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RUTH VERMONT MINE  
RECLAMATION PROGRAMME  
G.H. McDougall      May 1973



# COLUMBIA RIVER MINES

LTD. (N.P.L.)

302 - 475 Howe Street, Vancouver 1, British Columbia, Telephone 688-5915

May 10, 1973

J. D. McDonald, P. Eng.  
Senior Inspector of Mines Reclamation  
Department of Mines & Petroleum Resources  
120 - 1006 Government Street  
Victoria, British Columbia

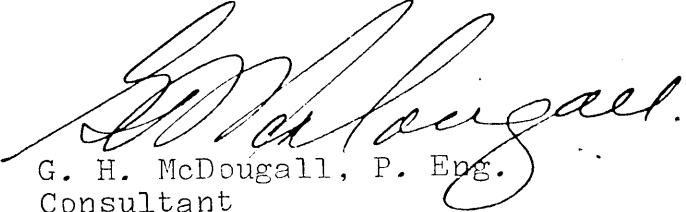
Dear Sir:

As discussed during our meeting of April 16th, 1973 we are enclosing a Reclamation Programme and Report for Columbia River Mines Ltd. (N.P.L.) Ruth-Vermont property anticipated re: opening. We have also enclosed 7 copies of the necessary maps.

Since this mine terminated operations, several consulting firms have been retained for advise and as a result the Company files are no longer complete. The Report and Maps have been compiled from available information and should you feel the report requires additional data, we would be pleased to discuss the matter at any time.

Yours very truly,

COLUMBIA RIVER MINES LTD. (N.P.L.)



G. H. McDougall, P. Eng.  
Consultant

GHMc:rs  
encls.

COLUMBIA RIVER MINES LTD. (N.P.L.)

RECLAMATION PROGRAM AND REPORT

Nature of the Mine

General

The operation is called the Ruth-Vermont mine and is located on 43 claims and fractions in the Golden Mining Division. It lies 23 miles South of Golden in the Purcell Mountains and may be reached by 35 miles of gravel road from Parsons, B.C. which is on the Canadian Pacific Railway and has a paved road access to the Trans-Canada Highway.

The mine is owned and will be operated by Columbia River Mines Ltd. (N.P.L.) of 302 - 475 Howe Street, Vancouver 1, B.C.

Geology and Mineralogy

The Ruth-Vermont property is underlain by rocks of the Horsethief Creek series of late Proterozoic. Polymictic quartz pebble conglomerates grade locally to grit and impure quartzite which in turn grade into slate or argillite and argillaceous limestone. The argillaceous limestones are the most significant host rocks in the area.

Structurally, the units have been folded to a series of synclines and anticlines of varying amplitudes. The main workings are along the limbs of a southeast plunging syncline.

Minerals present in veins and replacement zones are pyrite, galena, sphalerite, arsenopyrite, boulangerite, freibergite, chalcopyrite and scheelite. Gold occurs generally associated with arsenopyrite and pyrite.

The minerals to be recovered are, silver, lead, zinc, gold, cadmium and possibly tungsten.

### Mining

The ore reserves, proven and probable, in both vein and replacement orebodies have been calculated at 291,000 tons.

Mining is to be resumed on the 6000' level using present trackless equipment. It is quite possible ore below the 6000' level and above the 5750' level could be removed by using L.H.D. equipment for a portion of the work and the remainder recovered by conventional track methods applying an open stope - scram system. It is expected mining will be done at the rate of  $\pm$  500 tons per day. At this rate the mine should operate for a period of 1.6 years maximum. Exploration and development efforts, if successful, could add substantially to the life of the mine.

### Milling

Mill testing and actual experience has shown that with a grind of 73% minus 200 mesh followed by normal floatations with some cyanidation approximately 50 tons of concentrate are produced from 500 tons of ore. Tailings from the 500 tons per day thru put amount to about 450 tons with some 30% solids.

The concentrator produces two concentrates, a lead concentrate with a high silver and some gold content and a zinc concentrate containing a lesser amount of silver with some gold and cadmium. The tailings are impounded in the valley some 3000' north-east of the mill site.

### Construction

Plans of the Campsite showing all buildings and their location with respect to the mine portals is enclosed for your consideration and information. The plans also includes the service area, tailings ponds and roads in the immediate vicinity.

The plant and all buildings were built in the only area it was felt was free from snow slides. Water for the Camp and operation is taken from Vermont Creek under Conditional License No. 38384. Sewage is disposed of in a common septic tank.

Other than the roads now in existence to be upgraded, no new roads are contemplated. It is also anticipated that all mine waste rock shall be utilized upgrading the present road system. The 35 miles of road to Parsons, now under Crestbrook Timber Products Forest Management License requires continual maintenance in order to transport concentrates.

#### Effects on the Environment

The Ruth-Vermont mine is an underground mining operation and as such will have a minimal effect on the surface areas. At the present time there are only two main and one small portal opening plus numerous prior short exploration drifts into the mine and no known areas that will be mined through to surface. As reported previously, the waste produced will be used for road maintenance.

Should a stock pile for concentrates be required it will be designed in the form of a concrete pad.

The tailings impoundment is described in detail by the firm of Golder, Brawner & Associates Ltd. with the actual storage capacities calculated and shown by Dolmage Campbell & Associates Ltd. Copies of both original reports are enclosed.

It should be noted that actual ore reserves, both Proven and probable, are now shown at 291,000 tons as against an original estimate of 1,256,000 tons. The tailings discharge now should be shown as 90% of 291,000 tons or 261,900 tons to go to the tailings pond. At 20 cu. ft. to the ton 5,238,000 cu. ft. or 194,000 cu. yds. of storage is required. The capacity of the ponds is now well above the amount required for the present ore reserve.

The impoundment is not complete as fully designed but will be completed before the start of operations. The #3 pond has been divided into two parts by a dam through its centre and #2 pond requires raising of the walls. It is expected that a civil

engineering firm will again be called to the site in order to complete this work to the satisfaction of the Dept. of Mines & Petroleum Resources and the Pollution Control Board.

The total plant and service area consists of 22.5 acres. The total tailings empoundment area consists of 22 acres.

In summary it is recognized that the tailings ponds do disturb the environment. It is hoped these ponds may be planted with vegetation as the Placer Mining Co. has done. It has also been noted that slide alder will grow in talus which may assist in bringing this area back to its natural state.

In order to avoid any wash or run off from the tailings area when mining has been terminated it may be necessary to open a water course. This point is to be discussed by all interested parties prior to reopening of the mill.

There will be no open pits on the property and all waste rock will be utilized.

#### Nature and Present Use of the Land

The Vermont Valley is very steep walled and is subject to snow slides. The Valley floor itself is basically talus rock.

The only timber growth at the 5500' elevation is a few spruce that have been spared by the snow slides. Further down the Valley some light brush is found and in areas where the slides have missed a few trees are left. Slide alder may be found in the talus in many places.

The site is underlain by loose to compact brown silty sandy gravel stratum (talus material) consisting of flat particles grading from silt sizes up to 3" in diameter gravel.

The Golder Branner Report also describes the climatic conditions in the area as follows:

The site is located in a region of high annual precipitation and low mean temperatures. Records available for the Glacier

Park (Roger Pass) Meteorological Station (elevation 4348 ft.)  
for the 1966 calendar year are as follows:

Maximum recorded temperature:	82 <sup>0</sup> F (August)
Minimum recorded temperature:	-17 <sup>0</sup> F (January)
Mean annual temperature:	35 <sup>0</sup> F
Mean January temperature:	13 <sup>0</sup> F
Mean August temperature:	54 <sup>0</sup> F
Annual precipitation:	76 in.
Maximum monthly precipitation May to September inclusive:	3.59 in. (May)
Maximum monthly precipitation October to April inclusive:	13.50 in. (January)

The site of the tailings pond is some 1000 ft. above the Rogers Pass Meteorological Station and may therefore be expected to have generally lower temperatures and higher precipitation (particularly snowfall, which is believed to be between 20 ft. to 40 ft. per year). Climatic conditions may vary further because of the different exposures of the site and station.\*

The Vermont Creek is the only source of water supply for the mine area. During cold weather, say January and February this source becomes inadequate for both mill and domestic supply. It is possible it may be necessary to drill a well in order to procure the water so badly needed.

At present there is no other use of the land in the mine area other than for mining purposes, nor to the writers knowledge has there been any other use for it in the past. Production was started here in September, 1970 and terminated in June, 1971. Prior to that time exploration and development programs were carried out.

The timber is not logged in this area and there is no land with a suitable soil cover for agriculture or grazing purposes.

It is my understanding that there are no fish in Vermont Creek.

The wildlife consists of a few wolverine and <sup>martin</sup> ~~otter~~. There are, no doubt, other species but men working in the area report the above mentioned only.

#### Effects of the Operation

There will be no effect on livestock and grazing, as there is neither in the area. Any chemicals released from the mill will, by the time it reaches the fish area, be harmless. The small area involved should not effect any wildlife and all blasting is confined to underground. Raw tailings, sewage or garbage is not being dumped in the creek and if it is necessary to install culverts they will be of sufficient size to not curtail the flow of water.

There is no commercial timber in the immediate area and the closest inhabitants are at Parsons, some 35 miles away. The only environmental change will be, as reported, in the tailings ponds.

As it is expected that all waste material will be used for roads, the mine site should not change to any major extent.

#### Course of Action to Keep Disturbances at a Minimum

There would not appear to be any potential harmful disturbances to the environment of the area. As the whole area, with few exceptions, is subject to snow slides, there is no doubt this area, in several years, will again be covered with talus, contained in the snow slides which along with vegetation (planted) should return the Valley to its near natural state.

The Company will attempt at all times to engineer the remainder of this project to have a minimal effect on the environment. Studies will be done in co-operation with the reclamation branch to keep abreast of any new breakthrough in reclaiming of destructed areas.

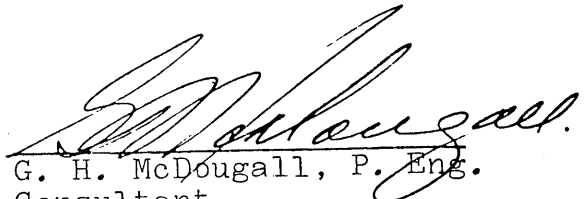


Potential Use of the Land

There would not appear at this time to be any other potential use of the land in the mine area other than for mining. The timber, where found, cannot be commercially logged and the talus slope and steep valley's preclude grazing. The water is seasonal and there does not appear to be game animals in the area and the local wildlife should remain unchanged.

The present life of this mine is short but an aggressive exploration program, now or in the future, could change this picture. However, the project will be now run in an organized manner with environment, ecology and economics prime factors.

May 10, 1973

  
G. H. McDougall, P. Eng.  
Consultant