluice boxes, spinning drums, suction and bucketline dredges, and centrifugal mercury amalgamators.

A new system which incorporates mercury amalgamation is being marketed by Lapierre International Sales of Surrey, BC. The model P-480 coupled with screening equipment, has a throughput of 150 to 225 tons/hour of raw material and it will also process 80 tons hour of $\frac{3}{8}$ minus materials. Water requirement is 250 gallons/minute but if pumping of the $\frac{3}{8}$ minus material to the plant and tailings pile is required, 400 to 600 gallons are needed.

Self-contained and portable, the P-480 includes a dewatering hopper, electronically controlled hydraulic feeder valves, four concentrators, a concentrate hopper and screw feeder, a ni-hard lined tailings pump, a centripetal amalgamator, a fifth concentrator to strip the amalgamator tailings and its own diesel generator.

Each concentrator handles 20 tons/hour of $\frac{3}{8}$ minus material fed in a slurry of 50% solids and 50% water. The five ft³ of material in the concentrator is displaced by the heavy metals as production takes place.

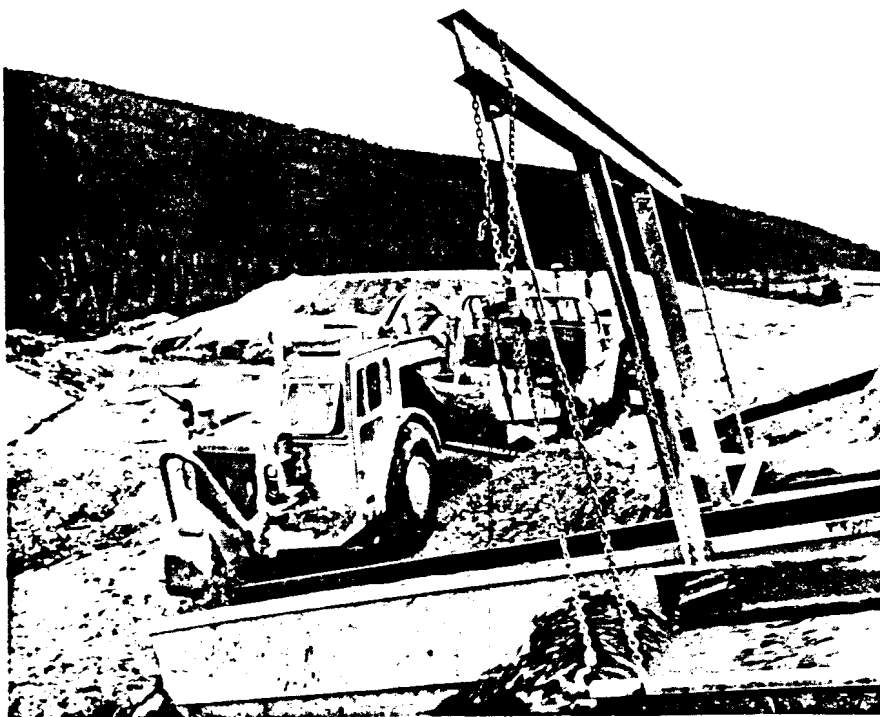
Final stage in the process is the centripetal amalgamator which handles 26 ft³/hour and recovers the gold from concentrate. The amalgamator uses centripetal force to induce amalgamation between gold and mercury. All other elements are rejected.

Only one of these plants was in operation in 1980, on the Spruce Creek in Atlin, BC although several other companies have similar units based on the centrifugal mercury amalgamator principle.

LARGER COMPANIES INVOLVED

Volume is the key to a successful placer operation and the recent influx of several large mining companies into the placer field has brought about some changes in the industry.

A Caterpillar 627B scraper removes sluice tailings at Arctic Rim Operators' show at Quartz Creek near Dawson City. The company employed five of the scrapers to move about a million yd³ in the 1980 season



Placer mining

One of the largest is Cogasa Mining Corporation which operates a complex, large-scale operation on Sixtymile River north of Dawson.

The operating subsidiary of B E L Yukon Establishment, a Liechtenstein-based company funded primarily by German and Swiss interests, Cogasa invested over \$12-million to develop a new placer mining process which incorporates methods for classifying and sorting the material.

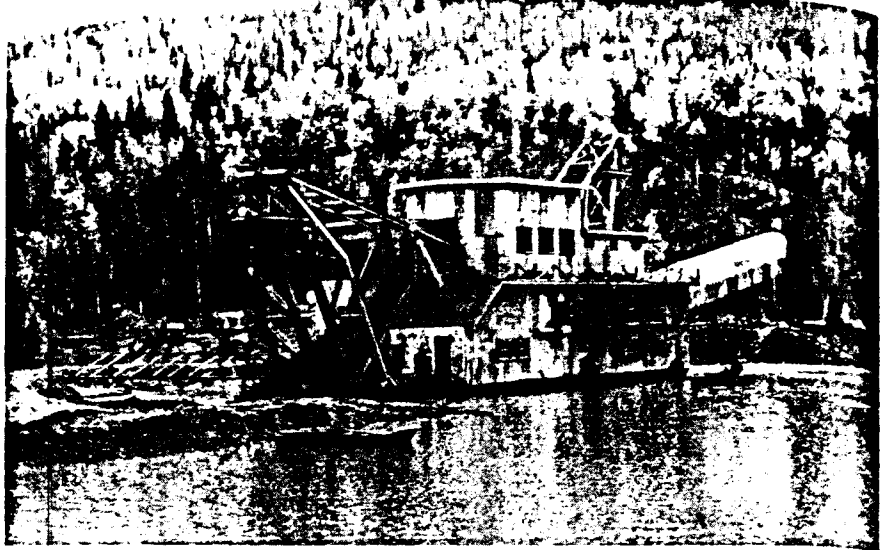
Scrappers haul material to hoppers where it is fed to screens. Waste material is stored in a silo and returned to its original location. Classifiers sort the material into size, preventing small particles of gold from being washed away with large particles of gravel; sluice boxes are used as nugget traps. The fine material is then drawn into hydro-cyclones where the waste water is removed and recycled through the plant. The concentrate of fine gravel, gold and other minerals is directed into two sorting machines, which separate the gold and minerals from the gravel.

Some 96 washboards form the second stage of the fine gold retrieval. These are cleaned continuously into a sump pump and pumped to the final stage of processing, which consists of washing the gold flakes from filter liners.

The Cogasa plant produces a concentrate containing 41% gold plus other heavy metals such as silver, tungsten and platinum.

The pilot plant at sixtymile is designed for a capacity of 500 yd³/hr. A second plant was built in 1980 and a third is planned for 1981, bringing total capacity to 30,000 yd³/day.

Gustav Schmid, manager of Cogasa is currently involved in a battle with the Royal Canadian Mint in Ottawa. He claims that the latter has not accounted for some 524 oz of



Bucketline dredge at Queenstake's Clear Creek placer mine

placer gold out of a total 1,888 oz shipped early in October.

A newcomer on the scene in 1980 was Copperfields Mining Corporation, a major shareholder of Teck Corporation.

Copperfields spent \$1.5-million to earn a 60% interest in the Granville project, a joint venture with Balner Enterprises (40%).

Mining on Sulphur Creek began early June and estimated production for the period was 4850 oz gold. Mining equipment consisted of three D627 scrapers, two D8K tractors, a 966 loader and a Ross sluice box. A total of 200,000 yd of pay gravel was treated and 270,000 yd of waste was moved during the season. About 20 people were employed at the camp. The operation moved approx 2000 yd/day in two 10-hour shifts.

Teck Corporation absorbed Yukon Consolidated Gold in a 1979 merger. The latter controlled nearly all the placer ground in the Klondike until the mid-1960s.

Canada Tungsten Mining Corporation, in

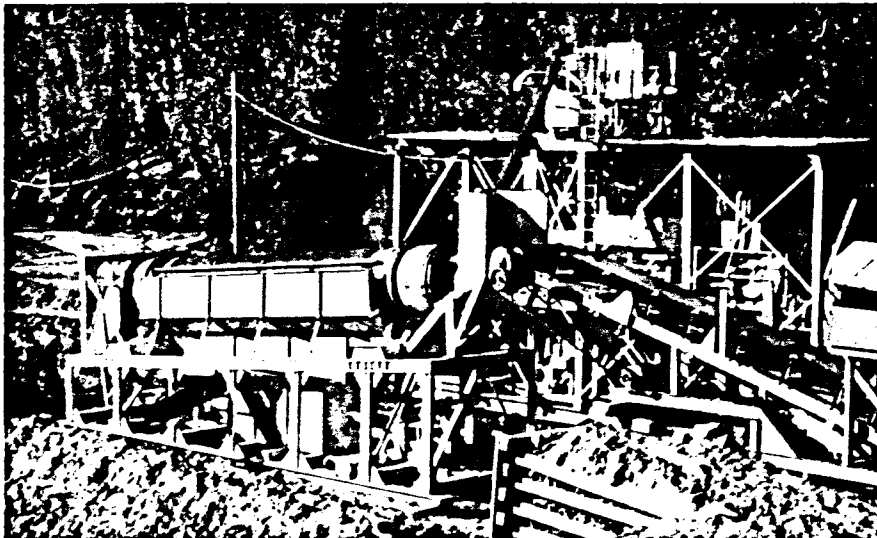
1979 spent \$1.6-million to build a 2000 yd/day placer plant on its Dublin Gulch placer property east of Mayo, held under option from Queenstake Resources Limited.

The gold-tungsten-tin recovery plant was fully operational in June 1980 and a secondary recovery unit consisting of a series of spirals and tables was added. Production figures for 1980 are not yet available, the company reports.

Canada Tungsten uses a conventional jig plant in its operation. The gravel is screened to minus 1/2 in in a trommel and pumped to a holding tank from where it is distributed to four triplex placer jigs. Concentrate from the jigs is upgraded by moving through six spirals and then to vibrating tables. The gold-tungsten-tin concentrate is sent to the company's Vancouver plant for future processing.

Queenstake Resources, owned 28% by Canada Tungsten, has its own placer operation on Clear Creek in the central

Canada Tungsten's jig plant at Dublin Gulch



Copperfields employees show their results

