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REPORT OF
EXAMINATION OF THE
WELLINGTON MINE
RETAILLACK, B. C.

TO:

Waddington Mining Corporation Ltd.,

423 Hamilton Street,

Vancouver, B. C.

BY:

Chas. C. Starr,

612 Pacific Building,

Vancouver, B. C.

August, 1950.

INTRODUCTION:

The two lowest tunnel workings, the Hazol and the Matheson, were examined in the early Spring, 1950, while snow was on the ground, since they are inaccessible in warm weather on account of gas. The remaining part of the property was examined in August. S. R. Ross, who was familiar with the property some fifteen or twenty years ago, accompanied the writer and was of great assistance.

LOCATION:

The camp and the southerly end of the claims are close to the Kaslo-Makusp branch of the C. P. Railway at Retallack and are connected by road to New Denver and Kaslo.

PROPERTY:

The Crown granted claims are:-

Blutcher	Lot 3633	Metis	Lot 3636
Hazol	" 3639	I. C.	" 2283
A. Y.	" 2272	Tiger #2	" 2273
Ivanhoe	" 1195	Ottawa	" 1196
Wellington	" 553		

The above are all shown on the map; other Crown granted claims, not shown on the map and whose locations are not known to the owners are given as follows in the option.

Red Fraction Lot 14223 Blue Fraction Lot 14224 Horse Shoe Lot 3634.

Claims held by recent location, and believed to be in good standing are:- I. C. Fraction #6, Homestake Fraction #6, Nelson, Nelson #2, Nelson #3, Nelson #4. The Hol Ross claims Nos. 1, 2, 3 and 4 are former defunct locations now covered by the Nelson claims. The I. C. Fr. #6 and the Homestake Fr. #6 are recent locations covering the I. C. Fraction and Homestake Fr. which had lapsed.

The above claims are all owned by the Wellington Mines Ltd., H. P. L. K. W. C. Block, Nelson, B. C., incorporated in British Columbia. They are situated in the Ainsworth Mining Division and adjoin the property of the Whitewater Mines Ltd. on the west.

TOPOGRAPHY:

The claims lie on the south slope of a mountain at altitudes from 3370 in the valley to approximately 5500 feet at the north end of the property, making an average slope of about 20 degrees. In detail the topography is moderately smooth.

GENERAL:

The property is well timbered with various species of evergreens of a size suitable for mine timbers. There is no water available for power. Murray Creek, near the west side of the claims, has ample water for domestic and milling use. Water from old abandoned workings has also been used for domestic purposes after flowing a considerable distance over the surface.

EQUIPMENT:

The camp consists of a bunk house, 24 x 40 feet with two stories and a basement; a cook house, 20 x 30 feet with two stories, in the rear of which is storage space and a vegetable cellar; and a combined staff house and office 26 x 34 feet with two stories and a basement. The storage and vegetable cellar are partially wrecked. The other buildings are in fair condition except for minor repairs above the first floor, and for rotten underpinning in the basements which is throwing the buildings out of plumb.

At the Matheson tunnel there is a small dry in fair condition and a shed covering a small diesel engine and air compressor suitable for operating one drill. Mechanical equipment at the Matheson tunnel consists of the following:-

- 1 International Diesel engine, Model UD9, Serial UDCD12754216AA, 1500 R. P. M. This is nearly new - all parts outside of clutch are missing and are said to be in Nelson, also some new part to replace a broken one.
 - 1 Ingersoll Rand air compressor, single stage 9" x 8" BRL No. 7194 100 lb. air, 300 R. P. M. appears O. K. - no belt from engine.
 - 1 Mine car, over dump, condition unknown
 - 1 D79 Gardner Denver drifter. Appears O. K.
 - 1 Gardner Denver Jackhammer #140 - back-head missing.
 - 1 Small air receiver
 - 1 Water pressure tank
 - 1 Pach, drilling column, arm, clamp, and saddle.
 - 1 7" Western Blower Co. fan #21EB, Volume. Gasoline engine said to have been mounted on same base is missing.
 - 1 Set steel 1-1/8" round fitted for Craig detachable bits. 200 (more or less) Craig detachable bits.
 - 1 Set steel 1" quarter-octagon. Rails in main x-cut. Ventilating pipe 10" in place through most of main x-cut; 8" and 6" pipe in east drift. Also 10" pipe on dump and piled in tunnel. Compressed air pipe 2" laid in main x-cut.
 - 1 Timber truck - 18" gauge.
- A very few shovels, picks, etc.

At the Hazel tunnel there is no equipment except a timber truck, 10" vent. pipe in part of the main x-cut and rails most of the way.

HISTORY:

Between 1892 and 1915 the mine is reported to have produced between \$90,000 and \$100,000 from 787 tons of ore containing 117,452 ozs. of silver, 475,622 lbs. of lead, and 100,402 lbs. of zinc. Little if any ore has been mined in the last 40 years. The present company obtained the property in 1927 and did some development in that and the following two years, between 1932^{and 1935} and in 1937. Since the mine was a producer, both the Matheson and Hazel tunnels have been driven to pick up the extension of the Whitewater vein, and have found two veins, one of which is believed to be the Whitewater, but it has shown no commercial ore to date.

DEVELOPMENT:

Approximate Footages.

<u>Place</u>	<u>Shaft</u>	<u>X-Cut Adits</u>	<u>Drifts</u>	<u>X-Cuts from Dr.</u>	<u>Req.</u>	<u>Altitude</u>	<u>Remarks</u>
Old Wellington above 200 level	360?	270	600A	?	?	4860 to 5070	Little more than a guess - probably too small. Caved.
Old Wellington on 200 level	-	630	1200	?	?	4850	Little more than a guess. Caved except adit.
Adit west of 40 level x-cut	-	450	-	-	-	4926	Caved.
Ivanhoe tunnel	-	640	250	400	55	4733	Caved. Some ore reported.
2 I. C. Shafts	60?	-	?	-	-	4750	Caved. Bits of ore.
Matheson Tunnels (2)	-	1010	425 E 210 W	200 90	30 -	4542	Drift at 240' from Portal. Drift at 280' from Portal.
Stewart Tunnels (4)	-	210A	230A	30	-	4100 to 4265	3 caved, 1 open and shows no ore.
Hazel Tunnel	-	1730	95 EW 685 EW 495 EW	- 245 50?	- 25 25?	3746	Drift at 150' from portal. Drift at 225' from portal. Drift at 1570' from portal. West drift caved at 150' - Raise beyond.
A. Y. Tunnel	-	260	-	-	-	3616	Caved.
	360?	5410A	4170A	1015A	135A		Totals

These totals indicate that at least 10,600 feet of adit - crosscuts, drifts, and crosscuts from drifts have been driven, as well as several hundred feet, each, of shafts and raises. There are in addition numerous open cuts, etc.

GENERAL GEOLOGY:

The Wellington property is underlain by the lower beds of the Slocan slates which are of Triassic age and consist of argillites with minor bands of limestone and quartzite. Regionally, the slates and associated limestones strike north - westward and dip south - westward. This strike generally holds good on the Wellington property, but the dips in the Wellington 200 level tunnel and in the Matheson tunnels are to the northward and, except in a few instances, to the southward in the Hazel tunnel.

The thrust fault which is occurred by the Whitewater lode has a displacement on the dip of possibly 400 feet. It is rudely parallel in strike to the general structure, and dips at various angles to the south-west. On the east (Whitewater) the dip is about 45° south, flattening to 20 degrees at lower elevations; on the west (Wellington property) it apparently steepens to about 80 degrees. It is a complex zone of breaking and shearing, with one prominent hanging-wall branch which has not been explored. In the Hazel and Matheson tunnels it cuts the bedding at a small angle on strike and at a larger angle on the dip.

(The above geology is chiefly from B. C. Dept. of Mines, Bulletin No. 22 - Geology of the Whitewater and Lucky Jim Mine Areas - - H. S. Hedley.)

VEINS AND GEOLOGY:

The older and only productive workings to date, are on the Wellington Claim and are now entirely caved and inaccessible, with the exception of the 200 level adit crosscut which has recently been opened to a point 630 feet from the portal, and still lacks a few feet of reaching the Wellington vein and drift. According to the old maps furnished by the Wellington Mines Ltd., the old drift should have been reached at 610 feet from the portal, indicating an error in the map.

Dr. G. E. Cairnes states (Memoir 184, Canada Geological Survey) "old mine plans indicate that work has been done on either two lodges or on hanging and foot-wall splits of one. The hanging-wall split or south lode strikes about N 50° E., (Apparently east and west on Company Maps - C. G. S.) and dips 60° southeast. On the 200 foot level it was intersected 555 feet from the portal of No. 2 crosscut adit, and has been partly stoped from this level. To the east the drift on this lode extends at least several hundred feet and in this direction probably continues into the adjoining Sunset claim. The footwall split or north lode was intersected on the 140 foot level, but developed mostly from the 80 foot intermediate level. It strikes about east and dips north at about 70°. At the surface it appears as a wide, crushed zone and has been traced easterly onto the Sunset claim where it is continuous with the Sunset lode. On the Wellington claim the highest grade ore was obtained from this north lode, as much as 5 feet of solid galena being found in the waste between the 40 and 80 foot levels. This lode has produced about 75 per cent of the ore from the Wellington Mine." (End of quote).

555 feet from the portal of the No. 2 (200 level) adit is at the point of the "Y" in the adit and it would appear that Dr. Cairnes was misinformed that the hanging-wall or south split of the vein was intersected here, since the old maps at hand show this to be a short drift. The bedding planes of the rock turn sharply into it. In the 25 feet from the point of the "Y" which are now open there is no

evidence of mineralization. This is confirmed by Mr. S. R. Hoag who was through these workings some years ago. In the left hand fork of the "Y" at 25 to 35 feet from the point of the "Y" there is a strong shear and gouge with an east west strike and steep southerly dip which probably represents a fault along the course of the South or Wellington vein which was instrumental in bending the bedding planes in its hanging-wall to the eastward.

If, as Dr. Cairnes states above, "The footwall split or north lode was intersected on the 140-foot level, but developed mostly from the 80 foot intermediate level", and, "the highest grade ore was obtained from this north lode, as much as 5 feet of solid galena being found in the winze between the 40 and 80 foot levels" is correct either the Wellington maps furnished us are incorrect or incomplete or else the north vein or split first dips north at some 70 degrees and then abruptly turns at the 80 level and dips about 45 degrees south.

The rock in the 200 level adit is almost entirely thin bedded, or slaty, argillite. The strike of the bedding in the outer half of the adit is approximately $N70^{\circ} W$ and the dip north at moderate angles. From 250 to 390 feet from the portal is a broken zone with slips striking $N65^{\circ} W$ and dipping either side of vertical. North of this zone the bedding swings from $N 25^{\circ} W$ to about east with an average dip of 35° east and south.

On the surface above the Wellington workings there is now no visible outcrop of rock or vein. For more than 500 feet nearly due east of the main 2 - Compartment shaft and 100 feet west of it there are numerous "craters", where shafts and cuts have caved, which follow a natural draw, or depression, 50 feet wide and up to 20 feet deep running diagonally on a gentle slope across the hillside and evidently representing the soft zone of the sheared lode. Dumps at the caved shafts, with the exception of the 2 - compartment shaft, consist of finely crushed slates with occasional fragments of quartz; no metallic minerals were noted. The above all boils down to the fact that there is extremely little dependable data on the old workings on the Wellington claim.

The old caved adit 600 feet west of the Wellington 200 level is at approximately the same level as the 140 level in the main Wellington workings. It is said to have struck a soft, wet shear where the tunnel is offset and to have found a "bit of ore" just beyond. This is likely the hanging-wall vein and fault of the Wellington "south" vein.

The Ivanhoe tunnel (caved), 700 feet west of the Wellington 200 level, at 125 feet lower elevation, contains a drift east on a vein which may likely be the south vein of the Wellington. It is reported that leasers found ore at 200 feet east of the main crosscut, but were so hampered by soft, heavy, ground and a flood of water that they made no shipments. The southeasterly branch of the drift is said to be in the hanging-wall of the vein to escape the water; whether or not the crosscut at the end found ore is not known.

The Whitewater have bulldozed off the surface of their vein apex from shortly above their #1 tunnel to the Myrtle R. shaft, within 300 feet of the Wellington boundary and, while bed-rock is not always visible, it seems fairly

certain that the Whitewater vein - shear passes through the Myrtle R. and the two I. C. shafts as drawn by Dr. Cairnes and Dr. Hodley.

Sample #610 was taken from a hole about 6 feet deep at 20 feet east of the "New" I. C. Shaft which is caved. The material is quartz and galena boulders in gossan and apparently lies, essentially in place, at or near the bed-rock surface. It assayed 104.4 oz. silver, 79.9 % lead, 7.1 % zinc over a width of about 8 inches.

I was unable to see much evidence of the split in the Whitewater shear shortly above their No. 1 tunnel and passing through the Iringio raise and the Matheson shaft as sketched on Dr. Hodley's map.

The two Matheson adits are at the same elevation and are connected by a drift underground. Both start on the Homestake Fr. No. 6 claim and the east adit penetrates practically to the boundary of the Collington claim. They were driven chiefly in the 1920's. In the east Matheson adit, at 240 feet from the portal, a drift extends N 82° E for 420 feet on a vein which dips 54° southward. For the first 325 feet from the crosscut the vein is a fairly strong shear with a few inches to two feet of gouge and a little quartz and spathic iron in strongly crushed and sheared argillite. Several short stringers of quartz and spathic with galena and sphalerite occur at intervals and there are traces of the same minerals in the crushed rock on the foot of the stringers. Sample #604, taken across 2 inches at 297 feet from the main crosscut, assayed 30.72 oz. silver, 37.20 % lead, 21.30 % zinc. From the 325 foot point in the drift the shear and mineralization begin to weaken and there is little of either left at the east face of the drift. A parallel but weaker shear shows at 20 to 30 feet in the foot-wall of the drift. little or no mineralization was noted along it, except in the crosscut at the face of the drift, where the shear is stronger; Sample #605, over a width of 1.9 feet in the crosscut across a lense of limestone, quartz and spathic with galena and sphalerite, assayed 4.60 oz. silver, 8.40 % lead, 14.30 % zinc. Unfortunately the lense pinches rapidly in all directions except possibly downward where it cannot be seen.

At 285 feet from the portal of the adit a drift extends 190 feet westward and connects with the west Matheson adit. This drift is apparently on a minor shear between the two mentioned in the east drift and shows little or no mineralization. A strong shear shows at a cove in the west adit at 130 feet from the portal, and is probably the continuation westward of the vein and shear in the east drift. This vein is believed to be the western extension of the Whitewater vein and is at 40 feet higher elevation than the #1 tunnel of the Whitewater, also the dip is considerably steeper and the strike some 20 degrees more southerly going west.

At 880 feet from the portal in the main east adit there is a strong shear with gouge, and a strong flow of water, striking N 60° E, and dipping 53° south which has the appearance of a vein. There are many irregular quartz stringers in the hanging-wall slates and a 4 foot vein of 60 % quartz about 25 feet in the footwall. A 15 foot raise was driven on the shear and S. R. Ross, under whose direction the raise was driven, says a few bits of galena in quartz were found in the muck. This vein does not correlate well with any other known vein.

Bedding strikes throughout the adit generally vary from N 60° E to nearly east and west; dips from vertical to 60° north. The rocks are mostly argillites of which the greater part are thin bedded and often slaty.

Of the three Stewart tunnels only the #2 at 4265 elevation is open. A strong shear and thick gouge striking nearly east and west and dipping 38° south borders the south side of the tunnel. The wall rocks are limestone except argillite at the north end of the crosscut near the face. There is no evidence of mineralization.

The Hazel edit starts on the claim of that name and crosses the length of the Homestake Fr. #6 for a total crosscut length of 1730 feet. From the main edit three drifts have been driven as follows:-

At 150 feet from the portal 10 feet east and 60 feet west.

At 230 feet from the portal 240 feet east and 485 feet west.

At 1570 feet from the portal 180 feet east and 325 feet west.

The drift at 150 feet is along the hanging-wall of a belt of limy argillite and weak chouring, dipping steeply south.

The drifts at 230 feet are along a moderately strong shear, known as the Hazel vein, 6" to 12" of gouge. In the east drift at 60 feet from the main crosscut there is a stringer 6 feet long and 2 inches thick which was sampled, #602, and assayed 22.24 oz. silver, 21.40 % lead, 0.50 % zinc. There is also some disseminated zinc of low grade in the same general vicinity and some spathic iron. In the West drift a similar streak 2" wide of quartz, spathic, galena and sphalerite was sampled, #601, and assayed 26.40 oz. silver, 29.00 % lead, 10.70 % zinc. This vein strikes N 67° E and dips 48° south.

The drifts at 1570 feet are on what is believed to be the Whitewater vein. It is a strong shear 5 to 10 feet wide with 6" to 30" of gouge on the hanging-wall. Under the gouge there is a broken zone with lenses of quartz and spathic with traces of zinc. Both walls of the shear are thin bedded argillite. The strike of the vein is due east and west; the dip of the hanging-wall is 10° south at the east face increasing to 33° south in the west drift. A single dip, read on the footwall at the main crosscut, was 54° . A raise about 25 feet long has been driven on the vein over the main edit and shows stringers of quartz and spathic iron. Fragments containing galena and sphalerite, sample #603, were picked out of the rock and assayed 15.12 oz. silver, 18.70 % lead, 7.70 % zinc.

There are some dip data adverse to the assumption that the westerly extension of the Whitewater vein passes through the I. C. shafts, the first drift in the Matheson tunnel and the most northerly drifts in the Hazel tunnel. The vein in the I. C. shafts is said to be nearly vertical, from the shaft to the position of the vein in the Matheson as given on the map would make the dip between them 76° , and from the Matheson to the drifts in the Hazel 80° . Actual dip readings in the Matheson tunnel are 54° , and 26° in the Hazel. Since several errors have been found in the maps it is possible that there is also an error in the relative locations of these workings. Or perhaps the dip of the vein varies widely from place to place as is reliably reported to be the case in the Whitewater Mine. The assumption that the three vein exposures belong to the same vein seems most likely to be correct in spite of the discrepancy in dip readings.

DUMPS:

There is no ore on any of the dumps below that at the 200 level edit on the Wellington claim. This dump has been roughly sampled by the Whitewater mine operators

with generally poor results. However two of their samples show profitable ore, and, from the amount of zinc ore seen on parts of the dump, there seems to be a good chance of finding a fair tonnage of pay ore for treatment in the Whitewater sink-float plant.

Some of the dumps at the 40 level tunnel and the main Wellington shaft above it show considerable zinc and a little lead. Small parts of two or more dumps have been hand-jigged, apparently for the lead only, as the tailings show considerable zinc.

Sample #607, taken about 125 feet southerly from the portal of the 40 Level tunnel, is from jig tailings over an area of about 25 x 100 feet and assays 27.6 oz. silver, ~~2.7~~ 2.7 % lead, 30.0 % zinc.

Sample #608 is of fragments of sphalerite, and a little galena and gray copper picked off several of the better dumps from the 40 level and the main shaft. The chief object of this sample is to give an estimate of the silver content. It assayed 62.8 oz. silver, 8.8 % lead, 37.0 % zinc.

Sample #609 is from jig tailings at about 200 feet west of the portal of the 40 foot level tunnel, perhaps representing 50 to 100 tons; it assayed 15.4 oz. silver, 1.6 % lead, 6.3 % zinc.

The better parts of the dumps at the main shaft, the 40 level and the 200 level are well worth careful sampling. A road could be cheaply bulldozed to all these dumps; a half finished "out" track now extends from the finished road to the 200 level dump.

FUTURE DEVELOPMENT:

The development most likely to open important ore appears to be the driving of the Matheson tunnel ahead to cut the Wellington south vein and north or Sunset vein at an additional depth of 300 feet. This would involve extending the Matheson tunnel a probable 700 feet to the south vein, at a cost of \$25,000 including mining equipment, etc., but excluding the cost of a camp at the Matheson tunnel. If a camp were not built at the Matheson it would be necessary to haul men from the lower camp by 4-wheel drive truck and during a snowstorm the road would have to be plowed before the truck could operate. Also the Matheson tunnel would probably require widening in places to allow the entry of mechanical rucking and tramping equipment.

Other possibilities for ore are the extension of the drifts on the Whitewater vein eastward in the Matheson and Hazel tunnels. In this direction there are distances of roughly 700 and 900 feet to the property boundary. Such work is not in my opinion especially likely to develop important ore. The same applies to the continuation of the west drift on the Whitewater vein in the Hazel tunnel. The Hazel is at 34 feet lower elevation than the #10 level of the Whitewater which is in a lean zone and produced little ore.

Good galena float is reported on the Nelson claim by S. H. Ross. This, and the possible extension of the known veins into the western part of the property, might best be tested by geophysical survey followed by bulldozing or diamond drilling of any anomalies.

CONCLUSION:

A great deal of development has been done on the property but little or no commercial ore has been found except in the old workings in the central part of the Wellington claim. These workings are now caved and completely inaccessible and no entirely authentic data as to the size, dip and strike etc. of the ore bodies can be obtained. Dr. Cairnes apparently obtained his information on them from verbal or other reports and they do not always check with the maps furnished by the Wellington Mines Ltd. which, in some instances, do not entirely check with later workings which are now open. It is therefore very difficult for an examining engineer to evaluate the chances of further profitable development of the Wellington vein. From metal prices and wages paid in the period 1892 to 1910, when most of the mine production was made, it appears that the ratio between wages and metal prices was not much different than they are now, except that zinc was nearly worthless then. If the profits then, or the showings in the bottom level, were not sufficiently good to encourage the "old timers" to develop the Wellington veins lower down it would seem to be quite a gamble under present conditions.

The terms of the present option to the Waddington Mining Corp. Ltd. calling for cash payments of \$3000 before there is any expectation of finding ore, plus a rental of \$200 per month for inadequate equipment, and the acquisition of 51% of the Wellington stock in payments, after the expenditure of \$100,000 seems too onerous. I therefore advise that the Waddington do not exercise their option.

Respectfully submitted.

Chas. C. Starr

Two maps accompany this Report.

Member of Association of
Professional Engineers of B. C.

August 19, 1950.