

W.A. No.

NAME

Ministry of

SUBJECT

82FNW155 Ottawa

PROPERTY FILE

02

002419

(82F/14W)

WORK DONE: R. B. Savage used a $\frac{3}{4}$ -yard shovel to excavate the main dump and subsequently shipped 891 tons of this material to the Trail smelter. The material shipped to Trail graded around 4.3 ounces per ton silver.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, GEM, 1970, p. 460; *B.C. Dept. of Mines & Pet. Res.*, Bull. 53, pp. 106-109.

MARMION, MARYLAND (82F/NW-141) (Fig. A, No. 136)

By P. E. Olson

LOCATION: Lat. 49° 45' Long. 117° 18' (82F/14W)
SLOCAN M.D. Seven and one-half miles east of Slocan, about 1,000 feet north of Tagart Creek, at approximately 6,000 feet elevation.

CLAIMS: MARMION (Lot 4975) and MARYLAND (Lot 4976).

OWNER: Gordon Cleland.

OPERATORS: M. R. MAZE and partner, Box 398, Castlegar.

METALS: Gold, silver (production shown on Table I).

DESCRIPTION: The property has been developed by a short adit and crosscut at an elevation of approximately 6,000 feet.

WORK DONE: Seven tons of ore, grading around 0.63 ounce per ton gold and 2.0 ounces per ton silver, was mined from the sidewalls and backs of the old workings and shipped to the Trail smelter.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1941, p. 63.

OTTAWA (82F/NW-155) (Fig. A, No. 132)

By P. E. Olson

LOCATION: Lat. 49° 47' Long. 117° 24' (82F/14W)
SLOCAN M.D. Two and one-half miles northeast of Slocan City, 1,000 feet east of Algiers Creek, a tributary of Springer Creek, at approximately 5,000 feet elevation.

CLAIMS: OTTAWA (Lot 4968) and other adjoining claims.

OWNER: Slocan Development Corporation Limited.

OPERATOR: MIKE POZNIKOFF, Slocan City.

METALS: Silver, lead, zinc (production shown on Table I).

DESCRIPTION: The Ottawa mine workings, which are quite extensive, are within a large northerly trending zone of shearing and brecciation. Dips vary from nearly flat to about 45 degrees easterly. Ore zones are usually quite small but carry significant values in silver with minor lead. Quartz and barite are the principal gangue minerals. Country rock is a coarse-grained feldspar porphyry of the Nelson granite.

WORK DONE: Mike Poznikoff produced several small shipments from stopes between No. 8 and No. 9 levels, and above No. 8 level. Ore recovery is a salvage operation around old stopes and is becoming very difficult.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, GEM, 1972, p. 56.

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(82F/10W)

HUMBOLT (No. 53, Fig. A)

LOCATION: Lat. 49° 45.2' Long. 116° 38' (92F/10E, 15E)
SLOCAN and FORT STEELE M.D. Between 5,200 and 6,400 feet elevation on Spring Creek, in Crawford Creek basin, 6 miles east of Riondel.

CLAIMS: HUMBOLT (Lot 2015), SAILOR BOY (Lot 2016), JOAN 1 to 71, SILVER 5 to 8, HOPE 1 to 4, BAREFOOT 1 and 2, DARI 1 and 2, ELLEN 1 to 3, GEM, GEM Fraction, VI 1 to 8, HOPE 2 to 6, ELEANOR.

ACCESS: By road from Crawford Bay, 14 miles.

OWNER: ROSE PASS MINES LTD., 630A - 17th Avenue SW., Calgary, Alta.

METALS: Silver, lead, zinc.

DESCRIPTION: Quartz veins in black argillaceous rocks contain galena, sphalerite, chalcopyrite, stannite, and pyrite.

WORK DONE: Surface diamond drilling, five holes totalling 963 feet on Barefoot 2, Ellen 3, and Silver 7.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 406.

CRAW (No. 116, Fig. A)

LOCATION: Lat. 49° 38.2'-40' Long. 116° 49.8'-51' (82F/10W)
SLOCAN M.D. Between Crystal and McGregor Lakes, on the west side of Crawford Bay on Kootenay Lake.

CLAIMS: CRAW 1 to 31.

ACCESS: By road from Nelson, approximately 25 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

DESCRIPTION: The claim group is underlain by schists of the Index Formation, Hamill quartzites and amphibolites and granitic intrusive rocks.

WORK DONE: Geochemical soil survey, approximately 500 samples covering Crawl 1-4, 9-16, 20-30.

REFERENCE: Assessment Report 4132.

OTTAWA (No. 172, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 47.4' Long. 117° 24' (82F/14W)
SLOCAN M.D. On the north side of Springer Creek, 5 miles from Slocan.

CLAIMS: OTTAWA (Lot 4968) plus other mineral claims.

ACCESS: By the Springer Creek mining road which leaves the Slocan-Nelson Highway one-half mile south of Slocan.

OPERATOR: PAMICON DEVELOPMENTS LTD., c/o Mike Poznikoff, Slocan.

METAL: Silver (production shown on Table I).

WORK DONE: Mike Poznikoff and partners produced several cars of sorted ore which were sent to the Trail smelter. Both 8 and 9 levels were worked but increasing amounts of development and exploration work became necessary and thus reduced the overall earnings of the operators.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 411.

OTTAWA (No. 126, Fig. G)

By P. E. Olson

LOCATION: Lat. 49° 47.4' Long. 117° 24' (82F/14W)
SLOCAN M.D. On the south side of Springer Creek, 5 miles from Slocan.

CLAIMS: The OTTAWA (lot 4968) and 10 other claims.

ACCESS: Via the Springer Creek mining road, which leaves the Slocan-Nelson highway one-half mile south of Slocan.

OWNER: Slocan Ottawa Mines Ltd.

OPERATOR: PAMICON DEVELOPMENTS LTD., c/o Mike Poznikoff, Slocan.

METAL: Silver (production shown in Table 1).

WORK DONE: Several cars of sorted ore were shipped to the Trail smelter.

REFERENCE: B.C. Dept. of Mines & Pet. Res., G.E.M., 1970, p. 448.

HOMESTAKE (No. 129, Fig. G)

By P. E. Olson

LOCATION: Lat. 49° 49.2' Long. 117° 25' (82F/14W)
SLOCAN M.D. On the north side of Memphis Creek, about 1 mile east of the Slocan-Silverton highway, at an elevation of 4,000 feet.

CLAIM: HOMESTAKE (Lot 15283).

ACCESS: Via 2 miles of jeep road from the Slocan-Silverton highway.

OWNER: C. THICKETT AND ASSOCIATES of Slocan have a lease on the property.

METALS: Gold, silver (production shown in Table 1).

WORK DONE: Sporadic shipments of ore have been made from this mine in recent years, and some exploration has been done, but no new ore has been found. A small amount of sorted ore was taken from the lower level and shipped to the Trail smelter. This shipment took the last of known ore on the claim and the mine was shut.

REFERENCES: B.C. Dept. of Mines & Pet. Res., G.E.M., 1969, p. 325; 1970, p. 449.

JOYCE (No. 130, Fig. G)

By P. E. Olson

LOCATION: Lat. 49° 49.2' Long. 117° 25.1' (82F/14W)
SLOCAN M.D. On the north side of Memphis Creek, immediately north of the Homestake Crown grant (Lot 15283).

CLAIMS: JOYCE, JOYCE 3.

ACCESS: Via a jeep road from the Slocan-Silverton highway.

OWNER: C. THICKETT, Slocan.

METALS: Gold, silver (production shown in Table 1).

WORK DONE: Bulldozer stripping uncovered a pocket of high-grade gold-silver ore which was mined out and shipped to the Trail smelter.

REFERENCE: Minister of Mines, B.C., Ann. Rept., 1968, p. 249 (Homestake).

REPUBLIC (No. 128, Fig. G)

By P. E. Olson

LOCATION: Lat. 49° 48' Long. 117° 27' (82F/14W)
SLOCAN M.D. Two miles north of Slocan, near the head of Climax Creek.

HECLA (No. 36, Fig. K)

LOCATION: Lat. 49°46' Long. 117°23' (82F/14W)
At approximately 6,000 feet elevation, on Springer Creek, 4 miles east of Slocan.

CLAIMS: HECLA 1 to 10.

ACCESS: By road from the Ottawa mine road, 3 miles.

OWNER: GOLDSTREAM MINES LTD., Box 54, Slocan.

METALS: Silver, lead.

DESCRIPTION: Trenching revealed a breccia shear zone up to 14 feet wide cutting through porphyritic granite. The breccia zone is cemented with barite as well as stringers of quartz mineralized with pyrite, sphalerite, galena, tetrahedrite, and argentite.

WORK DONE: Trenching, 3,600 feet on Hecla 1 to 3.

REFERENCE: *Geol. Surv., Canada*, Mem. 184, p. 170.

OTTAWA (No. 65, Fig. K)

By P. E. Olson

LOCATION: Lat. 49°47.4' Long. 117°24' (82F/14W)
On the south side of Springer Creek, 5 miles from Slocan.

CLAIMS: The OTTAWA Crown-granted mineral claim (Lot 4968) and 10 other claims.

ACCESS: Via the Springer Creek road, which leaves the Slocan-Nelson highway one-half mile south of Slocan.

OWNER: Slocan Ottawa Mines Ltd.

OPERATOR: PAMICON DEVELOPMENTS LTD.

METAL: Silver (*see* Table 1 for production).

WORK DONE: The Ottawa mine has a long history of development and production, but activity at this mine has dropped off recently. The company owns a complete 75-tons-per-day mill which has been idle during the last year. Since 1965, all production has come from the Nos. 8 and 9 areas, but ore reserves in these places are practically gone. About 1,000 feet of drifting and cross-cutting was done, mainly from No. 9 level, with discouraging results. Several cars of ore were shipped by the leasers during the early part of the year.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 324.

ARLINGTON (No. 66, Fig. K)

By P. E. Olson

LOCATION: Lat. 49°47.4' Long. 117°21.6' (82F/14W)
The Arlington mine is on the north side of Springer Creek, about 7 miles from Slocan. Main workings are at an elevation of 5,200 feet.

CLAIMS: Sixteen Crown-granted and recorded mineral claims, including the ARLINGTON (Lot 2416).

ACCESS: Via the Springer Creek road, which leaves the Slocan-Nelson highway immediately south of Slocan.

OWNER: ARLINGTON SILVER MINES LTD., 809, 525 Seymour Street, Vancouver 2.

METALS: Silver, lead, zinc (*see* Table 1 for production).

DESCRIPTION: The Arlington mine has been operated intermittently since the late 1800's. Continuous fractures and brecciated zones, several feet wide, contain scattered lenses of rich silver-lead-zinc mineralization accompanied by native silver. The property has been developed by eight levels and numerous cuts and trenches. The lowest level (A level) is the principal working. Much

work has been done in diamond drilling.
WORK DONE: An effort was made to develop the mine. Some development was shipped along Springer Creek for an indefinite period.
REFERENCE: *B.C. Dept.*

LITTLE TIM (No. 67, Fig. K)

LOCATION: Lat. 49°48' Long. 117°24' (82F/14W)
The Little Tim mine is on the north side of Springer Creek, about 6,600 feet.

CLAIMS: The area is held by the V DAY.

ACCESS: By 4 miles of road from Slocan.
OWNER: MOLY-WIN LTD.

METALS: Silver, lead.

DESCRIPTION: The main ore body is east and dipping. It is a fine-grained porphyry. The Little Tim are very rich.

WORK DONE: A minor amount of work has been done.

REFERENCE: *B.C. Dept.*

COLORADO, WHITE

LOCATION: Lat. 49°49.1' Long. 117°21.6' (82F/14W)
At approximately 5,200 feet elevation, Slocan City.

CLAIMS: WHITE HOP.

ACCESS: By road from Slocan.

OWNER: Rama Mining Co.

OPERATOR: HYPERION.

METALS: Silver, lead, zinc.

WORK DONE: Underground work.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 324.
Canada, Mem. 184.

HOMESTAKE (No. 68, Fig. K)

LOCATION: Lat. 49°49.2' Long. 117°21.6' (82F/14W)
On the north side of Springer Creek, about 7 miles from Slocan, highway, and at an elevation of 5,200 feet.

CLAIMS: The HOMESTAKE.

ACCESS: Via 2 miles of road from Slocan.

OWNER: C. THICKETT.

METALS: Gold, silver (see Table 1 for production).

DESCRIPTION: The Homestake mine has been operated intermittently since the late 1800's. Continuous fractures and brecciated zones, several feet wide, contain scattered lenses of rich silver-lead-zinc mineralization accompanied by native silver. The property has been developed by eight levels and numerous cuts and trenches. The lowest level (A level) is the principal working. Much

OTTAWA (No. 66, Fig. 41)

By P. E. Olson

LOCATION: Lat. 49° 47.4' Long. 117° 24.0' (82F/14W)

On the north side of Springer Creek, 5 miles from Slocan.

CLAIMS: The OTTAWA Crown-granted mineral claim (Lot 4968) and 10 other claims.

ACCESS: Via the Springer Creek road, which leaves the Slocan-Nelson highway one-half mile south of Slocan.

OWNER: Slocan Ottawa Mines Ltd.

OPERATOR: PAMICON DEVELOPMENTS LTD., 303, 1624 East Broadway, Vancouver 12. Pamicon has a lease on the Ottawa mine and mill and M. Poznikoff and partners have sub-leased the mine from Pamicon.

METAL: Silver.

WORK DONE: Considerable dump rock from No. 8 level was milled, and some ore mined underground from No. 9 level was milled.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 248.

DESCRIPTION: Milling of dumps proved unsuccessful owing to insufficient silver and possibly owing to difficulties in recovery. Very little ore is available in the old mine workings and hence much exploration is required. Ore zones were fairly well cleaned up during 1968.

ARLINGTON (No. 67, Fig. 41)

By P. E. Olson

LOCATION: Lat. 49° 47.4' Long. 117° 21.6' (82F/14W)

The Arlington mine is on the north side of Springer Creek, about 7 miles from Slocan.

CLAIMS: Sixteen Crown-granted and recorded mineral claims, including the ARLINGTON (Lot 2416).

ACCESS: Via the Springer Creek road, which leaves the Slocan-Nelson highway immediately south of Slocan.

OWNER: ARLINGTON SILVER MINES LTD., 809, 525 Seymour Street, Vancouver 2; mine office, Slocan; S. Walsh, manager.

METALS: Silver, lead, zinc (see Table 12 for production).

WORK DONE: Drifting, raising, and stoping on A and B levels. Surface diamond drilling was done between G and H levels.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 249.

DESCRIPTION: An extension of the Arlington vein is reported to have been intersected by diamond-drill holes above and north of the main workings. Stopped ore, which is mainly salvage from old workings, was shipped to the Trail smelter.

LITTLE TIM (No. 69, Fig. 41)

By P. E. Olson

LOCATION: Lat. 49° 48.4' Long. 117° 22.4' (82F/14W)

The Little Tim mine is near the head of Little Tim Creek, a tributary of Springer Creek from the north. Principal workings are at an elevation of 6,600 feet.

CLAIMS: The LITTLE TIM group, comprising the V DAY, VICTORY V, UTE Fraction, UOME, and CACHE claims, is surrounded by the LITTLE TIM 1 to 11 claims. The mine is on the V DAY.

ACCESS: By 4 miles of poor jeep road from the Ottawa mine.

OPERATOR: MOLY-WIN MINING LTD., 827, 510 West Hastings Street, Vancouver 2.

points over a length of several hundred feet. Erratic values in gold, silver, and lead are found in small lenses in a large shear within granite of the Nelson batholith. The shear has an east-west strike and is nearly vertical in dip. A sample of ore weighing 1,100 pounds was run through the Kenville mill at Blewett.

Silver

Boomerang and Richmond*

(49° 117° N.E.) The Boomerang and Richmond recorded mineral claims are situated on the south side of Enterprise Creek, about 12 miles from the Slocan City-New Denver highway. The claims were worked by the owners, George Forster and P. A. Ward, of Trail. The workings consist of two adits and a small stope which were worked early in the century. Ward and Forster drifted around the caved stope, but their efforts were hampered by an unexpected break-through into the stope. A compressor was winched up to the workings from the Enterprise Creek road.

SPRINGER CREEK

Silver-Lead-Zinc

White Hope*

(49° 117° N.E.) The White Hope mine is operated by D. F. Bentley and Associates, of Slocan City. The property is immediately east of the Slocan City-New Denver highway, 4 miles north of Slocan City. The property is explored by three adits and several open cuts that explore mineralized fractures in granite. The principal showing is on No. 2 level, which has a total of 500 feet of drifts and crosscuts. A mineralized shear exposed over a length of about 100 feet has an average width of about 10 inches. Ten tons of this material was shipped to the Trail smelter. No. 3 level was reopened and prepared for drifting, which is intended to explore ore located on No. 2 level, some 100 feet vertically above. A crew of four men worked on the property during most of the year.

Silver

Ottawa (Ottawa Silver Mines Limited)*

(49° 117° N.E.) Company office, Suite 201, 569 Howe Street, Vancouver 1; mine office, Box 75, Slocan City. J. L. Wilson, president and managing director; J. R. McLean, secretary. The mine is 5 miles by good road from Slocan City and the mill is 2½ miles from Slocan City on the same road. The mine operated from January to the end of August, when the operation shut down pending settlement of management disputes and a re-evaluation of the operation. Drifting and crosscutting on No. 9 level amounted to 700 feet, and 125 feet of short raises were driven from these openings. No. 9 level is an exploration drive on the Ottawa vein system that has not been connected to the upper workings. The exploration work done on No. 9 level has located only minor amounts of silver ore, and no stoping has been done in this area.

Raising and drifting between No. 8 and No. 6 levels amounted to 863 feet. Stopping and development ore from this area made up the 6,400 tons trucked to the mill. Concentrates were shipped to the Trail smelter.

Diamond drilling was started near the end of 1964, and 363 feet was done by December 31st. Drilling was confined to the area between the two lowest levels. The company employed 30 men prior to shutting down in August.

* By P. E. Olson.

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(49° 117° N.E.) Company office, 809, 525 Seymour Street, Vancouver 2. Work on the property was under the direction of B. I. Nesbitt, who controls the company. The property consists of Crown-granted and recorded mineral claims covering a 2-mile-long strip of land along the Arlington lode. The property is on the north side of Springer Creek, 6.7 miles by road from Slocan City.

The "A" and "B" levels were rehabilitated, roads to the property were repaired, and some new road was constructed. Preparatory to advancing the "B" level in 1964, 500 feet of track and compressed-air lines were laid. Some bulldozer trenching was done, and 326 tons of dump rock from the "B" level was shipped to the Trail smelter.

Ottawa (Ottawa Silver Mines Ltd.)* (49° 117° N.E.) Company office, 19 North Bernard Street, Spokane, Wash.; mine office, Slocan City. T. C. Hughes, president; C. Thickett, mine manager. The mine is 5 miles by good road from Slocan City. The company mill is 2½ miles from Slocan City on the same road.

In 1963, 2,521 feet of drift and 1,045 feet of raise were driven, mainly on No. 9 level. Diamond-drill holes, totalling 240 feet, were put in to test ore extensions below No. 8 level. A total of 384 tons of ore, containing about 113 ounces of silver per ton, was shipped to the Trail smelter, and about 3,000 tons of ore was stockpiled at the mine. In 1963, 16 men were employed at the mine.

Mill construction was started in June and completed late in December, but no milling was done in 1963. The flow-sheet included both flotation cells and vibrating tables. The more important components of the mill were formerly in a mill constructed at Woodbury Creek in 1953 by Can-Amer Mining & Milling Company Ltd. The mill capacity is expected to be 75 tons per day, and eight men will be employed during operation. Twenty men were engaged to construct the mill.

Calumet (Slocan-Hughes Mines Ltd.)* (49° 117° N.E.) Company office, 19 North Bernard Street, Spokane, Wash.; mine office, Slocan City. T. C. Hughes, president; C. Thickett, manager. Capital: 5,000,000 shares, no par value. The property consists of 11 Crown-granted claims under lease and 41 claims held by record. The property is accessible by 4 miles of road from Slocan City and is located immediately south of and across Springer Creek from the Ottawa mine. Bulldozer trenching exposed several shears near the old Calumet and Hecla mines, which were last worked in the early 1900's.

Meteor (Cultus Explorations Ltd.)* (49° 117° N.E.) Company office, 11810—112th Street, Edmonton; mine office, Slocan city. J. F. Sullivan, president; Tony Semeniuk, manager. The property consists of 19 Crown-granted and recorded mineral claims and fractions at the head of Tobin Creek, a tributary of Springer Creek. The mine is 9 miles by road from Slocan City.

The Meteor No. 6 level adit was rehabilitated, and new services were installed from the portal to a point 800 feet inside the level. During the rehabilitation, 265 tons of vein material was accumulated and later shipped to the Trail smelter.

*By P. E. Olson.

Ottawa (Ottawa Silver Mines Limited) (49° 117° N.E.) Company office, 19 North Bernard Street, Spokane, Wash.; mine office, Slocan City. T. C. Hughes, president; C. Thickett, mine manager. This mine is accessible by 5 miles of good road from Slocan City. The company started a development programme in March. A ventilation raise was driven from No. 8 level to No. 6 level, a distance of approximately 470 feet, following the dip of the vein. In driving the raise, several lenses of very high-grade ore were opened up. Some outstanding specimens of native silver were observed. The ventilation in the mine is now good. On completion of this raise two small stopes were developed. Drifting on No. 9 level was started on a one-shift basis. This drift is being driven along the Ottawa shear, to explore the shear and to intersect the downward extension of the vein on No. 8 level. A total of 500 feet of drifting has been done, 200 feet in 1962.

An average crew of twelve men was employed for ten months. A total of 740 tons of ore was shipped to the Trail smelter.

Slocan Prince (49° 117° N.E.) This group of Crown-granted claims is owned by J. K. Pearson, 1728 Thirteenth Street Southwest, Calgary. The property is at the head of Springer Creek and is accessible by 11½ miles of road from Slocan City. Pearson and one man did a considerable amount of stripping on the vein, with the idea of trying open-pit mining. A total of 257 tons was shipped to the Trail smelter, 4 tons of which came from the Bank of England claim.

CRESTON*

Silver-Lead-Zinc

Liz B (49° 116° S.E.) This property consists of eight recorded claims owned by Mrs. E. Barclay, of Nelson. It is at 3,100 feet elevation on Wildes Creek, 2 miles north of Wynndel. Mineralization occurs in limestone which dips steeply to the east and strikes north 35 degrees east. The footwall and hangingwall rocks vary from schist to limy schist. This series of rocks can be traced from the Kootenay Bay-Creston highway up the hill along the strike for 1½ miles, and mineralization is noted in some exposed sections of rocks.

The main mineral showings occur on the Liz B claims, a distance of 1,000 feet along strike. The predominant minerals are fine-grained and very light-coloured sphalerite, fine-grained pyrite, and minor galena. Fairly abundant sphalerite can be observed in cuts across the mineralized showings.

Seven diamond-drill holes have been drilled on the property. Newmont Mining Corporation of Canada Limited drilled five holes in 1954, four of which cut mineralized zones down dip. Sheep Creek Mines Limited optioned the property in the fall of 1961 and completed their second drill-hole in January, 1962. The option was dropped in the spring of 1962.

MOYIE†

Gold-Silver

Midway (Moyie Mines Limited) (49° 115° N.W.) This property is near No. 3 highway, 5 miles southwest of Moyie. It comprises sixteen mineral claims which were optioned or located by the company in 1962 for exploration, and includes two long adit levels which have been driven in past years. A detailed description of the property is included in the 1933 Annual Report.

* By J. D. McDonald.

† By D. R. Morgan.

westward. These movements are later than the mineralization of the quartzite, and, lacking evidence of any later period of mineralization, it is doubtful if this area within the granite is of commercial interest.

DRY SILVER ORES.

SLOCAN LAKE AREA.

This group of thirty-one claims, all Crown-granted except the *Double Ottawa Group*. *Cross Fraction*, which is in process of Crown-granting, is held by the Ottawa Silver Mining and Milling Company; head office, 401 Sherwood Building, Spokane, Washington. C. R. Thomas is president of the company, and D. D. Fairbanks is in charge of operations at the mine. A flotation mill, rated at 100 tons a day, powered by a 170-horse-power Diesel electric plant, is close to the highway only a mile from Slocan City. The mine, on Springer Creek, at an elevation of 4,500 feet, is reached from the mill by 5 miles of good road. At the mine, a 150-horse-power Diesel plant supplies power for an L-type 13½-inch and 8- by 8-inch compressor. A combined cook-house and bunk-house provides accommodation for twenty-five men. During the past year an average of eighteen men has been employed at the mill and mine. Ore is hauled by truck from mine to mill. During the past season the mill has been running only part time, either one or two shifts, depending on the output from the mine. Shipments of concentrates at the rate of 20 tons a month have been fairly well maintained. Total production for 1938 was 112 tons of dry ore and 75 tons of concentrates, containing 3 oz. gold and 59,959 oz. silver.

As described in Annual Report of the Minister of Mines for 1935 and previous years, and in Memoir 184, Geological Survey, Canada, original development on six levels explored a wide zone of shearing in coarse-grained porphyritic granite of the Nelson batholith. The movement is represented by two distinct shearings which strike north and dip flatly east almost parallel, known respectively as the east and west veins. Although there is apparently a tendency for the two lodes to approach each other on their southerly extensions, none of the underground development to date has proved any such intersection.

In the references cited above, complete data are given on the upper six levels. In 1937 and the early part of 1938 a few men were engaged in selective mining on No. 5 level, removing pillars and small blocks of ore left by the previous operators. In addition, one narrow hanging-wall strand of mineralization was located and mined. This sniping was abandoned principally because of the small size of the drift, not sufficiently large for a half-ton car, and the distance of the working-place from the portal, 2,600 feet. In the past two years development has been concentrated on the No. 8 level, driven at an elevation of 4,400 feet, 284 feet below No. 5, the next adit above. No. 6, below No. 5, is accessible only from the upper level and is flooded at the present time.

On No. 8 level a 1,200-foot crosscut was required to reach the west vein. Ensuing work in a northerly direction has proved both lodes to be strong and well maintained, with widths up to 20 feet on the west vein and probably 15 feet on the east. The estimated average width of each is 5 feet. Within the shear-zone the original granite has been brecciated, altered by regional metamorphism, finally silicified, and is now light green to grey in colour. Feldspar crystals have been destroyed to a great extent, particularly in the ore-bearing sections of the shear; where observed in the barren sections they are commonly elongated or shattered. Mineralization by native silver, argentite, tetrahedrite, galena, pyrite, sphalerite, and chalcopyrite occurs anywhere within the limits of the shear-zone as irregular concentrations, sometimes in vein-like form, sometimes as small isolated wedges or lenticular masses. Heavy concentrations of mineralization may be seen easily and mined selectively with little difficulty, but frequently milling or even high-grade ore may appear to be only sparsely mineralized, necessitating judicious handling in underground and later sorting. Gouge bands, 2 to 12 inches in width, swing through the shear-zone from one wall to the other. Slickensides are common on the walls.

The evidence indicates that following the primary shearing, secondary movements reopened tight and irregular fissures between the original walls. Later mineralization, responsible for the ore-deposits, was concentrated in the secondary openings. Final small strike-faults, disturbed the original walls and the ore-concentrations still further.

From the initial crosscut on No. 8 level, on December 1st, 1938, the drift on the west lode had been advanced 375 feet north. The strike of the shear is north 10 to 30 degrees west, the dip 30 to 35 degrees eastward. At 220 feet from the initial crosscut, another crosscut was driven 145 feet from the west lode to the east. A drift northward on the east lode had reached a point 500 feet north of the crosscut on December 1st. The strike of this shear is predominantly north 10' to 20 degrees west, and the dip 30 to 35 degrees eastward, but one short section strikes north 20 degrees east, dips 30 to 40 degrees eastward.

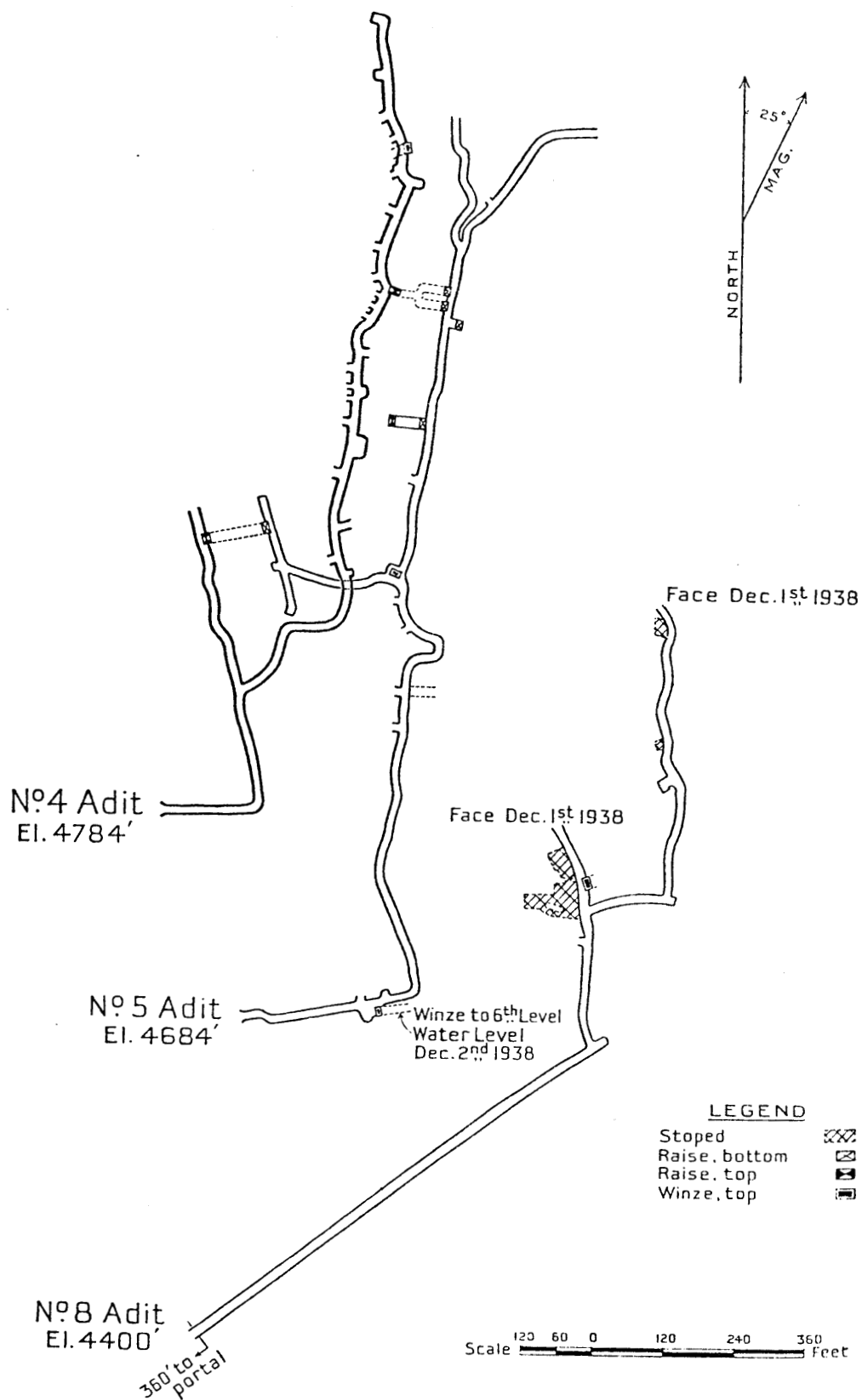
To date the west lode has produced most of the ore from No. 8 level. From the initial crosscut to the crosscut to the east drift the exposure, according to the operators, returns only low assays. From the crosscut to the east lode, for a distance of slightly over 100 feet northward, a stope had been carried to a maximum distance of 90 feet up the dip of the west vein. This stope provides the best exposures of the shear on this level. The southern part, stope No. 1, has been worked most extensively and, at the time of examination, a high-grade concentration was being mined at the south end. A sample across 16 inches assayed: Gold, trace; silver, 301 oz. per ton. Mineralization by argentite, native silver, and tetrahedrite was strong over this width, but a 4-inch width included at the centre of the sample showed particularly heavy concentration. A sample taken selectively from this 4-inch width assayed: Gold, trace; silver, 1,107.2 oz. per ton. A third sample taken across 48 inches, to the hanging-wall of the first sample, composed of silicified shear filling, little mineralized, assayed: Gold, *nil*; silver, 7.8 oz. per ton. Extension of the high-grade mineralization toward the north end of the stope was not well-defined but appeared to be rising toward the hanging-wall of the shear.

No. 2 stope is properly an extension of No. 1 stope northward, but has been developed separately by reason of an abrupt break in the hanging-wall which makes that wall some 4 feet lower in No. 1 than in No. 2. A dragging movement later than the shearing is clearly marked at this point by pronounced slickensides. At the south end of No. 2 stope, 40 feet up the dip of the vein from the drift, a sample across a 5-inch streak of heavy mineralization carrying argentite and tetrahedrite assayed: Gold, trace; silver, 166.8 oz. per ton. Another sample across 45 inches, little mineralized, on the foot-wall of the preceding sample assayed: Gold, *nil*; silver, 1 oz. per ton. Shallow underhand-stoping has been carried for a length of 50 feet on the east side of the drift, opposite No. 1 and No. 2 stopes. At the face of the west drift, beyond any stopes, the shear is practically barren of mineralization. A sample taken here across 60 inches assayed: Gold, *nil*; silver, 0.6 oz. per ton.

The crosscut from the west drift to the east drift followed a fracture striking north 60 to 75 degrees east, dipping 40 degrees southward. Twenty-five feet short of the east drift the strike changes to north 25 degrees east, the dip becomes almost vertical. The crosscut was continued eastward to the east lode. A drift run north on the lode intersected the cross-fracturing on the west wall of the drift.

The east lode, as so far exposed on No. 8 level, is more irregular in strike and dip than the west lode. A sample taken at the intersection of the crosscut and the east lode, across 30 inches of gouge and heavily-sheared rock, little mineralized, representative of the shear filling at this location, assayed: Gold, *nil*; silver, *nil*. For the first 250 feet of drift on the east lode, ore-lenses are irregular and not large. Beyond that point, to the face at 303 feet from the crosscut at the time of examination, the concentrations of mineralization are stronger and give promise of better continuity. At 220 feet a short crosscut was driven west to reach the foot-wall of the shear. There a sample taken across 25 inches of shear filling, little mineralized, assayed: Gold, 0.04 oz. per ton; silver, 5.4 oz. per ton. At 50 feet from the face a sample across a 5-inch width of strong mineralization assayed: Gold, trace; silver, 429.8 oz. per ton. This stringer could be traced along the wall for several feet. It is marked by a well-defined gouge band on its hanging-wall. Both the gouge band and the mineralization lie toward the centre of the shearing, and display no tendency toward concentration on either wall.

The drive northward on these two drifts has not yet reached the projected downward extension of the best mineralization within the shear-zone on the upper levels. One difficulty that the operators have encountered in their calculations is inadequate knowledge of the pitch of the ore-shoots. Estimation of outcome of the property is rendered extremely difficult without comprehensive bulk-sampling and close estimation of mining costs. Bulk-



Ottawa Silver Mining and Milling Co. Plan of 4th, 5th, and 8th level workings after company's map.

sampling, or careful compilation of assays of channel samples from both the high-grade concentrations and the remainder of the shear filling, would give an assay for mill-heads which might be mined at a reasonable cost. In the event that this assay proved too low to permit operation, the returns from the sampling of the high-grade concentrations might indicate the feasibility of selective mining, possibly by hand-steel, and a system of back-filling the waste. However, whether the property is considered on a milling or on a shipping basis, any contemplated system of underground work must allow for handling of the entire shear filling, as nowhere may any part of it be considered competent to remain in-place during the course of selective mining.

PLACER-GOLD DEPOSITS.

River Placers Syndicate. The operation by this syndicate during the past season on the Pend d'Oreille River, 6 miles by road west of Nelway, merits brief description. Under the direction of A. H. W. Crossley, of Nelson, experimental equipment

has been used to apply the principle of the air-lift to the problem of raising placer gravel from the bottom of the river. The lift, a small gas-engine, a compressor, receiver, and a short sluice-box are mounted on a raft. The raft is attached by movable blocks to an overhead cable slung across the river, and permits the working of a narrow strip of gravel from bank to bank. A hand-winch on the raft, with one end of the cable attached on shore, provides the motive power.

The lift-pipe is supported over one end of the raft, raised and lowered by block and tackle. The most efficient pipe size has not yet been definitely ascertained; at the time of examination the upper 8 feet were of 9-inch pipe, the lower 6 feet and a 2-foot nozzle on the bottom of 8-inch, but since then the advisability of using one diameter throughout has been given serious consideration. The advantage of having slightly greater diameter on the top section is that it may be slid over the lower section, to provide an easy adjustment for different depths of water. When the nozzle is on the river-floor a lip at the top of the 9-inch section must be above the upper end of the sluice-box. Air at about 20 lb. pressure is let into the pipe from two jets, one at the bottom, the other a few feet higher up, the air from the upper one acting as a booster. The rising column of air and water within the pipe carries sand, gravel, and boulders with it from the river-bottom. Any gold brought up with this material is saved in the sluice-box.

There is no doubt that the lift will function as planned; when examined it was bringing up boulders weighing up to 15 lb. A little fine gold showed on cleaning up the sluice-box, but the weakness of the operation appeared to be the lack of gold in the gravel rather than imperfection of the equipment.

Two placer operations have been conducted on Forty-nine Creek during the past season. **Nelson Placers, Ltd.** Nelson Placers, Limited, represented by H. W. Robertson, of Nelson, holds two adjoining leases, the *Pot Hole* and the *Old Channel*, accessible from the Blewett road by a quarter of a mile of side road. The end of this branch road is 8½ miles from Nelson. H. A. McKen represents the owners of, and applicants for, ten claims and four leases staked above and two leases staked below the *Pot Hole* and *Old Channel* leases.

The ground of the Nelson Placers, Limited, includes much of the area that was hand-worked and hydraulicked between the years 1890 to 1900. During the past season, the operation has been directed principally toward hydraulicking marginal gravel considered too low-grade to be worked by the earlier operators. To this end a high flume was built along the north-east bank of the creek, with intake at a considerable distance up-stream; 8-inch pipe-lines carry the water from penstocks to 4-inch and 2-inch monitors.

At the time of examination low water prevented operation of the larger monitor, which had already stripped a section from the north-east bank, 25 feet wide and 175 feet long. The face of the bank exposed over this length was made up of 20 feet of reworked boulder-clay at the top, underlain by 1 foot to 2 feet of brownish, angular fragments of granite in a medium fine matrix. Below this a 3- to 4-inch layer of gravel, loosely cemented by bluish clay, lying on bed-rock of Nelson granite, appeared to be the most favourable bed for gold occurrence. The 2-inch monitor was being used to prospect the same bank farther down-stream.

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SHIPPING-LIST, SHOWING APPROXIMATE TONNAGE MINED.

Mine.	Locality.	Weight.	Character of Ore.
		Tons.	
Silversmith	Sandon	668	Silver-lead.
Bosun	New Denver	256	Silver-lead-zinc.
Standard	Silverton	275	Silver-lead.
Van Roi and Queen Bess	Alamo	697	"
Last Chance	Sandon	70	"
Freddy Lee	"	25	"
Gem	"	10	"
Ruth	"	108	"
Molly Hughes	New Denver	27	"
Rambler-Cariboo	Rambler	2,000	"
Chambers	Sandon	6	"
Echo	Silverton	5	"
Majestic	Sandon	5	"
Surprise	"	4	"
Canadian	Silverton	10	"
Ivanhoe	Sandon	5	"
Redress	"	4	"

SLOCAN CITY MINING DIVISION.

Ottawa. This property is situated on Springer creek at an elevation of about 4,600 feet and at a distance of 5 miles by road from the railway at Slocan City. The history of the mine dates back to the early nineties, but apparently it was not until 1902 that extensive mining and development work was attempted. In this year the property was acquired by a Pittsburg syndicate, of which T. A. Noble was president and R. J. McPhee was mine manager.

In 1904 it is recorded that shipments amounted to 1,330 tons and the net profit for the year was \$70,000.

In 1913 it was bought by the Consolidated Mining and Smelting Company, which worked it until 1918. Since then it has been worked under lease by P. McGuire and A. L. McPhee, who confined their attention during the first two years of the lease principally to sorting and shipping ore from the dumps.

In 1920 H. L. Biggar purchased a half-interest in the lease and mill-construction was started in September under his supervision, but owing to unavoidable delays it was not completed until August, 1921.

The ore-deposits occur in a sheared fissure in granite. The character of the ore-bodies would indicate that they owe their origin to replacement by the circulation of mineral-bearing solutions or vapours through small channels and filling interstices in the sheared material between the walls of the fissure, and that continuity might be expected with depth.

The ore occurs in lenses of considerable dimensions, the stoping width being as great as 8 feet. The ore is essentially a "dry" silver ore consisting of argentite, with which is occasionally associated small leaves of native silver, the latter, no doubt, being of secondary origin. The gangue is quartz and country-rock. In places barytes is the predominant gangue and is invariably associated with high values. It is both a difficult ore to sort and to recognize underground, as often lean-looking material will run well in silver.

In the past only the highest-grade ore was shipped owing to the difficulties presented by the concentration of the silver minerals. Hence the dumps contain some high-grade and a considerable tonnage of second-grade ore, while there is a possibility of winning a fairly large tonnage of mill-feed from the old stope fillings.

The fissure dissects the hillside in a northerly and southerly direction and dips at 37° to the east. The mine has been opened by five adit-tunnels at vertical intervals of 100 feet. The uppermost, or the No. 1, is the old original prospect-tunnel and is no longer of any consequence. The Nos. 2, 4, and 5 are in good condition and the No. 3 is caved. Below the No. 5 there is still another level, the No. 6. This does not come out to the surface and is now full of water. It is interesting to note that the ore-shoots showed a marked increase in size as depth was gained.

The ore has been stoped out above the No. 5, although there are places from which small tonnages can be mined, while further prospecting on the hanging-wall side may reveal the presence of parallel shoots. By a rough estimation the dumps contain about 25,000 tons, in which the values are bound to be "spotty." In order to arrive at an estimate of the tonnage suitable for mill-feed extensive and costly sampling would have to be undertaken. Shipments made so far have been encouraging; for instance, 700 tons shipped in 1919 averaged 19.8 oz. in silver, while another 700 tons recently treated by the mill averaged 12 oz. in silver.

The mill is on Springer creek, at an elevation of about 1,000 feet below the No. 5 tunnel. It is supplied by a 2,000-foot 2-bucket tram, the upper terminal of which is on a level with the bottom of the No. 5 dump. The rated daily capacity of the mill is 50 tons. The flow-sheet is as follows: The tram discharges into a 45-ton storage-bin; the ore is then fed over a 1-inch grizzly to a 7 by 10 Blake crusher; then to a 40-ton feed-bin, from which it is fed direct to a 5- by 22-foot tube-mill; the discharge from this goes to a drag classifier; the oversize is kept in closed circuit with the tube-mill and the overflow constitutes the feed for the flotation-machine, it being 98 per cent. minus 100 mesh. The flotation-machine is a 9-cell M.S. type. Concentrates are taken off from the first four cells; the remaining five cells make middlings which are kept in closed circuit with the machine. Tailings made in the last cell go to waste. The plant is run by water-power developed from Springer creek under a head of 290 pounds. The average power used is about 100 horse-power.

Some little delay was caused by the silix liner of the tube-mill and difficulty was experienced in getting suitable pebbles, so it was decided to insert a steel liner and replace the pebbles with steel balls. This change has resulted in increased efficiency.

The first shipment of 20 tons of concentrates was made on November 9th. This contained 308.5 oz. of silver to the ton and gave net returns of \$3,989.48. The ratio of concentration for this shipment was about 35 to 1 and the average values in the feed were 12 oz. in silver to the ton. The cost of reclamation and treatment of the dumps is estimated at \$2 a ton. The crew consists of twelve men, six of whom are employed at the mill.

This is the first attempt made in the district to concentrate this class of ore, and the results will have an important bearing on many of the properties in the "dry ore" belt.

This property adjoins the claims of the *Ottawa* group to the west and comprises the following claims: *Tamarack*, *Falls View*, and *Essie*. Malcolm Cameron, of Slocan, who is a part owner, has been engaged at development-work during the year. The vein occupies a sheared fissure in granite, dipping at an angle of 30° to the south and striking due east. The ore is a "dry ore" similar to that of the *Ottawa*.

In 1905 extensive drifting was done on the vein by three adit-tunnels at vertical intervals of 80 feet. The uppermost, or No. 1, has been driven at an elevation of 4,600 feet or about 1,200 feet above Springer creek. It consists of a drift 206 feet long. The vein is continuous for the whole length of the tunnel. Recently ore was struck near the end, where the vein widens, and carries a pay-streak of from 18 to 24 inches. A composite sample taken at the face across these widths gave the following returns: Silver, 32 oz. This ore extends back into the drift for about 10 feet, when the vein becomes narrower and the filling more mixed.

The No. 2 tunnel, which is in 270 feet, only developed ore near the portal. A few car-loads were extracted from this shoot during the early history of the property and the ore was followed by a raise to the No. 1 level, above which it was continued for 45 feet. The remaining values at this point are confined to small streaks and pockets. A sample across narrow widths ran: Silver, 43.8 oz.

No ore was developed in the No. 3 tunnel, which is in about 330 feet. In this tunnel a fault-fracture was encountered. The walls are slickensided and the filling consists of crushed and decomposed granite.

The results obtained by recent work in the No. 1 tunnel are encouraging, more especially since it has recently been demonstrated that this class of ore is amenable to concentration by the flotation process. At present hand-sorting and cobbing is necessary before shipment. This is expensive, as the ore is both difficult to sort and extremely tough and hard to break.

This property is situated near the head of Springer creek at a distance of about 8 miles by road from Slocan. It is owned by the Rithet Estate in Victoria. The claims were staked as early as 1894 by C. E. Fielding. According to the only old records available, the mine reached its apex of production in 1901, when it

Under the limitations stated, the demand from the smelters for "dry ores," together with reasonably good transportation facilities, makes the outlook for this camp as bright as for any in British Columbia. The tributor and leaser are only beginning to operate to any extent in the Province, and their advent is regarded with much interest, as this class of work is the best school for independent, careful miners, who depend, not on day's pay, but upon the output of ore they make; and as their success means the success of the camp, there are no conflicting interests.

The following claims visited are but a few of those in the district which give promise of successful development :—

Ottawa.

The *Ottawa* mine has this past year been one of the most successful mines in the Slocan, and the largest shipper in the Slocan City Mining Division. The shipments amounted to about 1,330 tons of ore, which netted from the smelter \$120,000, and which was mined and shipped with the expenditure of \$50,000, leaving an actual profit on the year's operations of \$70,000. The net value of the ore at the point of shipment (Slocan City) for the year was, therefore, slightly over \$90 a ton, which was practically entirely in silver, the ore running from 175 to 200 ounces to the ton in silver, with 22 per cent. lead and 20 per cent. zinc.

The group consists of the *Ottawa*, *Ottawa Fraction*, *Jennie*, *Toronto*, *Hamilton*, etc., mineral claims, situated on the north side of the valley of Springer creek, about five miles from Slocan City, with which point it is connected by a good waggon road. The mine workings are about 1,000 feet above the level of Springer creek. The original claims were acquired two years or so ago, by a Pittsburg syndicate, of which Mr. T. A. Noble is president. Since making the original purchase the syndicate has bought a number of adjoining claims, and has obtained bonds on others. The local management of the company and of the mine is in the hands of Mr. R. J. McPhee, whose office is in Slocan City.

On the *Ottawa* there are two distinct veins, developed by adit tunnels, known respectively as the *Ottawa* or east vein and the *Noble* or west vein. Both veins are strong and clearly defined, and both have a general north and south course, and a dip to the east, but neither in strike nor dip are they quite parallel, and as they are traced to the south and to the dip they appear to be approaching each other, leading to the belief that they may eventually be shown to join in that direction. The actual mining was found to be confined practically to the east vein. The west vein outcrops on the edge of and in a small cross gully subject to snowslides, which rendered it difficult to prospect. It has been cut by No. 1 tunnel and a short cross-cut and drift on the vein, at a high level, and some very good ore has been obtained, but these workings belong more properly to the prospecting days, and have been abandoned for the deeper workings, consisting of cross-cuts from No. 4 tunnel on the east vein.

Tunnels Nos. 2 and 3 are run from the side of the cross gully to the eastward and cut the east vein at levels 100 feet apart. No. 2 tunnel and drift followed the vein for several hundred feet, but pay ore was found only in one place, and then but for a short distance along the tunnel. No. 3 tunnel and drift is about 500 feet long, and in this the ore chute was found about under where it was noted in No. 2, but in this tunnel it was discovered to have lengthened to about 94 feet, while in No. 4 tunnel the same chute appears to be from 250 to 300 feet long. That is to say, the ore chute, which in No. 2 was very small, has been found to lengthen in 200 feet depth to nearly 300 feet.

The No. 4 tunnel also started from the gully to the eastward and cut the *Noble* vein, the strike of which had at this level carried it across the gully to the east side. This vein was followed some distance to the north, but proving to be barren at this point, a cross-cut was

made eastward to the east vein, which was drifted on to the north, until the ore chute was cut for the distance already mentioned. Until this work was accomplished, the success of the property was problematic, and as this was finished only about a year ago, the development and equipment of the property have not yet taken definite shape. Surveys and plans were, however, being prepared for a No. 6 tunnel about 200 feet lower than No. 4, which would cross-cut to the vein in a distance estimated at about 500 feet, cutting it at a point much to the south of the present workings, so that a long drift to the north will be required to get under the known ore chute.

Pending the final decision as to the location of this tunnel, the permanent equipment of the mine has been delayed, but when completed it will include an aerial tramway to the valley of Springer creek, with probably a concentrating plant of some form, and also air compressors, etc., for which purposes surveys were being made, and a location and water rights secured, a short distance below the old *Arlington* saw-mill.

In July, the greater part of the production was being made from an intermediate level or drift between levels Nos. 3 and 4, from which stopes were being raised, with a face of about 160 feet in ore, of a width of from 1 to 3 feet of first-class ore, and of a greater thickness of second-class ore. This second-class ore will probably be concentrated eventually, but will require some process other than the ordinary hydraulic concentration, as the values are largely in gray copper, finely disseminated through a close-grained, highly silicious matrix.

The present mine plant, which is temporary in character, consists of a lumber cook-house, bunk-house, sorting shed and bins, and an office, while at the mouths of Nos. 3 and 4 tunnels are cheaply constructed timber-framing sheds and a blacksmith shop, the whole equipment, as valued by the management, being worth about \$7,000. Some 48 men were last season employed underground and 13 above. The total amount of tunnelling done is about 3,500 feet, exclusive of raises, etc.

About three miles farther up Springer creek, and on the same slope as the last-mentioned mine, are the *Arlington* and *Speculator* properties, which have in past years made large shipments of ore, but which are now closed down, and were found to be locked up and in charge of only a watchman. These properties are on a great crushed zone some 100 to 200 feet wide, filled with talcose matter. This zone has a strike of N. 10° E. and cuts from the valley of Springer creek diagonally up the hillside into the basin at the head of Ten-Mile creek, on which the *Enterprise* mine is located, and represents a very extensive fissuring and movement in the formation.

The *Arlington* has been very extensively opened up by a series of adit tunnels, A, B, C, D, E, F, G and H, and a small shaft, while, connected with these, extensive drifting operations have been carried on in the crushed zone. The filling material of this zone is reported as being fairly firm when first opened up, but the mine has stood for some time idle, and being very wet, the weather and water have acted on the filling, converting it into a talcose clay, which completely masks the formation and any ore which might otherwise be visible.

The first-class shipping ore is reported to have been found in "kidneys" of quartz carrying gray copper and silver-lead sulphides, which occur throughout the zone, but not, apparently, with sufficient frequency to permit of the mine being worked for these alone, without utilising the second class ore, of which there is a large quantity on the dumps, separated by hand-sorting from the shipping ore. For the treatment of this second-class ore the manager, Mr. J. F. Collum, has been investigating a number of processes of concentration, and is reported as having found one applicable to the conditions, which it is expected will be installed at no distant date.