

820266

GEOLOGICAL, GEOCHEMICAL, AND DIAMOND DRILLING REPORT

ON THE ELF GROUP

AKIE RIVER AREA

OMINECA MINING DIVISION

N.T.S. 94-F-7

LATITUDE: 57° 18' N

LONGITUDE: 124° 42' W

BY:

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CYPRUS ANVIL MINING CORPORATION

APRIL 27, 1980.

FIELD WORK DONE DURING THE PERIOD: MAY 15 - OCTOBER 15, 1979.

TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF CLAIMS	
INTRODUCTION	1
LOCATION AND ACCESS	1
PREVIOUS WORK	3
CURRENT WORK	3
REGIONAL GEOLOGY	4
ORTHOPHOTO BASE MAPS	6
ELF GEOLOGY	7
AKIE RIVER PANEL	7
CONUNDRUM SILTSTONE PANEL	8
ELF SHOWING PANEL	10
SILURIAN SILTSTONE THRUST PANEL	10
ECONOMIC GEOLOGY	11
SHOWING AND FLOAT OCCURRENCES	11
DIAMOND DRILLING	13
GEOCHEMICAL SURVEYS	16
CONCLUSIONS AND RECOMMENDATIONS	16
REFERENCES	20

FIGURES

Figure 1	Location Map	1:250,000	2
Figure 2	Photomicrograph of Float Mineralization		12

TABLES

Table I	Table of Formations	5
Table II	Regional Silt Sampling Program - Calculated Thresholds	17

APPENDICES

Appendix I	Statement of Qualifications
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MAPS

			<u>Scale</u>
Map No. 1	Grid Location Map	Sheets 1 & 2	1:10,000
Map No. 2	Grid Location Map		1:5,000
Map No. 3	Geology Map (For Legend see Map No. 4)	Sheets 1 & 2	1:10,000
Map No. 4	Lithostratigraphic Column		
Map No. 5	Geology Map (For Legend see Map No. 4)		1:5,000
Map No. 6	Geological Cross-sections		1:5,000
Map No. 7A	Drill Sections		1:100
Map No. 8	Soil Geochemical Values - Lead	Sheets 1 & 2	1:10,000
Map No. 9	Soil Geochemical Values - Zinc	Sheets 1 & 2	1:10,000
Map No. 10	Soil Geochemical Values - Barium	Sheets 1 & 2	1:10,000
Map No. 11	Soil Geochemical Values - Lead		1:5,000
Map No. 12	Soil Geochemical Values - Zinc		1:5,000
Map No. 13	Soil Geochemical Values - Barium		1:5,000

LIST OF CLAIMS - ELF GROUP

<u>Claim No.</u>	<u>Record No.</u>	<u>No. of Units</u>	<u>Recording Date</u>
1	1215	6	June 23, 1978
2	1216	6	June 23, 1978
3	1217	4	June 23, 1978
4	1218	10	June 23, 1978
5	1219	4	June 23, 1978
6	1220	10	June 23, 1978
7	1221	4	June 23, 1978
8	1222	18	June 23, 1978
9	1223	8	June 23, 1978
10	1224	8	June 23, 1978
11	1225	12	June 23, 1978
12	1226	1	June 23, 1978
13	1247	20	July 18, 1978
14	1248	20	July 18, 1978
15	1249	2	July 18, 1978
15 ?	1295	9	August 1, 1978
16	1804	5	June 22, 1979
17	1805	3	June 22, 1979
18	1951	4	August 13, 1979

GEOLOGICAL, GEOCHEMICAL, AND DIAMOND DRILLING REPORT
ON THE ELF GROUP

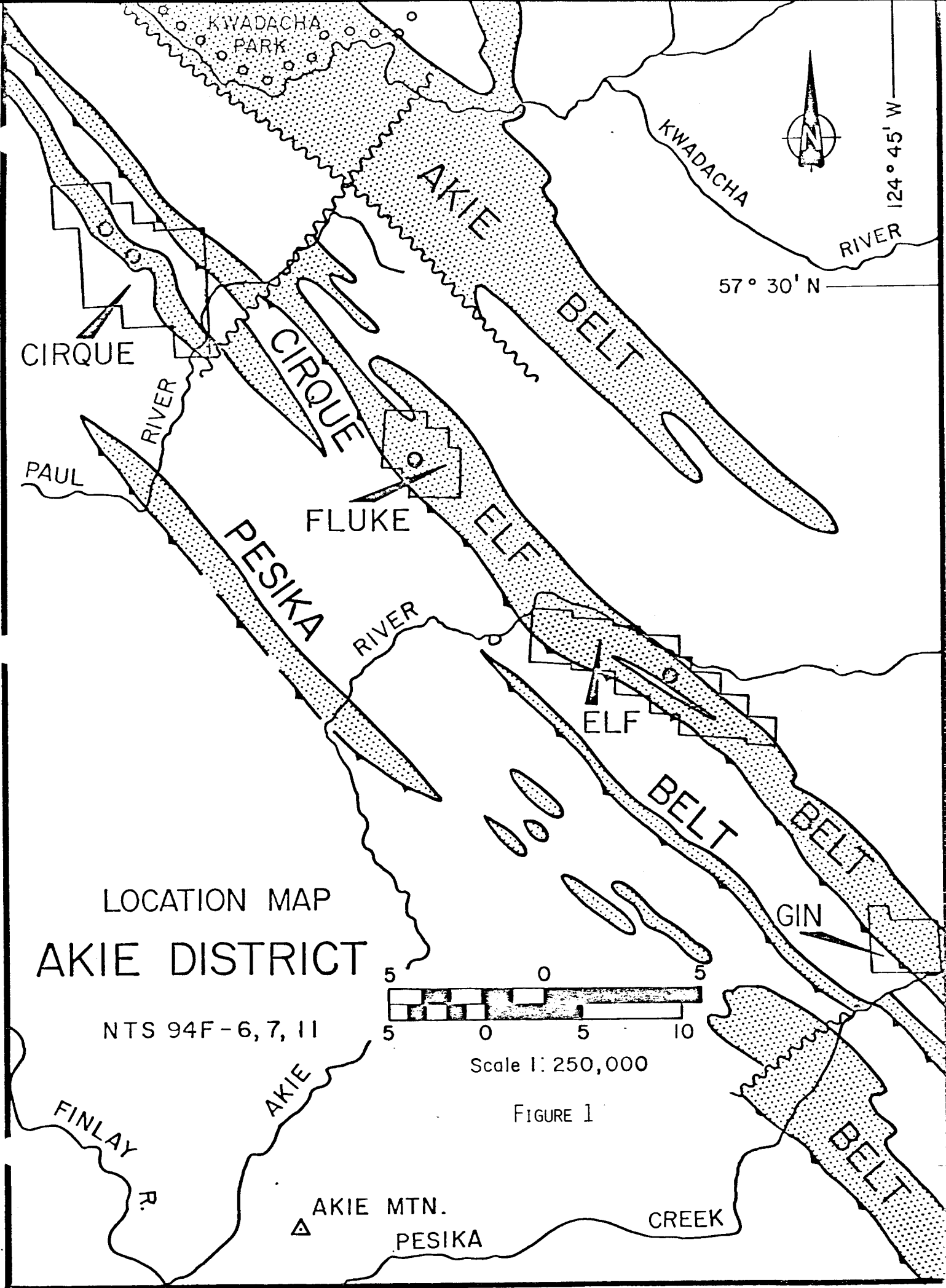
INTRODUCTION

The ELF GROUP, totalling 142 units, was staked in early June, 1978, to cover several moderate lead-zinc anomalies in tributaries of the Akie River and a float occurrence of high-grade stratiform barite-lead-zinc mineralization in Elf Creek. The area is underlain by a thick succession of Upper Devonian "Black Clastics", which host potentially economic lead-zinc deposits on the nearby Cirque and Driftpile Creek properties as well as the TOM-JASON claim groups in eastern Yukon.

LOCATION AND ACCESS

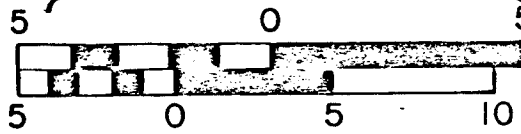
The ELF GROUP is located in the Ft. Ware area in northern British Columbia. The claims cover the south slope of the Akie River valley between the river and interfluvial ridge to the south (Figure 1). The centre of the claim group, located at latitude $57^{\circ} 124^{\circ} 42' W$, is roughly 35 kilometres on a bearing of 035 degrees from Akie Mountain.

Field work on the ELF GROUP was conducted with a helicopter borne program based at Pretzel Lake, 38 kilometres to the west. Logistical support was provided by float equipped fixed wing aircraft based at Mackenzie, 250 kilometres to the south.



LOCATION MAP
AKIE DISTRICT

NTS 94F-6, 7, 11



Scale 1:250,000

FIGURE 1

PREVIOUS WORK

Preliminary geological mapping, on a scale of 1:10,000, was conducted over the entire claim group in 1978. The preliminary geochemical program of 140 stream sediment samples and 350 soils along 8 widely spaced lines was completed during the 1978 field season. Nine kilometres of chain-saw grid was established along two northwest trending base lines and one cross-line to provide control for a chain and compass grid between Joel and MacIssac Creeks. Approximately 960 soils were taken at 50 metre intervals along the grid lines. Six kilometres of horizontal loop E.M. survey were conducted in an attempt to relate electromagnetic response to geologic units and possibly mineralization.

CURRENT WORK

In March, 1979, orthophoto base maps at scales of 1:5,000 and 1:10,000 were prepared for detailed work on the claim group. During the period May 15 to October 15, 1979, a base camp was established at Pretzel Lake and a detailed mapping program, on scales of 1:5,000 and 1:10,000 was initiated on the ELF Claims. The anomalies outlined in 1978 were followed up and the ELF showing was discovered as a source of the spectacular float. Cross-cutting and longitudinal trenches were dug to expose the mineralization.

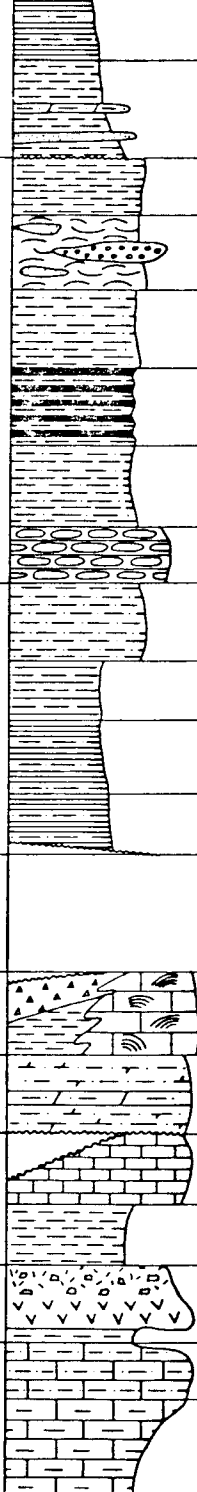

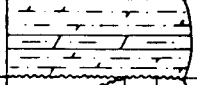
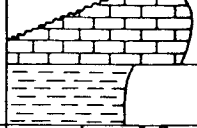

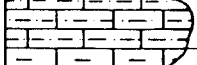
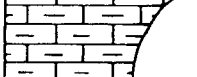
In June and August 1979, ELF Claims 16, 17, and 18 were staked to cover promising ground between existing claims. In July 1979, a total of 15.2 kilometres of chain-saw base line and 9 kilometres of axe and macheté cross-lines were cut. Approximately 2,520 soils were taken at 50 metre intervals along most grid lines and 25 metre intervals in the vicinity of the showing.

Drill pads were constructed above the ELF showing and in the bed of Elf Creek, upstream of the geologically mapped and inferred mineralized horizon. Five holes totalling 1,052 metres were drilled. One drill pad was constructed on the north side of Elf Creek for 1980 drilling.

REGIONAL GEOLOGY

Lower Devonian to Mississippian rocks are preserved in a series of synformal fold keels and thrust plates that form four sinuous, semi-continuous, northwest-trending belts (Figure 1). This package lies unconformably on an orange-weathering dolomitic siltstone of Silurian age and is structurally overlain by Cambrian to Silurian lithologies belonging to the Kechika, Road River and Silurian Siltstone units. The Devonian to Lower Mississippian section can be split into four main subdivisions. The Lower to Middle Devonian limestones and shales are characterized by massive, grey, fossiliferous limestone and limestone debris flows that grade into graptolitic shales, cherts and distal turbidites. The Akie Shale, consisting of shales, silty shales and siltstones is a distal turbidite package that unconformably overlies Lower to Middle Devonian rocks. The Akie Shale may be correlative with the Besa River Formation. The Gunsteel Formation, consisting of silvery-grey weathering, black, siliceous, carbonaceous, shale, chert and argillite conformably overlies the Akie Shale and is host for all known barite-sulphide mineralization and most of the known barren stratiform barite deposits in the region. The Warneford Formation, composed of polymictic conglomerate and interbedded silty shale and dolomitic siltstone unconformably overlies the Gunsteel.

TABLE I: TABLE OF FORMATIONS ON THE ELF PROPERTY

AGE	FORMATION OR GROUP	STRATIGRAPHIC COLUMN (NOT TO SCALE)	MAP UNIT	LITHOLOGY
EARLY MISSISSIPPIAN	WARNEFORD FORMATION M _W		9B	shale: rusty brown weathering, dark brown-grey, distinctly laminated, silty.
	unconformity		9A	shale: rusty brown weathering, dark brown, indistinctly bedded, silty, with interbeds of lithic sandstone and orange dolomitic siltstone.
LATE DEVONIAN	GUNSTEEL FORMATION UD _{GS}		8W	shale: undivided gunsteel weathering black siliceous.
			8U	shale: gunsteel weathering, black graphitic shale with light grey siltstone beds, lenticular cleavage.
			8S-8C	shale: gunsteel weathering, black, siliceous, laminated with graphitic partings, with nodular chert, pyrite and barite.
			8E to 8R	barite, galena, sphalerite and pyrite interbedded with black siliceous shale --see Map 7A.
	8C-8S		shale: gunsteel weathering, black, siliceous, laminated with graphitic partings with nodular chert, pyrite and barite.	
	8A		porcellanite: ribbon-bedded, gunsteel weathering black, interbedded with shale.	
	7E		siltstone: light silvery-grey to grey weathering, speckled, black, competent, quartzose siltstone to sandstone.	
EARLY TO MIDDLE DEVONIAN	AKIE SHALE UD _{SH}		7D	shale: large cleavage plate, rusty brown weathering, soft, black.
		7B	shale: pin-striped to banded, rusty grey to light grey weathering, dark brown, with siltstone laminae.	
		7A	shale: grey weathering, distinctly bedded, laminated, grey, silty.	
		6F	shale: black, graphitic.	
		6D	breccia: thin to thick, graded bedded; of chert, quartz sand and shale chips; interbedded with black graphitic shale.	
SILURIAN	PAUL RIVER FORMATION LD _L		6D, 6F, 6A	limestone: grey, thick bedded, fossiliferous (stromatoporoids, corals, crinoids, some in growth position).
	SILURIAN SILTSTONE SS		5A	siltstone: light orange weathering, bioturbated dolomitic to calcareous, laminated to massive.
ORDOVICIAN TO SILURIAN	ROAD RIVER GROUP OS _{RR}		4D, F, H	limestone: buff to light grey weathering rhythmic graded beds of calcarenite to calcilutite.
	unconformity		4A	shale: buff to light grey weathering, black, graphitic graptolitic.
ORDOVICIAN	ORDOVICIAN VOLCANICS O _V		2	volcanics: orange-weathering dominantly mafic sills and highly calcareous flows, breccias and tuffs.
CAMBRIAN TO ORDOVICIAN	KECHIKA GROUP EO _K		1B	dolostone: orange-buff to cream weathering nodular dolomitic, silty limestone.
			1A	limestone: monotonous silvery grey-weathering fine-grained shaly limestone with laminated planar bedding and distinctive limestone nodules.

ORTHOPHOTO BASE MAPS

Two base maps covering the area of interest on the ELF GROUP were prepared by McElhanney Surveying and Engineering Ltd. of Vancouver, B.C. in March 1979. The 1:10,000 scale orthophoto base map, covering the entire claim group, was constructed using the existing Federal Government aerial photography flown at an average scale of 1:30,000 during 1948. Stereo pairs were aerotriangulated in a Wild A8 autograph and adjusted to the best available ground control derived from the existing 1:250,000 scale map on N.T.S. sheet 94-F.

The contour compilation was done directly at a mapping scale of 1:10,000 with a 20 metre contour interval. In addition to the contours several spot elevations were plotted. The contour compilation was drafted by the scribing technique and one clear contour overlay was reproduced. An orthophoto negative was produced from the existing photography and photomechanically enlarged to a scale of 1:5,000 using ground control from the aerotriangulation. The orthophoto mosaic was prepared using all of the control points.

A 1:5,000 scale orthophoto base map covering our present area of interest was also constructed to give us better control for the detail geological mapping and diamond drilling program. The 1:5,000 scale orthophoto with 10m contours, constructed from existing 1:20,000 scale British Columbia Provincial aerial photography, was drafted and scribed by similar techniques used to produce the 1:10,000 orthophoto.

In late summer of 1979 the area was surveyed and flown by McElhanney Surveying and Engineering of Vancouver, B.C. They produced aerial photographs at scales of 1:10,000 and 1:20,000. These were used to construct orthophoto base maps at scales of 1:5,000 and 1:2,000 to cover areas of principal interest using similar techniques as for the previous orthophoto maps.

ELF GEOLOGY

The ELF Claims are in the middle Elf Belt of Black Clastics (Figure 1), on the southwest flank of the Kwadacha Reef (see Regional Geological Report, 1979). Most of the units described in the REGIONAL GEOLOGY REPORT are present on the ELF Claims. They are listed in Table I. The rocks are poorly exposed on heavily treed sloping terrane and in the sides of cross-cutting creeks in the Akie River valley. The geology of the ELF Claims is divided into four structural panels that trend at about 130° . They are described below, from northeast to southwest.

AKIE RIVER PANEL

The Akie River Panel is a graben bounded on the northeast by a major high-angle reverse fault that strikes at about 135° . This, the Silver Creek Fault, juxtaposes Kechika Group and Ordovician Volcanics on the northeast side against Silurian Siltstone to Black Clastic strata on the southwest side. The interpreted MacIssac's Fault on the southwest side of the graben has approximately the same strike but a smaller, opposite throw.

The Akie River Panel has exposures of Silurian Siltstone to Gunsteel shales that are deformed into open folds. The folds are interpreted to plunge southeasterly in order to explain the end of outcrop of the Silurian Siltstone at the mouth of Elf Creek and the end of the ribbon porcellanite, Unit 8A, just west of there. The termination of these outcrops could be equally well explained by an east-west normal fault shown on the regional map as the Akie Fault.

The Silurian Siltstone is distinctly laminated and well-cleaved dolomitic siltstone. It is overlain by Middle Devonian limestone,

Unit 6A, which is only a few metres thick on the southwest limb of the Silurian Siltstone anticline. Unit 6A pinches out to zero toward the southeast. The Silurian Siltstone and Middle Devonian limestone are overlain by a thick sequence of poorly exposed, laminated silty shales (7A) in Elf Creek. Waterfall-forming ribbon porcellanite (8A) and undivided Gunsteel (8W) overlie the shales and are preserved in an open syncline in Elf Creek. Ribbon porcellanite and Gunsteel shales appear to directly overlie the Middle Devonian Limestone adjacent to the Silver Creek Fault.

CONUNDRUM SILTSTONE PANEL

The Conundrum Siltstone Panel is bounded on the northeast by MacIssac's, Fault and on the southwest by the Conundrum Anticline and Fault. This panel is characterized by a very thick sequence of Akie Shale. The thick Pinstriped Shale (7B) is overlain by distinctive speckled weathering Conundrum Siltstone (7E). These two members are folded into a broad anticline which plunges and twists anticlockwise to the northeast. In the northeast corner of the ELF Claims,, MacIssac's Fault is interpreted to cross the Akie River just east of exposures of chert and shale-chip breccia interbedded with graptolitic shales. The breccia is assigned to the Early Devonian Paul River Formation, member 6D. The breccia dips to the southwest and is structurally overlain by siltstones (7A1) and the Pinstriped Shale. These shales are in turn overlain by the Conundrum Siltstone which is folded into an open to tight syncline. Undivided Gunsteel shales are in the core of this syncline where it crosses Joel's Creek.

The natures of the Conundrum Anticline and Conundrum Fault are poorly understood. The siltstone is clearly mappable

along much of the panel but the attitude of the siltstone changes from creek section to creek section. Between Ian's Creek and Joel's Creek both a syncline and anticline are shown by outcrop data. At Joel's Creek only the syncline is exposed. Between Joel's and Elf Creeks the siltstone dips consistently southwesterly. It is completely absent in Elf Creek. It dips southwest between Elf and MacIssac's Creek; and northeast in MacIssac's Creek. On the ridge southeast of the ELF Claims, the siltstone forms a broad anticline cored by the Pinstriped Shale. The interpretations shown in the Elf Creek and Joel's Creek cross-sections are two of many. The Conundrum Fault is tentatively interpreted as a high angle reverse fault cutting approximately through the axis of the Conundrum Anticline.

ELF SHOWING PANEL

The ELF Showing Panel is bounded by the Conundrum Fault and the Maxi Thrust. It contains the ELF Showing. It exposes hundreds of metres of Gunsteel Formation: siliceous laminated "Pregnant Shale" (8C=8S) with varying amounts of nodular chert, pyrite, barite, calcite; laminar banded pyrite; and barite-lead-zinc sulphides.

On Ian's Creek there are over 800 metres of discontinuously exposed Pregnant Shale, dipping at about 80° consistently to the southwest. Near Elf Creek and in ELF drill hole 79-E-04A, there are abundant "S" structures and bedding steeper than cleavage on the southwest side of the panel. Therefore much of the panel is interpreted as a tight to isoclinal, northeastward overturned syncline in the Pregnant Shale (see Diamond Drilling). In the core of the syncline there are local exposures of Unit 8U, lenticular-cleaved black graphitic shales with siltstone interbeds. Stratigraphically above the Gunsteel-weathering rocks there is rusty brown weathering, dark brown-

grey, well-cleaved shale with distinct to indistinct laminations. This is tentatively assigned to map-unit 9B.

SILURIAN SILTSTONE THRUST PANEL

The Silurian Siltstone Thrust Panel is a tightly folded sequence of Kechika Group, Ordovician Volcanics, Road River Group Shales, Silurian Limestones, Silurian Siltstone, Akie Shale, Gunsteel Formation and possibly Warneford Formation. These are thrust over the Showing Panel from the southwest.

On the southwest side of the panel there is a steeply dipping to westward overturned sequence of Kechika Group to Silurian siltstone. This constitutes the partly overthrust, southwest limb of the overturned syncline of Akie to Warneford Shales. The Akie Shale is very thin and silty. In most places the Gunsteel Formation is the first rock type exposed above the siltstone. The Gunsteel includes a Pregnant Shale, Unit 8C, very much like that in the Showing Panel and a graphitic lenticular-cleaved shale, Unit 8U. The Warneford Shale which is mapped as Unit 9B is rusty weathering, dark brown, indistinctly laminated, soft and silty. It has very large flat cleavage plates.

The northeast side of the panel is an overturned anticline which is thrust along the Maxi Thrust over the Gunsteel Panel. The limbs of the anticline in Elf Creek expose Silurian Limestone directly adjacent to the Silurian Siltstone. The core of the overturned anticline is silvery-grey weathering black, siliceous, graptolitic shales of the Road River Group. This structural style is identical to that of the Kechika Panel on the FLUKE Claims except that the overturned anticline west of the FLUKE Claims is truncated by the Fluke Fault.

ECONOMIC GEOLOGY

SHOWING AND FLOAT OCCURRENCES

Follow-up of the 57,000 ppm lead anomaly on the east side of Elf Creek revealed a small kill zone below an outcrop of interbedded barite-sulphides and green to black siliceous shales. The bedding dips about 50° toward 205° . Trenching revealed a stratigraphic thickness of more than 6 metres of barite-sulphides underlain by phyllitic, rusty-weathering, soft grey shales with nodular barite. The showing was also trenched for a lateral distance of over 50 metres down the hillside. Individual samples assayed over 14% Pb+Zn with over 20 grams per tonne Ag.

Cobbles to spectacular boulders of barite and sulphides occur at three localities on Elf Creek: directly downslope of the showing; about 100 metres downstream of Baseline 200 N; and near the crest of the anticline of Pinstriped Shale about 1 kilometre from the mouth of Elf Creek. The best of these boulders assayed 31 to 52 percent combined lead and zinc with 45 to 110 grams per tonne silver.

The barite and sulphides in the showing and float are finely laminated to massive bedded with sedimentary faults and folds. Many of the folds are also tectonic in origin. Some of the barite and sulphides are coarsely crystalline and massive in texture.

In polished section (Figure 2), the ELF float shows interlocking grains of galena and barite that average 50 to 100μ . There is a spatial association of the interstitial galena and euhedral barite. The pyrite is fine-grained ($<30\mu$) and spatially associated

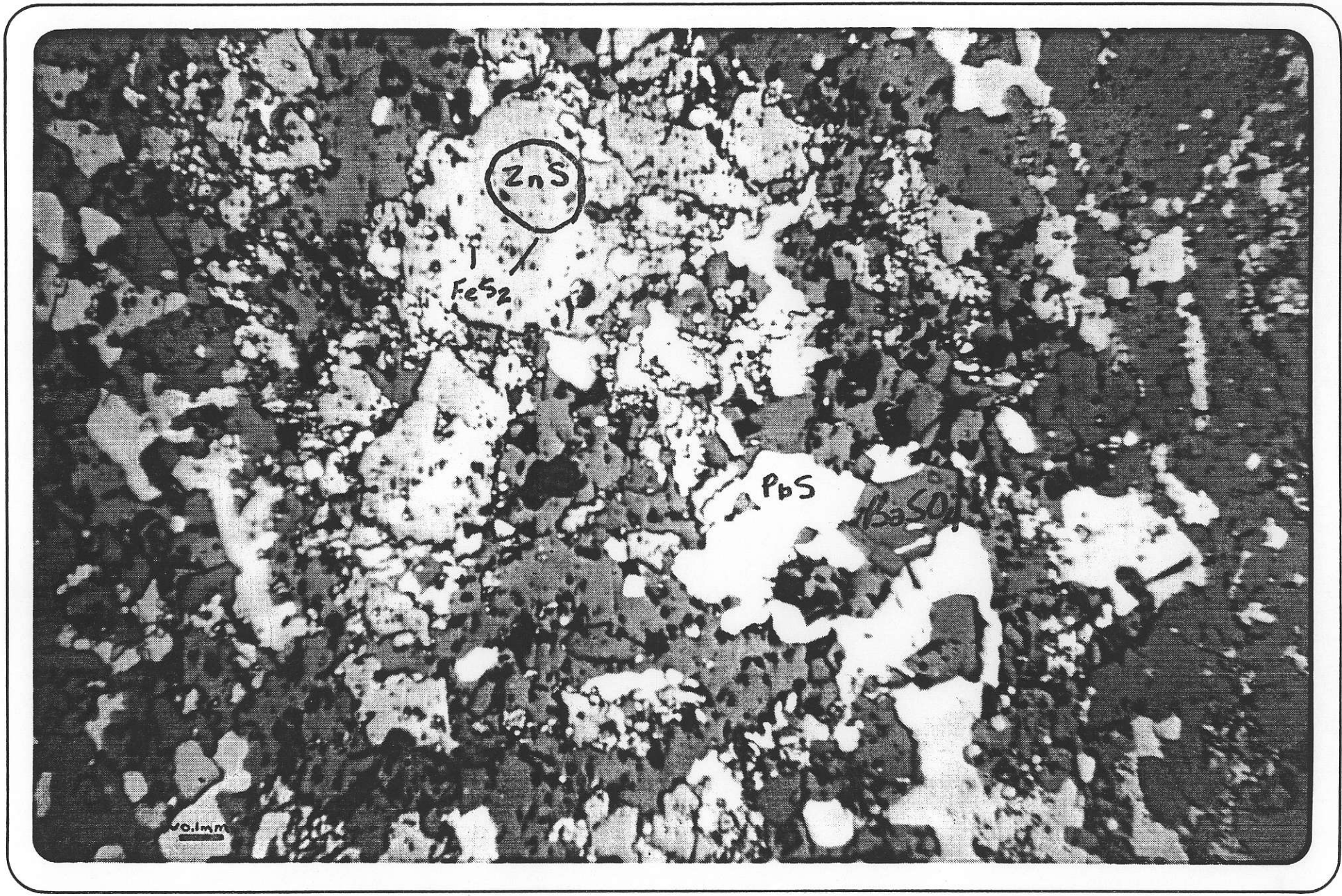


FIGURE 2 PHOTOMICROGRAPH OF FLOAT MINERALIZATION

with sphalerite grains that average 30 to 100 μ . The sphalerite encloses pyrite grains and is subhedral. The float has a high barite content and low pyrite content. This contrasts with the 8J sulphide beds in core.

DIAMOND DRILLING

One Longyear Super "38" drill contracted by J.T. Thomas of Smithers, B.C. was used. The holes were started with NQ equipment and reduced to BQ at depth. Five holes were drilled to test the grade and extent of the Elf Showing. Three short holes, 79-E-01 to 79-E-03, totalling 553 metres were drilled from the pad above the showing. One short hole, 79-E-04, and one long hole, 79-E-04A, totalling 498.7 metres were drilled from the pad in the creek.

The three holes drilled from above the showing were unsuccessful due to technical problems. Holes 79-E-01, 02, and 03, were aborted because they lost water. Hole 79-E-01 was successful until the bit broke off just above the mineralization. An attempt to drill through the bit resulted in lack of ore recovery through most of the mineralized horizon. The ore horizon was estimated to be about 28 metres thick. The best assay was 10.7 percent Pb+Zn and 12.0 grams per tonne Ag over an estimated interval of 5.5 metres.

The first hole drilled in Elf Creek was stopped at 56.7 metres due to binding of the rods in creek gravels. The second hole, 79-E-05, was triconed to 31.6 metres, then drilled successfully to a depth of 442 metres. It intersected potentially economic barite-sulphides from 250.1 to 278.5 metres. The Gunsteel Formation at the start of the hole and including the barite-sulphides has dominantly "S" small-scale structures. Therefore

the barite-sulphide zone was interpreted to be on the west limb of an overturned syncline. Drilling was continued in an attempt to intersect the opposite limb of the syncline. It entered a zone of dominantly "Z" structures at 385 metres, suggesting that the axis of the syncline had been crossed. Unfortunately, the hole had to be stopped while still in potentially economic Pregnant Shale because it had deviated to a plunge of less than 26° and the rods were binding.

The barite-sulphide intersection zone is illustrated by the detailed section, Map 7A in pocket. The zone is bracketted approximately symmetrically by Unit 8Q which is distinctly bedded, 30 to 50%, massive, laminated pyrite; 50% massive, siliceous shale to porcellanite and 5 to 20% calcareous siltstone turbidites. On the outside of 8Q there are massive, black, siliceous argillites with locally abundant calcite and barite nodules, and about 10 to 30% interlaminated to interbedded pyrite. These argillites are very much like 8S, the Pregnant Shale on the Cirque Claims. They are correlated as one of the rock types within the surface map-unit 8C.

The true thickness of the barite-sulphide zone is about 21.7 metres, using an average bedding: core-axis angle of 50° . The best section is a true thickness of 4.3 metres of 7.85 percent Pb+Zn combined and 18.5 grams per tonne Ag. This includes 2.5 metres of 10.47 percent Pb+Zn and 21.4 grams per tonne Ag.

Of the total thickness of the barite-sulphide zone, 12.6 percent is massive barite-sulphide; 27.7 percent is massive laminated pyrite with minor galena, sphalerite and interbeds of porcellanite; 59.6 percent is siliceous black shale and porcellanite with nodules of calcite and barite. The high proportion of shale

and the thinly bedded nature of the barite-sulphides is in marked contrast to the massive Cirque deposit.

The barite-sulphide zone is crudely symmetrical: about the middle 1/3 has most of the barite sulphide beds. The outer 2/3 are mainly siliceous argillite to porcellanite with the majority of the laminar banded pyrite.

The main barite-sulphide units are 8J4, 8J6, and 8J7. These units are mineralogically the same as 8J on the Cirque: pyrite, barite, galena and sphalerite. They are about 10% Pb, 6.5% Zn and 4 grams per tonne Ag. They differ in being medium to finely crystalline with fine laminae. The label 8J was used rather than erecting a new unit because there are so many units already. The label 8L: massive recrystallized barite, sphalerite, galena with minor pyrite was used to describe the Elf Showing but does not apply to the mineralization in drill core, which has significant pyrite.

The 8R units are interbedded 50 to 80% laminated pyrite and 20 to 50% black porcellanite. These are similar to the Cirque pyrite beds and run about 0.1 to 0.6% Pb, 0.1 to 9% Zn and 10 to 20 grams per tonne Ag. The Zn and especially Ag thus appear to be associated with the pyrite. The 8Q4 unit, structurally below the last bed of barite-sulphides, is 23.7 metres of interbedded 50% massive porcellanite 45% laminated to massive pyrite and 5% calcareous siltstone turbidites. This unit is barren, with at most 0.4% Pb+Zn and 13 grams per tonne Ag.

GEOCHEMICAL SURVEYS

During June, July and August, 1979, approximately 2,520 soil samples were taken on the ELF GROUP. Over most of the group the lines were spaced at 100 metres and samples were taken every 50 metres. In the vicinity of the Elf Showing the lines were 50 metres apart and sample stations 25 metres apart. Maps 8 to 13 show the results of lead, zinc and barium at scales of 1:5,000 and 1:10,000.

As in the Cirque area, lead was found to be the best indicator of mineralization. The Elf Showing was reconfirmed as a tremendous anomaly. A similar smaller anomaly was found on the opposite side of Elf Creek at about the same altitude. The Elf Showing Panel is anomalous along the entire length sampled and there are numerous anomalies over 200 ppm that must be followed up.

The Conundrum Siltstone Panel also has anomalous lead values. These occur in the Pinstriped Shale, Unit 7B. The pinstriped shale crops out in Elf Creek where some of the spectacular float occurs. The soil geochemistry suggest that even if the pinstriped shale is Akie Shale, not Gunsteel, there is still potential for lead-zinc mineralization.

CONCLUSIONS AND RECOMMENDATIONS

A northwest trending belt of Upper Devonian black clastics, unconformably overlying Mid-Paleozoic shale, siltstone and limestone, has been outlined in an imbricate thrust slice in the Gataga area in northern British Columbia. Regional mapping and preliminary widely spaced silt sampling along this thrust panel resulted in the discovery of stratiform sulphides on the ELF Group in 1978.

Preliminary soil and silt sampling in 1978 outlined several areas on the property that may contain stratiform barite-lead-zinc mineralization. Detailed soil sampling; mapping and comparism with the geology

TABLE II

REGIONAL SILT SAMPLING PROGRAM

CALCULATED THRESHOLDS

(ALL VALUES IN PPM)

UNIT		LEAD	ZINC	BARIUM
WARNEFORD		19	240	150
GUNSTEEL	CHERT & SHALE	28	680	555
	THICK BEDDED ARGILLITE	63	1240	420
	RIBBON CHERT	35	845	375
BESA RIVER		20	335	380
MID DEVONIAN LIMESTONE		18	310	250
SILURIAN SILTSTONE		21	365	330
ROAD RIVER		20	1640	620

of the Cirque Property in 1979 and 1980 has shown that the geochemical anomalies and showing occur at favourable stratigraphic horizons. These stratigraphic horizons are mapped for strike lengths of one to five kilometres and extend down-dip possibly 500 metres or more.

The one successful drill hole, in Elf Creek, intersected 21.7 metres of potentially economic barite-sulphide mineralization at a depth of 250.1 metres. This horizon is clearly the same one as at the Elf Showing, 350 metres to the northwest. Soil geochemical sampling suggests this horizon extends for the same distance to the southeast.

Recommendations for the 1980 field season are as follows:

- 1) One hole must be drilled northeast of the anomalous float 1 kilometre from the mouth of Elf Creek. This will test the stratigraphic position and economic potential of the Pinstriped Shale.
- 2) Several holes must be drilled southwest of the Elf Showing Panel to test the down-dip extension and strike-length of the mineralization.
- 3) At least one hole must be drilled downstream of the Elf Showing to test the hypothesis of the overturned syncline; establish the stratigraphic position of the Conundrum Siltstone; and define the nature of the Conundrum Fault.
- 4) Geochemical sampling must be extended southwest of Baseline 200 N to cover the Elf Showing Panel southeast of MacIssac's Creek. Sampling should also be extended northeast to Baseline 210 N to cover possible Gunsteel strata there.
- 5) The anomalies between Baselines northwest of Joel's Creek should also be followed up by detailed sampling, prospecting and drilling where results are encouraging.

- 6) Remapping and comparison of stratigraphy of the ELF, FLUKE, and CIRQUE CLAIMS is important to try to reduce the number of rock units and to establish key correlative strata.

Respectfully submitted,

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April 27, 1980.

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STATEMENT OF QUALIFICATIONS

I, CHARLES W. JEFFERSON, geologist, with business address in Vancouver, British Columbia, and residential address in Vancouver, British Columbia, hereby certify that:

1) I graduated from Carleton University in 1973 with a BSc majoring in Geology.

2) I graduated from the University of Western Ontario in 1977 with a MSc majoring in Geology.

3) I am completing a PhD in geology at the University of Western Ontario.

4) From 1973 to the present I have been actively engaged in geological mapping and mineral exploration in Canada.

5) I am a member of the Geological Association of Canada and the Society of Economic Palaeontologists and Mineralogists.

6) I personally participated in the field work on the ELF GROUP and have interpreted all data resulting from this work.

CHARLES W. JEFFERSON