JOHN R. FRASER June 6/91

Winfield

889

Tom: For your information. It was good to see you yesterday - many thanks for the rock samples.

Regards

John

WINFIELD CREEK PROPERTY

KEN CLAIM

OMINECA MINING DIVISION

93L/11W

Discovery Consultants
Box 795
Vernon, B.C.
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WINFIELD CREEK PROPERTY

Location:

On lower Winfield Creek on the north side of the Telkwa River valley 28 kilometres west-southwest of the town of Telkwa, B.C. The centre of the claim, 2.5 km north of the river, is at approximately 54°37.7' North and 127°28.5' West. Smithers, a major supply centre, is 26 km to the northeast of the property. (Fig. 1)

Access:

The property is served by excellent logging road access from Telkwa on Highway 16. Several new and old logging roads provide access to various parts of the claim. A major power-line and a natural gas pipeline pass immediately south of the claim.

Topography:

The claim is located on the moderately-sloping south facing north slope of the Telkwa River valley. Elevations on the claim vary from 750 metres above sea level at the southwest corner to 1100 m above sea level in the northeast part. The valley of Winfield Creek bisects the claim in a north-south direction. An anomalous linear topographic feature extends from the northwest corner to the southeast corner. A reversal of the regional slope is occupied by a broad low area of swamps and small lakes. This feature is parallel to the aeromagnetic trend and may be structually controlled. Another parallel topographic low passes through the northeast corner of the claim. (Fig. 4)

Title:

The Winfield Creek property presently comprises one 20-unit modified-grid system claim. The Ken claim, record number 12728 in the Omineca Mining Division, was located by Donald A. Davidson on October 26, 1990. The owner of record is Mr. Davidson, of Smithers, on behalf of himself and three associates. The current claim expiry date is October 26, 1991.

History:

The earliest evidence of mineral exploration on the property consists of old trenches and the remains of a camp near the centre of the claim, where an east flowing tributary enters Winfield Creek. An old timer, Mr. Art Cope, has reported a rumour of a copper showing on lower Winfield Creek where 20 feet of mineralization averaged 5% copper.

In the 1960's Mr. Lorne Warren, a Smithers prospector, found scorzalite-bearing boulders on Winfield Creek, and, later, on Sinclair Creek, a parallel flowing stream some 2.5 km to the west. In addition, at least two copper showings were discovered in the vicinity of the boulders on Winfield Creek. (Fig. 4)

In 1976 Granby Mining carried out detailed silt sampling in the area. A number of samples returned anomalous copper and zinc values.

Noranda Exploration optioned the property from Mr. Warren in 1980 and subsequently carried out an airborne magnetometer and VLF-EM survey, a limited soil survey (Cu, Zn, Ag, Pb, Mo) and a ground VLF-EM survey on widely spaced lines.

The option was dropped and the ara was inactive from 1983 to 1990. The current claim was staked in October, 1990 by Don Davidson of Smithers.

Geology:

The area of the claim is underlain by various volcanic rocks of the Jurassic Hazelton Group. The stratigraphic sequence consists of a lower unit, termed the Basalt Flow - Red Tuff Facies (lJTb), comprising basalt, basaltic tuff, red tuff and epiclastics, overlain by the Siliceous Pyroclastic Facies (lJTc), comprising felsic ash flows, ignimbrite, breccia, tuff, rhyolite and basalt flows. The felsic unit is overlain in turn by the Nilkitwa Formation Red Tuff Member (lJRT). These rocks have been intruded by small plugs of late Cretaceous to Eocene diorite, quartz-feldspar porphyry and rhyolite. The Hazelton volcanic rocks have been folded into an open syncline with a north trending axis. This syncline has been truncated by a southeasterly trending normal fault immedately north of the property.

The Winfield Creek prospect is apparently underlain by rocks of the Basalt Flow - Red Tuff Facies (lJTb).

Mineralization:

The boulders on Winfield Creek occur in the vicinity of where an east flowing tributary joins the creek, near the centre of the property. On Sinclair Creek, the boulders are reported to be located some 3.2 to 3.6 km upstream from the Telkwa River. (Fig 4)

The Winfield Creek boulders, estimated to be up to several thousand pounds in weight, contain scorzalite (see attached mineralogical and petrolgraphic descriptions), andalustie, and corundum, with variable amounts of pyrite and hematite while those on Sinclair Creek are much smaller, up to several hundred pounds, and consist largely of scorzalite and hematite. The scorzalite-andalusite mineralization is reported, in at least one locality, to occur in bands in quartz-eye rhyolite.

At least two bedrock copper occurrences are known in the vicinity of the Winfield Creek boulders and consist of malachite stain in rhyolite (on the tributary, several hundred feet upstream) and in green tuffs (on Winfield Creek, upstream from tributary). From the latter, Mr. Warren has obtained an assay of 0.32% Cu.

This unusal mineral suite is similar to that which forms the alteration assemblage associated with the copper-silver-gold deposits at the Equity Silver Mine, operated by Placer Dome, some 90 km to the southeast. (See Fig. 5 and attached descriptions).

Geophysics: An airborne geophysical survey by Noranda outlined a striking aeromagnetic anomaly in the Winfield Creek prospect area. An annular magnetic high is attenuated in a southeasterly direction. The "arms" of the high are flanked by linear magnetic lows. Airborne VLF-EM results indicate the presence of several conductors. (Fig. 3)

Soil Geochemistry: Noranda conducted a limited soil survey over parts of the claim. Copper, zinc and silver occur in anomalous amounts in several places (see maps). Molybdenum and lead values are negative.

Exploration Potential: The Winfield Creek property is a relatively untested prospect which exhibits potential for discovery of copper-silver-gold mineralization of the Equity Silver type or, possibly, a porphyry copper system.

Discovery Consultants
K.L. Daughtry

April 29, 1991

LAZULITE — $MgAl_2(OH)_2(PO_4)_2$

Crystallography. Monoclinic; prismatic. Crystals showing steep fourth order prisms rare. Usually massive, granular to compact.

Physical properties. Indistinct prismatic {110} cleavage. **H.** = 5–5½. **G.** = 3.0–3.1. Luster vitreous. Color azure-blue. Translucent.

Composition. A basic magnesium aluminum phosphate, $MgAl_2(OH)_2(PO_4)_2$. Ferrous iron replaces magnesium, and a complete series exists between lazulite and the iron end member, *scorzalite.*

Tests. Infusible. Before the blowpipe it swells, loses its color, and falls to pieces. In the closed tube whitens and yields water. Insoluble. After fusion with sodium carbonate, a nitric acid solution added to an excess of ammonium molybdate solution gives a yellow precipitate of ammonium phosphomolybdate.

Diagnostic features. If crystals are lacking, lazulite is difficult to distinguish from other blue minerals without a chemical or blowpipe test.

Occurrence. Lazulite is a rare mineral. It is usually found in quartzites associated with kyanite, andalusite, corundum, rutile. Notable localities for its occurrence are Salzburg, Austria; Krieglach, Styria; Horrsjoberg, Sweden. In the United States found with corundum on Crowder's Mountain, Gaston County, North Carolina; with rutile on Graves Mountain, Lincoln County, Georgia; with andalusite in the White Mountains, Inyo County, California.

Use. A minor gem stone.

Name. Derived from an Arabic word meaning *heaven,* in allusion to the color of the mineral.

FROM: DANA'S MANUAL OF MINERALOGY, 16th EDITION.

Economic Geology
Vol. 79, 1984, pp. 947–968

Geology and Mineralization at Equity Silver Mine

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AND T. G. SCHROETER

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Abstract

Equity Silver mine occurs in a homoclinal Upper Jurassic to Cretaceous inlier consisting of sedimentary, pyroclastic, and volcanic rocks plus intrusions overlain and surrounded by younger, unconformable Tertiary andesitic to basaltic flows and flow breccias. Four stratigraphic conformable subdivisions, termed the Goosly sequence, are recognized in the inlier and consist of a basal conglomerate and minor argillite (clastic division); intercalated subaerial tuffs breccias and minor reworked pyroclastic debris (pyroclastic division); interbedded volcanic conglomerate, sandstone, and tuff (sedimentary-volcanic division); and bedded andesitic to dacitic flows (volcanic flow division). A quartz monzonite stock with an approximate age of 58 m.y., and a gabbro-monzonite complex with an approximate age of 49 m.y. intrude the Goosly sequence. Postmineral andesitic and quartz latitic dikes with an approximate age of 49 m.y. crosscut the Goosly sequence and the gabbro-monzonite complex. Copper-silver-antimony sulfides and sulfosalts with associated gold occur as tabular zones with attitudes grossly conformable to the Goosly sequence. Sulfides were deposited as disseminations, open-space fracture fillings, veins, and crackle and breccia zones with an associated advanced argillic alteration suite including andalusite, corundum, pyrite, quartz, tourmaline, and scorzalite; they are believed to have developed at a high elevation in the porphyry system. Potassium-argon age dating indicates a main pulse of mineralization and hydrothermal alteration around 58 m.y. and a younger postmineral event at around 49 m.y.

Mining of the Southern Tail orebody commenced in April 1980 with a current mill feed rate of 5,400 metric tons/day. Production to December 1982 totaled 4.3 million metric tons of ore grading 135 g/metric ton Ag, 0.45 percent Cu, and 1.3 g/metric ton Au. Antimony and arsenic are leached from concentrate and recovered as by-products. The Main zone orebody, with reserves of 21.6 million metric tons grading 109 g/metric ton Ag, 0.35 percent Cu, and 0.85 g/metric ton Au, commenced production in late 1983. A smaller tonnage with similar grades is defined in the Waterline zone. Elsewhere, weak copper-molybdenum sulfides are associated with the quartz monzonite stock, and intense, irregularly distributed brecciation and tourmalinization with minor chalcopyrite, tetrahedrite, galena, and sphalerite occur in the northern part of the property, indicating that a mineralizing hydrothermal system was present in the proximity of known sulfide deposits.

Alteration and mineralization are compatible with an advanced argillic alteration, possibly related to base leaching associated with fluid circulation at a high level in a developing porphyry system.

Economic Geology
Vol. 79, 1984, pp. 969–990

Equity Silver Silver-Copper-Gold Deposit: Alteration and Fluid Inclusion Studies

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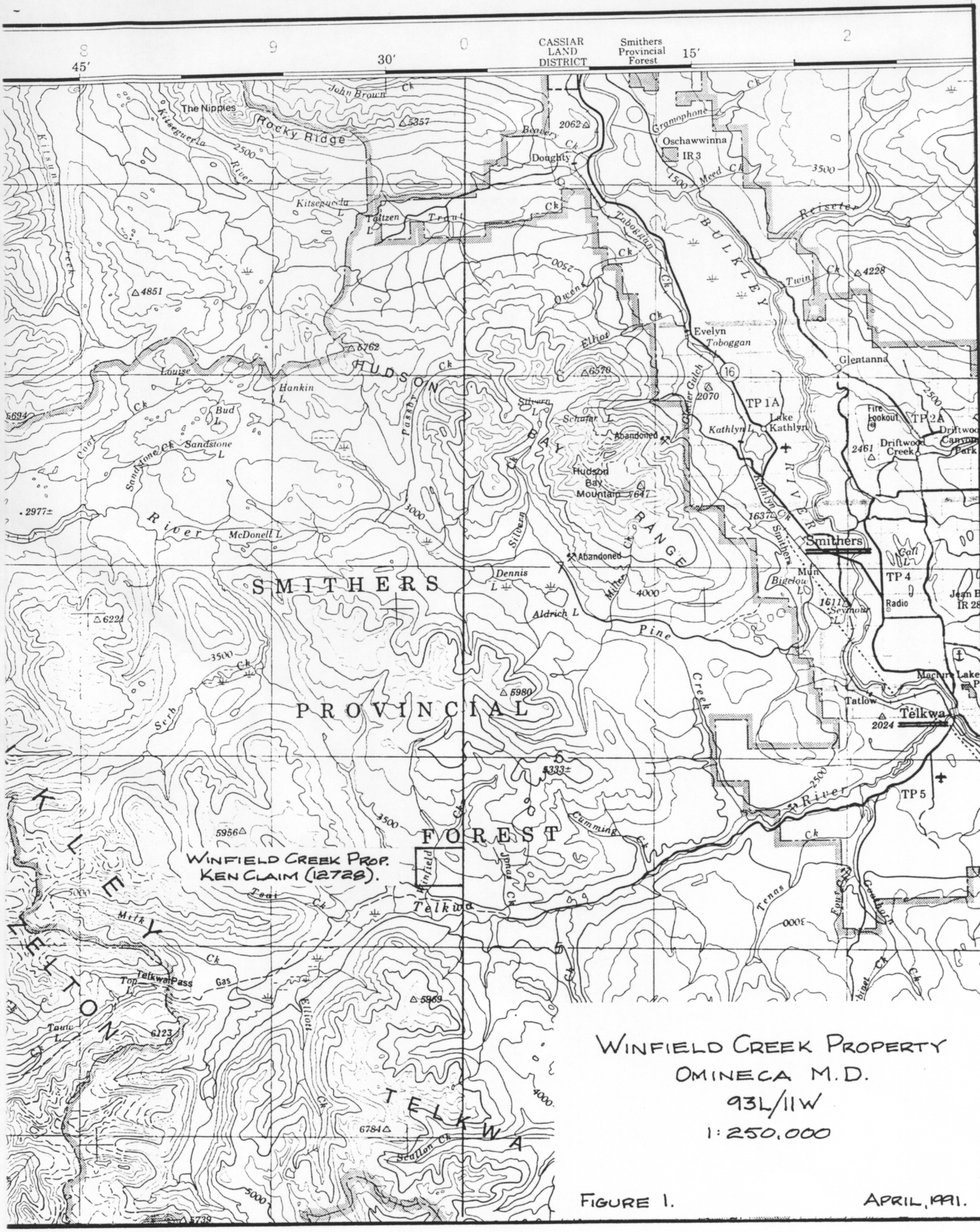
Abstract

The Equity Silver mine is a silver-copper-gold-antimony deposit 600 km northwest of Vancouver, British Columbia, mined at present from two open pits by Equity Silver Mines Ltd. The deposit is contained within tilted fragmental dacites of inferred Cretaceous age that are intruded by two Eocene stocks and surrounded by flat-lying younger plateau lavas. The two zones being mined occur along a continuous 1,500-m mineralized zone that is crudely parallel to the Cretaceous strata.

In the larger Main zone, ore minerals, principally pyrite, chalcopyrite, and tetrahedrite, are finely disseminated in the matrix of a volcanic breccia and are intimately associated with an aluminous and borosilicate alteration assemblage. Andalusite, distinctive blue scorzalite, tourmaline, corundum, and sparse dumortierite are developed from a monotonous groundmass of fine illite-sericite and quartz. Zones of aluminous minerals are concentric and broadly outline the mineralized zone but are asymmetric to it, extending up to 300 m into the hanging wall where alteration seems to terminate abruptly against comparatively fresh welded ash-flow tuff. Chlorite and carbonate in the Main zone occur with economically unimportant late ore-stage sulfide veins. Chlorite is also a prominent retrograde alteration.

The smaller Southern Tail deposit contrasts with the Main zone. Ore minerals, principally pyrite, arsenopyrite, chalcopyrite, and tetrahedrite with quartz and chlorite gangue are moderately coarse grained and fill open space in a crudely tabular brittle fractured zone. The breccia and halo of buff sericite alteration transect aluminous alteration which in this area consists of an andalusite-pyrophyllite-chlorite assemblage. The presence of pyrophyllite and abundant early chlorite implies a lower temperature than the Main zone, approximately 350°C. Study of fluid inclusions, mainly from the Southern Tail, indicates that ore was deposited from a low-salinity fluid at temperatures that decreased from 400° to 200°C corresponding to the sulfide paragenetic sequence.

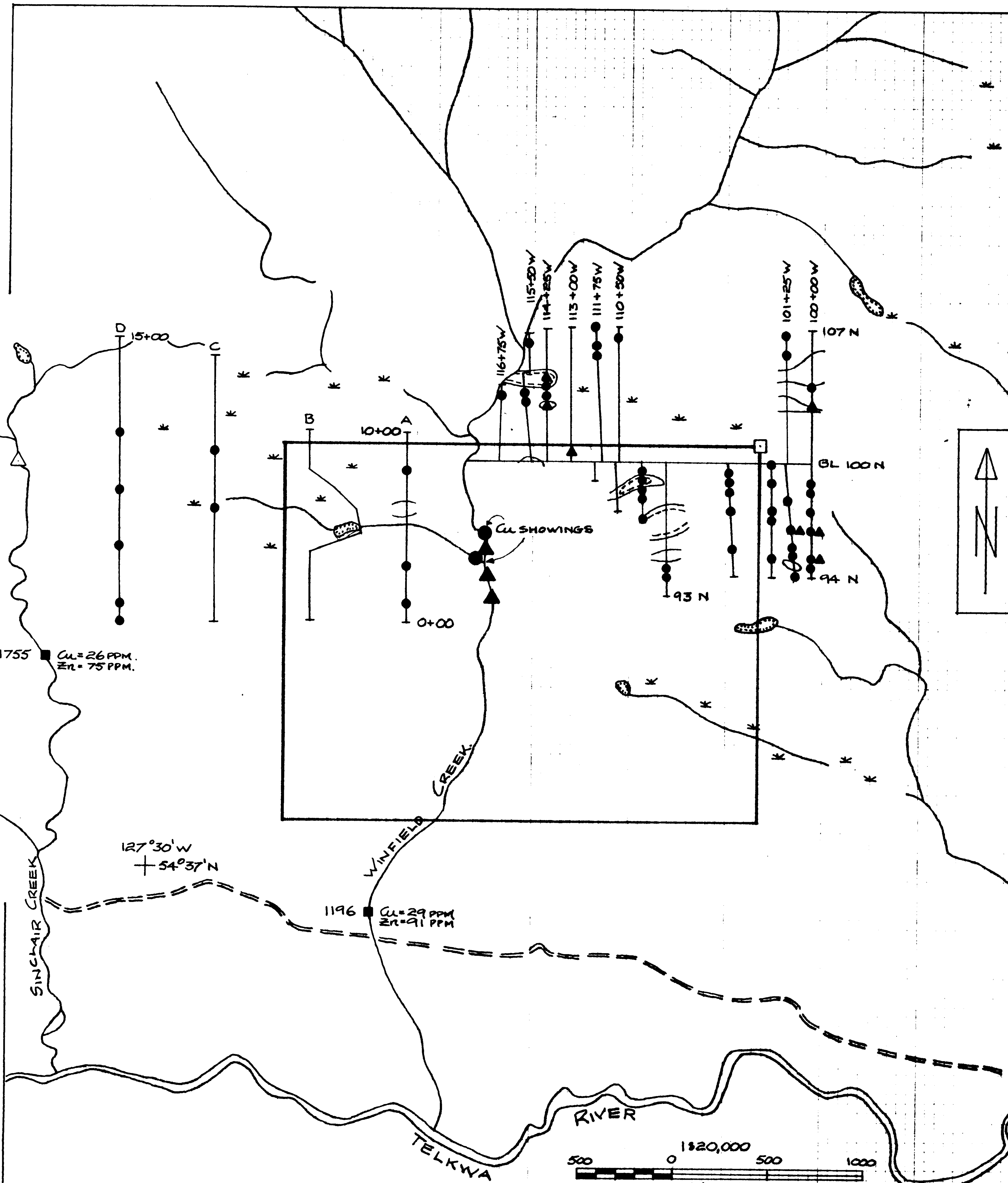
Whole-rock K-Ar dates of Southern Tail wall rock and a highly tourmalinized breccia more than 1 km from the Main zone both correspond closely to the older and more distant of the two Eocene stocks, a 59.4-m.y.-old quartz monzonite (cf. Wetherell, 1979). Although these features are distant from each other, mineralogical evidence also suggests a link between very weak sulfide development in the stock, the tourmaline breccia, and the ore zones. Fluid in the quartz monzonite was highly saline, whereas the tourmaline breccia was moderately saline and the ore-zone fluid was moderately saline initially but evolved to a gradually decreasing low-salinity fluid during the bulk of ore deposition. The data are consistent with an epithermal ore genesis model in which intrusive activity of quartz monzonite age heated acidic meteoric water to a high temperature and contributed a saline magmatic component to create an ore fluid. Movement of the ore fluid was controlled by structures and stratigraphy of the volcanic host rocks. Aluminous minerals formed mainly by an acid leaching reaction between the ore fluid and the wall rock but also involved desilication reactions that progressed under disequilibrium conditions.



WINFIELD CREEK PROPERTY
OMINECA M.D.
93L/11W
1:250,000

FIGURE 1.

APRIL, 1991.



LEGEND

COPPER IN SOILS ≥ 60, 90 PPM.

● ZINC IN SOILS ≥ >100 PPM.

▲ SILVER, POSSIBLY ANOMALOUS ≥ ≥ 0.6 PPM.

SAMPLES COLLECTED AND ANALYSED BY NORANDA, 1980-1982

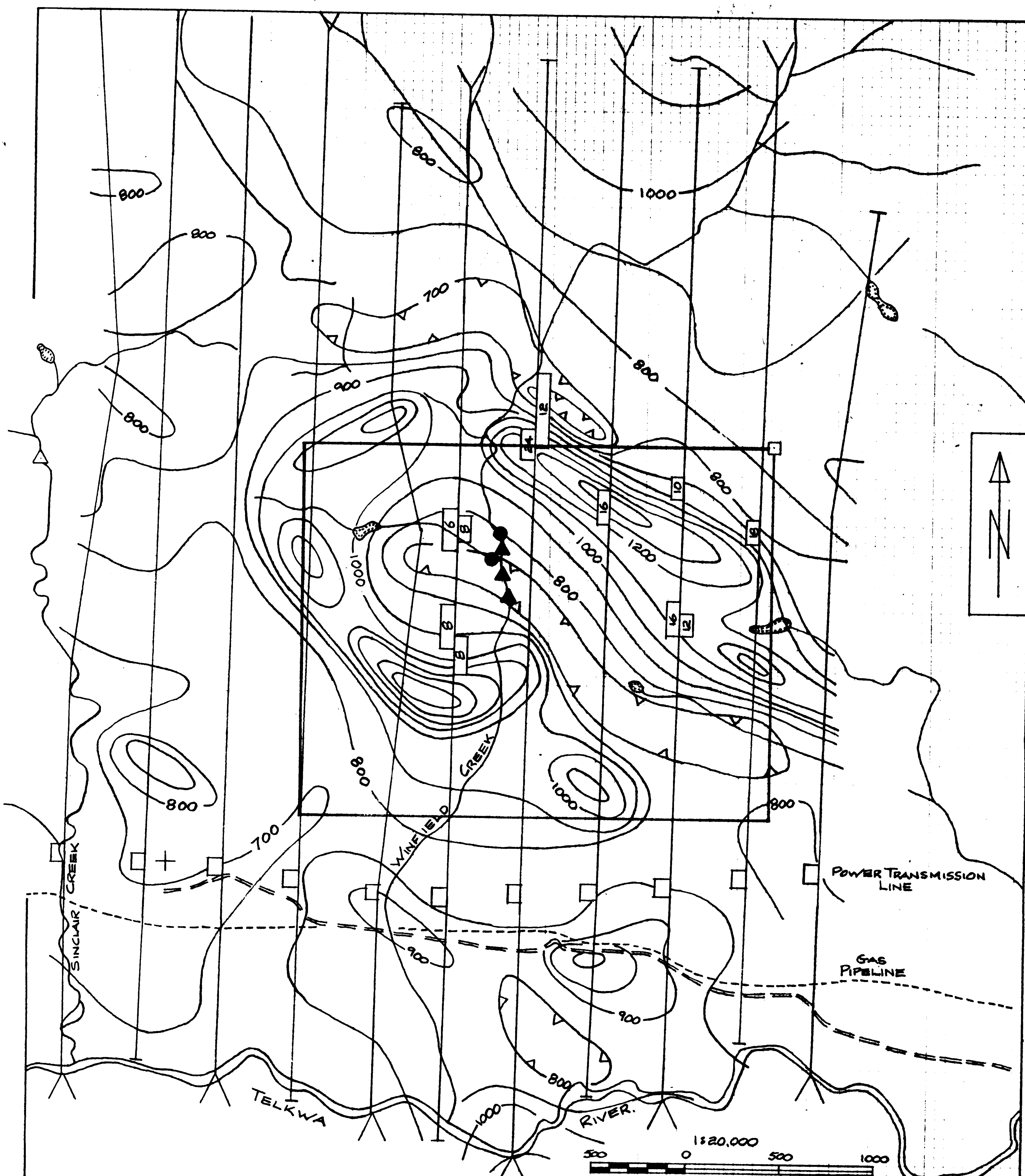
■ STREAM SEDIMENT ANALYSES - 1986 REGIONAL GEOCHEMICAL SURVEY, 93L/11.

WINFIELD CREEK PROPERTY.
OMINECA MINING DIVISION.

GEOCHEMISTRY

93L/11W	FIGURE 2	APRIL, 1991

109643



LEGEND

FLIGHT LINE AND DIRECTION.

MEAN TERRAIN CLEARANCE - 60 METERS.
FLIGHT LINE SPACING - 400 METERS.
MAGNETIC MEASUREMENT - TOTAL FIELD
- REF. LEVEL 57,000 nT.
- CONTOUR INT. - 100 nT.

VLF- MEASUREMENT - FIELD STRENGTH (HORZ. COMP.)
- TRANSMITTERS - SEATTLE
- ANNAPOLIS.

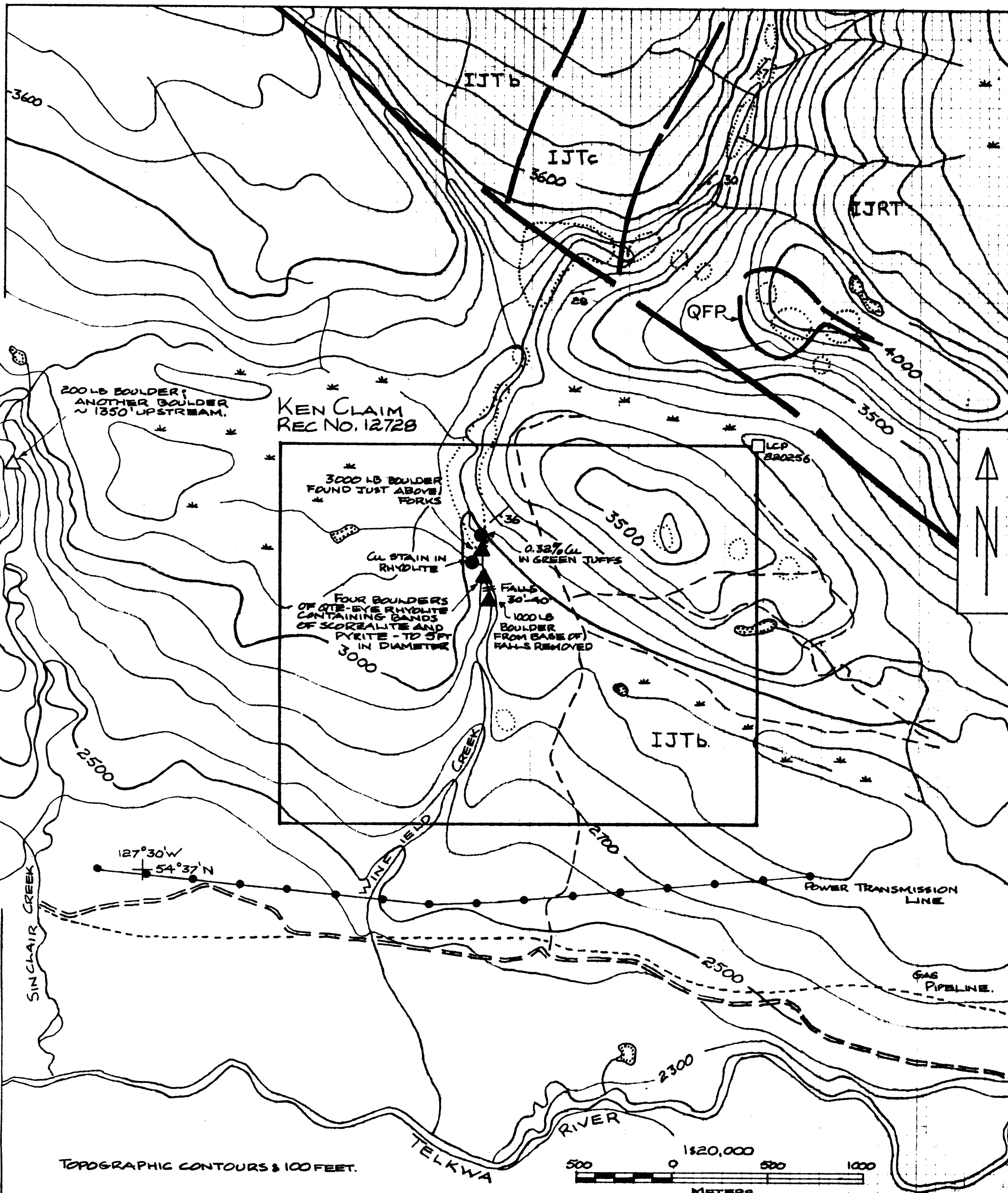
Tx.A. 12 | Tx.S. 10 — VFF-EM ANOMALY SHOWING % FIELD STRENGTH INCREASE.

SURVEY FLOWN BY NORANDA, OCTOBER 1980.

WINFIELD CREEK PROPERTY.
OMINECA MINING DIVISION

AIRBORNE MAG./VLF-EM

93L/11W	FIGURE 3	APRIL, 1991.



LEGEND

GEOLOGY LEGEND ON FOLLOWING PAGE

- ● COPPER SHOWING
- ▲ SCORZALITE-ANDALUSITE BOULDER(S)
- △ SCORZALITE-HEMATITE BOULDER.

NOTE: ACCORDING TO OLDTIME LOCAL RESIDENT (ART COPE), A COPPER SHOWING ON THE LOWER REACHES OF WINFIELD CREEK IS REPORTED TO HAVE YIELDED 20 FEET GRADING 5% COPPER. LORNE WARREN, WHO DISCOVERED THE SCORZALITE-ANDALUSITE BOULDERS, REPORTS FINDING AN OLD CAMPSITE AND TRENCH NEAR THE BOULDER OCCURRENCE AT THE FORKS.

WINFIELD CREEK PROPERTY.
OMINECA MINING DIVISION

GEOLOGY

FROM: GEOLOGY OF THE TELKWA RIVER AREA B.C. GEOL. SURVEY, OPEN FILE 1989-16.

93L/11W	FIGURE 4	APRIL, 1991.

109643

Ministry of
Energy, Mines and
Petroleum Resources

GEOLOGICAL SURVEY BRANCH

OPEN FILE MAP 1989-16

GEOLOGY OF THE TELKWA RIVER AREA

NTS 93L/11

D. MACINTYRE, P. DESJARDINS, P. TERCIER AND J. KOO

SCALE 1:50,000

LEGEND

LAYERED ROCKS

LOWER CRETACEOUS (ALBIAN)

SKEENA GROUP

lKS	*Red Rose Formation: shale, micaceous greywacke, chert pebble conglomerate, mudstone, coal bearing*

LOWER TO UPPER JURASSIC

HAZELTON GROUP

MIDDLE TO UPPER JURASSIC (CALLOVIAN TO OXFORDIAN)

muJA	*Ashman Formation: marine black shale, siltstone, greywacke*

MIDDLE JURASSIC (BAJOCIAN TO CALLOVIAN)

mJS	*Smithers Formation: feldspathic sandstone, greywacke, siltstone, shale, minor pebble conglomerate, very fossiliferous*

LOWER JURASSIC (PLEINSBACHIAN TO TOARCIAN)

lJRT	*Nilkitkwa Formation, Red Tuff Member: red, well-bedded air fall tuff, minor ash flow tuff*
lJN	*Nilkitkwa Formation: marine shale, calcareous siltstone, limestone, minor chert, conglomerate at base*

LOWER JURASSIC (SINEMURIAN TO LOWER PLEINSBACHIAN)

lJT	*Telkwa Formation: undivided andesite, dacite, rhyolite, basalt, flows and pyroclastics*
lJTc	*Siliceous Pyroclastic Facies: quartz-feldspar phyric ash flows, ignimbrite, breccia, siliceous air fall tuff, red tuff, basalt, rhyolite flows.*
lJTb	*Basalt Flow-Red Tuff Facies: amygdaloidal augite phyric basalt, basaltic tuff, red tuff and epiclastics*
lJTa	*Andesitic Pyroclastic Facies: andesitic air fall tuff, breccia, feldspar phyric andesite flows, feldspathic epiclastics, minor basalt, rhyolite*

INTRUSIVE ROCKS

LATE CRETACEOUS TO EOCENE

GD	*granodiorite; quartz dioritie; ;*
DR	*diorite, quartz diorite*
RH	*rhyolite, felsite*
FP	*feldspar porphyry*
BFP	*biotite - feldspar porphyry*
HFP	*hornblende - biotite - feldspar porphyry*
QFP	*quartz - feldspar porphyry*

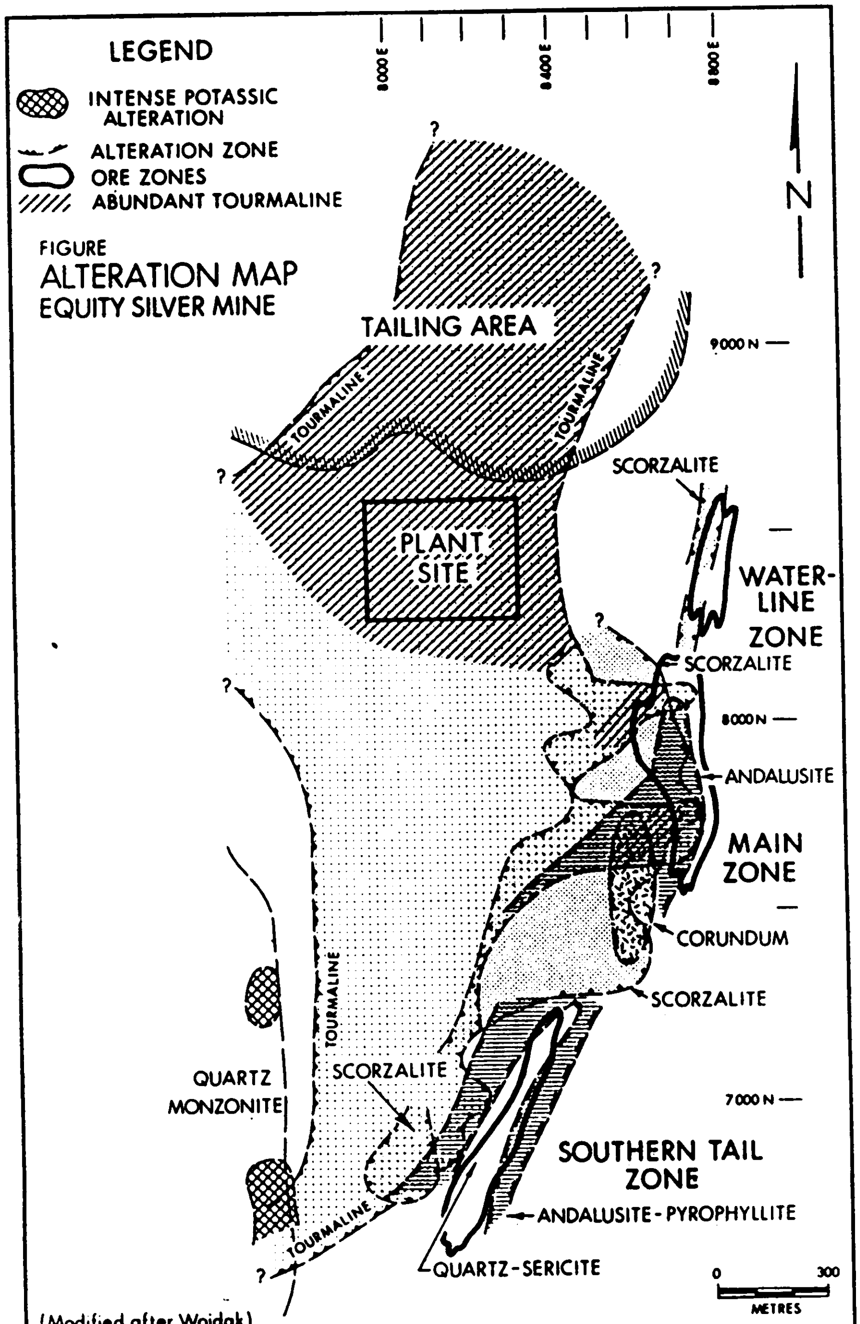


FIG. 6. Alteration map, Equity Silver mine.

FROM: EC. GEOL, VOL 79, 1984, PG. 954.

DEPOSITS AT EQUITY SILVER - AT SCALE OF 1:20,000.

FIGURE 5.