REPORT OF GEOLOGICAL AND GEOCHEMICAL EXPLORATION
ON THE PURCELL PROPERTY
INCLUDING
UNDERGROUND MAPPING AND SAMPLING OF THE GREY COPPER VEIN

Reverted Crown Grants:

Grey Copper L580	18230(2)
Goodenough L581	18230(2)
Purcell L849	18230(2)
Rawdon L855	18231(2)
Idaho No.2 L1013	18232(2)

Located Claims:

Grey Copper Fr.1	613(4)
Link 1	1264(6)
Link 2	1265(6)
Chambers Fr.1	1266(6)
Chambers Fr.2	1267(6)
Grey Copper Fr.2	6374(5)
Grey Copper Fr.3	6375(5)

Slocan Mining Division

N.T.S. 82 F/14

49° 59.3' N., 117° 11' W.

Owner:

AVRIL EXPLORATIONS INC.

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REPORT OF GEOLOGICAL AND GEOCHEMICAL EXPLORATION ON THE PURCELL PROPERTY INCLUDING UNDERGROUND MAPPING AND SAMPLING OF THE GREY COPPER VEIN

SUMMARY

The writers were retained by Avril Explorations Inc. of Vancouver, B.C. through Cassiar East Yukon Expediting Ltd. to conduct surface and underground exploration on the Purcell Property during summer, 1990.

The Purcell Property is located in the Slocan Range of the Selkirk Mountains of southeastern British Columbia. It comprises five reverted crown-granted claims, three of which are recorded together and seven located claims which are owned 100% by Avril Explorations Inc. These claims cover ten claim-units; about 70 ha (168 A).

The property is centred on 49° 53.9' north and 117° 11' west in the Slocan Mining Division of B.C. It is about 765 km (467 mi) from Vancouver via B.C. highways 1, 3 and 6 to New Denver, the nearest supply centre to the property. Access to the property from New Denver is via B.C. Highway 31A and dirt roads through Sandon and Cody, a trip of about 20 km (12 mi). The claims are about 4 km (2.4 mi) east of Sandon and directly up hill from Cody.

The Purcell Property occupies part of the northern side of the Carpenter Creek valley on the steep southwesterly facing slope of Reco Mountain. Elevations on the property range from 1555 m (5100 ft) to 2134 m (7000 ft) in the western part of the claims.

Exploration around the area now covered by the Purcell Property commenced in 1891. Mineral targets sought were northeasterly trending veins carrying high concentrations of silver and lead-bearing minerals. By 1901, sufficient work had been done on most of the claims around the Purcell Property-area to justify their having been surveyed and crown-granted. At that time, mineralized quartz and carbonate veins were explored on surface and underground on the Goodenough L581, Grey Copper L580, Purcell L849 and Idaho No.2 L1013 claims.

The Purcell Property is underlain by an inverted sequence of Triassic-age turbidites and pelites that form part of the Slocan Group. These rocks were complexly deformed, metamorphosed and intruded by quartz-dioritic rocks related to the Nelson Batholith from the Triassic to the Jurassic Period. Crustal extension during Eocene time resulted in the development of northeasterly striking fractures that were filled with silver-lead-zinc mineralization comprising the Slocan Veins.

Soils were sampled over a grid that covered the southeastern part of the Purcell Property during 1990. Samples were analyzed for copper, lead, zinc and silver. Anomalous and sub-anomalous threshold values from the 1987 soil survey were recalculated and plotted together with those from the 1990 survey to produce consistent soil maps for the whole property.

Copper in soils on the property is determined mainly by underlying Slocan Group stratigraphy. Soils formed on carbonaceous slate and phyllite have the highest copper contents and those formed on greywacke and nearby intrusives have the lowest copper contents.

Anomalous lead and zinc contents in soils strongly indicate the presence of Slocan silver-lead-zinc veins. There are several areas on the property where unexposed veins may be discovered through intensive exploration of soil-lead and zinc anomalies.

The four most promising anomalies are located: down hill along strike with the Idaho No.2 structure, near the northwestern corner of the Idaho No.2 claim south of the Purcell workings, on the northwestern part of the Grey Copper claim and near the southeastern corner of the Grey Copper claim.

Silver in soils is similar to lead and zinc except that its high mobility makes it less useful than the other metals for anomaly source location.

The Grey Copper Vein is exposed on surface and in underground workings for a vertical distance of 114 m (374 ft) between elevations of 1722 and 1836 m (5648 to 6022 ft).

The two most useful underground levels on this vein are No.3 and 5A. The No.3 level is driven in for 237 m (777 ft) at an elevation of about 1818 m (5963 ft). The first 134 m (440 ft) is on the vein; the rest is beneath it. This level is accessible and fitted with usable track. The No.5A level is 37 m (121 ft) long and is driven on the vein at an elevation of about 1740 m (5707 ft).

The Grey Copper Vein has an average thickness of about 20 cm (0.66 ft) and attains a maximum thickness of about 60 cm (2 ft) in ore shoots. These shoots are about 15 m (50 ft) long and are separated by 15 m (50 ft) lengths of narrower vein. Ore shoots average about 33 cm (1.1 ft) in thickness and extend down dip for at least 30 m (99 ft).

The Grey Copper Vein contains massive sphalerite with blebs and segregations of silver-bearing galena in a siderite-ankerite-quartz gangue. Mineralization in the No.3 level contains 18.8% lead, 42.6% zinc and 33 oz/ton silver with a gross value of $900.18/ton at current metal prices. Mineralization in the ore shoot exposed in the No.5A level contains 0.6% lead, 41.21% zinc and 6.66 oz/ton silver with a gross value of $693.04 at current metal prices.

There are six mineral reserve blocks on the Grey Copper Vein that are accessible through upgrading and extension of the No.3 and 5A levels. They are estimated to contain a potential 30,696 tons of mineralization with a gross value of $CDN23,133,258 at current metal prices.

Presently, there is road access to these workings. Contract milling capacity and power is located within 3 km (1.8 mi) of the property, and the vein intrudes competent rock that requires no timbering. The Grey Copper workings contain the most accessible and inexpensive mining potential on the Purcell Property.

The Idaho No.2 vein system comprises the main Idaho No.2 vein, a 2 to 3 m (6.6 to 9.8 ft) thick breccia zone, and the West Vein which is a 0.6 to 1 m (2 to 3.3 ft) thick vein located about 12 m (40 ft) northwest of the main structure. These two structures are sub-parallel.

The Idaho No.2 vein system contains massive sphalerite with minor silver-bearing galena. Consequently, zinc values predominate over those of lead and silver.

This vein system and its possible down-hill extension as indicated by soil-lead and zinc anomalies may contain the largest mineral reserve potential on the property. However, development and mining of this system would require a new access road from the Grey Copper claim and extensive exploration and underground development. The Idaho No.2 vein system is located in only moderately competent rock that would require extensive timbering during mining. Fortunately, the cost of timbering there would be mitigated by the lack of dilution while mining 2 to 3 m (6.6 to 9.8 ft) thick veins.

The Goodenough Vein is a 5 to 51 cm (2 to 20 in) thick high-grade silver-lead vein from which ore grading up to 760 oz/ton silver and 72% lead was shipped. It was mined out on seven levels from 1894 until 1919 and returned the equivalent of several million dollars in profit at current upon calculation of subsequent inflation.

During 1969, a second parallel silver-lead vein was reported to have been discovered in the Goodenough No.8 level. This combined with zinc-rich mineralization below the No.7 level represents the remaining economic potential of this vein.

The Purcell Vein has been presumed by many to be an up-hill extension of the Grey Copper Vein. It is a very narrow silver-lead vein that assays up to 182 oz/ton silver. Its narrowness and lack of development make it a comparatively unattractive target at this time.

The East Vein is a narrow 2.5 to 6 cm (1 to 2.5 in) thick silver-lead vein that may be a conjugate structure to the Grey Copper Vein. It is exposed on surface 75 m (246 ft) south of the Grey Copper No.3 portal and underground in the No.3 level. The East Vein assays from 100 to 164 oz/ton silver. If silver prices run to high levels then a few tons of high-grade silver mineralization could be mined at a profit from the Grey Copper No.3 level.

REPORT OF GEOLOGICAL AND GEOCHEMICAL EXPLORATION ON THE PURCELL PROPERTY INCLUDING UNDERGROUND MAPPING AND SAMPLING OF THE GREY COPPER VEIN

1.0 INTRODUCTION

1.1 Terms of Reference

The writers were retained by Avril Explorations Inc. of Vancouver, British Columbia through Cassiar East Yukon Expediting Ltd. to explore and report on the Purcell Property. Michael Linn, who was not a shareholder of Avril Explorations Inc (the owner of the Purcell Property), mapped and sampled economic mineralization in trenches and underground workings.

Exploration was conducted on the Purcell project from June 11 until July 30, 1990. Data compilation and processing continued intermittently until December 31, 1990.

This report is a record of exploration work conducted on the Purcell Property during 1990.

1.2 Location and Access

The Purcell Property is located in the Slocan Range of the Selkirk Mountains of southeastern British Columbia (Figure 1). It comprises five reverted crown grants, three of which are recorded together and seven located claims. These claims comprise 10 claim-units covering about 70 ha (168 A). The property is centred on 49° 59.3' north latitude and 117° 11' west longitude in the Slocan Mining Division of British Columbia (Figure 2).

It is about 765 km (467 mi) from Vancouver via B.C. highways 1, 3 and 6 to New Denver, the nearest supply centre to the property. Access to the property from New Denver is via B.C. Highway 31A and dirt roads through Sandon and Cody, a trip of about 20 km (12 mi). The claims are on the steep northern slope of the Carpenter Creek valley about 4 km (2.4 mi) east of Sandon and directly above Cody.

During the 1990 program, most supplies were obtained from Kaslo, B.C., located about 47 km (28 mi) east of New Denver via B.C. Hwy. 31A.

The 1990 exploration camp was located at the Grey Copper No.3 portal. Road access to the camp-area was from the 8th eastern switchback above Cody on the Noble Five road. The road system across the Purcell Property received minor repairs during snowdrift removal in mid-June, 1990. All major workings on the property were accessible by road during the 1990 exploration program.

1.3 Terrain and Vegetation

The Purcell Property is located in the Slocan Range of the Selkirk Mountains of southeastern British Columbia Holland (1976).

Holland's description of the terrain of the Slocan Range around the Purcell Property is as follows:

> South of Trout Lake the area is largely underlain by intrusive rocks, which Cairnes remarks in the Slocan Mountains "show the strong relief characteristic of a mountainous topography in a late adolescent stage of erosion. . . . The areas of Nelson granite and Kaslo series are normally more rugged and sharper in outline than those underlain by sediments of the Slocan series." The Slocan Ranges are characterized by long, uniformly steep, heavily timbered slopes rising through about 5,000 feet to angular peaks and sharp narrow interconnecting ridges. Cirque glaciers have sculptured the peaks, and high ridges and valley glaciers have faceted the spurs.
>
> Holland, S.S.; 1976: p. 80.

The Purcell Property occupies part of the northern side of the Carpenter Creek valley on the steep southwesterly facing slope of Reco Mountain (Figure 2). Elevations on the property range from 1555 m (5100 ft) to 2134 m (7000 ft) in the western part of the claims.

Soils in the Purcell Property-area were developed beneath a fir, spruce and hemlock forest. Generally, their profiles were sufficiently mature to have distinct horizons amenable to meaningful soil survey results, despite their development on steep slopes.

The original forest covering the claims has been removed by fires and logging for mining timber early during the 20th century. It has been replaced by second growth timber.

Near tree-line at elevations near 2134 m (7000 ft) above sea level, tree diameters rarely exceed 15 cm (0.5 ft). On the lower parts of the property, tree diameters commonly exceed 45 cm (1.5 ft). Alder and berry bushes grow moderately thickly beneath the forest canopy on most parts of the property.

Major creek gullies which are regularly swept by snowslides have no forest cover at higher elevations. Below elevations of about 1829 m (6000 ft) these gullies are populated by a dense community of willow and slide alder.

Much of the Goodenough, Grey Copper and Idaho No.2 claims is covered with old mine dumps and scree on which no vegetation grows.

There is a moderate amount of timber suitable for mining purposes on the Purcell Property. Permanent creeks flow in gullies on the property below elevations of about 1829 m (6000 ft) that can provide sufficient water for mining operations.

The Purcell Property is snow-covered from November until early May. Snowdrifts remain in protected gullies and road cuts until mid-June.

1.4 Property

The Purcell Property comprises the following claims located in the Slocan Mining Division of British Columbia (Figures 2, 3 and 4):

Claim Name	Record No.	No. of Units	Record Date
Grey Copper L580 Goodenough L581 Purcell L849	18230(2)	1	February 28, 1975
Rawdon L855	18231(2)	1	February 28, 1975
Idaho No.2 L1013	18232(2)	1	February 28, 1975
Grey Copper Fr.1	613(4)	1	April 21, 1979
Link 1	1264(6)	1	June 27, 1979
Link 2	1265(6)	1	June 27, 1979
Chambers Fr.1	1266(6)	1	June 27, 1979
Chambers Fr.2	1267(6)	1	June 27, 1979
Grey Copper Fr.2	6374(5)	1	May 24, 1990
Grey Copper Fr.3	6375(5)	1	May 24, 1990

These claims are owned 100% by Avril Explorations Inc. of Vancouver, British Columbia.

The five reverted crown grants were acquired by application. The writers have examined some of the posts of the located claims and believe them to have been staked in accordance with the laws and regulations of the Province of British Columbia.

The property is surrounded by claims that were surveyed (Figure 3). Consequently, the property boundaries are defined almost completely by old surveys. The writers suggest that the company should re-establish the appropriate survey lines on the ground before producing ore from near a property boundary.

1.5 Early Previous Work: 1891 to 1975

Exploration around the area now covered by the Purcell Property commenced in 1891. Mineral targets sought were northeasterly trending veins carrying high concentrations of silver and lead-bearing minerals. By 1901, sufficient work had been done on most of the claims around the Purcell Property-area to justify their having been surveyed and crown-granted (Figure 3). At that time, mineralized quartz and carbonate veins were explored on surface and underground on the Goodenough L581, Grey Copper L580, Purcell L849 and Idaho No.2 L1013 claims.

1.5(i) Goodenough Vein

The Goodenough Vein was probably the best-known of the veins mined in the area now covered by the Purcell Property.

The Goodenough L581 and Reucau L624 claims were staked over the Goodenough (No.3) Vein by two different groups in 1891. By 1895, a tunnel was driven northward into the steep hillside along the narrow quartz-siderite vein toward the Reucau-Goodenough claim boundary (Figure 4). The tunnel was named the A or No.2 level. In that tunnel, the vein was up to 51 cm (20 in) thick and contained argentite, pyragyrite, native silver, tetrahedrite and galena.

Work on the No.2 and No.4 levels in the Goodenough workings during 1895 were reported upon by a provincial government geologist as follows:

Goodenough

This claim is a fraction, lying near the Reucau, and has a small lead of very rich ore; at present the owners are driving a tunnel, and are in about 200 feet. No. 2 Tunnel is in about 150 feet, and is 65 feet below surface. 35 tons of ore are ready for shipment. 20 tons of ore were shipped this summer and realized $6,875. Ten men are at work.

B.C. Min. Mines, Ann. Rept.; 1895: p. 675.

The Goodenough L581 claim was crown-granted to J.H. Thompson and associates on August 14, 1896. Returns from a 600-ton ore shipment sent from the Goodenough Vein that year were summarized as follow:

... The small Reco-Goodenough vein, the width of which is measured in inches, is probably the richest vein yet mined, as from the smelter returns of about 600 tons, the average was 407 ounces of silver per ton and 42% lead. The high percentage of lead makes this ore a very desirable one for the smelters, and the lead contents are usually sufficient to pay the freight and treatment charges, and the duty charged on the lead.

B.C. Min. Mines, Ann. Rept.; 1896: p. 37.

By 1896, net smelter returns from the Goodenough Vein contained from 167 to 507 oz/ton silver with 15 to 67% lead (B.C. Min. Mines, Ann. Rept.; 1896: p. 47).

The Goodenough Vein was mined on both the Goodenough and Reucau claims concurrently by different companies from common cross-cuts located near the claim boundary. Reports of shipments from the Goodenough related only to that part of the vein mined on the Goodenough claim (Figure 4). Shipments from the vein on the Reucau claim were reported in annual reports with other shipments from the Reco group (Section 1.7, this report).

Ore was being mined on several levels accessible from the No.2, 4 and 6 tunnels during 1896. Progress in the Goodenough workings on both sides of the Goodenough-Reucau claim boundary was recorded by a provincial government geologist as follows:

RECO GROUP

... From the Small or Goodenough vein, lying several hundred feet to the east, has come the richest silver-bearing galena yet found in Kootenay, the silver evidently occurring as argentite, although much ruby silver is found in some of the solid galena. The mining operations are being carried on in co-operation with the Goodenough mine, and three tunnels, Nos. 2, 4 and 6, have been driven to and then extended both ways along the vein in each of these properties; the vein being from 2 or 3 inches wide up to 20 inches of solid ore, with in places only a streak of iron-stained matter. The ore so lies that generally the ground can be mined out along it, leaving the ore to be afterwards broken down clean. The ground is faulted in one place with a lateral throw of the vein for 10 feet, and where the vein passes through the porphyry dykes the ore shoot is found, generally, to be about the most productive part of the vein. From these tunnels several hundred feet of drifting have been driven, the vein being not always productive, but in the miner's term "in and out," and these levels will be continued much farther before reaching the limits of the claim. (see Goodenough mine below).

This ore, while mined from a small vein, is very profitable, and at the time of visit, in August, several tons of rich ore were piled at each tunnel mouth, and the following data from smelter returns will give some idea of the value:- The galena ore has run from 225 to 730 ounces of silver per ton, and 67% lead; one lot of 21 tons assaying 730 ounces of silver per ton, and 67% lead; and two shipments in 1896, or 45 tons, yielded net (or 95% of assay) 24,820 ounces of silver, and 27 tons of lead, or $340 per ton, after deducting all charges.

The carbonate ore from this vein, for 20 carloads, has yielded from 230 to 337.8 ounces of silver per ton, and 19 to 28% lead.

This company now propose to build an areal tramway down to Cody Creek, and there erect a concentrator. Foreman, Alex McPhee. Number of men, 15 (in Aug.)

GOODENOUGH

The Goodenough, title, Crown grant, 8.3 acres, and the location the Grey Copper, 600 by 1,284 feet, lying south of the Reucau, are owned by Jno. A. Whittier, Jno. Thompson, and Jno. Martin, Sandon, and six men were at work on the "small vein" as described in the Reco above. In the workings, tunnel No. 6, or the lowest, was a cross-cut for 275 feet, and near the point of intersection with the vein an upraise had been made for 169 feet to tunnel level No. 4 along the Reucau-Goodenough line, following for nearly all that distance several inches of very high grade ore. In the N.E. the drift ran off into the Reco ground, while to the S.W. the Goodenough drift, in 170 feet, with 500 feet of the vein on this level available before leaving the side line, had good ore for 110 feet both above and below the level, with a narrow streak of carbonates to the face, an improvement in the ore shoot being expected when the vein passed through the dyke 30 feet ahead . In the tunnel levels Nos. 2 and 4, relation of the vein to the surface was such that but a comparative short distance along the vein could be worked out on this ground, and all was stoped out, but on the Reco these two levels were being extended to the N.E.

There is a fair amount of good timber. As in the other mines, greatest activity is during the winter season, when the cost of shipping ore to Sandon, by rawhiding, is $3 per ton, instead of $7 by packing on mules in the summer. The grade of the ore, of course, is similar to that sent from the Reco, the smelter returns for carload lots giving from 277 to 507 ounces silver per ton, and 48 to 67% lead for galena ore, and 168.5 to 322.5 ounces of silver per ton, and 2 to 34% lead for carbonate ores, while one lot of 6 1/2 tons assayed 768 ounces silver per ton and 64.1% lead.

B.C. Min. Mines, Ann. Rept.; 1896: p. 59.

More than 300 m (984 ft) of underground development had been completed in levels 1 to 6 on the Goodenough Vein by 1896. A further 183 m (600 ft) of tunnel was driven on the vein in 1898 (B.C. Min. Mines, Ann. Rept.; 1898: p. 1074). By 1905 the No.8 level was developed (Figure 4) and a total of more than 1476 m (4843 ft) of tunnel and an unknown amount of stope had been excavated over a vertical distance of 161 m (529 ft) on the two claims.

The Goodenough Vein had produced about $700,000 in revenue from the Reucau claim and another $100,000 from the Goodenough claim, of which $80,000 came from smelting galena. From that production, about $287,000 in dividends were paid to shareholders from the Reucau claim and $45,000 were paid to shareholders from the Goodenough claim (Zinc Commission; 1906: p. 260)(B.C. Min. Mines, Ann. Rept.; 1905: p. G192).

Work on the Goodenough Vein on both sides of the Goodenough-Reucau boundary was summarized by a provincial government geologist as follows:

> ... Of the three veins mentioned, the best known is the most easterly, the No. 3 or, or as it has been called, the Reco or Goodenough vein, which cuts through from the Goodenough into the Reco ground, and which has been developed by a series of cross-cut tunnels run in on the Goodenough ground near the dividing line, at the joint expense of the Reco and Goodenough mines, from such cross-cuts the respective companies have run drifts on their own portions of the vein.
>
> The vein in the Reco ground is found between clean, hard walls, from which the ore parts readily, and in width varies from a mere rusty streak up to about 24 inches, having an average width of about 6 inches of quartz, etc., of which an average of about 3 inches is solid ore, which consists of silver sulphides, argentite, ruby silver, and some galena, with grey copper and zinc. The ore is easily hand-sorted in the workings, no grade being produced other than shipping ore, which for the first five years that property was operated, from 1894, averaged, as shipped, 309.6 oz. of silver to the ton and 46% lead. Laterally, however, shipments have been somewhat lower in grade, lower freight and treatment rates not calling for such close sorting, and average about 225 oz. in silver and 55% lead. Zinc is present in the ore, but in unimportant amount, being about 5%.
>
> The mine is opened up by tunnel No. 2, 900 feet long; No. 4, a cross-cut of 57 feet and drift of 1,050 feet; No. 6, a cross-cut of 270 feet, and a drift 1,025 feet long; No. 7, an intermediate "blind" level, is 640 feet long. No. 8 has a cross-cut 350 feet, with a drift of 550 feet. Although some ore exists above levels Nos. 2 and 4, the vein has been pretty well stoped out as far as the levels have been run, and the greater part of the ore known is between Nos. 7 and 4. Comparatively little ore has come out of No. 8 level as yet, but it is possible that the ore-chute on No. 7 will go down and be found on the production of No. 8.

> It is of more than passing interest to note the values which have been extracted and realised upon from this small vein. Mr. Harris reports that, as worked up to present, the vein alone has produced on Reco ground about $700,000 from ore shipped , while from the vein in Goodenough ground another $100,000 was mined. The original cash outlay for the purchase of the mine and its development was $2,700, while in 10 years there has been paid in dividends, chiefly from this vein, $287,000.

B.C. Min. Mines, Ann. Rept.; 1905: p. G192.

From the reports of the provincial government geologists, it was obvious that ore shipments were made on a regular basis from the two operators on the Goodenough Vein. Unfortunately, shipping records were not available to the writers.

The Goodenough claim was acquired in 1905 by J.A. Whittier who grouped the claim with the Grey Copper and Purcell claims. He operated the mine on the Goodenough claim from 1905 until after 1917.

Mr. Whittier embarked upon an aggressive program in the No.8 level hoping to intersect large quantities of good ore 137 m (450 ft) below development stopes on the No.6 level.

Old mine maps indicate that he explored the vein on that level extensively (Figure 4). It is apparent that production financed development from 1908 until 1916. No detailed records of in are known to the writers. Cairnes (1935) reported that the Goodenough Vein produced high-grade silver ore in the following years: 1895 to 1904, 1909, 1913 and 1915 to 1919. During 1917, a 4-man crew produced 62 tons of ore (B.C. Min. Mines, Ann. Rept.; 1918: pp. F162-F163).

Cairnes (1935) reported total production from the Goodenough Vein on the Reucau claim as follows:

Years:	lb of Ore	Ag ounces	Lead pounds	Net smelter
1894 to 1919	7,732,001	875,374.44	3,285,618	$556,572.05

Cairnes, C.E.; 1935: p. 108.

Cairnes' tally of production from the Goodenough Vein could not have supported the $700,000 reported by Mr. Harris to have been received from ore shipments by 1905 from the mine on the Reucau side of the boundary. It seems likely that many of the smelter receipts from the Goodenough Vein were not available to Mr. Cairnes when he wrote his report.

Reco Silver Mines Ltd. held the Goodenough and Grey Copper claims together with the Bluebird, Reucau and Noble Five group from the mid-1960s until 1974. In 1969, work in the No.7 and 8 levels of the Goodenough Mine disclosed a parallel vein lying east of the Goodenough Vein in those workings.

The tenor of that vein is unknown to the writers; the Goodenough workings having been caved near the No.8 portal during their 1990 work on the property.

1.5(ii) Grey Copper Vein

The Grey Copper Vein was discovered in the creek gully below the Goodenough Vein in 1891 (Figure 4) and the Grey Copper L580 claim was staked to cover it.

By 1893, the claim was owned by J. Thompson and associates who had stripped a wide sphalerite-rich vein for 61 m (200 feet) in the creek gully,probably where later the No.5 and 5A levels were driven (Figures 4, 9 and 20). There, the Grey Copper Vein was up to 0.9 m (3 ft) thick and averaged 0.3 m (1 ft) in thickness. Assays from the vein; probably from galena-rich areas, ran from 145 to 160 oz/ton silver and 72% lead (B.C. Min. Mines, Ann. Rept.; 1893: p. 1060).

The Grey Copper L580 claim was crown-granted to J.A. Whittier on July 27, 1896 (Figure 3).

By 1905, the Grey Copper Vein was grouped with the Goodenough and Purcell claims. Both the Grey Copper and the Goodenough veins were being developed by J.A. Whittier.

When the Grey Copper claim was visited by a geologist from the zinc commission in 1905, an upper level tunnel (Level No.2) had been driven 15 m (50 ft) into the hillside along the vein. A lower tunnel (Level No.3) located 18 m (60 ft) vertically below the upper tunnel had been driven in for 37 m (120 ft) along the vein into the hill (Zinc

Commission; 1906). These tunnels were about 55 m (180 ft) above the part of the vein that had been stripped and sampled in 1893.

The zinc commission's geologist observed that the pay-streak on the Grey Copper Vein was 0.3 m (12 in) thick in the upper (No.2) level and 0.6 m (24 in) thick in the lower (No.3) tunnel. It was estimated that these two tunnels were separated by a distance of 26 m (85 ft) on the plane of the vein and that a 1,000-ton block of ore lay between. A five-cut sample from the lower tunnel (Level No.3) assayed 42.6% zinc, 18.8% lead and 33 oz/ton silver.

A 40-ton test shipment milled at the Payne concentrator near Sandon assayed as follows:

	Silver oz/ton	Lead%	Zinc%
Assay of original ore..........	17	4.6	41
Assay of lead product..........	100	61.0	13
Assay of zinc product..........	12	1.5	50.4

Zinc Commission Report; 1906: p. 260.

When Cairnes (1935) visited the Grey Copper claim during the early 1930s,five adits had been driven northeastward into the vein from the gulch between elevations of 1524 and 1829 m (5000 to 6000 ft). Levels 1 to 4 were within 30 m (100 ft) of each other. The Grey Copper Vein was exposed intermittently for a horizontal distance of about 305 m (1000 ft) and a vertical distance of about 90 m (295 ft) in the gully (Figures 4 and 18).

It is interesting to note that Cairnes (1935) recorded the existence of the East Vein lying on the side of the hill less than 90 m (295 ft) southeast of the Grey Copper Vein. No early work was recorded from the East Vein. However, examination along the trend of the vein during the 1990 exploration program revealed several very old test pits that had been dug to explore its extent.

It had been suspected that the Grey Copper Vein was contiguous with the Purcell Vein, the workings of which were located about 200 m (656 ft) northeast of the Grey Copper No.1 adit. A series of trenches were dug between the two groups of workings in an attempt to establish their contiguity. Those trenches were sloughed in when Cairnes visited the Grey Copper claim.

Cairnes (1935) noted that a 37-ton ore shipment had been made from the Grey Copper claim during 1917 that contained 80 oz/ton silver and 50% lead, probably from hand-cobbed galena.

By 1931, the Grey Copper claim was being developed by J. Miciewic of Sandon, B.C. who shipped 2 tons of gold-silver-lead-zinc ore that year. An additional 2 tons of ore returning good values of silver, lead and zinc were shipped during 1933 B.C. Min. Mines, Ann. Rept.; 1931: p. A138 and 1933: p. A220).

By 1951, the Grey Copper claim had become part of the Bluebird group comprising the Grey Copper, Bluebird, Stranger, Rawdon and Idaho No.2 claims (Figures 3 and 4). The claims were developed by Bluebird Slocan Mines Limited of Vancouver, B.C. and managed by J. Mollard (B.C. Min. Mines, Ann. Rept.; 1953: p. A139).

The company built two large camp buildings; since collapsed, at the eighth eastern switchback on the Noble Five road on ground now covered by the Grey Copper Fr.2 claim (Figure 4). In 1953, the Grey Copper No.3 level was extended for 46 m (150 ft) to 198 m (650 ft) in from the portal Also, a raise was completed between the No.3 and No.2 levels. It was located in the No.3 tunnel about 76 m in from the portal (Figure 19A).

The age of platform timbers and oxidation of the vein in stope walls indicated to the writers that the 1000 tons of high-grade ore delineated between the No.2 and No.3 levels in 1905 was probably mined during the early 1950s. When Sipald Resources Ltd. rehabilitated this working in 1980, that ore-block had been stoped out up to the No.1 level (George Sipos, pers. comm.).

1.5(iii) *Purcell Vein*

The Purcell L849 claim was staked on July 19, 1892 and crown-granted on August 25, 1897 to the Purcell Mining Corporation. By 1905, it was grouped with the Goodenough and Grey Copper claims under the management of J.A. Whittier.

The Purcell Vein is located about 200 m (656 ft) northeast and up the hill from the Grey Copper No.1 portal. These two veins are on strike with each other (Figures 4 and 18). The writers share the long-held view that these are probably two exposures of the same vein.

The 1990 exploration crew found a series of eight old trenches on the hillside between the Grey Copper and Purcell workings which seemed to be the result of an attempt to connect the two along the vein. These trenches were sloughed in and were not reopened during the work program.

The Purcell workings were located near the centre of the Purcell claim at an elevation of about 1975 m (6478 ft)(Figure 4). During the 1990 exploration program, they were badly caved and no attempt was made to reopen them.

It appeared from Sookochoff's (1986) maps that the Purcell workings were accessible through a northeasterly trending 54 m (177 ft) long adit that jogged 12 m (39 ft) southeastward 36 m (118 ft) in from the portal (Figure 4). Two northward trending raises located 12 m (39 ft) and 42 m (138 ft) in from the portal were driven upward along the vein toward surface. Near the end of the adit was a small stope from which, silver-bearing galena was mined (George Sipos, pers. comm.).

At least 20 old exploration trenches and pits were located northeast of the road from just above the Purcell portal up hill to an old horse trail near the Purcell-Bluebird claim boundary. Probably the trenches were excavated to explore the northeastward extension of the narrow galena-bearing quartz vein drifted upon in the workings below.

The date of the trenching above the Purcell adit was unknown to the writers who found no record of early exploration on the Purcell claim in the literature.

1.5(iv) Idaho No.2 Vein System

The Rawdon L855 claim was staked over the Bluebird and Idaho No.2 claims by J.A. Whittier on July 8, 1892. When it was surveyed and crown-granted to J.S. Montgomery and associates on December 20, 1898, the claim covered only two areas not previously included in the other two claims (Figure 3).

By 1920, the Rawdon claim had been included with the Bluebird claim in the inventory of C. Cunningham (B.C. Min. Mines, Ann. Rept.; 1920: p. N124).

The Idaho No.2 L1013 claim was staked by G.P. Aspenwall on July 11, 1892 and was crown-granted to J.B. McArthur and associates on August 5, 1897.

No record of work on the Idaho No.2 claim from 1892 until 1928 is known to the writers. However, in subsequent reports there are references to earlier work on the claim. By the mid-1920s, the Idaho No.2 Vein had been followed on surface in a series of trenches from an elevation of about 1899 m (6200 ft) on the Idaho No.2 claim up to the Big Vein workings on the Bluebird claim. The Big and Idaho No.2 veins were found to be the same structure which had been exposed for a vertical distance of at least 152 m (500 ft). It averaged over 0.9 m (6 ft) in thickness.

Obviously encouraged by the width and contiguity of the vein, early miners drove two tunnels on the Idaho No.2 Vein (Figure 4). The No.1 tunnel was at an elevation of 1939 m (6361 ft) and the No.2 tunnel was at an elevation of 1906 m (6252 ft). A small shaft was sunk above the No.1 tunnel to test the down-dip extension of a galena-rich section of the vein. All subsequent recorded work was done in the No.2 tunnel.

Bluebird Mines Limited of Kaslo, B.C. was incorporated in 1928 to develop the Bluebird Property which comprised the Bluebird, Stranger, Rawdon and Idaho No.2 claims (Figures 3 and 4). W.H. Burgess was the managing director of the company at that time. He conducted work on both the Idaho No.2 and Stranger claims.

Work on the Idaho No.2 Vein in 1928 comprised the extension of the No.2 tunnel to a point 96 m (315 ft) in from the portal (B.C. Min. Mines, Ann. Rept.; 1928: p. C287). The stated objective of that work was to intercept the down-dip extension of silver-bearing galena previously found on surface above the No.1 tunnel.

A 1928 local newspaper account of this work described the vein in this tunnel as " Eight feet of material showing prinklings of galena and iron pyrites". At that time, the company had little interest in the rich lodes of sphalerite encountered along the vein. However, the company was very encouraged by the increasing galena content near the working face.

Work progressed that winter. A newspaper account of the company's annual meeting held on March 20, 1929 quoted Mr. Burgess as announcing that "...very rich ore had been disclosed in the Idaho No.2 tunnel. The values were given as 100 ounces of silver, 84% lead and 5% zinc..."

A clipping from a 1933 Financial post survey of mining companies summarized subsequent 1928 work as including several cross-cuts and a 39 m (127 ft) raise.

During 1929, an electric survey was conducted over the whole property for Bluebird Mines Ltd. by the Radiore Company. The results of the electric survey were not available to the writers.

The following year, 3.2 km (2 mi) of tractor trail was constructed from the Noble Five Property to the Idaho No.2 tunnels to provide direct road access to the workings. Later, that trail became the main access road connecting the Grey Copper and Idaho No.2 workings-areas (Figure 4).

In 1931, a contract was let to continue work on the Idaho No.2 tunnel. It was extended for 260 m (852 ft) across the Idaho No.2 claim onto the Rawdon claim. When operations ceased late that year, the working face of the No.2 tunnel was 360 m (1180 ft) in from the portal.

Low metal prices during the 1930s depression forced abandonment of operations.

The Idaho No.2 workings were inaccessible when Cairnes inspected the property during the mid-1930s. Cairnes (1935) summarized the workings as comprising a "90 foot shaft and an adit 200 feet long". Cairnes description could have referred to the upper shaft and the No.1 tunnel and not the main No.2 tunnel which at the time of his visit to the property had caved.

From the descriptions of the workings, the writers are not certain whether the raise from the No.2 tunnel connected with the shaft above the No.1 tunnel to provide ventilation.

The Idaho No.2 and Rawdon claims were part of an enlarged version of the Bluebird Property in 1951. Then, the property included the Bluebird, Grey Copper, and Stranger claims. It was controlled by Bluebird Slocan Mines Limited of Vancouver, B.C.

During 1951, the old tractor trail connecting the Noble Five road with the Idaho No.2 workings was widened to permit 4-wheel drive access to the workings. This improved access facilitated an extensive underground drilling program conducted in the Idaho No.2 tunnel that year (Figure 22). Drilling resulted in the confirmation of a 0.6 to 1 m (2 to 3 ft) thick zinc-rich structure trending parallel with and located northwest of the Idaho No.2 Vein (B.C. Min. Mines, Ann. Rept.; 1952: p. A175).

During 1952, a branch tunnel was driven 24 m (80 ft) northeasterly from a point 122 m (400 ft) in from the portal in the No.2 tunnel. This branch tunnel ran along a 15 m (50 ft) length of a lode containing abundant sphalerite. From a point 183 m (600 ft) in from the portal, a cross-cut tunnel was driven northwesterly for 6 m (20 ft) to expose another lode containing abundant sphalerite.

As was previously mentioned (Section 1.5(ii), this report) Bluebird Slocan constructed a 2-building camp near the Grey Copper No.3 portal in spring, 1952. As soon as the new camp was built, the old buildings at the Idaho No.2 workings were abandoned.

When drifting was completed at the Idaho No.2 tunnel, development emphasis was redirected to the Grey Copper No.3 tunnel for the 1953 season.

1.6 Recent Previous Work: 1975 to 1990

George Sipos of Kaslo, B.C. acquired the Goodenough, Grey Copper, Purcell, Idaho No.2, Rawdon, Bluebird and Stranger reverted crown-granted claims on February 28, 1975. He called these claims the Bluebird group.

During 1976, physical work was done on the claims which comprised mostly location and improvement of access to old workings.

An exploration contract was let by Sipos to Allstate Mining Corporation in 1977 and more physical work was done. Allstate was a private company controlled by George Sipos and Horst Aldinger. On April 21, 1978, the Grey Copper Fr.1 was recorded by Mr. Sipos (Figure 4) to cover a possible down-hill extension of the Grey Copper Vein below the No.5 level. During 1978, about 10 m (33 ft) of slash drifting on the Grey Copper No.5A level (Figure 20) produced 20.5 tons of ore that grossed $2974.18 or $145.08/ton (Sookochoff, 1980). It contained 0.015 oz/ton gold, 9.59 oz/ton silver, 3.6% lead and 26.8% zinc.

On June 27, 1979, Horst Aldinger recorded the Link 1 and 2 and Chambers Fr.1 and Fr.2 claims (Figure 4).

That summer Sipos and Aldinger continued to improve access to several of the workings on the property. Sipos leased out development rights to the Grey Copper No.5 and 5A levels. A raise connecting the Grey Copper No.5 and 5A levels was developed and sampled (Figure 20) and 9.5 tons of ore was shipped from a slushing operation in the No.5A level before the lease terminated.

A smelter record from that shipment showed that a net of 8.5385 dry tons of ore contained 36.95 oz/ton silver, 4.5% lead, 42.5% zinc and 0.3% cadmium.

Laurence Sookochoff (1980) examined the Bluebird Property during summer, 1979 and took some samples from the Grey Copper workings and other showings around the property for Sipald Resources Ltd., another company formed by George Sipos.

On August 13, 1979, the Bluebird Property was split. All claims north of the Bluebird-Rawdon boundary remained in the Bluebird Property;

all claims south of that boundary became the Purcell Property, generally as it is today. The Purcell Property was transferred to Sipald Resources Ltd. Sipald did a public financing to raise further exploration and development money for the Purcell Property and commenced trading on the V.S.E. in spring, 1980.

Armed with Sipald's treasury and buoyed by high metal prices, Mr. Sipos embarked upon an ambitious program of exploration and development on the newly segregated Purcell Property. The 1980 work, including both surface and underground exploration, was supervised by Laurence Sookochoff, P.Eng.

Early during that program, Sookochoff (1980 and 1982) examined mineralized areas including the Goodenough No.6 and 8 dumps, and the Idaho No.2 shaft-area dumps. Road outcrops across the property were mapped and trenches above the Purcell adit were sampled.

A single drill hole, 152 m (500 ft) long was collared south of and above the Grey Copper No.3 level on ground now covered by the Grey Copper Fr.3 claim (Figures 4 and 18). The hole was drilled northward at an angle that resulted in its intersection with the Grey Copper Vein about 61 m below the Big Stope on an ore-shoot in the No.3 level (George Sipos, pers. comm.). The drill intersected over 1.8 m (6 ft) of sphalerite with minor galena in siliceous argillite breccia that assayed about 7 oz/ton silver. Mr. Sipos could not remember what the lead and zinc values were for that intersection. Sookochoff (1986) calculated the true width of that intersection to have been 1.06 m (3.5 ft) at 138 m (453 ft) down in a hole that was 146 m (479 ft) long.

It is interesting to note that if the Grey Copper No.5A level is extended along the vein to underneath the Big Stope in the No.3 level, it would develop the vein very close to the intersection of the drill hole with the vein. The writers believe that the ore-shoot mined in the Big Stope up in the No.3 level, persists for 55 m (180 ft) vertically downward to the No.5A level.

When the drill hole was completed, a nearby exposure of the East Vein was trenched by lowering the drill access road. The East Vein assayed about 100 oz/ton silver from a 1 cm (0.4 in) thick seam of galena (George Sipos, pers. comm.). It was not recognized in the drill hole (Sookochoff, 1986).

Late during 1980, the Grey Copper No.3 adit was reopened and examined. It was discovered, much to the distress of Sipald's directors, that the 1000-ton block of ore proven between the No.2 and No.3 levels had been mined out. Subsequently, some high-grade ore was recovered from a small-scale slashing operation near the Big Stope and farther along the vein at the Rat Stope (Figure 19A). The writers had no records of ore shipments from that work.

The Purcell Vein received significant attention during the 1980 program (Figures 4 and 18).

A small soil survey revealed several soil-silver anomalies above the Purcell adit. Two of the many old trenches above the adit were reopened and sampled. One small grab sample of galena assayed 20.11% lead and 128.63 oz/ton silver Sookochoff (1986). A composite float sample from the same area graded 68.58% lead and 433.2 oz/ton silver (Sookochoff, 1982).

Sookochoff (1980, 1982 and 1986) conducted an intensive sampling program on the Idaho No.2 Vein System in an effort to delineate shoots of high-grade silver-bearing galena in a generally zinc-rich system (Figure 22). He confirmed the 1951 drill results which tested the presence of a zinc-rich main shear averaging from 1.8 to 2.5 m (6 to 8 ft) in thickness, flanked to the northwest by a second zinc-rich structure averaging 0.6 to 0.9 m in thickness.

Sipald's 1981 exploration on the Purcell Property was supervised by J.C. Snell, P.Eng.

That year, the Purcell adit was reopened and examined (Section 1.5(iii), this report). No further work was done on the Purcell Vein during that exploration program.

An electromagnetic survey was conducted over the Grey Copper Vein and its possible extension to the Purcell workings. The survey was unsuccessful in locating the trace of the vein, probably due to topographic effects and the non-conductive nature of sphaleritic mineralization.

Sampling during 1981 included the Grey Copper Vein near the No.5A portal and the No.6 and 8 Goodenough dumps. Snell calculated that the Goodenough No.6 dump contained 25,000 tons of rock grading an average of 0.41% lead, 1.09% zinc and 3.74 oz/ton silver, and that the No.8 dump contained 30,000 tons of rock grading an average of 0.56% lead, 0.93% zinc and 2.58 oz/ton silver (Sookochoff, 1982).

That year, physical work comprised mostly road work. The upper road from the Purcell workings to the Idaho No.2 portal was completed in 1981. The road connecting the Bluebird No.4 portal on the Rawdon claim with the rest of the Purcell Property was completed by 1983.

The Bluebird No.4 adit was developed during the 1970s before the Bluebird and Purcell properties were split. It was a cross-cut that was driven across the Rawdon claim to the Big Vein on the Bluebird claim and encountered no mineralization on the Purcell Property (Figure 4). The Bluebird No.4 portal was examined by the writers during the 1990 exploration program and was found to be caved.

About 152 m (500 ft) of the Idaho No.2 tunnel was cleaned out and, in places, retimbered in 1983. The work was contracted by Sipald to Sipos' and Aldinger's service company. Samples from the cross-cut 122 m (400 ft) in from the portal intersected a 21.3 m (70 ft) length of the vein parallel to the main Idaho structure. There, the parallel structure was 1.06 m (3.5 ft) thick and assayed 0.24% lead, 10.21% zinc and 8.3 oz/ton silver. The cross-cut located 183 m (600 ft) in from the portal intersected a 1.37 m (4.5 ft) width of the parallel structure that graded 6.23% lead, 11.2% zinc and 3.3 oz/ton silver (Figure 22).

In July 1983, Sipald optioned mining rights to the dumps on the Goodenough claim to Modern Metal Recovery Systems Ltd. of Nelson, B.C.

Modern Metal Recovery sent a large test shipment of dump material to the mill at Ainsworth, B.C. Recovery was reported in a Sipald Resources news release to have been 63%. Modern Metal Recovery sent a 5-ton shipment of hand-sorted material to the smelter at Trail, B.C. A smelter receipt from that shipment credited Modern Metal Recovery with 4.431 dry tons grading 0.2% copper, 11.4% lead, 29.8% zinc, 110.05 oz/ton silver and 0.017 oz/ton gold.

Subsequently, Sipald bought out Modern Metal Recovery's assets including the option on the Goodenough dumps. In October, 1983, Sipald reoptioned the dumps to Wavecrest Resources Ltd. which, after a large promotion, let the option lapse.

The Purcell Property was optioned to Knie Resources Inc. in June, 1984. That option was dropped later that year with no significant work having been done on the ground.

Faced with extreme difficulty in refinancing Sipald, Mr. Sipos did the honourable thing for the shareholders and sold control of the company to Bernard Fitch and associates in 1986.

Mr. Fitch consolidated, refinanced and renamed the company Rawdon Resources Ltd. later that year.

Rawdon's crew conducted an intensive soil survey on a northeast-southwest trending grid laid out over the Goodenough, Grey Copper, Purcell and Rawdon claims (Figures 14 to 17). They were testing for contiguity of the Grey Copper and Purcell veins and for any other undiscovered veins in that area. The soil-sample data from that survey was processed and filed by C. Geoffrey Spearing, B.Sc. and John Ostler; M.Sc., P.Geol. (1988).

Soil-metal anomalies occurred over all known veins and in several areas where no veins were exposed (Figures 14 to 17). Interpretation of the survey results was made difficult by the presence of a large number of mine dumps and haulage roads in the survey-area.

Control of Rawdon Resources Ltd. was sold to the "Advanced Ecology Group" in 1988. They bought the company to facilitate financing of a garbage separation plant at Nanaimo, B.C. They had little interest in the Purcell Property.

The company was financed and renamed Advanced Ecology Corp. later that year. During 1989 the company was consolidated and again renamed Consolidated Advanced Ecology Corp. to facilitate further financing.

On June 23, 1989, Consolidated Advanced Ecology signed a letter of intent with General Tunnel Company Ltd., a private company controlled by J.C. Snell, P.Eng. and associates, to option the Purcell Property to General Tunnel. Snell had supervised the 1981 work on the property and remained very interested in its potential.

Work on the property by Snell's company comprised minor mucking at the Grey Copper No.3 adit with a bulldozer. The deal lapsed that year.

On March 13, 1990, Consolidated Advanced Ecology optioned the Purcell Property to Avril Explorations Inc., a private company controlled by John Ostler: M.Sc., P.Geol. who had supervised developments on the property for Advanced Ecology since 1988. The Grey Copper Fr.2 and 3 were staked and recorded on May 24, 1990 to cover two small areas of open ground among the surveyed claims near the Grey Copper Vein (Figure 4). On October 29, 1990, Avril completed the option and bought out the optionor's residual interest to attain 100% ownership of the Purcell Property.

Avril's 1990 work on the property is reported upon in later sections of this report.

1.7 Summary of Known Production Records

1.7(i) Goodenough Vein

1895	20 tons	from Goodenough claim; net revenue = $6875 (B.C. Min. Mines, Ann. Rept.; 1895: p. 675)
1896	600 tons	from Goodenough claim; average grade = 42% lead, 407 oz/ton silver which included: Galena Ore in carload lots (20-ton lots) that averaged 48-67% lead, 277-507 oz/ton silver including a 6.5-ton shipment that graded 64.1% lead, 768 oz/ton silver

Carbonate Ore in carload lots (20-ton lots) that averaged 2-34% lead, 168.5-322.5 oz/ton silver (B.C. Min. Mines, Ann. Rept.; 1896: p. 37)

1896 from Reucau claim

Galena ore:
21 tons grading 67% lead, 730 oz/ton silver
45 tons grading 60% lead, 551.5 oz/ton silver

400 tons Carbonate ore:
grading 19-28% lead, 230-337.8 oz/ton silver
(B.C. Min. Mines, Ann. Rept.; 1896: p. 59)

1894-1905 Total production quoted from mine manager:

Goodenough claim:
Net Revenue = $100,000
(of which $80,000 came from galena ore)
Dividends = $45,000

Reucau claim:
Net Revenue = $700,000
Dividends= $287,000

(Zinc Commission; 1906: p. 260 and B.C. Min. Mines, Ann. Rept.; 1905: p. 287)

1917 62 tons from Goodenough claim
(B.C. Min. Mines, Ann. Rept.; 1918: pp. F162-3)

1894-1904, 1909,1913, 1916-1919 Reucau claim: total estimated production

Lb ore	Lb Lead	Oz Silver	N.S.R.
7,732,001	3,285,618	875,374.44	$556,572.05
(3866 tons)	(42.5% Pb)	(226.4 oz/t)	

(Cairnes, C.E.; 1935: p. 108)

1983 ? tons Goodenough No.6 and 8 dumps; bulk sample got 63% recovery at Ainsworth mill

1983 5 tons Goodenough No.6 and 8 dumps; hand-sorted ore graded 0.2% copper, 11.4% lead, 29.8% zinc, 110.5 oz/ton silver, 0.017 oz/ton gold

1.7(ii) Grey Copper Vein Production

1905 40 tons from No.3 level, averaging 4.6% lead, 41% zinc and 17 oz/ton silver
(Zinc Commission; 1906: p. 260)

1917 37 tons from No.3 and 5 levels, grading 50% lead and 80 oz/ton silver
(Cairnes, C.E.; 1935: p. 51)

1931 2 tons gold-silver-lead-zinc ore
(B.C. Min. Mines, Ann. Rept.; 1931: pp. A24, A138)

1933 2 tons silver-lead-zinc ore
(B.C. Min. Mines, Ann. Rept.; 1933: P. A200)

1953?	1000 tons	blocked out in 1906 between No 2 and 3 levels grade estimate = 18.8% lead, 42.6% zinc and 33 oz/ton silver was mined out in 1980 when No.3 level was opened and inspected
1978	20.5 tons	from No.5A level, grading 3.6% lead, 26.8% zinc, 9.59 oz/ton silver and 0.015 oz/ton gold
1979	9.5 tons	from the No.5A level, grading 4.5% lead, 42.5% zinc and 36.95 oz/ton silver
1980	?	small tonnage probably mixed with other ore

1.8 Summary of Present Work

Field work on the Purcell Property was conducted from June 11 until July 30, 1990. The work was undertaken by:

John Ostler; M.Sc., P.Geol. West Vancouver, B.C.	Consulting Geologist
Michael Linn, B.Sc. Kaslo, B.C.	Consulting Geologist
Don W. Tully, P.Eng. West Vancouver, B.C.	Consulting Engineer
David P. Nunuk, B.Sc. Aldergrove, B.C.	Geological Technician
W. Adam Foran Toronto, Ont.	Geological Technician
Jack Denny Nelson, B.C.	Professional Prospector
R & S Holdings Ltd. Ronald Saalfeld, General Manager Kaslo, B.C.	Road Contractor

The 1990 work program on the Purcell Property included the following:

1.8(i) Physical Work	Man-days June 10-27	Man-days After June 27
A. Machine Trenching: 258 m^3 of rock, soil and regolith was excavated by a John Deere 15 mini excavator from trenches at the Grey Copper Vein No. 3, 5 and 5A; at Idaho No.2 shaft and No.2 portal-area; East Vein; Purcell Vein, and 90 m of 1905 horse trail to Grey Copper No.5 adit (Figures 4, 19A to 22).	11.5	10.5 man-days
B. Drilling and Blasting: Related to machine and hand trenching	5.5	10.0 man-days

C. Hand Trenching: 20 m^3 of rock and regolith excavated using hand tools at the East Vein: above the Idaho No.2 Vein; Grey Copper Vein between No.5 and 5A adits, and above the No.3 adit (Figure 4).	16.0	22.5 man-days
D. Hand Clearing of Trails: 1.9 km of trail was cleared along the main horse trail that crosses the Link 1 and 2 claims and on a new foot trail that connects the Grey Copper No.5 adit with the horse trail (Figure 4).	0.0	5.0 man-days
E.Snowdrift Ploughing: on Noble Five and Idaho No.2 Access Roads with a Cat. D6 (sub-contracted to R&S Holdings)	3.0	0.0 man-days
F. Transport, expediting and camp set-up time apportioned to physical work	10.0	14.0 man-days
Total time apportioned to physical work	*June 10-27* 46.0	*After June 27* 62.0 man-days

1.8(ii) Geological and Geochemical Work

A. Geological Mapping 90 ha mapped at a scale of 1:2500 (Figure 9).	5.0	14.5 man-days
B. Soil Geochemical Survey 7.3 km of compass line was flagged and sampled at 50 m intervals comprising the 1990 grid where 153 samples were taken. All samples were analyzed for Cu, Pb, Zn and Ag (Figures 4, 10 to 13, 14 to 17, and Appendices A and C).	0.0	9.0 man-days
C. Rock Geochemical Sampling: 0.01 ha of trenches and on the Grey Copper, Purcell, Idaho No.2 and East veins, and 332 m of tunnel at the Grey Copper Vein were sampled and mapped at detailed scales (Figures 4 and 18 to 22) (Appendices A and B).	5.0	24.0 man-days
D. Road Compass Survey: 3.9 km on Noble Five and Idaho No.2 access roads surveyed with compass and hip-chain	2.0	5.5 man-days

E. Transportation, expediting, camp set-up, data compilation, drafting and report time apportioned to geological and geochemical work.	5.0	58.5 man-days
Total time apportioned to geological and geochemical work	June 10-27 17.0	After June 27 111.5 man-days
Total time spent on the 1990 work program	June 10-27 63.0	After June 27 173.5 man-days

1.9 Claims Worked On

During 1990, work was done on the following claims:

Claim Name	Record No.	No. of Units	Current Expiry Date
Grey Copper L580 Goodenough L581 Purcell L849	18230(2)	1	February 28, 1994
Rawdon L855	18231(2)	1	February 28, 1994
Idaho No.2 L1013	18232(2)	1	February 28, 1994
Grey Copper Fr.1	613(4)	1	April 21, 1994
Link 1	1264(6)	1	June 27, 1994
Link 2	1265(6)	1	June 27, 1994
Chambers Fr.1	1266(6)	1	June 27, 1994
Chambers Fr.2	1267(6)	1	June 27, 1994
Grey Copper Fr.2	6374(5)	1	May 24, 1991
Grey Copper Fr.3	6375(5)	1	May 24, 1991

2.0 GEOLOGY AND GEOPHYSICS

2.1 Regional Geology

2.1(i) Regional Geological History

The area around the Purcell Property is underlain by stratified rocks that were deposited during the Early Mesozoic Era. They were mapped as the Slocan Group (Beudoin, 1990; Read and Wheeler, 1976).

These rocks form some of the upper part of the Kootenay Arc, which extends in southwestern British Columbia from the U.S. border to northeast of Revelstoke (Douglas et al; 1970).

Kootenay Arc sediments and volcanics were deposited at the western margin of proto-North America in the Cordilleran Geosyncline. Kootenay Arc deposition from Late Proterozoic until Middle Palaeozoic time was in a large eugeosyncline that segregated into smaller sub-basins during the Late Palaeozoic Era. Mesozoic deposition was mostly miogeosynclinal.

The older eugeosynclinal assemblage is exposed mostly in the eastern part of the Kootenay Arc; the younger miogeosynclinal assemblage is exposed mostly in the western part of the Kootenay Arc. The Purcell Property is underlain by the Slocan Group which forms part of that miogeosynclinal assemblage.

Read and Wheeler (1976) mapped the Slocan Group over a broad area just north of the Purcell Property. Their description of the Slocan Group was as follows:

> The Slocan Group lies between the Kuskanax and Nelson Batholiths and extends into Vernon map-area (Jones, 1959), between Thor-Odin and Pinnacles Domes. The group consists of a thick unit of pelitic rocks overlain by approximately 4,000 feet of volcanic rocks. At the base of the group, lenses of conglomerate and sedimentary breccia ... , composed of Kaslo detritus, disconformibly overlie the Kaslo Group. Near the base, limestone ..., up to 100 feet thick, forms layers intercalated with grey argillite, phyllite and fine-grained quartzite ... Near the top of (this) map unit ..., rocks become tuffaceous and pass into meta-andesite and meta-dacite tuffs and flows ..., and augite meta-basalt and meta-andesite flows and tuffs ... Between Columbia River and Slocan Lake, these volcanic rocks core the depressions of the doubly-plunging synclines ... West of Slocan Lake, an increase of metamorphic grade towards Valhalla Dome, which lies south of the map-area, has converted metasedimentary rocks of the Slocan Group to mica schist ... and marble ...
>
> Read, P.B. and Wheeler, J.O.; 1976:
> Descriptive Notes to G.S.C., O.F. 432.

Slocan Group rocks are intruded by a suite of calc-alkalic batholiths and stocks that are part of the Nelson Batholith (Read and Wheeler, 1976). Nelson Batholith intrusions are concordant intrusions elongate parallel to the westerly trend of the country rock. They are dated by Read and Wheeler (1976) as Jurassic to Cretaceous, generally about 164 million years old.

Read and Wheeler (1976) recognized four phases of regional deformation in Kootenay Arc rocks north of the Sandon area.

The first phase of deformation produced rootless isoclinal folds with well-developed, axial plane foliation during the Middle Palaeozoic. This phase of deformation was completed before the Slocan Group was deposited and consequently, has no relevance to the geology of the Purcell Property.

The second and third phases of deformation occurred during the Middle Jurassic Period after deposition of the Slocan Group and early during emplacement of Nelson Batholith intrusions. Read and Wheeler (1976) estimated that these phases of deformation and associated regional metamorphism occurred between 178 and 164 million years ago.

Second-phase folds are open to tight folds with a crenulation axial plane cleavage. They are commonly asymmetric with S-profiles looking northwest and a vertical to northeasterly dipping axial planes.

Third-phase folds are open to tight folds with crenulation axial-plane cleavages. They are commonly asymmetric with Z-profiles looking northwest with vertical to southwesterly dipping axial planes.

Read and Wheeler (1976) recognized a late phase of deformation that produced microscopic kink folds of various orientations in phyllites.

Jurassic-age regional metamorphism in Slocan Group rocks varies from chlorite to biotite sub-facies of the greenschist facies of metamorphism. Locally, Slocan Group rocks are metamorphosed to granulite facies due to contact metamorphism during the emplacement of intrusions related to the Nelson Batholith.

The Cenozoic history of the area around the Purcell Property has received comparitively little attention in the geological literature.

A pervasive northeasterly striking fracture cleavage in Slocan Group rocks and Nelson Batholith intrusives is probably a manifestation of a phase of brittle deformation during the Early to Middle Tertiary Period. It is probably related to crustal extension during the Eocene Stage.

The writers share the opinion of Beudoin (pers. comm.) that the northeasterly striking mineralized veins of the Sandon Camp were deposited at that time.

The Slocan Range underwent significant erosion during the Pliocene and Early Pleistocene Stages, producing broad valleys and ridges. Deep weathering of country rocks and oxidation of mineralized veins to up to 5 m (16.4 ft) below the present surface occurred in rocks now above elevations of about 1750 m (5740 ft). Alluvial fanglomerates and sandstone beds were deposited and lithified in the valley bottoms at that time. Remnants of lithified fanglomerates were found in creek gulches in the area at elevations from about 1750 m (5740 ft) to about 1900 m (6232 ft) during 1990 mapping on the Purcell Property.

Rapid rejuvenation and valley downcutting occurred in the Slocan Range during the Pleistocene and recent time. Upper slopes were carved by cirque glaciation and lower slopes were excavated by Pleistocene valley glaciers and Recent downcutting. Consequently, valley bottoms were lowered by about 700 m (2296 ft) and almost all of the Pliocene valley-bottom sediments were eroded away.

The preceding geological history is summarized in a table of geological events and units that accompanies this report (Figure 5).

2.1(ii) Geology and Mineralization of the Sandon Camp near the Purcell Property

There are several detailed published maps of Slocan Group stratigraphy in areas around the northern part of the Nelson Batholith but none of the area including the Purcell Property. The only published maps of reasonable scale that include the property are G.S.C., Maps 272A and 273A (Figure 6)(Cairnes, 1934) and B.C. Min. Energy Mines and Petr. Res., Open File 1990-18 (Figure 7)(Beudoin, 1990). Both of these maps show the Slocan Group as undivided.

Fortunately, although there is no stratigraphic detail on G.S.C., Map 273A, the cross-sections issued with that map are quite detailed and very accurate. Cross-section I-J, located just southeast of the Purcell Property (Figure 6) contains stratigraphy and structures that are confirmed by the writers' mapping on the property.

Logan (1986) succinctly summarized the geology of the Sandon Camp as follows:

GENERAL GEOLOGY

The Late Triassic (Orchard, 1985) Slocan Group underlies the Sandon area in a structurally complex belt of typically argillaceous rocks with subordinate quartzite, limestone, and volcanic (tuffaceous) units. The principal structure within the camp is a regional recumbent fold concave to the southwest, referred to as the 'Slocan Syncline' (Headley, 1952). Intruding the Slocan sediments generally concordant with the strike of bedding, are dykes and sills related by Cairnes (1934) and Headley (1952) to the Upper Jurassic Nelson batholith (Nguyen et al., 1968; Archibald, et al., 1983). Emplacement of this composite, post tectonic batholith (Duncan et al., 1979) has been related spatially and temporally by many (Cairnes, 1934; Reynolds and Sinclair, 1971; Cox, 1979; and Andrew, et al., 1984) to the mineralizing event.

Slocan silver-lead-zinc-gold veins are mineralized parts of a system of interconnected and in many cases multistranded breaks or lodes (Robinson, 1950) which trend easterly to northeasterly across the regional fold structure of the enclosing strata. Veins occur along these lodes where dilation coincided in time with the mineralizing event.

Logan, J.M.; 1986: p. 289

Economic mineralization around the Nelson Batholith was summarized simply by Cairnes (1934) as follows:

ECONOMIC GEOLOGY

The mineral deposits are chiefly fissure-veins whose walls have also been mineralized in varying degree depending on the strength and character of the fissuring and, especially, the composition of the wall rock. Most of the mineralized fissures strike northeasterly and dip southeasterly; this feature is particularly characteristic of veins in the Slocan series. The ores are chiefly valuable for their silver and secondly for their lead and zinc content. In some deposits, mostly within Nelson batholithic rocks, gold is also important.

Most of the important deposits occur in the Slocan series and the principal area of mineralization surrounds Sandon with a radius of 3 miles. Within this area 6 properties have each produced ore valued at over $1,000,000 and the aggregate production of 55 properties has exceeded $28,000,000. Argentiferous galena, grey copper (freibergite) and zinc blende are the chief ore minerals; siderite, quartz and more locally, calcite are the more abundant gangue minerals. Ore bodies occur at irregular intervals along the vein-filled fissures. Vein outcrops are generally rusty as a result of oxidation of pyrite and siderite.

The ore-bearing veins of the Nelson batholithic rocks are mostly smaller but richer than those in the Slocan series. Few have produced over $100,000 worth of ore, but native silver, ruby silver, argentite, stephanite, etc., may be present. Argentiferous galena and sphalerite are nearly always present but values in lead and zinc rarely approach those of silver. Quartz is generally the most abundant gangue mineral and commonly occupies the greater part of the fissures. More rarely siderite, calcite, or barite may be plentiful. Fluorite is conspicuous on one property.

Cairnes, C.E.; 1934: Notes to Map 272A

Logan (1986) studied the petrology of the ore minerals at the Hallmac mine located about 6 km (3.7 mi) west of the Purcell Property. He found that as brittle deformation progressed along northeasterly striking fractures, ore mineral deposition progressed in a sequence. More common sulphides including sphalerite, galena and pyrite were deposited early during vein development, and more exotic minerals including tetrahedrite, pyragyrite and argentite were deposited later.

Beudoin (pers. comm.) strongly suspected that the northwesterly striking structures containing mineralized veins occurred during crustal extension during the Eocene Stage, long after the emplacement of the Nelson Batholith and associated northwesterly trending dykes and sills. This would explain why only northeasterly striking veins in the Sandon Camp are commonly mineralized.

2.2 Regional Geophysics

An aeromagnetic survey was flown of the area around the Purcell Property by Geoterrex Limited for the federal Department of Energy, Mines and Resources in 1969 and 1970. The results were published on E.M.R. Map 8482G (Figure 8).

On that map. the Grey Copper and Goodenough claims coincide with a slight magnetic high located within a broad area with little magnetic variation. It is possible that the presence of thick metal-bearing structures such as the Goodenough and Grey Copper veins are sufficient to account for the magnetic high.

Two geophysical surveys were conducted on the Purcell Property. An electric survey was conducted over the whole property-area in 1929 and an electromagnetic survey was conducted over possible extensions of the Grey Copper Vein in 1981. As was previously mentioned, the results of the 1929 survey were unknown to the writers and the 1981 survey was unsuccessful in locating the Grey Copper Vein.

2.3 Property Geology

2.3(1) Slocan Group Stratigraphy

The oldest rocks mapped on the Purcell Property are metamorphosed sediments of the Triassic-age Slocan Group (Figure 9) which the writers divided into five lithological units based on composition and sedimentology. The five units were: carbonaceous slate and phyllite, slate and phyllite, calcareous meta-siltstone, non-calcareous meta-siltstone and meta-greywacke.

Hereafter the prefix 'meta' is omitted to avoid boring repetition.

Carbonaceous slates and phyllites occupy a broad northwesterly striking belt that extends from near the northeastern boundary of the property across the Bluebird claim to the Stranger claim (Figure 9).

These are fine-grained black rocks that weather to dark grey. Their tendency to break into shards along cleavage planes makes them weather recessively. Except for fresh road cuts, outcrops of this unit are mostly screes or piles of broken shards.

The incompetence of these carbonaceous pelites during deformation is evident at the Bluebird No.4 cross-cut portal on the eastern part of the Rawdon claim (Figures 4 and 9) where minor folds from the first two phases of deformation complexly contort strata. Tunnels driven through carbonaceous slate and phyllite require extensive timbering and maintenance.

Dark grey to black slates and phyllites stratigraphically overlie carbonaceous slates and phyllites. The contact between them is conformible and gradational. The non-carbonaceous slates and phyllites form a northwesterly striking band across the Purcell, Rawdon and Idaho No.2 claims (Figures 6 and 9). Due to complex deformation, true thicknesses of rock units can not be guessed with reasonable accuracy.

Slate and phyllite outcrops weather into light grey flags that tend to form scree which is quite extensive on the eastern part of the Idaho No.2 and Nabob claims (Figure 9).

Stratigraphically above the slate and phyllite is an extensive siltstone unit which is dark grey on fresh surfaces that weather to light grey. This siltstone comprises a multitude of thin turbidite beds that are commonly well-defined by colour differentiation on weathered surfaces.

This rock unit is exposed across the northeastern and southwestern parts of the Purcell Property stratigraphically above slate and phyllite and below greywacke. Contacts between this unit and others seem to be conformible.

The siltstone is comparitively competent in the Purcell Property-area. Tunnels through it near the Goodenough and Purcell portals require only a moderate amount of timbering. The eastern end of the Grey Copper No.3 level cuts through siltstone at depth below the Purcell claim (Figures 4 and 9). There, no timber is required.

A narrow unit of carbonate-bearing siltstone lies within the main siltstone unit on the Purcell, Rawdon and Idaho No.2 claims. Second-phase folding makes this unit seem much thicker than it really is (Figure 9).

Carbonate-bearing siltstone is blue-grey on fresh surfaces and light grey on characteristically pitted weathered surfaces. When struck, this unit produces a high-pitched 'carbonate clink' sound.

A broad, northwesterly striking greywacke unit extends across the central part of the Purcell Property (Figures 6 and 9). It weathers prominently, forming rounded bluffs. Turbidite beds ranging from 1 cm (0.4 in) to 1.5 m (4.9 ft) in thickness are conspicuous in greywacke outcrops. Top determinations from these beds reveal that these rocks are invariably overturned.

Greywacke beds are light grey on fresh surfaces that weather from light greenish grey to white depending on quartz and chlorite content.

Some greywacke outcrops near the Grey Copper workings and on the Link 2 claim appear to be quartz wackes. They are highly silicified from extensive metasomatism during deformation and injection of nearby quartz diorite bodies. Commonly, rock fragments and micaceous minerals in pelitic parts of turbidite beds are obliterated by variable anatexis and metasomatism in the greywacke unit. Pervasively metasomatized greywacke is commonly pale green due to the presence of very fine-grained chlorite.

Greywacke is the most competent metasedimentary rock unit on the Purcell Property. Tunnels driven through it along the Grey Copper Vein require no timbering.

2.3(ii) Slocan Group Provenance

By the Triassic Period, the Cordilleran Geosyncline had evolved into several northwest-southeasterly trending successor basins (Douglas et al.; 1970). Slocan Group rocks in the Purcell Property-area are a partial record of filling of one of the successor basins.

Stratigraphically, the lowermost rock unit on the property is a carbonaceous slate which was probably deposited at the bottom of a deep basin in euxinic, quiet water. Sediment supply was from neritic fallout.

A series of slate, siltstone containing some calcareous beds and finally, coarse-grained greywacke was deposited on top of the carbonaceous slate. This coarsening-upward succession was a record of clastic basin infilling from a prograding basin margin. Consequently, as the Triassic-age basin filled, sediments in the Purcell Property-area became more proximal to the sources of turbidite deposition near the basin margin.

2.3(iii) Nelson Batholith Intrusives

Slocan Group rocks were intruded by concordant, northwest-southeasterly striking quartz diorite bodies related to the Nelson Batholith during the Jurassic Period (Read and Wheeler, 1976).

Quartz diorites on the Purcell Property are white, medium-grained grannoblastic intrusives comprising 75 to 90% plagioclase and orthoclase feldspar, and 10 to 25% quartz with minor amounts of hornblende and chlorite. Biotite and pyrite are scarce in these intrusives.

A northwesterly striking, sub-vertical barren, white quartz vein intrudes quartz diorite along the Idaho No.2 access road on the southern part of the Texas claim (Figure 9). The writers believe this vein to be due to a late distillation of quartz deposited contemporaneously with the enclosing quartz diorite. This vein seems to be typical of barren northwesterly trending quartz veins that are exposed throughout the Sandon mining camp.

Quartz diorite has preferentially intruded the greywacke unit that transects the central part of the Purcell Property (Figure 9). As has been mentioned previously, greywacke beds near quartz diorite bodies were variably anatexized and metasomatized resulting in the breakdown of feldspar and the removal of micaceous minerals making the greywackes resemble quartz wackes.

The writers found very little evidence of forceful magma injection in the altered greywackes. It was inferred that hot fluids advanced through the most permeable rocks in the Slocan Group stratigraphy; the greywackes, ahead of magma. Channelling was established in conjunction with hydraulic filter pressing which facilitated subsequent magma injection. If metasomatism and anatexis advanced ahead of magma injection, evidence of that injection would be blurred by gradational contacts such as those commonly observed between greywacke and quartz diorite on the Purcell Property.

In less permeable strata near the northeastern boundary of the property, quartz diorite dykes and sills have well-defined intrusive contacts with Slocan Group siltstone and slate.

2.3(iv) Slocan Silver-lead-zinc Veins

Long has it been known that in the Slocan mining camp that northeasterly striking veins were generally mineralized and that northwesterly striking veins were mineralized only near contacts with northeasterly striking structures (Cairnes, 1935).

All mineralized veins on the Purcell Property strike northeasterly. Both on surface and in tunnels, it can be readily observed that mineralized veins cut cleanly across both the Slocan Group stratigraphy, and Nelson Batholith Intrusives and related northwesterly striking structures. Also, the mineralized veins contain none of the regional cleavages found in other rocks on the property. The Slocan

Silver-lead-zinc veins are interpreted to be younger than the Slocan Group metasediments and the Nelson Batholith intrusives. The writers share the opinion of Beudoin (pers. comm.) that the Slocan Silver-lead-zinc veins are probably Eocene-age, related to Tertiary crustal extension.

There are four major mineralized vein systems known to occur on the Purcell Property: the Goodenough Vein, the Grey Copper and East veins, the Purcell Vein (probably an extension of the Grey Copper Vein) and the Idaho No.2 vein system. The history of development and some of the mineral showings on these veins are described in detail in sections 1 and 4 of this report.

Mineralized veins on the Purcell Property are typical Slocan silver-lead-zinc veins. At lower elevations they are barren quartz-carbonate veins. In their intermediate sections, they are up to 2.0 m (6.8 ft) thick and are mineralized with dark purple sphalerite containing small segregations and layers of blue-grey galena. Brassy, subhedral pyrite dustings are common at contacts between quartz and sphalerite. Gangue minerals comprise quartz and siderite with minor amounts of ankerite and calcite. On weathered surfaces, pyrite forms yellow limonite, siderite rusts to an orange mixture of hematite and limonite and ankerite alters to limonite and dark purple magnesite.

A 1000-ton block of this kind of ore sampled in the Grey Copper No.3 level in 1905 ran 42.6% zinc, 18.8% lead and 33 oz/ton silver (section 1.5(ii), this report). Zinc-rich mineralization occurs in the Grey Copper Vein, below the No.7 level on the Goodenough Vein and in the West Vein of the Idaho No.2 vein system (Figures 4, 9 and 18 to 22).

The Idaho No.2 Main Vein contains a variation on this style of mineralization. There, sphalerite-rich mineralization is exposed in a 2.4 m (8 ft) thick breccia zone in siltstone and slate (Figure 22).

Generally, high-grade silver-lead mineralization occurs in the upper parts of Slocan veins. This mineralization comprises mostly fine-grained argentiferous galena with minor amounts of tetrahedrite, pyragyrite, argentite and native silver in a quartz-siderite-ankerite-calcite gangue. Silver grades run up to 760 oz/ton silver with up to 72% lead (section 1.5(i), this report).

The upper silver-lead rich sections of Slocan Veins are commonly much thinner than the middle zinc-rich sections. The silver-lead rich upper part of the Goodenough Vein is up to 0.5 m (40 in) thick. The Purcell and East; the other examples of upper silver-lead rich veins on the property, are only about 2.5 cm (1 in) thick on average.

Where the East Vein is exposed on surface, it has a 2.5 cm (1 in) thickness of medium-grained galena that is flanked by a 60 cm wide alteration zone containing abundant limonite and magnesite in quartz diorite. Alteration is not obvious where the vein crosses siltstone.

2.3(v) Late Tertiary Fanglomerate

There are several small exposures of Eocene to Pleistocene-age fanglomerate across the Purcell Property. All are erosional remnants located at elevations above 1750 m (5740 ft) in creek gullies (section 2.1, this report).

They contain a poorly stratified mixture of Slocan Group, Nelson Batholith and Slocan vein rock clasts. These clasts are subangular and range from sand to cobble-size. They are cemented in a light grey pelitic matrix.

Fanglomerates are unmetamorphosed and rest unconformably on all other lithologies. Consequently, they are interpreted to have been deposited during the Late Tertiary Period after unroofing of the Slocan silver-lead-zinc veins.

2.3(vi) Property Deformation and Metamorphism

There is evidence of at least three phases of deformation in rocks on the Purcell Property.

The first phase of deformation on the property is equivalent to Read and Wheeler's (1976) second regional phase of deformation. A regional-scale recumbent fold with a gently southwesterly dipping, southeasterly striking axial plane formed in the Sandon camp-area at that time. It was named the Slocan Syncline (Logan, 1986) by early writers. Erosion has exposed the overturned lower limb of this fold in the Purcell Property-area resulting in stratigraphic inversion of Slocan Group strata. This phase of deformation created a pervasive northwest-southeasterly striking cleavage.

First-phase cleavages have generally southwesterly dips in the southwestern part of the property and generally northeasterly dips in the northeastern part of the property, depending on local refolding. First-phase minor folds are most readily observed in slate and siltstone near the northeastern boundary of the property where they have recumbent S-shaped profiles looking northwesterly.

The second phase of deformation produced open to close upright folds with northwest-southeasterly striking, steeply dipping axial planes. Regionally, these folds culminate in a complex antiformal closure the axis of which transects the central part of the Purcell Property (Figures 6 and 9). Second-phase minor folds are most common in pelitic rocks where they are normally upright or box folds. Fold sense in these minor structures depends on relation to local closures.

The approximate locations of several of the second-phase fold closures in the Purcell Property-area have been established during 1990 geological mapping (Figure 9). Other suspected closure locations were not recorded on the geological map due to lack of proof in soil-covered areas.

The first two phases of deformation were accompanied by middle greenschist facies regional metamorphism; which in the Purcell Property-area, reached biotite grade. Retrograde minerals include muscovite and chlorite.

Local contact metamorphism accompanied by anatexis and pervasive metasomatism in greywacke in contact with quartz diorite, produced much higher temperature metamorphic mineral assemblages.

Read and Wheeler (1976) estimated that granitic intrusion related to the Nelson Batholith occurred from 173 to 164 million years ago, generally at the same time as the first two phases of deformation in the Purcell Property-area.

It appears to the writers that anatexis and metasomatism in greywacke and quartz-diorite emplacement occurred contemporaneously with the second phase of folding and regional metamorphism.

The quartz diorites invariably contain fracture cleavages parallel with the second and third-phase cleavages in Slocan Group rocks.

The third phase of deformation was comparatively brittle and had no major corresponding metamorphic event.

Cleavages from this phase of deformation strike northeast-southwest and have steep dips. As has been mentioned previously, the writers believe that the Slocan silver-lead-zinc veins were deposited during development of this cleavage. The third phase of deformation was possibly related to wrenching during crustal extension during the Eocene Stage.

3.0 SOIL GEOCHEMISTRY

3.1 1990 Soil Survey

The 1990 soil survey was conducted over the Link 1 and 2, Chambers Fr.1 and 2 claims and over parts of the Idaho No.2 and Rawdon claims. Soil lines comprising the 1990 grid were run east-west at 50 m (164 ft) intervals. The southern part of the grid was laid out from a base line located near the eastern boundary of the Link 1 claim. The northern part of the 1990 grid was laid out east and west from a secondary base line that was extended northward from 00 S, 350 W (Figures 14 to 17). A total of 7.3 km (4.45 mi) of lines were surveyed by hip chain and compass in laying out the grid, which comprised 15 lines of various lengths covering 30 ha (72 A) (Figures 4 and 14 to 17). Soil stations were located at 50 m (164 ft) intervals along the lines.

The area of intersection of the 1900 era horse trail and the creek below the Bluebird No.4 adit was used as a starting point for the 1990 grid (Figures 4 and 14 to 17). The unsurveyed base line is not tied in with any of the old crown-grant survey pins. This combined with magnetic deflection and minor compassing and slope correction errors accumulate to make the 1990 grid station co-ordinates slightly different from their true co-ordinates relative to the 00 S, 00 W post on the base line and to old survey pins and posts around the property.

Soil survey results comprise Appendix C. These results are contoured on Figures 14 to 17.

At most sample stations, soils were sufficiently developed to enable collection of a sample from an illuviated "B" horizon. Sampling depths varied from about 0.1 to 0.3 m (0.3 to 1.0 ft).

A large part of the Purcell Property is covered with old mine dumps and haulage roads. Soil samples from these areas tend to have anomalously high soil-metal contents due to contamination from former mining operations. To differentiate between soil-metal anomalies due to contamination from natural soil-metal anomalies, the mine dumps and haulage roads on the property are located on the maps of the soil survey (Figures 14 to 17).

Soils on the Purcell Property are typical of those formed on glaciated lower alpine slopes where a thin layer of ablation till formed the initial regolith for soil development. Periglacial processes such as cryoturbation caused mixing with underlying rock. Subsequent post-glacial organic activity and solifluction developed and complicated soil profiles. On more moderate slopes, this resulted in well-developed soil horizons and comparatively mature soil profiles derived mostly from local parent rock. On steep slopes rapid down-hill transport of soil has resulted in multiple horizons or bare rock bluffs and scree slopes

Soil-metal concentrations commonly reflect the metal content of the underlying parent rock.

Soil samples were shipped in undyed kraft paper envelopes to Chemex Labs Limited of North Vancouver, B.C. A total of 153 samples were taken from the 1990 grid-area. All samples were analyzed for copper, lead, zinc and silver (Appendix C). The method of analysis forms part of Appendix A.

A statistical analysis using the methods of LePeltier (1969) with minor graphic variation was performed on the soil geochemical data (Figures 10 to 13). Through this method, graphic representations of cumulative frequency curves resulted in the separation of data into common and anomalous populations.

Accepting the assumption that the common logs of the soil data naturally tend to form a normal distribution, these populations reflect the elimination of data below the 50th., 84th. and 97.5th. centiles and represent regional background, sub-anomalous and anomalous thresholds respectively.

Once threshold values were established over the 1990 grid-area, data from the 1987 grid were recontoured using the threshold values for the 1990 data and all data were included in the soil-metal contour maps (Figures 14 to 17).

Geochemical contour intervals of the common logs of data from the 1990 grid for copper, lead, zinc and silver were plotted (Figures 10 to 13). They reflected the upper first and second standard deviations on the trends of lognormal distributions of populations of normal soils derived from graphic analysis as follows:

	Cu ppm	Pb ppm	Zn ppm	Ag ppm
84th. Centile (sub-anomalous)	52	42	330	0.47
97.5th. Centile (anomalous)	97	80	500	0.64

During the 1987 survey, soils were analyzed for gold and arsenic as well as for copper, lead, zinc and silver (Spearing and Ostler, 1988). The writers thought that it was not necessary to test for gold and arsenic during the 1990 soil survey on the Purcell Property because concentrations of those metals in rocks and mineralization on the property were very low.

3.2 Interpretation of Soil-metal Distribution Curves

The Purcell Property is underlain by Slocan Group metasediments and Nelson Batholith Intrusives which are cut through by Slocan silver-lead-zinc veins. The Slocan veins would be thought of by a prospector as "mineralized formation" and the other lithologies would be considered to be "country rock". In this setting, soil-metal distribution curves should reveal identifiable soil-metal data populations from normal soils derived from country rock and from enriched soils derived from mineralized veins. This division of soil-metal data populations is quite obvious in the soil-metal distribution curves from the Purcell Property (Figures 10 to 13).

The Slocan veins contain no copper-bearing minerals in their zinc-rich central parts. Tetrahedrite; locally in which much of the copper is replaced by silver, is the only significant copper-bearing mineral in the lead-silver rich upper parts of the veins. These veins do not contribute any significant copper to soils in the property-area.

The copper distribution curve (Figure 10) reflects this. It contains a single lognormal soil-copper data population probably derived almost entirely from country rock.

The lead, zinc and silver soil-metal distribution curves dramatically demonstrate contributions of these metals to soils from both country rock and mineralized veins.

The lead and zinc distribution curves (Figures 11 and 12) contain near lognormal data population distributions up to about the 75th. centile, interpreted to represent contributions of these metals to normal soils from country rock. At that point, the curves are positively skewed representing a statistical excess in high metal concentrations (LePeltier, 1969). The upper positively skewed parts of these curves contain other lognormal data population distributions, interpreted to represent contributions of these metals to enriched soils from Slocan veins.

The soil-silver distribution curve (Figure 13) is similar to those of lead and zinc (Figures 11 and 12). However, the soil-silver data distribution curve contains a nearly lognormal distribution of data from silver-enriched soils that extends down the 40th. centile; the enriched populations of lead and zinc data extend down to about the 75th. centile. This indicates to the writers that Slocan veins contribute a greater amount of silver to soils perportionate to silver in soils from country rock than do lead and zinc. Consequently, the presence of high soil-silver contents should be a very strong indication of the presence of Slocan silver-lead-zinc veins.

3.3 Interpretation of 1990 Soil Survey Results

3.3(i) Interpretation of Copper in Soils

The soil-data distribution curve for copper on the Purcell Property indicates that soil-copper concentrations form a single population from a common primary source (Figure 10). The source is interpreted to be Slocan Group metasedimentary rocks.

The distribution of soil-copper concentrations over the property (Figure 14) confirms this. Generally, high soil-copper contents are underlain by variously carbonaceous pelites near the Bluebird claim boundary and on the eastern part of the Purcell Property. The horseshoe-shaped area of sub-anomaluos soil-copper near the Idaho No.2 veins follows pelitic rocks around a southeasterly plunging, second-phase antiform (Figures 9 and 14).

Areas of anomalously high soil-copper concentrations near the Goodenough, Purcell and Idaho No.2 dumps are interpreted to be related to accelerated leaching of copper from weathered Slocan Group rocks that have been broken up by former mining activities.

It is interesting to note that dump and scree related copper anomalies are not associated with the lower dumps on the Grey Copper and East veins. This is probably because those areas are below the Late Tertiary-age valley bottom where less deeply weathered Slocan Group rocks would not release their copper as rapidly as would the deeply weathered rocks on higher parts of the slope.

3.3(ii) Interpretation of Lead in Soils

The soil-data distribution curve for lead on the Purcell Property (Figure 11) indicates that there are two primary sources of lead in soils, pelitic Slocan Group metasediments and galena from Slocan silver-lead-zinc veins.

The distribution of soil-lead across the property (Figure 15) confirms this. Also, it reveals that lead is quite mobile is soils and forms broad down-slope dispersion anomalies as well as those from the two types of primary source.

Soil-lead emanating from carbonaceous slates and pelites within the Slocan Group are located around the Bluebird claim boundary. Generally, these are mild anomalies that tend to mask anomalies from other sources on the Purcell and Rawdon claims (Figure 15).

There are several soil-lead anomalies presumed to be related to the presence of Slocan silver-lead-zinc veins on the property. The anomaly at the northern boundary of the Goodenough claim is obviously related to the Goodenough Vein which is stoped to surface in that area.

A discontinuous soil-lead anomaly is located about 150 m (492 ft) northwest of the Grey Copper Vein. That anomaly may be related to a vein striking parallel with the Grey Copper Vein that forms the southwesterly extension of mineralization exposed on the Bluebird claim.

A soil-lead anomaly generally coincides with the surface traces of the Purcell, Grey Copper and East veins except on very steep slopes on the southern part of the Purcell claim where eluviation has probably removed soil-lead. Coincident soil-lead and zinc anomalies between the lower workings on the Grey Copper Vein and the East Vein indicate that another silver-lead-zinc vein is located in that area. Accelerated lead liberation from weathered rock in mine dumps and down-slope dispersion significantly blur soil-lead anomalies associated with silver-lead-zinc veins on this part of the property.

An intense soil-lead anomaly is located on the southwestern part of the Rawdon claim. It extends along the nose of the slope southwestward from the Bluebird claim boundary to the Idaho No.2 access road. This anomaly is probably related to an undiscovered vein.

An extensive coincident lead and zinc anomaly extends southwestward from the Idaho No.2 veins, across the Link 2 claim to the Chambers claim. Because the anomaly does not follow the creek across the Derby claim, it is assumed not to be related to down-hill dispersion or illuviation. It is presumed to be an expression of the Idaho No.2 Vein system below the workings-area.

It is believed that the southeastward jog in the creek near the centre of the Link 2 claim below the Idaho No.2 workings is caused by a northwesterly striking fault that dislocates stratigraphy and the Idaho No.2 vein system (Figure 9). Dislocation of the vein by the fault would explain why the Idaho veins were not found in the creek below the workings-area.

Soil-lead anomalies on the Chambers Fr.2 claim and at the centre of the Link 1 claim form a tenuous northeasterly trend to the Trade Dollar workings located on the southwestern part of the Trade Dollar claim (Figure 15). It is possible that a northeasterly striking silver-lead-zinc vein may be present in that area.

3.3(iii) Interpretation of Zinc in Soils

Soil-zinc anomalies on the property, like those of lead have two primary sources: zinc from silver-lead-zinc veins and carbonaceous pelites within the Slocan Group metasediments (Figures 12 and 16). Anomalies from pelites are located near the Bluebird claim boundary. Unlike lead, zinc is not very mobile in soils in the property-area. Consequently, anomalies caused by down-slope dispersion and illuviation are minimal. This makes zinc the best soil-metal indicator for the location of silver-lead-zinc veins.

Minor soil-zinc anomalies coincide with lead anomalies at the Goodenough and Purcell veins and around the western part of the Rawdon claim. As previously mentioned, these anomalies are probably related to silver-lead-zinc vein mineralization on the northern part of the property.

Mineralization in this area is from the upper silver-lead enriched parts of veins. As would be expected, soil-zinc anomalies in these areas are far less well-developed than those of lead and silver (Figures 15, 16 and 17).

Soil-zinc anomalies are very well-developed near exposures of the central zinc-rich part of the Grey Copper Vein on the Grey Copper claim (Figure 16). A soil-zinc anomaly about 150 m (492 ft) northwest of the surface trace of the Grey Copper Vein strongly indicates the presence of a silver-lead-zinc vein that runs parallel with the Grey Copper Vein in that area. Rapid erosion in the gulch near the surface trace of the Grey Copper Vein precludes the development of an intense soil-zinc anomaly along that vein. Between the lower workings on the Grey Copper Vein and the East Vein is an intense linear soil-zinc anomaly that indicates the presence of a silver-lead-zinc vein that runs parallel with the East Vein and is a conjugate to the Grey Copper Vein.

The largest zinc-bearing structure exposed on the property is the Idaho No.2 vein system. It is confined within a massive soil-zinc lead and silver anomalies that extend across the Idaho No.2 and Link 2 claims (Figures 15, 16 and 17). As has been mentioned previously, these anomalies do not follow the creeks and therefore are not due to down-slope dispersion or illuviation. They are probably caused by an extension of the Idaho No.2 vein system between the Idaho No.2 and Chambers claims.

3.3(iv) Interpretation of Silver in Soils

The soil-data distribution curve for silver (Figure 13) is positively skewed throughout with regard to lognormal distribution trends. This indicates an extreme excess of high soil-silver concentrations in the property-area (LePeltier, 1969). Rigorous establishment of sub-anomaluos and anomalous thresholds along the lognormal trend for normal soils includes too much data above the contours on the soil-silver map (Figure 17) making interpretation difficult.

However, raising the statistical thresholds and contour values to levels that clean up the map would artificially accentuate secondary soil-silver anomalies around the dumps at the expense of primary anomalies related to the presence of silver-lead-zinc veins. This is a prime example of the application of type 1 and 2 statistical errors through which either too much or too little data is excluded by the establishment of confidence intervals.

The writers have plotted contours from the thresholds generated from the lognormal trend for normal soils (Figures 13 and 17) to maintain consistency of method with the treatment of distributions of other metals in soils and to display wide-spread dispersion of silver in soils.

Soil-silver anomalies are coincident with soil-lead and zinc anomalies which have been discussed previously. The writers found silver to be a less effective geochemical source indicator than lead or zinc in the Purcell Property-area.

4.0 DESCRIPTION OF ECONOMIC MINERALIZATION OF THE GREY COPPER AND IDAHO NO.2 VEIN SYSTEMS

4.1 Grey Copper and East Veins

4.1(i) Description of Workings on the Grey Copper Vein

The Grey Copper Vein is exposed in the gully along the centre line of the Grey Copper claim between elevations of 1722 m (5648 ft) and 1836 m (6023 ft)(Figures 4 and 18). Within this elevation interval, the vein is probed by underground workings on six levels, No.1 to 5A.

The No.1 to 4 levels are clustered along the oxidized upper exposure of the vein near the 1818 m (5963 ft) elevation (Figures 18, 19A and 19B). Levels 5 and 5A bracket the fresh lower exposure of the vein near the 1740 m (5707 ft) elevation.

During the 1990 exploration program, the No. 2, 3, 5A and 5 levels were mapped and variably sampled. The No.1 level had been stoped out from below and the No.4 level had been buried beneath the No.3 dump. Consequently, no work was done on those two levels.

Most of the development work near the upper exposure of the Grey Copper Vein was done on the No.3 level (Figures 19A and 19B).

The Grey Copper No.3 drift is 237 m (777 ft) long and contains five stopes and two short branch tunnels. The first 15 m (50 ft) of this level is timbered through weathered quartz diorite. The timbers date from 1953 and 1980 and are in good condition. The rest of the tunnel is through more competent rock and needs no timbering.

Except below the Big Stope, the first 180 m (590 ft) of this level is set with 18" gauge track with 12 lb rail. The back 57 m (187 ft) of the No.3 level and 5 m of tunnel beneath the Big Stope has track with 20 lb rail.

The only water that enters this working is a small amount from the No.1 level portal above the Big Stope. This could be arrested by mucking out the No.1 portal so that it drains outward rather than inward to the stope. Minor mucking around the No.3 portal and clearing of rubble from the last 1980 exploration blast in the Rat Stope would clear this level for future development.

The Big Stope and upper levels provide excellent ventilation and a good secondary escape route for the western part of the No.3 drift (Figures 18 and 19A). No secondary access or ventilation is developed in the eastern part of this working yet.

The No.5 and 5A levels are developed in the lower unoxidized exposure of the Grey Copper Vein. The No.5A portal is at 1740 m (5707 ft) elevation, about 78 m (256 ft) vertically below the No.3 portal (Figure 18).

Early mining on these levels was done with hand steel; rock was removed using wheel barrows. Recent development on the No.5A level was by the use of a slusher. Consequently, this drift would require slashing, a lowering of grade to 1% and rails to upgrade it for future development. The No.5A drift makes no water.

The No.5A drift follows the vein for 37 m (121 ft). The No.5 drift follows the vein for 38 m (125 ft) at an elevation 18 m (59 ft) vertically below the No.5A level (Figure 20). These two drifts are connected by a 25 m (82 ft) long raise in the plane of the vein (Figures 18 and 20).

During the 1979 slushing operation in the No.5A drift, the raise was blocked with waste rock. Reopening the raise would be of dubious value to further development.

4.1(ii) Description of the Grey Copper Vein within the Workings

The Grey Copper Vein occupies a plane with an average strike of 059° and an average dip of 80° southeast. Dips on the vein in the No.3 and No.5A levels are generally from 55 to 70°, indicating that the vein must be nearly vertical in its unexposed section between these two levels (Figures 18 to 20).

Since early development of the Purcell Property-area, it has been suspected that the Purcell Vein was an uphill extension of the Grey Copper Vein. The Purcell Vein workings have been projected onto the average plane of the Grey Copper Vein (Figure 18) to demonstrate its approximate location with regard to the Grey Copper workings.

For the location of the Purcell Vein to be accurate, either the dip of the plane of the vein would have to flatten to about 64° between the Grey Copper No.1 and Purcell adits, or the Purcell Vein would have to be an en echelon offset of the Grey Copper Vein. This could be why a connection between the two veins has not been found.

As has been mentioned previously, the surface exposure of the Grey Copper Vein between the No.1 and 3 portals is very oxidized. There, the vein is up to 40 cm (1.3 ft) thick and averages about 20 cm (0.66 ft) thick. It comprises quartz, iron oxides, pyrite, and residual galena and sphalerite. The same pervasive oxidation is present in the vein in the No.2 drift and for the first 56 m (184 ft) in the No.3 drift (Figures 18 and 19A).

The vein averages about 20 cm (0.66 ft) in thickness from 56 to 82 m (184 to 269 ft) in from the portal. It widens to about 60 cm (2 ft) in three areas that are extensively stoped above the No.3 level.

Mineralization in this area comprises massive purple sphalerite assaying up to 54% zinc. With this. are segregations of blue-grey galena containing from 80 to 100 oz/ton silver and up to 72% lead.

Only the silver-bearing galena was ore to early miners who stoped out the vein wherever vein widths exceeded 30 cm (1 ft) and where galena comprised a significant part of the mineralization.

During 1953 development, both galena and sphalerite mineralization were taken. The 1000-ton block of ore sampled by the zinc commission's geologist during 1905 was taken from the Big Stope at that time. That ore block contained 18.8% lead, 42.6% zinc and 33 oz/ton silver.

The vein is sheared out along a subsequent parallel fault from 82 to 105 m (269 to 344 ft) along the No.3 drift. There is little economic potential on the vein in this area.

From 105 to 128 m (344 to 420 ft) along the No.3 drift, the fault veers away from the vein and good widths of mineralization are exposed (Figure 19B). Two small stopes are extended where widths exceed 30 cm (1 ft). Mineralization in this part of the vein is similar to that near the Big Stope except that sphalerite comprises a larger part of the mineralization here.

At 128 m (420 ft) in from the portal, the Grey Copper Vein is intersected by a 4 to 6 cm (1.6 to 2.4 in) thick galena silver-bearing vein which is presumed to be the East Vein.

Miners continued driving along the Grey Copper Vein for an additional 12 m (40 ft) then lost it along a sub-parallel fault (Figure 19B).

Seduced by silver assays ranging from 100 to 164 oz/ton, early miners veered off along the galena-rich vein. They followed it for 14 m (46 ft) and lost it in a series of cross-faults.

It is very curious that upon having lost the East Vein, miners did not return to drifting along the Grey Copper Vein. Instead, they drove an additional 89 m (292 ft) into country rock beneath the plane of the Grey Copper Vein.

During the 1990 exploration program, 11 channel samples were taken from the Grey Copper Vein in the No.3 drift. They averaged 13.35% lead, 29.24% zinc and 28.93 oz/ton silver. Sampling in the drift was not rigorous and the slight divergence between the zinc commission's grade estimate and that of the writers probably was due to the lack of 1990 samples from higher grade sections of veins in stope ceilings.

Generally, mineralization in Slocan silver-lead-zinc veins is found to be zoned (Cairnes, 1935). In this regard, the Grey Copper Vein is typical (Figure 18). The upper part of the vein as exposed in the Purcell workings is a narrow high-grade silver-bearing galena vein. Grey Copper levels 1 to 3 occupy part of a transition zone where zinc-lead-silver mineralization is exposed as massive sphalerite containing blebs, stringers and segregations of silver-bearing galena. The No.5 and 5A levels expose part of the zinc-rich central part of the vein where mineralization is almost entirely sphalerite containing about 54.4% zinc and 7.4% iron.

The No.5A level was sampled at 2 m (6.6 ft) intervals along its 37 m (121 ft) length (Figure 20). These samples averaged 1.18% lead, 29.55% zinc and 4.82 oz/ton silver across an average width of 23.3 cm (0.76 ft). The ore shoot exposed in the last 13 m (43 ft) of the No.5A drift averaged 27 cm (0.89 ft) in width with a maximum width of 50 cm (1.64 ft) that contained an average of 0.06% lead, 41.21% zinc and 6.66 oz/ton silver in massive sphalerite with siderite-quartz-ankerite gangue.

4.1(iii) Potential Mineral Reserves near the Grey Copper Workings

To estimate potential mineral reserves, assumptions with regard to thickness and grade along the vein must be made and projected from the workings to more distant parts of the vein.

The Grey Copper Vein has an average thickness of about 20 cm (0.66 ft) and attains a maximum thickness of about 60 cm (2 ft) in ore shoots. These shoots are about 15 m (50 ft) long and are separated by 15 m (50 ft) lengths of narrower vein. Consequently most of the mineralization is concentrated on ore shoots comprising about 50% of the vein (Figure 18).

Ore shoots average about 33 cm (1.1 ft) in thickness and extend to down dip for at least 30 m (100 ft).

The zinc commission's grade estimate for the area near the Big Stope in the No.3 level is a good estimate of mineral grade in ore shoots along that level. The average assay from the ore shoot at the end of the No.5A drift is probably representative of grade in ore shoots along the vein at that level. Current values of those grades of mineralization are listed below:

CURRENT VALUE OF AVERAGE GRADE MINERALIZATION

	Pb	Zn	Ag	
No.3 Level: grade	18.8%	42.6%	33.00 oz/ton	
$CDN Value/ton	$80.28	$682.62	$137.28	$900.18 total
No.5A Level: grade	0.06%	41.21%	6.66 oz/ton	
$CDN Value/ton	$0.26	$660.35	$32.43	$693.04 total

NOTE: The values tabled above are computed from L.M.E. prices for December 10, 1990
Pb = $US 0.1825/lb, Zn = $US 0.6848/lb, Ag = $US 4.16/oz
= $CDN0.2135/lb, = $CDN0.8012/lb, = $CDN4.87/oz

The part of the Grey Copper Vein reasonably accessible through development and extension of existing workings has been divided into six reserve blocks (Figure 18). Blocks 'A' and 'B' are assumed to contain grades of mineralization like that quoted by the zinc commission from the No.3 drift. Blocks 'C' to 'F' probably contain grades similar to those found in the No.5A level.

Mineral reserve block 'A' contains an area of 3596 m^2 (38,687 ft^2) on the average plane of the vein. It is located west of the intersection of the Grey Copper and East Veins in the No.3 drift. It is bounded below at 15 m (50 ft) below rail level in the No.3 drift and it is bounded above by the base of surface oxidation on the vein (Figure 18).

The existence of five ore shoots has been established by stopes in this reserve block. Remaining mineral reserves vary from proven to potential. Rigorous definition of ore reserves in this block would require more extensive sampling than has been conducted to date.

It is estimated that reserve block 'A' contains about 1700 tons of minable mineralization worth about $CDN1,530,306 at $CDN900.18/ton. These reserves are located below the No.3 level and in unstoped ore shoots above it.

Reserve block 'B' extends eastward from the intersection of the Grey Copper and East veins to the eastern end of the No.3 drift (Figure 18). Its upper boundary is generally 60 m (197 ft) above the No.3 drift and its lower boundary is 15 m (50 ft) below that drift. It contains an area of 8822 m^2 (94,920 ft^2) on the average plane of the vein.

Because the No.3 level is driven beneath the Grey Copper Vein east of its intersection with the East Vein, this reserve block is almost unexplored. If the character of the vein in this block is similar to that in reserve block 'A' then reserve block 'B' would contain about 7278 tons of mineralization worth about $CDN6,551,510 at $CDN900.18/ton.

Reserve block 'C' is bounded below by the No.5 drift, above by the surface exposure of the Grey Copper Vein and to the east by the end of the No.5A drift (Figure 18). It occupies about 700 m^2 (7532 ft^2) on the average plane of the vein. Three ore shoots are well-documented in this reserve block. It is estimated that about 385 tons of minable reserves worth about $CDN266,820 at $CDN693.04 are located in reserve block 'C'.

Reserve block 'D' represents the area above the No.5 drift between reserve blocks 'C' and 'A' (Figure 18). It contains 7375 m^2 (79,355 ft^2) on the average plane of the vein. This reserve block is totally unexplored. If the character of mineralization in blocks 'D' and 'C' are similar then block 'D' would contain 6084 tons of minable mineralization worth about $CDN4,216,455 at $CDN693.04/ton.

Reserve block 'E' is located directly below reserve block 'A' and is bounded below by the No.5 level (Figure 18). It contains 9628 m^2 (103,597 ft^2) on the plane of the vein.

This reserve block is penetrated by a 1980 drill hole that intersects massive sphalerite and galena mineralization over 1.06 m that assays about 7 oz/ton silver (G. Sipos, pers. comm.; Sookochoff, 1986). This intersection indicates that mineralization on the vein in this area is similar to that in the No.5A drift. About 7943 tons of minable mineralization may be located in reserve block 'E' worth about $CDN5,504,817 at $CDN693.04/ton.

Reserve block 'F' is located below block 'B' and is east of block 'E' (Figure 18). It contains 8856 m^2 (95,291 ft^2) on the average plane of the vein with a potential 7306 tons of minable mineralization worth about $CDN5,063,350 at $CDN693.04/ton.

In conclusion, it is estimated that the six reserve blocks accessible through extension of the Grey Copper workings may contain a total of 30,696 tons of minable mineralization worth about $CDN23,133,258 at current metal prices.

4.1(iv) *Economic Potential of the East Vein*

The East Vein is a narrow, high-grade lead-silver vein that may be a conjugate structure to the Grey Copper Vein. It is exposed in two places: on surface in trenches located about 75 m (246 ft) south of the Grey Copper No.3 portal (Figure 21) and in the No.3 drift from 128 to 148 m (420 to 485 ft) in from the portal.

This vein is from 1 to 2.5 cm (0.4 to 1 in) thick on surface and up to 6 cm (2.4 in) thick in the No.3 drift. It carries up to 146 oz/ton silver and up to 72% lead in solid galena.

Its narrowness precludes any economic potential at present silver prices. However, if silver prices run as they did during 1980, then a few tons of high-grade ore could be extracted profitably from the East Vein in the No.3 drift.

4.2 Idaho No.2 Vein System

Presently, the main Idaho No.2 vein is exposed in two outcrops above the 1906 m level. The largest outcrop is at the Idaho No.2 shaft (Figures 9 and 22). There, the main Idaho No.2 vein is a 2.4 m (8 ft) thick breccia zone containing oxidized sulphides.

Early during development of this vein, it was exposed in trenches from the No.2 portal up to the Bluebird-Idaho No.2 claim boundary. It was known as the Big Vein on the Bluebird claim.

The workings on the Idaho No.2 vein system comprise two tunnels and a shaft. The No.1 tunnel and shaft are located at an elevation of 1939 m (6361 ft) (Figures 4 and 22). They were buried beneath Sipald Resources' access road and are inaccessible now. Most of the underground exploration was conducted in the No.2 (main) tunnel driven at an elevation of 1906 m (6252 ft) (Figure 22).

During the 1990 program, the main Idaho No.2 tunnel was closed because some roof timbers had fallen off a set near the portal. Consequently, current knowledge of these workings was assembled from reports of former operators.

The 1906 m level is a drift along the main Idaho No.2 breccia zone for 360 m (1180 ft) that terminates near the Rawdon-Nabob claim boundary. Reportedly, this drift contains track throughout (G. Sipos, pers. comm.). The weight of the rails and the condition of the track is not known. This drift is driven through moderately incompetent carbonate-bearing siltstone and phyllite that require extensive timbering.

During the 1983 exploration program, the main Idaho No.2 drift was retimbered as far as the cross-cut 183 m (600 ft) in from the portal. The timber beyond that point was in poor condition and would need extensive renovation before further development could be conducted in the back half of the working (G. Sipos, pers. comm.). The front half of the Idaho No.2 drift was retimbered in 1983 and probably is still in reasonably good condition.

The Idaho No.2 drift was drilled and sampled by Bluebird Mines Ltd. in 1951 (Figure 22). The 1951 sampling was confirmed during Sipald Resources Ltd.'s 1983 sampling program (Sookochoff, 1986).

Mineralization in the drift can be divided into three zones based on thickness, grade and degree of oxidation. For the first 100 m (305 ft) in from the portal, the main Idaho No.2 structure is a 2 m (6.6 ft) thick breccia zone containing clasts of country rock in a sphaleritic matrix. Part of this zone is intensively oxidized. The greatest thicknesses and best grades of mineralization occur from 100 to 200 m (305 to 610 ft) in from the portal in the central part of the working. There, the main Idaho No.2 structure is reported to be up to 3 m (9.8 ft) thick and contains both silver-bearing galena and sphalerite. The raise along the vein that was reported in 1929 to have contained ore grading 100 oz/ton silver was driven in that area (Figure 22).

The West Vein, a parallel structure with the main Idaho No.2 structure located about 12 m (39.4 ft) northwest of the main shear, is explored by drill holes and cross-cut tunnels in the central part of the working. The West Vein reportedly is 0.6 to 1 m (2 to 3.3 ft) thick and contains massive sphalerite assaying up to 53% zinc with minor galena. In form and mineral grade, it resembles the Grey Copper Vein.

The main Idaho No.2 structure is exposed throughout the eastern part of the drift. Although it persists to near the Rawdon-Nabob claim boundary, former sampling indicates that mineral contents drop to sub-economic levels there.

Considerable rehabilitation and intensive sampling would be required to make an accurate estimation of mineral reserves and economic potential of this working.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1(i) Geology

The Purcell Property is underlain by an inverted sequence of Triassic-age turbidites and pelites that form part of the Slocan Group. These rocks were complexly deformed, metamorphosed and intruded by quartz-dioritic rocks related to the Nelson Batholith from the Triassic to the Jurassic Period. Crustal extension during Eocene time resulted in the development of northeasterly striking fractures that were filled with silver-lead-zinc mineralization comprising the Slocan Veins (Figure 9).

5.1(ii) Soil Survey

Soils were sampled over a grid that covered the southeastern part of the Purcell Property during 1990. Samples were analyzed for copper, lead, zinc and silver. Anomalous and sub-anomalous threshold values from the 1987 soil survey were recalculated and plotted together with those from the 1990 survey to produce consistent soil maps for the whole property (Figures 10 to 17).

Copper in soils on the property is determined mainly by underlying Slocan Group stratigraphy. Soils formed on carbonaceous slate and phyllite have the highest copper contents and those formed on greywacke and nearby intrusives have the lowest copper contents (Figure 14).

Anomalous lead and zinc contents in soils strongly indicate the presence of Slocan silver-lead-zinc veins (Figures 15 and 16). There are several areas on the property where unexposed veins may be discovered through intensive exploration of soil-lead and zinc anomalies.

The four most promising anomalies are located: down hill along strike with the Idaho No.2 structure, near the northwestern corner of the Idaho No.2 claim south of the Purcell workings, on the northwestern part of the Grey Copper claim and near the southeastern corner of the Grey Copper claim (Figures 15 and 16).

Silver in soils is similar to lead and zinc except that its high mobility makes it less useful than the other metals for anomaly source location (Figure 17).

5.1(iii) Grey Copper Vein

The Grey Copper Vein is exposed on surface and in underground workings for a vertical distance of 114 m (374 ft) between elevations of 1722 and 1836 m (5648 to 6022 ft).

The two most useful underground levels on this vein are No.3 and 5A. The No.3 level is driven in for 237 m (777 ft) at an elevation of about 1818 m (5963 ft). The first 134 m (440 ft) is on the vein; the rest is beneath it. This level is accessible and fitted with usable track. The No.5A level is 37 m (121 ft) long and is driven on the vein at an elevation of about 1740 m (5707 ft).

The Grey Copper Vein has an average thickness of about 20 cm (0.66 ft) and attains a maximum thickness of about 60 cm (2 ft) in ore shoots.

These shoots are about 15 m (50 ft) long and are separated by 15 m (50 ft) lengths of narrower vein. Ore shoots average about 33 cm (1.1 ft) in thickness and extend down dip for at least 30 m (99 ft).

The Grey Copper Vein contains massive sphalerite with blebs and segregations of silver-bearing galena in a siderite-ankerite-quartz gangue. Mineralization in the No.3 level contains 18.8% lead, 42.6% zinc and 33 oz/ton silver with a gross value of $900.18/ton at current metal prices. Mineralization in the ore shoot exposed in the No.5A level contains 0.6% lead, 41.21% zinc and 6.66 oz/ton silver with a gross value of $693.04 at current metal prices.

There are six mineral reserve blocks on the Grey Copper Vein that are accessible through upgrading and extension of the No.3 and 5A levels (Figure 18). They are estimated to contain a potential 30,696 tons of mineralization with a gross value of $CDN23,133,258 at current metal prices.

Presently, there is road access to these workings. Contract milling capacity and power is located within 3 km (1.8 mi) of the property, and the vein intrudes competent rock that requires no timbering. The Grey Copper workings contain the most accessible and inexpensive mining potential on the Purcell Property.

5.1(iv) Idaho No.2 Vein System

This vein system comprises the main Idaho No.2 vein, a 2 to 3 m (6.6 to 9.8 ft) thick breccia zone, and the West Vein which is a 0.6 to 1 m (2 to 3.3 ft) thick vein located about 12 m (40 ft) northwest of the main structure. These two structures are sub-parallel.

The Idaho No.2 vein system contains massive sphalerite with minor silver-bearing galena. Consequently, zinc values predominate over those of lead and silver.

This vein system and its possible down-hill extension as indicated by soil-lead and zinc anomalies (Figures 15 and 16) may contain the largest mineral reserve potential on the property. However, development and mining of this system would require a new access road from the Grey

Copper claim and extensive exploration and underground development. The Idaho No.2 vein system is located in only moderately competent rock that would require extensive timbering during mining. Fortunately, the cost of timbering there would be mitigated by the lack of dilution while mining 2 to 3 m (6.6 to 9.8 ft) thick veins.

5.1(v) Goodenough, Purcell and East Veins

The Goodenough Vein is a 5 to 51 cm (2 to 20 in) thick high-grade silver-lead vein from which ore grading up to 760 oz/ton silver and 72% lead was shipped. It was mined out on seven levels from 1894 until 1919 (Figure 4) and returned the equivalent of several million dollars in profit at current upon calculation of subsequent inflation.

During 1969, a second parallel silver-lead vein was reported to have been discovered in the Goodenough No.8 level. This combined with zinc-rich mineralization below the No.7 level represents the remaining economic potential of this vein.

The Purcell Vein has been presumed by many to be an up-hill extension of the Grey Copper Vein. It is a very narrow silver-lead vein that assays up to 182 oz/ton silver. Its narrowness and lack of development make it a comparatively unattractive target at this time.

The East Vein is a narrow 2.5 to 6 cm (1 to 2.5 in) thick silver-lead vein that may be a conjugate structure to the Grey Copper Vein. It is exposed on surface 75 m (246 ft) south of the Grey Copper No.3 portal and underground in the No.3 level (Figures 4, 18, 19B, and 21). The East Vein assays from 100 to 164 oz/ton silver. If silver prices run to high levels then a few tons of high-grade silver mineralization could be mined at a profit from the Grey Copper No.3 level.

5.2 Recommendations

A major program of underground development on the Grey Copper Vein and an ancillary program of exploration on other mineral targets on the property are recommended. The major program is designed to expedite the development of minable reserves of zinc-silver-lead mineralization on the property at minimal cost to the company. The major program should receive priority over the ancillary exploration program.

5.2(i) Major Program; Phase 1: Development of No.5A Level on the Grey Copper Vein

Presently, the Grey Copper No.5A level is a 37 m (121 ft) long slusher drift along the vein. It needs to be slashed out, lowered to a +1% gradient and fitted with track to permit weather underground development. Necessary associated surface development would include laying about 40 m (131 ft) of track to establish a waste dump beyond the No.5 portal and minor road upgrade to facilitate mineral and supply handling.

The No.5A drift should be extended for 50 m (164 ft) along the vein to test contiguity of mineralization. Raises should be extended up along the vein from the level at about 37 m (121 ft), 62 m (203 ft) and 87 m (285 ft) in from the portal.

The raise at portal + 37 m is estimated to intersect the base of surface oxidation on the vein at about 10 m (33 ft) above rail level in the flattened No.5A drift. The raise at portal + 62 m is estimated to encounter oxidation in the vein at 15 m (50 ft) above the drift. These raises should not be extended to within 6 m (20 ft) of surface. The raise at portal + 87 m should be driven up the vein for 35 m (115 ft) then leave the vein and go vertically to surface (an estimated distance of about 10 m) to provide ventilation for the No.5A workings. The exact routes of the raises should be determined by surface and underground transit survey to ensure that none of the raises break surface near the creek.

This program would prove a block of mineral reserves comprising an area of 1522.5 m^2 (16,382 m^2) in the plane of the vein in reserve blocks 'C' and 'D' (Figure 18). Assuming that 33 cm (1.1 ft) thick ore shoots occupy 50% of the block, this block would contain 2512 tons of mineralization worth $CDN1,740,916 at $CDN693.04/ton.

If zinc prices remain at or above current levels, enough mineral product should be produced during this phase of development to offset costs significantly. Cost and revenue projections for the first phase of the major program form section 5.3 of this report.

5.2(ii) Major Program; Subsequent Phases of Development

With reasonable encouragement from the first phase of development of the No.5a workings, subsequent phases of development should include extension of the No.5A drift to beneath the eastern end of the No.3 drift and connection of the two by raises at regular intervals. This would result in proving of mineral reserves between the two levels.

5.2(iii) Ancillary Program of Surface and Underground Exploration

There are several exploration targets apart from the Grey Copper Vein on the property. They are listed as follow in order of first to last priority:

A. The soil-lead and zinc anomalies near the southeastern corner of the Grey Copper claim (Figures 15 and 16) should be subjected to an intensive soil survey and prospecting. If a conjugate to the Grey Copper Vein exists there, it could be mined in part through the Grey Copper workings.

B. The main tunnel on the Idaho No.2 vein system should be opened, mapped and sampled to establish potential mineral reserves in that system. Underground exploration should be conducted in conjunction with intensive soil survey and prospecting of the soil-lead and zinc anomalies down hill from the Idaho No.2 workings (Figures 15 and 16).

C. Other soil anomalies on the property should be prospected.

D. The Goodenough Vein and parallel vein reported in the Goodenough No.8 level should be mapped and sampled in that level to determine their economic potential.

5.3 Costs and Revenues Generated by the First Phase of Underground Exploration on the Grey Copper Vein, No.5A Level

5.3(i) Estimated Cost of First Phase of Recommended Major Program

A. Upgrade of No.5A Drift and Surface Infrastructure

Laying new track outside No.5A portal		
60 m of track @ $165/m	$ 9,900	
Slashing and lowering of No.5A drift		
37 m @ $165/m	$ 6,105	
Laying of new track in No.5A drift	$ 6,105	
	$ 22,110	$ 22,110

B. Advance of No.5A Drift

Driving new 1.5 x 2.1 m (5 x 7 ft) tunnel including track (no timbering needed)		
50 m @ $1300/m	$ 65,000	$ 65,000

C. Driving 3 Raises from the No.5A Drift

Raise at p+37 m: 10 m advance up the plane of the vein along a 33 cm average thickness of mineralization by a 1 x 3 m raise;		
44 tons of mineralization moved @ $50/ton . . .	$ 2,200	
60.5 tons of waste rock moved @ $50/ton	$ 3,328	
	$ 5,528	$ 5,528
Raise at p+62 m: 15 m advance up the plane of the vein along a 33 cm average thickness of mineralization by a 1 x 3 m raise;		
66 tons of mineralization moved @ $50/ton . . .	$ 3,300	
90.75 tons of waste rock moved @ $50/ton	$ 4,538	
	$ 7,838	$ 7,838
Raise at p+87 m: 35 m advance up the plane of the vein along a 33 cm average thickness of mineralization by a 1 x 3 m raise;		
154 tons of mineralization moved @ $50/ton . . .	$ 7,700	
211.75 tons of waste rock moved @ $50/ton . . .	$ 10,558	
and 10 m advance to surface off the plane of the vein for ventilation		
90.75 tons of waste rock moved @ $50/ton	$ 22,825	$ 22,825
Contingency	$ 6,699	$ 6,699
Total Estimated Cost on Property		$130,000

5.3(ii) Projected Revenue from First Phase of Recommended Major Program

MINERALIZATION PRODUCED DURING PROGRAM

Slashing of 37 m of No.5A Drift	23.2 tons
Advance of No.5A Drift for 50 m	125.4 tons
Raise p+37 m	44.0 tons
Raise p+62 m	66.0 tons
Raise p+87 m	154.0 tons
Total Mineralization Produced during Program	412.6 tons

AVERAGE ASSAYS

	Pb	Zn	Ag	Total
Mineralization along drift	18.80%	29.55%	4.82 oz/ton	
$CDN Value/ton	$80.28	$473.35	$23.47	$577.10
Mineralization in raises	0.06%	41.21%	6.66 oz/ton	
$CDN Value/ton	$00.26	$600.35	$32.43	$693.04

NOTE: The values tabled above are computed from L.M.E. prices for December 10, 1990
Pb = $US 0.1825/lb, Zn = $US 0.6848/lb, Ag = $US 4.16/oz
= $CDN0.2135/lb, = $CDN0.8012/lb, = $CDN4.87/oz

NET REVENUE PROJECTIONS FOR FIRST PHASE OF RECOMMENDED MAJOR PROGRAM

	Depressed Zinc Price Zn=$US 0.500 =$CDN0.5850	Current Zinc Price Zn=$US 0.6845 =$CDN0.8012	Advanced Zinc Price Zn=$US 0.900 =$CDN1.053
Gross Revenue:			
148.6 tons from drifts	$ 66,794	$ 85,757	$ 98,758
264.0 tons from raises	$135.920	$182,963	$237,750
412.6 tons total	$202,714	$268,720	$336,508
Production Costs:			
Cost of 1991 Program	$130,000	$130,000	$130,000
Loading and handling of mineral + road work (wear from trucks) .	$ 10,000	$ 10,000	$ 10,000
Shipping from property to mill 412.6 tons @ $5/ton	$ 2,063	$ 2,063	$ 2,063
Milling charge: 412.6 tons @ $40/ton	$ 16,504	$ 16,504	$ 16,504
Losses during transport+milling: 5% of gross value	$ 10,136	$ 13,436	$ 16,825
Shipping from mill to smelter at Trail, B.C.: 275 tons of concentrate @ $17/ton	$ 4,675	$ 4,675	$ 4,675
Smelting charge for zinc con. 275 tons @ $335/ton	$ 92,125	$ 92,125	$ 92,125
Provincial mineral tax	$ 00	$ 00	$ 1,286
Total Production costs	$265,503	$268,803	$273,478
Net Revenue from Program:			
Gross Revenue	$202,714	$268,720	$336,508
Production Costs	-$265,503	-$268,803	-$273,478
Net Revenue	($ 62,789)	($ 83)	$ 63,030
Cash remaining in exploration account after program assuming initial $130,000 financing of the program	$ 67,211	$129,917	$193,030

NOTES: The average assays for mineralization in drifts and raises were used to develop the gross revenue from mineralization.

Revenue generated from lead and silver through the average assays was comparatively so small that changes in lead and zinc prices would be of little consequence. Net revenue projections involving only changes in zinc price were developed.

The net revenue projections from the preceding analysis represent three cash-flow cases resulting from depressed, current and advanced zinc prices.

The net revenue projected for exploration during times of depressed zinc prices suggests that the company would recover $67,211 from mineral product produced during the recommended $130,000 first-phase program. If the company is in particularly strong financial condition while exploring during such times, it would be advisable to stockpile the mineral product for subsequent shipment during times of higher prices.

The net revenue projection for exploration when zinc prices are at current levels indicates that exploration could be conducted about on a break-even basis. This would allow the company to proceed with mine development without continual refinancing.

The net revenue projection for exploration during times of advanced zinc prices represents the ideal situation. With advanced zinc prices, this phase of mine development would return a profit of $63,030 in addition to return of the initial $130,000 program cost to the company's treasury. The result would be a net cash reserve of $193,030 for future use.

In general, it must be expected that underground exploration through drifts and raises is not very profitable. The pay out comes from large-scale stoping during subsequent mining. The greatest increase in value contributed to the company by the recommended program is not the small profit that may be gained through exploration. It is in proving ore reserves for subsequent mining.

Vancouver, British Columbia
December 31, 1990

John Ostler; M.Sc., P.Geol.
Consulting Geologist
President, Avril Explorations Inc.

Michael Linn, B.Sc.
Consulting Geologist

6.0 REFERENCES

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B.C. Minister of Mines Annual Reports:

Goodenough Vein;

1895; p. 675.
1896: pp. 37, 47, 59.
1898: p. 1074.
1905: pp. G192, G287.
1918: pp. F162-F163.

Idaho No.2 Vein;

1920: p. N124.
1928: p. C287.
1952: p. A175.

Grey Copper Vein;

1893: p. 1060.
1931: pp. A24, A138.
1933: p. A200.

7.0 ITEMIZED COST STATEMENT FOR THE 1990 WORK PROGRAM

	Physical (until June 27)		Geological (until June 27)		Physical (after June 27)		Geological (after June 27)	
Wages:								
Don W. Tully, P.Eng.								
3 days @ $500/day							$ 1,500.00	
J. Ostler; M.Sc., P.Geol.								
93.25 days @ $250/day	$ 2,000.00		$ 1,750.00		$ 3,125.00		$16,437.50	
Michael Linn, B.Sc.								
27 days @ $200/day					$ 900.00		$ 4,300.00	
David Nunuk, B.Sc.								
50 days @ $185/day	$ 2,045.00		$ 555.00		$ 5,365.00		$ 925.00	
13.25 days @ $190/day							$ 2,517.50	
Jack Denny								
12 days @ $225/day	$ 1,912.50		$ 787.50					
W. Adam Foran								
51 days @ $150/day	$ 1,950.00		$ 600.00		$ 2,250.00		$ 2,850.00	
	$ 7,907.50	$ 7,907.50	$ 3,692.50	$ 3,692.50	$11,640.00	$11,640.00	$28,530.00	$28,530.00
Contractors:								
R & S Holdings Ltd.								
D6 + operator								
35.45 hr @ $80/hr	$ 2,837.50							
George Sipos								
2 days @ $250/day							$ 500.00	
	$ 2,837.50	$ 2,837.50					$ 500.00	$ 500.00
Transport:								
1, 1-ton pick-up								
1 2/3 month @ $2400/mo	$ 1,847.62				$ 2,152.38			
1, 3/4-ton pick-up								
1 2/3 month @ $2000/mo	$ 881.05		$ 325.60		$ 1,322.72		$ 1,204.26	
Gasoline and oil	$ 447.95		$ 165.54		$ 586.46		$ 536.95	
Highway tolls + repair	$ 14.60		$ 5.40		$ 37.16		$ 33.84	
	$ 3,191.22	$ 3,191.22	$ 496.54	$ 496.54	$ 4,098.72	$ 4,098.72	$ 1,775.05	$ 1,775.05
Balances carried forward:		$13,936.22		$ 4,189.04		$15,738.72		$30,805.05

	Physical (until June 27)		Geological (until June 27)		Physical (after June 27)		Geological (after June 27)	
Balances carried forward:		$13,936.22		$ 4,189.04		$15,738.72		$30,805.05
Camp:								
1 base camp inc. power								
1 2/3 month @ $1000/mo	$ 440.41		$ 162.76		$ 573.29		$ 521.95	
2 chain saws								
1 2/3 month @ $150/mo ea	$ 174.42				$ 328.57			
Trenching, line cutting								
+ traversing equipment								
1 2/3 month @ $600/mo	$ 285.71		$ 57.14		$ 547.62		$ 109.52	
Naphtha + propane	$ 28.21		$ 10.43		$ 6.50		$ 5.50	
Camp + survey supplies	$ 695.57		$ 257.27		$ 308.47		$ 284.75	
1 John Deere 15 Mini-								
excavator rental	$ 782.97				$ 1,565.94			
1 Pionjar rock drill								
rental + drill steel	$ 641.61				$ 1,283.23			
Insurance for excavator								
+ rock drill	$ 166.67				$ 333.33			
1 drum of diesel fuel	$ 40.00				$ 65.75			
Explosives	$ 190.30				$ 755.70			
Fire pump + hose rental					$ 104.70		$ 96.64	
Grease	$ 23.00				$ 21.71			
	$ 3,468.87	$ 3,468.87	$ 487.60	$ 487.60	$ 5,894.81	$ 5,894.81	$ 1,018.36	$ 1,018.36
Crew Costs:								
Hotel	$ 121.41		$ 44.91					
Meals in transit	$ 254.67		$ 94.19		$ 183.11		$ 169.02	
Camp food	$ 481.06		$ 177.93		$ 818.92		$ 755.93	
	$ 857.14	$ 857.14	$ 317.03	$ 317.03	$ 1,002.03	$ 1,002.03	$ 924.95	$ 924.95
Balances carried forward:		$18,262.23		$ 4,993.67		$22,635.56		$32,748.36

	Physical (until June 27)		Geological (until June 27)		Physical (after June 27)		Geological (after June 27)	
Balances carried forward:		$18,262.23		$ 4,993.67		$22,635.56		$32,748.36
Communication:								
Long distance calls					$ 27.71		$ 25.51	
Shipping of samples, and supplies during camp							$ 96.30	
					$ 27.71	$ 27.71	$ 121.81	$ 121.81
Assay and Analysis:								
32 element ICP							$ 93.75	
Rock assay							$ 1,921.50	
Soil analysis							$ 1,704.75	
							$ 3,720.00	$ 3,720.00
Report Production:								
Production of 1:2,500 scale base maps			$ 118.80					
S.O.B. + V.S.E. file searches							$ 22.00	
Photocopy and reduction							$ 248.40	
Rept. covers + maps for diagrams							$ 54.24	
Blackline copy of large maps			$ 134.46				$ 927.05	
			$ 253.26	$ 253.26			$ 1,251.69	$ 1,251.69
Prorated total costs:		$18,262.23		$ 5,246.93		$22,663.27		$37,841.86

Total cost of 1990 work program = $84,014.29

John Ostler

John Ostler; M.Sc., P.Geol.
President, Avril Explorations Inc.

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX A

A9019595

Comments: ATTN: JOHN OSTLER

CERTIFICATE A9019595

AVRIL EXPLORATIONS INC.

Project:
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 2-AUG-90.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	135	Dry, sieve to -80 mesh
203	2	Dry, sieve to -35 mesh
205	2	Geochem ring to approx 150 mesh
217	16	Geochem ring entire sample
238	153	NITRIC-AQUA REGIA DIGESTION

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
2	153	Cu ppm: HNO3-aqua regia digest	AAS	1	10000
4	153	Pb ppm: HNO3-aqua regia digest	AAS-BKGD CORR	1	10000
5	153	Zn ppm: HNO3-aqua regia digest	AAS	1	10000
6	153	Ag ppm: HNO3-aqua regia digest	AAS-BKGD CORR	0.2	100.0

1990 SOILS

Chemex Labs Ltd.
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APPENDIX A

32 Element ICP

A9023175

Comments: ATTN: JOHN OSTLER CC: DON TULLY

CERTIFICATE A9023175

AVRIL EXPLORATIONS INC.

Project:
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 25-SEP-90.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
214	5	Received sample as pulp
233	5	Assay AQ ICP digestion charge

* NOTE 1:

The 32 element ICP package is suitable for trace metals in soil and rock samples. Elements for which the nitric-aqua regia digestion is possibly incomplete are: Al, Ba, Be, Ca, Cr, Ga, K, La, Mg, Na, Sr, Ti, Tl, W.

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
921	5	Al %: 32 element, soil & rock	ICP-AES	0.01	15.00
922	5	Ag ppm: 32 element, soil & rock	ICP-AES	0.2	200
923	5	As ppm: 32 element, soil & rock	ICP-AES	5	10000
924	5	Ba ppm: 32 element, soil & rock	ICP-AES	10	10000
925	5	Be ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
926	5	Bi ppm: 32 element, soil & rock	ICP-AES	2	10000
927	5	Ca %: 32 element, soil & rock	ICP-AES	0.01	15.00
928	5	Cd ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
929	5	Co ppm: 32 element, soil & rock	ICP-AES	1	10000
930	5	Cr ppm: 32 element, soil & rock	ICP-AES	1	10000
931	5	Cu ppm: 32 element, soil & rock	ICP-AES	1	10000
932	5	Fe %: 32 element, soil & rock	ICP-AES	0.01	15.00
933	5	Ga ppm: 32 element, soil & rock	ICP-AES	10	10000
951	5	Hg ppm: 32 element, soil & rock	ICP-AES	1	10000
934	5	K %: 32 element, soil & rock	ICP-AES	0.01	10.00
935	5	La ppm: 32 element, soil & rock	ICP-AES	10	10000
936	5	Mg %: 32 element, soil & rock	ICP-AES	0.01	15.00
937	5	Mn ppm: 32 element, soil & rock	ICP-AES	5	10000
938	5	Mo ppm: 32 element, soil & rock	ICP-AES	1	10000
939	5	Na %: 32 element, soil & rock	ICP-AES	0.01	5.00
940	5	Ni ppm: 32 element, soil & rock	ICP-AES	1	10000
941	5	P ppm: 32 element, soil & rock	ICP-AES	10	10000
942	5	Pb ppm: 32 element, soil & rock	ICP-AES	2	10000
943	5	Sb ppm: 32 element, soil & rock	ICP-AES	5	10000
958	5	Sc ppm: 32 elements, soil & rock	ICP-AES	1	10000
944	5	Sr ppm: 32 element, soil & rock	ICP-AES	1	10000
945	5	Ti %: 32 element, soil & rock	ICP-AES	0.01	5.00
946	5	Tl ppm: 32 element, soil & rock	ICP-AES	10	10000
947	5	U ppm: 32 element, soil & rock	ICP-AES	10	10000
948	5	V ppm: 32 element, soil & rock	ICP-AES	1	10000
949	5	W ppm: 32 element, soil & rock	ICP-AES	10	10000
950	5	Zn ppm: 32 element, soil & rock	ICP-AES	2	10000
320	5	Cd %: HClO4-HNO3 digestion	AAS	0.001	100.00

NOTE: Analytical Procedures for A9015970 and A9023175 are the same.

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APPENDIX A

Rock Assay

A9018004

Comments: ATTN: JOHN OSTLER

CERTIFICATE A9018004

AVRIL EXPLORATIONS INC.

Project:
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 15-JUL-90.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
208	1	Assay ring to approx 150 mesh
294	1	Crush and split (0-10 pounds)

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
398	1	Au oz/T: 1/2 assay ton	FA-AAS	0.002	20.00
385	1	Ag oz/T: Aqua regia digestion	AAS	0.01	20.0
301	1	Cu %: HClO4-HNO3 digestion	AAS	0.01	100.0
312	1	Pb %: HClO4-HNO3 digestion	AAS	0.01	100.0
316	1	Zn %: HClO4-HNO3 digestion	AAS	0.01	100.0
331	1	As %: HClO4-HNO3 digestion	AAS	0.01	100.0

NOTE: Assay procedure for A9018004 are the same.
A9018343
A9020088
A9020517

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX A

Rock Assay

A9019954

Comments: ATTN: JOHN OSTLER CC: DON TULLY

CERTIFICATE A9019954

AVRIL EXPLORATIONS INC.

Project:
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 15-AUG-90.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
208	11	Assay ring to approx 150 mesh
294	11	Crush and split (0-10 pounds)

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
398	11	Au oz/T: 1/2 assay ton	FA-AAS	0.002	20.00
385	11	Ag oz/T: Aqua regia digestion	AAS	0.01	20.0
331	11	As %: HClO4-HNO3 digestion	AAS	0.01	100.0
301	11	Cu %: HClO4-HNO3 digestion	AAS	0.01	100.0
312	11	Pb %: HClO4-HNO3 digestion	AAS	0.01	100.0
316	11	Zn %: HClO4-HNO3 digestion	AAS	0.01	100.0

NOTE: Assay procedure for A9019954 and A9015968 are the same.

Chemex Labs Ltd.

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212 Brooksbank Ave., North Vancouver
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PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project : PURCELL
Comments: ATTN: JOHN OSTLER

APPENDIX B
32 element ICP

Page Number : 1-A
Total Pages : 1
Invoice Date: 1-JUN-90
Invoice No. : I-9015970
P.O. Number :

CERTIFICATE OF ANALYSIS A9015970

SAMPLE DESCRIPTION	PREP CODE		Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm
GCL-5 ZN	299	233	0.08	52.6	160	< 10	< 0.5	38	0.01	>100.0	14	9	828	7.44	10	< 1	0.01	< 10	0.07	3700	3

CERTIFICATION : B. Cargill

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project : PURCELL
Comments: ATTN: JOHN OSTLER

APPENDIX B
32 element ICP

Invoice Date: 1-JUN-90
Invoice No. : I-9015970
P.O. Number :

CERTIFICATE OF ANALYSIS A9015970

SAMPLE DESCRIPTION	PREP CODE		Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
GCL-5 ZN	299	233	< 0.01	< 1	840	40	< 5	< 1	1	< 0.01	< 10	< 10	2	390	>10000

CERTIFICATION : B. Cargill

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

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VANCOUVER, BC
V6C 1V5

APPENDIX B
32 element ICP

Invoice Date: 25-SEP-90
Invoice No. : I-9023175
P.O. Number :

Project :
Comments: ATTN: JOHN OSTLER CC: DON TULLY

CERTIFICATE OF ANALYSIS A9023175

SAMPLE DESCRIPTION	PREP CODE		Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm
34072T-01	214	233	0.25	>200	65	20	< 0.5	20	0.25	>100.0	4	26	350	2.05	< 10	2	0.15	< 10	0.08	710	2
34074T-03	214	233	0.18	>200	360	10	< 0.5	70	0.56	>100.0	10	21	774	5.65	< 10	4	0.04	< 10	0.14	1460	8
34077T-05	214	233	0.17	81.2	65	30	< 0.5	38	0.18	>100.0	8	< 1	960	>15.00	< 10	< 1	< 0.01	< 10	0.84	>10000	9
34079T-07	214	233	0.15	>200	465	80	< 0.5	64	0.16	>100.0	11	14	1385	7.19	< 10	< 1	0.06	< 10	0.06	2100	6
34082T-10	214	233	0.15	>200	1150	< 10	< 0.5	62	0.04	>100.0	15	13	1530	6.29	< 10	1	0.08	< 10	0.01	455	7

CERTIFICATION: B. C[illegible]

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX B
32 element ICP

Invoice Date: 25-SEP-90
Invoice No. : I-9023175
P.O. Number :

Project :
Comments: ATTN: JOHN OSTLER CC: DON TULLY

CERTIFICATE OF ANALYSIS A9023175

SAMPLE DESCRIPTION	PREP CODE		Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	Cd %
34072T-01	214	233	0.02	3	260	>10000	4040	< 1	52	< 0.01	10	< 10	1	520	>10000	0.076
34074T-03	214	233	0.02	11	740	>10000	400	< 1	79	< 0.01	< 10	< 10	< 1	790	>10000	0.380
34077T-05	214	233	0.01	6	640	4460	< 5	4	13	< 0.01	< 10	< 10	< 1	600	>10000	0.250
34079T-07	214	233	0.01	8	800	2760	95	< 1	12	< 0.01	30	30	< 1	760	>10000	0.360
34082T-10	214	233	0.01	21	760	5000	< 5	< 1	3	< 0.01	< 10	< 10	< 1	740	>10000	0.370

CERTIFICATION: B. Cargill

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project :
Comments: ATTN: JOHN OSTLER

APPENDIX B

Rock Assay

Invoice Date: 15-JUL-90
Invoice No. : I-9018004
P.O. Number :

CERTIFICATE OF ANALYSIS A9018004

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Cu %	Pb %	Zn %	As %				
GCL3-SG	208	294	0.002	107.0	0.02	56.2	15.90	0.01				

CERTIFICATION: ____________

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project :
Comments: ATTN: JOHN OSTLER

APPENDIX B

Rock Assay

Invoice Date: 22-JUL-90
Invoice No. : I-9018343
P.O. Number :

CERTIFICATE OF ANALYSIS A9018343

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Cu %	Pb %	Zn %	As %				
GC-3-080.0	207	294	0.002	79.6	0.05	36.2	27.8	0.03				
GC-3-131.0	207	294	0.002	1.77	< 0.01	0.61	3.74	0.15				
GC-3-138.5	207	294	< 0.002	9.76	0.01	15.90	8.55	0.08				
GC-3-142.0	207	294	< 0.002	33.3	0.06	16.60	37.3	0.04				
GC-3-144.5	207	294	< 0.002	33.8	0.06	16.50	36.9	0.04				
GC-3-151.0	207	294	0.018	106.0	0.02	54.7	16.30	< 0.01				
GC-3-158.0	207	294	< 0.002	146.0	0.02	64.7	6.28	< 0.01				
GC-3-182.0	207	294	0.004	6.23	0.01	2.16	5.34	0.10				
GC-5A-02.0	207	294	0.002	27.9	0.05	21.0	16.40	0.03				
GC-5A-04.0	207	294	0.002	4.66	0.06	1.38	18.20	0.40				
GC-5A-06.0	207	294	< 0.002	1.40	0.08	0.05	34.5	0.02				
GC-5A-08.0	207	294	0.002	7.27	0.08	1.82	25.3	0.12				
GC-5A-10.0	207	294	< 0.002	7.16	0.08	4.75	25.5	0.03				
GC-5A-12.0	207	294	< 0.002	1.75	0.08	0.10	30.7	0.03				
GC-5A-14.0	207	294	< 0.002	0.74	0.02	0.53	8.42	0.06				
GC-5A-16.0	207	294	< 0.002	2.01	0.13	0.03	42.8	0.01				
GC-5A-18.0	207	294	0.004	3.69	0.11	0.20	40.7	0.06				
GC-5A-20.0	207	294	< 0.002	0.27	0.02	0.05	3.83	0.05				
GC-5A-22.0	207	294	< 0.002	1.27	0.06	0.09	18.70	0.06				
GC-5A-24.0	207	294	< 0.002	4.90	0.12	0.09	42.0	0.03				
GC-5A-25.0	207	294	< 0.002	5.55	0.12	0.06	41.1	0.02				
GC-5A-30.0	207	294	0.002	4.59	0.14	0.07	49.0	0.04				
GC-5A-32.0	207	294	< 0.002	1.66	0.11	0.04	53.3	0.04				
GC-5A-33.6	207	294	0.002	8.88	0.14	0.08	49.6	0.15				
GC-5A-34.0	207	294	< 0.002	1.26	0.05	0.05	14.60	0.10				
GC-5A-36.0	207	294	0.002	23.1	0.15	0.07	41.3	0.04				
GC-5A-37.0	207	294	0.002	7.90	0.10	0.05	38.8	0.28				
GC-TRI-06S	207	294	< 0.002	1.86	0.03	0.03	12.00	0.23				
GC-TRI-08S	207	294	< 0.002	2.25	0.09	0.12	35.5	0.02				
GC-TRI-10S	207	294	< 0.002	1.45	0.08	0.01	30.0	< 0.01				
GC-TRI-12S	207	294	0.002	1.96	0.07	0.03	26.3	0.13				
GC-TRI-14S	207	294	< 0.002	0.47	0.03	0.05	9.32	0.01				
GC-TRI-15S	207	294	< 0.002	0.55	0.03	0.03	13.00	0.09				

CERTIFICATION:____________________

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project :
Comments: ATTN: JOHN OSTLER

APPENDIX B

Rock Assay

Page Number : 1
Total Pages : 1
Invoice Date: 20-AUG-90
Invoice No. : I-9020517
P.O. Number :

CERTIFICATE OF ANALYSIS A9020517

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Cu %	Pb %	Zn %	As %				
GC-3-60	214	--	< 0.002	2.94	0.05	0.06	33.2	0.05				
GC-3-70	214	--	< 0.002	99.4	0.01	34.2	4.03	0.19				
GC-3-131 B	214	--	< 0.002	33.0	0.07	17.90	40.4	0.03				
GC-3-134	214	--	< 0.002	4.27	0.09	1.04	53.4	0.01				
GC-3-139	214	--	< 0.002	22.5	0.08	10.50	41.9	0.01				
GC-3-144	214	--	< 0.002	12.40	0.06	7.45	44.4	< 0.01				

CERTIFICATION:

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX B

Rock Assay

Project :
Comments: ATTN: JOHN OSTLER CC: DON TULLY

Invoice Date: 15-AUG-90
Invoice No. : I-9019954
P.O. Number :

CERTIFICATE OF ANALYSIS A9019954

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	As %	Cu %	Pb %	Zn %				
34072T-01	208	294	0.004	108.0	0.03	0.02	51.3	9.94				
34073T-02	208	294	< 0.002	31.8	0.03	0.03	20.6	28.5				
34074T-03	208	294	0.002	30.5	0.03	0.07	6.53	47.0				
34075T-04L	208	294	< 0.002	78.1	0.03	0.05	68.2	3.61				
34076T-04Z	208	294	< 0.002	2.96	0.01	0.15	1.06	51.9				
34077T-05	208	294	< 0.002	2.25	< 0.01	0.09	0.47	34.9				
34078T-06	208	294	< 0.002	1.35	< 0.01	0.11	0.08	51.3				
34079T-07	208	294	< 0.002	12.10	0.04	0.13	0.28	48.9				
34080T-08	208	294	< 0.002	1.94	0.02	0.13	0.04	41.7				
34081T-09	208	294	< 0.002	88.6	0.04	0.02	63.4	7.25				
34082T-10	208	294	0.002	11.90	0.13	0.14	0.50	47.3				

CERTIFICATION:____________________

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project : PURCELL PROPERTY
Comments: ATTN:JOHN OSTLER

APPENDIX B

Rock Assay

Page Number : 1
Total Pages : 1
Invoice Date: 12-AUG-90
Invoice No. : I-9020088
P.O. Number :

CERTIFICATE OF ANALYSIS A9020088

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Cu %	Pb %	Zn %	As %				
GC3-125	214	--	< 0.002	2.08	0.06	0.49	31.4	0.09				
GC5-1	214	--	< 0.002	1.15	0.01	0.06	1.93	0.01				
GC5-16	214	--	< 0.002	12.40	0.15	0.06	50.5	0.06				
GCTR1-22S	214	--	< 0.002	2.18	0.12	0.03	47.4	0.02				
GCTR1-32S	214	--	< 0.002	0.76	0.01	0.02	2.29	0.03				
PVTR1-1	214	--	< 0.002	182.0	0.01	61.3	0.46	0.04				
EVTR1-4N	214	--	< 0.002	73.0	0.04	73.2	2.77	0.04				
EVTR1-8N	214	--	< 0.002	2.56	0.15	1.00	53.5	< 0.01				

CERTIFICATION:

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project : PURCELL
Comments: ATTN: JOHN OSTLER

APPENDIX B

Rock Assay

Page Number : 1
Total Pages : 1
Invoice Date: 04-JUN-90
Invoice No. : I-9015968
P.O. Number :

CERTIFICATE OF ANALYSIS · A9015968

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Cu %	Pb %	Zn %					
GCL-1-ASPY	207	294	0.002	0.42	< 0.01	0.06	6.99					
GCL-2-PY	207	294	< 0.002	0.53	< 0.01	0.06	0.21					
GCL-5-PY	207	294	< 0.002	0.09	< 0.01	0.01	0.56					
GCL-5-ZN	207	294	< 0.002	1.45	0.08	< 0.01	54.7					

CERTIFICATION : [signature]

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
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APPENDIX C

Page Number : 1
Total Pages : 4
Invoice Date: 2-AUG-90
Invoice No. : I-9019595
P.O. Number :

Project :
Comments: ATTN: JOHN OSTLER

CERTIFICATE OF ANALYSIS A9019595

SAMPLE DESCRIPTION	PREP CODE	Cu ppm	Pb ppm	Zn ppm	Ag ppm Aqua R
00S - 000W	201 238	130	120	1900	1.5
00S - 050W	201 238	54	10	135	0.4
00S - 100W	201 238	56	14	140	0.4
00S - 150W	201 238	46	30	114	0.3
00S - 200W	201 238	30	10	112	0.5
00S - 250W	201 238	34	14	145	1.0
00S - 300W	201 238	36	14	175	0.2
00S - 350W	201 238	60	15	340	1.4
00S - 400W	201 238	56	12	210	1.2
00S - 450W	201 238	26	88	1100	1.3
00S - 500W	201 238	156	>10000	>100000	90.0
00S - 550W	201 238	34	58	212	0.8
00S - 600W	201 238	22	84	165	0.3
00S - 650W	201 238	14	34	178	0.3
50S - 000W	201 238	19	22	158	0.8
50S - 050W	201 238	18	14	180	0.2
50S - 100W	201 238	36	20	160	0.3
50S - 150W	201 238	52	12	145	0.5
50S - 200W	201 238	38	10	155	0.5
50S - 250W	201 238	32	26	270	0.4
50S - 300W	201 238	18	20	134	0.2
50S - 350W	201 238	60	22	228	0.7
50S - 400W	201 238	34	16	188	0.3
50S - 450W	201 238	40	14	510	0.6
50S - 500W	201 238	34	470	1800	3.5
50S - 550W	201 238	22	22	215	1.0
50S - 600W	201 238	26	16	240	0.3
50S - 650W	201 238	16	26	280	0.2
50N - 250W	201 238	16	8	65	0.7
50N - 300W	201 238	60	20	265	0.3
50N - 350W	201 238	16	8	60	0.2
50N - 400W	201 238	32	10	132	0.3
50N - 450W	201 238	60	28	900	0.2
50N - 500W	201 238	60	1000	6100	8.3
50N - 550W	201 238	34	22	195	1.3
50N - 600W	201 238	32	20	115	0.4
50N - 650W	201 238	24	12	138	0.6
100S - 000W	201 238	38	18	250	0.5
100S - 050W	201 238	32	9	135	0.3
100S - 100W	201 238	40	14	130	0.5

1990 SOILS

CERTIFICATION: [signature]

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

Project :
Comments: ATTN: JOHN OSTLER

APPENDIX C

Invoice Date: 2-AUG-90
Invoice No. : I-9019595
P.O. Number :

CERTIFICATE OF ANALYSIS A9019595

SAMPLE DESCRIPTION	PREP CODE		Cu ppm	Pb ppm	Zn ppm	Ag ppm Aqua R						
100S - 150W	201	238	36	14	165	0.2						
100S - 200W	201	238	12	14	83	0.4						
100S - 250W	201	238	54	40	225	1.4						
100S - 300W	201	238	32	18	210	0.5						
100S - 350W	201	238	48	10	162	0.5						
100S - 400W	201	238	42	14	105	0.2						
100S - 450W	201	238	38	16	350	0.6						
100N - 300W	201	238	34	40	155	0.2						
100N - 350W	217	238	38	36	142	0.5				1990 SOILS		
100N - 400W	201	238	84	114	3000	5.0						
100N - 450W	201	238	42	450	2250	5.8						
100N - 500W	201	238	32	12	160	0.8						
100N - 550W	201	238	18	30	115	0.2						
100N - 600W	201	238	28	20	150	0.3						
100N - 650W	201	238	14	20	105	0.9						
150S - 050E	201	238	22	18	240	0.4						
150S - 000W	201	238	24	12	156	0.2						
150S - 050W	201	238	38	10	120	0.3						
150S - 100W	201	238	46	26	225	0.4						
150S - 150W	201	238	20	60	170	0.4						
150S - 200W	201	238	48	8	115	0.4						
150S - 250W	201	238	68	12	225	0.6						
150S - 300W	201	238	26	20	245	0.4						
150S - 350W	201	238	30	10	120	0.2						
150S - 400W	201	238	36	11	73	< 0.2						
150S - 450W	201	238	34	20	190	< 0.2						
150N - 250W	201	238	10	16	98	< 0.2						
150N - 300W	201	238	66	20	265	0.5						
150N - 350W	201	238	74	14	145	1.7						
150N - 400W	201	238	58	40	750	3.2						
150N - 450W	201	238	64	400	4200	3.0						
150N - 500W	201	238	30	18	160	0.6						
150N - 550W	201	238	60	14	155	1.1						
150N - 600W	201	238	24	19	125	0.3						
200S - 050E	201	238	18	14	140	0.3						
200S - 000W	201	238	14	10	118	0.6						
200S - 050W	201	238	48	10	140	0.4						
200S - 100W	201	238	46	14	165	0.8						
200S - 150W	201	238	16	14	184	0.2						
200S - 200W	201	238	32	16	172	0.6						

CERTIFICATION: Hart Bichler

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.

1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX C

Invoice Date: 2-AUG-90
Invoice No. : I-9019595
P.O. Number :

Project :
Comments: ATTN: JOHN OSTLER

CERTIFICATE OF ANALYSIS A9019595

1990 SOILS

SAMPLE DESCRIPTION	PREP CODE		Cu ppm	Pb ppm	Zn ppm	Ag ppm Aqua R						
200S - 250W	201	238	50	14	145	0.7						
200S - 300W	201	238	16	18	222	0.4						
200S - 350W	201	238	18	20	205	0.3						
200S - 400W	201	238	44	14	100	< 0.2						
200S - 450W	201	238	100	48	330	4.5						
200S - 500W	201	238	48	60	260	1.6						
200S - 550W	201	238	60	450	3000	3.0						
200S - 600W	201	238	34	26	115	1.0						
200S - 650W	201	238	18	26	275	0.3						
200N - 200W	217	238	20	16	173	< 0.2						
200N - 250W	217	238	26	20	475	< 0.2						
200N - 300W	217	238	36	20	200	< 0.2						
200N - 350W	217	238	36	24	255	< 0.2						
200N - 400W	217	238	50	74	1000	4.6						
200N - 450W	203	205	74	28	310	1.9						
200N - 500W	201	238	74	8	88	0.6						
200N - 550W	201	238	48	11	80	< 0.2						
250S - 050E	201	238	14	14	125	0.2						
250S - 100E	201	238	40	26	260	1.2						
250S - 000W	201	238	18	10	126	0.3						
250S - 050W	201	238	36	16	220	0.6						
250S - 100W	201	238	38	15	140	1.0						
250S - 150W	201	238	16	15	250	0.7						
250S - 200W	201	238	30	17	200	0.8						
250S - 250W	201	238	50	10	145	0.6						
250S - 300W	201	238	24	24	200	0.2						
250S - 350W	201	238	34	22	190	0.4						
250S - 400W	201	238	48	14	180	0.2						
250S - 450W	201	238	36	12	104	< 0.2						
250S - 500W	201	238	26	134	330	1.0						
250S - 550W	201	238	38	200	1200	2.4						
250S - 600W	201	238	28	32	365	< 0.2						
250S - 650W	201	238	24	28	260	< 0.2						
250W - 150W	217	238	50	26	650	1.2						
250W - 200W	217	238	36	16	650	0.2						
250W - 250W	217	238	38	20	600	0.7						
250W - 300W	217	238	24	28	230	< 0.2						
250W - 350W	217	238	48	28	430	0.5						
250W - 400W	217	238	22	90	680	0.9						
300S - 050E	201	238	28	12	160	0.3						

CERTIFICATION: Hart Bichler

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: AVRIL EXPLORATIONS INC.
1016 - 470 GRANVILLE ST.
VANCOUVER, BC
V6C 1V5

APPENDIX C

Page Number : 4
Total Pages : 4
Invoice Date: 2-AUG-90
Invoice No. : I-9019595
P.O. Number :

Project :
Comments: ATTN: JOHN OSTLER

CERTIFICATE OF ANALYSIS A9019595

SAMPLE DESCRIPTION	PREP CODE		Cu ppm	Pb ppm	Zn ppm	Ag ppm Aqua R						
300S - 100E	201	238	70	156	600	2.1						
300S - 000W	201	238	26	32	185	0.5						
300S - 050W	201	238	38	16	185	0.6						
300S - 100W	201	238	30	10	450	0.4						
300S - 150W	201	238	24	16	190	0.2						
300S - 200W	201	238	28	12	122	< 0.2						
300S - 250W	201	238	25	21	190	< 0.2						
300S - 300W	201	238	25	18	162	< 0.2				1990 SOILS		
300S - 350W	201	238	20	18	228	0.4						
300S - 400W	201	238	14	16	165	< 0.2						
300S - 450W	201	238	24	44	365	< 0.2						
300S - 500W	201	238	38	16	120	0.2						
300S - 550W	201	238	36	14	110	0.3						
300S - 600W	201	238	36	98	500	1.6						
300S - 650W	201	238	24	24	260	0.3						
300N - 150W	203	205	164	870	5100	10.8						
300N - 200W	217	238	26	30	600	0.5						
300N - 250W	217	238	62	18	900	0.8						
300N - 300W	217	238	60	44	1250	0.8						
300N - 350W	217	238	36	370	1900	3.1						
350S - 000W	201	238	14	16	100	0.4						
350S - 050W	201	238	44	16	95	1.6						
350S - 100W	201	238	38	16	130	0.4						
350S - 150W	201	238	58	10	110	0.2						
350S - 200W	201	238	30	10	86	0.2						
350S - 250W	201	238	22	12	120	< 0.2						
350S - 300W	201	238	36	80	255	0.2						
350S - 350W	201	238	54	42	255	0.6						
350S - 400W	201	238	19	56	290	0.5						
350S - 650W	201	238	28	106	460	0.6						
400S - 000W	201	238	32	11	161	0.2						
400S - 350W	201	238	20	82	225	< 0.2						
400S - 400W	201	238	12	40	140	0.2						

CERTIFICATION: Hart Bichler

APPENDIX D

CERTIFICATE OF QUALIFICATION

I, John Ostler, of 2224 Jefferson Avenue in the City of West Vancouver, Province of British Columbia do hereby certify:

That I am a consulting geologist with business address at 1016-470 Granville Street, Vancouver, British Columbia;

That I am a graduate of the University of Guelph in Ontario where I obtained my Bachelor of Arts degree in Geography (Geomorphology) and Geology in 1973 and that I am a graduate of Carleton University of Ottawa, Ontario where I obtained my Master of Science degree in Geology in 1977;

That I am licensed to practice as a Professional Geologist by the Association of Professional Engineers, Geologists and Geophysicists of Alberta, that I am a Fellow of the Geological Association of Canada, and a member of the Yukon Professional Geoscientists Association;

That I have been engaged in the study and practice of the geological profession for over 20 years;

That this report is based on data in literature, most of which is readily available for public inspection, and work conducted by me on the Purcell Property from June 11 until July 30, 1990;

That I am President and controlling shareholder of Avril Explorations Inc. which owns the Purcell Property;

Dated at Vancouver, British Columbia this 31st day of December, 1990.

John Ostler

John Ostler; M.Sc., P.Geol.
Consulting Geologist
President, Avril Explorations Inc.

APPENDIX D

CERTIFICATE OF QUALIFICATION

I, Michael Linn, of 660 Arena Avenue in the Village of Kaslo, Province of British Columbia do hereby certify:

That I am a self-employed consulting geologist with office at 660 Arena Avenue, Kaslo, British Columbia;

That I am a graduate of the University of British Columbia where I obtained my Bachelor of Science degree in Geology in 1970;

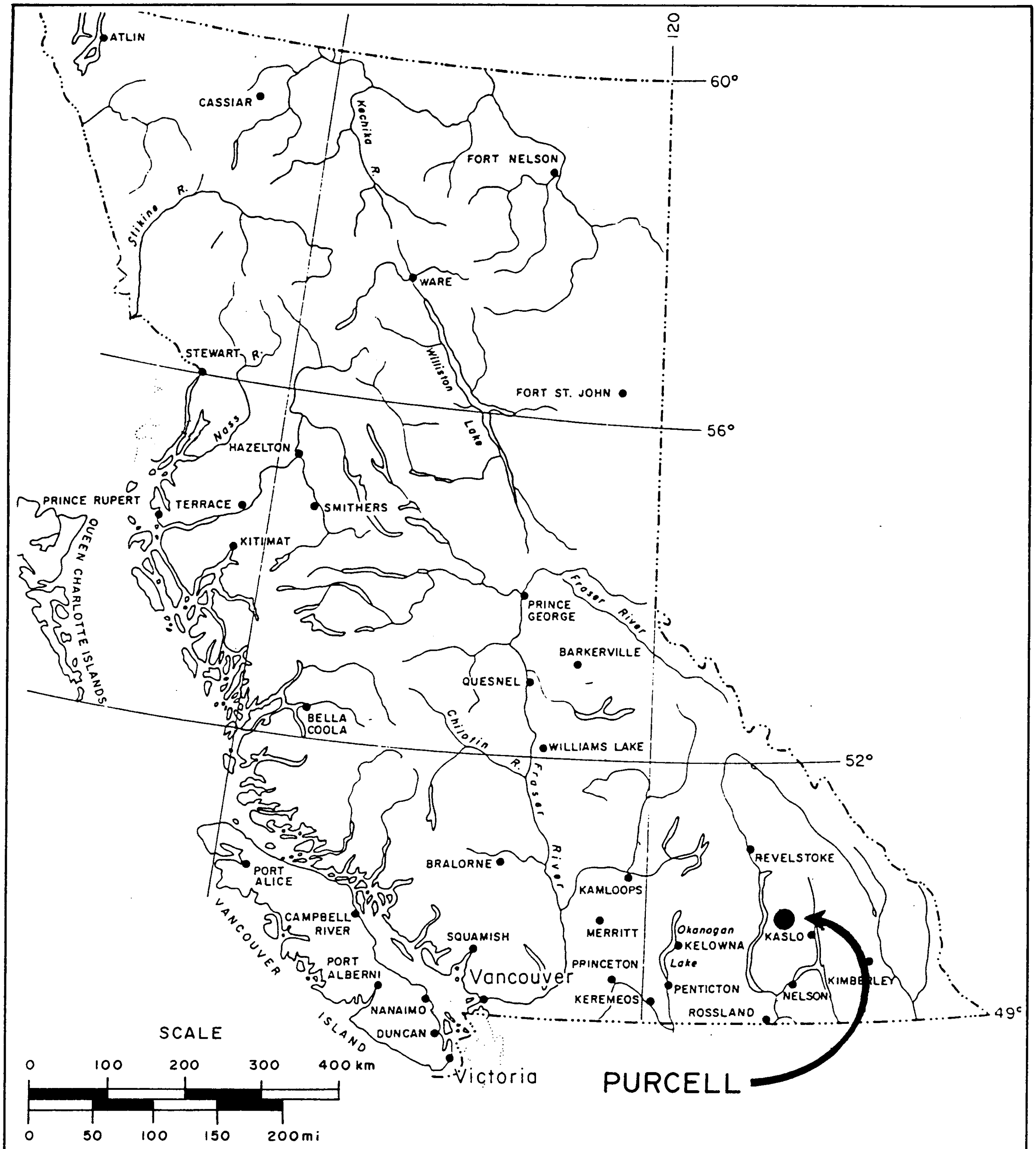
That I have been engaged in the practice of the geological profession for over 20 years, and that my principal employment has been in mineral exploration;

That this report is based on literature, most of which is readily available for public inspection, and work undertaken by me on the Purcell Property from June 28 until July 30, 1990;

That I have no interest in the Purcell Property nor in the securities of Avril Explorations Inc., nor do I expect to receive any.

Dated at Kaslo, British Columbia this 31st day of December, 1990.

Michael Linn, B.Sc.
Consulting Geologist



N.

Figure I

CASSIAR EAST YUKON EXP. LTD.

AVRIL EXPLORATIONS INC.

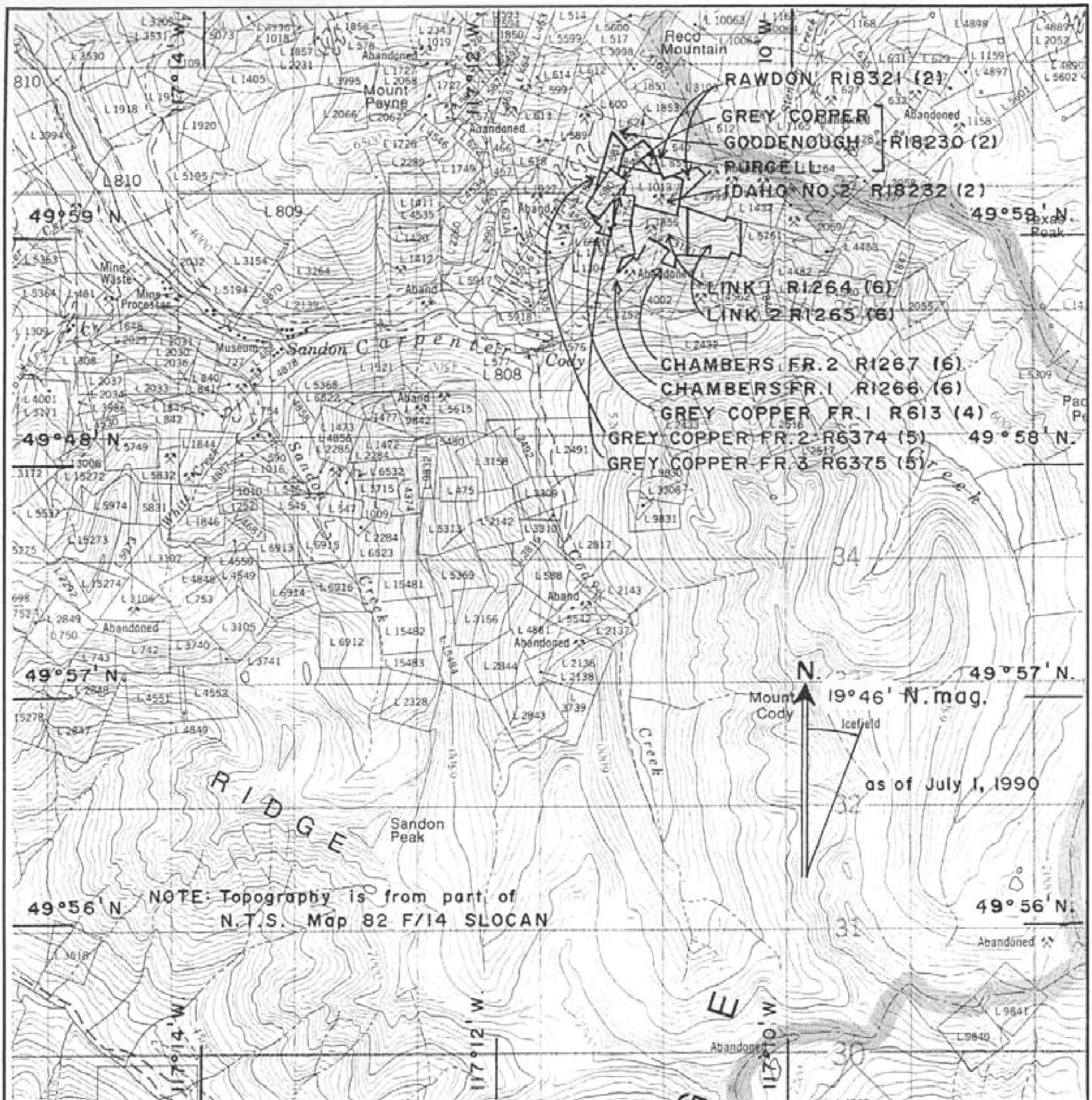
GENERAL LOCATION

PURCELL PROPERTY
49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990

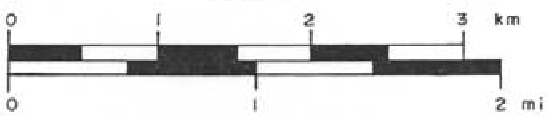


LOCATION

Figure 2

CASSIAR EAST YUKON EXP. LTD.

SCALE



AVRIL EXPLORATIONS INC.

LOCATION and TERRAIN

PURCELL PROPERTY
49° 59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990

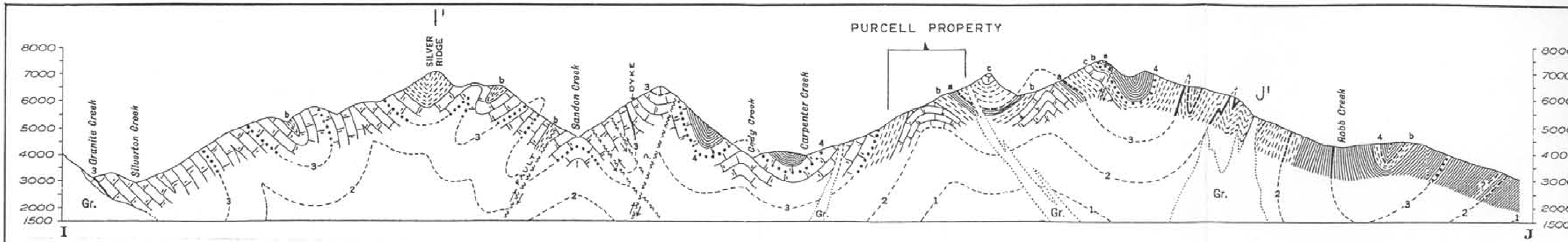
FIGURE 5

TABLE OF GEOLOGICAL EVENTS AND LITHOLOGICAL UNITS IN THE PURCELL PROPERTY-AREA

Time	Formation or Event
Pleistocene to Recent	-valley rejuvenation and 700 m (2296 ft) of downcutting causing the removal of almost all Tertiary-age fanglomerates
Eocene to Pleistocene	-erosion of the Slocan Range and creation of broad valleys, -deep weathering of rocks and oxidation of mineralized veins 5 m (16.4 ft) below surface at elevations now above 1750 m (5740 ft) -deposition and lithification of fanglomerates in valley bottoms now at 1750 m (5740 ft)
Eocene	**-brittle deformation** and development of north-east striking fracture cleavage **-development of silver-lead-zinc mineralization** in quartz-siderite-calcite veins
Jurassic to Eocene	-erosion of stratigraphy above the Purcell Property-area culminating in post-Eocene unroofing
Jurassic	**-deposition of Nelson Batholith intrusives** (164 m.y*) -anatexis and metasomatism of more permeable arenaceous Slocan Group rocks culminating in northwesterly striking quartz diorite bodies and barren northwesterly striking quartz veins on and near the Purcell Property
Triassic to Jurassic	**-folding and metamorphism of Slocan Group rocks** (173 to 164 m.y.*) resulting in: 1. inversion of the stratigraphic section 2. development of structures and cleavages of the first and second phases of deformation; equivalent to Read and Wheeler's (1976) second and third phases 3. middle greenschist regional metamorphism
Triassic	**-deposition of the Slocan Group** a coarsening-upward, basin-filling sequence of variably carbonaceous pelite, variably calcareous siltstone and greywacke

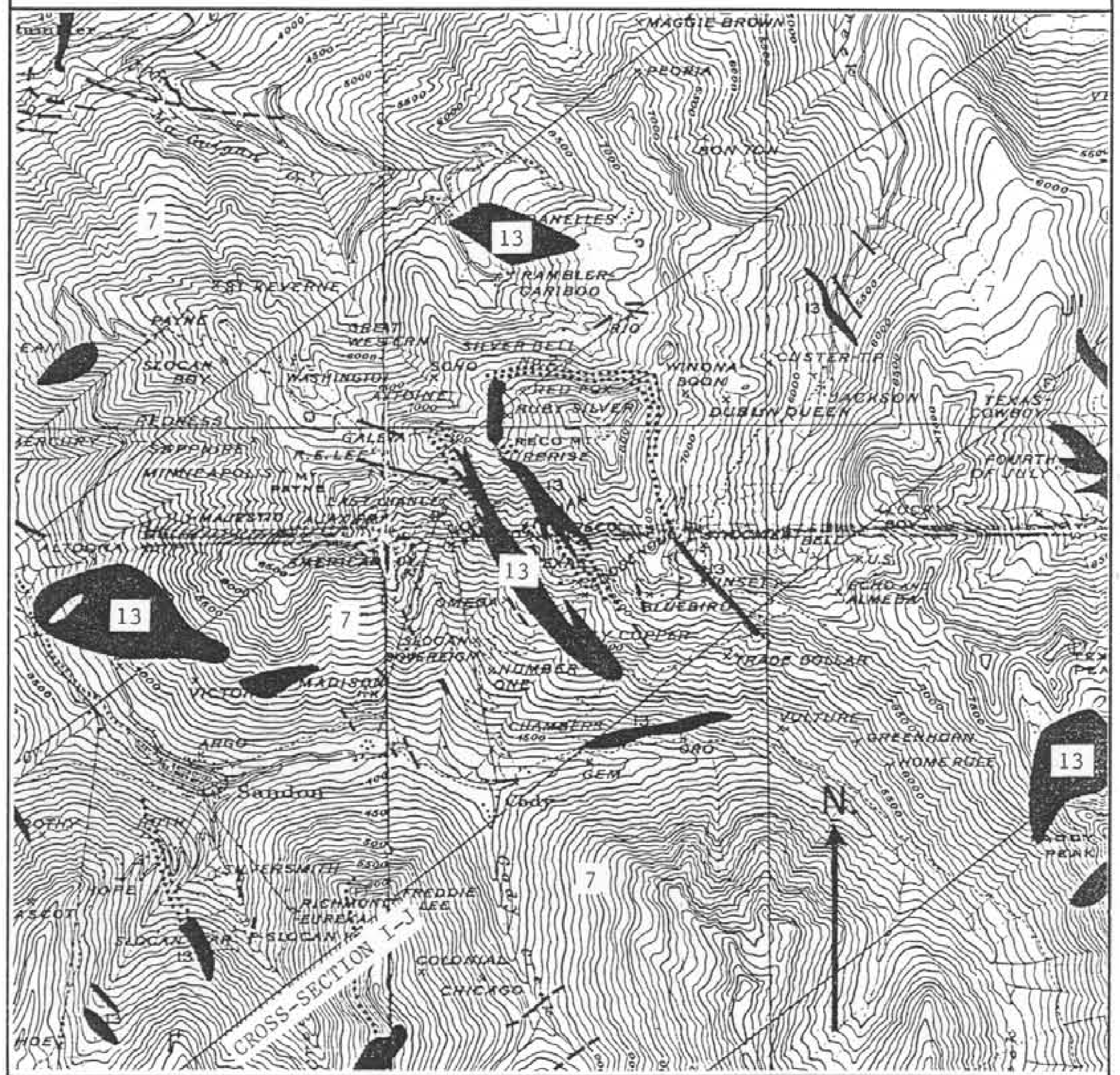
* million years ago

PURCELL PROPERTY



6A: PART OF CROSS-SECTION I-J

6B: PART OF G.S.C. MAP 273A



LEGEND for 6B

RECENT

14 — Delta and stream deposits

POST-TRIASSIC

13 — Granite, syenite, granodiorite, quartz diorite and their porphyritic and felsitic equivalents; zones of dykes or sills are represented by dots, single dykes or sills by lines

MESOZOIC

NELSON BATHOLITH

12 — A complex of coarse (pegmatitic) granite, fine to medium gneissic granite, and inclusions of Precambrian rocks

11 — Granite and granodiorite

10 — Porphyritic granite

9 — Crushed, mostly porphyritic, granite

8 — Gneiss (granitized pre-batholithic rocks), crushed granite, and masses of partly altered pre-batholithic rocks

TRIASSIC

SLOCAN SERIES

7 — Slate, argillite, limestone, quartzite, and tuffaceous sediments

KASLO SERIES

6 — Serpentine

5 — Extrusives (andesite and dacite) and related intrusives; some intercalated, tuffaceous sediments

A — Schists, quartzite, argillite, limestone, altered volcanics and tuffaceous sediments; probably chiefly Slocan series

Areas of few rock exposures

Geological boundary

Geological boundary (position approximate)

Geological boundary (position assumed)

Fault (position approximate)

Glacial striæ

Ⓕ Fossil locality

John Ostler
M. J. Linn

Figure 6

CASSIAR EAST YUKON EXP. LTD.

LEGEND for 6A

Gr. — Granite and allied rocks

Limestone

Limestone (position approximate)

Limestone (assumed)

Numbers 1, 2, 3, 4, (on Sections) indicate successive horizons

a — Fissile slate and argillaceous rocks

b — Fissile slate and argillaceous rocks interbedded with more massive phases and with slightly coarser strata

c — Chiefly massive argillaceous and quartzitic strata

Fault

HORIZONTAL SCALE

0 1 2 3 km

0 1 2 mi

AVRIL EXPLORATIONS INC.

REGIONAL GEOLOGY from G.S.C. MEMOIR 173

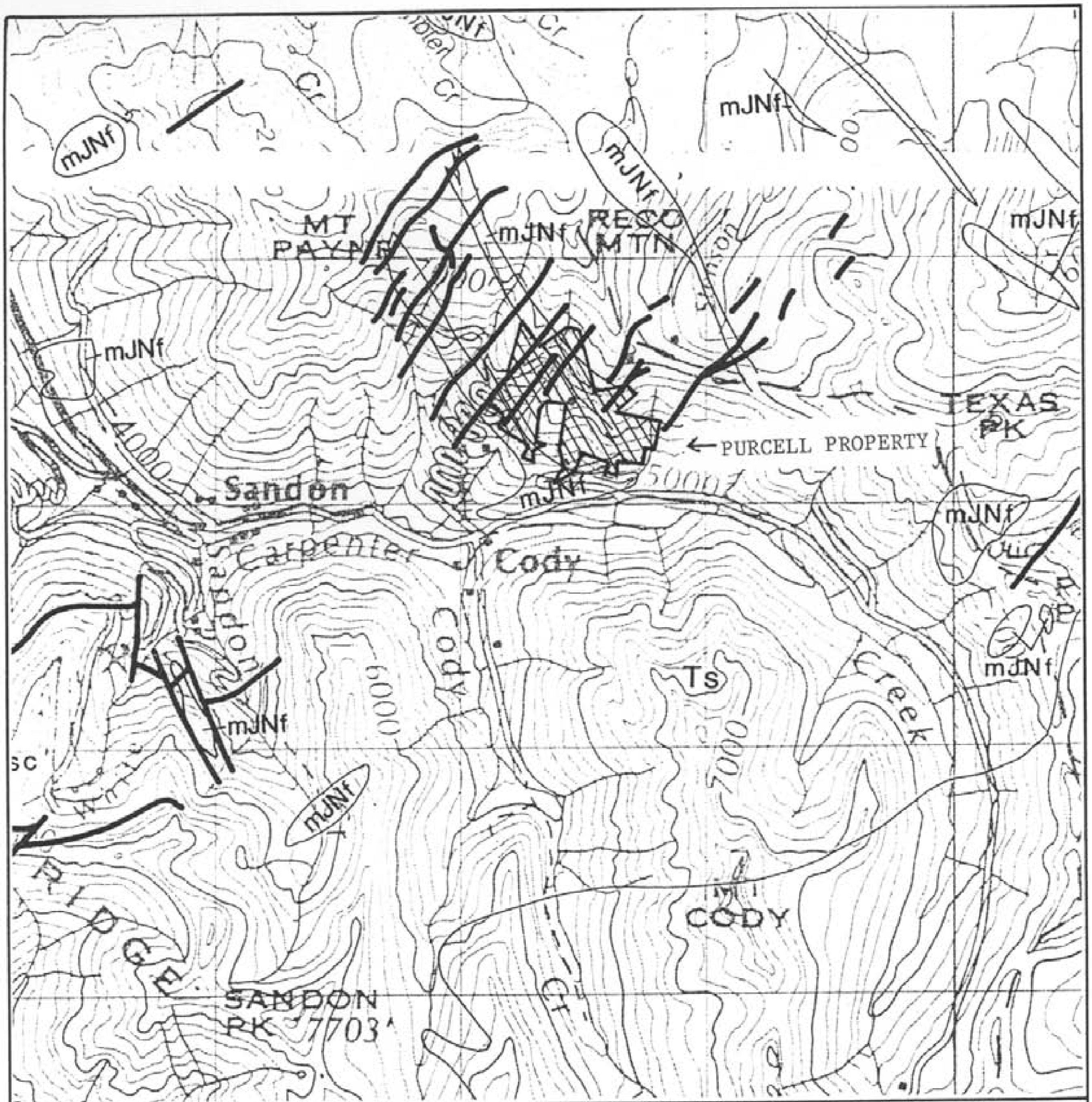
PURCELL PROPERTY

49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



NOTE: For legend, see Figure 7A

N.
19°46' N.mag.
as of July 1, 1990

SCALE
0 1 2 3 4 5 km
0 1 2 3 mi

AVRIL EXPLORATIONS INC.

REGIONAL GEOLOGY from OPEN FILE 1990-18

PURCELL PROPERTY

49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82 F/14

JOHN OSTLER; M.Sc., P.Geol.

MICHAEL LINN, B.Sc.

DECEMBER, 1990

Figure 7

CASSIAR EAST YUKON EXP. LTD.

FIGURE 7A

LEGEND TO FIGURE 7

Note: Abbreviated legend from:
Beudoin, G.; 1990: Geological Compilation Map, Northern Kokanee and southern Goat Ranges, N.T.S. 82F, 82K; B.C. Min. Energy, Mines and Petr. Res., Open File 1990-18.

Lithostratigraphy

Middle Jurassic

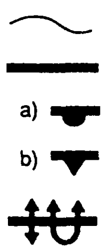
Nelson Batholith

mJNf Feldspar or quartz porphyry, felsic dykes
mJNd Diorite, porphyric biotite diorite, and hornbendite dykes
mJNm Quartz monzonite
mJNgb Biotite granite to granodiorite
mJNghk Hornblende potassium feldspar porphyric granite
mJNgk Potassium feldspar porphyric granite

Upper Triassic

Ts Slocan Group (undivided)
Tsp Graywacke, siltstone, sandstone
Tsc Limestone
Tst Tuff

Symbols



Lithological contact

Fault or shear zone: a) Normal; b) Thrust

Fold axis, anticlinal, overturned anticlinal

Note

This geological compilation map has been compiled from existing geological maps. Geological contacts were not verified in the field and lithostratigraphic units are those defined in the original geological maps. The reader should refer to the original work for detailed description of the units and structures. Geological maps and reports used in this compilation are listed in the refeences.

Because the compilation is made from maps with variable degree of detail, all geological contacts are drawn in full line and one symbol is used for faults and and shear zones. Those extrapolations made by the author are drawn in broken lines.

LEGEND

ISOMAGNETIC LINES (absolute total field)

500 gammas . . . .

100 gammas . . . .

20 gammas . . . .

10 gammas . . . .

Magnetic depression . . . .

Flight lines 15 687

Flight altitude 1000 feet above ground level

Figure 8

CASSIAR EAST YUKON EXP. LTD.

SCALE

0 1 2 3 4 5 km

0 1 2 3 mi

AVRIL EXPLORATIONS INC.

AEROMAGNETISM: E.M.R. MAP 8482G

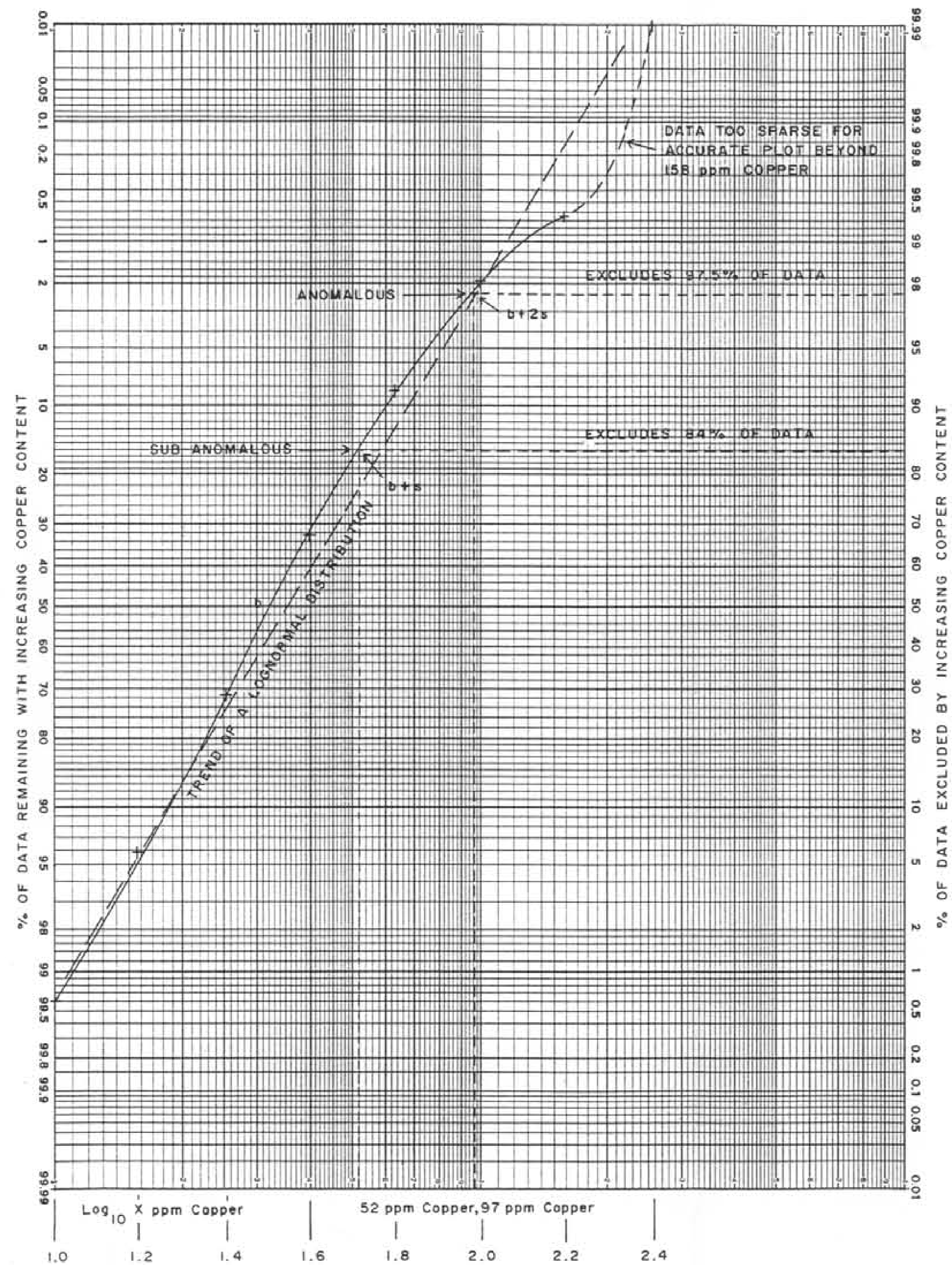
PURCELL PROPERTY

49° 59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



LEGEND

N = 153 for the 1990 soil survey
b median value which approximates the mean value
b+s first positive standard deviation
b+2s second positive standard deviation

NOTE: For map of distribution of copper in soils, see Figure 14.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,836

PROFESSIONAL GEOLOGIST ALBERTA
JOHN OSTLER
LICENSED TO PRACTISE

Figure 10

CASSIAR EAST YUKON EXP. LTD.

AVRIL EXPLORATIONS INC.

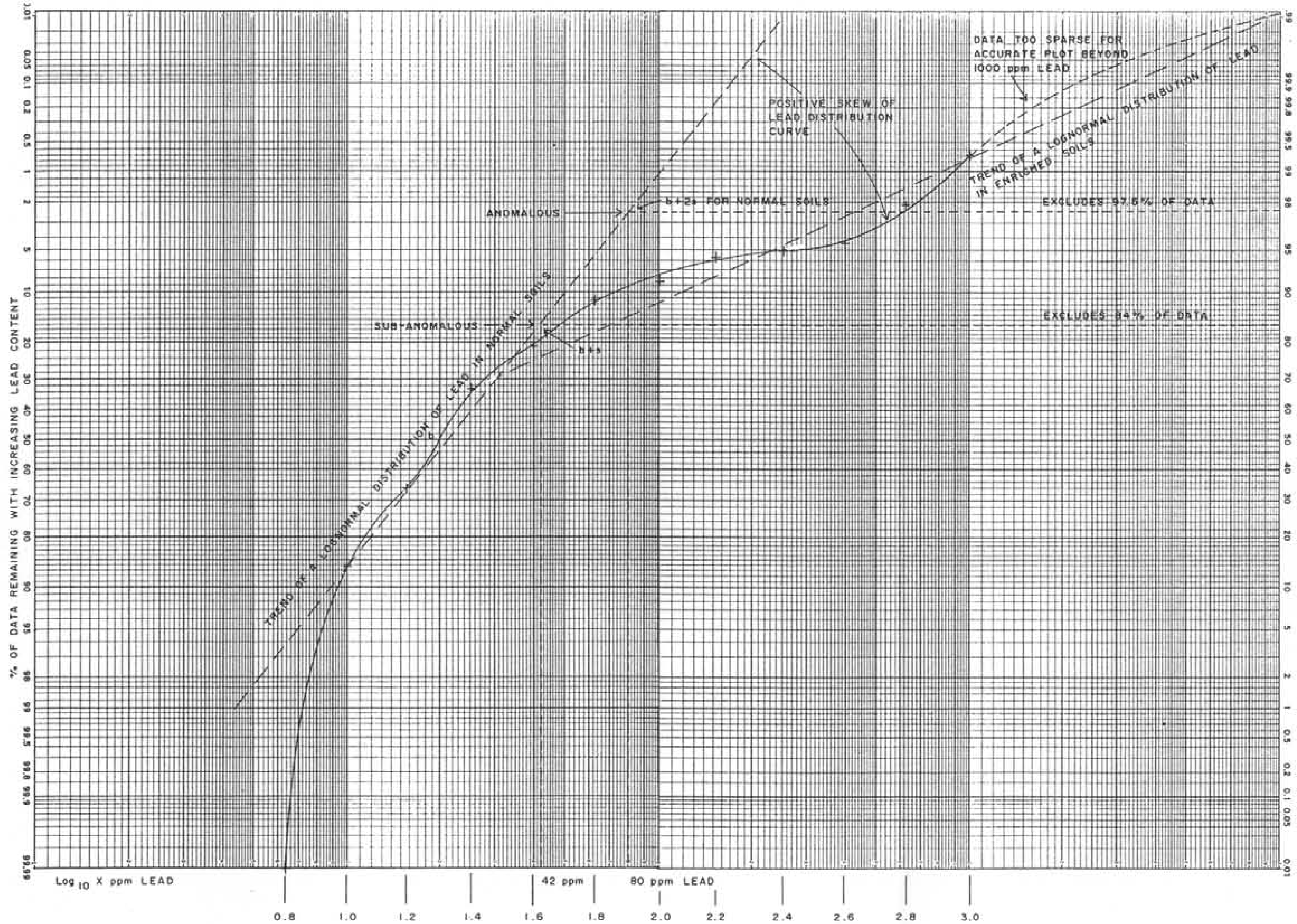
1990 SOIL SURVEY: COPPER DISTRIBUTION CURVE

PURCELL PROPERTY
49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



LEGEND

N = 153 for the 1990 soil survey
b median value which approximates the mean value
b+s first positive standard deviation
b+2s second positive standard deviation

NOTE: For map of distribution of lead in soils, see Figure 15.

Figure 11

CASSIAR EAST YUKON EXP. LTD.

AVRIL EXPLORATIONS INC.

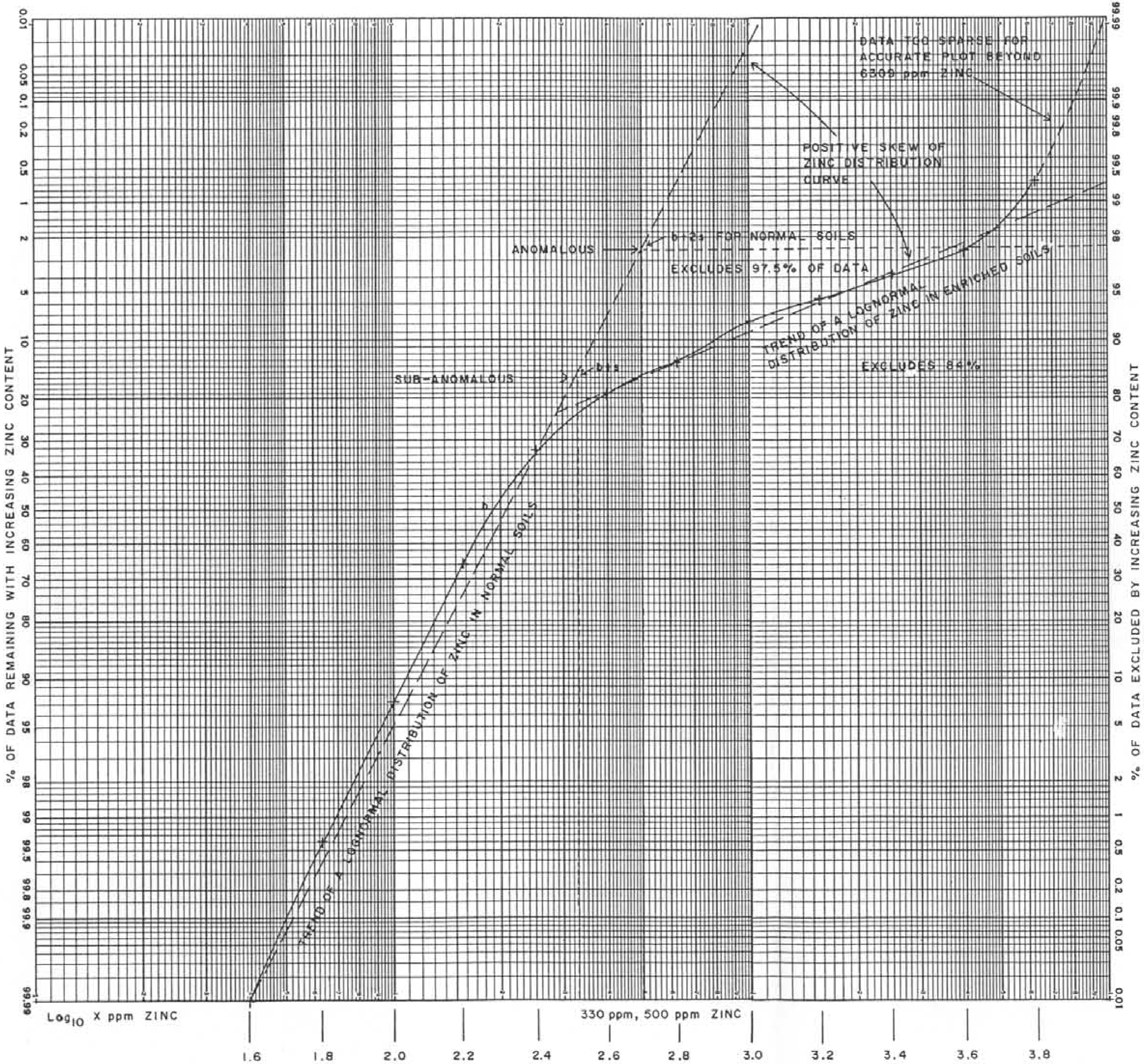
1990 SOIL SURVEY: LEAD DISTRIBUTION CURVE

PURCELL PROPERTY
49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER, M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



LEGEND

N = 153 for the 1990 soil survey
b median value which approximates the mean value
b+s first positive standard deviation
b+2s second positive standard deviation

NOTE: For map of distribution of zinc in soils, see Figure 16.

Figure 12

CASSIAR EAST YUKON EXP. LTD.

AVRIL EXPLORATIONS INC.

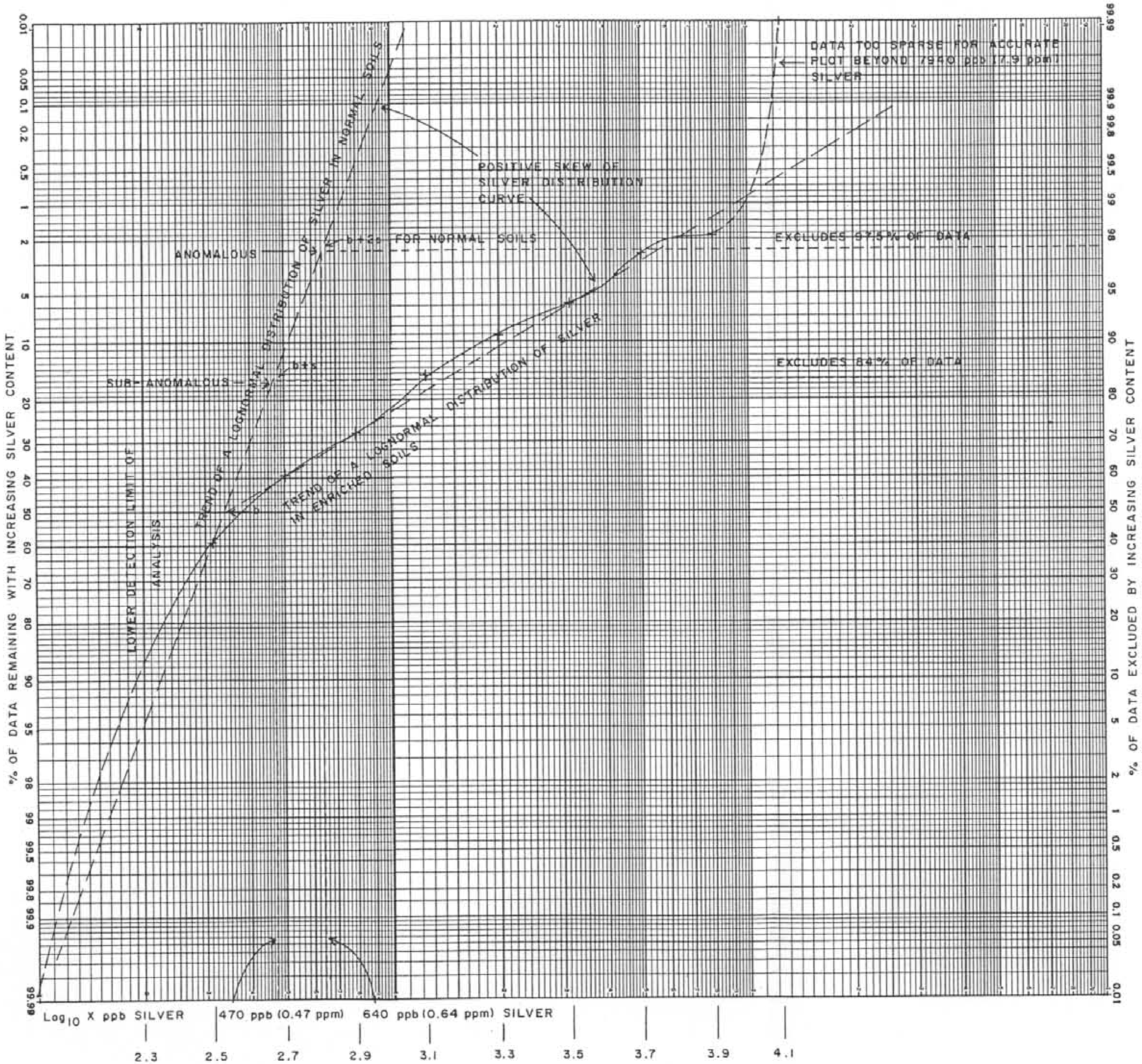
1990 SOIL SURVEY: ZINC DISTRIBUTION CURVE

PURCELL PROPERTY
49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S.82F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



LEGEND

N = 153 for the 1990 soil survey

b median value which approximates the mean value

b+s first positive standard deviation

b+2s second positive standard deviation

NOTE: For map of distribution of silver in soils, see Figure 17.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,836

PROFESSIONAL GEOLOGIST ALBERTA JOHN OSTLER LICENSED TO PRACTISE

Figure 13

CASSIAR EAST YUKON EXP. LTD.

AVRIL EXPLORATIONS INC.

1990 SOIL SURVEY: SILVER DISTRIBUTION CURVE

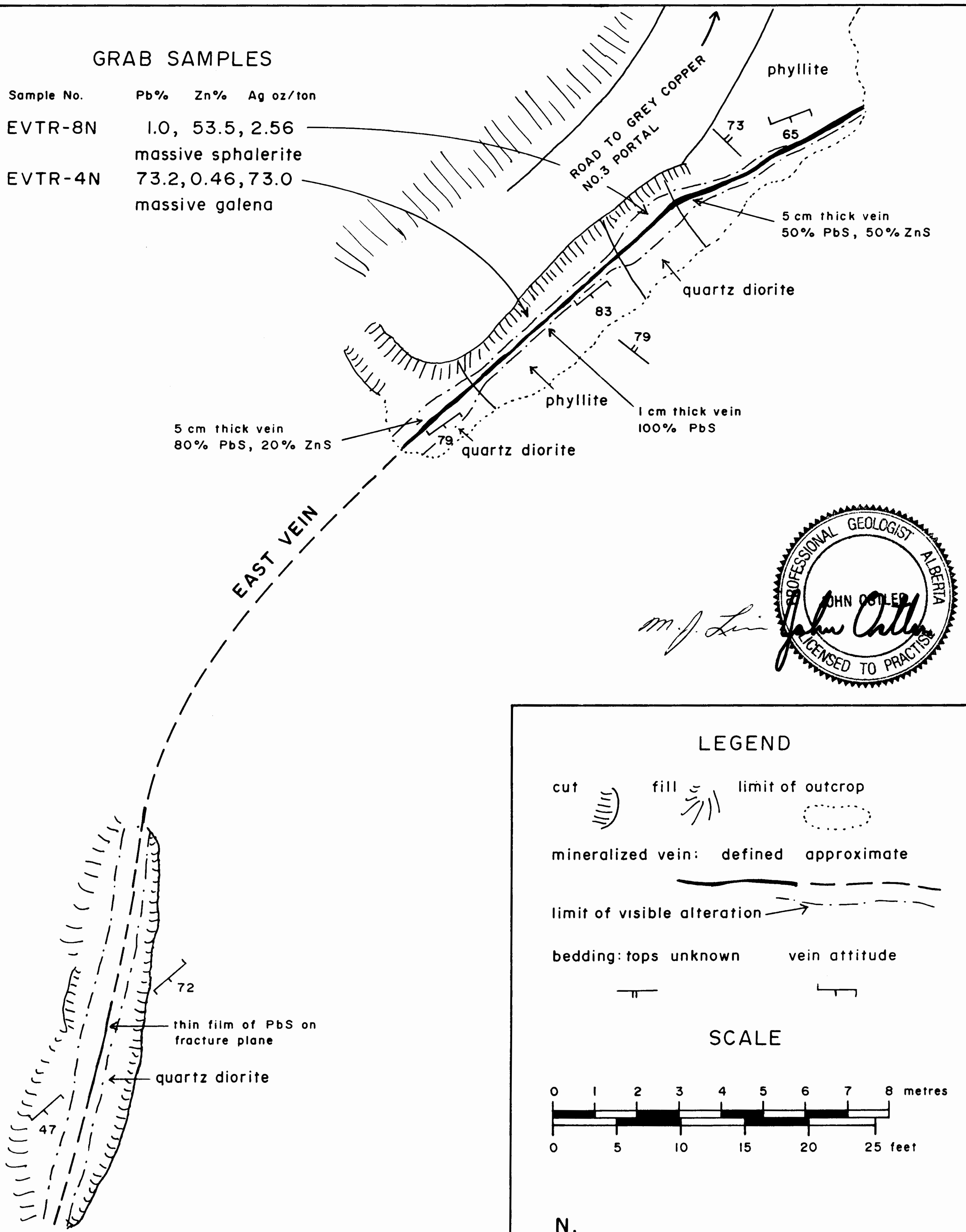
PURCELL PROPERTY

49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

JOHN OSTLER, M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990



LEGEND

cut — fill — limit of outcrop

mineralized vein: defined — approximate

limit of visible alteration

bedding: tops unknown — vein attitude

SCALE

0 1 2 3 4 5 6 7 8 metres

0 5 10 15 20 25 feet

N.

19°46' N.mag.

as of JULY 1, 1990

Figure 21

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

AVRIL EXPLORATIONS INC.

EAST VEIN: SURFACE EXPOSURE

PURCELL PROPERTY

49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA, N.T.S. 82F/14

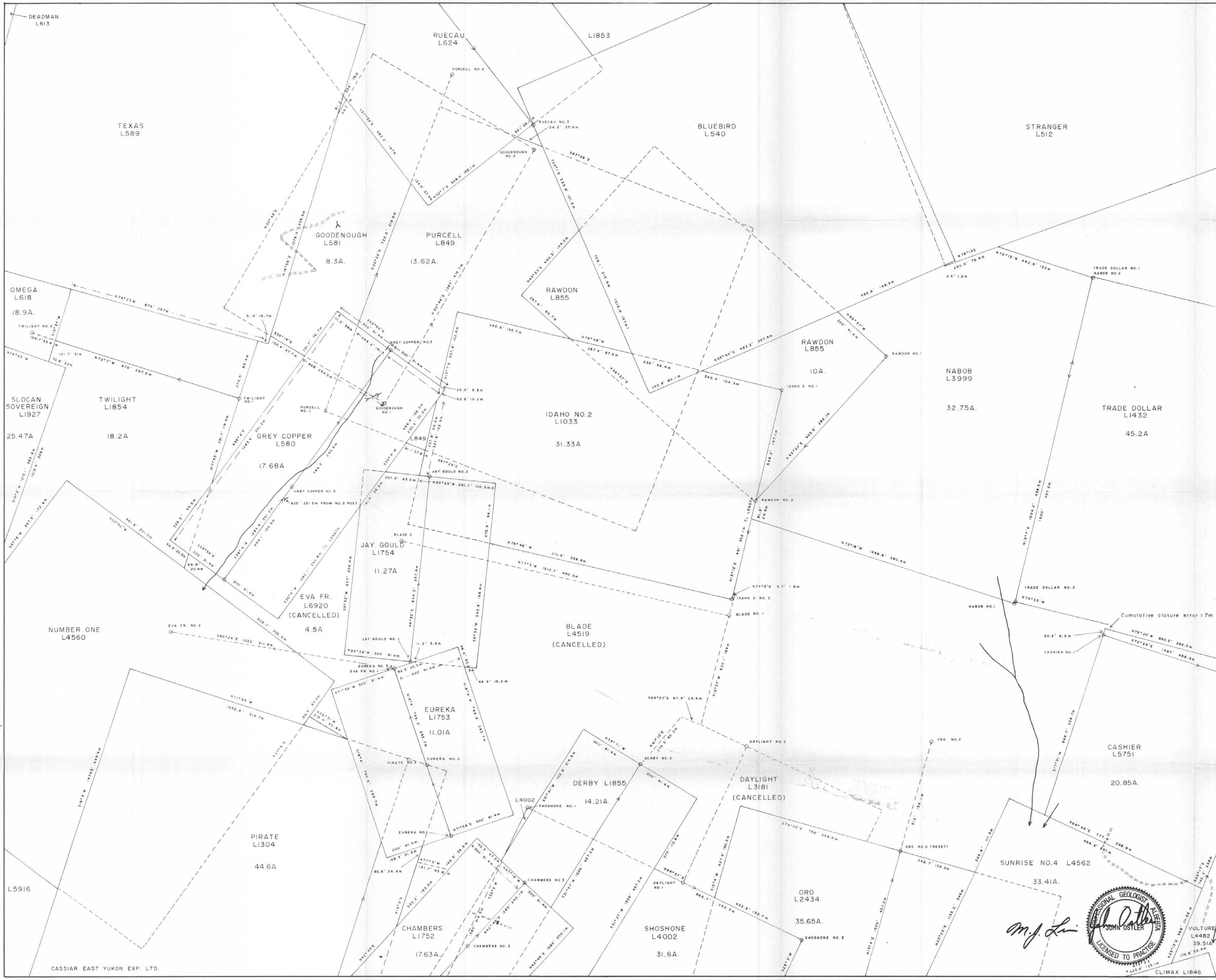
JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990

NOTES: For location on property, see Figure 4.

For intersection of the East Vein by the Grey Copper No.3 drift, see Figure 19B.

CASSIAR EAST YUKON EXP. LTD.



LEGEND

Claims: valid — superimposed or cancelled

Line

Location line — claim post, location direction

Length indication

Identification: GREY COPPER ← name; L580 ← lot number; 17.68A ← size

Topography: cabin, portal, trail, creek

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

N.

19°46' N.mag.

Magnetic declination for the northern part of N.T.S. Map 82 F/14 as of July 1, 1990. Declination decreases 7.4' annually.

Figure 3

AVRIL EXPLORATIONS INC.

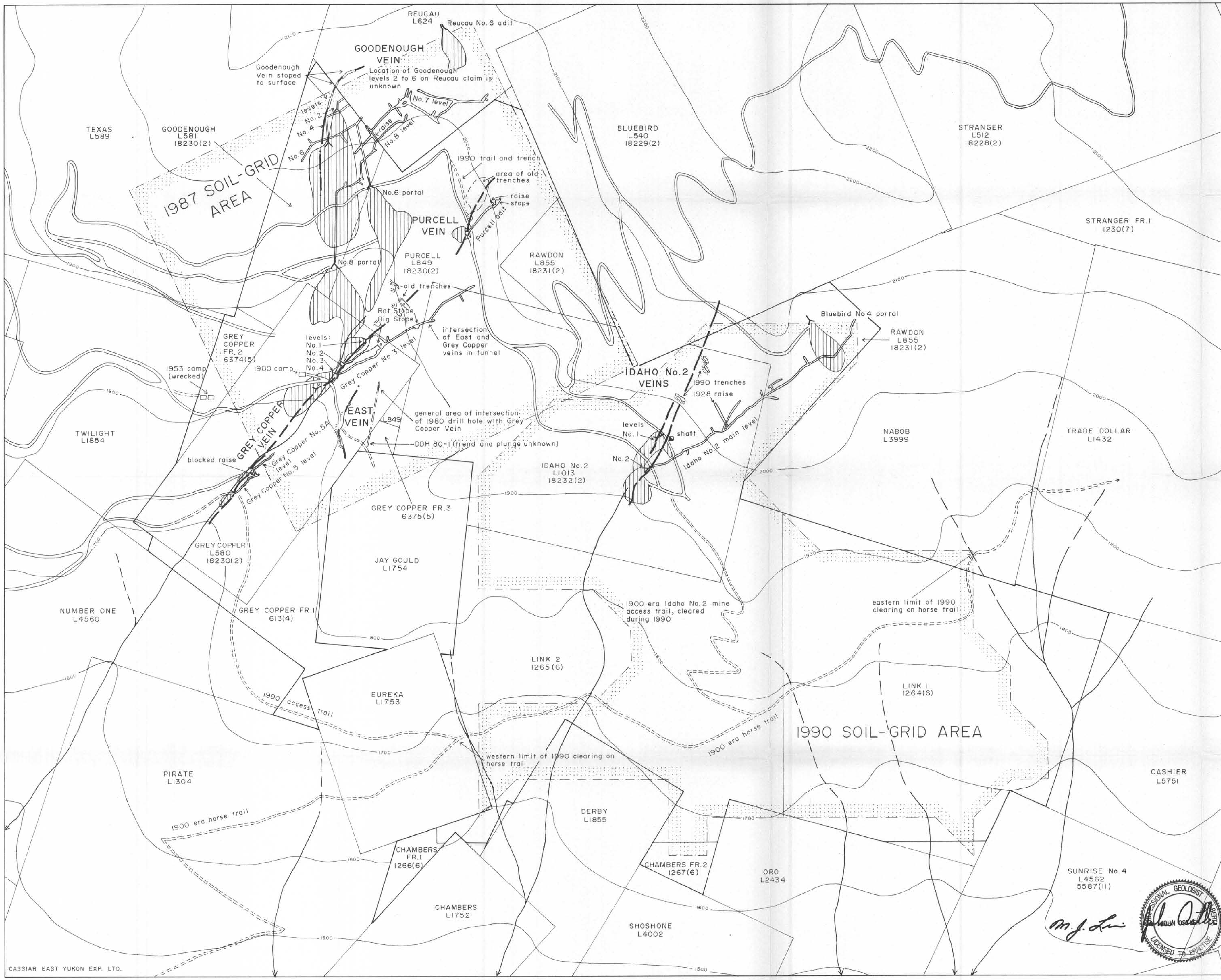
CROWN GRANT SURVEYS: 1895 to 1901

PURCELL PROPERTY
49° 59.3'N., 117° 11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14

JOHN OSTLER; M.Sc., P.Geol. — DECEMBER, 1990

MICHAEL LINN, B.Sc.



LEGEND

Topography: creek, intermittant creek, contour in metres, road, trail

Workings: trench (cut, fill), ore dump, portal, tunnel or raise, shaft

Limit of soil grid area

Surface trace of mineralized vein: defined, approximate, assumed

Claims: claim boundary, Purcell Property boundary

SUNRISE No.4 ← claim name
L4562 ← surveyed lot number, if any
5587(11) ← record number, if any

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,836

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

N.

19°46' N. mag.

Magnetic declination for the northern part of N.T.S. Map 82 F/14 as of July 1, 1990. Declination decreases 7.4' annually.

Figure 4

AVRIL EXPLORATIONS INC.

ROADS, TRAILS, WORKINGS and SOIL-GRID AREAS

PURCELL PROPERTY
49° 59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14

JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.

DECEMBER, 1990

LEGEND

TABLE OF LITHOLOGIC UNITS

AGE		FORMATION AND LITHOLOGY
Eocene to Pleistocene	Fgm	fanglomerate and arkosic sandstone; angular clasts of Slocan Group rock, poorly sorted and stratified, cemented in a grey pelitic matrix
Eocene		Slocan Silver Veins
	/	northeasterly striking quartz-siderite-calcite veins containing massive sphalerite and galena with minor pyrite, tetrahedrite, pyragyrite, argentite and native silver
Jurassic		Nelson Batholith Intrusives
	Qd	northwesterly striking concordant quartz diorite bodies and barren white quartz veins; quartz diorite contacts are commonly gradational with metasomatized and anatexized arenaceous Slocan Group rocks
Triassic		Slocan Group: basin-filling sedimentary sequence
	Gwke	lithic greywacke deposited in turbidite beds 1 cm to 1.5 m thick, very light grey weathering to pale green, tends to form rounded bluffs
	Slst	siltstone, dark grey weathering to light grey, deposited in thin turbidite beds
	Slt	black slaty or phyllitic pelite that weathers light grey, breaking into flags that tend to form skree
	CaSlst	dark blue-grey siltstone containing a significant amount of carbonate; weathered surfaces are mid-grey and variably pitted
	CSlt	carbonaceous slate and phyllite, recessively weathers to dark grey; breaks into shards forming extensive skree

STRUCTURE

Geological contact: defined, approximate, assumed
Fault
Synform (F2)
Antiform (F2)
Vein attitude
Bedding: upright, overturned, tops unknown
Cleavage: first, second, third

TOPOGRAPHY

creek, intermittant creek, contour in metres (1900), road, trail, limit of outcrop

Workings: trench (cut, fill), mine dump, portal, shaft, Surface trace of vein: defined, approximate, assumed

Claims: claim boundary; Purcell Property boundary; SUNRISE No. 4 ← claim name; L4562 ← surveyed lot number, if any; 5587(11) ← record number, if any

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

N.

19° 46' N. mag.

Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.

Figure 9

AVRIL EXPLORATIONS INC.

GEOLOGY

PURCELL PROPERTY
49°59.3'N., 117°11'W.

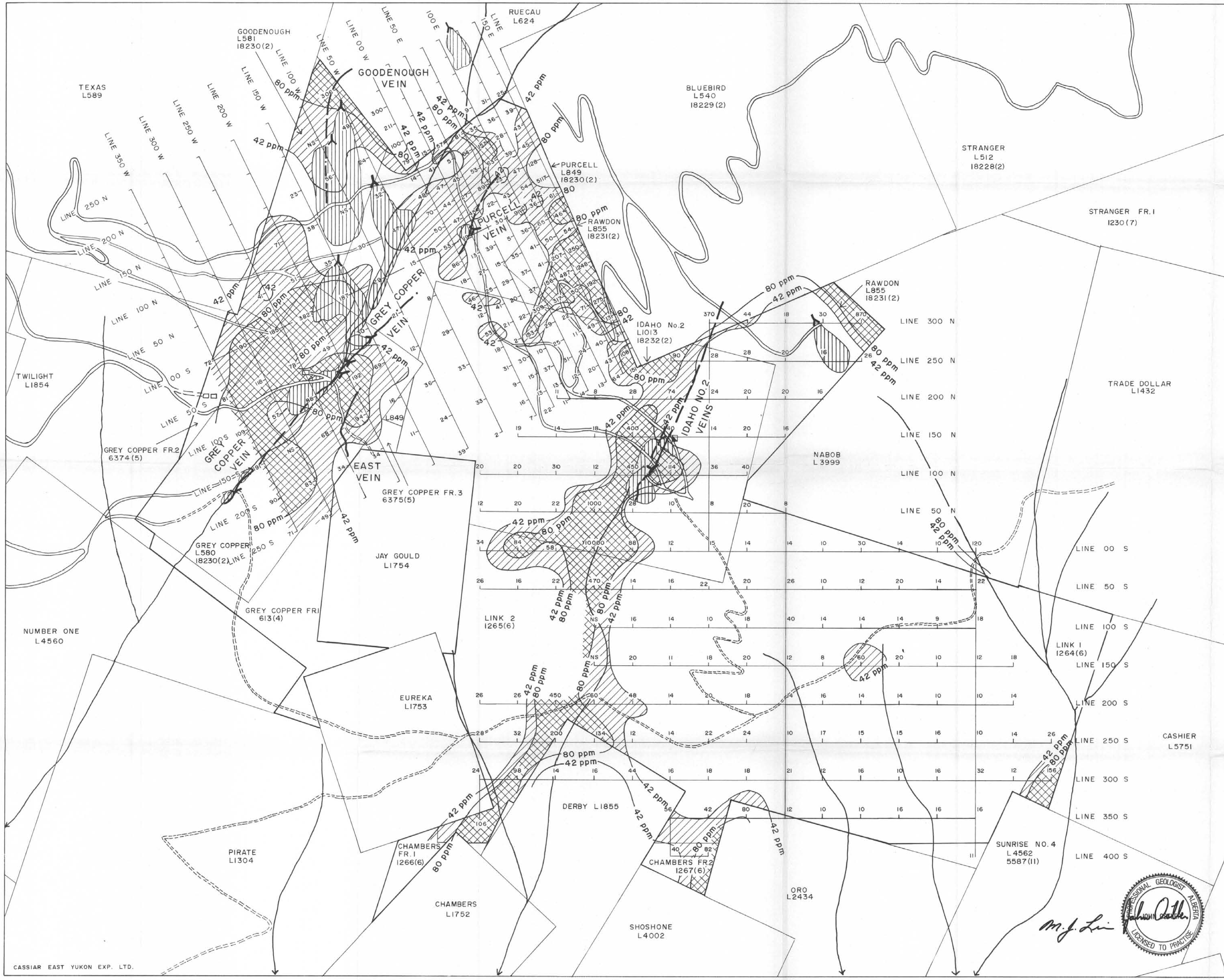
SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14

JOHN OSTLER; M.Sc., P.Geol. — DECEMBER, 1990

MICHAEL LINN, B.Sc.

PROFESSIONAL GEOLOGIST ALBERTA — JOHN OSTLER — LICENSED TO PRACTISE


LEGEND
1987 and 1990 Soil Grids:
line designation
soil line
station
ppm copper in soil
contour
Claims:
claim line
Purcell Property boundary
SUNRISE NO.4 ← claim name
L4562 ← surveyed lot number, if any
5587(11) ← record number, if any
Areas of High Soil-Copper Content
52 ppm copper contour (sub-anomalous) excludes 84 % of data
97 ppm copper contour (anomalous) excludes 97.5 % of data
Topography:
mine dump
portal
shaft
road
trail
building
creek or intermittent creek
Surface Trace of Mineralized Vein:
defined
approximate
assumed
SCALE
metres
feet
NOTE: For soil-data distribution curve, see Figure 10.
GEOLOGICAL BRANCH ASSESSMENT REPORT
20,836
N.
19° 46' N. mag
Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.
Figure 14
AVRIL EXPLORATIONS INC.
COPPER in SOILS: 1987 and 1990 SURVEYS
PURCELL PROPERTY
49°59.3'N., 117°11'W.
SLOCAN M.D., BRITISH COLUMBIA
JOHN OSTLER; M.Sc., P.Geol.
MICHAEL LINN, B.Sc.
N.T.S. 82 F/14
DECEMBER, 1990
GOODENOUGH VEIN
PURCELL VEIN
GREY COPPER VEIN
EAST VEIN
IDAHO NO.2 VEINS
TEXAS L589
GOODENOUGH L581 18230(2)
RUECAU L624
BLUEBIRD L540 18229(2)
STRANGER L512 18228(2)
STRANGER FR.1 1230(7)
PURCELL L849 18230(2)
RAWDON L855 18231(2)
IDAHO No.2 L1013 18232(2)
TWILIGHT L1854
GREY COPPER FR2 6374(5)
GREY COPPER FR.3 6375(5)
GREY COPPER L580 18230(2)
GREY COPPER FR1 613(4)
JAY GOULD L1754
NABOB L3999
TRADE DOLLAR L1432
LINK 2 1265(6)
LINK 1 1264(6)
NUMBER ONE L4560
EUREKA L1753
CASHIER L5751
DERBY L1855
PIRATE L1304
CHAMBERS FR.1 1266(6)
CHAMBERS L1752
CHAMBERS FR2 1267(6)
SHOSHONE L4002
ORO L2434
SUNRISE NO.4 L4562 5587(11)
CASSIAR EAST YUKON EXP. LTD.
PROFESSIONAL GEOLOGIST ALBERTA LICENSED TO PRACTISE



LEGEND

1987 and 1990 Soil Grids:

line designation, soil line, station, ppm lead in soil, contour

Claims:

claim line; Purcell Property boundary; SUNRISE NO.4 ← claim name; L4562 ← surveyed lot number, if any; 5587(11) ← record number, if any

Areas of High Soil-lead Content

42 ppm lead contour (sub-anomalous) excludes 84% of data on the lognormal distribution curve for normal soils.

80 ppm lead contour (anomalous) excludes 97.5% of data on the lognormal distribution curve for normal soils

Topography:

mine dump, portal, shaft, road, trail, building

creek or intermittent creek

Surface Trace of Mineralized Vein:

defined, approximate, assumed

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

NOTE: For soil-data distribution curve, see Figure 11.

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

N. 19° 46' N. mag

Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.

Figure 15

AVRIL EXPLORATIONS INC.

LEAD in SOILS: 1987 and 1990 SURVEYS

PURCELL PROPERTY

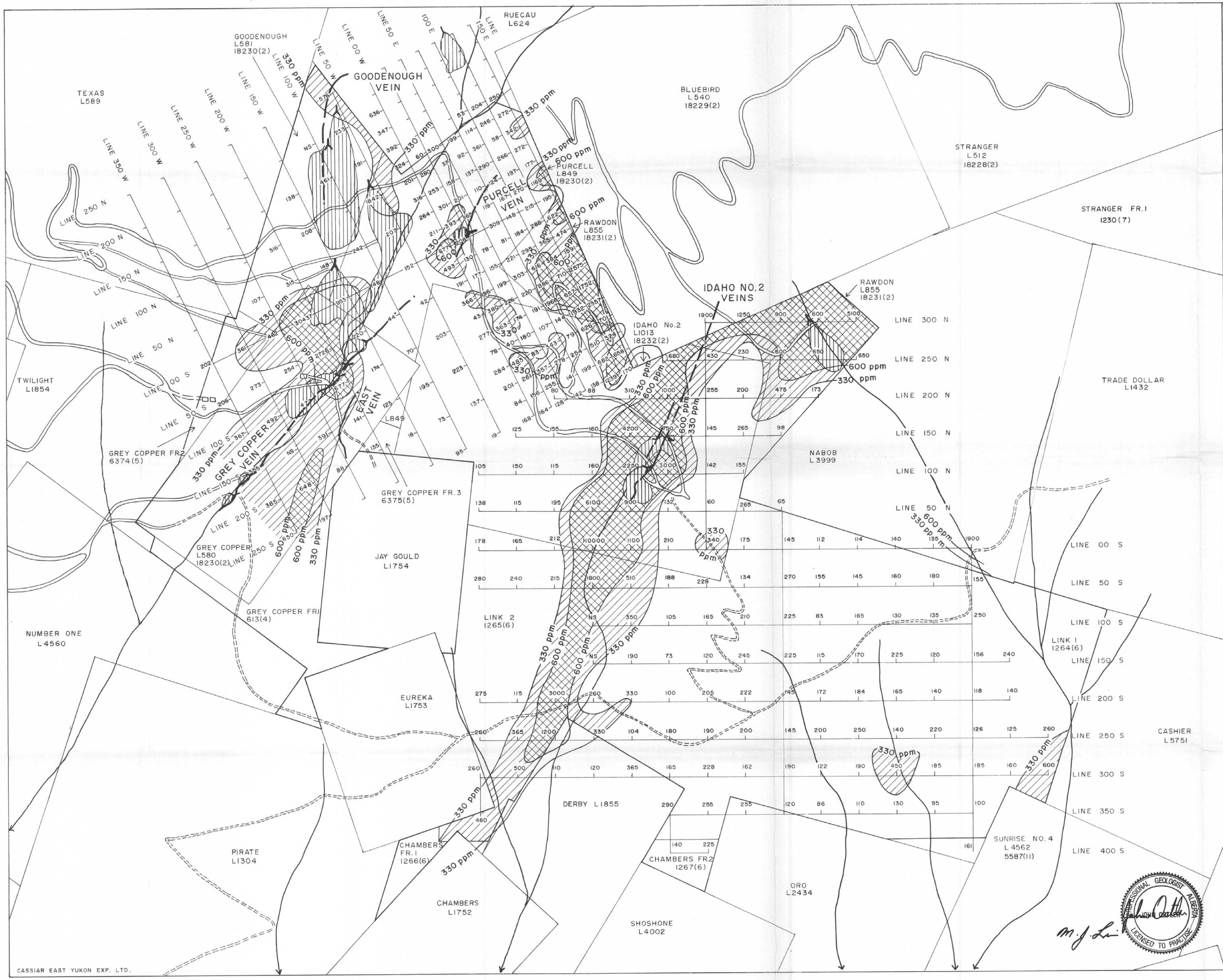
49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14

JOHN OSTLER, M.Sc., P.Geol. — DECEMBER, 1990

MICHAEL LINN, B.Sc.

PROFESSIONAL GEOLOGIST ALBERTA — JOHN OSTLER — LICENSED TO PRACTISE



LEGEND

1987 and 1990 Soil Grids:

line designation, soil line, station, ppm zinc in soil, contour

Claims:

claim line; Purcell Property boundary; SUNRISE NO.4 ← claim name; L4562 ← surveyed lot number, if any; 5587(11) ← record number, if any

Areas of High Soil-zinc Content

330 ppm zinc contour (sub-anomalous) excludes 84% of data on the lognormal distribution curve for normal soils

500 ppm zinc contour (anomalous) excludes 97.5% of data on the lognormal distribution curve for normal soils

Topography:

mine dump, portal, shaft, road, trail, building

creek or intermittent creek

Surface Trace of Mineralized Vein:

defined, approximate, assumed

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

NOTE: For soil-data distribution curve, see Figure 12.

N. 19°46' N. mag

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.

Figure 16

AVRIL EXPLORATIONS INC.

ZINC in SOILS: 1987 and 1990 SURVEYS

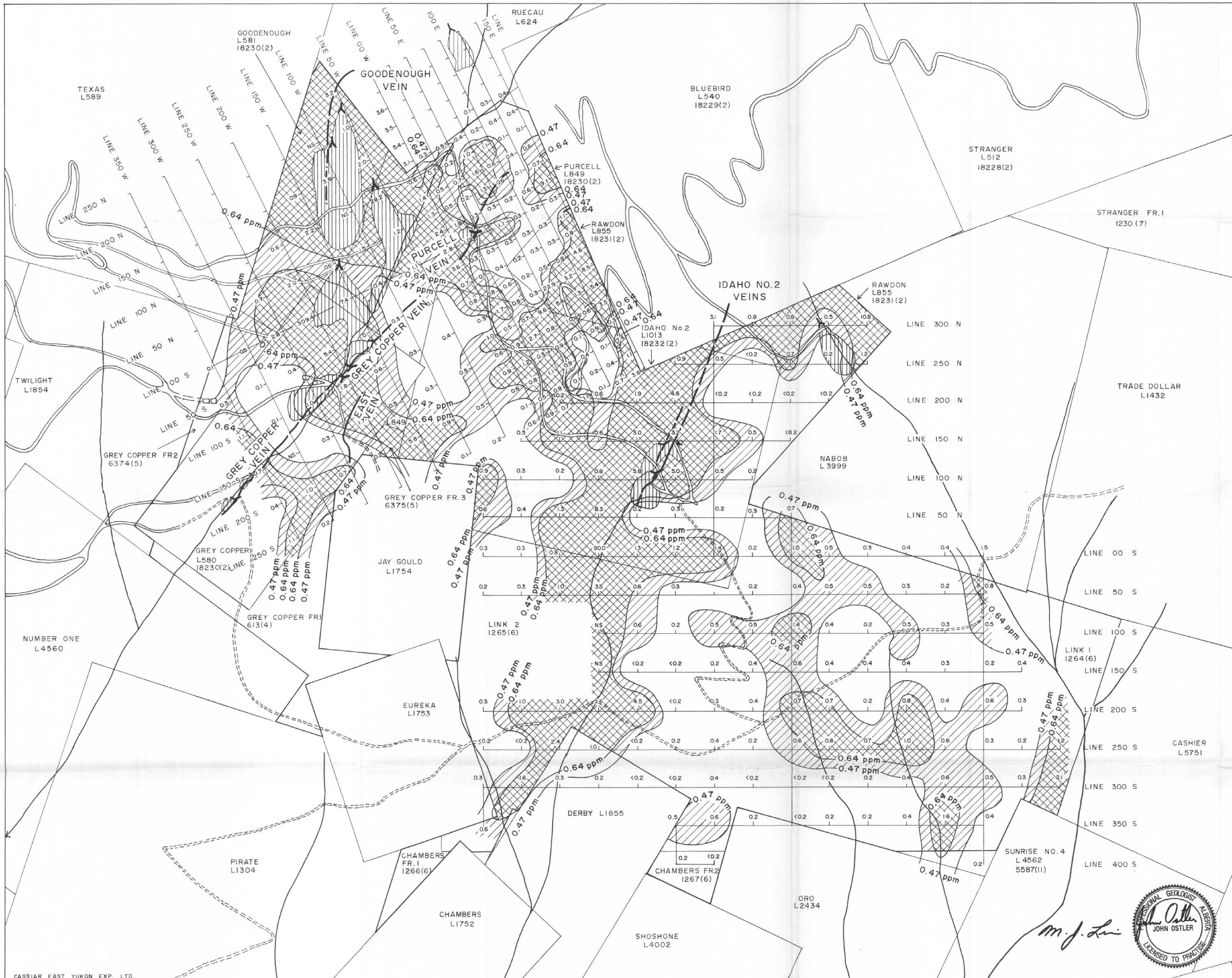
PURCELL PROPERTY

49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14

JOHN OSTLER; M.Sc., P.Geol. — DECEMBER, 1990

MICHAEL LINN, B.Sc.



LEGEND

1987 and 1990 Soil Grids:

line designation, soil line, station, ppm silver in soil, contour

LINE 150 N
LINE 100 N
LINE 50 N

Claims:

claim line — SUNRISE NO.4 ← claim name
L4562 ← surveyed lot number, if any
5587(11) ← record number, if any
Purcell Property boundary

Areas of High Soil-silver Content

0.47 ppm silver contour (sub-anomalous) excludes 84% of data on the lognormal distribution curve for normal soils

0.64 ppm silver contour (anomalous) excludes 97.5% of data on the lognormal distribution curve for normal soils

Topography:

mine dump, portal, shaft, road, trail, building

creek or intermittent creek

Surface Trace of Mineralized Vein:

defined, approximate, assumed

SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 metres

0 100 200 300 400 500 600 700 800 900 1000 feet

NOTE: For soil-data distribution curve, see Figure 13.

GEOLOGICAL BRANCH ASSESSMENT REPORT

20.836

N.

19° 46' N. mag

Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.

Figure 17

AVRIL EXPLORATIONS INC.

SILVER in SOILS: 1987 and 1990 SURVEYS

PURCELL PROPERTY
49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82 F/14
JOHN OSTLER, M.Sc., P.Geol. — DECEMBER, 1990
MICHAEL LINN, B.Sc.

PROFESSIONAL GEOLOGIST ALBERTA — JOHN OSTLER — LICENSED TO PRACTISE

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

Figure 18

AVRIL EXPLORATIONS INC.

GREY COPPER & PURCELL VEINS: PROJECTION on the AVERAGE PLANE of the VEIN

PURCELL PROPERTY
49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA — N.T.S. 82F/14
JOHN OSTLER; M.Sc., P.Geol. — DECEMBER, 1990
MICHAEL LINN, B.Sc.

PROFESSIONAL GEOLOGIST ALBERTA — JOHN OSTLER — LICENSED TO PRACTISE

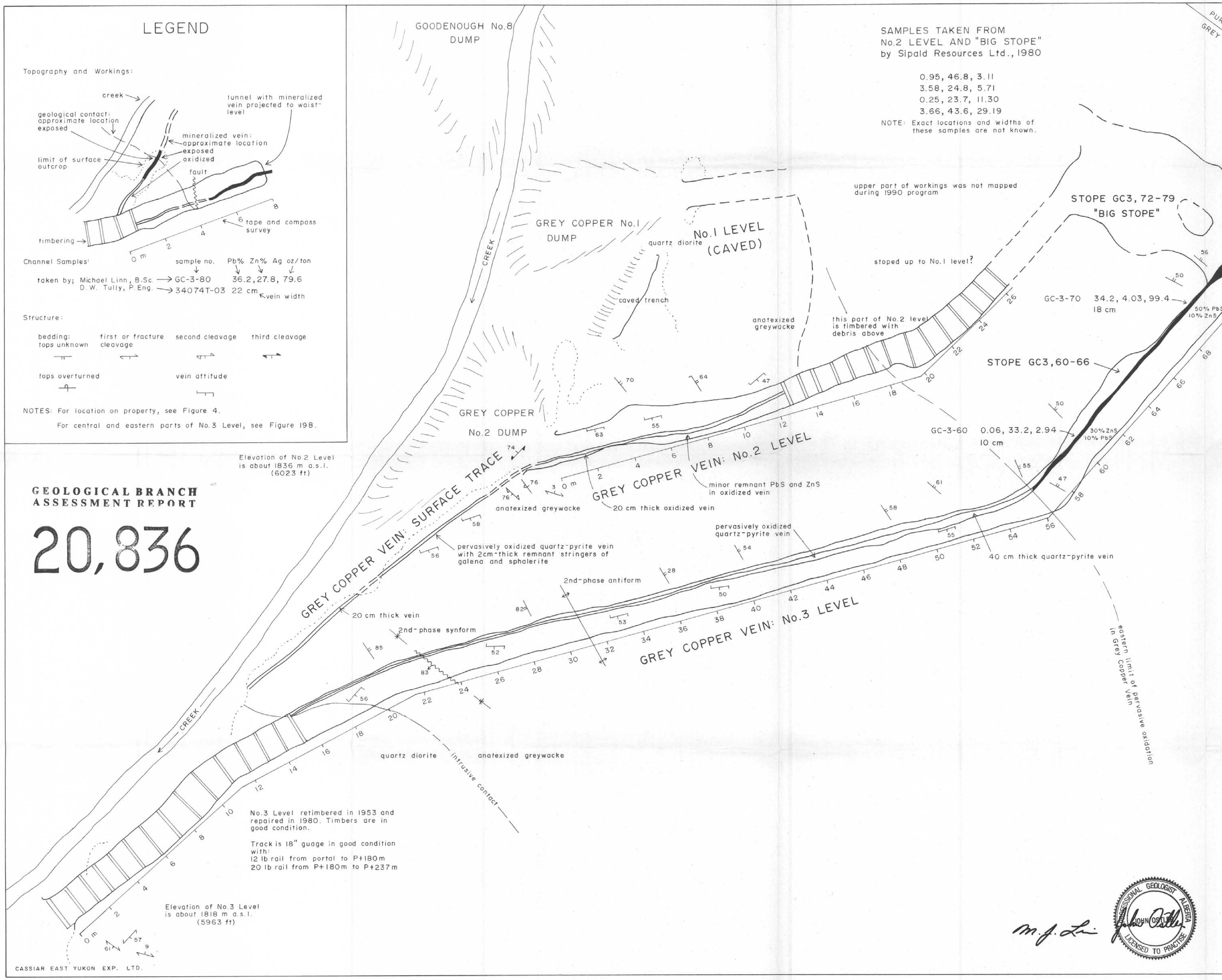


Figure 19A

AVRIL EXPLORATIONS INC.

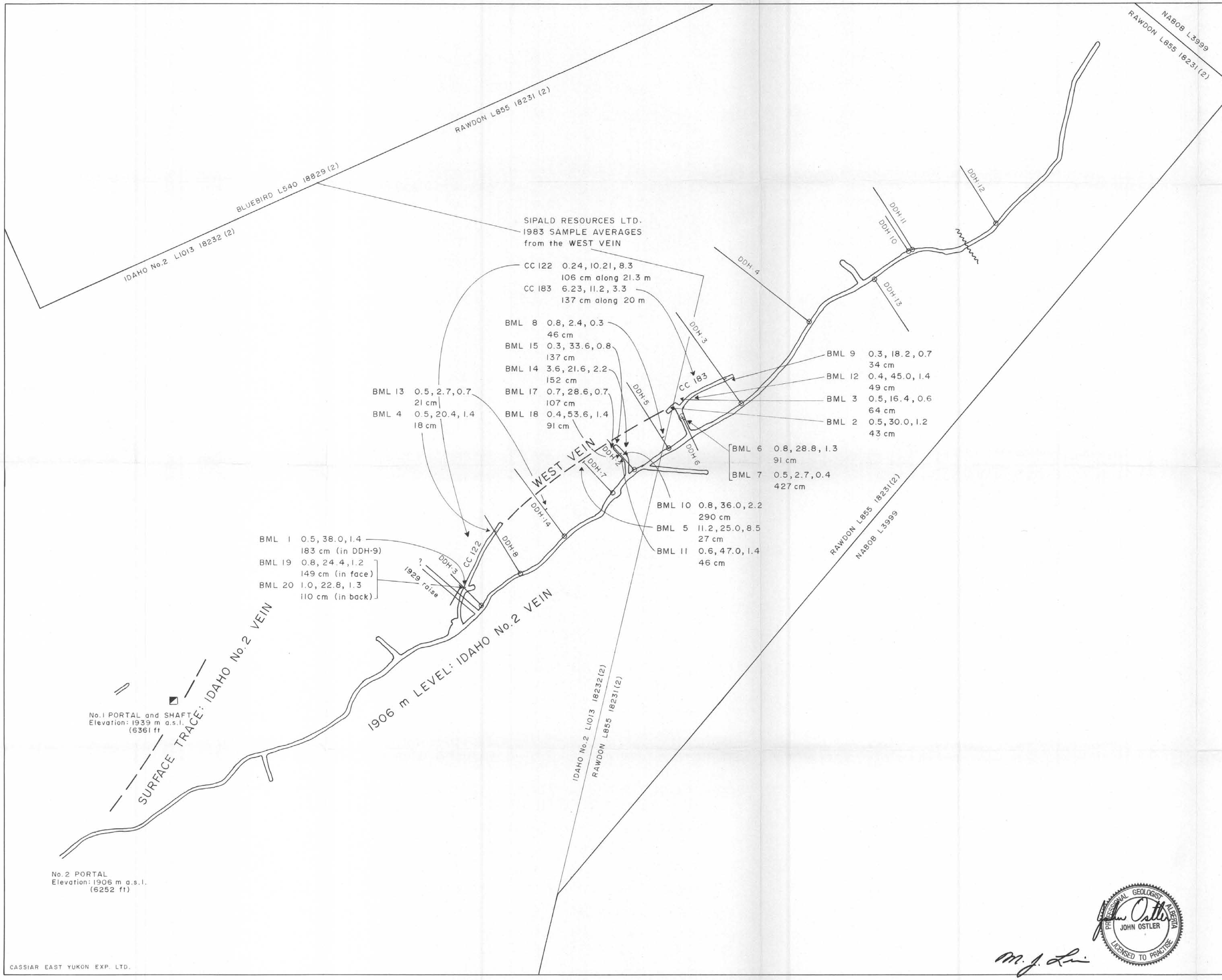
GREY COPPER VEIN: No.1, 2 and 3 LEVELS, WESTERN PART

PURCELL PROPERTY
49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA   N.T.S. 82F/14
JOHN OSTLER; M.Sc., P.Geol.   DECEMBER, 1990
MICHAEL LINN, B.Sc.


LEGEND
Topography and Workings:
creek
geological contact: approximate location exposed
limit of surface outcrop
tunnel with mineralized vein projected to waist-level
mineralized vein: approximate location exposed oxidized
fault
timbering
tape and compass survey
Channel Samples:
sample no. Pb% Zn% Ag oz/ton
taken by; Michael Linn, B.Sc. → GC-3-158 64.7, 6.28, 146.0
D.W. Tully, P.Eng. → 34072T-01 5 cm
vein width
Structure:
bedding: tops unknown
first or fracture cleavage
second cleavage
third cleavage
tops overturned
vein attitude
NOTES: For location on property, see Figure 4.
For western part of No.3 Level, see Figure 19A.
GEOLOGICAL BRANCH ASSESSMENT REPORT
20,836
Figure 19B (ii) No.3 LEVEL: EASTERN PART
metasiltstone
carbonaceous phyllite
phyllite
metagreywacke
PURCELL L849 boundary
IDAHO No.2 L1013
quartz diorite containing disseminated pyrite
open 2nd-phase synform
western limit of 20 lb rail on track
eastern limit of 12 lb rail on track
flat-lying contact of quartz diorite beneath metasiltstone near roof
iron stain
2% PbS
2% ZnS
quartz-rich fractured zone with disseminated pyrite
GC-3-182 2.16, 5.34, 6.23
20 cm
quartz diorite
mafic dike
intrusive contact
quartz diorite in walls metagreywacke in back
open 2nd-phase antiform
open 2nd-phase synform
adjoins FIGURE 19B (i)
adjoins FIGURE 19B (ii)
60% steel PbS, 5% ZnS
GC-3-158 64.7, 6.28, 146.0
5 cm
34072T-01 51.3, 9.94, 108.0
5 cm
white fault gouge containing galena
45% steel PbS, 40% ZnS
GC-3-151 54.7, 16.3, 106.0
6 cm
EN ECHALON PODS OF ZnS
STEEL GALENA VEIN
GC-3-144.5 16.5, 36.9, 33.8
6 cm
34073T-02 20.6, 28.5, 31.8
6 cm
30% PbS, 30% ZnS
GC-3-144 7.45, 44.4, 12.4
15 cm
15% PbS 30% ZnS
East Vein: sulphide in limonitic fracture
PRESUMED TRACE OF GREY COPPER VEIN
5% PbS, 60% ZnS
Pressure Tanks from 1953 mining
15% PbS, 5% ZnS
10% PbS, 25% ZnS
STOPE GC3, 114-121 "RAT STOPE" 4 m high
ZnS stringers in quartz vein with white gouge
5% PbS 20% ZnS
5% PbS 60% ZnS
5% PbS 70% ZnS
10% PbS, 50% ZnS
STOPE GC3, 104-110 6 m high
argillite and anatexized greywacke
vein in limonitc shear
adjoins FIGURE 19A
quartz diorite
PURCELL L849 boundary
IDAHO No.2 L1013
GC-3-142 16.6, 37.3, 33.3
8 cm
GC-3-138.5 15.9, 8.55, 9.76
5 cm
GC-3-139 10.5, 41.9, 22.5
4 cm
GC-3-134 1.04, 53.4, 4.27
10 cm
GC-3-131B 17.9, 40.4, 33.0
11 cm
GC-3-131 0.61, 3.74, 1.77
8 cm
GC-3-125 0.49, 31.4, 2.08
22 cm
GREY COPPER VEIN: No.3 LEVEL
PRESUMED TRACE OF EAST VEIN
intrusive contact
CASSIAR EAST YUKON EXP. LTD.
Figure 19B (i) No.3 LEVEL: CENTRAL PART
SCALE
0 1 2 3 4 5 6 7 8 9 10 metres
0 5 10 15 20 25 30 feet
N.
19°46' N. mag.
Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.
PROFESSIONAL GEOLOGIST ALBERTA JOHN OSTLER LICENSED TO PRACTISE
Figure 19B
AVRIL EXPLORATIONS INC.
GREY COPPER VEIN: No.3 LEVEL: CENTRAL and EASTERN PARTS
PURCELL PROPERTY
49°59.3'N., 117°11'W.
SLOCAN M.D., BRITISH COLUMBIA
N.T.S. 82 F/14
JOHN OSTLER; M.Sc., P.Geol.
DECEMBER, 1990
MICHAEL LINN, B.Sc.


LEGEND
Topography and Workings:
creek
geological contact: approximate location exposed
limit of surface outcrop
tunnel with mineralized vein projected to waist-level
mineralized vein: approximate location exposed
fault
tape and compass survey
Channel Samples:
sample no. Pb% Zn% Ag oz/ton
taken by; Michael Linn, B.Sc. → GC-5A-02.0 63.4, 7.25, 88.6
D.W. Tully, P.Eng. → 34081T-09 20 cm ← vein width
Structure:
bedding: tops unknown
first or fracture cleavage
second cleavage
third cleavage
vein attitude
NOTE: For location on property, see Figure 4.
GEOLOGICAL BRANCH
ASSESSMENT REPORT
20,836
Elevation of creek is about 1750 m a.s.l. (5740 ft)
GC-5A-37.0 0.05, 38.8, 7.90
36 cm
GC-5A-36.0 0.07, 41.3, 23.1
17 cm
GC-5A-34.0 0.05, 14.6, 1.26
40 cm
34079T-07 0.28, 48.9, 12.1
50 cm
GC-5A-33.6 0.08, 49.6, 8.88
50 cm
GC-5A-32.0 0.04, 53.3, 1.66
22 cm
GC-5A-30.0 0.07, 49.0, 4.59
13 cm
argillite xenolith
quartz diorite
GC-5A-25.0 0.06, 41.1, 5.55
17 cm
GC-5A-24.0 0.09, 42.0, 4.90
19 cm
GC-5A-22.0 0.09, 18.7, 1.27
10 cm
GC-5A-20.0 0.05, 3.83, 0.27
20 cm
GC-5A-18.0 0.20, 40.7, 3.69
8 cm
GC-5A-16.0 0.03, 42.8, 2.01
12 cm
34080T-08 0.04, 41.7, 1.94
12 cm
GC-5A-14.0 0.53, 8.42, 0.74
12 cm
GC-5A-12.0 0.10, 30.7, 1.75
25 cm
GC-5A-10.0 4.75, 25.5, 7.16
26 cm
GC-5A-08.0 1.82, 25.3, 7.27
24 cm
GC-5A-06.0 0.05, 34.5, 1.40
32 cm
GC-5A-04.0 1.38, 18.2, 4.66
15 cm
GC-5A-02.0 21.0, 16.4, 27.9
20 cm
34081T-09 63.4, 7.25, 88.6
20 cm
argillite
quartz diorite
CREEK
GREY COPPER VEIN: No. 5A LEVEL
No. 5A Level elevation is about 1740 m a.s.l. (5707 ft)
GCL-5-PY 0.01, 0.56, 0.09, <0.002 Au
(grab sample of pure pyrite)
GCL-5-ZN <0.01, 54.7, 1.45
(grab sample of pure sphalerite)
GCTRI-06S 0.03, 12.0, 1.86
35 cm
GCTRI-08S 0.12, 35.5, 2.25
20 cm
GCTRI-10S 0.01, 30.0, 1.45
40 cm
34077T-05 0.47, 34.9, 2.25
40 cm
GCTRI-12S 0.03, 26.3, 1.96
10 cm
GCTRI-14S 0.05, 9.32, 0.47
14 cm
GCTRI-15S 0.03, 13.0, 0.55
30 cm
GCTRI-22S 0.03, 47.4, 2.18
40 cm
34076T-06 0.08, 51.3, 1.35
40 cm
RAISE ALONG GREY COPPER VEIN
NOTE: The raise was plugged with waste rock from slushing in the No.5A level during 1979.
SAMPLES TAKEN FROM RAISE
by George Sipos during 1978-9
13.6, 39.6, 16.9
---, 52.7, 5.30 (grab sample
0.02, 0.33, 0.14 ← of wall rock)
0.17, 4.2, 0.26
0.03, 2.7, 0.86
0.07, 27.2, 8.07
6.10, 19.8, 0.46
0.12, 7.4, 1.40
NOTE: This is assumed to be a series of channel samples taken in ascending order up the raise. Sample numbers and widths are not known.
working face seen through blockage at base of raise
blockage
main intrusive contact
quartz diorite
1 to 5 cm thick quartz veins
18 cm thick quartz-siderite vein with traces of PbS and ZnS
1 to 5 cm thick quartz veins
GREY COPPER VEIN SURFACE EXPOSURE
phyllite and metasiltstone
GCTRI-32S 0.02, 2.29, 0.76
15 cm
greywacke and argillite
GC-5-16.0 0.06, 50.5, 12.4
8 cm
GREY COPPER VEIN: No. 5 LEVEL
No. 5 Level elevation is about 1722 m a.s.l. (5648 ft)
quartz diorite
GC-5-1.0 0.06, 1.93, 1.15
15 cm
greywacke
SCALE
metres
feet
N.
19°46' N. mag.
Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.
Figure 20
AVRIL EXPLORATIONS INC.
GREY COPPER VEIN:
No.5 and 5A LEVELS
PURCELL PROPERTY
49°59.3'N., 117°11'W.
SLOCAN M.D., BRITISH COLUMBIA
N.T.S. 82F/14
JOHN OSTLER; M.Sc., P.Geol.
DECEMBER, 1990
MICHAEL LINN, B.Sc.
PROFESSIONAL GEOLOGIST ALBERTA
JOHN OSTLER
LICENSED TO PRACTISE
CASSIAR EAST YUKON EXP. LTD.



LEGEND

Workings: drift, cross-cut or raise; shaft; 1951 drill hole

Channel Samples: sample no. Pb%, Zn%, Ag oz/ton

taken by Bluebird Mines Ltd. during 1951 → BML 10 0.8, 36.0, 2.2
290 cm ← width

average of channel samples taken by L. Sookochoff, P.Eng. as reported to Sipald Resources Ltd. during 1983 → CC 122 ← cross-cut 122 m from portal

Claims:

Purcell Property boundary

claim boundary

RAWDON L855 18231 (2)

record number, if any
surveyed lot number
claim name

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,836

SCALE

0 5 10 15 20 25 30 35 40 45 50 metres

0 25 50 75 100 125 150 feet

N.

19° 46' N. mag.

Declination is for the northern part of N.T.S. Map 82 F/14 SLOCAN as of JULY 1, 1990. Declination decreases by 7.4' annually.

Figure 22

AVRIL EXPLORATIONS INC.

IDAHO No.2 VEIN SYSTEM: WORKINGS

PURCELL PROPERTY

49°59.3'N., 117°11'W.

SLOCAN M.D., BRITISH COLUMBIA N.T.S. 82F/14

JOHN OSTLER; M.Sc., P.Geol.

MICHAEL LINN, B.Sc.

DECEMBER, 1990

PROFESSIONAL GEOLOGIST ALBERTA JOHN OSTLER LICENSED TO PRACTISE