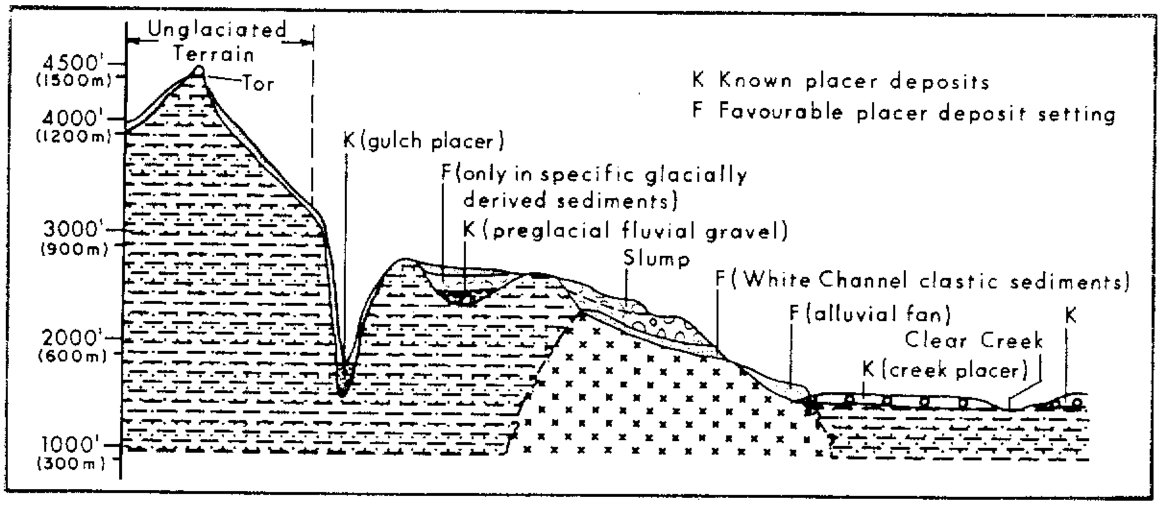
Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

YUKON

EXPLORATION and GEOLOGY 1983



Clear Creek Drainage Basin

Canada

MASTER COPY

Clear Creek has been mined for placer gold since the early 1900's. This schematic profile of Clear Creek drainage basin shows known placer deposits and other sediment types which may contain placer gold. This figure is discussed by S.R.Morison in "Placer Deposits of Clear Creek Drainage Basin, 115P Central Yukon", in this issue of Yukon Exploration and Geology (p.89).

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YUKON
Exploration
and Geology 1983

Exploration and Geological Services Division
Mineral Resources Directorate
Northern Affairs Program
Yukon Region
Indian and Northern Affairs Canada

Whitehorse, Yukon

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RESUME

APERCU DES TRAVAUX D'EXPLORATION ET D'EXPLOITATION MINIERES EN 1983

Les activités d'exploration et d'exploitation minières ont enregistré une baisse importante en 1983 comparativement à 1982. En effet, le nombre de mines en activité a diminué de trois à une et les dépenses d'exploration sont passées de 22 millions de dollars à environ 10 à 13 millions de dollars.

La United Keno Hill Mines a repris ses activités au milieu de l'année pour devenir le seul producteur important en 1983 alors que la Whitehorse Copper a cessé toute activité en décembre 1982 et a démantelé ses installations. La Cyprus Anvil a repris ses activités à Faro en mai, mais s'est limitée à un programme de déblaiement des stériles. Plusieurs petits projets d'exploitation de filons d'argent-plomb à haute teneur ont également été réalisés dans les régions de Keno Hill et de la rivière Hess.

Des travaux de recherche de métaux précieux ont été effectués partout au Yukon en 1983. L'AGIP a continué d'effectuer des travaux de forage dans le champ filonien de métaux précieux situé dans les régions volcaniques du mont Skukum au sud-ouest de Whitehorse. La région de Skukum-Wheaton qui contient de nombreux filons épithermaux typiques associés a un volcanisme fait actuellement l'objet de recherches importantes. L'Arctic Red Resources a continué à effectuer des travaux d'exploitation souterraine en vue d'accroître les réserves de minerai à la mine Laforma, à l'ouest de Carmacks. On s'intéresse de nouveau au champ filonien d'or-argent, qui a été exploité la dernière fois au milieu des années 1960 pendant à peine huit mois, ainsi qu'à plusieurs autres gisements de métaux précieux dans la région entre Carmacks puis Dawson. Cherchant des métaux précieux encaissés dans des skarns, la Noranda a entrepris, dans le cadre d'un programme de forage au diamant, des travaux de prospection dans les concessions de la MARN au nord de Dawson. A l'ouest de Watson Lake, les veins d'argent-plomb que renferme le gisement Midway et qui sont situées dans la région de Rancheria ont suscité beaucoup d'intérêt. D'ailleurs, plusieurs compagnies ont obtenu des résultats intéressants. On a récemment attribué une origine épithermale au champ filonien de Rusty Springs, au sud d'Old Crow.

Constituant toujours une source d'intérêt pour certains, les schistes argileux contenant des veines de plomb-zinc-argent au lac Clear et au col MacMillan ont fait l'objet d'autres travaux de forage au diamant par la Getty Mines Limited et la Cominco Limited respectivement. En dehors de ces travaux, il y avait très peu d'activité dans ce domaine.

Peu de gisements de tungstène ont fait l'objet de travaux d'exploration en 1983. D'autres travaux d'échantillonnage souterrain ont été effectués au gisement de Mactung de la Amax et un programme de forage au diamant a été mis sur pied au gisement Kalzas contenant du porphyre à tungstène de l'Union Carbide, au sud-est de Mayo.

De petits projets d'exploration d'amiante ont été réalisés dans la région du ruisseau Clinton à l'ouest de Dawson.

L'industrie de l'exploitation des placers a maintenu à peu près le même niveau d'activité qu'en 1982, bien que la production de l'or a été plus élevée. Trois placers souterrains étaient exploités.

PRODUCTION MINIERE AU YUKON

	1978*	1979*	1980*	1981*	1982*	1983*
Or (veine)	$ 7,354,000	$ 5,835,000	$ 19,200,000	$ 53,964,000	$ 42,430,000	---
g	1,026,000	523,353	908,550	3,046,000	2,858,000	---
Or**(placer)	$ 4,167,000	$ 8,819,000	$ 34,799,000	$ 55,093,400	$ 32,404,000	$ 39,026,000
g	581,346	790,949	1,646,717	2,479,935	1,842,355	2,345,648
Argent	$ 29,405,000	$ 47,713,000	$108,725,000	$ 69,528,000	$ 22,141,000	$ 13,081,600
g	148,000,000	125,172,604	137,565,148	172,000,000	70,000,000	29,117,337
Plomb	$ 65,466,000	$104,625,000	$ 76,636,000	$ 50,706,000	$ 25,950,000	$ 651,900
kg	80,643,000	79,744,650	70,154,178	51,651,000	35,838,000	1,117,897
Zinc	$ 75,481,000	$115,137,000	$ 94,137,000	$103,783,000	$ 63,264,000	$ 70,300
kg	98,506,000	120,291,108	97,935,887	86,486,000	58,961,000	63,161
Cadmium	$ 590	---	---	---	---	---
kg	96	---	---	---	---	---
Cuivre	$ 18,066,000	$ 18,670,000	$ 28,504,000	$ 20,192,000	$ 14,077,000	Mine de cuivre de Whitehorse fermée
kg	11,012,000	7,931,060	10,879,636	9,129,000	7,236,000	
Amiante	$ 32,404,000	Mine de Clinton Creek fermée	---	---	---	---
t	63,000		---	---	---	---
Charbon	$ ---	---	---	---	---	---
	26,000	25,356	11,364	28,933.4	---	---
Valeur brute (a l'exception du charbon)	$232,343,590	$301,651,000	$362,001,000	$353,266,000	$200,266,040	$ 52,830,700

EXPLORATION, EXPLOITATION, ET PRODUCTION DES MINES

1 JANVIER,1983 - 31 DECEMBRE,1983

	Cyprus Anvil (la compagnie a repris ses activités le 24 mai 1983)	Silvermount (cessation des activités d'exploitation minière a la fin novembre)	Plata-Inca (cessation des activités d'exploitation minière a la fin octobre 1983)	Sadie-Ladue (cessation des activités d'exploitation minière a la fin septembre)	United Keno Mines (les activités d'exploitation minière et de broyage ont repris le 4 juillet 1983)		Laforma	Total
Abattage vertical (m^3)								
Abattage latéral (m^3)		35			Husky Ruby	189 65	425	714
Abattage en remontage (m)							58	58
Forage de surface au diamant (m)						604		604
Forage souterrain au diamant (m)							678	678
Forage de roches de recouvrement (m)		216				4,094		4,310
Deblaiement des stériles (m)	2,389,320					51,256		2,440,576
Minerais broyé (t)		255	655 (approx.)	390	Bermingham Husky Ruby Sadie-Ladue C-Structure Silver King	14,973 11,634 2,354 200 509 72		31,067
Argent extrait (g)		3,483,200	2,643,798	3,079,247		19,911,046		29,117,337
Or extrait (g)								
Plomb extrait (kg)		101,606	408,240	123,833		484,218		1,117,897
Zinc extrait(kg)						63,161		63,161

Introduction

The Government of Canada manages mineral resources in Yukon and Northwest Territories through the Northern Affairs Program of the Department of Indian Affairs and Northern Development. Within the Program three mineral resource directorates exist based in Yellowknife, Northwest Territories, Ottawa-Hull and Whitehorse, Yukon. This volume is prepared by the Exploration and Geological Services Division of the Mineral Resources Directorate, Yukon.

Yukon Exploration and Geology 1983 discusses the geology of Yukon mineral deposits and mineral districts under active investigation. Much of the reports are summaries of exploration work done in Yukon during 1983 by mineral exploration companies. Some work done in 1982 that was not previously documented is also included. This volume follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian and Northern Affairs and by the Geological Survey of Canada.

The geological reports present the results of field work done during 1983. The aim of these reports is to provide authoritative descriptions of the geology of mineral showings or districts based on first-hand field study. Most of these studies focus on areas of current economic interest, but some concern districts or deposits where geological problems require study. Reports are by geologists on the Geology Division's staff, geologists and geology students on a contract basis, Division summer employees and also general geological studies in Yukon that were not supported by D.I.A.N.D., but for which this volume is a suitable publication vehicle. The geological reports are grouped in the first part of this volume and are ordered alphabetically by author.

Summaries of exploration work are grouped in the second part of this volume. They are based on reports submitted to the department for assessment credits by exploration companies. Some of these are amplified by replies to questionnaires sent to exploration companies by the Geology Section and by responses to enquiries of the staff. Each summary has been edited and approved for publication by the company that filed the work. The emphasis in the summaries is on the nature and the results of work done. References to published descriptions of the geology are included. For new showings, where no description is published, a summary based on regional data is given.

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. They also give the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1983 are distinquished from those located earlier to emphasize areas that will focus future explortion. Also shown are lands withdrawn from staking due to Native Land Claims.The mineral claim information derives from maps of the Mineral Rights Division, and Native land claims information from maps of the Land Resources Division, both D.I.A.N.D., Yukon. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes an section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is commonly that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

The geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs may be of interest to exploration geologists. An index to mining assessment reports, including those that are confidential and those available for inspection, is available from the department. Assessment reports are released for public inspection six months after the claims (on which the work was carried out) have lapsed.

EXPLORATION AND GEOLOGICAL SERVICES DIVISION

Services

The Geology Division sells topographic, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering Yukon and adjacent parts of B.C., and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, US federal and Alaska state government geological publications, and geological texts and journals is availbale for consultation. Open file reports of the Geological Survey of Canada the concern Yukon are available for viewing. Air photos, covering Yukon from latitude 60 to 65 N, are available for use in the office as is the latest catalogue of Yukon air photos from the National Air Photo Library.

The H.S. Bostock Core Library, across the street from the Geology Division, contains drill core from Yukon mining properties. Some core is available for inspection and some is confidental. The core library contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope with capability of transmitted and reflected light, and a binocular microscope are also situated in the Core Library. The Geology Division has the following technical equipment: McPhar Spectra 44 (four channel) gamma-ray spectrometer, ultraviolet lamps and two GR-101A scintillometers. The equipment and instruments are available for use by industry personnel by arrangement with the Core Librarian.

ACKNOWLEDGEMENTS

This report stems from the Geology and Drafting groups of the Northern Affairs Program in Whitehorse. It is an ongoing annual event which essentially starts as soon as the last one is ended. Much of the information is gathered from the mining and mineral exploration industry and their cooperation and assistance are gratefully acknowledged. Virtually the entire Geology office participates in putting Yukon Exploration and Geology Report together and manuscript was typed and laid out 'in house'. Summer students involved in the last minute assembly details include Jennifer Smith, Susan Acorn, Barbara D'Silva and Heather Avison.

Drafting Services Section provided most of the figures used in the report including the N.T.S. maps in the back. Their standard is excellent work.

Public Affairs handles the publishing end and through the competent supervision of Patti Smillie, a nicely finished product emerges.

Exploration and Geological Services Division, 1983-84:

Back row (left to right): Virginia Klaver (Office Manager), Jackie Joe (Assistant - Canada Map Office), Diane Emond (Staff Geologist), Kate Grapes (Staff Geologist), Julie Broeren (Secretary-Typist);
Front row (left to right): Steve Morison (Placer Geologist), Rob McIntyre (Geotechnician - Canada Map Office and H.S. Bostock Core Library), Jim Morin (Chief Geologist) and Grant Abbott (Minerals Geologist).

1983 YUKON MINING AND EXPLORATION OVERVIEW

By
K.J. Grapes and J.A. Morin
Exploration and Geological Services Division
Department of Indian Affairs and Northern Development, Yukon

SUMMARY

Mining and exploration activity dropped severely in 1983 from 1982 levels - one producing mine versus three producers in 1982 and exploration expenditures of $10 to $13 million verus $22 million in 1982.

United Keno Hill Mines resumed production in mid-year, becoming the only major producer in 1983 and Whitehorse Copper terminated production in December 1982 and dismantled their operation. Cyprus Anvil resumed operations at Faro in May, but limited them to a program of waste rock stripping only. Several small high grading operations exploited silver-lead veins in the Keno Hill and Hess River areas.

The search for precious metals took place everywhere in Yukon during 1983. AGIP continued their drilling on a precious metal vein system hosted in the volcanic complex at Mount Skukum southwest of Whitehorse. The Skukum-Wheaton area contains many examples of classic epithermal volcanic - associated mineralization and is receiving much exploration attention. Arctic Red Resources continued their underground work directed towards increasing ore reserves at the Laforma mine, west of Carmacks. The gold-silver bearing vein system was last mined in the middle 60's in a short-lived venture lasting eight months and is receiving renewed interest along with several other precious metal properties in the Dawson Range. Skarn hosted precious metals were explored for by Noranda's diamond drilling program on the MARN claims north of Dawson. West of Watson Lake, the Midway deposit has generated much interest in silver-lead mineralization in the Rancheria area, and interesting results have been forthcoming from several companies. An epithermal origin has recently been demonstrated for the Rusty Springs vein system south of Old Crow.

Still an attractive target to some, shale hosted lead-zinc-silver mineralization at Clear Lake and Macmillan Pass was further explored through more diamond drilling by Getty Mines Limited and Cominco Ltd. respectively. Otherwise, exploration for this type of target was minimal.

Few tungsten properties were investigated in 1983. Continued underground sampling took place at Amax's Mactung deposit and a diamond drill program was conducted on Union Carbide's Kalzas tungsten porphyry deposit southeast of Mayo.

Minor asbestos related exploration was conducted in the Clinton Creek area west of Dawson.

The placer mining industry maintained about the same level of activity as in 1982, though gold production was higher. Three underground placer mines were operated.

MINING AND DEVELOPMENT

There were seven underground and/or high-grading mining operations, employing 192 people, in the Yukon in 1983. United Keno Hill's Mine at Elsa (105 M 14) was the largest, employing 154 people. The operation resumed milling July 4th and underground production on July 18th, after being shutdown for almost one year (July 15, 1982). Between July 18th and December 31st, 29,742 tonnes of ore from the Bermingham stock-pile, Husky and Ruby Mines was milled with 19,911,092 g Ag, 484,218 kg Pb, and 63,161 kg Zn produced. At the Galkeno and Sugiyama vein 28,318.5 m^3 were stripped with 22,938 m^3 stripped on the Bermingham S.W. vein. In the Keno Hill area, United Keno Hill Mines conducted a drilling program on the Silver King and Ruby Mines. Seven holes totalling 899.2 m were diamond drilled and 84 holes totalling 4,093.5 m were percussion drilled at the Silver King with 34 percussion holes totalling 1,123.2 m at the Ruby Mine. Three hundred and ninety tonnes of ore was mined grading 7,886 g Ag/t and 35% Pb from a high-grading operation on the Sadie Ladue vein (105 M 14). The property was leased by U.K.H.M. and managed by Archer Cathro and Associates.

Springmount Operating Company have two operations in the Keno Hill area. The old Silver Spring mine workings were de-iced in preparation for further work and at the Mount Keno Mine a new portal was collared at the 3700 level, 35 m were advanced laterally and 216.4 m of overburden drilling was conducted. High-grading operations on the Pb-Ag vein produced 81.2 tonnnes from a trench on surface and 25 tonnes underground.

In the Rogue and Hess River area (115 N 9), Dawson Eldorado Gold Exploration Ltd. and Silvercrest Resource Corporation geologically mapped, geochemically sampled, percussion drilled and bulk sampled the PLATA-INCA property. A total of 680.25 tonnes of select vein material was mined from the PLATA Zones 1,2,3,5, INCA Zones 1,7,12, and Stevens, Lucik and Smith Zones.

The Cyprus Anvil Mine at Faro (105 K 6) reopened May 24, 1983. An agreement between the company and the federal government directed monies toward a two year program of major waste rock stripping. This stripping will remove an island of waste rock overlying ore and separating the two open pits. The expenditure amounts to 50 million dollars - one half the expenditure is made by the company, about 5 million dollars are provided through programs of Employment and Immigration Canada and 19.6 million dollars are provided by Department of Indian Affairs and Northern Development as a loan, payment to be initiated upon resumption of mine production. Results of this agreement are direct employment of a minimum of 210 people and the lowering of future production costs. Waste rock stripping commenced May 30th on the Faro No. 3 Pit where approximately 2,389,328 m^3 have been stripped.

West of Carmacks, Arctic Red Resources continued work on the Laforma Mine, (115 I 3). One hundred and fifty two meters of drifting has been completed on the No. 4 level. Rehabilitation of the 407 raise between the No. 3 and No. 4 levels is complete and diamond drilling to test for additional reserves below the No. 4 level has been completed.

Amax Minerals Exploration conducted an underground exploration program at the Mactung deposit at Macmillan Pass (105 O 8).

Yukon Exploration and Geology, 1983, p. 5-15

		1978*	1979*	1980*	1981*	1982*	1983*
Gold (lode)		$ 7,354,000	$ 5,835,000	$ 19,200,000	$ 53,964,000	$ 42,430,000	---
	grams	1,026,000	523,353	908,550	3,046,000	2,858,000	---
Gold** (placer)		$ 4,167,000	$ 8,819,000	$ 34,799,000	$ 55,093,400	$ 32,404,040	$ 39,026,900
	grams	581,346	790,949	1,646,717	2,479,935	1,842,355	2,345,648
Silver		$ 29,405,000	$ 47,713,000	$108,725,000	$ 69,528,000	$ 22,141,000	$ 13,081,600
	grams	148,000,000	125,172,604	137,565,148	172,000,000	70,000,000	29,117,337
Lead		$ 65,466,000	$104,625,000	$ 76,636,000	$ 50,706,000	$ 25,950,000	$ 651,900
	kg	80,643,000	79,744,650	70,154,178	51,651,000	35,838,000	1,117,897
Zinc		$ 75,481,000	$115,137,000	$ 94,137,000	$103,783,000	$ 63,264,000	$ 70,300
	kg	98,506,000	120,291,108	97,935,887	86,486,000	58,961,000	63,161
Cadmium		$ 590	---	---	---	---	---
	kg	96	---	---	---	---	---
Copper		$ 18,066,000	$ 18,670,000	$ 28,504,000	$ 20,192,000	$ 14,077,000	Whitehorse Copper Mine Closed
	kg	11,012,000	7,931,060	10,879,636	9,129,000	7,236,000	
Asbestos		$ 32,404,000	Clinton Creek Mine Closed	---	---	---	---
	tonnes	63,000		---	---	---	---
Coal		$ ---	---	---	---	---	---
	tonnes	26,000	25,356	11,634	28,933.4	---	---
Gross Value (excludes coal)		$232,343,590	$301,651,000	$362,001,000	$353,266,000	$200,266,040	$ 52,830,700

* dollar values determined using average metal price during the year, according to Canadian Mining Journal figures.

** placer gold production based on royalty paid on crude gold, adjusted to reflect fine gold content.

EXPLORATION ACTIVITY

An estimated $10-13 million was spent on exploration in 1983, as compared to $22 million in 1982. Most exploration centered around precious metal and shale hosted lead-zinc deposits.

Although 4,345 new quartz claims were staked to the 31st of December, the total quartz claims in good standing, 45,402, is down from 49,679 last year at the same time. The most active areas this year were in the Wheaton River Valley (105 D SW) for epithermal Au, Ag deposits and in the Rancheria area (105 B SE) north of the MIDWAY shale hosted Ag-Pb-Zn deposit in northern B.C.

Gold, Silver (Lead, Zinc)

AGIP Canada Limited continued work on the Mt. Skukum property (KUKU, CHIEF, WOOF claims, 105 D 3). Property work included diamond drilling of 40 holes (NQ) for a total of 4,545 m, geological mapping (1:1,000), rock geochemical sampling, magnetometer surveying (43 km) and 5 bulldozer trenches. Precious metal mineralization is associated with veins hosted in continental volcanic rocks of late Cretaceous to early Cenozoic age. Nearby, AGIP conducted geological mapping (1:10.000), rock and soil geochemical sampling on the GLENLIVET (105 D 3) and LATER (105 D 5) claims, and 20 m^3 of hand trenching on the LATER claims.

Trenching on the TYCON claims on Mt. Anderson (105 D 3) exposed quartz and chalcedony veins with precious metal values. To the east on Tally-Ho Mountain (105 D 3), Tally-Ho Exploration investigated an epithermal vein that had been mined for precious metals in the early 1900's. Geological mapping, soil geochemical sampling, VLF-EM and Proton Magnetometer surveying and trenching delineated a narrow east-northeast trending linear anomaly.

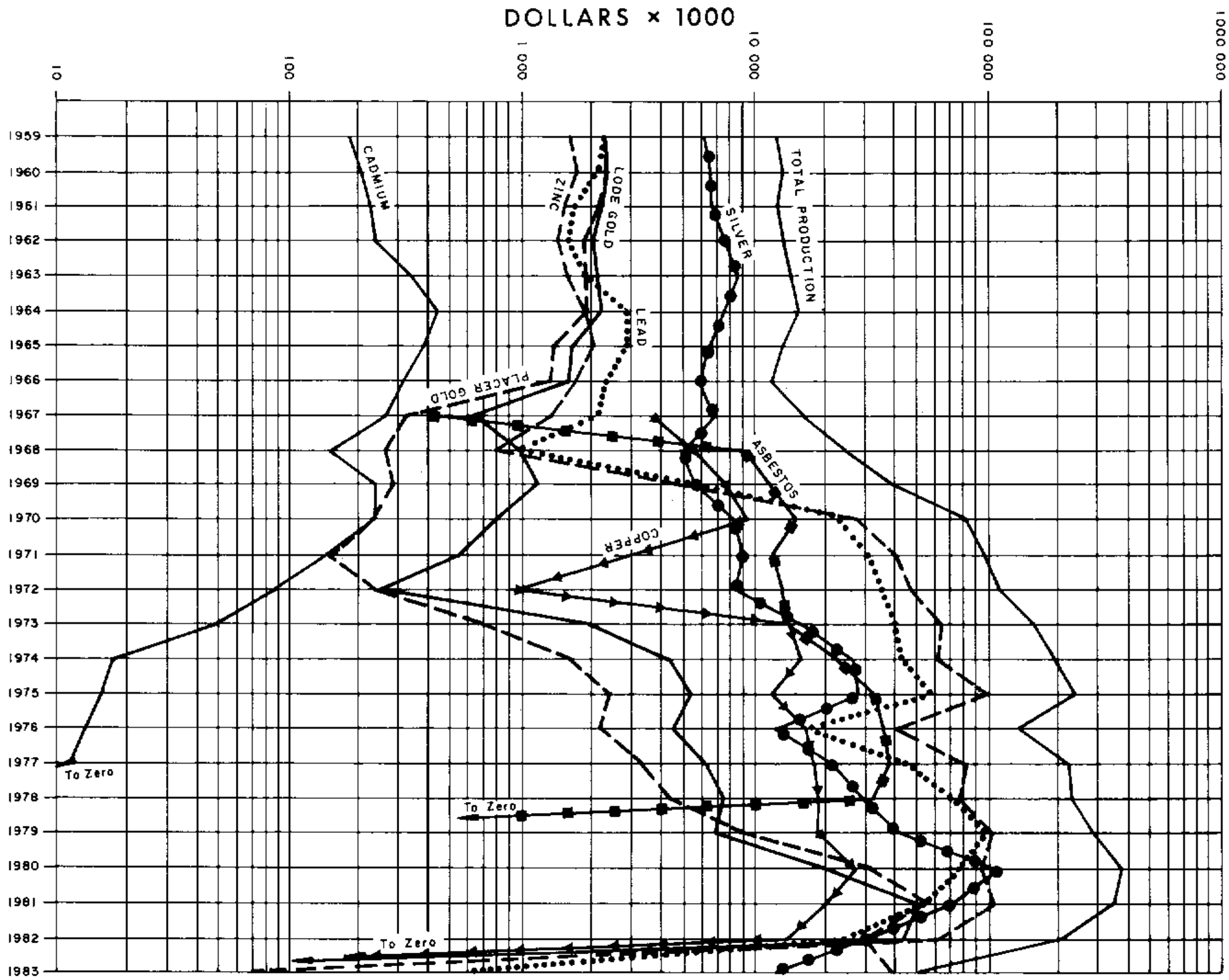
Canadian Nickel Company Limited staked the TON claims in the Mt. Stevens area (105 D 2,3),as a follow up to geochemical anomalies generated in 1974-75 reconnaissance programs. The claims cover an area of brecciated Tertiary rhyolite dikes with quartz stockwork that are intrusive to chlorite schist of the

MINE EXPLORATION, DEVELOPMENT AND PRODUCTION

JANUARY 1, 1983 - DECEMBER 31, 1983*

	Cyprus Anvil (company resumed operation on May 24, 1983)	Silvermount (mining operation suspended at end of November)	Plata-Inca (mining suspended at end of Oct, 1983)	Sadie-Ladue (mining operation suspended at end of Sept.)	United Keno Hill Mines (mining and milling resumed July 4, 1983)		Laforma	TOTAL
Sinking Advances (m^3)								
Lateral Advances (m^3)		35			Husky Ruby	189 65	425	714
Raising Advances (m)							58	58
Surface Diamond Drilling (m)						604		604
Underground Diamond Drilling (m)							678	678
Overburden Drilling (m)		216				4,094		4;310
Stripping (m)	2,389,320					51,256		2,440,576
Ore Milled (tonnes)		255	665 (approx.)	390	Bermingham Husky Ruby Sadie-Ladue C-Structure Silver King	14,973 11,634 2,354 200 509 72		31,067
Silver produced		3,483,200 g	2,643,798	3,079,247		19,911,046 g		29,117,337
Gold produced (gm)								
Lead produced (kg)		101,606	408,240	123,833		484,218		1,117,897
Zinc produced (kg)						63,161		63,161

* information from Mining, Engineering and Inspection, Company Monthly Reports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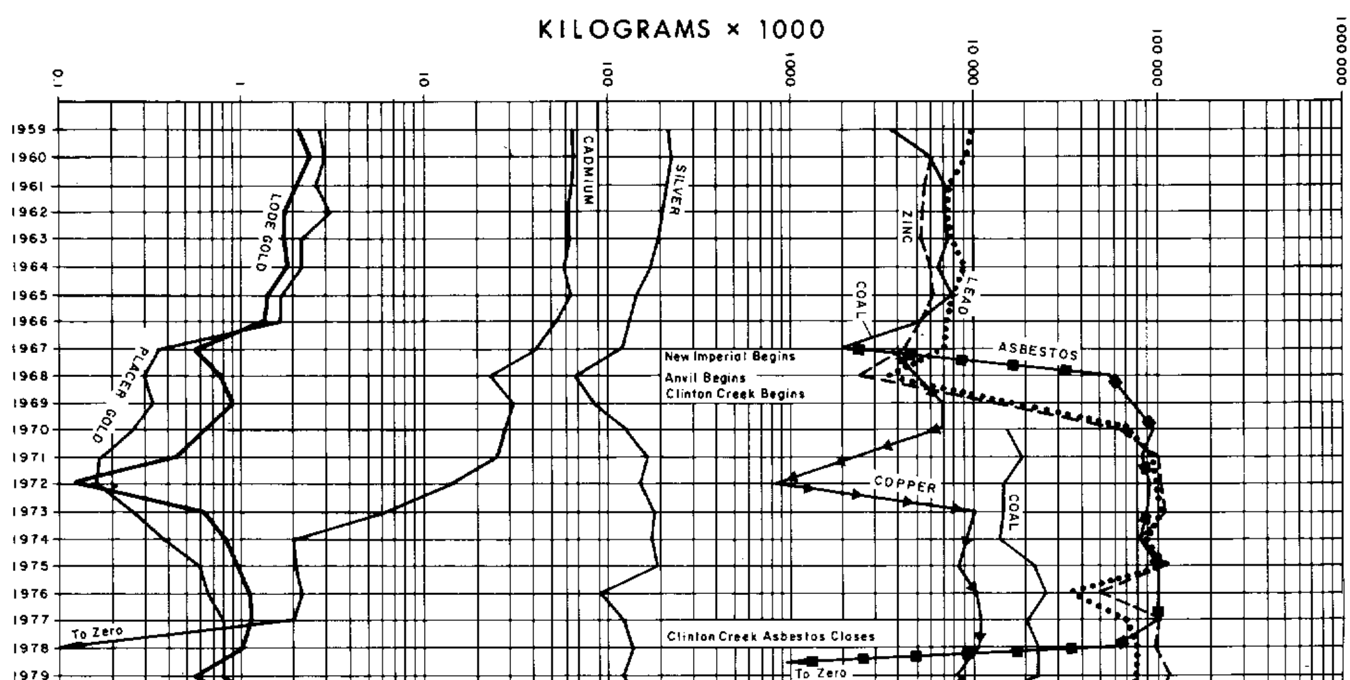
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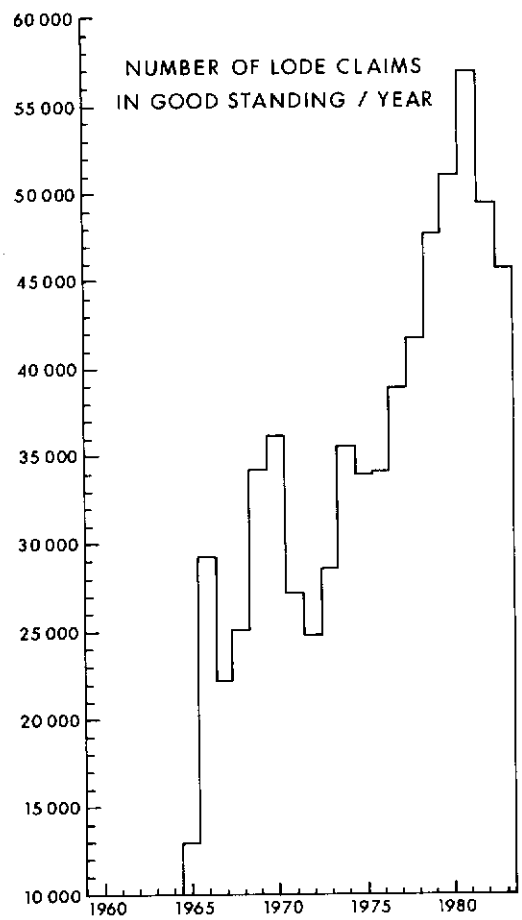
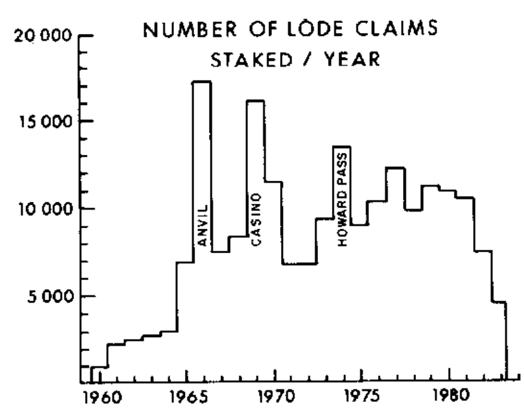
Figures on opposite page: Annual volumes (top) and value (bottom) of metal and mineral production from 1959 to 1983.





Triassic Lewes River Group. The claims were mapped (1:2,500) and soil sampled. Parallel rhyolite dykes 5-10 m wide, covering an area of 200 m x 200 m were located.

Logan Mines Ltd. further trenched and sampled the JUBILEE property (105 D 1), a Au-Ag-Cu showing in a limonitic shear zone in Cretaceous volcanic rocks near Marsh Lake.

Quartz stringers and narrow zones of silicification cutting black argillite on the SEL claims (105 I 13) were geologically mapped, trenched and sampled for Ag-Au by Trident Resources Inc.

On the North Canol Road (105 J 5), AGIP continued exploration for precious metals in South Fork volcanic rocks. The RAGS and WENDY claims were mapped (1:10,000) and soil and rock geochemically sampled.

Canamax Resources Inc. conducted a geological (1:2,000) and soil geochemical program on the NURF claims near Dragon Lake (105 J 12). The claims cover minor Au-Ag bearing pyroxene-pyrrhotite pods and quartz-arsenopyrite veins in Hadrynian marble.

To the northeast in the Macmillan Pass area, AGIP staked 112 DALL claims(105 O 3) covering an area underlain by lower Earn Group clastics cut by a small Cretaceous intermediate intrusion. The property was mapped (1:10,000) and stream sediment, soil and rock geochemically sampled. To the north, 39 LEAF claims (105 O 6) were staked covering Road River sedimentary rocks intruded by a Cretaceous granitic stock. The property was mapped (1:10,000, 1:2,000), and soil and rock geochemically sampled. To the east, the BRICK and NEVE claims covering quartz-realgar-stibnite veinlets in acidic sills were mapped at 1:2,000 scale, water, stream sediment, soil and rock geochemically sampled, CEM, magnetometer surveyed and trenched (three trenches totalling 640 m^3 on the BRICK claims). The WALL claims (105 O 8) covering Hadrynian Grit Unit sedimentary rocks intruded by a Cretaceous granitic stock were geologically mapped (1:10,000, 1:2,000) and soil and rock geochemically sampled.

Canamax Resources Inc. conducted geological (1:5,000) and soil geochemical surveys on the NUT claims (105 O 7). The claims cover a small quartz monzonite stock intruded into Paleozoic argillite, calcareous argillite and limestone. Galena and sulphosalt bearing veins in brecciated and occasionally bleached hornfels partially rings the intrusion.

Cominco Ltd. conducted work on AGIP's SUN, FIRE and ICE claims (105 O 11).Bismuthinite and arsenopyrite with associated gold occur as joint or fracture fillings in a syenite intrusion. The claims were mapped (1:10,000) and geochemically sampled.

Kerr Addison Mines Ltd. conducted a reconaissance geology and geochemistry program on the HIK claims (115 H 12). The claims cover an area of felsic volcanic rocks overlying schists and gneisses.

On Prospector Mountain west of Carmacks, Archer Cathro and Associates continued their exploration program on the LILYPAD (115 I 5, J 8) and NUCLEUS (115 I 6) claims. Geochemical sampling and bulldozer trenching were conducted.

Two quartz-chalcedony vein structures were investigated by Canico Ltd. on the RAIN claims (115 I 5,12). The veins occur in Mesozoic granitic rocks, the basement to nearby late Cretaceous Carmacks Group volcanic flows and tuffs. Both zones contain

GROUPS OF 20 OR MORE CLAIMS STAKED IN 1983*.

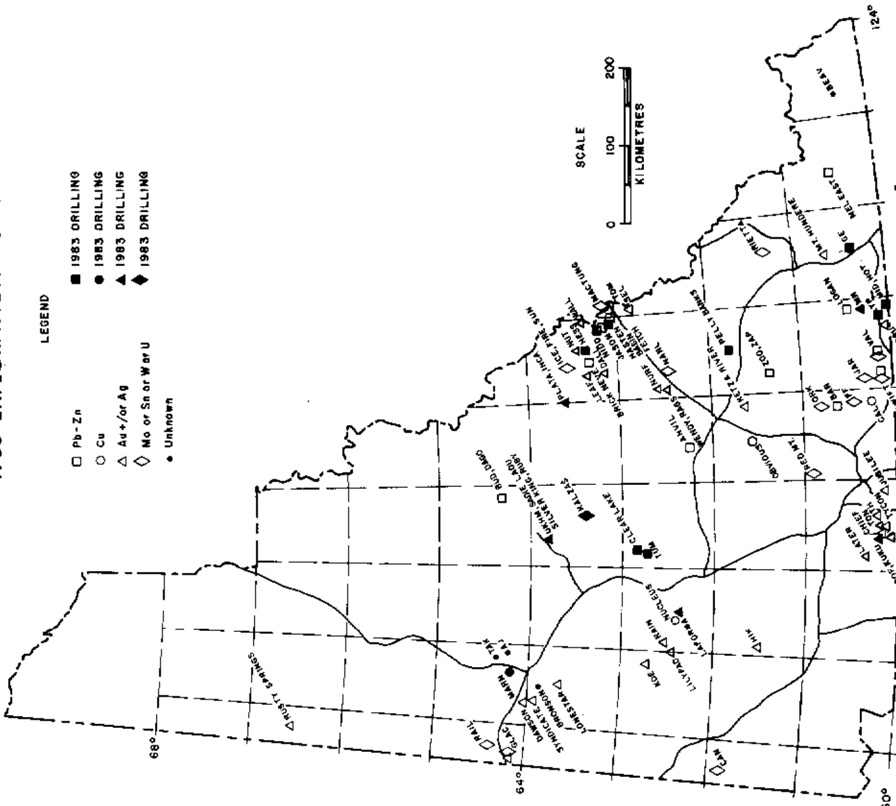
N.T.S.	CLAIM NAME	NUMBER OF CLAIMS	COMPANY
105 A 2	MAN	32	
105 B 1	GARRETT	36	
105 B 1	MID	31 FR	Canamax Resources
105 B 1	JACK	61	
105 B 1	CARL	40	
105 B 1	STAR	32	W.E. England Drilling Co. Ltd.
105 B 1	DILL	32	Goldform Resources Ltd.
105 B 1	RUN	28	W.E. England Drilling Co. Ltd.
105 B 1	MOON	28	Orotek Resources Corp.
105 B 1	BLUE	38	Acorn Resources
105 B 1	WIND	30	Beaver Resources Inc.
105 B 1	SUN	30	W.E. England Drilling Co. Ltd.
105 B 1	ZAM	36	
105 B 1	AG	37	
105 B 1	TIM	160	
105 B 1, 8	MR.	160	Regional Resources
105 B 1	CORD	38	Bellabon Resources Ltd.
105 B 1	ACE	24	W.E. England Drilling Co. Ltd.
105 B 1, 2	SPENCER	60	
105 B 1	ORO	24	
105 B 1	ERIC	46	Rioalto Silver Resources Inc.
105 B 7	CMC	82	W. Hyde (60%) McCrory Holdings (40%)
105 C 11	EVE	76	McCrory Holdings
105 C 14	ED	80	B. Poulin
105 D 2	WEST	24	
105 D 2	MIL	32	
105 D 3	MIN	44	
105 D 3	MED	32	
105 D 3	TYCON	35	W. Hyde
105 D 3	PUB	85	
105 D 3, 6	TH	20	
105 D 6	CR	172	
105 D 3, 4	EARL	32	AGIP Canada Ltd.

GROUPS OF 20 OR MORE CLAIMS STAKED IN 1983*.

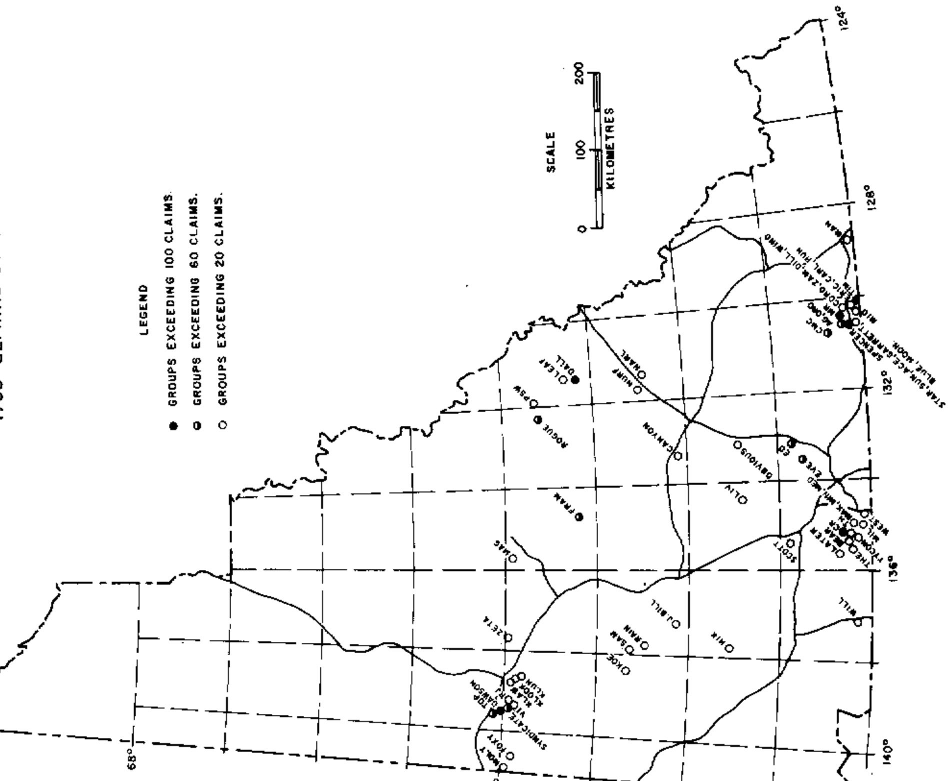
N.T.S.	CLAIM NAME	NUMBER OF CLAIMS	COMPANY
105 D 14	SCOTT	30	
105 D 3, 6	THE	48	AGIP Canada Ltd.
105 D 6	BEAR	56	AGIP Canada Ltd.
105 D 5	LATER	35	AGIP Canada Ltd.
105 E 8	LIV	20	Archer Cathro and Assoc.
105 J 6, 11	NARL	40	Canamax Resources Ltd.
105 J 12	NURF	38	Canamax Resources Ltd.
105 K 2	CANYON	40	A. Carlos
105 M 13	MAG	32	
105 M 2	FRAM	60	Union Carbide
105 N 9	ROGUE	92	
105 0 12	PSW	40	
106 0 3	DALL	112	AGIP Canada Ltd.
106 0 6	LEAF	39	AGIP Canada Ltd.
115 A 3	WILL	32	
115 H 12	HIK	32	
115 I 5, 12	RAIN	48	Canadian Nickel Co. Ltd.
115 I 3	J. BILL	32	
115 I 12 115 J 9	SAM	30	Hudson Bay Exploration
115 J 9	KOE	48	
115 N 15	MOLY	56	
115 N 15	FOXY	23	Connaught Mines Ltd.
115 0 14	SYNDICATE	83	Dawson Syndicate
115 0 14	VI	31	
115 0 14	RJ	31	
115 0 15	KLAW	24	Archer Cathro and Associates
115 0 15	KLUN	32	Archer Cathro and Associates
115 0 15	KLOOK	48	Archer Cathro and Associates
115 P 14	ZETA	40	Noranda Exploration Company Ltd.
116 B 3	DAWSON	222	Dawson Sundicate
115 0 14			
115 B 4	TOP	74	

* Information gathered from District Mining Recorders' Reports, January 1, 1983 to December 31, 1983.

1983 EXPLORATION ACTIVITY



1983 CLAIMS STAKED



anomalous Au, As, Hg and Ba values and are weakly conductive. Canico conducted a geological (1:2,500), geophysical, and geochemical (gas chromatography) program on the claims.

To the west, Kerr Addison Mines Ltd. staked the KOE claims (115 J 9). A reconnaissance geology and geochemistry program was conducted. In the Dawson Range, Tombill Resources worked on the Hayes Creek property (115 J 9). Quartz veins and stockwork with gold and base metal values occur in shear zones peripheral to a central rhyolite porphyry plug.

In the Klondike, Dawson Eldorado Gold Exploration in joint venture with Archer Cathro and Associates mapped and sampled the LONE STAR property (115 O 14) and reopened the old adit. Eleven new properties were staked in the area KLAM 115 O 10; KLOX 115 O 14 etc. They were geologically mapped (1:50,000) and soil sampled. The BRONSON claims (115 O 14,15) owned by Cominco Ltd were mapped, soil and rock geochemically sampled for Ag, Pb, Zn, Cu and trenched (4,000 m^3).

Dawson Syndicate staked, and conducted geochemical and geophysical surveys on the SYNDICATE, DAWSON, WILLIAM, 83, 98 and WILD claim blocks. Several areas anomalous in gold were outlined by heavy mineral sampling and a strong NW-SE EM conductor extending 1.2 km was delineated.

To the northwest (116 K 8,9), Taiga Consultants Ltd. for Rio Alto Exploration completed a 426.7 m airstrip on the Rusty Springs epithermal Ag-Pb-Zn property. The claims were geologically mapped (1:2,500) and soil geochemically sampled. Nine km of VLF-EM survey were conducted and 487.7 m of NQ diamond drilling in two holes were completed. New drill targets were identified on Mike and Orma Hills.

Lead-Zinc

Five diamond drill holes totalling 606.5 m, linecutting and a geophysical survey were completed on the GE claims (105 A 2) by Kerr Addison Mines Ltd.

Butler Mountain Mineral Corp. conducted a diamond drill program on the YP property southeast of Watson Lake (105 B 1). Six holes were drilled into thin stringers of pyrite, galena and sphalerite in a quartz porphyry breccia .

Cordilleran Engineering, Regional Resources and Getty Canadian Metals Ltd. continued evaluating the MR property (105 B 1,8). Geological, geochemical, geophysical surveys, trenching and diamond drilling were conducted in 1983. Sphalerite, galena and zinc-, lead-,silver-rich oxide zones occur within low grade metamorphosed sedimentary rocks.

On 105 C 8 and 9, Cambac Resources Ltd. mapped (1:5,000 and 1:500), soil and rock geochemically sampled, VLF-EM and Pulse EM surveyed and trenched the BAR property, a Ag-Pb-Zn-Ba stratiform massive sulphide deposit hosted in sedimentary rock. An IP anomaly located in 1976 was extended.

In the Hoole River area, Canamax Resources mapped (1:10,000) and soil sampled the ZOO and ZAP claims (105 G 5,6). The claims cover disseminated to laminated sphalerite and galena in baritic lenses within a Mississippian fragmental volcanic unit. Hudson Bay Exploration and Development conducted an overburden drilling program on their PELLY BANKS (105 G 14) property. Eighteen meters were drilled to test EM conductors.

In the Faro area (105 K 6), Cyprus Anvil mapped the TIE and FIRTH claims at 1:5,000 scale and coordinated the surface geology with the relogging of old drill holes.

Cominco Ltd. drilled one NQ hole totalling 149 m on their TUM Pb-Zn prospect (105 L 11,14). To the north on the Clear Lake property, Getty Minerals continued diamond drilling their shale and volcanic hosted massive sulphide deposit.

At Macmillan Pass, Cominco Ltd. continued to work on the HASTEN, BASIN and FETCH property (105 O 1) where they drilled one NQ hole (HASTEN) totalling 301.8 m. To the north on the NIDD claims, minor sphalerite and galena mineralization occurs in sedimentary rocks of the Road River Formation and Earn Group. Cominco geochemically sampled, Proton magnetometer, Max-Min, Horizontal Loop Em surveyed and diamond drilled five holes (HQ,NQ,BQ) totalling 1,757 m. On the HESS claims to the northwest (105 O 7), Cominco drilled one hole (NQ,BQ) totalling 105.5 m.

At Hudson Bay's Tom Valley deposit (105 O 1), two trenches were excavated totalling 1,560 m^3.

In continued exploration for Zn-Ag-Pb mineralization in brecciated dolomite, Acheron Resources Ltd. geologically mapped (1;2,500), collected 370 soil samples and excavated four trenches totalling 40 m^3 on the BUD and DAGO claims (106 D 9).

Tungsten, Tin

In the Tootsie River area (105 B 1), Canamax Resources Inc. worked on the HOT claims which cover a hornfels and skarn zone in Cambrian (?) interbedded argillite and limestone. Two NQ holes totalling 576 m were drilled intersecting scheelite and molybdenite in green calcsilicate hornfels. To the northwest, Archer Cathro and Associates conducted a fluxgate magnetometer survey and excavated 14 trenches on the OBVIOUS claims (105 F 6). The claims cover the Cretaceous Nisutlin Batholith which intrudes a sequence of Ordovician-Devonian quartzite, shale and limestone. Irregular and discontinuous skarns with an average grade of around 0.4% WO_3 occur in silty limestone and calcareous quartzite.

East of Frances Lake, (105 H 7), A and M Exploration conducted a magnetometer survey and geologically mapped (1:5,000) the RIETTA claims which overlie tungsten bearing skarns along the contact of quartz monzonite with limestone and phyllite.

Hornfels developed in interbedded Cambrian limestone and limy argillite are Canamax Resources' target on the NARL claims in the Otter Creek area (105 J 6,11). The claims were geologically mapped (1:12,000) and 355 soil samples were collected. Weak Cu, Pb, Zn, Ag, and W soil anomalies occur over parts of the hornfels zones.

Southeast of Mayo on Kalzas Mountain (105 M 7), Union Carbide Exploration Company drilled two BQ holes totalling 667.8 m, trenched and mapped at 1:5,000 scale on their tungsten prospect. Wolframite occurs in a quartz vein swarm and quartz stockwork in "Grit Unit rocks. The mineralization is exposed over an area of 1 km x 0.8 km, and has been encountered up to depths of 300 m below surface.

Dupont of Canada Exploration Ltd. conducted a detailed magnetometer survey over the MC, SWIFT, SLIP and VAL A claims (105 B 3,4) and trenched the VAL claims to expose cassiterite mineralization in skarns along the contact with the Seagull Batholith.

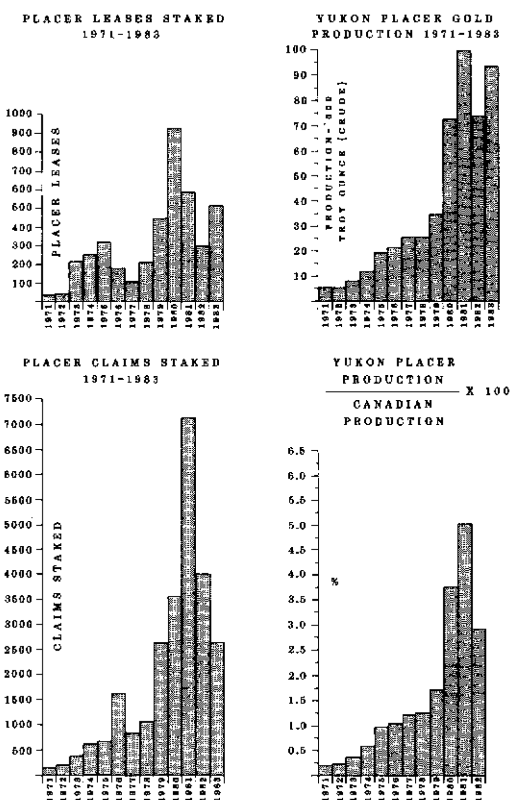
D.C. Syndicate conducted a geophysical, geological and trenching program on the ORK claims (105 C 9). Mapping at 1:5,000 scale, magnetometer, IP, Pulse EM surveys and two trenches attempted to define Sn-Cu-Ag mineralization in skarn and disseminated pyrrhotite and chalcopyrite in altered quartzite.

Placer

According to royalty records gold production to date has exceeded the total gold production for 1982. To December 31, 1983 production of gold totals 2,932,061 g. crude.

Staking activity decreased during 1983. There were 2,605 new claims and 521 new leases for 1,067 km staked to December 31, 1983, compared to 3,969 new claims and 294 new leases during the same period in 1982.

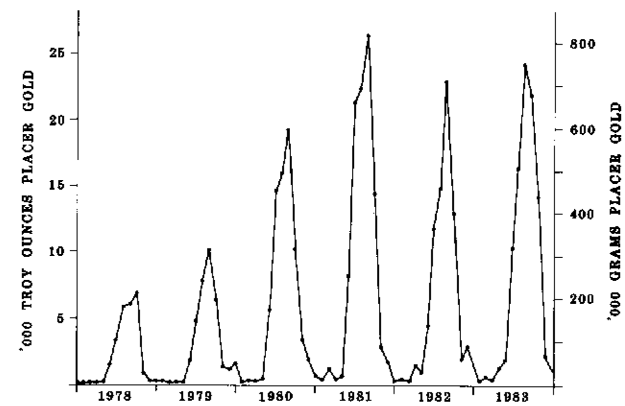
Approximately 33,413 m^3 were mined in three underground placer mines employing 15 people - two in the Klondike and one in the Sixtymile area. Jackson Hill Ventures - Universal Exploration drove an adit into Jackson Hill (116 B 2) and advanced 291 m between January and March. They mined approximately 13,000 m^3. The operation closed for the summer on March 12 but started up again in the winter.



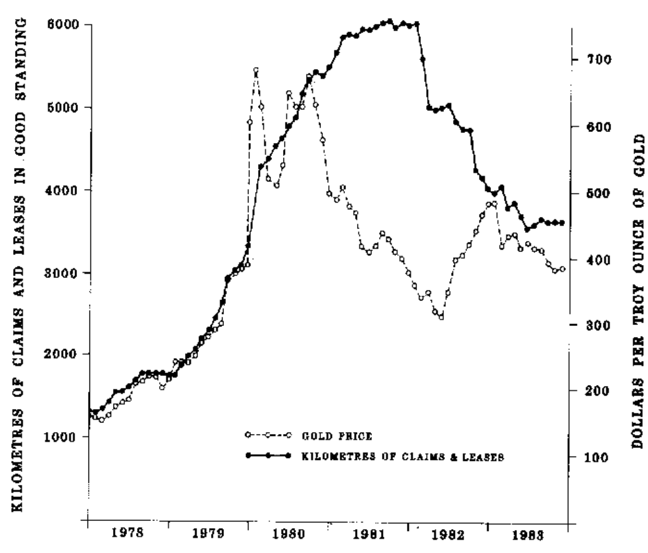
Main Street Mining were back working underground on Dago Hill from January to March, 1983. Four hundred and eighty-eight m were advanced , and 7,416.6 m^3 were mined. The operation shut down for the summer on April 2, 1983 and started back up November 25th.

Chumar Placers operated from January to April 13th on their Miller Creek Mine and mined approximately 1,200 m^3 of frozen gravels. Mining resumed on the 15th of October, 1983. A raise was driven to surface, and 764.6 m^3 of ore was hoisted.

A major concern affecting the Yukon placer mining industry were the proposed placer mining guidelines put forth by the federal Departments of Indian Affairs and Northern Development, of Fisheries and Oceans, and Environment. A public review was held during fall 1983 and the Review Committee's recommendations were released in early 1984.



Crude gold production from placer deposits during 1978-1983.



Total kilometreage of placer claims and leases in good standing and the price of gold during 1978-1983.

1983 ACTIVITIES OF NORTHERN AFFAIRS

Exploration and Geological Services Division Yukon consists of a staff of five geologists, an office manager, a geological technician and a secretary. During 1983, numerous projects were undertaken by permanent staff members and also individuals on a contract basis, commonly associated with universities.

Jim Morin, Chief Geologist and Regional Manager of the Division, continued his investigations of precious metal occurrences throughout Yukon. An outgrowth of this will be an open file map depicting all gold-silver-occurrences in Yukon.

Minerals Geologist Grant Abbott divided his 1983 summer between MacMillan Pass (1) and the Rancheria area (2). At the former, he checked out critical field relationships prior to the release of an open file report on the Geology of the MacMillan Pass Area, 105 O SW, 1:50,000 scale. In the Rancheria area, he investigated many vein and replacement type silver-lead-zinc showings. This area is actively being explored by several companies and his observations will be of use to these workers. The regional geologic setting of stratiform shale hosted lead-zinc deposits in Selwyn Basin is the subject of a paper he is co-authoring with Steve Gordey and Dirk Tempelman-Kluit.

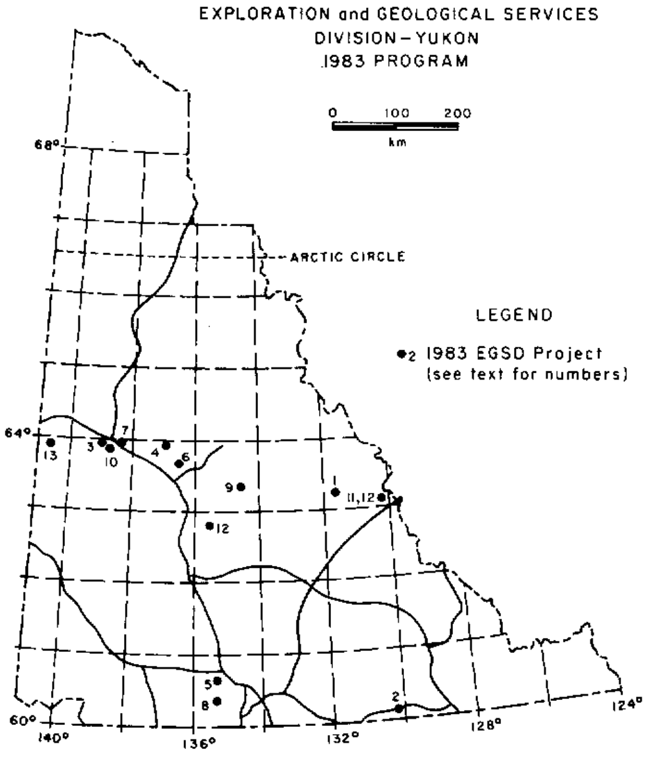
Placer Geologist Steve Morison studied sedimentology of the White Channel gravels in the Klondike (3). His 1982 work was released in an Open File in December 1983 as a 1:50,000 scale map - 'Surficial Geology of the Clear Creek Drainage Basin, Parts of NTS 115 P 11, 12, 13 and 14' (4). Steve is also authoring a paper on placer deposits in Canada for the volume 'Geology and Economic Minerals of Canada'.

Staff Geologist Pat Watson compiled maps and production data on the Whitehorse Copper Belt into a 1:25,000 scale map that summarizes many of its geologically important features (5). Pat left the Division in the fall and was replaced by Diane Emond. Diane is currently completing her M.Sc. thesis (Carleton University) on the tin mineralization at Oliver Creek, McQuesten River area (EPD property 6).

Bedrock geology of the Klondike area (west half) was mapped by Ruth Debicki (on contract), staff geologist Kate Grapes and Lori Walton (term position)(7). The work was released in an Open File in early 1984 as a 1:50,000 scale map. This map will provide a much needed base for geologists and prospectors to use in the Klondike area.

Monica Pride (University of Manitoba) continued her Ph.D thesis study of the Late Cretaceous to Eocene continental volcanic rocks in the Mount Skukum area (8). These rocks are associated with epithermal precious metal vein systems.

Greg Lynch (Washington State University) completed his fieldwork on the Kalzas tungsten property south of Mayo (9). Clastic rocks of the Grit Unit are extensively altered and cut by a quartz-wolframite-tourmaline vein and stockwork system. The style of mineralization is unique in Yukon and has important metallogenic implications regarding metals and their association with granitic plutons.



Michael Dufresne (University of Alberta) spent the first of two summer's fieldwork studying alteration near the bedrock interface within and below the White Channel gravels in the Klondike area (10). This argillic alteration is locally pervasive and has been proposed by Dirk Tempelman-Kluit to be related to ground water dissolution, transportation and deposition of gold.

Bob Turner (Stanford University) completed his fieldwork investigating the sedimentology of stratiform lead-zinc-silver mineralization in the JASON deposit at MacMillan Pass (11). One of the major problems in the study involves the differentiation of replacement mineralization from syngenetic mineralization.

Linda Benton (Dartmouth University) received partial support for her M.Sc. thesis of primary nitrogen dispersion haloes in shale-hosted stratiform sulphide deposits, using TOM, JASON and Clear Lake as study candidates (12).

Grant Lowey (University of Calgary) completed his Ph.D fieldwork examining the sedimentology of Late Cretaceous conglomerates in western Yukon Crystalline Terrane. He has determined through palynomorph examination that these conglomerates previously thought to be Eocene are early to Late Cretaceous (13).

'MINERAL DEPOSITS OF NORTHERN CORDILLERA'

The following excerpt is from a summary by Chris Healey in CIM Bulletin, Vol. 77, No. 862, February 1984: "The symposium on Mineral Deposits of Northern Cordillera", held in Whitehorse, Yukon, December 5-7, 1983, was attended by 220 delegates. This meeting was an extended version of D.I.A.N.D.'s Annual Geoscience Forum. The CIM Geology Division, along with the Mineral Dposits Division of GAC, acted as co-hosts. As a result of CIM participation this year the technical papers presented will be published as a Special Volume.

The meeting opened on the morning of Monday, Decembver 5, with words of welcome from Cam Ogilvy (D.I.A.N.D.), Chris Healey (CIM Geology Division Symposia Chairman) and Ken Dawson (MDD-GAC). The technical program consisted mainly of deposit descriptions, with each session devoted to a particular deposit type.

Each session started with a review paper followed by descriptions, and discussions of specific deposits. Topics covered were stratiform Pb-Zn-Ag-Ba, carbonate-hosted Zn-Pb-Ag, copper, precious metals, coal, uranium and Mo-W-Sn.

Technical sessions were held all day on Monday, December 5 and Wednesday, December 7, and on the afternoon of Tuesday, December 6. On the morning of Tuesday, December 6, the oral presentations were replaced by poster sessions.

As is usual at geological meetings all sessions were very will attended, right up to the very last paper. Indeed, rumour has it that the late departure of CP Air's flight to points south was a direct result of the timing of the concluision of the technical program.

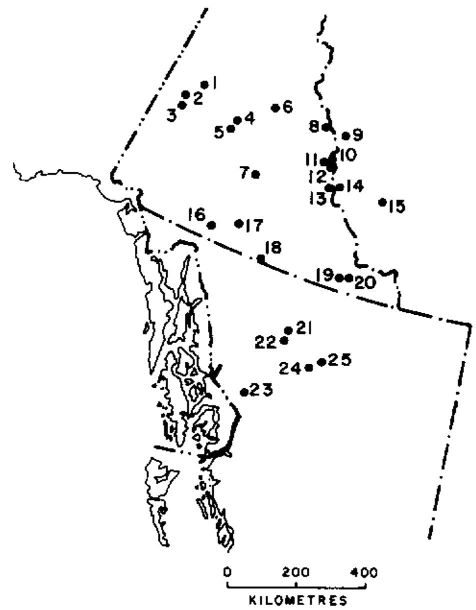
The program committee, chaired by Jim Morin (D.I.A.N.D.) assisted by Ian Paterson (Cominco), Dave Sinclair (GSC) and Grant Abbott (D.I.A.N.D.), did a fine job of assembling top-notch speakers on a variety of very interesting and topical subjects. Abstracts of all papers will be included in the "1983 Yukon Exploration and Geology Report", (D.I.A.N.D., Whitehorse), which will be available by Fall 1984.

The social traditions of the annual Geoscience Forum were not forgotten this year. Under the careful control of Kate Grapes (D.I.A.N.D.) the delegates were treated to a variety of social events in the finest tradition of Yukon hospitality. On each of Monday and Wednesday evenings a visit to the Takhini Hotsprings was offered. Those adventurous souls who braved the Arctic night were treated to the thrill of swimming outdoors in temperatures hovering around -30° C (your hair freezes!).

The conference banquet was held on Tuesday evening. After an excellent buffet meal the delegates were addressed by CIM President, Peter Young. Dr. Young spoke of the need for geologists and earth scientists to be more versatile in the application of their talents to society's needs.

The next speaker was Cam Ogilvy, Director - Mineral Resources, Yukon, D.I.A.N.D. He commented that declining exploration activities in the Yukon and declining attendance at the Geoscience Forum seemed to go hand-in-hand. The fact that attendance at this meeting was up nearly 50% over 1982 may be a sign of improved fortunes for the industry in 1984.

Murray Morison, Director-General, Northern Affairs Program, Yukon Region, then spoke briefly, and called on Mrs. Patricia Young to enlighten the delegates with some observations on the mining industry as seen while



1. Ting
2. Klondike
3. Lucky Joe
4. Ray Gulch
5. Oliver Creek (EPD)
6. Bonnet Plume Coalfield
7. Anvil District
8. Snake River Iron Formation
9. Mountain Diatreme
10. Mactung
11. Jason
12. Tom
13. Howard's Pass
14. Lened
15. Redstone
16. Whitehorse Copper
17. Red Mountain
18. JC
19. Mel
20. Rock River Coal
21. Kutcho Creek
22. Lawyers
23. Big Missouri
24. Red Chris
25. Cirque

Location map of deposits discussed at meeting - 'Mineral Deposits of Northern Cordillera'.

Yukon Exploration and Geology 1983, p. 16-33.

travelling throughout Canada with her husband. Her impromptu remarks were certainly the highlight of the evening.

On Tuesday morning the Third Annual Whitehorse Challenge Cup hockey game was held. No one is sure who won!

The meeting was certainly a great success. The Geology Division of CIM is very thankful for the work done by Jim Morin, General Chairman, and Kate Grapes who ran everything except the technical program. Everything went very smoothly and we are pleased to have been associated with this event."

ABSTRACTS

(Reprinted from meeting program, Mineral Deposits of Northern Cordillera, Dec. 5-7, 1983, Whitehorse).

Paper No. 1

REGIONAL SETTING OF PALEOZOIC SEDIMENT-HOSTED STRATIFORM LEAD-ZINC DEPOSITS IN YUKON AND NORTHEASTERN BRITISH COLUMBIA.

J.G. Abbott, Geology Division, INA, Whitehorse, Yukon, S.P. Gordey and D.J. Tempelman-Kluit, Geological Survey of Canada, Vancouver, B.C.

In Yukon and northeastern British Columbia, sedimentary exhalative zinc, lead, (silver), (barite) deposits of Cambrian to Mississippian age are hosted by three of four dominantly clastic assemblages that make up the outer part of the Cordilleran miogeocline.

The oldest assemblage includes latest Precambrian gritty quartzose clastic (lower 'Grit Unit') overlain by maroon and green to dark grey weathering shale and minor sandstone (upper 'Grit Unit') of Early Cambrian age. Younger Lower and Middle Cambrian rocks, (host to Anvil deposits?) identified locally, are shale and siltstone. Cambro-Ordovician argillaceous limestone in the southeast (Rabbitkettle Formation) correlates with calcareous and non-calcareous phyllite and with overlying basalt flows and tuffs in the western part of the miogeocline. A succeeding early Ordovician to middle Devonian assemblage (host to Howard's Pass deposits) is dominated by chert, black graptolitic siliceous shale and local, mafic volcanics of the Road River 'Group'. Both assemblages change facies easterly and northerly across a narrow zone to thick, time equivalent shallow-water shelf carbonates and clastics of Mackenzie-MacDonald Platform. An elongate, shallow water, carbonate clastic platform, Cassiar Platform, developed in Siluro-Devonian time above black shale and chert and Cambro-Ordovician volcanics near the present western margin of the miogeocline. The third assemblage (host to Macmillan Pass, Gataga, Clear Lake deposits) is the middle Devonian to Mississippian Earn Group. Thick marine chert-rich turbidite sequences derived from the two older assemblages characterize the Earn Group but it also includes black, graphitic shale and chert. Mississippian alkalic volcanic and subvolcanic rocks are confined to the Pelly Mountains. Platformal carbonate deposition ceased in the middle Devonian and clastic rocks over Pelly-Cassiar Platform and shale extends far to the east over Mackenzie Platform. Uplift and erosion leading to the large influx of clastic rocks has been variously attributed to rifting, large-scale strike-slip faulting and collisional orogeny. The fourth assemblage is Mississippian to Triassic and comprised of shale, sandstone, chert and lesser limestone that mark a return to normal clastic, marine, shelf sedimentation. Volcanic rocks and sedimentary exhalative deposits are notably absent.

The deposits vary greatly in age, distribution, composition and host rock but all are near the craton margin in a thick pile of fine grained clastic rocks that is probably underlain by thin continental crust. Cambrian to Mississippian volcanism is not directly related to mineral deposits but indicates wide spread roughly contemporaneous tectonic instability. Local stratigraphic and structural controls are poorly understood. Abrupt changes in stratigraphy near some Devonian deposits indicate syndepositional faulting, but generally differences between strata near deposits and elsewhere are not obvious.

Paper No. 2

GEOLOGY AND SULPHIDE DEPOSITS OF ANVIL RANGE, YUKON TERRITORY.

D.S. Jennings, Dynasty Resources Inc., Vancouver, British Columbia, and

G.A. Jilson, Cyprus Anvil Mining Corporation, Vancouver, British Columbia.

Anvil Range is bounded on its northeastern and southwestern margins by major, Mesozoic faults and is allochthonous in this sense. Within and adjacent to this fault-bounded terrane, lithologic units are divided into two major stratigraphic packages.

The lower package in ascending order is:
a) non-calcareous phyllite to schist, minor calc-silicate, marble, graphitic phyllite and metabasite (Mt. Mye Formation),
b) calcareous phyllite (locally metamorphosed to calc-silicate phyllite) graphitic phyllite and metabasite (Vangorda Formation);
c) mafic, metavolcanic rocks, dominantly pillowed to massive flows, breccias and tuffs (Menzie Creek volcanic unit).

The transition from non-calcareous pelites (Mt. Mye) to calcareous pelites (Vangorda) occurs over an interval of ten to approximately one hundred metres. Five Pb-Zn-Ag-(Ba) deposits, associated with graphitic phyllite, occur within this transition or within basal Vangorda Formation. Graptolite faunas from sedimentary interbands in Menzie Creek volcanic unit allow its correlation with Upper Kechika Group ("Road River Formation"). This implies lithological correlation of Mt. Mye and Vangorda Formations with Upper Grit Unit and Lower Kechika Group (Rabbitkettle

Formation) respectively.

This lower package was probably deposited on an Atlantic-style continental margin. The volcanic component of this package does not contradict the trailing margin hypothesis as trace element compositions of these rocks suggests a within-plate setting.

The upper stratigraphic package in northeastern Anvil Range is autochthonous, lithologically similar to and homotaxial with Earn Group. In southern Anvil Range, correlation of a similar package of (in ascending order): (1) black pelites and minor crinoidal limestone; (2) grey-beige phyllitic cherts, chert conglomerates and chert grits; (3) stratiform barite; (4) beige-green and red chert; and (5) massive basalt flows is less certain. Units 4 and 5 comprise Anvil Range Group. Units 1, 2 and 3 correlate lithologically and, in part, faunally with Earn Group. The relation of upper and lower packages in southern Anvil Range is controversial. Local relations favour a conformable sequence of units 1 to 5 on Menzie Creek, but regional mapping suggests any or all may be allochthonous.

The Anvil terrane has a complex polydeformational/polymetamorphic history. Two Mesozoic, regional metamorphic and folding events are recognized in low pressure, Abukuma-type facies series ranging from green-schist to amphibolite facies grade. These metamorphic zones decrease in grade radially outward and stratigraphically upward from a central metamorphic/plutonic culmination termed Anvil Arch which domes the entire stratigraphic sequence into an open, doubly-plunging antiform. Subsequent events are regionally non-penetrative, brittle folding episodes superimposed on these earlier fabrics.

Characteristic vertical and lateral zonation of lithofacies seen in all ore deposits is, from base, ribbon-banded, graphitic quartzite, pyritic quartzite, massive pyritic sulphides and baritic, massive sulphides. The basal and marginal ribbon-banded facies may result from mixing "normal" sedimentary and hydrothermal products, while the overlying, more massive, sulphidic central facies shows less sedimentary components. Most deposits are surrounded by a white mica dominant alteration envelope often footwall biased. The deposits tend to be more Zn-rich at the base in the banded, disseminated sulphide facies and more Pb+Ag+Ba-rich in the upper massive sulphide facies.

No consistent, spatial association of sulphide deposits is seen with volcanic rocks. In general, the deposits are hosted by metasediments. However, deposits occur with the first mappable accumulation of volcanic material in the lower stratigraphic package with bulk of the volcanics younger than the ores. Basaltic volcanism in the pile is most likely an indicator of extensional tectonic conditions leading to focused exhalation of evolved basinal, metalliferous brines into local, reduced basins straddling the Mt. Mye/Vangorda Formation boundary.

Paper No. 3

GEOLOGY AND MINERALIZATION OF THE HOWARD'S PASS ZINC-LEAD DEPOSITS, YUKON-NORTHWEST TERRITORIES.

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Economically important sedimentary-exhalative type Zn-Pb deposits exist in the lower Silurian basinal facies of the Selwyn Basin along the Yukon-Northwest Territories border. Three major, similar deposits have been defined to date and are referred to collectively as the Howard's Pass deposits. Similar geologic environments and minor Zn-Pb mineralization also occur in the Flat Lakes and the Itsi lakes areas.

The geologic setting of the Zn-Pb deposits is that of the pre-Mesozoic Selwyn Basin defined by basinal western facies and platformal eastern facies. Four major sedimentary sequences are identified. The Grit Unit occurs at the base and consists of clastics that are Hadrynian to Cambrian in age. These rocks have been weakly metamorphosed in contrast to the upper three sequences. The second sequence is a laminated basinal carbonate sequence, the Cambrian Rabbitkettle Group. The Road River Group of Ordovician to Lower Devonian age appears to be starved basinal facies in the Howard's Pass area. Within the "Black Shale" sequence occurs the lower Ordovician to upper Silurian Howard's Pass Formation, host to the Howard's Pass Zn-Pb deposits. Specific regional facies in the Howard's Pass Formation are from West to East, chert basin, base of slope, slope and platform facies. A dolomitic orange weathering regionally extensive siltstone and carbonaceous cherts constitute the upper portions of the Group. The fourth sequence consists of coarse clastics of the Earn Group, deposited in a tectonically active environment. Barite Zn-Pb-Ag deposits such as the TOM and JASON occur in these Devono-Mississippian turbidites. The stratigraphic position and sedimentary environment for these younger deposits help distinguish them from the Howard's Pass deposits.

Individual Howard's Pass deposits are associated with sub-basins (2nd order) occurring within the Selwyn Basin (1st order). These sub-basins are characterized by order of magnitude thickening of the Howard's Pass Formation at the base of slope and development of the lithologically heterogeneous Lower Silurian active member. Individual Howard's Pass deposits consist of complex saucer shaped bodies containing laminated to massive sulphides. Sulphide occurrences can be defined by texture and active member lithofacies.

There are nine named facies occurring in the active member, gradational facies can also occur. Within any one complete stratigraphic section of the active member, various lithofacies may be repeated up to six or seven times suggesting a possible cyclicity to the facies. Overall there may be a grand cycle in which carbonates decrease in abundance up section within the member while silica (chert) increases.

The deposits are characterized by simple sulphide mineralogy, predominantly sphalerite, galena and pyrite that can be classified into six textural types. Types I, II and III consist of laminated sulphides showing increasing tectonic and/or synsedimentary structural complexity. Textural types IV and V consist of laminated to massive sulphides, while textural type VI consist of late diagenetic concretionary sulphides and later tectonically remobilized sulphides. Textural types I through V are associated with specific lithofacies occurring within the active member.

The Howard's Pass deposits show characteristics common to sedimentary-exhalative deposits such as conformity with bedding, no obvious association with volcanic rocks, similar age of associated deposits, single-stage Pb isotope systematics and association with organic-rich sedimentary rocks. In contrast, differences between the Howard's Pass Deposits and other stratiform-sedimentary deposits include deposition in a starved basin sedimentary environment, a lack of any apparant associated feeder zone within 10 km, a lack of massive pyrite associated with the deposits, relatively low Ag and Cu contents associated with the deposits and a lack of bedded barite near the deposits.

These data suggest that the Howard's Pass deposits are unique, and therefore a model is proposed which is relevant to the geologic setting. The most important part of the model is the synsedimentary deposition of Zn and Pb sulphides within sub-basins occurring at the base of slope of the eastern edge of the Selwyn Basin.

Paper No. 4

ENVIRONMENT OF FORMATON OF THE HOWARD'S PASS (XY) Zn-Pb DEPOSIT, SELWYN BASIN, YUKON AND NORTHWEST TERRITORIES.

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The Howard's Pass (XY) stratabound Zn-Pb deposit is hosted within an Early Silurian starved basinal sequence of carbonaceous mudstone and chert which comprises part of the Selwyn Basin. Although reconstruction of the Selwyn Basin is complicated by later transform faulting, it is considered to represent an epicratonic marine basin that formed due to subsidence accompanying rifting of the continental margin, initiated during Early Cambrian time.

The environment within the Selwyn Basin, as deduced from $\delta^{34}S$ values in sulphides and barite, and other paleoenvironmental indicators (e.g., sedimentology, preservation of organic matter, mineral stability, boron content) fluctuated throughout most of the Paleozoic era from open and ventilated conditions to closed, stagnant, stratified and hypersaline conditions. The establishment of anoxic environments was influenced by a number of factors including climate, glacial history, bathymetric configuration, tectonism and periods of hydrothermal activity.

The onset of hydrothermal fluid discharge into the Howard's Pass sub-basin is recorded by a marked buildup of ore-forming and associated elements in the footwall carbonaceous mudstone, and a trend towards increasingly anoxic conditions as shown by $\delta^{34}S$ values in pyrite that approach those for coeval open seawater. This hydrothermal activity culminated in mid-Llandovery time with the episodic discharge of low temperature ($< 120^{o}C$) ore-forming fluids into the sub-basin, and the precipitation of sphalerite and galena onto the seafloor.

The waning stages of sulphide deposition were accompanied by a change in the host mineralogy from calcite to fluorapatite, due presumably to decreasing $-{}^{a}CO_3^{2}/{}^{a}PO_4^{3}$ activity ratios and increasing pH in the sub-basinal fluids. As a result, the sulphide zone is overlain by up to 50 metres of phosphatic carbonaceous chert that decreases in phosphorus content and thickness outside the sub-basin. Although the main period of hydrothermal discharge in the Howard's Pass sub-basin was terminated in Early Silurian time, structures controlling the geometry of the basin were the focus of sporadic but minor hydrothermal activity, indicated by enrichments of Zn, Pb and certain associated elements in rocks of Early to Middle (?) Devonian age.

Paper No. 5

SEDIMENTARY AND DIAGENETIC TEXTURES AND DEFORMATION STRUCTURES WITHIN THE SULPHIDE ZONE OF THE HOWARD'S PASS (XY) Zn-Pb DEPOSIT, YUKON AND NORTHWEST TERRITORIES.

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The Howard's Pass (XY) Zn-Pb sulphide deposit is a blanket-like body enclosed by a sequence of Early Silurian carbonaceous or limy mudstone and chert which forms part of the Selwyn Basin stratigraphy. It is considered to be exhalative in origin. Its environment of deposition, together with evidence in support of the genetic model is the subject of a companion paper (Goodfellow and Jonasson, this volume). This work presents a detailed summary of the available textural evidence for a synsedimentary origin of the sulphide laminae and their subsequent deformation during diagenesis.

Examples are given of sedimentary textures such as graded bedding involving pyrite framboids and calcite grains, scour and fill structures, local small slump folds and truncation of beds and folds. All sedimentary textures are affected by soft-sediment deformation which took place during diagenesis of the deposit. As one result, very few diagenetic textures are preserved in sulphide-rich beds; however minor development of small carbonate concretions which distort bedding, crystallization of pyrite euhedra and replacement by sphalerite of microfossils can be observed in chert and limy chert beds within the sulphide zone.

Following deposition of the orebody and its immediate hangingwall carbonaceous chert, but prior to de-watering and compaction of the sedimentary sequence, seismic shocks are postulated to have triggered extensive shearing, slumping and gravitational sliding leading to convolute folding, fluidization, slurrying, and soft-sediment brecciation of the rheologically unstable sulphide laminae. At the same time, the orebody underwent extensive de-watering which also induced local dissolution and replacement of sphalerite, galena, silica and soluble organic matter into a de-watering "cleavage" developed along planes of shearing stress. By contrast, laminae composed predominantly of chert, limestone and pyrite were less subject to shearing and fluidization and behaved as more rigid confining strata, inhibiting and confining the remobilization of sphalerite and galena if they were sufficiently thick to withstand porewater pressures. Upon failure, these beds formed boudins and soft-sediment breccias around which solutions and slurries flowed to form contorted pillars and diapirs of intimately mixed sphalerite and galena.

Lastly, coarse calcite or fibrous (bull) white quartz crystallized in dilation zones adjacent to boudins and within laminae now depleted in sulphides. The quartz fibres align parallel to de-watering cleavage and are clearly affected by shearing stresses still active within the sulphide mass. Stylolites, commonly composed of organic matter, are found to intersect or turn into de-watering "cleavage" but generally are a rarely seen feature in the sulphide-rich beds.

During epigenesis, final compaction and de-watering occurred and caused the emplacement of thin quartz-calcite veins which cross-cut all earlier developed textures. At this time, organic matter underwent extensive degradation to mainly amorphous carbon with some tarry residues.

Following lithification, the XY deposit was subjected to minor faulting during Devonian time. These events had little effect on ore textures. In Laramide (Late Cretaceous) time, the entire sequence of sediments was compressed into broad open folds and a pervasive brittle or slaty cleavage was superimposed locally. Minor remobilization of galena into dry fractures along with quartz, pyrite and calcite mark these events.

Paper No. 6

THE CIRQUE DEPOSITS, NORTHEASTERN BRITISH COLUMBIA

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Detailed drilling and geology on the Cirque claims in northeastern British Columbia have outlined a lensoid, stratiform, barite-sulphide body 1000 meters long, 300 meters wide, and 2 to 70 meters thick. At present this deposit is the most significant of several stratiform barite-lead-zinc deposits recently discovered in Devonian carbonaceous shales in the Akie District. Current drill indicated reserves for the Cirque deposit are 40 million tonnes with an average grade of 7.8% Zn, 2.2% Pb, and 47 g/t Ag. Widely spaced drilling about 1 kilometer southeast of the Cirque has resulted in the discovery of the South Cirque deposit at the same stratigraphic horizon. This discovery indicates a significant resource potential which has not been fully explored.

Both deposits consist of barite, pyrite, sphalerite, and galena in decreasing order of abundance. Baritic, pyritic, and laminar-banded pyrite facies have been recognized although proportions of barite and sulphides range continuously from nearly pure barite to nearly pure sulphides. The main barite-sulphides bodies consist dominantly of baritic and pyritic facies with only minor shale interbeds. Both of these facies are massive to diffusively banded on a scale of centimeters to meters. Laminar-banded pyrite is a marginal facies which contains numerous fine black siliceous shale interbeds and is Pb-Zn poor.

The Cirque deposit is an asymmetric, east-tapering, wedge shaped lens which trends northerly. The axis of thickest barite and sulphides is near the western margin of the deposit; the highest Zn/Pb ratios also occur along the western margin. Pyritic facies predominates in the northern part of the lens with baritic facies increasing in amount to the south along the general trend of the thickness axis. Laminar-banded pyrite occurs dominantly along the eastern margin and top of the deposit.

The deposits occur within earliest Late Devonian (Frasnian) carbonaceous shales of the Earn Group. The background depositional unit is a soft grey aluminous shale. Enveloping the deposits are diagenetically silicified, carbonaceous, thick-bedded shales and ribbon porcellanites. Contacts between sulphide bodies and enclosing fine clastic units are sharp. Stockworks, alteration halos, or disturbed bedding zones have not been found within the vicinity of the deposits. Chert-pebble conglomerates have not been noted in the immediate vicinity of the deposits;

nearby they are stratigraphically above the mineralized horizon.

Akie District barite and barite-sulphide bodies were deposited within the Kechika Trough, a southeast extension of the Selwyn Basin. Cirque deposits occur within a northwest-trending, second order depostional trough which is bounded on the northeast margin by Early to Middle Devonian reefs. This second order trough is greater than 50 kilometers long and 16 kilometers wide. The deposits appear to be related to isolated basins or sub-basins within the second order trough. Little direct evidence of origin for the Cirque deposits is available but their overall features are consistent with other deposits considered to have formed by submarine venting of hydrothermal solutions or diagenetic replacement just after deposition of the host rocks. Following this sedex model has led to the discovery of several other barite-zinc-lead showings in the Akie District.

Paper No. 7

STRATIFORM LEAD-ZINC-SILVER DEPOSITS, JASON PROSPECT, MACMILLAN PASS, YUKON.

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Massive to laminated deposits rich in lead, zinc, silver barium and iron, and consisting principally of sulphides and sulphates, were deposited on the sea floor during the Late Devonian at the Jason Prospect, Yukon Territory. The deposits were precipitated from exhaled hydrothermal brines and were localized near the margins of a small graben. Underlying the stratiform deposits are cross-cutting, discontinuous zones of brecciated, silicified and carbonatized rock cut by veinlets of quartz, ankerite and lesser galena, sphalerite, chalcopyrite and pyrrhotite.

The deposits, which are hosted by Lower Earn Group shales and turbidites, occur near the eastern margin of the Selwyn Basin in the Macmillan Fold Belt. They are closely associated with coarse clastic sediments consisting of chert pebble conglomerate and locally derived debris flows. This coarse clastic material is localized within a submarine canyon which hosts the Jason massive sulphide deposits. Deposition of coarse clastic material was apparently triggered by a major Upper Devonian tectonic event. This event may have also initiated the upward migration of mineralizing hydrothermal solutions through the sedimentary pile.

To date, diamond drilling has lead to the discovery of three zones with geological reserves of 14.1 million tonnes grading 7.09% lead, 6.57% zinc and 79.9 g/t silver.

The stratiform deposits are well zoned. A high-grade, massive to thick-banded sulphide facies is interpreted as being proximal to a vent source. A well laminated facies consisting of layers of chert, barite and sulphides is more distal from the vent. Lead to zinc and silver to zinc ratios decrease outward from the presumed vent area.

Paper No. 8

THE GEOLOGY OF THE TOM DEPOSIT, MACMILLAN PASS, YUKON TERRITORY.

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The Tom stratiform Zn-Pb-Ag-barite deposit, located at Macmillan Pass Yukon Territory, contains reserves of 9,798,000 tonnes averaging 7.54% Zn, 6.37% Pb and 67 g/t Ag. The mineralization occurs within the 'black clastic' rocks of the middle-upper Devonian Earn Group in the Macmillan Fold Belt on the northeastern margin of the Selwyn Basin.

Two stratiform ore zones, Tom West and Tom East occur above the distinctive, massive chert pebble conglomerate unit of the Lower Earn Group and at the boundary between the turbiditic sand-banded argillite facies of a submarine fan complex and the overlying interbedded pyritic and carbonaceous cherts, cherty argillites and argillites of a small euxinic basin. The Tom deposit and its host rocks are complexly folded and faulted.

The Tom West Zone is a little folded steeply west dipping lens of bedded and interlaminated barite-sphalerite-galena-witherite and chert on the west limb of the faulted N-S Tom anticline. The southern end of the Tom West Zone is underlain by a presumed 'feeder vent' of cross-cutting vein and breccia mineralization comprising pyrite-chalcopyrite-galena-sphalerite-quartz carbonate.

The Tom East Zone consists of several lenses of complexly folded and faulted, bedded and laminated barite-sphalerite-galena and chert on the east limb of the Tom anticline. The Tom East Zone has been correlated with the mineralization proximal to and overlying the 'vent' at the southern end of the Tom West Zone.

The Tom mineralization was formed at the margin of a small euxinic sub-basin. Hydrothermal fluids (probably 200^{o}-$250^{o}C$) vented into the basin along marginal growth faults and sulphide deposition occurred from a brine pool. Mineralization proximal to and overlying the vent area is relatively poor in barite whereas the barite content increases away from the vent area.

Subsequent tectonism and low grade regional metamorphism involving several phases of deformation has folded and disrupted the deposit.

Paper No. 9

GEOLOGY AND GEOCHEMISTRY OF SOME STRATIFORM BARITE DEPOSITS OF THE MACMILLAN PASS AREA, YUKON TERRITORY.

John W. Lydon, Ian R. Jonasson and Wayne D. Goodfellow, Geological Survey of Canada, Ottawa, Ontario.

Paleozoic basinal facies rocks of the western margin of the North American continent, probably contain the major part of the world's known barite resources. Although vast quantities of barite are associated with some of the well-known stratiform Zn-Pb sulphide deposits e.g. Tom, Red Dog, Cirque, Faro, Dy etc., and probably even larger quantities are contained in low grade, thin, but regionally extensive baritic horizons e.g. in the Upper Devonian of Selwyn Basin, most of the potentially economic deposits of barite are thick isolated stratiform lenses with no other economic mineral association.

All three types of baritic deposit occur in the Upper Devonian Lower Mississippian rocks of the Macmillan Pass area, which therefore can be regarded as a microcosm of the regional barite mineralization. Investigations, including detailed measured sections and geochemical profiles, of natural exposures have been carried out on four barite deposits (Tea, Moose, Gary North and Pete) and on the Upper Devonian regional barite horizon in the Macmillan Pass area, as part of a programme that includes similar examinations elsewhere in Selwyn Basin.

The predominant mineral in the baritic deposits is barite but locally witherite, barytocalcite, celsian, hyalophane and cymrite can predominate. Quartz (as recrystallized chert) and calcite are the most common genetically associated minerals. All the deposits are bedded, and are also typically finely laminated. Beds are usually 0.5 to 3 metres thick, and although individual beds may contain all three main mineralogical components, one mineral usually predominates. Thus beds of baritite, chert or limestone are easily distinguishable. There does not appear to be any distinctive or characteristic vertical chemical or mineralogical zonation to the deposits, nor do the deposits contain any significant anomalous concentrations of chemical components, other than high barium, calcium, sulphate and carbonate, compared to the argillaceous-siliceous host rocks. Sulphur isotopes of the barite are in the range $\delta^{34}S$ = +21‰ to +45‰ and generally are 5‰ - 10‰ heavier than those of coeval seawater sulphate. The bulk of the geological and geochemical evidence suggests that the barite deposits are chemical precipitates from low temperature ($< 150^{\circ}C$) acid thermal springs.

Paper No. 10

A REVIEW OF BARITE IN THE NORTHERN CANADIAN CORDILLERA.

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The three principal types of barite deposits in the northern Canadian Cordillera are (1) stratiform shale-hosted baritites; (2) stratabound carbonate-hosted barite-fluorite deposits; (3) veins of several types.

Stratiform baritites, hosted by autochthonous Devono-Mississippian clastic rocks, constitute the largest known barite resources in the Cordillera, and form part of the world's largest barite metallogenic province, which follows the eastern Cordilleran miogeocline from the Arctic to Mexico. Baritites range in age from middle Devonian to middle Mississippian but are most widespread in the northern Canadian Cordillera in Late Devonian (Frasnian) time. Stratiform baritite is an important metallotect in exploration for related sedimentary exhalative PbZnAgBa deposits. A subtype of stratiform baritic-base metal deposits has been recently recognized to occur in allochthonous sedimentary and volcanic rocks of mainly Mississippian age within and to the west of the Pelly-Cassiar Platform.

Stratabound carbonate-hosted barite-fluorite deposits occur predominantly in early to middle Devonian carbonate rocks in the northern Rocky Mountains. All are epigenetic stockworks, breccia-fillings, replacements and veins that exhibit structural and stratigraphic control. Massive stratabound barite-fluorite deposits are spatially related to base metal-barite-fluorite veins and probably genetically related to exhalative PbZnAgBa deposits in the Kechika Trough to the west.

Vein-type deposits of monomineralic barite commonly are closely related to the deposits described above, whereas polymetallic-barite veins occupy a broader geologic spectrum. Some principal subtypes include: (1) ZnPbAgBa veins in sedimentary rocks; (2) UCuCoBa veins and breccia-fillings in Proterozoic sedimentary rocks; and (3) AuAgBa (PbSb) veins in granitoid, metamorphic and sedimentary rocks.

Development of the substantial barite reserves in the northern Cordillera has been deterred by the familiar problems of transportation and power, compounded by the high content of barium carbonate in some of the more accessible deposits that detracts from their use as direct-shipping drill mud.

Paper No. 11

MEL BARITE-ZINC-LEAD DEPOSIT

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The Mel barite-zinc-lead deposit is located in southeastern Yukon within 44 km of the Alaska Highway. The deposit occurs at the contact between Lower Cambrian cryptograined limestone and Cambrian to Ordovician calcareous phyllite, grading to silty wavy banded limestone. Because of a lack of primary sedimentary features, the origin of the deposit is questionable.

Mineralization occurs in a folded lens-shaped body, up to 21.7 m thick centrally, which gradually thins towards both ends over a total strike-length of 800 m. Drilling to a depth of 330 m has indicated 4.8 million tonnes grading 52.1% barite, 5.61% zinc and 2.05% lead. The deposit is presently open at depth.

The deposit is reflected by prominent zinc and lead geochemical anomalies in soils and by weak gravity and induced polarization anomalies. Metallurgical test work results show excellent metal recoveries. In 1981, a new containing smithsonite mineralization was found in the same stratigraphic horizon as the Mel, but some 7.5 km to the northeast, on the opposite limb of a synclinal structure. To date, only minimal work has been done on the new showing referred to as the Mel-East.

Paper No. 12

METALLOGENY OF CARBONATE-HOSTED Zn-Pb-Ag DEPOSITS IN THE NORTHERN CANADIAN CORDILLERA.

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Carbonate-hosted Zn-Pb-Ag deposits in the northern Canadian Cordillera can be related to three general metallogenic events based on depositional tectonics and stratigraphy, minor elements in sphalerite, and galena-lead isotope analyses. Ages of the three events are: Group 1: - Cambrian or earlier (ca. 0.52 to 1.50 Ga), Group 2: - Devonian-Mississippian (ca. 0.37 Ga), and Group 3: mid-Cretaceous (ca. 0.09 Ga).

Group 1 deposits, in Proterozoic to Early Cambrian carbonates, are characterized by sphalerite enriched in minor elements and darker colour compared to sphalerite from Group 2 deposits, and by galena-lead isotope analyses that define a Lower Cambrian (ca. 0.52 Ga) isochron or different ages along a growth curve. Descriptions of some deposits and the numerous unconformities in related rocks indicate that many Group 1 deposits are related genetically to Karstic processes.

Group 2 deposits, in carbonate rocks up to Devonian age, are characterized by pale sphalerite typically impoverished in minor elements compared to Group 1 deposits, and by galena-lead isotope analyses which plot on a unique Devonian-Mississippian isochron (ca. 0.37 Ga) related to shale-hosted Ba-Pb-Zn deposits of this age. Deposits with markedly radiogenic lead might form a distinctive subgroup. The deposits generally are deposited from stratafugic solutions derived from the Late Cambrian to Mississippian Selwyn Shale Basin.

Group 3 deposits, in carbonate rocks of variable age, are characterized by mineralization with generally high Ag:Pb ratios and by galena-lead isotopic compositions which plot on a distinctive isochron related to mid-Cretaceous intrusions (ca. 0.09 Ga). These deposits are related closely to clastic hosted vein deposits in the Ketza River, Keno-Galena Hills, Peso-Rex, and Plata-Inca camps. Deposits which cluster on Pb-Pb plots near Keno Hill might form a subgroup destinguishable from deposits with markedly more radiogenic lead.

Paper No. 13

COAL IN YUKON.

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Mississippian bituminous coals in the Liard Plateau (Mattson Fm) and semi-anthracites in the British and Barn Mountains (Kayak Fm) accumulated in coastal plain and deltaic environments, in a stable platform (miogeoclinal) setting, as a late, to post tectonic tectonic molassic phase of the Ellesmerian Orogeny. Known coal seams are too thin (max. 1.5 m) and too poorly accessible to be economically viable in the immediate future.

Triassic (Lewes River Gp.) and Jurassic to Lower Cretaceous (Laberge Gp.) coals are present in the Whitehorse Trough, a forearc basin which formed to the east of an active arc terrain (Stikine block). Pre Upper Jurassic coals developed within a relatively narrow coastal zone characterized by fan deltas, which separated the emerging arc terrain from flyschoid environments within the trough. By Upper Jurassic - Lower Cretaceous times (upper Laberge Gp.) the trough had become more restricted, with a broad coastal zone characterized by tidal marshes, with some high constructive river dominated deltas; thick coals accumulated in lower delta plain environments. The influx of chert pebble conglomerates in the overlying Upper Jurassic - Lower Cretaceous Tantalus Formation reflects the final closure of the trough and its transformation to a successor basin following mid-Jurassic tectonism. Bituminous coals in the uppermost Laberge Gp. and overlying Tantalus Fm have been mined intermittently since the beginning of the century. Although thick seams are known in the vicinity of Division Mountain, structural complexity and steep dips will preclude recovery of anything but small quantities of coal from this and other localities within the Whitehorse Trough.

Minor coals accumulated during the early Cretaceous in a stable platform environment north of the present Ogilvie Mountains (Parsons sandstone, white and coaly quartzite) possibly in back-barrier settings. Disruption of the Cordilleran Geosyncline by major strike slip faults in mid-Cretaceous and later times led to the production of many sites favourable for accumulation of thick terrestrial coal bearing clastic sequences. These include the mid Cretaceous to Eocene Bonnet Plume Fm, the predominantly Eocene fill of the Tintina Trench and the Oligocene Amphitheater Fm of the St. Elias Mountains. Depositional style within these intermontane basins is a function of basin size, geometry, relative relief and location within the regional drainage net. Lignites deposited in a lowland moor environment in the upper member of the Bonnet Plume Fm have a speculative resource potential of more than 1.5 Gt; sub-bituminous coals in the lower member, deposited in fan-marginal and lowland moor settings are probably even more extensive. In the Tintina Trench small deposits of lignite and sub-bituminous coals near Dawson and low to medium volatile bituminous coals near Ross River might provide an adequate base for small thermal plants. Associated Eocene strata in the Rock River field may include several thick coal zones amenable to strip mining. Small deposits of sub-bituminous coal are present in the Ampitheater Fm, their location in Kluane National Park inhibits development in the near future. Other Tertiary and Cretaceous coal deposits which accumulated in lowland swamp enironments away from the major fault systems (Indian River and Big Salmon fields) and in the foreland molasse of the Laramide Orogeny (upper Eagle Plain Fm, and Moose Channel Fm) have very low potential for workable coal seams.

While over 37,000 km^2 of the Yukon is underlain by coal bearing strata, only a small part of this can be considered as having a moderate to good potential for economic development in the next twenty years. The greater potential is in the Late Cretaceous and Tertiary fault related coal basins, especially those of the Bonnet Plume and Rock River coal areas.

Paper No. 14

BONNET PLUME COALFIELD.

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The Bonnet Plume Coalfield, located in the northeastern portion of the Yukon Territory approximately 210 kilometres north of the town of Mayo, contains extensive deposits of high volatile C bituminous, thermal grade coal formed in a sedimentary basin of Albian to Maastrichtian age. The coal seams appear to be of Campanian age and are located in the Lower Bonnet Plume Formation which has a thickness estimated to be approximately 1,000 metres. The Formation is composed of conglomerate, sandstone, siltstone, shale and coal. Five coal seams up to 15 metres thick have been located within the middle member of the Formation. Seven separate coal bearing areas have been investigated by geological mapping and diamond drilling to date. The results of this work have indicated in situ reserves in excess of 650 million tonnes. One deposit has been extensively drilled and contains measured reserves of 121 million tonnes of thermal coal suitable for underground mining. This coal has an average grade, on a clean coal basis of: Yield, 76.9%, Ash, 14.3%, Calorific Value, 10,000 BTU's/lb and sulphur 0.33%. Aberford Resources Ltd. has completed a preliminary feasibility study on the deposit and an engineering study on a three phase thermal power plant having 70 megawatt units to supply power to the Yukon Territory.

Paper No. 15

ROCK RIVER COAL BASIN.

James Wright and Dave Miller, Sulpetro Minerals Limited, Kamloops, B.C.

During July, 1980, company employees Paul Chung and Chris Harrison encountered coal float and a 9 m thick exposure of coal on a tributary of the Rock River, Yukon. Subsequently, coal float was identified along the Rock River and a few tributary streams over a north-south distance of 42 km.

During August and September, 1981, 5 HQ/NQ diamond drill holes totalling 717.81 m were completed near the outcrop area. Geophysical logging was done for all holes and coal analyses were done for holes 1 to 4.

Significant near surface coal was intersected in drill holes 1 and 2, spaced 900 m apart near the coal outcrop. Coal resources intersected by holes 1 and 2 are estimated at 56,000,000 tonnes to a depth of 80 m with a thermal content of 6645 BTU/lb at equilibrium moisture and a waste to coal ratio of approximately 2:1. The coal ranges from lignite A to sub-bituminous C rank based on the A.S.T.M. classification. The coal and associated sediments are considered to be of Tertiary age based on correlation with similar coals in the Watson Lake area.

During March, 1982, a gravity survey was completed over 21 lines spaced 2 km apart for a total of 110 line-km. Gravity readings were taken at 50 or 100 m intervals along the lines. Two Lacoste-Romberg gravity meters were employed. Tidal, latitude, free air and Bouguer corrections were applied to gravity readings.

A total of 9 responses possibly sourced by coal units were identified. These responses can be divided into 6 anomalous areas, one of which includes the known coal deposit. Additional work is required to define the most southerly anomaly, part of which lies east of the present survey limits.

On one line, toward the northern end of the basin, sufficient gravity data was obtained to estimate the depth of Tertiary sediments to be in the order of 1100 m.

Paper No. 16

GEOLOGY OF THE KIMBERLITIC MOUNTAIN DIATREME, NORTH-CENTRAL MACKENZIE MOUNTAINS, DISTRICT OF MACKENZIE, NORTHWEST TERRITORIES.

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The Mountain Diatreme, in the Sayunei Range of the northern Mackenzie Mountains, is accessible by helicopter from Norman Wells, N.W.T., 195 km northeast, or from Ross River, Y.T., 305 km south-southwest. The diatreme, near elevation 1,680 m, is above treeline in a southwest-trending U-shaped creek valley. Outcrop constitutes about 25% of the surface area otherwise covered by till and talus.

Near the western edge of the Misty Creek Embayment, the Mountain Diatreme intrudes Upper Cambrian to Middle Ordovician silty limestone to a disconformity at, or slightly above, the base of the Upper Ordovician to Lower Silurian Mount Kindle Formation dolomite. A K-Ar date on phlogopite from the diatreme is late-Ordovician (445 $\pm$ 17 Ma). Conodonts, from a limestone breccia block within the diatreme, define the earliest possible age for the intrusion as mid-Ordovician (ca. 475 Ma). These ages suggest a genetic correlation with Late Cambrian to Early Devonian volcanic rocks 30 to 60 km westerly from the Mountain Diatreme.

Subcircular in plan and averaging 600 m in diameter, the Mountain Diatreme has a central core of rarely bedded dark green breccia. Zenoliths of country rock carbonate are common, but rounded and spherical autoliths, 0.5 cm in diameter, characterize the breccia. Autoliths, up to 30% of the breccia, have quenched rims that enclose phlogopite, carbonate pseudomorphs after olivine and pyroxene. Matrix material is fine grained chlorite, phlogopite and carbonate with minor serpentine, tremolite and opaques. Minor dykes of similar composition, but without autoliths or zenoliths, cut this unit. A discontinuous rusty marginal unit, up to 150 m wide, also is similar to the central green unit, but is richer in silica-carbonate, disseminated pyrite and exotic zenoliths. A discontinuous unit of well bedded rock, 50 to 300 m west of the diatreme, consists of carbonate-rich tuffs, autoliths, and a pale-green fuchsitic chromite-flecked quartzite. These rocks probably represent reworked breccia preserved at the disconformity. This implies that all exposures at the Mountain Diatreme formed in, or adjacent to, a maar on the sea floor in a carbonate shelf environment.

Petrography of the rocks of the Mountain Diatreme is not typical of kimberlite. This is due, in part to the epiclastic and unusually high level of formation. Kimberlitic affinities for the Mountain Diatreme, however, are supported by petrochemistry, which is similar to kimberlite if effects of carbonatization and xenolith contamination are disregarded, and by diagnostic indicator minerals, which include microdiamonds, picro-ilmenite, pyrope garnet and chrome diopside.

Paper No. 17

THE REDSTONE COPPER BELT, MACKENZIE MOUNTAINS, N.W.T.

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J.C.L. Ruelle, Shell Canada Resources Ltd., Calgary, Alberta.

The Redstone Copper Belt is a 300 km arcuate zone of Late Proterozoic stratabound copper occurrences in the Mackenzie Mountains fold and thrust belt, Northwestern Canada. Strata of economic interest are contained in the Coates Lake Group (proposed) which is an unconformity bounded sequence, transitional in nature, between the Little Dal and Rapitan Groups. This sequence was deposited in restricted areas during the early part of an extensional tectonic event at about 750 Ma. The Coates Lake group comprises three formations separated by gradational contacts, with local unconformities.

The Thundercloud Formation (proposed) is lowest in the Coates lake Group. It unconformably overlies stromatolitic grainstones and basalts of the Little Dal Group, and was previously included in the latter. It consists of basal volcanic conglomerates which fine upward to maroon mudstones, rhythmically intercalated with tan dolostones and containing a quartzarenite member. This sequence records transgression from alluvial fan to sabkha and shallow platformal marine carbonate conditions.

The dolostones are overlain gradationally by evaporities, or abruptly by conglomerates, both of which grade upward to maroon mudstone rhythmites, all being members of the Redstone River Formation. The evaporites are the result of restricted marine, lagoonal or lacustrine evaporation. The clastic rocks are dominantly carbonate in composition, contain fining upward cycles, trough cross beds and desiccation cracks, and are interpreted as components of alluvial fan complexes derived from the upper part of the Little Dal Group.

The economically most important part of the Coates Lake Group is the Transition Zone, an interbedded coastal sabkha sequence of mudstones, evaporites and carbonates between the Redstone River and Coppercap Formations. The Coppercap Formation above the Transition Zone comprises coarsening upward shaly calcisiltite to calcirudite turbidites with zones of cherts and stromatolite bioherms. These are thought to be the result of dominantly subaqueous clastic deposition during a regional transgression. Graded, maroon coloured, siliciclastic rhythmites and tillites of the Rapitan Group onlap Coates Lake Group to Little Dal Group strata with local conformity to angular unconformity. Facies changes and paleocurrent data throughout the Coates lake Group delineate six main areas of deposition and preservation, influenced by growth faults, with the Coates Lake embayment being the economically most significant.

Numerous copper occurrences have been found in the sequence from the Little Dal basalts to the top of the Coates lake Group. The most important occurrences of disseminated stratabound copper sulphide minerals are confined to the Transition Zone between the Redstone River and Coppercap Formations. Quiet coastal sabkha conditions are indicated in the Transition Zone by evaporites, cryptalgal laminites, red beds, ripple marks and desiccation cracks. An early diagenetic age of mineralization is suggested by an upward and eastward-decreasing copper: iron ratio, concentration in cryptalgal laminated carbonate beds, and association with sedimentary pores and diagenetic replacement textures. Active faults and coastal morphology played specific roles in controlling the different styles of mineralization in each embayment.

The ultimate source of copper abundance in these rocks could have been any or all of the following: rifting with concommitant exhalative activity, leaching and/or compactional dewatering of underlying formations, including the Little Dal basalts. A limited number of chemical analyses suggest caution in interpreting the Little Dal basalts as the sole ultimate source of copper.

The genesis of the copper beds at Coates Lake is tentatively explained as follows. Copper was concentrated by evaporation in the depositional embayment, its solubility enhanced by chloride complexing. Copper sulphide minerals were diagenetically added to algal carbonate beds which formed highly reducing local environments (chemical filters) in the Transition Zone during the landward passage of metal-bearing groundwaters. The timing of this event appears to be related to the major transgression during Coppercap time.

Paper No. 18

Mo, W AND Sn IN THE NORTHERN CORDILLERA OF CANADA AND ADJACENT PARTS OF ALASKA.

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The Northern Cordillera of Canada and adjacent parts of Alaska host a variety of Mo, W and Sn deposits and occurrences, most of which are associated with granitic intrusions. Skarn, porphyry and vein/breccia deposits are the principal deposit types. Skarn W deposits are currently the most important economically and include one of the world's largest W deposit (Mactung) as well as the largest single producer of W concentrates in North America (Cantung). Skarn Sn deposits (e.g. JC) are small but may have some potential. Mo and/or W are also present in a number of skarn Cu deposits (e.g. Cowley Park). Porphyry Mo (e.g. Red Mountain, Adanac, Storie), W-Mo (e.g. Logtung) and Cu-Mo (e.g. Taurus, Casino) deposits are large and have considerable potential although none are currently economic. Vein/breccia deposits of Sn (e.g. EPD) and W (e.g. Fiddler) are relatively small and, although high grade in places, appear to have limited economic potential.

The ages of Mo, W and Sn deposits and occurrences, based for the most part on ages of associated intrusions, range from Devonian to Tertiary. Several periods of deposit formation are evident, the major periods being mid-Cretaceous (118-80 Ma) and Late Cretaceous - Early Tertiary (75-50 Ma) with minor periods during the Devonian, Mississippian, Early Jurassic and mid-Tertiary. Mo deposits have the widest range of ages, having been formed during both of the main periods and most of the minor periods. W deposits on the other hand, are associated mainly with mid-Cretaceous and Early Teritary plutons and, to a minor extent, with Devonian plutons. Tin deposits are even more restricted and are related entirely to intrusions of mid-Cretaceous age except for some minor occurrences associated with a Mississippian intrusion.

The plutons associated with Mo, W and Sn deposits (excluding skarn Cu and porphyry Cu-Mo deposits) are composed predominantly of granite (as is defined by Streckeisen, 1976). The Red Mountain porphyry Mo deposit, which is associated with granodiorite, is a notable exception. The intrusions can be distinguished, to some extent, on the basis of their major and minor element chemistry. In particular, the Sn-related Seagull batholith is relatively enriched in Rb and depleted in Ba and Sr. At the Mactung and Cantung skarn W deposits and the Logtung porphyry W-Mo deposit, associated plutons consist of several phases that show different degrees of Rb-enrichment and Ba- and Sr-depletion.

Paper No. 19

RECENT DEVELOPMENTS IN THE GEOLOGIC PICTURE OF MACTUNG.

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Tungsten-bearing skarn at Mactung, located on the Yukon-Northwest Territories border at latitude 63°17', is hosted by limestone-rich Cambrian and Lower Ordovician units. The basal unit, a limestone slump breccia, contains the lower ore zone and directly overlies early Cambrian clastic rocks. Although fragments and matrix are predominantly limestone, a wide variety of pelitic rock type fragments including early Cambrian are locally abundant and may be up to 10 metres in diameter. Within this unit sections containing abundant interbedded calcareous shale and siltstone are interpreted to lie on the upslope side of the slump, while sections containing abundant pelitic fragments in a mud matrix represent a muddy toe. The toe thins and grades laterally into several centimetres of siltstone and shale locally with interbedded limestone. Approximately 100 metres above the lower ore zone is the 100 metre thick upper ore zone composed of 3 units of thinly interbedded siltstone, shale, calcareous siltstone and up to 30 percent limestone.

Low grade regional metamorphism and deformation have resulted in weak recrystallization, development of a locally pronounced slaty cleavage and a large overturned asymmetric fold in the basal unit. The outermost indication of hydrothermal activity, which post dates regional metamorphism and deformation, is the bleaching of otherwise black marbles and metaclastic rocks. The bleached zone extends up to 400 metres from the edge of the deposit. Traversing inward, marbles become progressively skarned with the following mineralogic zoning:

1) an outer mixed marble-skarn zone with a dominant garnet-pyroxene assemblage,
2) an intermediate pyroxene skarn zone, and
3) a central pyrrhotite-pyroxene skarn.

Scheelite and chalcopyrite concentrations vary systematically with the skarn zoning and attain maximums in the pyrrhotite-rich core of the deposit.

The Cirque Lake stock, a composite biotite quartz monzonite intrusive exposed north and up-dip of the deposit, has previously been considered the source for hydrothermal fluids. Recent data indicate MacTung is only coincidentally located near the margin of this exposed stock. Quartz vein densities and orientations, location of pegmatites and aplites, patterns of skarn zoning, alteration and bleaching of metaclastic rocks and the systematic up dip, up section stacking of mineralization in each limestone-rich unit all indicate hydrothermal fluids were derived from a source at depth south of Mactung.

Paper No. 20

RAY GULCH TUNGSTEN SKARN DEPOSIT DUBLIN GULCH AREA.

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The Ray Gulch Tungsten skarn deposit is located near Dublin Gulch in central Yukon Territory.

Placer mining has been carried out in the Dublin Gulch area since 1895. Since 1978, Canada Tungsten Mining Corporation Ltd. has carried out extensive exploration programs in the area. Several tungsten bearing skarn units containing drill indicated and possible reserves of 6,000,000 tons of 0.8% WO_3 were discovered by diamond drilling in 1979 and 1980.

The Dublin Gulch area lies within the Selwyn Fold Belt and is underlain by Proterozoic to Mesozoic metasediments intruded by late Cretaceous granitic plutons. The deposit is underlain by rocks belonging to the Proterozoic Grit Unit. An elongate granodioritic pluton containing a scheelite bearing quartz vein stock work intruded the Grit Unit.

Four phases of deformation have been recognized in the deposit area. The emplacement of the elongate pluton may have been controlled by the east-west trending Lynx Creek Anticline formed during the second phase of deformation.

A hornfels aureole formed around the intruding granodiorite and altered the metasediments up to 1.5 kilometers from the contact zone. Biotite rich hornfels and calc-silicate skarns of varying mineralogy were formed when pelitic and limy units underwent thermal alteration.

The results of Mr. Cyrill N. Orssich's detailed study of the skarn units within the orebody area were presented in his 1981 Bachelor of Science thesis. This study indicated that two metasomatic phases occurred due to the passive emplacement of the granodiorite stock. Pale green to white coloured skarns containing no scheelite characterize the first phase of metasomatism.

Dilute aqueous solutions infiltrated schist and marble units and effected a transfer of components such as CaO between these interbedded units. Wollastonite and quartz are the most abundant mineral in the first phase skarns.

Dark green coarse grained scheelite bearing skarns characterize the second metasomatic phase. Iron and silicon enriched solutions emanated from within the intrusion and altered rocks affected by the first metasomatic phase. Marble units were affected to a greater extent by the second phase metasomatism than by the first phase. Tungsten mineralization (scheelite) was introduced during the second phase. Clinopyroxene and quartz are the most abundant minerals in the second phase skarns.

Two mineralogical zones were formed during the second metasomatic phase. Silicon, being less mobile than iron, is enriched near the intrusion while iron is enriched further away from the intrusion.

Paper No. 21

GEOLOGY OF THE LENED TUNGSTEN SKARN, LOGAN MOUNTAINS, NORTHWEST TERRITORIES.

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M.J. Burson, Geological Consultant, Vancouver, (both formerly with Union Carbide Exploration, Vancouver).

Tungsten mineralization at Lened is associated with scheelite-bearing skarn within metasomatised and contact metamorphosed lower Paleozoic carbonate rocks, peripheral to three Cretaceous quartz monzonite stocks. Two tabular-shaped ore zones have been delineated. They range from 2 to 14.5 metres thick and dip from 60 to 70 degrees toward the southwest. These zones occur in a restricted structural-stratigraphic setting on the southern margin of the Lened stock: (1) They are hosted by a wavy banded marble unit and an overlying unit of thinly interbedded marble and hornfels, which comprise the upper part of the Cambro-Ordovician Rabbitkettle Formation; (2) They occur within an imbricate fault zone in the footwall of a major pre-intrusive thrust fault of probable regional extent; (3) They are spatially associated with intrusive apophyses that display a distinctive array of alteration features.

The spatial distribution and textural relationships of metasomatic minerals within the skarn zones are complex, but indicate an early pervasive phase of pyroxene-garnet (-vesuvianite) development, associated with medium grade scheelite mineralziation (approx. 1.8 percent WO_3), locally and sequentially over-printed by amphibole, followed by biotite (-pyrrhotite-chalcopyrite) skarn, which contain erratic but generally higher grade scheelite mineralization (greater than 1.0 percent WO_3).

Northeasterly trending cross-faults, along which both pre-intrusive movement took place, are found adjacent to these zones of enrichment, and probably provided some of the pathways for the tungsten-bearing metasomatic fluids which emanated from near-by intrusive apophyses. A pervasive, pre-metasomatic, north-easterly trending joint set, at right angles to the axes of tight northeasterly verging folds and preserved with the skarn zones, exhibits a similar structural control of skarn development and associated mineralization on the small scale.

Paper No. 22

THE RED MOUONTAIN PORPHYRY MOLYBDENUM DEPOSIT, SOUTHERN YUKON.

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The Red Mountain porphyry molybdenum deposit is situated in the Big Salmon Range, approximately 80 kilometers east-northeast of Whitehorse, Yukon. The Mining Division of Amoco Canada Petroleum Company optioned the property from Tintina Mines Ltd. in 1978; ownership is now 50/50 with Amoco the manager.

Red Mountain is underlain by Paleozoic, argillaceous sediments of the Yukon Cataclastic Complex which have been intruded by a 70 hectare, multi-phase, Mid-Cretaceous stock. The deposit is associated with well-developed quartz stockwork and fracture systems within a quartz monzonite porphyry body and adjacent hornfelsed sediments.

Molybdenite mineralization, quartz stockwork, metal zonation, and an alteration assemblage characteristic of a porphyry molybdenum system have been superimposed on the quartz monzonite porphyry and adjacent hornfelsed sediments. A later, barren, pyritic quartz-eye diorite (field notation) body, with related dikes, has dissected the quartz monzonite porphyry, hornfels and associated molybdenite mineralization.

Work on the property was carried out each year from 1978 to 1982; however, due to present metal prices, the project is now dormant. Drill indicated geological reserves of molybdenum mineralization outlined to date consist of 187,270,000 metric tons grading 0.167% MoS_2.

Paper No. 23

THE JC Sn-Fe-F (Be-B-As) SKARN, WOLF LAKE AREA, YUKON TERRITORY.

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The JC deposit is located near the NW flank of the Seagull Batholith at the contact of a ridge-like lobe, or satellitic intrusion of the batholith with shallowly dipping (< 30^0) calcareous sediments of Mississippian age. The nearest known outcrop of the main batholith lies 2 km to the east.

The skarn is confined to a 30 m thick layer of marble and siliceous marble lying within a thick succession of very fine-grained quartzite and argillaceous quartzite.

Mineralization is concentrated along one flank of the intrusive ridge, above an elongate contact zone with a known strike length of 700 m. This zone plunges shallowly and is terminated at one end by surface and at the other by a series of near vertical post-skarn faults. Skarn appears at distances of up to 150 m laterally from the contact.

The skarn itself shows a complex multi-stage evolution of mineral assemblages which has been subdivided as follows:

I) An early metasomatic stage characterized by andradite + hedenbergite.

IIA) An Fe-enriched stage with ferrohornblende + magnetite ± fluorite ± quartz ± cassiterite.

IIB) Pyrrhotite ± chalcopyrite ± sphalerite ± fluorite. Possibly a sulphide-rich substage or replacement of IIA.

III) Epidote + axinite ($(Ca, Mn, Fe)_3Al_2BO_3-(Si_4O_{12})OH^-$) + calcite + malayaite ($CaSnSiO_5$) as a massive or veinlike replacement of IIA.

IV) An F-rich stage characterized by biotite + fluorite with accompanying vein minerals which include quartz, beryl, tourmaline and danalite ($(Fe,Mn,Zn)_4(Be_3Si_3O_{12})S$) ± arsenopyrite ± cassiterite.

V) Late-stage pyrite ± chlorite ± calcite with accompanying calcite-filled breccias.

Early skarn silicates, particulary andradite and ferrohornblende, are Sn-bearing. The bulk of cassiterite mineralization is associated with the later stage veining and accompanying biotitic alteration in Stage IV.

Paper No. 24

URANIUM MINERALIZATION AT THE TING PROPERTY, YUKON.

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The Ting property lies along the southern margin of the Tombstone Batholith, a late Cretaceous alkalic complex located at latitude 64°23'N and longitude 138°38'W, 51 km northeast of Dawson City. The mineralization is associated with the earliest intrusive phase, a highly potassic porphyritic nepheline syenite known as tinguaite. Background uranium values in the tinguaite are in the range of 30 to 70 ppm, but locally are up to 200 ppm. High grade mineralization is confined to narrow veins, the best of which can be traced from distances of up to 50 m and produced assays in the range 0.1 to 1.0% U_3O_8 over widths of 1 to 2 m. Common uranium-bearing minerals include: biotite which is the principal mafic mineral in the tinguaite; purple fluorite which occurs as disseminated interstitial grains and in narrow veinlets; and, uraninite which is normally found in veins. The tinguaites are distinguished from subsequent phases of the Tombstone Batholith and most other uraniferous intrusions by the lack of resistate minerals, low Th:U ratios ranging from 1:2 to 1:10, and low rare earth element contents. A genetic model is presented which suggests that the porphyritic texture of the tinguaite is due to quenching which resulted when volatiles boiled following adiabatic ascent of the magma. During the boiling, uranium and potassium were concentrated in the upper portion of the magma chamber while the less mobile thorium and sodium were relatively unaffected. Some uranium was later remobilized into veins when portions of the tinguaite were strongly sheared and partially recrystallized during emplacement of subsequent intrusive phases, and by circulating groundwaters associated with a weak porphyry system.

Paper No. 25

DISSEMINATED CHALCOPYRITE IN NASINA FACIES METAMORPHIC ROCKS NEAR LUCKY JOE CREEK, WEST CENTRAL YUKON.

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Disseminated chalcopyrite occurs at several locations in Nasina facies rocks of the Yukon Cataclastic Complex near the headwaters of Lucky Joe Creek, Yukon Territory. The Nasina facies is divided into lower, middle and upper assemblages - a combined structural thickness of 5000 m. The lower assemblage is feldspathic gneiss and amphibolite in the lower part and muscovitic schist in the upper part. The middle assemblage comprises graphitic schist, quartzite, amphibolite and crystalline limestone. The upper assemblage contains biotite gneiss, quartzite, slate, limestone and minor amphibolite. This sequence represents a change from predominantly metavolcanic rocks to more mature, quartzo-feldspathic metasedimentary rocks.

The host rocks for the copper occurrences are in the upper part of the lower assemblage, which is overturned in the Lucky Joe Creek area. They consist mainly of quartz-muscovite and biotite-muscovite schist that were probably deposited originally as carbonaceous shale and argillaceous sandstone, respectively. The copper occurs in blanket-like zones of disseminated chalcopyrite and pyrite that transgress lithologic contacts. Within the sulphide zones, pyrite is more abundant near the top and chalcopyrite is concentrated near the base. The lack of associated hydrothermal alteration, and alignment parallel to foliation suggest that the sulphides were emplaced prior to metamorphism, probably before the sedimentary rocks lost significant permeability. A sedimentary diagenetic origin for the copper mineralization seems likely.

The Lucky Joe Creek copper occurrences resemble the more highly metamorphosed Minto and Williams Creek deposits to the southeast and are also similar to important copper deposits elsewhere, such as the Malundwe and Chimiwungo deposits in Zambia and the Aitik deposit in Sweden.

Paper No. 26

THE RED-CHRIS PORPHYRY COPPER-GOLD DEPOSIT, NORTHWESTERN BRITISH COLUMBIA - GEOLOGY AND REGIONAL SETTING.

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C.J. Hodgson, Department of Geological Sciences, Queen's University, Kingston, Ontario.

The RED-CHRIS porphyry copper-gold deposit, near Eddontenajon Lake in northwestern British Columbia, is the best delineated of several prospects explored in this area between 1973 and 1981 by Texasgulf Inc. (now Kidd Creek Mines Ltd.). The deposit and nearby prospects are generally irregular zones of quartz vein stockworking in highly altered, sub-alkalic monzonitic plutons and adjacent volcanic and volcaniclastic sedimentary rocks. These mid-Mesozoic plutons are coeval with and form an integral part of the Upper Triassic - Lower Jurassic Takla (or Stuhini) Group. Alteration assemblages in these deposits are complex, but in general consist of a laterally very extensive zone of propylitic alteration characterized either by ankerite or epidote-calcite assemblages depending on the original rock-type, surrounding an inner but still extensive area of quartz-sericite-pyrite alteration. Classic K-feldspar or biotite assemblages either were not extensively developed or are not well preserved. Sulphide mineralization consists of pyrite, chalcopyrite and rare bornite, either disseminated or in sulphide and quartz veinlets. Gold values are generally low, reaching about 3 g/tonne in the higher grade sections. The RED-CHRIS deposit, although not exhaustively drilled, contains about 41 million tonnes of material grading 0.56% copper and of the order of 0.3 ppm gold. Molybdenum contents are extremely low, averaging about 20 ppm for the entire deposit.

The RED-CHRIS and other prospects in this area show several characteristics which tend to support an "alkalic" porphyry copper classification. The most compelling of these characteristics, which they share with several British Columbia "alkalic" deposits, are their age (late Triassic or early Jurassic), setting (within the Nicola-Takla - Stuhini arc), and metal association (relatively abundant gold, very low Mo content). They tend to differ from other examples of the "alkalic" clan in having abundant quartz in vein stockworks and zones of quartz-sericite-pyrite alteration.

Paper No. 27

LAWYERS GOLD-SILVER DEPOSIT, BRITISH COLUMBIA.

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The Lawyers property is located approximately 280 kilometres north of Smithers, British Columiba.

Gold and silver mineralization, consisting of mainly electrum, native silver, native gold and argentite, is associated with banded chalcedony-quartz stockwork veins and breccia zones cutting across various units of the Lower Jurassic Toodoggone Group of volcanic rocks. From the patterns observed on a hand-specimen scale, as well as on a mine-wide scale, it appears that quartz and chalcedony breccia is dependent on the intensity of fracturing and host rock characteristics. The presence of various kinds of chalcedony (white to cream, green, red and dark brown) as well as banding in veins and veinlets is due to episodic boiling of mineralizing fluids.

The alteration zones associated with mineralization are propylitic, sericitic, argillic zones and silicification . Drill-hole data and field mapping suggest that the argillic alteration zone is more prevalent at higher levels within trachyte crystal tuffs and welded tuffs, whereas propylitic zones are more widespread in quartz-andesites and on the margins. Silicification is common within breccias at all levels. Sericite is very restricted and occurs mainly as envelopes to veins and veinlets.

Assay data from drill holes, underground sampling and trenches suggest that silver values increase with respect to gold toward north and at depth. Major variations in ratios do occur, and this may be due to various periods of mineralization superimposed on each other.

Several post-mineral faults off-set the mineralization into two distinguishable zones. The mode of occurrence of mineralization suggests that Lawyers is a typical epithermal gold-silver vein-type deposit.

Paper No. 28

GEOLOGY OF THE BIG MISSOURI PROPERTY, STEWART, BRITISH COLUMBIA.

S.M. Dykes, A. Galley and H.D. Meade, Westmin Resources Limited, Vancouver, British Columbia.

A southwest-facing, moderately dipping sequence of rhyolitic to andesitic volcanic and volcaniclastic rocks of the lower Middle Jurassic Hazelton Group hosts the stratabound precious-base metal deposits of the Big Missouri property. Pyrite, sphalerite, galena and chalcopyrite with significant gold and silver occur in siliceous cherty tuff layers within a siliceous and sericitic andesite flow, tuff and agglomerate unit. The andesites overlie a mixed volcaniclastic and rhyolite fragmental sequence characterized by rapid facies variation related to synvolcanic faulting.

Three mineralized horizons, each consisting of several cherty tuff layers with fine disseminated to semi-massive sulphide lenses, are recognized. The gold and silver minerals electrum, argentite, native silver and tetrahedrite occur as small grains on grain boundaries and fractures in the sulphides and within quartz gangue. Wallrock alteration, sulphide mineralogy, precious-base metal ratios and style or habit of mineralization are variable for deposits at the three stratigraphic levels.

Precious-base metal cherty tuff mineralization and silica and sericite alteration of the andesite are interpreted to have formed on or near the seafloor as the result of submarine exhalative activity. Cherty layers and sulphide lenses were deposited during periods of quiescence. Distribution of sulphide mineralization is stratigraphically controlled and is associated with footwall quartz-sulphide stringer zones (vents). Favourable topographic traps on the seafloor near these vents resulted in local more sulphide-rich accumulations. Both of these features are possibly related to synvolcanic faults that controlled distribution of lithologies lower in the volcanic sequence. Further exploration utilizes stratigraphic and structural control of the mineralization and the variations that may occur within mineral deposits formed on or near the seafloor.

Paper No. 29

REVIEW OF LODE GOLD-SILVER DEPOSITS IN NORTHERN BRITISH COLUMBIA.

A. Panteleyev and T.G. Schroeter, B.C. Ministry of Energy, Mines and Petroleum Resources, Victoria and Smithers, British Columbia.

Gold $\pm$ silver prospects in Northern B.C. have been worked since the turn of the century, particularly spurred on by activity in the Omineca and Atlin placer gold fields. A brief historical review of past lode producers will include the Big Missouri - Premier camp near Stewart, the Tulsequah 'camp' and smaller prospects, classified as vein-type. Emphasis will be placed on current activity centred on the search for epithermal lode precious metals prospects, notably the Toodoggone 'camp', and the Stewart 'camp' (incl. Big Missouri, Premier, Silver Butte, Porter-Idaho and Sulphurets). Staking rushes and activity in the Troitsa Lake and Manson Creek areas are evidence of the recent heightened interest in exploration for epithermal prospects.

Lode, precious metals deposits in Northern B.C. can be categorized into six main types:

1) Epithermal eg. Toodoggone, Stewart area, Cinola, Engineer.

2) Veins (assoc. with mesothermal environment) eg. Cassiar, Rocher Deboule Range.

3) Replacement eg. Equity, Silver, Polaris-Taku, Scottie Gold.

4) Accessory elements with massive sulphides eg. Windy-Craggy, Granduc, Anyox, Kutcho Creek.

5) 'Porphyry' Cu-Au/Cu-Ag eg. Bell Copper, Red-Chris, Galore, Schaft Creek.

6) Skarn eg. Erickson-Ashby, TP.

Each type has certain unique characteristics but there are overlaps, particulary in the transition from porphyry to the mesothermal and epithermal environments.

Comparison of lode precious metal deposits in Northern B.C. with similar mineralization in Tertiary resurgent caldera settings in the western U.S.A. gives useful insights into controls and geometries of orebodies. Application of modern epithermal models as defined by Buchanan, Berger and Eimon, and others, provides better understanding of the significance of characteristic alteration assemblages and allows interpretation of depth zoning relationships. A preliminary model that considers mineralizing environments from porphyry copper to hotspring discharge sites provides a conceptual framework for a variety of gold-silver deposits observed in the Toodoggone and elsewhere in the Canadian Cordillera.

POSTER PRESENTATIONS

Poster No. 1

GEOLOGY AND MINERALIZATION OF THE KLONDIKE AREA, YUKON

R.L. Debicki, Consultant, Vancouver and
K.J. Grapes, Geology Division, INA, Whitehorse, Yukon

Poster No. 2

GEOLOGY AND MINERALIZATION OF THE WHITEHORSE COPPER BELT

P. Watson, United Keno Hill Mines, Elsa, Yukon (formerly with Geology Division, INA, Whitehorse, Yukon)

Poster No. 3

GEOLOGY OF THE KUTCHO CREEK VOLCANOGENIC MASSIVE SULPHIDE DEPOSITS

D. Bridge, J. Marr, Esso Minerals Canada, Vancouver, B.C. and K. Hashimoto, M Obara and R. Suzuki, Sumitomo Metal Mining, Tokyo, Japan and Vancouver, B.C.

Poster No. 4

IRON FORMATION IN THE RAPITAN GROUP, MACKENZIE MOUNTAINS, YUKON AND N.W.T.

G. Yeo, Geology Division, INA, Yellowknife, N.W.T.

Jasper-hematite iron formation occurs discontinuously throughout the Mackenzie Mountains in the late Proterozoic Rapitan Group. The latter comprises a thick sequence of marine, glaciomarine, and possible glacial sediments laid down in a northwesterly trending series of partly fault controlled sub-basins at or near the margin of the North American platform. The principal iron deposits are in the Snake River area, where they are hosted in crudely stratified maroon mixtites with minor sandstone and conglomerate of the Shezal Formation. Dropstones and abundant striated, faceted clasts indicate glacial influence, although sediment gravity flow was probably the dominant process in their deposition. Iron formation sub-units up to 24 m thick are interbedded with clastic sediments in two major iron-rich zones. Laminated textures in the iron formation is a primary feature, while nodular and irregular textures of jasper and hematite are diagenetic. Reserves in this area are estimated to be in excess of nineteen billion tonnes with average grades over 46% Fe. Lack of access and infrastructure, as well as obligatory beneficiation costs due to fine grain and high phosphorus (+0.35%), combine to make the Snake River iron deposits economically unattractive at present, however. Elsewhere in Mackenzie Mountains laminated and nodular iron formation occurs near the top of the Sayunei Formation. Maroon turbidite rhythmites with dropstones and minor mixtite and conglomerate in the latter are interpreted to be distal facies equivalents of the Shezal Formation. Although the Sayunei iron formation is persistent, it is too thin to have any economic potential. High silica and iron content, and low alumina, manganese, and trace metal abundances indicate that the Rapitan iron deposits resulted from hydrothermal proceses. The Rapitan iron formation is not unique. Remarkably similar late Proterozoic iron deposits, including even more immense ones, are found in other parts of the world. They are commonly associated with thick glacioclastic sequences deposited near craton margins. Their geochemistry also indicates hydrothermal origins. Such a global association of late Proterozoic iron formation and glacial deposits suggests a common factor. Global rifting (probably diachronous) at this time would have been accompanied by the development of hydrothermal systems which produced iron formation, while formation of new seaways and uplift along cration margins favoured widespread glaciation.

Poster No. 5

A REVIEW OF PRECIOUS METALS DEPOSITS IN YUKON

J.A. Morin, Geology Division, INA, Whitehorse, Yukon

Poster No. 6

GEOLOGY AND MINERALOGY OF THE OLIVER CREEK TIN OCCURRENCE, McQUESTON DISTRICT, YUKON TERRITORY

D.S. Emond, Geology Division, INA, Whitehorse, Yukon, and Department of Geology, Carelton University, Ottawa, Ontario

The EPD property is underlain by cataclastic rocks lithologically similar to the Grit Unit of Upper Precambrian to Lower Cambrian age (quartzite, quartz-chlorite schist, quartz-mica schists, and chlorite schist with minor intercalated actinolite +/-pyrrhotite schist, calc-silicate and marble). Many small high level quartz-monzonite plutons intrude the McQuesten area and are dated fron 83 to 108 Ma. One porphyritic quartz-monzonite intrusion outcrops approximately 2 km west of the EPD showing. Detailed logging of 2300 m of drill core revealed several zones of breccia localizing most mineralization; however, some sulphide-bearing actinolite schists are also tin-bearing. There are two main phases of breccia; an early rock flour breccia consisting of fragments of country rock (quartzite) in a matrix of finely comminuted rock; and a late breccia consisting of several phases identified by the matrix material quartz, tourmaline, biotite, chlorite muscovite, or calcite-fluorite (in approximate paragenetic order). The late breccia cuts both the early breccia and country rocks. Tin mineralization occurs mainly in the chlorite breccia, but is also present in some rock flour and tourmaline breccias. High Ag, Cu, and Zn values accompany some tin anomalies. The only tin mineral identified is cassiterite. Pyrrhotite, pyrite, chalcopyrite, and sphalerite are commonly found in the matrix of chlorite and tourmaline breccias. A 'spotted' zone, where the schist contains andalusite porphyroblasts, encountered in all deep drill holes could reflect a thermal aureole of a hidden pluton which may underlie the EPD deposit. Initial brecciation, or formation of the rock flour breccia may have been caused either by faulting, or by gaseous explosion associated with emplacement of the proposed pluton. Emplacement would set up a thermal gradient, cause hydrothermal convection, precipitation, and alteration of permeable breccia zones.

Poster No. 7

PLACER DEPOSITS IN THE CLEAR CREEK DRAINAGE BASIN, CENTRAL YUKON

S.R. Morison, Geology Division, INA, Whitehorse, Yukon

ACKNOWLEDGMENTS

A meeting like this doesn't happen overnight. This particular one was conceived about two years ago by Bill Petruk (then CIM Division Symposia Chairman) and Vic Hollister (then Secretary of the GAC Mineral Deposits Division). Their seed and early support are appreciated and are being continued by Chris Healey (CIM). Initial CIM Whitehorse Branch involvement was made by R.E. 'Dutch' Van Tassell who shortly thereafter moved down south.

Certainly, the greatest accolade should go to the speakers and authors of the papers. Collectively they represent a thorough coverage of mineral deposits in northern Cordillera. Their assembly was arranged through the Program Committee-Ian Paterson of Cominco, Vancouver, Dave Sinclair of G.S.C. Ottawa and Grant Abbott and Jim Morin, both of I.N.A., Whitehorse.

The Geology Division of CIM has ably assisted in the planning, promotion and execution of the meeting. The CIM staff in Montreal were responsible for preliminary advertising, program printing, registration collections, etc. Through the main contact person Anna Lee Chabot, all of this effected easily.

Sponsors of social events are especially thanked for helping all of us enjoy the non-session hours. During these times of economic restraint, their contributions are even more welcome. In this large group are included E. Caron Diamond Drilling Ltd., Arctic Diamond Drilling Ltd., C.P. Air, Trans North Air, Alkan Air, Terr-Air, McCrory Holdings (Yukon) Ltd. and Air North Charter and Training ltd. and others.

Staff of the Exploration and Geological Services Division of Indian and Northern Affairs, Whitehorse were heavily involved in the planning and logistics of this meeting. Special thanks go to staff geologist Kate Grapes who is responsible for much of what 'went right' during the symposium.

SILVER-BEARING VEINS AND REPLACEMENT DEPOSITS OF THE RANCHERIA DISTRICT

by

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INTRODUCTION

Numerous silver-rich, galena- and sphalerite-bearing veins and stratabound lenses are located on both sides of the Yukon-British Columbia border in the Rancheria District (Figure 1). Some veins are within either the Cassiar Batholith or other mid-Cretaceous intrusions; some veins and lenses are near the Cassiar Batholith within early and middle Paleozoic carbonate rocks; and others are far from any exposed Cretaceous Batholiths. Green (1968) first thought that a distinctive type was defined by those associated with Lower Cambrian limestone. Gabrielse (1968) and Mulligan (1969, 1975) emphasized the well defined stratigraphic and structural controls of those located near the Cassiar Batholith, and inferred that they were related to that intrusion. Stratabound lenses far from large intrusions are recent discoveries. Exploration geologists first considered them to be Paleozoic syngenetic/diagenetic deposits, but later exploration has revealed their epigenetic nature. No explanation has been offered for the origin of veins within the Cretaceous intrusions.

This report describes the characteristics of the deposits, and attempts to show that they comprise a distinct type with a common genesis. If so, the deposits are younger than and unrelated to mid-Cretaceous Batholiths. They are closely related to; steeply dipping faults with a variety of strikes, mafic dykes, felsic dykes and breccias. The deposits, dykes, faults and breccias may all be related to regionally extensive, large scale, northwest-trending, dextral transcurrent faults that were active during Late Cretaceous and Early Tertiary time.

The writer briefly visited most properties in late August and early September of 1983. Mike Sanguinetti, George Gorzynski and Owen Hairsine with Cordilleran Engineering; Barry Furneaux with Butler Mountain Minerals Corporation; Terry McCrory; Barry Price; Garry Medford; and Peter Christopher provided invaluable support, information and stimulating discussions. Sue McFarland with Canwest helicopters gave excellent logistical support. The manuscript benefited from critical reading by D. Sinclair, H. Gabrielse, D. Emond and J. Morin.

REGIONAL GEOLOGY

The Rancheria district is primarily underlain by folded Late Proterozoic to Devonian miogeoclinal clastic and carbonate rocks of Cassiar Platform; by allochthonous assemblages of sheared ultramafic, volcanic, sedimentary and intrusive rocks that where accreted onto North America during Mesozoic arc-continent collision(Tempelman-Kluit, 1979); and by Cretaceous intrusion of intermediate composition.

Folds and thrust faults within the miogeoclinal rocks, and some of those within the accreted rocks are related to arc-continent collision. Superposed upon these early Mesozoic structure are large, regionally continuous, northwest-trending, transcurrent, faults with dextral displacements that range in age from Jurassic to early Tertiary. Associated with the Late Cretaceous-early Tertiary transcurrent faults are small local faults with a variety of orientations, some east trending folds and thrust faults, dykes, small intrusions, volcanic rocks, metamorphic rocks, and fluvial sedimentary rocks (Gabrielse, in press).

MINERAL DEPOSITS

The Rancheria Deposits vary widely in composition, type of host rock and morphology. All but the AMY (Marbaco) and MIDWAY deposits are small, poorly exposed prospects that have received little exploration attention. Comparisons are therefore difficult, but most share enough common characteristics to suggest that they are related and have common origin. These characteristics are described here and are summarized in Table 1. More detailed descriptions and/or references for deposits in Yukon are found in this volume under Summaries of Assessment Work, Descriptions of Mineral Properties and Mineral Claims Staked in 1983. References to deposits in British Columbia are found in the B.C. MINFILE. Some of the information in this report and in Table 1 is taken from these reports.

Mineral and Internal Structure

Mineral ratios and internal structures vary widely both within individual deposits, and from one to another, regardless of type. Galena, sphalerite, quartz carbonate, and, less commonly, pyrite are the predominant minerals in most deposits, and are accompanied by a variety of accesories. Few detailed mineralogical studies have been undertaken. One, of the AMY deposits, by Gross (1964), is available to the public. He reports the following minerals: quartz siderite, calcite, limonite, galena, sphalerite, (and smaller amounts of) pyrite, arsenopyrite, freibergite, chalcopyrite, pyrargyrite, pyrrhotite, covellite, marcasite, native gold and native silver. Mulligan (1975, p. 79) report accessory cassiterite and/or stannite from the FIDDLER, LUCK and SILVERTIP deposits and trace amounts of tin from the AMY and LORD(?) deposits. Accesory gold, copper, tin and bismuth are reported from the MIDWAY deposit (Goldie, 1982). Wolframite and scheelite are significant on the FIDDLER property and scheelite occurs in small amounts on the LUCK deposit. The primary mineralogy and textures of many deposits, other than those which are quartz-rich, are unknown because they are completely weathered to distinctive black, manganiferous, and/or less commonly, to rusty, ferrous oxides.

Precious metal content varies widely. Silver content of selected samples typically ranges from 200 to 600 g/t and reaches 9,252 g/t. Silver-lead ratios range, approximately, from 15 g Ag:1% Pb to 225 g Ag:1% Pb. The higher ratios compare with the approximate average ratio of 169 g Ag:1% Pb for the Keno Hill District (Abbott 1982, p. 18). Significant values of gold are only known on the LORD occurrence where a

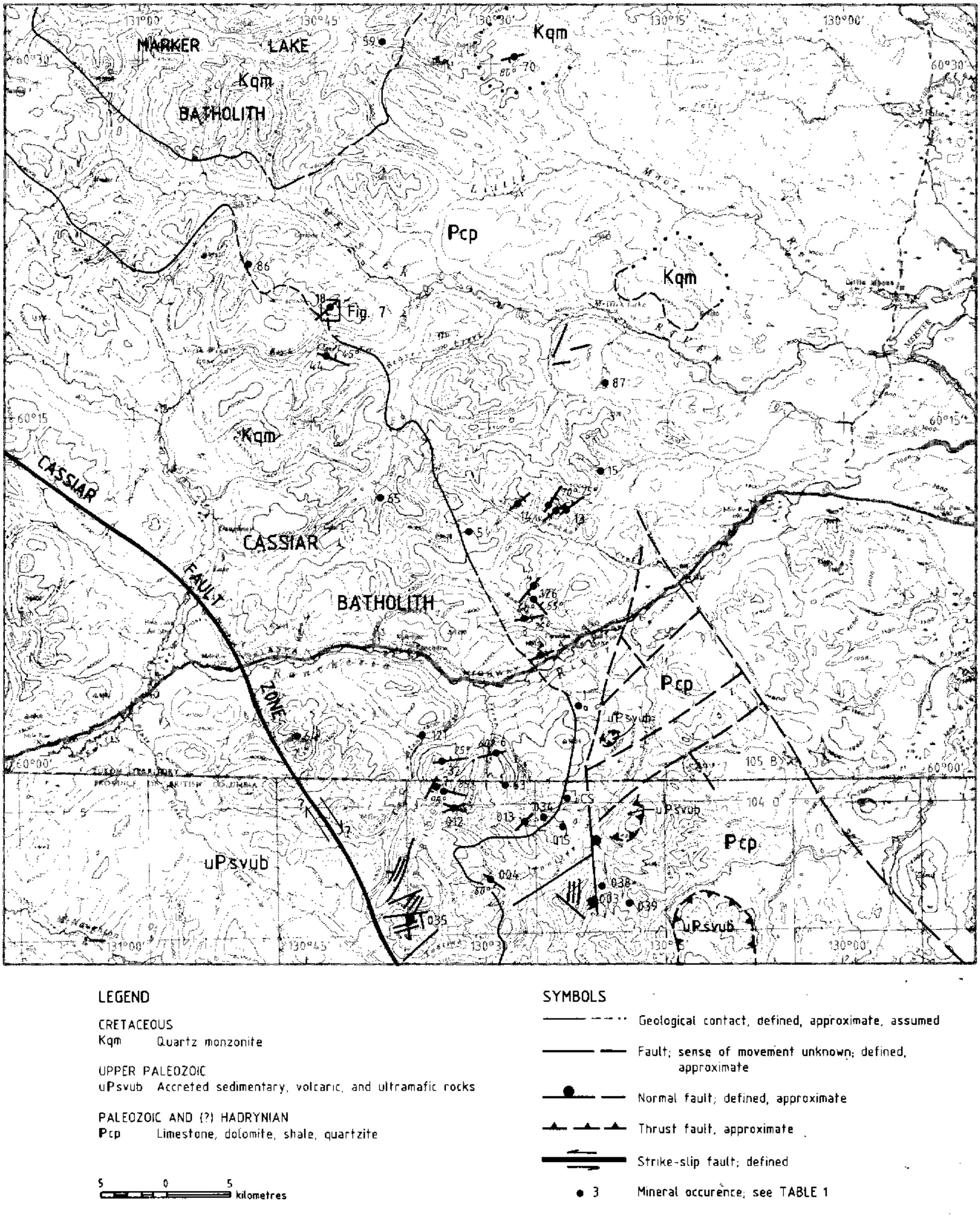

Figure 1 Geological map of the Rancheria District (modified from Poole, 1963 and Gabrielse, 1969a). Mineral occurrences are numbered and described in Table 1.

TABLE 1

NAME (REFERENCE NO.) (YUKON - YEG) (B.C. - MINFILE)	TYPE	HOST ROCK	ASSOCIATED PHENOMENA	DESCRIPTION
TOOTS NV 104 O (035)	Vein	Cretaceous Cassiar Batholith	Mafic Dykes Breccias	Galena fills fractures in sheared, manganese-stained, sericitized granodiorite. The best grab sample assayed 222.76 g Ag/t, 0.93% Pb, 0.10% Zn, 0.01% Cu.
SILVERTIP 104 O (003)	Vein	Middle Devonian limestone, McDame Fm.	Mafic Dykes Breccias	Four oxide zones are localized on steeply dipping northeast trending faults and fractures. The No. 2 Zone, the largest, is 3.05 - 10.6 m wide, 213.4 m long and averaged 195.0 g Ag/t, 6.2% Pb, 2.9% Zn. Galena-rich sulphides have assayed 0.26% Sn.
AMY 104 O (004)	Vein Replacement	Lower Cambrian marble, schist	Mafic(?) Dykes	A vein and replacement of galena, sphalerite, pyrrhotite and ankerite are localized along a shear zone and a sub-parallel marble-schist contact. Proven and indicated reserves are 78,000 tonnes grading 410.52 g Ag/t, 2% Pb, 6% Zn.
NANCY NV 104 O (013)	Vein	Cretaceous Cassiar Batholith	Felsic Dykes Felsic Dykes	Narrow, galena-, sphalerite- and quartz-bearing veins and breccias are localized along northeast-trending shear zones. Nearby, north-northwest trending molybdenite bearing quartz veins form a 100 m wide northeast-trending zone.
ROOT NV 104 O (034)	---	Silurian(?) Devonian(?) limestone	Mafic Dykes	Small oxide gossans and geochemically anomalous lead values in soil are associated with mafic dykes. Small amounts of molybdenite and scheelite occur in skarn that is probably related to the nearby Cassiar Batholith.
BERG NV 104 O (015)	Vein? Replacement?	Silurian(?) Devonian(?) limestone	---	Galena, sphalerite and pyrite occur in a rusty gossan about 30 m in diameter.
JCS NV 104 O (-)	---	Silurian(?) Devonian(?) limestone, quartzite	Breccias	A breccia at least 10 m x 25 m contains blebs of galena. Scheelite- and molybdenite-bearing skarn is nearby. The best grab sample assayed about 311 g Ag/t.
MIDWAY 104 O (038)	Replacement	Middle Devonian limestone, McDame Fm.	Breccias	Massive sulphide lenses as thick as 9.14 m, roughly parallel bedding, and fill open spaces and/or replace the McDame limestone at or near the contact with overlying shale of the Sylvester Group. Estimated reserves are 4,170,000 tonnes grading 348.9 g Ag/t, 5.1% Pb, 12.3% Zn. Minor Cu, Sn and Bi are also present.
TOOTSEE STAR NV 104 O (039)	Vein	Devonian(?) shale, Sylvester Group	---	Galena and sphalerite occur in narrow veinlets.
LORD (BUTLER) 105 B 1 (1)	Vein? Replacement?	Lower Cambrian(?) limestone	Felsic Dykes Breccias	Sulphide-bearing quartz veins and lenses of pyrrhotite-rich massive sulphides are associated with a steep dipping, north trending zone of felsic dykes and breccias about 400 m long and 75 m wide. Assay values and thicknesses, are erratic, but include drill intersections of 15.26 g Au/t over 3.4 m and 337.37 g Ag/t over 2.2 m.
STERLING 105 B 1 (2)	Vein	Lower Cambrian(?) dolomite	Breccias	Small amounts of sphalerite, galena and pyrite are erratically distributed within the matrix of a calcite-cemented breccia at least 2x4 m in area.
LUCK (A&B) 105 B 1 (3)	Replacement	Lower Cambrian(?) limestone	---	A zone about 1.5 m thick contains stratabound lenses, about 15 cm thick, of disseminated sphalerite and pyrite and massive galena. The zone is between two northeast-trending faults. Calcite veins along the northern fault contain scheelite. The best drill intersection assayed 140.26 g Ag/t, 6.08% Pb, 9.67% Zn over 3.05 m. Traces of Bi are also reported.
FIDDLER 105 B 1 (4)	Vein	Lower Cambrian(?) phyllite, limestone	Breccias	Veins up to 0.8 m wide contain cassiterite and wolframite. The largest vein averaged 8.45% WO_3 over a length of 30.5 m and average width of 0.46 m. Composite samples have assayed 0.2% Sn. A nearby quartz-phyllite breccia about 600 m long contains scheelite.
DALE 105 B 1 (6)	Vein	Cretaceous Cassiar Batholith	Mafic Dykes	A galena-bearing quartz vein less than 20 cm wide is localized along a steep northerly dipping, easterly trending fault.
KODIAK 105 B 1 (13)	Vein Replacement	Lower Cambrian limestone, phyllite	Mafic Dykes	Lenses of black, sphalerite- and galena-bearing manganiferous oxides up to 2 m wide and 4 m long replace limestone near cross-cutting faults that contain veins of similar material up to 2 cm wide.

HARDTACK 105 B 1 (14)	Vein Replacement	Lower Cambrian limestone, phyllite	Mafic(?) Dykes Breccias	Manganiferous oxides and vuggy quartz breccias replace limestone in a 1 m wide zone that is localized along the margins of two narrow dykes.
KERNS 105 B 1 (15)	Replacement	Lower Cambrian(?) limestone	Mafic Dykes	A $2m^2$ area manganiferous gossan in limestone.
LUCKY (ANT) 105 B 1 (63) 104 O (033)	Vein	Cretaceous Cassiar Batholith	---	Float boulders containing galena and small amounts of sphalerite, chalcopyrite, barite and pyrite occur in six boulder trains. Assays from 43 different boulders averaged 9,252.1 g Ag/t, 57.9% Pb, 0.74% Zn, 0.43% Cu, 0.03 g Au/t.
MR 105 B 1, 8 (87)	Replacement(?)	Lower Cambrian(?) limestone	---	A steep dipping north-trending oxide zone about 1 km long and 0-20 m thick is localized along or near the contact between underlying limestone and overlying phyllite. A better than average trench assayed 47.56 g Ag/t, 0.32% Pb, 12.01% Zn over 14 m.
PETE NV 105 B 1 (126)	Vein	Lower Cambrian(?) phyllite	---	A massive galena vein 2 to 20 cm wide occurs along a shear zone. 3 samples 10-20 cm wide ranged from 390.0 - 5,442.8 g Ag/t, 8.36 - 34.58% Pb, 1.91 - 830% Zn, 1.0 - 2.1 g Au/t.
LENA 105 B 2 (5)	Vein?	Lower Cambrian(?) limestone, phyllite	---	Black sphalerite, galena, pyrite, chalcopyrite, quartz and carbonate occur as coarse grained vein material in float.
HOLLIDAY 105 B 2 (7) 104 O (012)	Vein	Cretaceous Cassiar Batholith	Mafic Dykes	Several veins of massive galena and sphalerite are localized along steeply dipping north-northeast to northeast trending faults. A 14 tonne shipment assayed 532.01 g Ag/t, 29.1% Pb, 13.9% Zn, 0.16% Cu, 1.30 g Au/t.
LICK 105 B 2 (64)	Vein	Cretaceous Cassiar Batholith	---	A fault contains a galena- and pyrite-bearing quartz vein about 4 cm wide and 30 cm long. A grab sample assayed 15.0 g Ag/t, 1.16% Pb.
GOAT 105 B 2 (65)	Vein	Cretaceous Cassiar Batholith	---	Shear zones up to 3 m wide contain small amounts of galena and sphalerite.
AURORA 105 B 7 (19)	Vein Replacement?	Lower Cambrian(?) limestone, phyllite	---	An east-trending, steeply north-dipping vein. It is about 30 cm wide and is comprised of coarse grained black sphalerite, galena, and chalcopyrite in a quartz and carbonate gangue.
POG 105 B 2 (32)	Vein	Cretaceous Cassiar Batholith	---	A galena- and sphalerite-bearing quartz vein less than 50 cm wide is localized along an east-trending, steep dipping fault.
ALAN 105 B 2 (121)	Vein?	Cretaceous Cassiar Batholith	---	Small, silver-bearing, limonite stained patches of unreported size and shape are in granodiorite that is altered to chlorite and sericite. Grab samples ranged from 0.77 - 24.26 g Ag/t.
MID (CMC) 105 B 7 (18)	Vein Replacement	Lower Cambrian marble schist, Cretaceous Cassiar Batholith	---	Black, manganiferous, galena-bearing gossans up to 10 m wide are localized along a northeast-trending fault and along schist-marble contacts. A galena vein about 20 cm wide cuts quartz monzonite. A 0.6 m chip sample across the vein assayed 4135.9 g Ag/t, 18.3% Pb, 0.72% Zn.
BOY NV 105 B 7 (44)	Vein	Cretaceous Cassiar Batholith	---	Pyrite- and galena-bearing quartz veins up to 15 cm wide occur across a 2 m width in highly fractured granitoid rock.
LOGAN 105 B 9 (70)	Vein	Cretaceous granitoid intrusion	Felsic Dykes Breccias	A vein about 1.5 m wide is comprised of crudely banded, coarse grained black sphalerite, chalcopyrite, pyrite and arsenopyrite in a gangue of white quartz. A 1.78 m chip sample assayed 65.74 g Ag/t, 7.22% Zn, 0.73% Cu. Cassiterite occurs in a nearby, vuggy quartz breccia.
BINGY 105 B 10 (59)	Vein	Cretaceous Marker Lake Batholith	---	Fragments of massive galena and oxides up to 10 cm across are exposed in handpits dug into felsenmeer and overburden.
LAKE (SANDY) NV 104 O (012)	Vein	Cretaceous Cassiar Batholith	Mafic Dykes	Boulders of galena- and sphalerite-bearing vein quartz and altered intrusive rocks assayed as high as 1197.35 g Ag/t, 2.38% Pb and 3.14% Zn. Sulphides and alteration zones are next to east-northeast and east-southeast trending mafic dykes.

NV - Not visited by writer. Information for all occurrences was obtained from reports that are summarized and/or referenced in Yukon Exploration and Geology Report 1983 and B.C. MINFILE.

drill intersection of 3.35 m assayed 15.26 g/t.

In veins hosted by granitoid rocks, unlike most deposits in sedimentary rocks, the dominant gangue is vuggy white quartz (Figure 2). Sulphides are mainly coarse grained galena with lesser amounts of sphalerite and some pyrite, chalcopyrite and tetrahedrite. Sulphides and gangue are crudely banded parallel to vein walls in some places, but elsewhere are erratically distributed. Secondary manganiferous oxides commonly stain weathered surfaces, but primary minerals are preserved in most deposits.

Figure 2 Galena-bearing quartz veins and mafic dykes cut the Cassiar Batholith. This one on the Dale Property parallels a dyke contact.

Alteration envelopes up to several metres wide commonly enclose these veins. Within them, mafic minerals are altered to chlorite and feldspars to clay. Silver is reported, in small quantities, from alteration zones on the ALAN and HOLLIDAY properties.

Within sedimentary host rocks, sulphides are commonly in a pale brown carbonate-rich gangue, or are massive. The tendency of these deposits to form manganiferous gossans suggests that the carbonate is manganiferous siderite. Rhodochrosite may also be present, but has not been identified.

The only preserved carbonate-rich veins are the LENA, AMY and AURORA. They have a coarse carbonate-quartz gangue in which coarse grained black sphalerite, galena and small amounts of pyrite, chalcopyrite and other (?) accessories are erratically distributed. The FIDDLER veins are unusual tungsten-bearing quartz veins that are reported to contain erractically distributed wolframite, and small amounts of scheelite, cassiterite, fluorite, galena and secondary copper minerals.

On the KODIAK property, partially oxidized, sulphide-bearing siderite(?) forms a small lens that replaces enclosing thin-bedded phyllitic limestone. Galena and sphalerite occur as coarse disseminated grains within the carbonate. Relict bedding and metamorphic layering are preserved within the black-weathering siderite, and can be traced into barren limestone. Boundaries of the mineralized zone are diffuse. Individual hand specimens could easily be misinterpreted as having come from a syngenetic, stratiform shale-hosted deposit. The LUCK (A+B) occurrence is similar but replacement of limestone has not been demonstrated. Assays and metal ratios resemble those of the early Paleozoic stratiform sediment hosted deposits at ANVIL and this prospect was at one time interpreted to be of the same age and type.

In contrast to the carbonate-rich replacement deposits, the MIDWAY and LORD (Butler Mountain) prospects are lenses of massive sulphides. At MIDWAY, sulphides are both carbonate- and shale-hosted. Shale-hosted mineralization consists of "finely interlaminated light brown sphalerite, abundant pyrite, variable amounts of galena, and very fine grained quartz and sericite." (Stollery and Selmer, 1982, p. 68). Carbonate-hosted mineralization consists of massive sulphides (Regional Resources, 1984, p. 47). The LORD (Butler Mountain) prospect contains coarse- grained, vuggy aggregates of sulphides and sulphide-bearing quartz veins. Pyrrhotite is the dominant sulphide. Assays indicate that sphalerite, chalcopyrite, galena and arsenopyrite are less abundant and more erratically distributed than at MIDWAY.

Breccias are associated with the LORD (Butler Mountain), STERLING, LOGAN, HARDTACK, MIDWAY and other occurrences. Some consist of intensely shattered rock in which fragments are oriented close to their original position. In others, which generally contain a higher proportion of crystalline matrix, fragments show no relationship to each other and are transported. Still others contain more than one type of fragment; the clasts are locally derived, but have been transported for at least short distances. Breccias on the LORD are associated with quartz porphyry dykes, and cut phyllite and carbonate wall rocks. Most contain angular fragments up to 10 cm wide of limestone, dolomite, phyllite, quartz porphyry, and sulphides in a vuggy, quartz and carbonate matrix. The STERLING occurrence (Figure 3) is a spectacular breccia in which large angular fragments of dolomite, limestone and phyllite up to 30 cm across are supported in a matrix of coarse grained white calcite. Pyrite, chalcopyrite, galena, sphalerite and tetrahedrite are sparsely and erratically distributed within the calcite matrix. The breccia crosscuts limestone wallrocks along a sharp, contact. Breccias on the LOGAN and HARDTACK properties consist of angular vein quartz fragments encrusted by a vuggy quartz matrix. Cassiterite is reported from the LOGAN breccia. On the FIDDLER property a scheelite-bearing breccia comprising angular quartz and phyllite fragments in a vuggy quartz matrix is reported to be more than 600 m long, and up to 40 m wide. The strike of the breccia is parallel to nearby wolframite-bearing quartz veins that have been previously described. In the MIDWAY deposit, carbonate breccias are common and widespread (Regional Resources, 1984,p. 4).

Origin of the breccias is uncertain. The close spacial relationship of some to faults, and the angularity of clasts suggests that fragmentation was mechanical and resulted from fault movement. However, the presence of a transported mixture of different clast types in others suggests that brecciation was caused by gas and/or fluid streaming and possibly, by explosive pressure release. Breccias on the MIDWAY property are confined to the Middle Devonian McDame limestone and are thought to be related to karsting and solution collapse (Regional Resources, 1984, p. 4).

Composition of the oxide gossans and the primary minerals from which they are derived is poorly understood. The largest and most thoroughly studied oxide

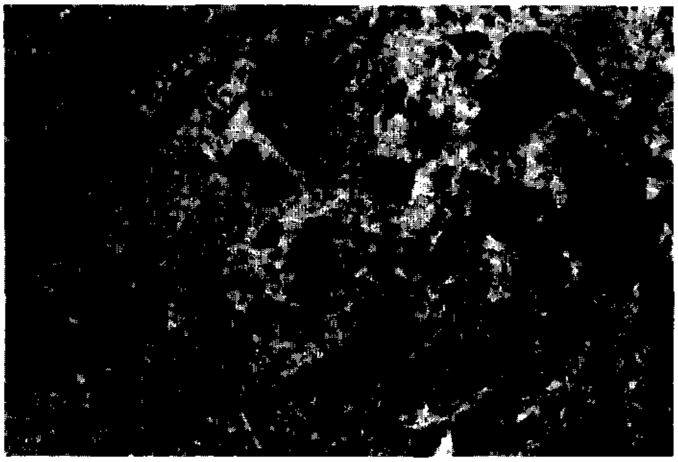

Figure 3 Many sulphide occurrences in the Rancheria District are associated with breccias. This breccia on the a STERLING property comprises transported, angular fragments of limestone and phyllite in a coarse grained calcite matrix.

Figure 4 Many occurrences in the Rancheria District are weathered to iron and manganese oxides. The largest of these (shown here) is the WEST ZONE of the MR Property. It is a steeply dipping zone that is slightly discordant to bedding, and bounded; in the footwall, by linestone, and in the hangingwall, by phyllite.

zone is the West Zone on the MR property (Figure 4). M. Sanguinetti (1983) states that "the oxide mineralization consists of an interlayering and intermixing of siliceous and earthy iron and manganese oxides.The iron oxides are brown, orange, black and purple minerals of which goethite, limonite and hematite (specular, botryoidal and earthy) have been identified. Manganese oxides are primarily black and silvery grey in colour of which pyrolusite (earthy, crystalline and dendritic forms) and psilomelane are probably the principal minerals present." The oxide zone yields significant silver and zinc, and minor lead assays. Sanguinetti reports that "The principal zinc mineral within the oxide horizon is assumed to be hemimorphite (Zn_4 (Si_2O_7) $(OH)_2.H_2O$) which occurs in pale green to colourless, crystalline to amorphous coatings and layers within the oxide mineralization. No preference wasobserved for its favouring the manganese or the iron rich oxide. A comparison of assay results of the oxide material shows no consistent relationship between zinc, lead, silver, manganese, gold and iron values. However,in a few of the trenches a gross relationship appears to exist between zinc and manganese values only." Nodular aggregates 2 to 3 cm wide of red-brown sphalerite and secondary, euhedral calcite forms layers concordant with oxide layering. A few massive cobble sized pods of coarse-grained, silver-rich galena with some limonite, pyrite and quartz are contained by the oxides.

Other oxide zones are generally similar. Some zones on the LUCK (A+B) and KODIAK properties are only partially weathered, and brownish stained carbonate is the apparent source. Primary sphalerite and galena are the most abundant primary sulphides in these deposits, but they are subordinate to the gangue. Therefore, the spectacular gossans seen on some properties may not indicate the presence of massive sulphides.

Dykes

Mafic and less commonly, felsic dykes are associated with many deposits. Mafic dykes are massive, dark green and fine grained. Most are 1 to 2 metres wide, and are parallel to veins and faults. They are most notable near veins in granitoid rocks where bedrock exposure is good, but also cut sedimentary rocks near the HARDTACK, KODIAK, AMY and SILVERTIP occurrences. At the HARDTACK and DALE occurrences, dykes are adjacent to manganiferous alteration and a galena vein, respectively. Elsewhere, they are some distance away from the associated occurrence.

Felsic dykes are associated with the LOGAN, LORD and NANCY occurrences. At the LOGAN occurrence, a is 5 to 10 m wide dyke can be traced for several hundred metres. The dyke is subparallel to the vein, and about 100 m north of it. It is light grey, aphanitic, and in places contains a few quartz and feldspar phenocrysts. Wall rocks are weakly altered to clay and contain a few quartz veins. On the LORD (Butler Mountain) property, white, quartz-feldspar porphyry together with lenses of massive sulphides and breccias forms a north-trending, steeply-dipping zone at least 400 m long and 75 m wide. The porphyry apparently occurs as a series of narrow dykes which at the north end of the zone widen and coalesce into a small plug. Feldspars within the porphyry are commonly altered to clay but wall are not visibly altered. Boundaries between dykes, breccias and sulphides are unclear, but the three are certainly related. A rubidium-strontium age of 52 $\pm$ 3 Ma and a initial 87Sr/86Sr ratio of 0.7125 was obtained by the Geochronology Laboratory at the University of British Columbia from a core sample of the porphyry collected by Gary Medford (G. Medford, pers. com. 1984).

The felsic dykes might indicate the presence of larger intrusions at depth although none have been seen in the Rancheria district. Drill holes up to 600 m deep on the Fiddler property have revealed the presence of a metamorphic aureole, and molybdenum- and tungsten-bearing skarns beneath the tungsten-bearing veins on surface. A genetic link between the tungsten-bearing veins and nearby silver-bearing galena veins, although likely, has not been proven.

Controls of Mineralization

Carbonate-shale boundaries and faults exert a strong control on the form and location of deposits. Almost everywhere replacement lenses are in limestone at, or near, a contact with shale or phyllite, and are roughly concordant with that contact. Green (1968) and Gabrielse (1968) considered the host rocks for these deposits to be Lower Cambrian, and speculated that a genetic link may exist between the deposits and strata of that age. This possibility now seems unlikely. There are few diagnostic fossils reported from the carbonate host rocks particularly within Wolf Lake map area. Although some are certainly Lower Cambrian, others seen by the writer could be younger. The unusually large size of the Midway deposit suggests that the McDame Limestone is particularly favourable for sulphide deposition. If breccias within the deposit are karst or solution collapse features, then sulphides may have been deposited in large, preexisting open spaces, that are restricted to the McDame limestone.

Faults are probably host to most veins and next to, or near replacement deposits. Figure 1 shows those faults mapped by Poole (1958), Gabrielse (1968), the writer, and, near some occurrences, by other geologists. All dip steeply and most trend northeast, but some trend north or east, and a few, northwest. In sedimentary host rocks, some faults are indicated by offsets in bedding and/or the eastern contract of the Cassiar batholith. Others are inferred by the presence of dykes or veins which parallel known faults. The sense of movement on most is unknown. The amount of movement is probably small, on the order of ten to one hundred metres. Within granitoid rocks, no markers are present to demonstrate faulting, but strong topographic lineaments that parallel known faults within sedimentary rocks indicate theirpresence. Gently plunging slickensides occur on the walls of the DISCOVERY vein.

A direct relationship between faults, veins and replacement zones is apparent on the KODIAK and MID (CMC) properties. These occurrences are described in some detail because their features are thought to characterize of the Rancheria deposits. On the KODIAK property two conformable lenses of black wad replace limestone beds. One end of each lens terminates abruptly against a northeasterly-trending fracture zone or fault which contains a narrow, intermittent, 2-3 cm wide vein of similar material. One lens is about 4 m long and gradually decreases inthickness away from the the vein where it is about 30 cm wide. The lens is comprised of coarse-grained, vuggy black oxides that contain a few coarse grains of galena. The second lens is exposed in the end wall of a large trench. Most of it has been mined (Figure 5) and the remaining portion is about 2 m long and 1 m wide. The mineralized zone consists of coarse-grained, light brown carbonate that is partially oxidized to black wad. Galena and some sphalerite occur as coarse, disseminated grains within the oxides. Unlike the first lens, relict bedding and metamorphic

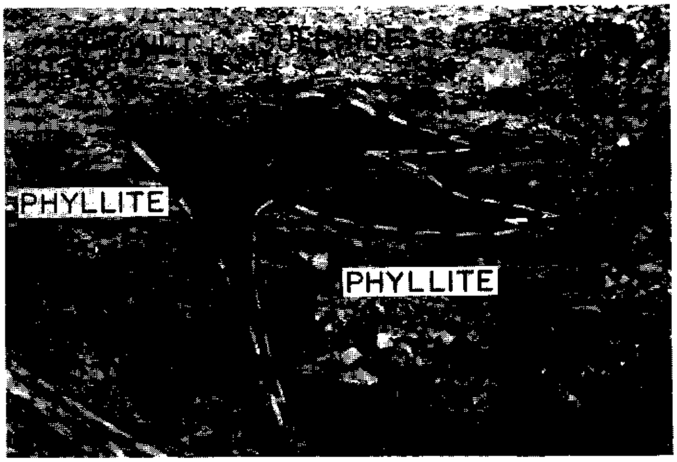

Figure 5 The strong control exerted by bedding and faults on the form and location of sulphide deposits in the Rancheria District is clearly illustrated in this photograph of a showing on the KODIAK Property. Galena-bearing carbonate and secondary manganiferous oxides replace phyllitic limestone near a northeast-trending fault. Similar material is localized along the fault.

layering are visible and can be traced from the mineralized black weathering carbonate into barren limestone. Boundaries of the mineralized zone are diffuse.

The MID (CMC) showings (Figure 6) straddle the eastern margin of the Cassiar batholith and include veins hosted by granitoid rocks, veins hosted by sedimentary rocks, and stratabound lenses within sedimentary rocks. Figure 7 is a simplified interpretation of the geology of the showings. Black manganiferous gossans occupy a fault and replace limestone beds within a Lower Cambrian schist and limestone sequence at the eastern margin of the batholith. The mineralized fault strikes 045° and dips steeply. An apparent sinistral displacement of about 150 m is indicated by offset of northwest-trending bedding and the intrusive contact; However, normal movement could also account for the offset. At least one other parallel fault is present. Prominent airphoto lineaments mark these structures and indicate the presence of many others nearby. None have been explored. Patches of vuggy, fine-grained, black manganiferous material up to 10 m wide can be traced for about 200 m along the fault. Similar material also forms conformable lenses within two limestone beds that intersect the fault. These lenses are about 50 m long and up to 5 m wide. Coarse galena, in rare patches up to 3 cm across, is the only sulphide mineral seen. In nearby outcrops, manganiferous veinlets a few centimetres wide occupy vertical, northeast-trending fractures, and clearly crosscut older, sphalerite-bearing garnet pyroxene skarn that is likely related to the Cassiar batholith. Scheelite and molybdenite have also been reported from this skarn (D.I.A.N.D., 1983, p. 96). A second zone, parallel to, and about 50 m southeast of the first, is in altered biotite quartz monzonite. Two small trenches expose a galena-bearing quartz vein about 4 cm wide and a related zone of silicification and alteration 3 to 4 m wide and at

Figure 6 Many characteristic features of sulphide occurrences in the Rancheria District are displayed on the MID (CMC) Property. This view looking north, is the area shown in Figure 7.

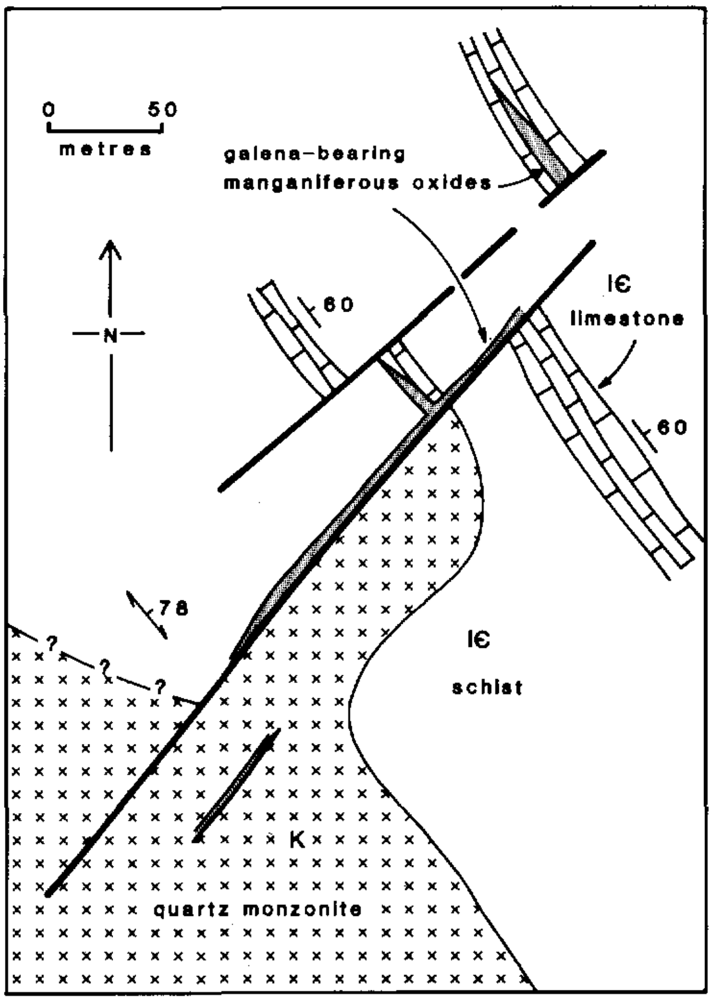

Figure 7 This simplified interpretation of the geology of the MID (CMC) Property shows many of the characteristics of deposits in the Rancheria District. Faults cut both Cretaceous intrusions and enclosing metasedimentary rocks. Sulphide-bearing quartz and carbonate veins, and secondary manganiferous oxides are localized along the faults, and along schist-carbonate contacts.

least 50 m long. The silicified zone is poorly defined and is interspersed with altered intrusive rocks in which mafic minerals are altered to chlorite, and feldspars to clay. Quartz-rich zones are fine grained and vuggy. They may replace wall rock or fill open spaces. All of these rocks are intensely fractured. Black manganiferous wad, a pale green (scorodite?) and brown boxwork, and some fine grained galena coat most surfaces.

REGIONAL TECTONICS AND DISCUSSION

The Rancheria deposits are probably younger than, and unrelated to large mid-Cretaceous intrusions such as the Cassiar Batholith. Some veins are along faults which cut, and locally offset the intrusions. Other deposits are far from any exposed batholith, and are associated with faults of the same type that cut the granitoids. No late phases of the large batholiths, to which the deposits within them might be related, have yet been recognized. Felsic and mafic intrusive rocks that are spacially related to the deposits are compositionally unlike the large granitoid bodies. A radiometric age of 52 Ma that has been obtained from one of the felsic intrusions suggests that these rocks are significantly younger than the Cassiar batholith, which has yielded radiometric ages of 98 Ma or older (Wanless et al p. 11). The others are not dated but are probably the same age. If the deposits were related to the large batholiths, a mineral zonation between deposits; within the intrusions, near the margins, and far away would be expected, but is not seen. The concentration of deposits along the eastern margin of the Cassiar batholith, evident in Figure 1, is not proof that these deposits are related to the batholith. Hornfelsed sedimentary rocks within the metamorphic aureole of the batholith are resistant and far better exposed than equivalent unmetamorphosed rocks nearby, and deposits are more likely to be exposed there than elsewhere. Also, the relatively recent discovery of the MIDWAY and MR deposits, far from large intrusions suggests that the metamorphic aureoles have been more intensively prospected than other areas.

The close association of deposits, dykes and breccias with faults suggests that the latter controled distribution of the first three. The faults may have been more than passive zones of weakness which localized the emplacement of intrusive rocks and associated mineralizing fluids. Possibly, they were active participants in the ore forming process, and were themselves being either generated or reactivated during the emplacement of dykes, breccias and sulphides.

The only known regional features, younger than mid-Cretaceous, to which the Rancheria deposits can be related are large scale, right lateral strike-slip faults. In the Cassiar and Omineca Mountains of north-central British Columbia, Gabrielse (in press) has documented a network of such structures that were active from mid-Jurassic through early Tertiary time (Figure 8). In a general sense, the age of fault movement becomes younger from southwest to northeast and spans the period when the large Cretaceous batholiths were being emplaced. Faults closest to Rancheria are mid-Cretaceous and younger. The Cassiar fault is southwest of Rancheria, along the western margin of the Cassiar batholith. For much of its length, the fault is a mylonite zone up to 3 km wide. Radiometric ages from biotites within the fault zone give mid-Cretaceous ages. Horizontal to gently-plunging lineations suggest strike-slip movement, but offsets have not been demonstrated. The Kechika Fault projects into the south-central part of the district, but has not been mapped there. Late Cretaceous and/or early Tertiary, right lateral movement on the northern portion of the fault may have been as much as 210 km. The Tintina-Northern Rocky Mountain Trench fault is northeast of Rancheria. Late Cretaceous and/or early Tertiary movement on the fault is at least 450 km.

Gabrielse (Figure 8) has shown that small, seemingly unrelated faults with northerly and easterly strikes can be related to the large northwest-trending structures. Figure 8 also shows the stress field required to generate transcurrent faults and the pattern of related secondary faults that are seen in experiments, and in actual wrench fault systems (McClay, 1984, p. 103-108, Tchalenko, 1970, p. 1625-1640). Such a stress field can generate; northwest-trending synthetic shears (R1 and less commonly, P), easterly to northeasterly-trending antithetic shears (R2), and northerly-trending extensional faults (EF). Faults of this nature do accompany the transcurrent faults in northern British Columbia (Figure 8). However, many wrench-fault systems are more complex and are accompanied by folds and thrust faults in zones of compression, and normal faults in zones of extension. Complications such as these may account for the failure of some faults in the Rancheria District to match the orientation of those predicted by theory.

Gabrielse (in press) has described metamorphic and igneous phenomena that are spacially and temporally associated with the Late Cretaceous and early Tertiary transcurrent faults. Some are similar to those associated with the Rancheria faults (and deposits). Felsic and andesitic volcanic rocks of Eocene age are found in two places along the Kechika Fault. North-trending, Eocene mafic dyke swarms cut older rocks near the south end of the Kechika Fault. Furthermore, metamorphic rocks in the Horseranch and Sifton Ranges also give Eocene radiometric ages. A few, small, Late Cretaceous and early Tertiary intrusions are scattered south and southeast of Rancheria. One is near the Cassiar fault zone and some are near small faults. Three small quartz monzonite and alaskite intrusions along the eastern margin of the Cassiar Batholith, near Cassiar, give K/Ar ages of 62.0, 68.3 and 71.7 Ma (Christopher et al 1972 p. 1732). A quartz monzonite stock, about 50 km south of Rancheria is 58 Ma (Wanless et al., p. 6) and two granite porphyry plugs about 20 km east of Cassiar at Mt. Haskin and Mt. Reed are about 50 Ma (Christopher et al, 1972). Gabrielse concluded that these phenomena may reflect extension and thinning of continental crust, and a resultant rise in geothermal gradient.

OTHER DEPOSITS

Cretaceous and early Tertiary precious metal bearing deposits are present in other parts of the Cordillera where large scale transcurrent faults of the same age are also known. A few of these are mentioned here. Some may have an origin similar to the Rancheria deposits and a study of these deposits could shed light on the origin of those near Rancheria. In addition, the possibility of previously unrecognized favourable environments should be considered.

Descriptions of silver-bearing deposits near Mt. Reed and Mt. Haskin (Gabrielse, 1963, p. 113-116; Holland, 1965) resemble those of some Rancheria deposits. The deposits are associated with steeply-dipping faults that trend northwest, north and northeast, but unlike the Rancheria deposits, contain skarn minerals and are near Tertiary porphyry stocks. These intrusions and the older, Late Cretaceous stocks near Cassiar also host molybdenum- and tungsten-bearing porphyry deposits.

Near the same area, gold-bearing quartz veins (Diakow and Panteleyev, 1982 p. 156-161) trend northeasterly or easterly and dip steeply. A radiometric age of 131 Ma was obtained from one of the veins, and Diakow and Panteleyev concluded that the gold-bearing "mineralization appears to be related to structural-metamorphic events that pre-date and are independent of major granitic emplacement." Either not all northeast-trending veins are related to the processes proposed here to explain the Rancheria deposits, or transcurrent faulting and related processes were active in this area in Early Cretaceous time.

Veins in the Keno Hill district, about 90 km northeast of Tintina fault in north-central Yukon, are somewhat similar mineralogically to those near Rancheria and are along steep faults that trend easterly to northeasterly. They cut metamorphic rocks that give Cretaceous radiometric ages, but themselves give ages of about 80 Ma (Sinclair et al 1980). A few feldspar porphyry dykes are exposed nearby (Boyle, 1965) and Sinclair et al concluded that the deposits are primarily related to Cretaceous intrusions.

Mineral deposits might also be localized along the large transcurrent faults although none have yet been discovered there. The presence of Late Cretaceous and early Tertiary andesitic and felsic volcanic rocks, and subaerial clastic rocks (Gabrielse, in press) along the Kechika and Tintina-Northern Rocky Mountain Trench fault systems suggests the possibility of epithermal deposits.

SUMMARY

This preliminary report proposes that silver-bearing deposits in the Rancheria district are Late Cretaceous and/or early Tertiary in age and are spacially and temporally related to faults, mafic and felsic dykes, and breccias. Faults may be the fundamental control of sulphide deposition, and intrusive activity. The only known regional event of the same age, that could relate to the deposits, is movement on large scale transcurrent faults with associated secondary faulting, metamorphism, and igneous activity.

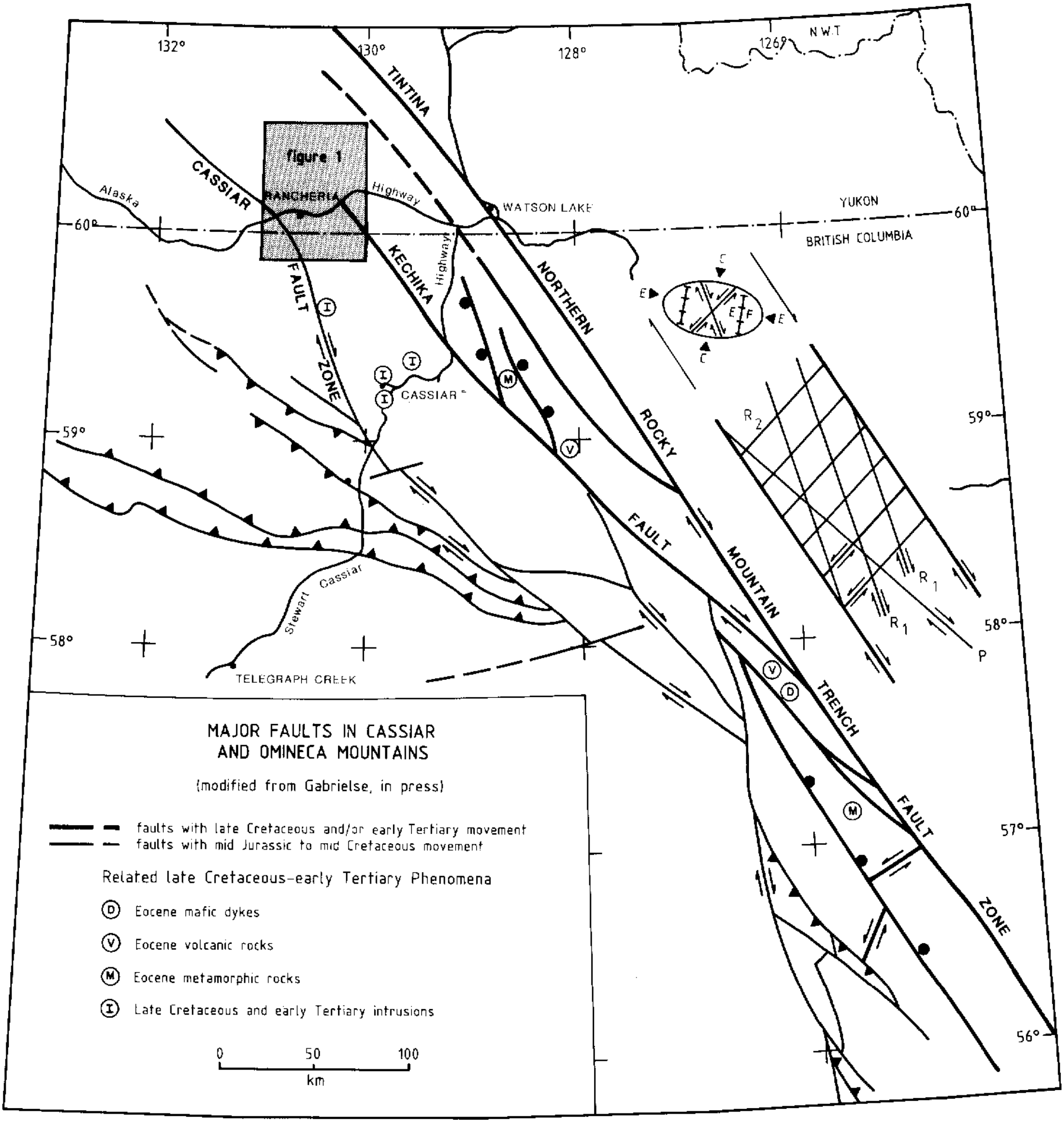

Figure 8 This map, modified from Gabrielse (in press) shows the location of major transcurrent faults and related phenomena in the Cassiar and Omineca Mountains. The strain ellipse shows how local faults with a variety of orientations, such as those in the Rancheria District, could be related to the large scale structures.

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NH_4 GEOCHEMISTRY NEAR SEDIMENTARY EXHALATIVE DEPOSITS IN SELWYN BASIN: A POSSIBLE EXPLORATION TOOL

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ABSTRACT

Studies conducted on two Alaskan shale-hosted stratiform Pb-Zn-Ag deposits showed that the NH_4 content of illites increased toward the ore bodies and might be used as an exploration tool (Sterne, 1981). This study compares the NH_4-chemistry of five shale-hosted stratiform deposits in Selwyn Basin and verifies the existence of a halo near some.

The five are Howards Pass, Driftpile (Gataga District), Clear Lake, Tom, and Jason (Macmillan Pass). NH_4 was found in feldspars, but not in illites. This is probably due to a transferral of NH_4 from illites to authigenic feldspars during regional metamorphism. NH_4 in feldspars was found to increase in the hangingwall over the Howards Pass and Clear Lake deposits. Concentrations reached as high as 2000 ppm. Evidence suggests that NH_4 halos around the other deposits were disturbed by detrital input.

The NH_4 anomalies near deposits in Selwyn Basin resemble those near active hydrothermal systems in the Guaymas Basin, Gulf of California - a modern analogous rift basin. A model is proposed for the formation of an NH_4 halo.

INTRODUCTION

Sterne (1981) studied the clay mineralogy of the Lik and Competition Creek sedimentary exhalative (abbr. "sedex" after Carne and Cathro, 1981) prospects in the Delong Mountains, northern Alaska. He found and first reported the occurrence of NH_4-illites. Analysis of 50 samples showed that NH_4 substitution for potassium (K) in the illite interlayer site increased toward the ore zone, indicating some chemical association with the sulphides. The inference was that NH_4 may form a halo around sedex deposits.

To test and better understand this phenomenon, more than 200 drill core samples were collected from five Selwyn Basin sedex deposits; 103 of these samples were analyzed for NH_4 content. The deposits include the Devono-Mississippian Tom and Jason deposits at Macmillan Pass; Clear Lake, also Devono-Mississippian, located just west of the Tintina Trench; Driftpile, of the same age, located in the Gataga District, northern B.C.; and the Silurian Howards Pass deposit (Figure 1).These deposits were chosen because they are relatively unmetamorphosed (lower greenschist facies).

REGIONAL SETTING

Selwyn Basin is part of the northern Cordilleran miogeocline and is comprised of rocks ranging in age from late Proterozoic to Triassic. It is bounded by the Mackenzie Arch (N.W.T.) and MacDonald (B.C.) platforms to the east, and by the Pelly-Cassiar platform and Tintina Trench to the west. It is underlain by thinned continental crust. Right lateral movement along the Tintina fault is estimated to be 450 km (Tempelman-Kluit, 1977).

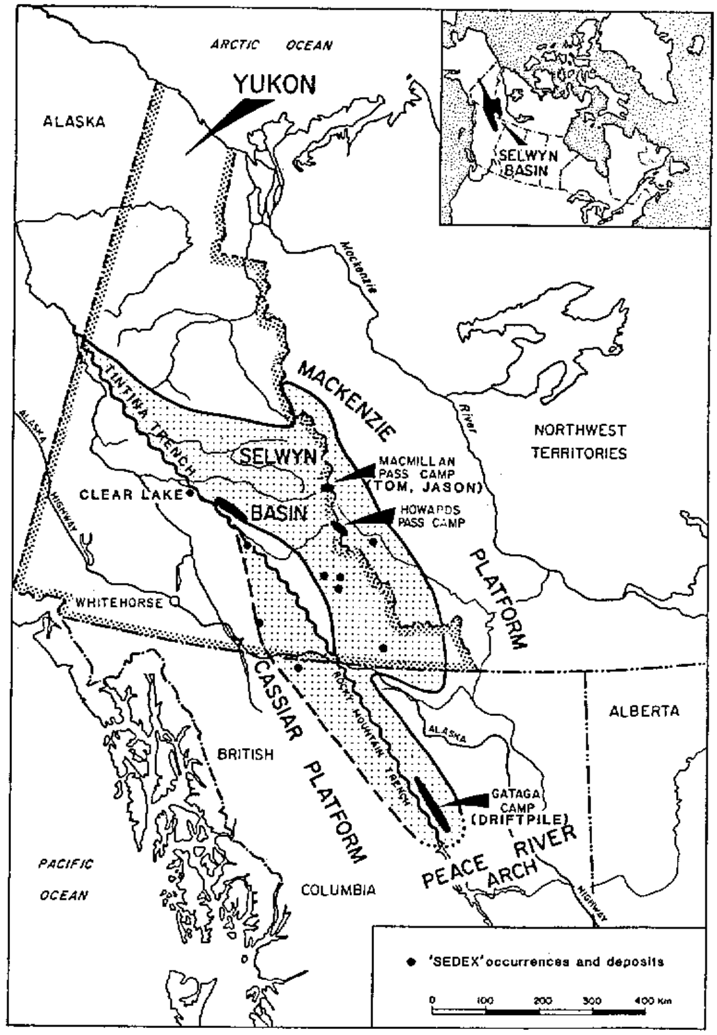

Fig. 1 Location of the Selwyn Basin and the main sedex zinc-lead-silver camps (modified from Carne and Cathro, 1981).

Figure 2 summarizes the stratigraphy near Macmillan Pass and resembles that seen near the other deposits. More extensive descriptions and correlations are published by Abbott et al, 1983; Blusson, 1976; Carne, 1979, 1981a; Cecile, 1980; Dawson, 1977, 1982; Gordey et al, 1981, 1982; Gordey, 1980, 1981; Morganti, 1979; Tempelman-Kluit, 1977, 1979; Tempelman-Kluit et al, 1977; and Gabrielse, 1967.

LOCAL GEOLOGY AND STRATIGRAPHY

The depositional environments of the five deposits under comparison vary in detail, however, all were probably deposited during periods of extensional faulting in deep basins predominantly comprised of black shales and cherts. All of the deposits are thought to be near faults that were active during periods of mineralization (Figure 3). The tectonic activity may be associated with a heat source

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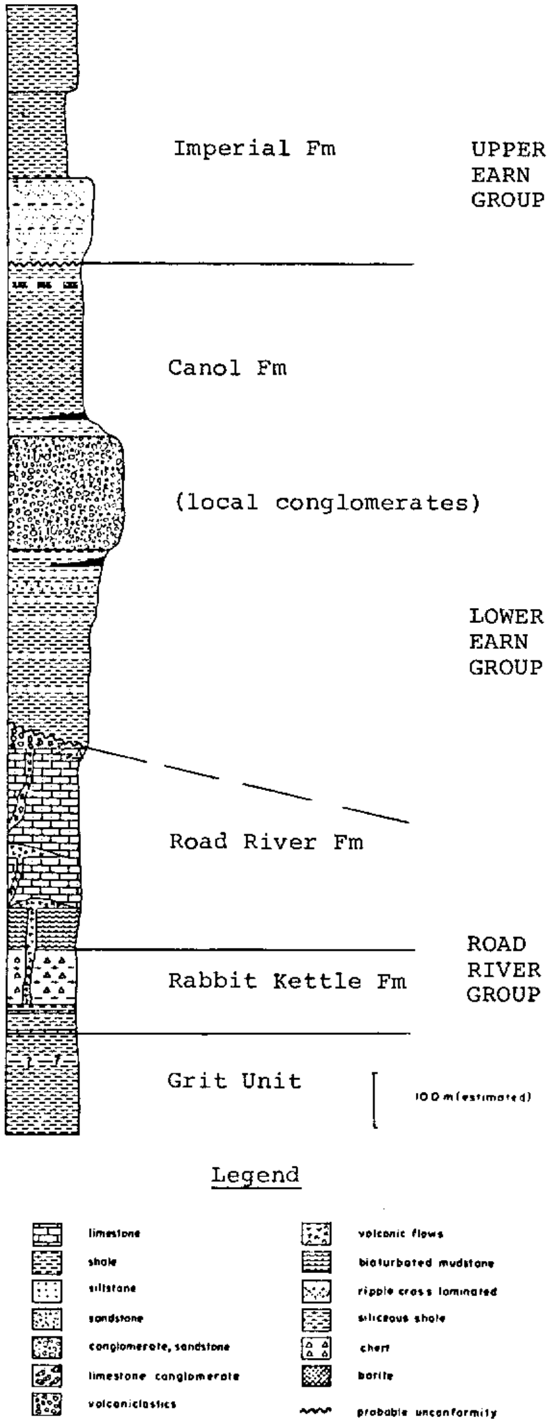


Fig. 2 Regional stratigraphy, Selwyn Basin. Typical section from MacMillan Pass (after Abbott, 1982).

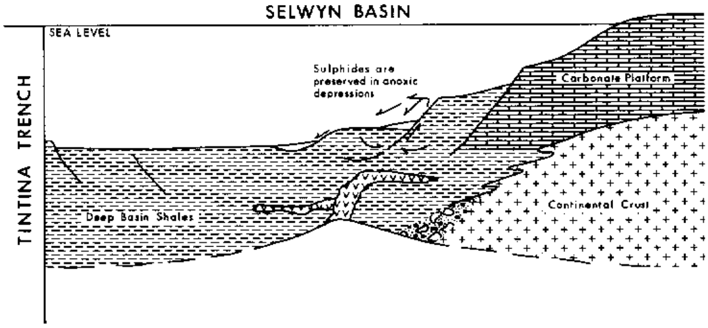


Fig. 3 Schematic tectonostratigraphic setting of sedex deposits.

in the basin. Either crustal thinning, or igneous intrusion related to rifting began circulation of hydrothermal fluids which leached metals from the existing sediments and exhaled them onto the seafloor. The deposits are localized in mini-basins, within the shale depocenter, in which dense hydrothermal brines were either trapped or emitted. The deposits are all stratiform and stratabound in lenses several meters to kilometers in length, and tens of meters thick (Large, 1983).

Howards Pass

The Howards Pass deposit is unique among the five in that it was deposited in an environment of extraordinary anoxia. ^{34}S values indicate that for a 20 m.y. period, almost all sulphate was reduced to sulphide. Sulphides were deposited over 4 m.y. while the sedimentation rate in the basin was approximately 0.4 cm/1000 yrs. (Goodfellow, pers. comm., 1984).

The local stratigraphy consists of the basal upper Cambrian-lower Ordovician Rabbit Kettle formation (limestone) which grades into the Silurian Howards Pass formation; host to the sulphides. This formation is divided into several lithologic units, with organic carbon content as high as 12%. The stratigraphic footwall is a carbonaceous, pyritic, cherty mudstone. The sulphides are referred to as the Active Member and the hangingwall sediments are phosphatic carbonaceous chert (lower-middle Devonian) overlain by a bioturbated laminated mudstone. Units above this are calcareous and dolomitic mudstones. The sequence is capped by the Iron Creek formation, a massive baritic grey mudstone and shale. An unconformity marks the beginning of high energy deposition of mudstone, siltstone and sandstone called the Yara Peak formation (Goodfellow et al, 1983).

There is no evidence of a vent in the immediate Howards Pass area. Morganti (1979) suggests that ore brines were introduced from outside the mapped area (10 km) and accumulated in minibasins at the base of a slope. The lack of stringers, brecciated ore, and high energy sediments in the Howards Pass formation preserves the laminated sulfides in a nearly undisturbed environment. This setting seems ideal for the study of host rock chemistry; however, there is some regional post-mineralization deformation. Metamorphic temperatures may have been as high as 250^{o}C based on conodont colour thermometry (Goodfellow, pers. comm., 1984).

Tom and Jason

The Macmillan Pass stratigraphy is extensively reviewed by Carne (1979) and Abbott (1982). Macmillan Pass is defined by a 30 by 60 km, west trending fault and fold belt which crosses the predominant north-south structural grain. Abbott (1982) has divided the so named Macmillan Fold Belt into three sections (north, central and south) which define a horst and graben structure. Movement along normal faults defining the graben structure was responsible for venting mineralizing solutions to the basin, and for the introduction of detrital material through turbidity currents and slumping. Turbidity currents in the lower Earn Group flowed into the graben from the northwest (Lydon et al, 1979, cited from Smith, 1978).

The Tom and Jason deposits are contained within the lower Earn Group at the same stratigraphic level. The old name for the host unit is the Canol formation or Black Clastic group. It directly overlies the Road River formation and is separated from the Imperial formation by an unconformity. The local stratigraphy is divided into four units. Unit 1 is the basal unit consisting of black silty shales that may be distal turbidites (Gardner, 1983). Unit 2 is a chert pebble conglomerate that cuts two major channels through unit 1. Clasts are as big as 6 mm in diameter (Carne, 1979). Homolithic and heterolithic breccias are also found at this stratigraphic level. They represent local scarp environments (Winn et al, 1981). Unit 3 is subdivided into 3a and 3b. Unit 3a is similar to unit 1 but it is more pyritic and weathers brown (Carne, 1979). It is a black argillite with fine silty and sandy layers. This unit is the stratigraphic footwall for the Tom and Jason deposits. Unit 3b is referred to as the "silvery weathering unit". It is a black cherty shale that forms the hangingwall. The top of the unit becomes more cherty, and some non-fossiliferous horizons are calcareous (Large, D., 1980). Unit 4 belongs to the Mississippian Imperial formation. It is a reddish brown weathering, shallow water, ripple cross-bedded sandstone. Its presence establishes the completed infilling of the basin.

Tom and Jason both contain two sulphide lenses up to 40 meters thick. They are thought to have been exhaled during the second tectonic movement along the growth faults at Macmillan Pass (Lydon et al, 1979). The first exhalation deposited predominantly barite. Bailes et al (1983) have interpreted a massive to thick banded sulphide facies as being proximal to a vent source. A schematic diagram of the depositional environment is presented by Winn et al (1981) (Figure 4).

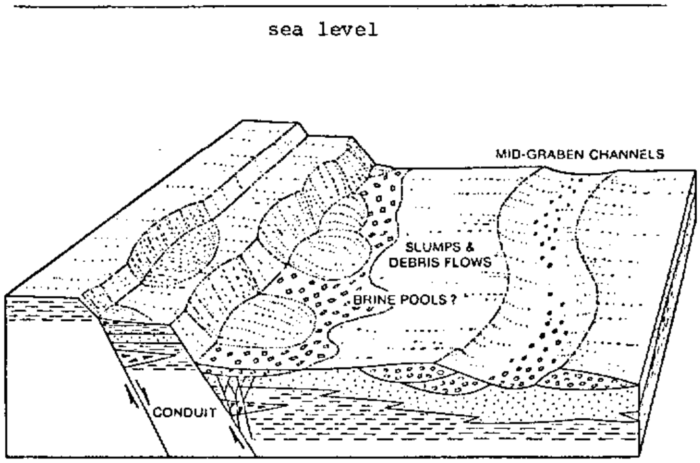


Fig. 4 Schematic diagram of the depositional environment of sulphides at MacMillan Pass, Tom and Jason deposits. Detrital influx may have diluted or washed out NH_4 in the brine pools (after Winn et al, 1981).

Driftpile and Clear lake

The Gataga Camp and Clear Lake deposits are time equivalents of the Macmillan Pass deposits, but they were not deposited in a graben, so the coarse clastic component is absent in the local stratigraphy. The 450 km movement along the Tintina fault is thought to have displaced the Clear Lake deposit from Driftpile. The stratigraphy around both deposits is similar and may suggest that mineralization occurred in the same basin. The Driftpile deposit is located in a section of the lower Earn Group formerly called the Gunsteel formation. Lithologic variation around the sulphide body is complex. The deposit occurs in two lenses contained in a basin bounded to the northwest by a paleotopographic ridge, and to the east and west by regional fault zones. A normal fault to the southeast may be remnant of a Devonian growth fault. High Pb values in the southern part of the basin indicate a vent location south of the paleotopographic ridge. This ridge apparently acted as a barrier to turbidity currents until the lower Mississippian infilling event (Carne, 1981b).

Stratigraphic correlations between Clear lake and Driftpile have not been completed (Carne, pers. comm., 1983). Mapping is difficult due to lack of outcrop, so stratigraphic interpretation is based largely on drill core correlation. The basic local stratigraphy contains a basal massive, fine grained sandstone (unit 1), overlain by a black carbonaceous silty argillite (unit 2). This unit contains porcellaneous barite with disseminated pyrite, and some altered pyroclastic tuff layers. It forms the footwall to the massive sulphides. Sulphides are greater than 80% fine to medium grained, botryoidal and fragmented pyrite (unit 3). It is believed that several venting episodes resulted in phreatic explosion and fragmentation of previously deposited sulphides. The suphides are overlain by a black argillite with silty and sandy laminations (unit 4). This unit is visibly indistinguishable from unit 2.

The structure at Clear Lake is complicated by numerous faults. However, it has been established that the section is on the upper limb of an overturned syncline (Verley, 1981). One drill hole is believed to intersect the vent. This interpretation is based on numerous brecciated horizons, stringer zones, increased silicification, and increased metal values (Hawke, pers. comm., 1984). The proximity of sulphide deposition to the vent precludes formation of laminated sulphides seen at the other deposits.

GUAYMAS BASIN: A MODERN ANALOG

The Guaymas Basin, located in the Gulf of California, is part of an actively spreading ocean basin. Active hydrothermal systems found within Guayamas Basin may represent the best modern analog to those that formed sedex deposits within Selwyn Basin. Guaymas Basin is a short segment of the East Pacific Rise-San Andreas Fault system between Baja California and the mainland (Figure 5). The basin is approximately 240 km long by 60 km wide, and 50-150 m deep (Williams et al, 1979). High heat flow measurements in the Guaymas Basin are indicative of active rifting and hydrothermal activity (Kelts et al, 1982). The discharge of hydrothermal fluids occurs along transform faults and fracture zones predominantly in the central depression of the Guaymas Basin. No significant effluent is being discharged more than a few kilometers from the spreading axis (Williams et al, 1979).

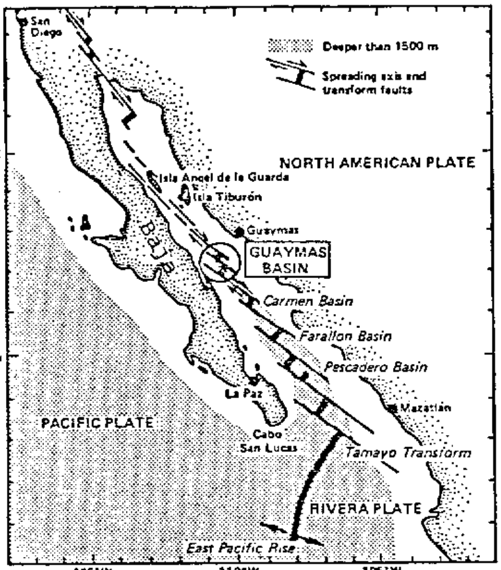


Fig. 5 Location and tectonic features of the Guaymas Basin, Gulf of California (after Curray et al, 1982).

The Guaymas Basin represents a special case of an oceanic rift environment. Extremely rapid sedimentation occurs as silty clays are introduced into the basin from rivers to the northeast (Van Andel, 1964). Williams et al (1979) estimates a sedimentation rate of 1-4 m/1000 yrs. The unconsolidated sedimentary section is cut by several dolerite sills representative of the new oceanic crust. According to Curray et al (1982), this type of oceanic crust may be important in the early stages of rifting along continental margins.

Direct measurements have shown that hydrothermal effluent in the Guaymas Basin is emitted at 315°C. The fluids are enriched in ammonia (NH_3) with concentrations as high as 15 moles/liter. This is greater than the concentrations of K^+ and Ca^{++} in the fluid (Edmond, pers. comm., 1984). The sediments in the Guaymas Basin, containing approximately 4% organic carbon, are the proposed source of NH_3. As hydrocarbons are thermally cracked, NH_3 is given off (Berner, 1971). Thermal cracking is induced by the intrusion of sills rather than burial. NH_3 accumulates in a convection cell of hydrothermal fluids around the vent. When the fluid is exhaled onto the seafloor, the NH_3 reacts with H^+ from seawater to form NH_4. This, and mixing with seawater, causes a rise in pH of basin waters and, along with the temperature change, results in precipitation of sulphides. In support of this model, the pH over vents in the Guaymas Basin is as high as 6.5. Over other vents on the East Pacific Rise, where sediment cover is negligible, the pH of effluent is as low as 3.5. NH_4 values at such vents are less than .01 u moles/liter (Edmond, pers. comm., 1984).

Interstitial waters were analyzed from three drill holes in the Guaymas Basin by Gieskes et al (1982). The trends of alkalinity and NH_3 concentrations vs. depth are parallel, and inverse to the sulphate trend (Figure 6). These trends suggest that the following reactions may take place:

$$(1)\ (CH_2O)\ (NH_3)\ H_3PO_4 + 53\ H_2SO_4 =$$

$$106\ CO_2 + 53\ H_2S + H_2O + H_3PO_4 + 16\ NH_3$$

$$(2)\ NH_3 + CO_2 + H_2O = NH_4 + HCO_3$$

$$(3)\ 2\ CH_2O + SO_4 = 2\ HCO_3 + H_2S$$

$$(4)\ 2\ HCO_3 + Ca = CaCO_3 + CO_2 + H_2O$$

Organic breakdown and sulphate reduction reactions produce the constituents observed in the stratigraphic columns associated with the Selwyn Basin sedex deposits; namely, phosphate (1) and non-fossiliferous carbonate (4). The observed increase in alkalinity is due to production of HCO_3 by (2) or (3). The coeval decrease in SO_4 implies that (3) is the primary producer of HCO_3.

The NH_3 content of the interstitial fluids generally increases with depth except around sills where there is a sharp decrease due to alteration reactions in the basalt (Curray et al, 1982). The increase in NH_3 results from increasing thermal decomposition of organic matter. In basins with high sedimentation rates, or thick organic sediment accumulations, the sediment column becomes virtually a closed system at depths greater than 45 meters (Gieskes et al, 1982). Thus the rate of chemical decomposition is high while the diffusion rate is low. Only such a system would allow the observed high concentration of NH_3.

SAMPLING METHODS

Over 200 samples were taken from drill cores in the five sedex deposits of the Selwyn Basin. Drill holes were chosen progressively away from the known or inferred location of the hydrothermal vent or fissure. Vents were identified by stringer zones below or adjacent to laminated sulphide horizons; by brecciated sulphides where phreatic explosions of late mineralizing pulses had disrupted previously exhaled sulphides; and by extensive silicification of argillites attributed to hydrothermal alteration. Where physical evidence is not observed, chemical contouring of Pb and Zn deduces the general location of vents. The assumption is that Pb precipitates closer to the vent than Zn, so the vent is located in the direction of high lead values.

Within each drill hole, samples were taken from the blackest, most argillaceous intervals in the hangingwall, footwall and between sulphide layers of the ore zone. The method was employed to obtain samples with the highest possible clay content. Sterne (1981) was only able to obtain samples up to 15 m above and below sulphide lenses. In this study, emphasis was placed on

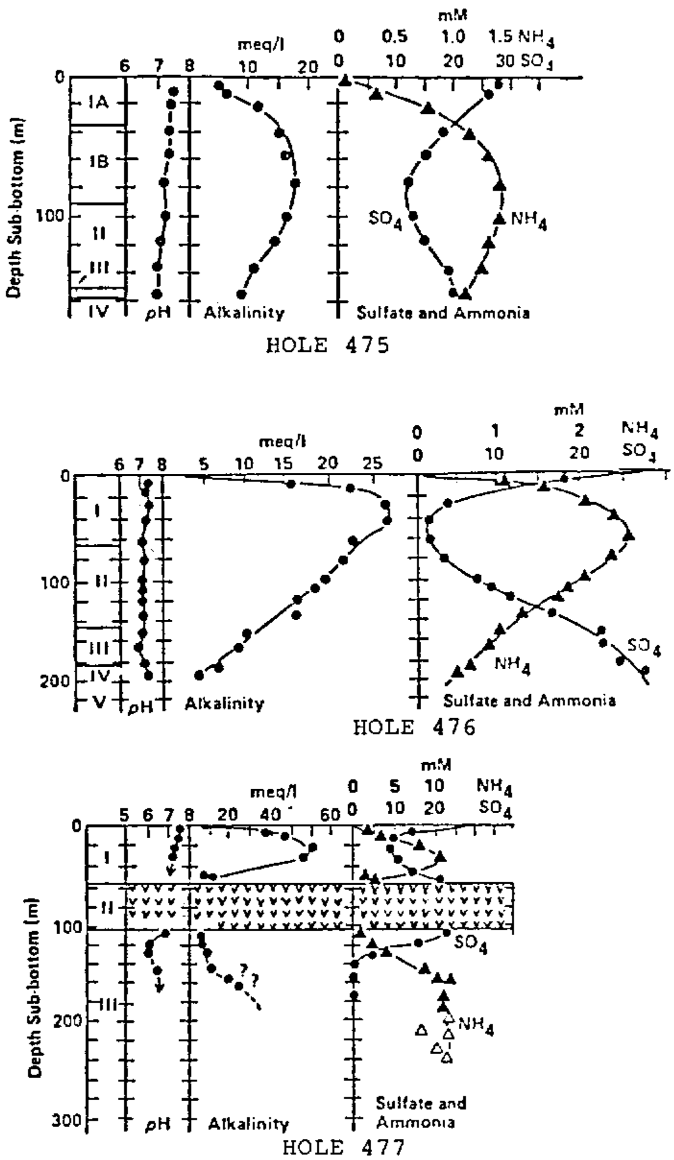


Fig. 6 NH_4 geochemistry, Guayamas Basin (from Gieskes, 1982).

sampling the inter-ore argillites. Samples were taken from all stratigraphic horizons in several drill cores. However, sampling was restricted to depths below 60 m to avoid any nitrogen contamination by weathering. Special care was taken to keep ammonia detergents and aerosols away from the samples throughout analysis.

Time constraints allowed analysis of only 103 samples. Samples were analyzed for NH_3 by quantitative infrared (IR) spectrophotometry on a Perkin-Elmer 599 IR spectrophotometer. Samples were prepared by 1) grinding for 5 minutes in a SPEX mill, to fine powder; 2) boiling for 1 hour (or until colour changed) in a solution of NaOCl + KCl to remove organics (Note: KCl was used to saturate the solution with K so that any organic nitrogen released by oxidation would not be fixed in exchangeable sites of clay minerals; 3) samples were dried overnight at 100°C; 4) 2 mg of sample was ground by hand in an agate mortar and pestle with 100 mg KBr, and pressed in a die cast at 20,000 psi pressure to make a translucent disk for IR analysis.

Fifty prepared, organic-free powders were also analyzed by x-ray diffraction on a Siemens FK 60-04 diffractometer. From diffraction patterns, estimates of mineral abundance (%) were calculated.

RESULTS

The individual depositional mechanisms of sedex deposits complicate the interpretation of chemical data. The physical behaviour of an ore forming fluid depends on its temperature and salinity or density, as described by Sato (1972). The combination of these factors determines the degree and rate of mixing with seawater, which influences the zonation within, and dispersal of the sulphides (Figure 7). Additionally, density variations in the basin water, currents, and seafloor topography will influence the dispersal of metaliferous brines (Turner and Gustafson, 1978; Henley and Thornley, 1979). Finally, the rate of fluid exhalation will also affect brine mixing and metal precipitation (Lydon et al, 1979). These factors must all be considered when looking for a geochemical halo around sedex deposits.

The clay separation for x-ray analysis of NH_4 illites is a long and tedious process. Therefore, on the assumption that NH_4 would be highest in inter-ore clay minerals, those samples from each deposit were analyzed first. No NH_4 was detected. Bulk rock powders of these samples were analyzed by IR spectrophotometry, and NH_4 was detected, in varying amounts. The hypothesis formulated was that NH_4 undergoing 250°C metamorphic temperatures, was released by illites, and taken up by the authigenic formation of feldspars. If this is true, and if it can be shown that NH_4, now contained in feldspars, increases toward the orebodies, then the NH_4 halo observed by Sterne in illites persists, and may be a useful guide to mineralization even in metamorphic terranes.

Unfortunately, partial substitution of NH_4 for K^+ in feldspars is not as easily detected by x-ray diffraction pattern as it is in illite. Therefore, analysis was done on whole rock powders by IR methods. Quantitative analysis by IR methods on powders is plagued with complications (Farmer, 1974). Accordingly, the reported NH_4 values should only be considered as semi-quantitative estimates. Nonetheless, the trends are real. Values for NH_4 from the 103 samples analyzed range from 0 to 2000 ppm, and average 467 + 51. Plots of NH_4 (ppm) vs. stratigraphic position varied among the deposits. Notably, in sections where detrital input was high (ie. sandy argillites or breccias), NH_4 was very low or below detection limit. Also, in general, NH_4 concentration was low where sulphide concentrations were high. Obviously the samples were diluted by mineral phases that did not contain NH_4.

Drill cores that contained the most NH_4 were chosen for x-ray analysis. Semi-quantitative analysis of percent quartz (qtz), muscovite (mus), orthoclase (ksp) and plagioclase (plag) were plotted against NH_4 (ppm) to see which mineral phase contained the NH_4. It should be noted that these plots cannot be perfectly

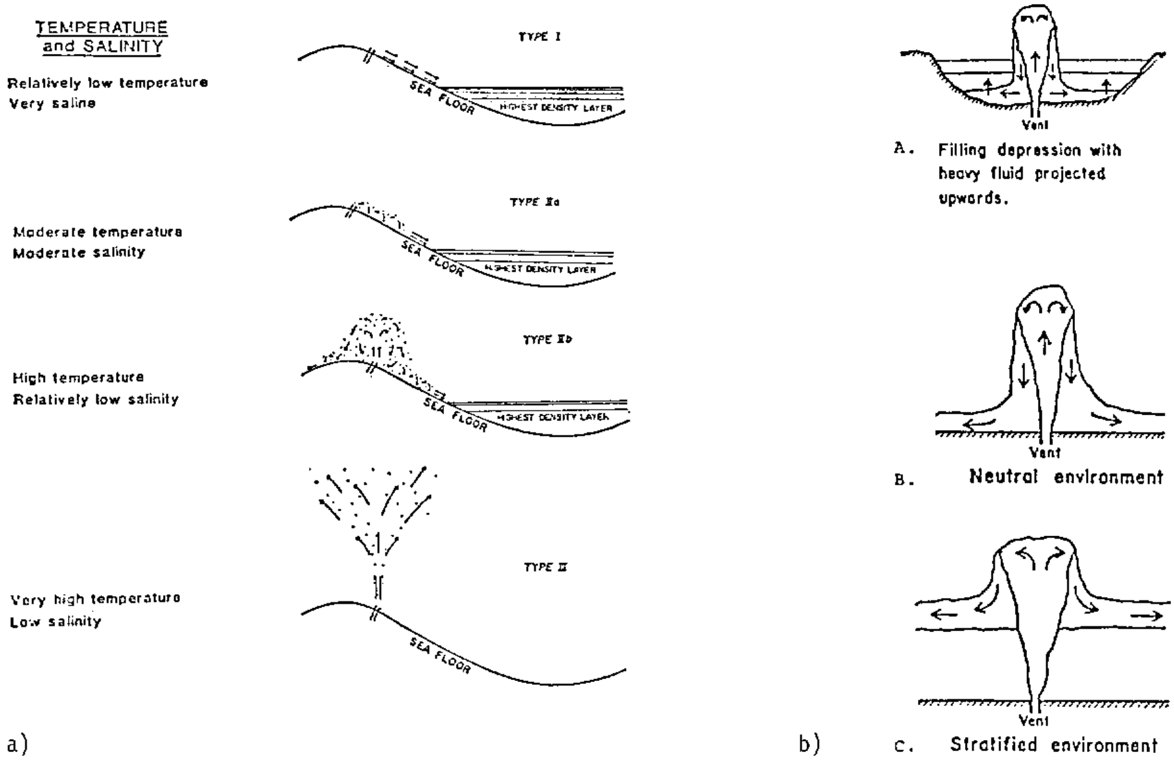


Fig. 7 Ore fluid dynamics: a) Sato's (1972) description of the behaviour of ore fluids based on temperature and salinity; b) Model on the behaviour of ore fluids based on seafloor topography (A) and basin density stratification (B vs. C) (Turner and Gustafson, 1979).

correlated because there are probably both detrital and authigenic minerals in the sample. Only the authigenic minerals would pick up NH_4 from the immediate environment. The assumption is made that NH_4 is only enriched in sediments affected by the brine pool. Presumably the detrital constituents do not contain significant fixed NH_4.

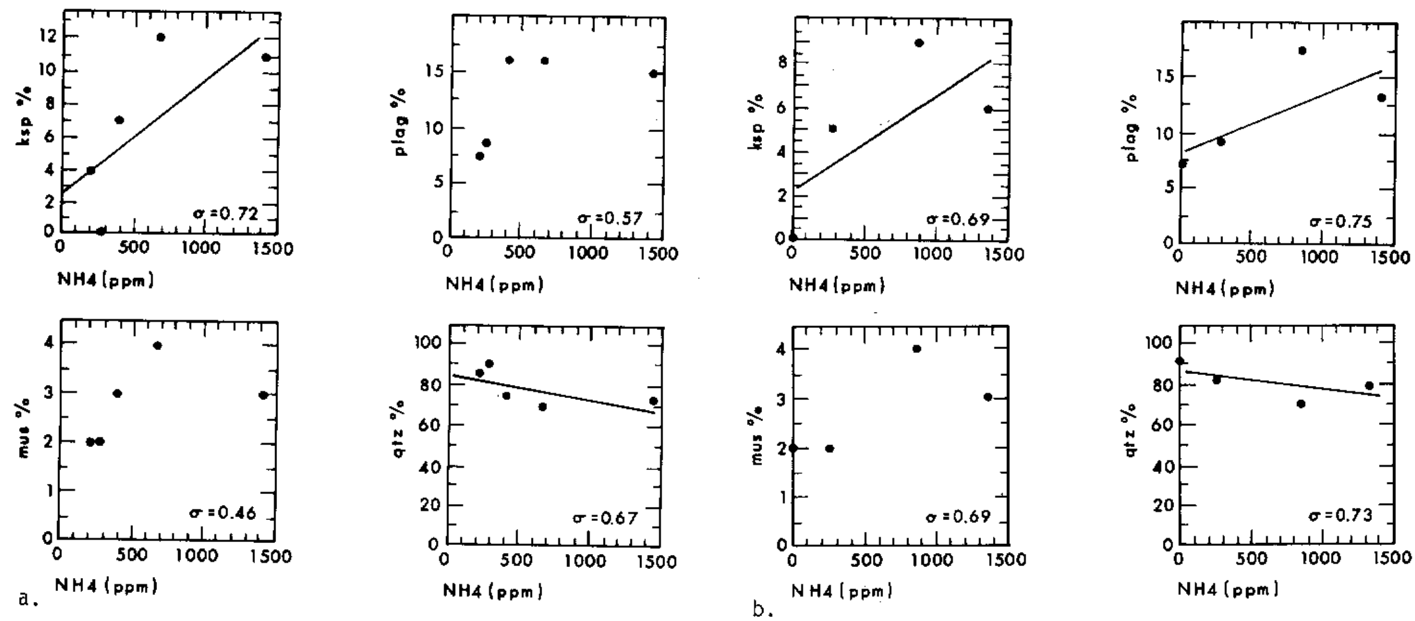
The data indicates that NH_4 is contained in orthoclase or plagioclase. Degens (1965) found that Ca-plagioclase does not form authigenic feldspars. If this is true, then only K^+ and Na^+ are in competition with NH_4 for the octahedral sites of feldspars. If all three ions are available while new feldspars form, then the relative abundance of the ions will determine which ion is preferred in the feldspar structures. At equilibrium, there is an order of preference for ions in silicate mineral structures, called the lyophobic series. Unfortunately, conflicting reports of NH_4, K^+, and Na^+ preference make it difficult to predict the order of site filling in authigenic feldspars. Until further studies are done, it must suffice to say that NH_4 will substitute for either K^+ or Na^+, and can thereby be correlated with both feldspar groups.

As expected, all quartz vs. NH_4 plots showed a negative correlation with high correlation coefficients, indicating that quartz does dilute the NH_4 analysis. Plots of other mineral phases at the Tom and Driftpile deposits show no significant correlations. NH_4 values in these deposits were generally below average indicating dilution by detrital input. Since few samples were available from these deposits, the analytical results are inconclusive.

At Jason, where the NH_4 values are most erratic in stratigraphic correlation, one drill core shows a fairly good correlation with the feldspars. However, a depth profile of NH_4 feldspar shows no significant change of NH_4 content in the hangingwall. Again, this is thought to be an influence of the great detrital influx during deposition of this deposit.

Clear Lake, the proposed counterpart of Driftpile, shows NH_4 correlated with plagioclase in drill holes 27 and 32, and with orthoclase in hole 34 (Figure 8). It is interesting that the K-feldspar association is in the drill hole that intersects the vent. Probably K^+ ions were abundant in this area, whereas further from the vent, seawater Na would have a more significant contribution to the brine chemistry. The depth profile of NH_4 vs. feldspar shows that NH_4 does increase in the hangingwall (Figure 9). The size of the NH_4 halo should be an indication of the size of the brine pool, however core depths at Clear Lake were not great enough to show declining NH_4 values in the hangingwall.

Howards Pass represents the most pristine sedex deposit in that detrital influx was minimal during its deposition. The NH_4 halo should be least disturbed. Figure 10 shows a significant correlation of NH_4 with orthoclase. Scatter around the regression line



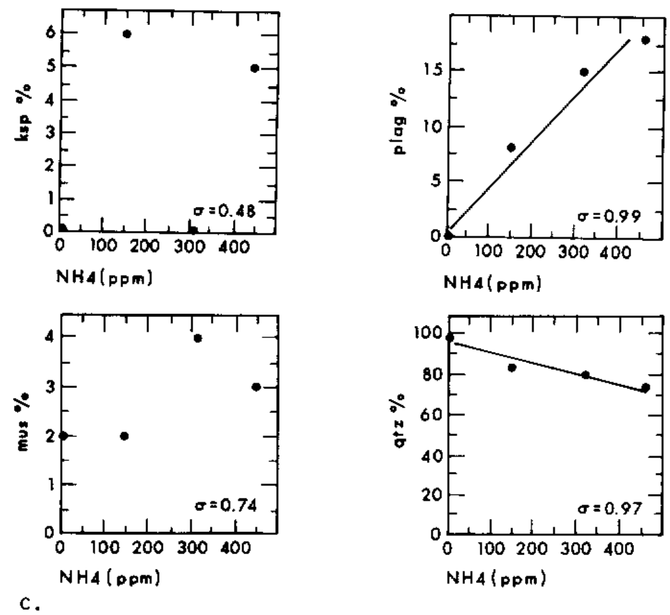


Fig. 8 NH_4 correlation diagram, Clear Lake.
a. NH_4 correlated with K feldspar (Drill Hole CL-34 - believed to cross the vent)
b. NH_4 correlated with K feldspar and plagioclase (Drill Hole CL-32)
c. NH_4 correlated with plagioclase (Drill Hole CL-27 - located farthest from vent)

reflects a variation in the amount of NH_4 substitution within the feldspar. The depth profile of NH_4 vs. feldspar again shows an increase of NH_4 in the hangingwall (Figure 11).

CONCLUSIONS

This study has shown that NH_4 is enriched in the hangingwall of two Selwyn Basin sedex deposits; Howards Pass and Clear Lake. In other deposits, the NH_4 may have been diluted or washed out by pervasive detrital influx (Tom and Jason) or the deposits were not sufficiently sampled (Driftpile).

From observations in a modern rift envirnoment possibly analogous to the Selwyn Basin, the following model is proposed for the formation of the NH_4 "halo" above sedimentary ore deposits. Rifting introduces a heat source that thermally cracks hydrocarbons in basinal sediments. NH_3 is produced and enriched in pore fluids which move toward a fissure or vent due to convection circulation. The hydrothermal fluids leach metals from basin sediments and become brines. The brine is eventually exhaled onto the ocean floor along a fissure or vent. NH_3 will react with seawater H^+ to form NH_4. This increases the pH which, together with the temperature decrease, causes precipitation of sulphides.

Presuming that the metalliferous brines are expelled into a basin where the NH_4 and sulphides will not be dispersed, the NH_4-enriched brines will be ponded over the sulphides. As clay particles (i.e. smectite) settle through the brine pool they will pick up NH_4 in interlayer sites. NH_4 will become fixed in illites as the smectite structures collapse during burial diagenesis. Illites are a stable diagenetic product, therefore they should retain the NH_4. By this mechanism, one would expect NH_4-illites to be enriched in the hangingwall of the sedex deposit. However, if detrital illite, feldspar, or quartz is introduced, the NH_4 signature will be reduced.

In this study, NH_4 was not found in illites, but rather in feldspars. The feldspars at Howards Pass are thought to be authigenic. They have sharp, well formed crystal edges undisturbed by transport, and in some areas appear to be pseudomorphs after barite (Goodfellow, pers. comm., 1984). At Clear Lake, no studies have been made on the nature of the feldspars.

Regional metamorphism may have caused the release of NH_4 from illites at the time of new feldspar

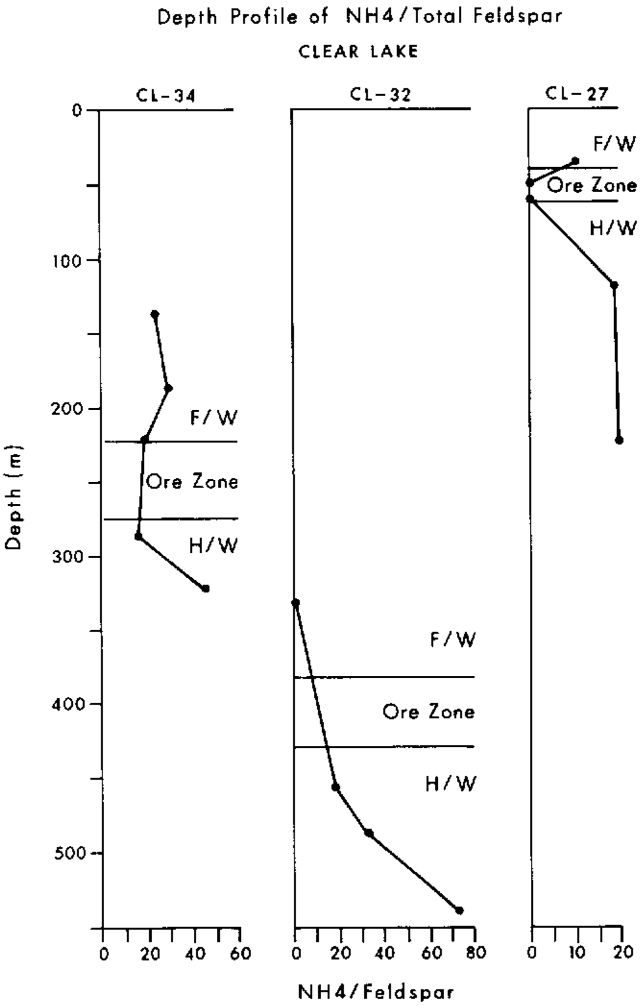
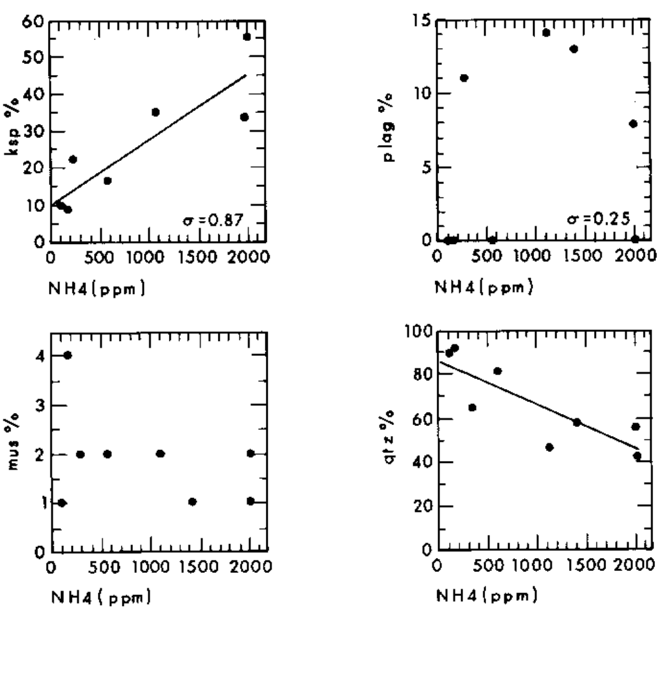


Fig. 9 Depth profile of NH_4/ total feldspar, Clear Lake. NH_4 in feldspar increases in the hanging wall.



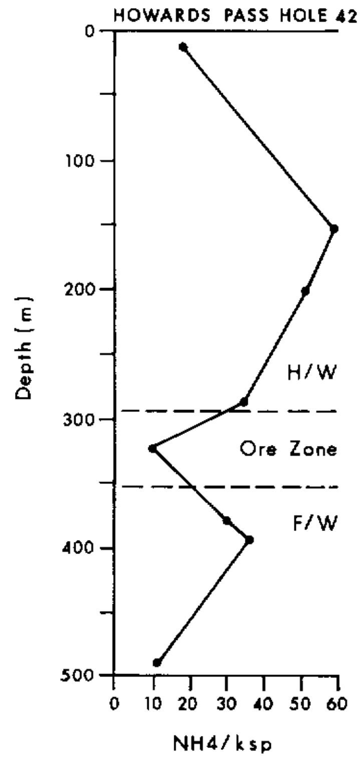


Fig. 11 Depth profile of NH_4/feldspar, Howards Pass NH_4 in K feldspar increases in the hanging wall.

growth, allowing capture of NH_4 in the feldspar structure. Work is in progress to prove the hypothesis and better understand the conditions under which NH_4 content increases in various silicate minerals.

The successful use of NH_4 as an exploration tool is limited to sedimentary ores deposited in still-water depressions, where detrital influx is minimal. As an intra-prospect exploration tool, it may help define the limits of a deposit, or at least identify the hanging-wall sediments.

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Fig. 10 NH_4 correlation diagram, Howards Pass. NH_4 correlates with K feldspar in drill hole HP-42 .

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STRATIGRAPHY AND ALTERATION OF THE WHITE CHANNEL GRAVEL AT DAGO HILL, A PROGRESS REPORT KLONDIKE AREA, YUKON

by

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INTRODUCTION

The high level bench gravels of the Klondike region were first described by R.G. McConnell (1905, 1907). He divided the gravels into two formations; the older and stratigraphically lower White Channel gravel, and the younger Klondike or high level river gravel (Figure 1). The White Channel gravel occurs on bedrock benches composed of metasedimentary and metavolcanic rocks (Debicki, 1984), and is usually 50 to 100 metres above present day stream courses (Figure 1). McConnell further subdivided the White Channel gravel into interbedded white and yellow gravel units (Figure 2). This suggests contemporaneous deposition, with the white gravel unit containing important concentrations of placer gold.

A distinct alteration zone is recognized in White Channel clastic sediments at Dago Hill (Figure 3). Tempelman-Kluit (1982) suggested that increased gold values at the White Channel gravel and bedrock contact were directly linked to the alteration of the gravel and bedrock. This idea prompted a study by the authors during the summer of 1983 to determine the relationship (if any) of the alteration zones to the deposition of gold. This report is a preliminary description of the stratigraphy and alteration of the White Channel gravel at Dago Hill.

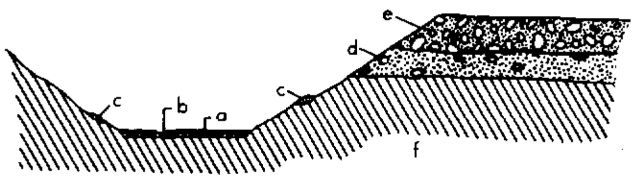

Figure 1. Generalized section across the lower part of Bonanza valley (from McConnell, 1907).

STRATIGRAPHY

The stratigraphy at Dago Hill is characterized by an erosional contact which separates White Channel clastic sediment from an overlying gravelly sequence (Figure 4). The overlying gravels are iron-stained, and planar stratified. This gravelly sequence is fluvial in origin, and cannot be correlated with the Klondike gravels (Figure 1). The Klondike gravels have an interbedded relationship with White Channel gravel, and are representative of a pre-Reid glacial advance from the Ogilvie Mountains (Hughes et al, 1972).

Underlying these iron-stained fluvial gravels is an organic rich, massive silty clay facies which contains discontinuous fine sand laminae (Figure 4). This facies is probably the result of overbank depositional processes associated with White Channel clastic sedimentation. It is important to note the stringer-like relationship between altered and primary overbank sediments (Figure 4). These structures do not appear to be sedimentary in origin, and they outline the geochemical front associated with alteration of White Channel sediments.

White Channel gravel is found below the overbank fine sediment (Figure 4). Both primary and altered White Channel gravel is present, with an irregular boundary outlining the alteration product. White Channel gravel at Dago Hill is approximately 35 to 40 m. thick, with the upper 10 m. comprising the primary or unaltered portion. Above the alteration boundary the physical appearance of the unaltered White Channel gravel is distinct from the altered gravel. The unaltered White Channel gravel is generally light brown, and lithofacies characteristics are clearly distinguishable. There is little secondary clay development in the gravel matrix, and the gravel clasts are competent to slightly friable, and highly iron-stained. The altered White Channel gravels at Dago Hill are bleached grey to white, and lithofacies characteristics are not discernable.

ALTERATION

Intense alteration of the White Channel gravel and underlying bedrock at Dago Hill, was originally described by Tempelman-Kluit in 1982. Preliminary X-ray diffraction work indicates that pronounced differences in clay mineralogy correspond to observed differences in the physical characteristics of the altered and unaltered White Channel sediment.

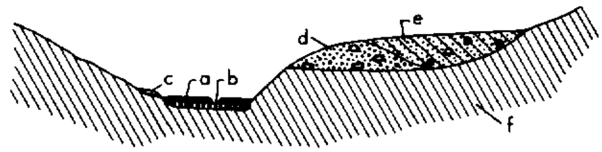

Figure 2. Generalized section across Bonanza valley below Eldorado Forks (from McConnell, 1907).

Yukon Exploration and Geology 1983, p. 55-59

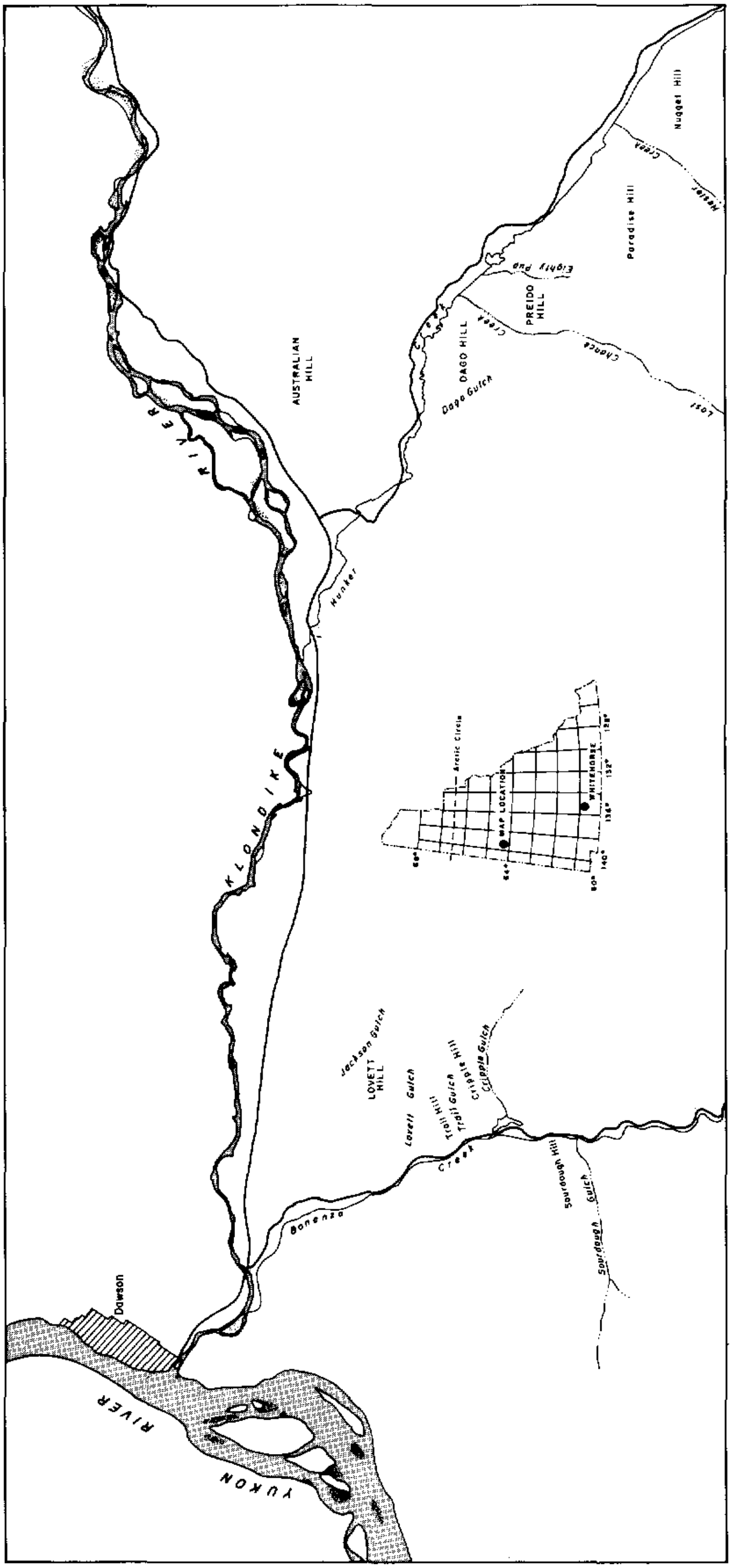

Figure 3. Location map for the Klondike area.

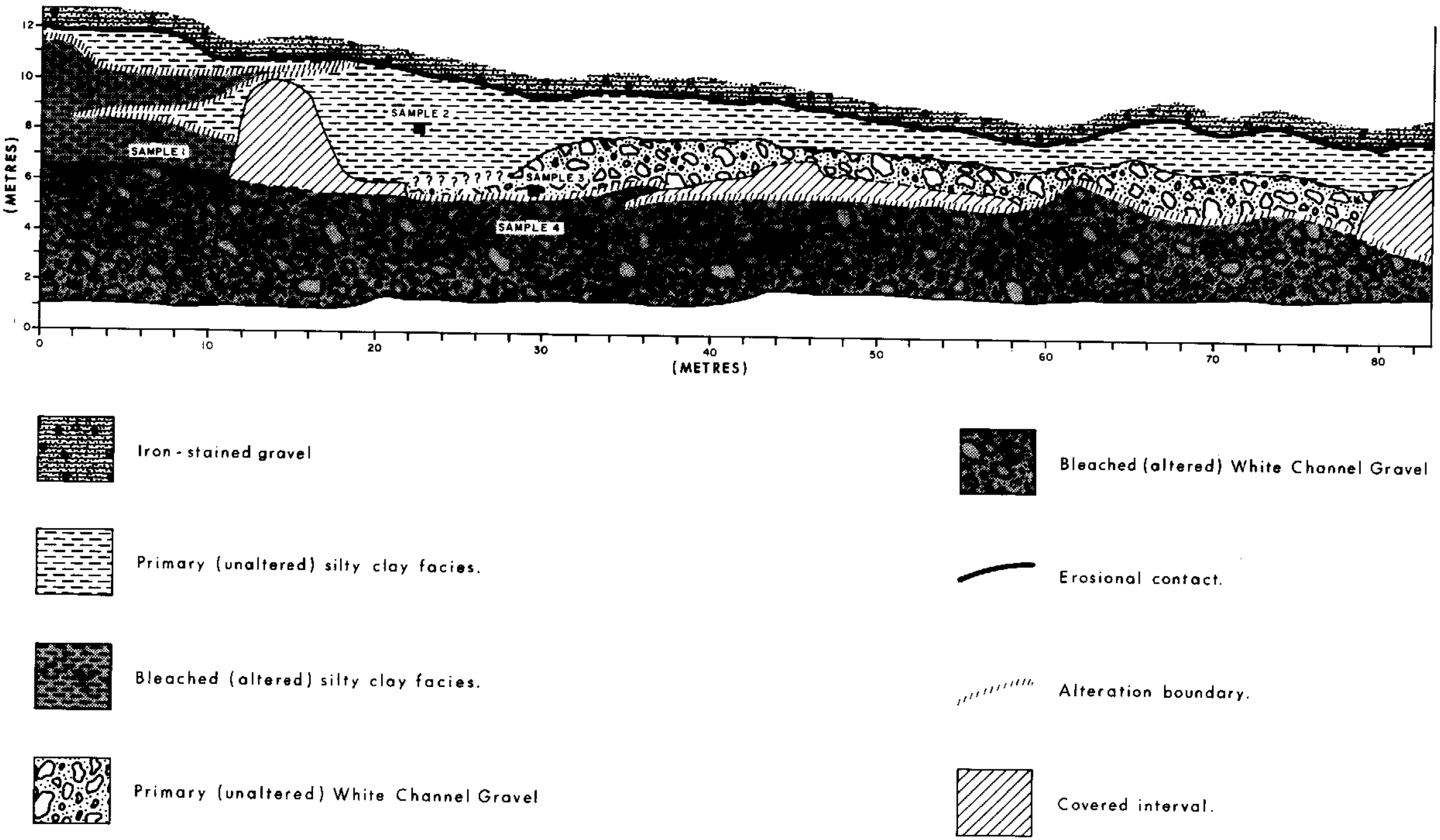

Figure 4. Exposure at Dago Hill showing gravelly sequence overlying White Channel clastic sediment and alteration front.

In the altered gravel, clasts of rhyolite and dacite porphyries, sericite-chlorite schists, and ultramafic cobbles are largely decomposed to a soft clay that is friable when dry (Tempelman-Kluit, 1982). The original fabric and texture of the altered clasts is usually preserved. Figure 5 shows a rhyolite cobble that is easily penetrated by a knife. Clasts of graphitic quartzite and massive quartz will often break easily with the blow of a hammer (Tempelman-Kluit, 1982).

Figure 5. Altered rhyolite cobble.

In general, the intensity of alteration at Dago Hill is greatest in the 2 to 3 meter zone directly above the gravel and bedrock contact. In this zone, development of secondary clays in the matrix of the gravel has distorted sedimentary structures beyond recognition. Limonite staining is usually present within 2 to 5 meters of the gravel and bedrock contact. Above this zone the amount of secondary clays present in the gravel matrix decreases upward. There is little change in the degree of alteration of clasts from the bedrock contact upward to the alteration boundary (25-30 meters above bedrock).

Separating the altered and unaltered White Channel sediment at Dago Hill is a distinct alteration boundary usually 30 to 50 cm thick (Figure 4). This dark brown, manganese-iron rich front is probably composed of elements leached from the altered White Channel sediment. The front both follows and cuts across lithofacies contacts (Figure 4) within White Channel sediment.

Bedrock underlying the White Channel gravel at Dago Hill is highly deformed albite sericite-chlorite schist, and graphitic quartzite. The altered bedrock is bleached, incompetent and the feldspars and micas are replaced by clay minerals (Tempelman-Kluit, 1982). Original fabric and structures are usually visible. Quartzitic bedrock is generally brittle and falls apart easily upon thawing (Tempelman-Kluit, 1982).

The degree of alteration varies from place to place in the Klondike area. Similar intense alteration occurs in Hunker and Last Chance Creek areas on hills such as Preido, Paradise and Nugget (Figure 3). Alteration in the lower Bonanaza Creek area is highly irregular. On hills such as Lovett, Trail, Cripple and Sourdough, the alteration in the White Channel gravel is less intense than at Dago Hill (Figure 3). It is noteworthy however, that intense bedrock alteration exists on these latter hills, commonly where the overlying gravels have been removed by mining activities.

X-ray diffraction work was conducted on 7 samples from the White Channel sediment at Dago Hill. The location of samples 1 to 4 are shown in Figure 4. Samples were taken approximately 25 to 30 meters above the bedrock surface. Samples 1 and 2 were taken at equivalent height, from overbank sediments. Sample 1 is representative of a bleached, alteration stringer penetrating the overbank sediments. The less than 2 micron clay mineral assemblage is dominantly kaolinite, with illite and minor smectite. Sample 2 from the unaltered overbank sediment has approximately equal amounts of kaolinite, illite and smectite. Sample 3, from approximately 50 cm above the visible alteration front in unaltered White Channel gravel contains relatively equal proportions of kaolinite, illite and smectite. Sample 4 (from 1 meter below sample 3 and 50 cm below the front in altered gravel) is primarily composed of kaolinite with illite and trace amounts of smectite. Samples 5 to 7 were taken from the main pit currently being mined. Sample 5 is a sample of gravel matrix (6 to 7 meters above bed-rock), sample 6 is a rhyolite cobble (2.5 meters above bedrock), and sample 7 is a dacite cobble (1.5 meters above bedrock). All three samples had high kaolinite/illite ratios in the region of 5:1 to 10:1, with trace amounts of smectite. These preliminary results suggest that kaolinite with minor illite is the dominant clay assemblage of altered White Channel sediment. The matrix of the unaltered gravel appears to contain equal amounts of kaolinite, illite, and smectite; perhaps the original primary assemblage. These differences in clay mineralogy between the altered and unaltered sediment correspond well with the observed differences in the physical characteristics of White Channel sediment at Dago Hill.

FUTURE WORK

During the summer of 1984 detailed mapping and sampling of the alteration products in White Channel sediment will be undertaken. The main objective of this work is to establish the relationship, if any, between the altered White Channel gravel and the distribution of gold.

Laboratory work will involve a complete characterization of the altered gravel and bedrock using X-ray diffraction and detailed petrography. Whole rock, major and minor element chemistry will be carried out to determine any chemical anomalies that might be associated with alteration and/or gold distribution. This type of information will provide insight into the chemistry of the fluids responsible for the described alteration. Knowledge of the fluid chemistry is important in any attempt to link the alteration of the White Channel gravel to the transport and deposition of gold during fluid migration.

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ROCK RIVER BASIN
(NTS 95 D 11 and 14)

by

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INTRODUCTION

Coal was discovered in the Rock River Basin (Fig. 1) by Sulpetro Minerals Ltd. in July 1980, and five holes sunk to delimit coal occurrences in September 1981 (D.I.A.N.D., 1982, p. 86; Wright and Miller, 1983 and in press). Samples were collected from all five holes for palynologic analysis and the undisrupted core from three holes examined in the field to determine the depositional setting of the coal and provide a basis for evaluation of the coal potential of this area.

GEOLOGICAL SETTING

Tertiary strata of the Rock River Basin lie within an elongate intermontane basin in the north-central part of the Coal River map area, about 80 km north of the Alaska Highway and 115 km northeast of Watson Lake (Fig. 1). The walls of the valley consist of low hills of folded Hadrynian to Ordovician strata which rise about a kilometre above the centre of the basin-plain. Mapping by Gabrielse and Blusson (1968) indicates that the area west of the valley consists predominantly of mudstones and sandstones, with some limestone, dolomite and volcanic material, while the area to the east is dominated by limestone with minor volcanics. Gabrielse and Blusson (1968) indicate the presence of a high angle reverse fault along the southwest margin of the basin, and by extrapolation along the southeast margin of the basin.

Much of the floor of the modern intermontane valley is mantled with a thick cover of Pleistocene and Holocene sand, gravel and mud. Klassen (1982) indicates the presence of extensive glaciolacustrine material and lodgement till over most of the valley floor, with a large fluvio-deltaic sand and gravel unit extending from the west central part of the valley. Exposures of Tertiary strata are very rare, and are limited to a few outcrops of mudrock along the Rock River, and a 5 m outcrop of lignite on one of its tributaries. The maximum thickness of the Tertiary sequence is uncertain. Wright and Miller (in press) used gravity data to indicate the presence of as much as 1100 m of unconsolidated Tertiary sediments towards the north end of the basin.

LITHOLOGY AND MICROFACIES

The bulk of the Tertiary sequence encountered in the five holes drilled by Sulpetro Minerals Ltd., and seen in surface exposures is dark to light grey mudstone, with minor sandstone and some thick lenses of coal. All strata are of fluvial origin and can be related to specific depositional settings (Table 1). Detailed logs of the three holes examined in the field are included in figures 2, 3 and 4.

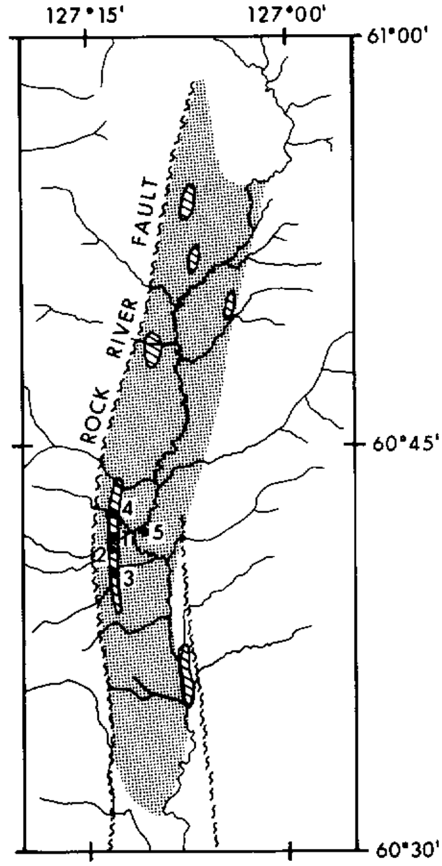


Fig. 1. Possible distribution of Tertiary strata in the Rock River Basin (shaded) showing location of bore holes, and gravity anomalies related to coal (cross hatched).

Mudrocks (2, 3, 4, 5)

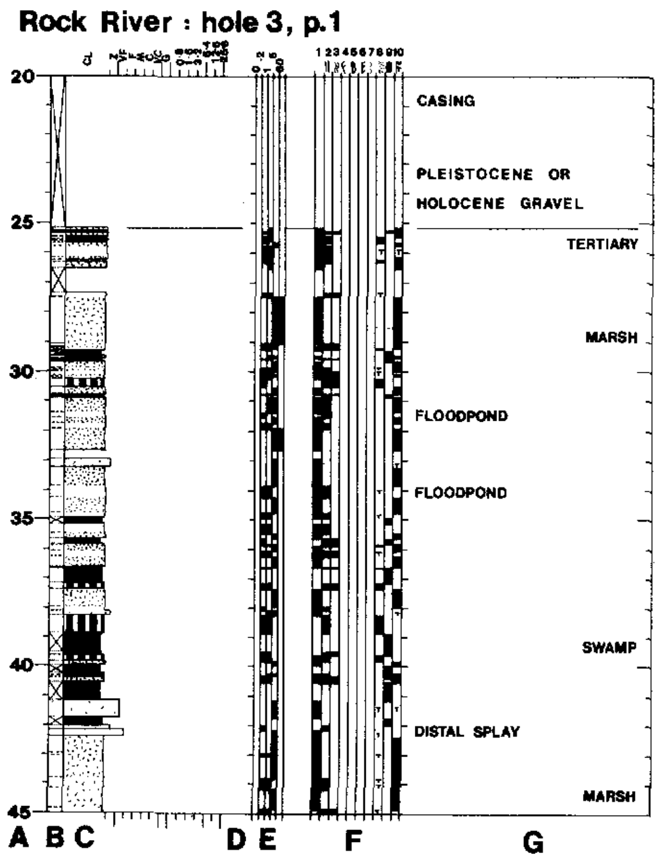
Mudrocks form over seventy percent of the section encountered in the five bore holes. They range in colour from ligh grey to black with minor white, brown and green tints. Colour is dependent on the state of oxidation and organic content of the mudrocks.

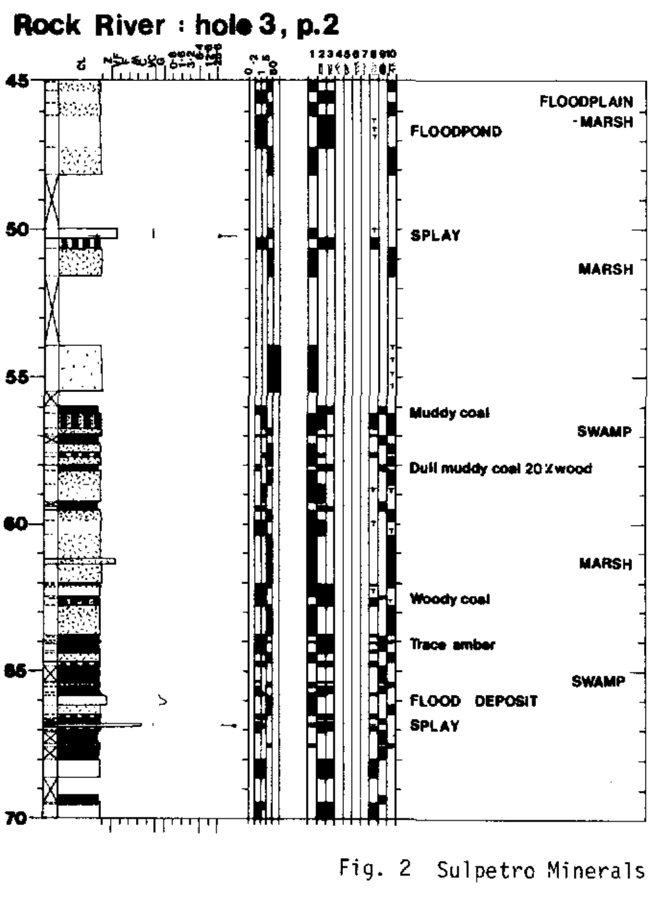
Black mudrocks are typically plane to wavy bedded and have a high organic content, both as dispersed organic material and woody plant remains. Their common association with coal, especially in holes 1 and 2, indicates that they formed in marsh or swamp environments, where the rate of organic accumulation exceeded oxidation. Grey mudrocks form the bulk of the Tertiary sequence in holes 1 and 2, about a third of the sequence in holes 3 and 4 (Fig. 2, 3) and a fifth of hole 5 (Fig. 4). The grey colour is related to dispersed organic material. Most of the grey mudrocks are massive or poorly laminated, and contain some carbonized plant roots. Soil development is indicated by the presence of abundant slickensides. These grooved and polished surfaces are commonly considered to form in association with a fluctuating water table

Yukon Exploration and Geology 1983, p. 60-68

Table 1. Lithology and depositional setting of rocks from the Rock River Basin.

Lithology	Depositional Setting
1). Sandstone (massive or flat bedded)	Splay, levee, ?channel
2). Black, organic rich mud (massive, planar to wavy bedded)	Floodplain: marsh or swamp, where organic accumulation exceeds oxidation
3). Grey mudrocks (massive to poorly laminated: some roots and wood)	Floodplain-marsh limited oxidation
4). Light grey to white mudrocks (massive to poorly laminated, roots, slickensides and ped textures common)	Floodplain-distal marsh and intermittent floodponds with frequent exposure and oxidation
5). Laminated mudrocks	Floodpond (semi-permanent)
6). Dull muddy lignite	Lowland reed or telemic moor, floodplain swamps
7). Woody lignite	Forest moor, swamps





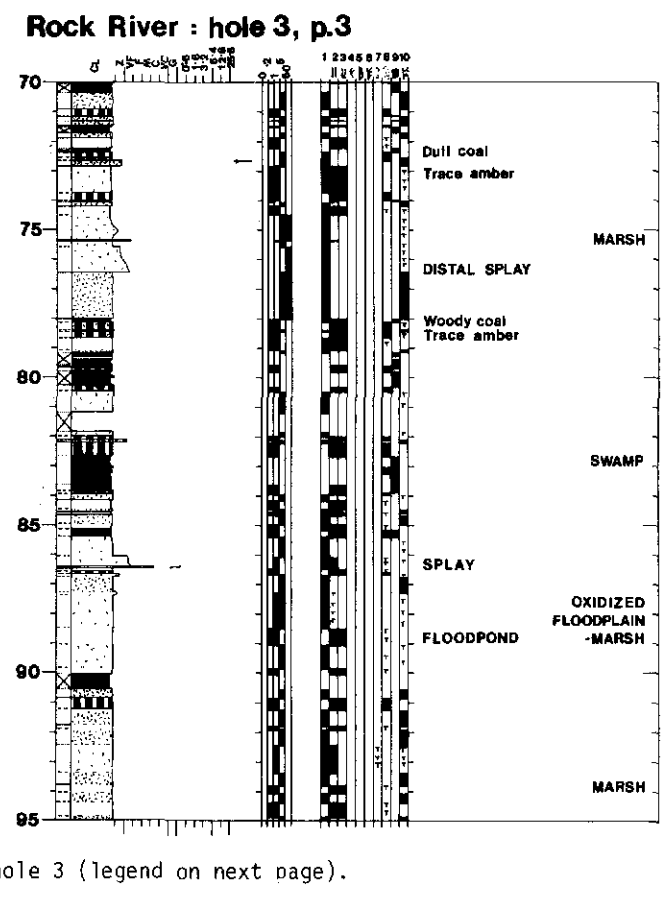
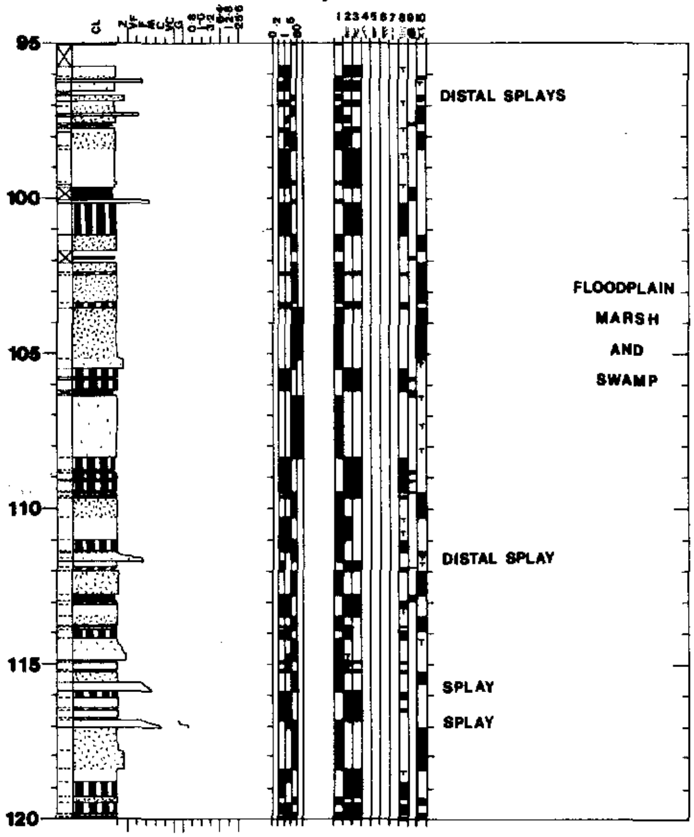
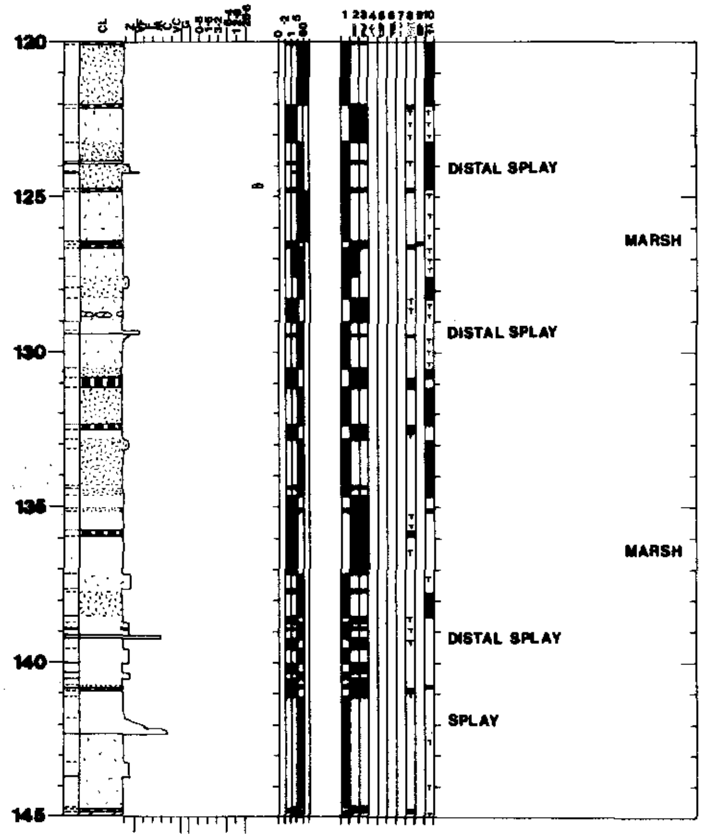


Fig. 2 Sulpetro Minerals, Bore hole 3 (legend on next page).

Rock River : hole 3, p.4



Rock River : hole 3, p.5



Rock River : hole 3, p.6

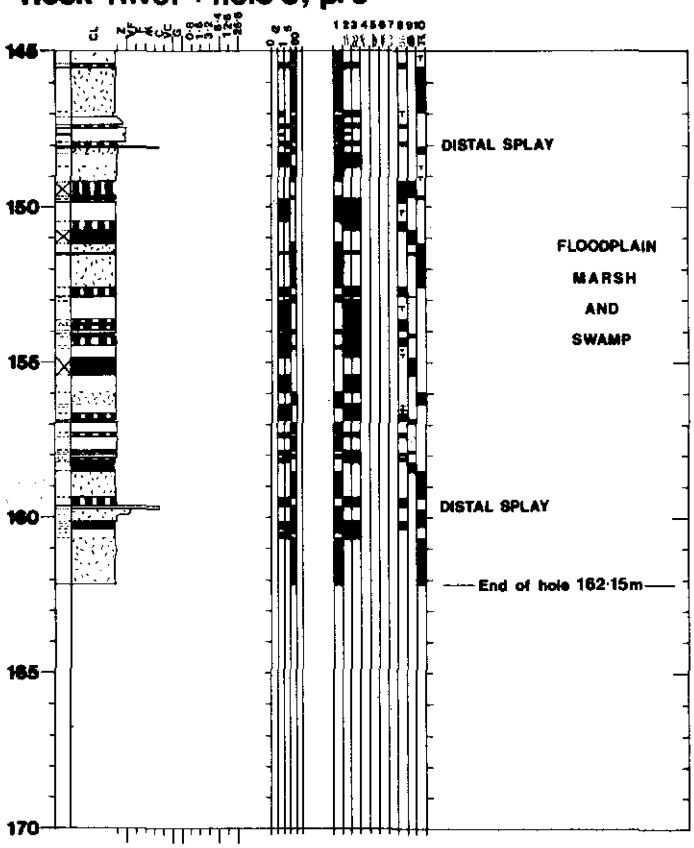


Fig. 2 (cont'd)

A = depth from surface in metres.

B = Contacts: —— sharp, --- transitional; ... not seen, cross indicates no recovery, or core removed prior to examination.

C = Lithology; mean grain size of rock indicated.

Cl = clay; Z = silt; VF, F, M, C, VC = sand; g = granule; 0.8 to 25.6 grain size in cm.

Maximum grain size indicated by line to right of main column.

Coal is shown in black, organic shale by vertical stripes:

Plant roots are indicated by stippled pattern.

D = Large woody fragments (spars).

Siderite nodules.

Well preserved plant fossils.

E = Bed thickness in centimetres.

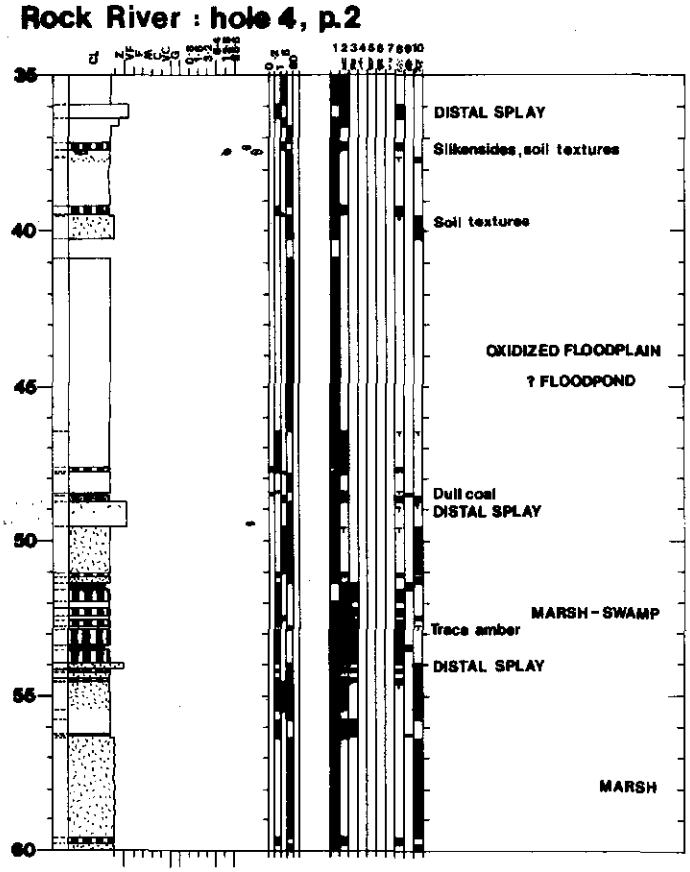
F = Sedimentary structures, 1 = massive; 2 = plane bedded; 3 = wavy bedded; 4 = ripple cross-laminated; 5 = trough cross-beds; 6 = planar cross-beds; 7 = intraformational mudstone clasts; 8 = dispersed organics; 9 = coal; 10 = plant roots; T = trace.

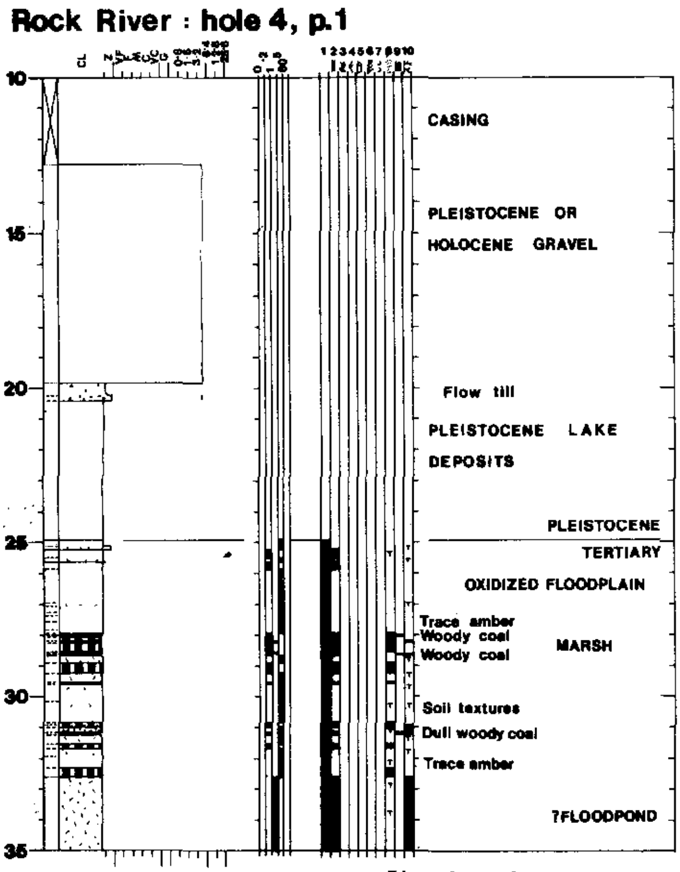
G = Remarks.

as naturally formed granules, blocks, clods or aggregates of soil (peds) rub against each other as they expand and contract in response to wetting and drying (Fitzpatrick, 1980). Soil textures are more pronounced where peds are outlined by thin laminae of clay minerals washed into place during eluviation of the soil (cf. hole 4, -30.7, -69.5 and -70.6 m levels; hole 5, -31.0, -49.2 and -59.4 m levels: Fig. 3, 4).

Grey mudrocks, in the Rock River Basin, probably accumulated in floodplain marsh environments where the water table was at or near surface during part of the year, but was periodically lowered to such a level that oxidation of most of the contained organic material took place.

Grey mudrocks grade vertically into light grey to white mudrocks, which dominate holes 2, 3 and 4. They are typically massive or have weakly developed plane bedding. While some contain distinct carbonized plant roots, in many of the lighter coloured mudrocks the past presence of plants is indicated only by faint casts. Soil development is indicated by abundant





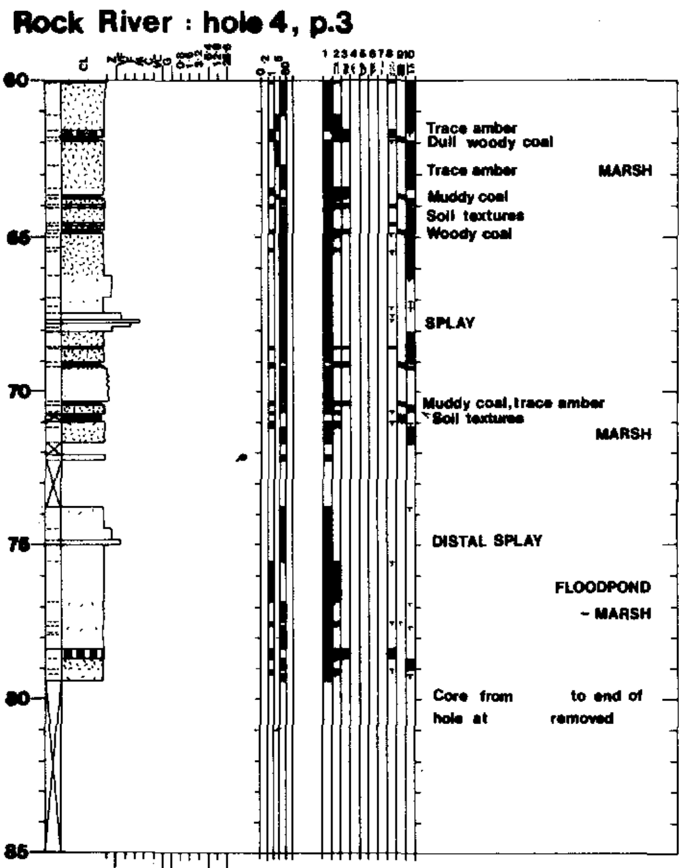


Fig. 3 Sulpetro Minerals, hole 4 (legend in Fig. 2)

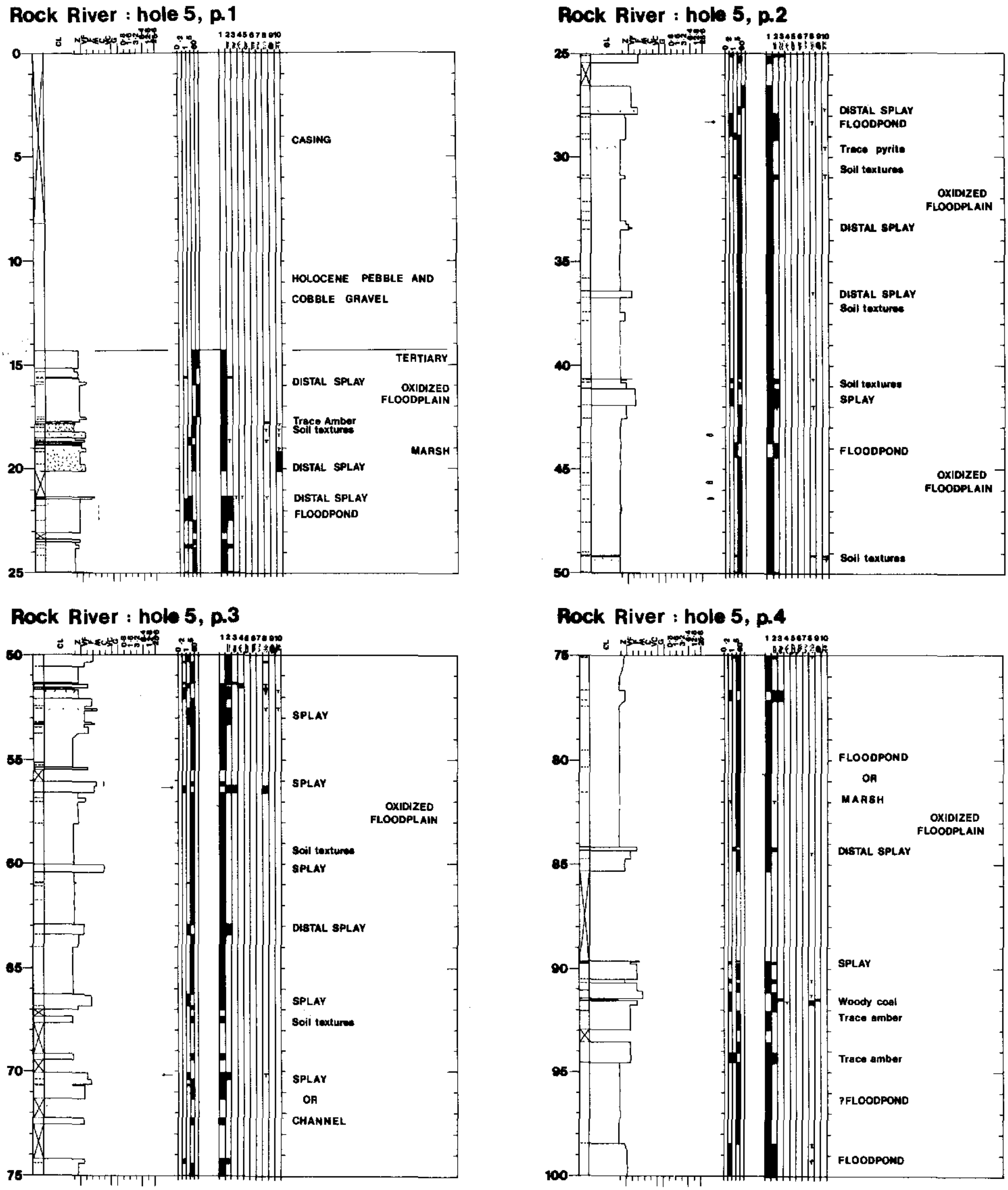


Fig. 4 Sulpetro Minerals, hole 5 (legend in Fig. 2)

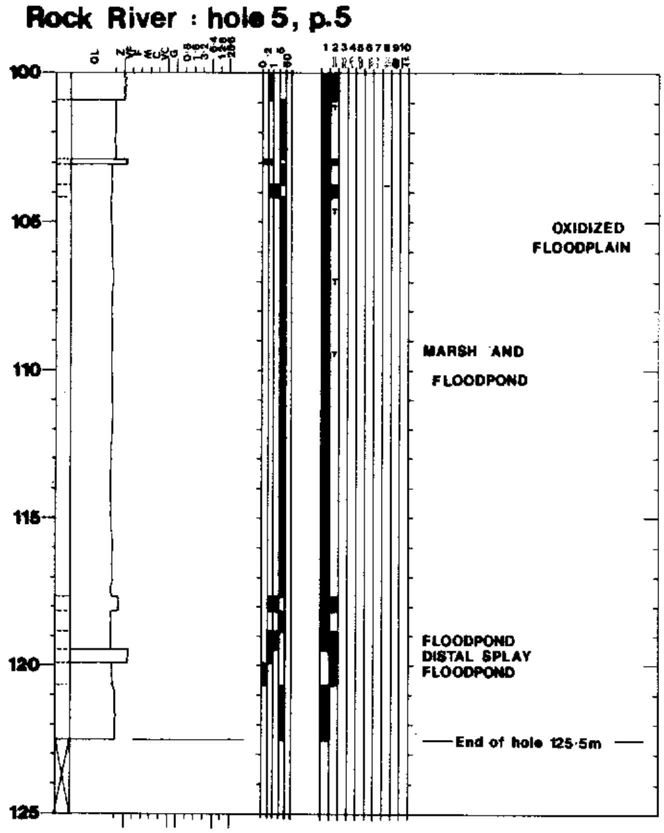


Fig. 4 (cont'd).

slickensides, and peds outlined by clay mineral laminae (Hole 4, -37.7 and -40 m levels; Hole 5, -17.5, -37.5, -41, and -67.5 m levels: Fig. 3, 4). Light grey to white mudrocks probably accumulated in distal marsh and intermittent floodpond environments in floodplain settings where frequent exposure and, periodic lowering of the water table led to oxidation of most of the contained organic material.

Grey and light grey laminated mudrocks are present in hole 3 (Fig. 2) at the -47, and -89 m levels and in hole 5 (Fig. 4) of the -44, -99 and -120 m levels. The laminated character of these deposits indicates that they accumulated in semi-permanent floodponds.

Pebbly mudstone is present in hole 3 (Fig. 2) at the -66 m level. This thick bedded, internally massive unit probably formed as a flood deposit.

Sandstone (1)

Sandstones form less than three percent of the section preserved in holes 3 and 4, and 15.8% of the section preserved in hole 5. Of this 63% is of very fine sand grade, 25% of fine sand grade, 9% of medium sand grade and 3% of very coarse sand grade. Most of the sand units appear to be moderately well sorted. Coarser material, of granule to medium pebble grade is present in minor amounts in some units. Sand units may be massive or flat to wavy laminated, and can contain carbonized plant roots, and transported woody material. Ripple lamination was observed locally in hole 5 at the -91.5 m level.

Sand units occur as isolated units, between mudrocks or coals. (Hole 3, -42, -50, -61, -67, -82, -96, -97, -100, -139 and -148 m levels; Hole 4, -49 and -54 m levels; Hole 5, -16, 17.4, -18.3, -19, -20, -25, -36.5, -60 and -120 m levels), in fining upwards sequences (Hole 3, -76, -86, -102, -116, -117 and -142 m levels; Hole 4, -75 m level; Hole 5, -27.7 m level), in coarsening upwards sequences (Hole 3, -124.4 and -159.7 m levels; Hole 4, -36 m level; Hole 5, -21.5, -50, -53, -56, -63, -74.3 and -84.2 m levels) and in sequences which show an initial coarsening upwards trend, followed by a fining upwards trend (Hole 4, -68 m level; Hole 5, -33, -41.5, -67, -71 and -92 m levels). Upper and lower contacts of sand units may be sharp or gradational.

Petrographic examination of sandstones from the Rock River Basin indicates a very local provenance. All samples analyzed are sedlitharenites (Fig. 5, Table 2) with an average composition of 13% quartz, 2% altered feldspars and 85% labile components. Mudstone is the most common rock fragment (36%), with sparry carbonate grains forming 33% of the framework grains, sandstone and siltstone 11%, detrital wood 4.5% and metasiltstone fragments 0.4%. One volcanic rock fragment was seen in a sample from the -60 m level of hole 5. Most quartz grains were strained, with numerous inclusions. Sand grains were predominantly angular to sub-angular, lacked signs of chemical corrosion. Granules tend to be subrounded. Carbonate is present locally as a cement.

Most sands in the Tertiary sequence intersected in holes 1 to 5 are interpreted as splay or levee-splay deposits. Distinct channel deposits have not been recognized. The presence of scattered granule to medium pebble grade material in some of the sand units may be indicative of the mean grain size of such deposits.

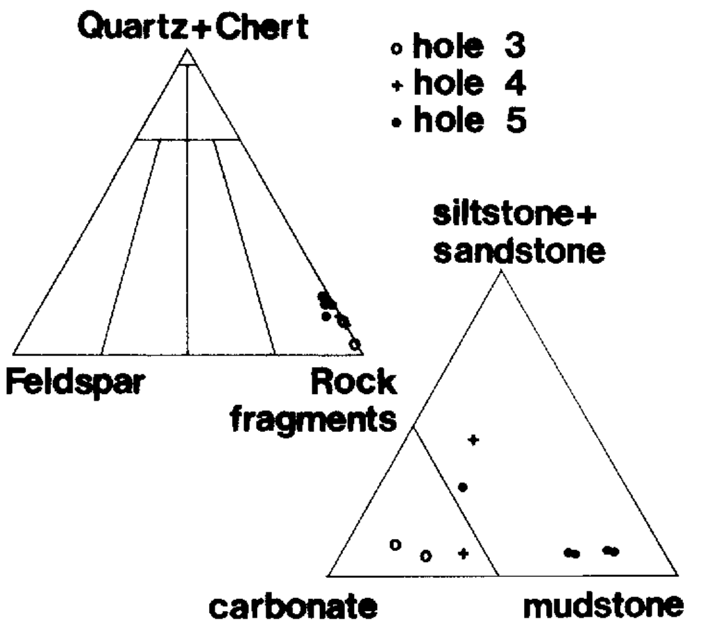


Fig. 5. Composition of framework components of sandstones from the Rock River Basin. Daughter triangle (right) indicates relative proportions of main sedimentary rock fragments (cf. Table 2).

Table 2. Petrographic analysis of sandstones from Rock River Basin (based on 500 points per slide).

Depth in metres	Quartz mono	Quartz poly	Quartz chert	Feldspar (altered)	Rock fragments, Others: Carbonate	Mudstone	Silt & sst.	Wood	Metamorphic
Hole 3									
-96.5	7.8	1.8	1.0	0.2	65.6	11.8	9.6	2.2	0
-142.2	1.2	1.8	0.2	0.4	65.0	24.0	6.8	0.2	0.4
Hole 4									
-67.7	5.4	6.0	0	0.6	43.6	26.6	6.4	11.4	0
-68	5.4	2.0	2.8	0.2	22.6	31.6	29.6	5.2	0.6
Hole 5									
-20.3	16.2	2.2	0.2	4.6	20.2	48.2	6.2	1.4	0.8
-50	13.2	4.4	0	3.8	12.8	57.0	6.6	1.6	0.6
-60	4.2	12.4	0	0.6	36.8	19.2	23.6	2.0	1.2
-84.3	10.8	5.4	0.2	3.2	11.4	60.8	6.4	1.8	0
-91.7	6.4	5.8	0	4.8	17.6	45.0	5.4	15.0	0
Average		13%		2.0	32.8	36.0	11.2	4.5	0.4

Lignite (6, 7)

Most of the lignite encountered in holes 3, 4 and 5 had been removed for analysis prior to this investigation, and, along with samples from holes 1 and 2 had been used for proximate analysis (cf. Wright and Miller, 1983 and in press). The majority of samples of lignite seen in the cores, and character samples from all holes examined at the Sulpetro Minerals Ltd. office in Kamloops, are "bright" woody coals. Bright, vitrinite rich coals are generally considered to have accumulated in forest swamp environments (Stach et al, 1982; Bustin et al, 1983, p. 172) where sustained water levels have inhibited oxidation. Most of the woody coals in hole 1 and 2 and in outcrop are associated with floodplain marsh and swamp deposits, as are coals at the -62 and -78 m levels of hole 3 and the -28 to -29 m level of hole 5 (Fig. 2, 4). Woody coal at the -91.5 m level in hole 5 (Fig. 4) is associated with splay deposits. Dull coals are commonly interpreted as products of peat accumulation in grass and reed moor environments where tree and shrub growth was limited. Those in hole 3 at the -56 to -60 m level and in hole 5 at the -20.4 m level are associated with deposits of marsh and swamp environments while those in hole 4 at the -48.5 m level accumulated on top of a splay sequence.

Depositional Environment of Rock River Coals

The abundance of floodplain, or wetland deposits (cf. Table 1) in all five holes sunk by Sulpetro Minerals Ltd. in the Rock River Basin indicates that coal accumulation was associated with a fluvial system in which vertical rather than lateral accretion was dominant. This situation occurs in low gradient fluvial systems where bank stability is sufficiently high, due to abundance of plant roots (Smith, 1976), to inhibit lateral migration of river channels across their floodplains. In normal braided and meandering systems, rivers have sufficient competence to erode their banks and hence produce sheet sands. These have not yet been encountered in the Rock River Basin, hence the coals appear to have accumulated in association with a stable channel fluvial system.

Stable channel fluvial systems are of two types: those with interconnected multiple channel systems - termed anastomosed streams by Smith and Smith (1980) and those with single channel systems - termed covered floodplain systems by Melton (1936). Smith and Smith (1980) and Smith (1983) indicate that six facies are dominant in modern intermontane anastomosed river systems in cool-temperate climatic zones: these are 1) Peat bog facies, 2) Backswamp facies, 3) Floodpond facies, 4) Levee facies, 5) Crevasse splay facies, and 6) Channel facies. Typically wetland facies (1 to 5) form 60 to 90% of the floodplain area (Smith, 1983).

Peat bog facies in modern anastomosed systems contain up to 98% organic material in units up to 1.5 m thick in the Mistaya and Alexandria river systems (Smith and Smith, 1980) and 1.3 m thick in Columbia River system (Smith, 1983). In the Mistaya and Alexandria rivers, this facies constitutes 15 to 30% of modern overbank deposits, while in the larger scale Columbia River it is less abundant and confined to the margins of the floodplain (cf. Smith, 1983). Elongate gravity anomalies, interpreted as thick coals (Wright and Miller, 1983 and in press) are uniformly distributed across the northern part of the Rock River Basin, but could be confined to valley margins in the south (Fig. 1). Peat deposits in the modern cool-temperate anastomosed systems described by Smith and Smith (1980), Smith and Putnam (1980) and Smith (1983) should produce dull coals analogous to the dull muddy lignites (Table 1, facies 6) of this study. The relative abundance of woody material in the majority of coals from the Rock River Basin (Table 1, facies 7) is probably a function of accumulation in a warmer climatic setting than the given modern examples (cf. Anderson, 1964) and is typical of Eocene coals in association with the Tintina fault system (Hughes and Long, 1980; Long, 1981). Woody lignites may have accumulated in forest moor or swamp settings adjacent to levees (cf. Hole 3, -40 m level) or in more extensive swamps between channels (cf. Hole 3, -82 m level and thick coals in Holes 1 and 2).

Backswamp (Smith and Smith, 1980) or marsh (Smith, 1983) facies are the dominant wetland facies in modern cool-temperate anastomosed systems. They are represented in the Rock River Basin by black organic rich mudrocks and grey mudrocks (Table 1, facies 2, 3). Floodpond deposits are represented by light grey to white mudrocks and laminated mudrocks (Table 1, facies 4 and 5). The laminated varieties presumably represent the deeper parts of the floodponds, that were not subject to frequent exposure and consequent oxidation. Massive varieties may grade laterally into distal marsh facies. Studies of modern systems (Smith, 1983) indicate that while some lakes contain some laminated silts and clays, most of the deposits are non-laminated due to bioturbation.

Levee and crevasse splay facies are represented by massive and flat bedded sandstones in the Rock River Basin (Table 1, facies 1). Splay sandstones are common in multiple and single channel, stable channel fluvial systems; they form when overbank flow cuts a small channel through a levee and transports and deposits a lobate sheet of sand in the adjacent wetland environment (Smith, 1983).

Sandstones with a sharp base and tendency to fine up section represent rapid progradation of splays across floodplain marshes, followed by progressive splay abandonment as the crevasse becomes blocked by sediment vegetation or log jams. Coarsening upwards sequences are a hallmark of the anastomosed system (Smith, 1983) and form due to progressive progradation of splay systems into floodpond settings during several flood cycles. The sharp truncation at the top of many of these sequences in core from the Rock River Basin may be related to log jams blocking the crevasse systems, or avulsion diverting channel flow to new channels. Symmetrical coarsening-fining sequences presumably represent long lived splays which prograded into wet-land environments and were progressively abandoned.

Channel deposits have not been positively identified in core from the Rock River Basin. This is partly a function of the limited amount of drilling to date, and the relative importance of channel deposits in stable channel fluvial systems. Channel deposits, when found may be of coarse sand to small pebble grade and should form stacked, shoestring-like deposits (Smith and Smith, 1980; Smith and Putnam, 1980; Smith, 1983).

Miller and Wright (in press) estimate that $56x10^6$ tonnes of lignite A to subbituminous C grade coal with an average thermal value of 6645 Btu/lb (15.45 Mj/kg) lies within 80 m of the surface in the vicinity of holes 1 and 2. If the elongate gravity anomalies identified by Miller and Wright (1983 and in press) are thick coals the ultimate coal potential of this area is very high. The high rate of lateral facies changes associated with stable channel - high constructive fluvial systems will necessitate an extensive program of closely spaced drill holes to prove the coal reserves of this basin.

CONCLUSIONS

Tertiary strata in the Rock River Basin accumulated in an intermontane valley whose geometry and history was probably controlled by subsidence associated with the Rock River Fault (Fig. 1). The character of the earliest deposits in this basin are unknown, but may include fluvial (braided and meandering) and lacustrine strata. Coal deposits in the Rock River Basin are interpreted as products of deposition in forest moor environments associated with stable channel fluvial systems. This interpretation is supported by the abundance of wetland deposits and the presence of numerous splay sandstones. The absence of identifiable channel deposits is probably a function of the relative importance of this facies, combined with the limited number of boreholes in the area. A similar deficiency of conglomeratic channel deposits can be seen in core from the "Hat Creek Coal Formation" in British Columbia (cf. Church, 1975). Other Tertiary coal deposits associated with stable channel (or high-constructive) fluvial systems include seams up to 21.9 m thick in the Australian Creek Formation, south of Quesnel, British Columbia (Graham, 1978; Long, 1981) and seams up to 17 m thick in the lower part of the Eocene succession near Dawson, Yukon Territory (Hughes and Long, 1980; Long, 1981).

Stable channel systems in the fault controlled intermontane coal basins at Dawson and Quesnel were probably triggered by tectonic subsidence or by analogy with modern anastomosed systems, downstream grade control by alluvial fan progradation across the valley floors. The latter may have occurred in the Rock River Basin, although location of such fan deposits has yet to be confirmed. All sand grade material in the succession appears to be of local origin, indicating that the system was fed by runoff from a relatively small drainage basin. The streams may have flowed to the south, as Tertiary clay and coal is known to occur 91 km south of the basin along the banks of the Coal River (126°58'W, 59°42'N) in the Rabbit River Area of British Columbia (Gabrielse, 1962). The paleogeographic and age relation wih other Tertiary coal basins in the Yukon (Hughes and Long, 1980; Long, 1981; Long, 1983; Long in press) is not yet fully resolved.

ACKNOWLEDGEMENTS

Support for this research was provided by the Department of Indian and Northern Affairs (Contract Y3MG-11) and Natural Sciences and Engineering Research Council of Canada (Grant A8456). I wish to thank Sulpetro Minerals Limited for permission to examine the core in the field and in Kamloops, British Columbia, and thank D.C. Miller, H.L. King, S.R. Morison and J.A. Morin for discussion on the coal geology of the area. S.R. Morison proved indispensable in moving and logging core in the Rock River Basin.

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AURIFEROUS CONGLOMERATES AT McKINNON CREEK, WEST-CENTRAL YUKON (115 O 11): PALEOPLACER OR EPITHERMAL MINERALIZATION?

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ABSTRACT

Siliciclastic sedimentary rocks at McKinnon Creek, Indian River area, consist of interbedded sandstone, conglomerate, siltstone and coal, in order of decreasing abundance. The sediments are Lower Cretaceous (Albian) in age and were deposited in fluvial and deltaic environments. Strata are at least 500 m thick and subdivided into a lower lithic unit and an upper quartzose unit. Upper Cretaceous-Paleocene andesite dykes and sills intrude the sedimentary rocks.

Conglomerates of the upper quartzose unit contain up to 3.4 g/t gold. Historically, this deposit was regarded as a paleoplacer. However, an epithermal origin is suggested by extensive quartz and clay cementation and authigenic pyrite and tourmaline in the conglomerates and by their close proximity to faulting and intrusions. The area should be reassessed for its economic potential.

INTRODUCTION

Siliciclastic sedimentary rocks are widespread in west-central Yukon from the Indian River westwards to the Sixtymile River. As described elsewhere (Bostock, 1942, Hughes and Long, 1980, Lowey, 1982, 1983, Tempelman-Kluit, 1974) the deposits are mainly fluvial and lacustrine in origin and occur in continuous or discontinuous, fault-bounded continental basins of Early Cretaceous to Paleocene age.

Strata in the Indian River area were known to be auriferous since 1899, when gold was first discovered in conglomerates on the east bank of McKinnon Creek (MacLean, 1914). These conglomerates consist predominantly of well-rounded pebbles and cobbles of vein quartz, quartzite and schist, that are lithologically similar to the White Channel Gravels in the Klondike District. Gold content is low, although fine colours can be panned from the old workings.

A placer origin for the gold was first suggested by McConnell (1905) and since then, the conglomerates have been referred to as a paleoplacer occurrence. An alternative interpretation became evident to the author during the present study. Extensive silicification of the conglomerates, faulting and close proximity to felsic and intermediate intrusions indicates the possibilty of a hydrothermal origin. The purpose of this report is to summarize the current information on the deposits in the Indian River area with emphasis on the origin of the gold.

Acknowledgements

Approximately four weeks were spent from mid-July to mid-August 1983 in a re-examination of the rocks in the Indian River area and in reconnaissance surveys of lithologically similar strata north of Dawson City and in the Carmacks and Whitehorse map-areas. J.F. Lowey performed competently as field assistant during this time and her help is especially appreciated. Discussions with J. Morin and other geologists of the Exploration and Geological Services Division in Whitehorse are gratefully acknowledged.

STRATIGRAPHY AND STRUCTURE

The Indian River area lies within the Yukon Cataclastic Terrane. It is underlain by metamorphic rocks of sedimentary, volcanic and plutonic derivation. Approximately 500 m of siliciclastic sedimentary rocks lie unconformably on the metamorphic rocks. The sedimentary rocks were formerly thought to be Eocene in age (Bostock, 1942) but are now assigned an Early Cretaceous (Albian) age; they are coeval with parts of the Bonnet Plume Formation, the Tantalus Formation and the Keno Hill Quartzite (Lowey, 1983).

The sedimentary rocks are bounded on the north by the Indian River Fault and on the west by the Ruby Creek Fault (Fig. 1). An important fault, inferred to lie along the valley of McKinnon Creek, is indicated by pronounced silicification and shearing in conglomerates along the valley. Generally, strata dip to the northeast at five to ten degrees.

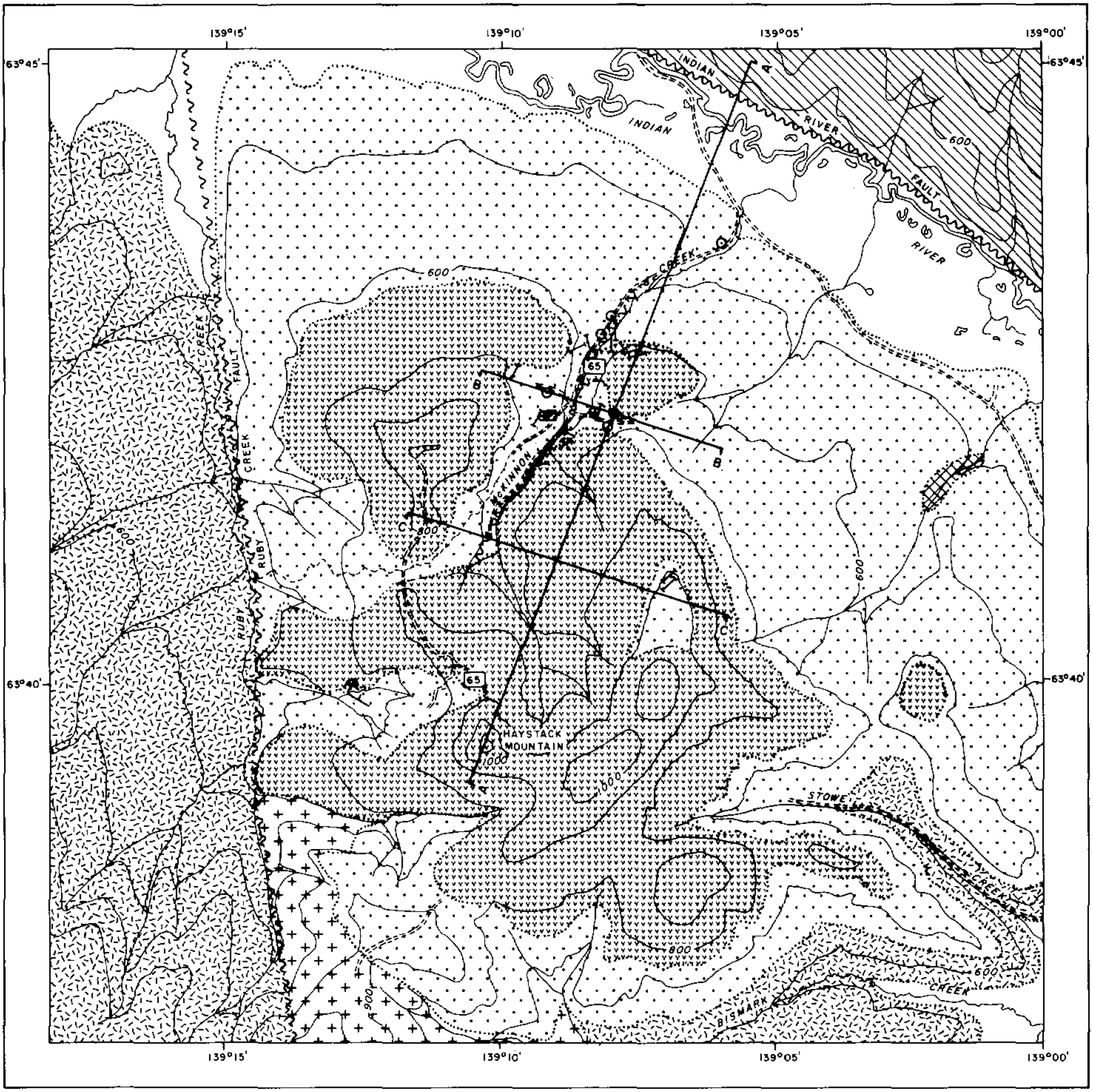
Clastic rocks crop out as far as Henderson and Eureka Domes, 25 km south and southeast respectively. Bostock (1942) correlated strata in the South Fork Ditch, north of the Klondike River, with the Indian River strata but the present study demonstrates that rocks exposed in the Ditch are part of the Tintina Trench fill sediments and are probably Eocene in age.

Strata in the Indian River area consist of interbedded sandstone, conglomerate, siltstone and minor coal, in decreasing order of abundance. They are subdivided into two units based on lithology. The lower unit is approximately 50 m thick and is characterized by clasts of chert and volcanic rocks (Fig. 2a) - the 'Red Conglomerate unit' of Lowey (1982). The sandstones are classified as litharenites (Fig. 3). The upper unit is approximately 450 m thick and consists entirely of quartzose fragments of monocrystalline quartz, quartzite, vein quartz, schist and gneiss (Fig. 2b) - the 'White Conglomerate unit' of Lowey (1982). The sandstones are classified as predominantly quartz arenites, with minor sublitharenites and subfeldsarenites (Fig. 3). Only conglomerates from the 'White Conglomerate unit' are known to be auriferous.

Volcanic rocks intrude and overlie the sedimentary rocks. They consist predominantly of andesite with minor dacite. The andesite is porphyritic, consisting of 15 to 20% plagioclase (An 30-45), 10 to 20% hornblende, 0 to 5% augite and 0 to 5% biotite, in a very fine- to fine-grained dark grey-green groundmass of plagioclase, magnetite and minor apatite (Fig. 4). Phenocrysts range from 0.3 to 2 mm long and are usually subparallel. The groundmass is felted to trachytic in texture. Xenoliths of quartzite, monzonite and schist-gneiss are present.

These rocks are dated (K-Ar) as 69 to 65 Ma (Lowey, in press) and they belong to the Carmacks Group. Subaerial volcanic flows are exposed on the

GEOLOGY OF INDIAN RIVER AREA



LEGEND

CENOZOIC / MESOZOIC

RECENT

Unconsolidated alluvial deposits.

PALEOCENE AND UPPER CRETACEOUS

Andesite and minor dacite, porphyritic; light-to dark-green, weathering light-grey-brown (Carmacks Group).

LOWER CRETACEOUS

Interbedded sandstone, mudstone and conglomerate with minor coal; light-grey to black, weathering light-grey.

PROTEROZOIC and/or PALEOZOIC

PERMIAN AND OLDER

Dunite; dark-green, weathering brown.

Felsic Schist: quartz-muscovite-chlorite-schist and muscovite schist, light-grey-green, weathering dark-grey-orange.

Schist-Gneiss: quartz-muscovite schist and gneiss; light-grey, weathering light-grey-brown.

Granitic Gneiss: muscovite-chlorite-biotite schist and foliated gneissic granodiorite; dark-grey, weathering light-grey.

Geologic boundary: Approximate
Assumed

Bedding, tops known (inclined)

Foliation (inclined)

Fault: Defined
Approximate

Mine (1, Ruby Creek Coal Mine; 2, Britannia Gold Mine).

Diamond drill hole

Rotary drill hole

Shaft

Adit

Trench

Trail (bulldozer, foot)

Radiometric age (millions of years) 65

CROSS-SECTIONS

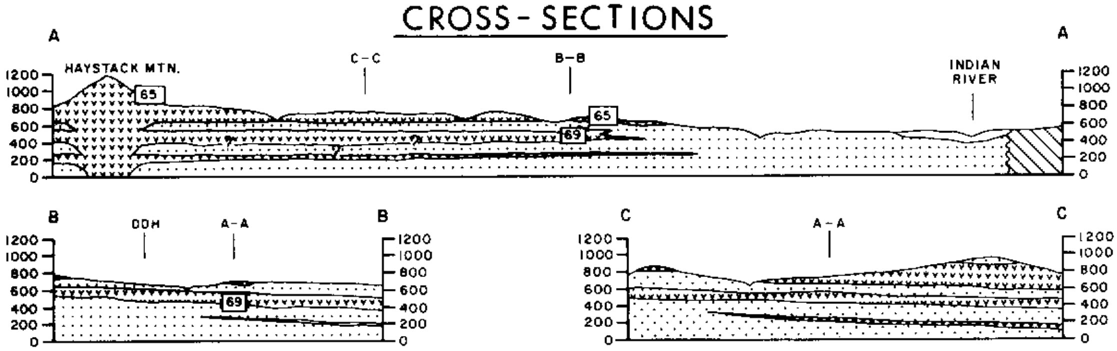


Figure 1. Geologic map and legend of the Indian River area.

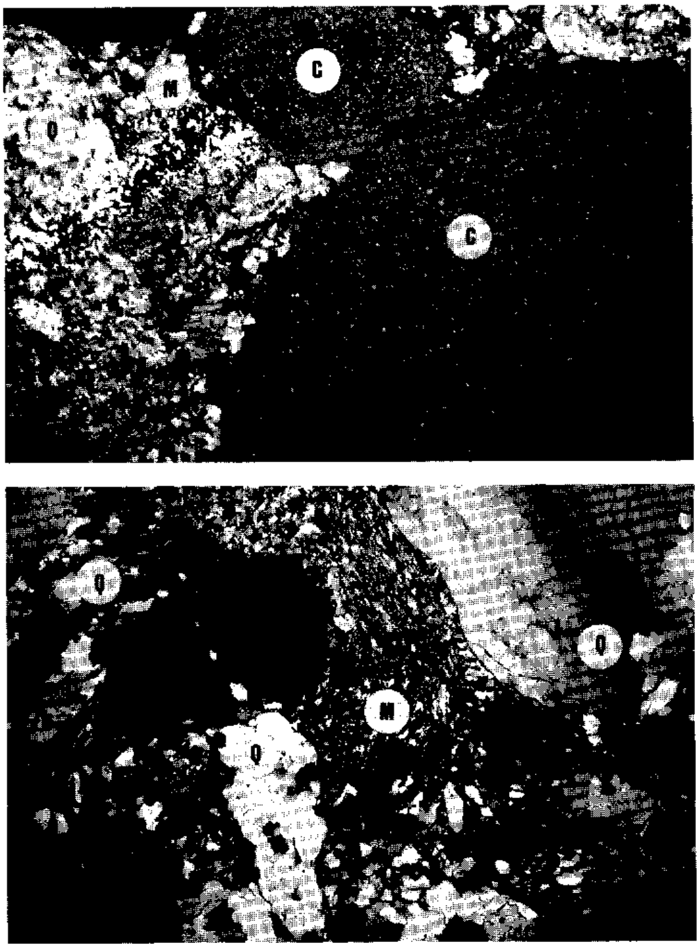


Figure 2. Photomicrographs of conglomerate, crossed polarizers; length of view 6 mm. Q = polycrystalline quartz, C = chert, M = matrix. 2a. Lithic unit. 2b. Quartzose unit.

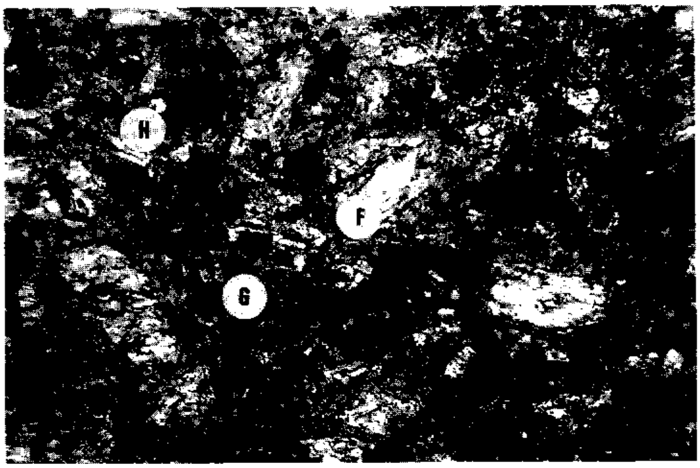


Figure 4. Photomicrograph of andesite, crossed polarizers; length of view 10 mm. F = feldspar (plagioclase), H = hornblende and G = groundmass.

northwest flank of Haystack Mountain and dykes and/or sills up to 50 m thick are present in the subsurface. Haystack Mountain is interpreted as the eroded remnant of a volcanic neck.

SEDIMENTOLOGY AND DIAGENESIS

Based on stratigraphic thickness, the sedimentary rocks are comprised of 70% sandstone, 17% conglomerate, 11% siltstone and 2% coal. These beds are usually arranged into fining-upwards sequences. Generally, conglomerate increases in abundance up-section.

Sandstone is light- to dark-grey and light- to dark-grey-green and consists of silty, micaceous and locally pebbly, coarse- to fine-grained sand. It occurs as 0.1 to 5 m thick beds that are massive, planar parallel, cross-bedded, horizontally laminated or convolute laminated. Conglomerate is light- to medium-grey and medium-grey-green and consists of sandy and rarely calcareous, cobble to pebble gravel. It forms 0.5 to 10 m thick beds that are massive. Siltstone is medium- to dark-grey, medium- to dark-grey-green and black and consists of sandy or clayey silt. It occurs as 0.1 to 15 m thick beds that are massive, horizontally laminated, wavy laminated or flaser laminated. Coal is black, subbituminous and forms 0.1 to 1.5 m thick beds.

Sandstone and siltstone beds are commonly bioturbated and contain well preserved trace fossils

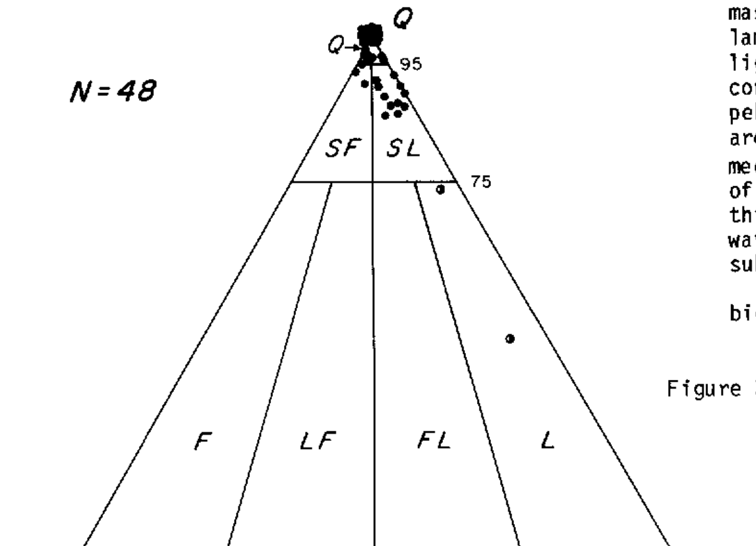
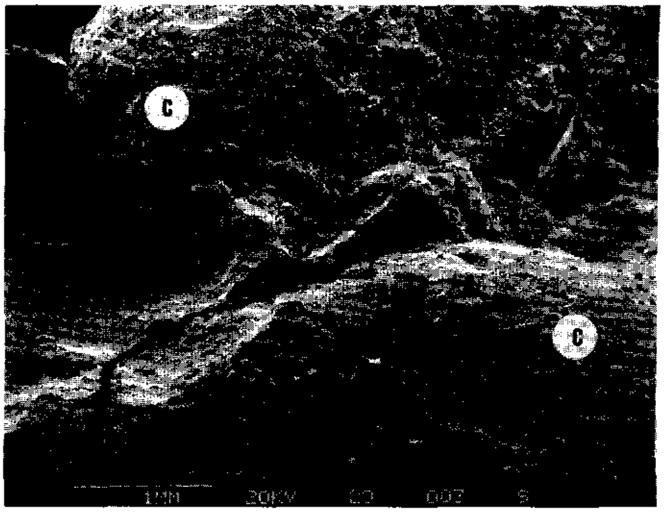
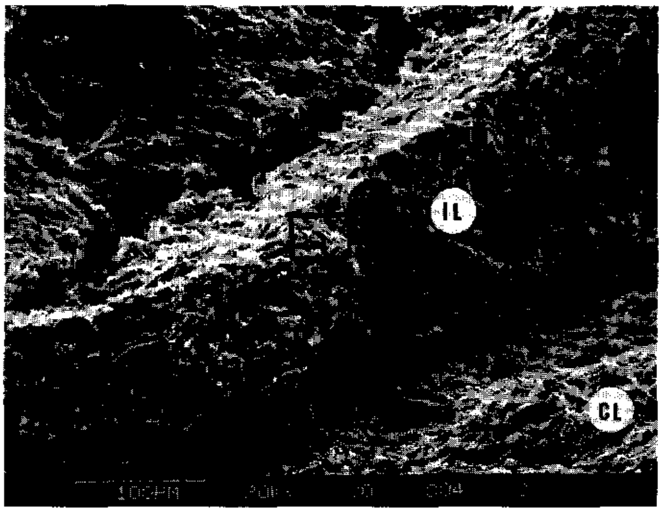


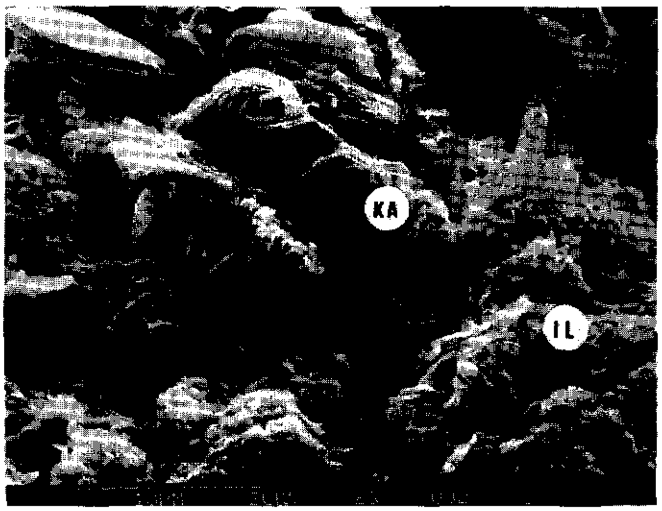
Figure 3. QFL Plot of sandstone compositions. Q = monomineralllic, monocrystalline and polycrystalline quartz; F = feldspar; and L = poly-minerallic rock fragments and chert. Follows classification of Folk et al. (1970) (Q = quartzarenite, SF = subfeldsarenite, SL = sublitharenite, F = feldsarenite, LF = lithic feldsarenite, FL = feldspathic litharenite, L = litharenite).



5a



5b



5c

of Teichichnus, Chondrites, Arenicolites and possibly Ophiomorpha. Abundant carbonized plant fragments, microspores, pollen and dinoflagellates are also present.

The source of the lithic clasts in the lower unit remains uncertain. The quartzose clasts in the upper unit are all locally derived from the Yukon Cataclastic Terrane.

The sediments are interpreted to be fluvial and deltaic in origin. Depositional environments recognized include the delta front, interdistributary bays and marshes and distributary channels of the delta plain, and meandering river, braided river and alluvial fan-delta. The strata represent a prograding delta complex that was ultimately overlain by fluvial deposits.

The siliciclastic sedimentary rocks display several classic diagenetic features. Initial compaction of both the lithic and quartzose units resulted in bending of detrital muscovite and squeezing of labile rock fragments around and between chert and quartzose grains. Further compaction caused splintering of plagioclase along cleavage planes and in quartz grains, fracturing and the development of strain shadows (Boehm lamellae).

Cementation followed, and the sequence and types of cements differs in the two units. In the lower unit, chlorite rim cement was deposited on chert and volcanic rock fragments, followed by abundant illite and minor kaolinite pore filling cements (Fig. 5). In the upper unit, cementation is dominated by syntaxial quartz overgrowths (Fig. 6), followed by minor illite pore filling cement, rare authigenic pyrite and authigenic tourmaline (Fig. 7). In both units, the last stage of cementation was calcite, which replaced earlier quartz and clay cements.

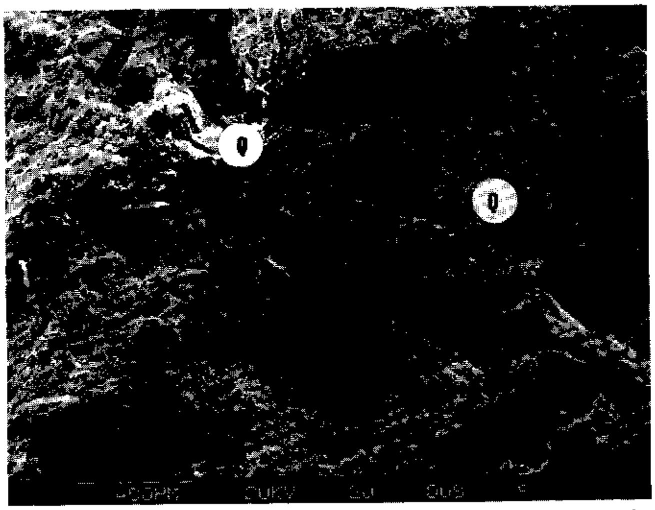
Andesite underwent only local alteration. The most obvious changes occur along McKinnon Creek valley opposite the Brittannia adit. Here, hornblende and plagioclase are leached and the latter partially replaced by clays (Fig. 8).

Figure 5. SEM photomicrograph of the lithic conglomerate. C = chert clast, CL = chlorite, IL = illite and KA = kaolinite (scale in mm or um in lower left corner).

5a. Low power showing chert clasts and interparticle cement (black square indicates location of 5b).

5b. Intermediate power showing chlorite rim cement and illite pore filling cement (black square indicates location of 5c).

5c. High power showing illite and kaolinite pore filling cements.



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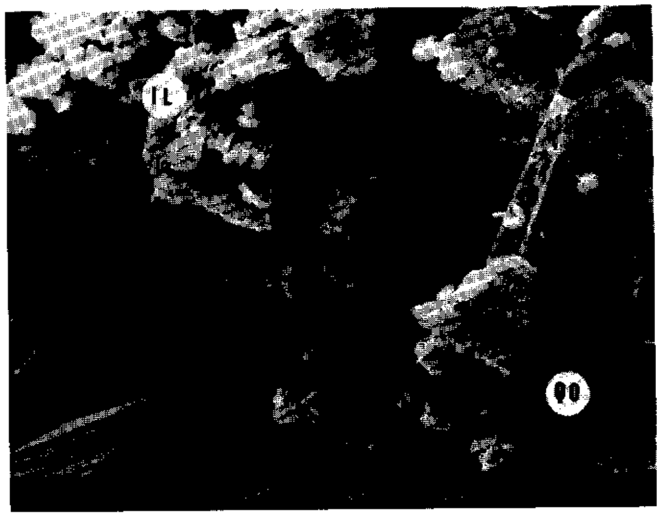

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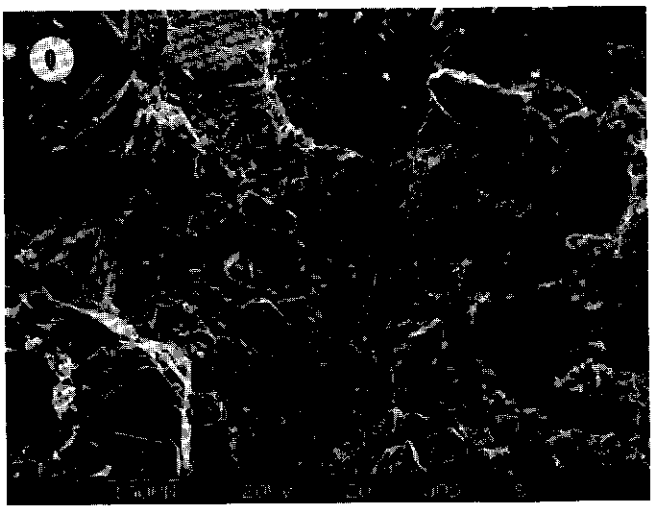
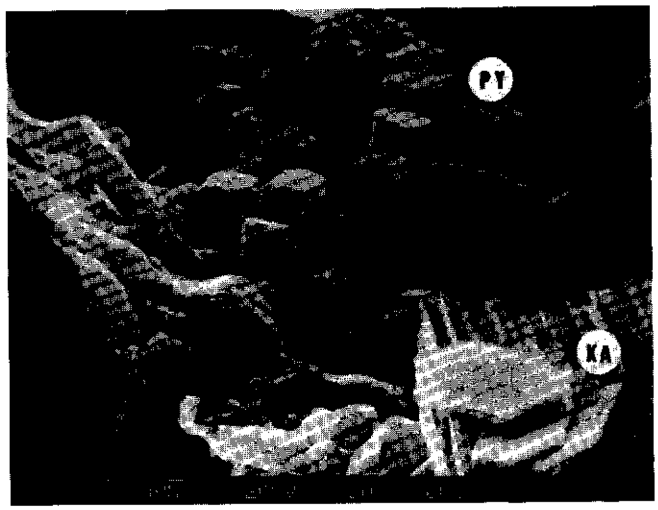
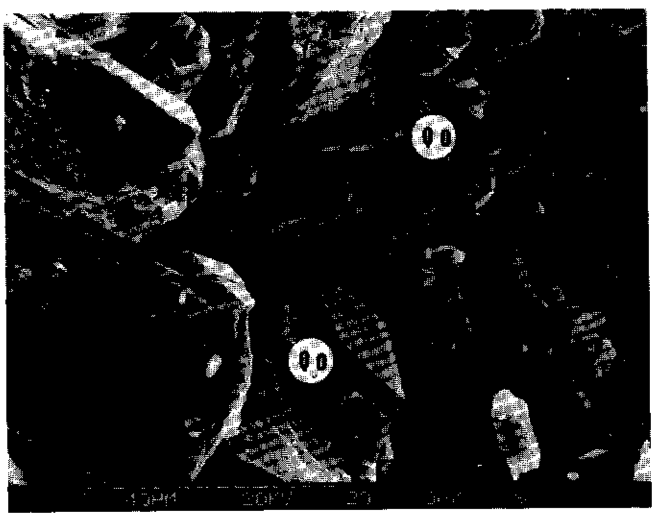


6b



7b



6c

Figure 6. SEM photomicrograph of the quartzose conglomerate. Q = quartz clast, QO = quartz overgrowth (scale in um in lower left corner).

6a. Low power showing quartz clasts and matrix (black square indicates location of 6b).
6b. Intermediate power showing quartz clasts and quartz overgrowths in the matrix (black square indicates location of 6c).
6c. High power showing well developed quartz overgrowth cement.

Figure 7. SEM photomicrograph of the quartzose conglomerate. QO = quartz overgrowths, IL = illite, KA = kaolinite and PY = pyrite (scale in um in lower left corner).

7a. High power showing quartz overgrowths and illite pore filling cement.
7b. High power showing kaolinite pore filling cement and authigenic pyrite.
7c. High power showing rodlike authigenic tourmaline.

Figure 8. Photomicrograph of altered andesite, crossed polarizers; length of view 5 mm. AF = altered feldspar, replaced by clays, AH = altered and leached hornblende, and G = groundmass. Sample is from andesite opposite the Brittannia adit.

ECONOMIC GEOLOGY

Placer Model

Very fine-grained gold (less than 0.1 mm) is present in conglomerates of the upper (quartzose) unit, particularly in the vicinity of the Brittannia adit. It occurs between the quartzose clasts, either in the matrix (detrital) or in the cement (precipitate). The gold is not restricted along any horizon or concentrated in any pay streak, but rather, is disseminated throughout the conglomerates.

These conglomerates are interpreted as braided river and alluvial fan-delta deposits and are not unlike the Witwatersrand goldfield in South Africa. Pretorius (1975) suggests the Rand conglomerates are fluvial fan in origin (essentially an alluvial fan-delta), and were deposited at the mouth of a major river as it debouched into a shallow-water, intermontane lake. He was able to subdivide the fan system into a fanhead, midfan and fanbase, and observed that the zone of maximum gold enrichment was the midfan region. Detrital gold (some of it later remobilized by metamorphism) occurs in the matrix of the vein quartz, quartzite and chert pebble conglomerates. Its average grain size is 0.08 mm and the average grade of the ore is 8.6 g/t Au (Boyle, 1979).

Detrital(?) gold in the conglomerates at McKinnon Creek may have been derived from the ubiquitous muscovite-quartz schists in the area. According to Boyle (1979), gold is present in quartz boudins, veins, stringers and lenses in the schist and averages 3.4 g/t. The overwhelming abundance of clasts of vein quartz, eroded from the schists together with a braided river and alluvial fan delta origin for the conglomerates, tends to support a placer origin for the gold.

Epithermal Model

Numerous disseminated gold deposits occur in western United States (Hausen and Kerr, 1968). They are epithermal deposits in which silicification of the host rocks was prominent in their formation (Boyle, 1979). Champigny and Sinclair (1980, 1982a, b) list several characteristics of these deposits:

1) small particle size of the gold;
2) enrichment in the epithermal suite of trace-elements, particularly Hg, As and Sb, but no enrichment in Ag;
3) high porosity of the host rock;
4) argillic alteration;
5) proximity to a major fault system;
6) Tertiary age of mineralization;
7) spatial and possibly genetic association with felsic intrusions.

The auriferous conglomerates at McKinnon Creek display similar characteristics. The gold is disseminated and very fine-grained. However, chemical analyses of the conglomerates (-80 mesh fraction after crushing) indicate little if any enrichment in the traditional epithermal suite and the results are inconclusive (Table 1). In addition, porosity of the conglomerate was originally quite high, as revealed by the abundant quartz overgrowths that have grown into the pore space and the pore filling clay cements. A fault or fault system parallels the trend of McKinnon Creek valley, which also happens to coincide with the highest gold values. Lastly, the conglomerates were intruded by andesite and dacite of Late Cretaceous to Paleocene age.

The model envisaged here involves deposition of the conglomerates as a braided river and alluvial fan-

AREA	SAMPLE No.	ELEMENT (values in ppm except for Au and Pb in ppb)										
		Ag	As	Au	Ba	Hg	Pb	Sb	Sn	Ta	U	W
INDIAN RIVER AREA (McKINNON CREEK)	153-A	L.T. 0.5*	3	19	280	L.T. 10	2	0.7	L.T. 3	L.T. 5	0.4	L.T. 1
	161-B	L.T. 0.5	1	9	360	L.T. 10	2	0.8	L.T. 3	L.T. 5	0.5	L.T. 1
	211-A	L.T. 0.5	1	2	440	L.T. 10	2	0.5	L.T. 3	L.T. 5	0.3	1
	274-B	L.T. 0.5	1	6	440	L.T. 10	4	1.5	L.T. 3	L.T. 5	0.5	L.T. 1
	80-1-8	L.T. 0.5	18	2	320	L.T. 10	14	1.3	L.T. 3	L.T. 5	0.5	L.T. 1
	137-1-17	L.T. 0.5	3	1	1040	10	6	3.5	3	L.T. 5	1.6	2
	137-2-2	L.T. 0.5	2	1	580	10	4	0.7	L.T. 3	L.T. 5	1.1	L.T. 1
	137-2-3	1.0	30	2	780	80	14	5.0	L.T. 3	L.T. 5	2.6	2
	137-2-13	L.T. 0.5	3	2	680	20	6	1.1	L.T. 3	L.T. 5	0.8	L.T. 1
	137-3-2	0.5	2	L.T. 1	240	L.T. 10	10	0.8	L.T. 3	L.T. 5	0.4	L.T. 1
	137-3-9	L.T. 0.5	2	3	320	L.T. 10	4	0.6	3	L.T. 5	0.3	1
	137-3-12	L.T. 0.5	1	9	440	L.T. 10	L.T. 2	0.4	L.T. 3	L.T. 5	0.5	L.T. 1
SIXTYMILE RIVER AREA	451-2	L.T. 0.5	L.T. 1	1	460	L.T. 10	12	0.5	3	L.T. 5	2.5	L.T. 1
	602-3	L.T. 0.5	4	2	460	L.T. 10	6	1.2	3	L.T. 5	2.2	2
TANTALUS FM CARMACKS	55-2	L.T. 0.5	62	19	860	160	8	1.4	L.T. 3	L.T. 5	1.2	1
RHYOLITE TUFF McKINNON CREEK	32	L.T. 0.5	3.5	3	1980	100	30	1.8	3	–	–	8

L.T.= less than   * Analyses by X-Ray Assay Laboratories Limited, Toronto.

TABLE 1. Trace element results of conglomerate samples (all samples except #32 were crushed and the minus 80 sieve fraction analyzed). Sample 274-B is taken from the Brittannia adit.

delta complex during the Early Cretaceous (Albian). During the Late Cretaceous (Maastrichtian)-Paleocene and probably following minor uplift of the strata, this sequence was intruded by andesite and dacite dykes and sills. Intrusion resulted in a large geothermal system and the highly porous conglomerates provided an optimum setting for mineralization. This included silicification, argillization, and minor pyritization and tourmalinization, as well as precipitation of minute particles of gold. The gold may have been introduced by the intermediate to felsic intrusions (magmatic) or may have been gleaned from the sedimentary rocks themselves (detrital), remobilized, and subsequently precipitated in the same rock. The driving force for remobilization would have been the geothermal system set up by the intrusions.

CONCLUSION

Auriferous conglomerates at McKinnon Creek, Indian River area, display several characteristic features of both a placer deposit and an epithermal deposit. Historically this deposit has been interpreted as a paleoplacer deposit, and exploration and exploitation of the gold was carried out with this model in mind. However, faulting, and extensive alteration, fine particle size of the gold and close proximity to intermediate to felsic intrusions, also suggests an epithermal origin for the gold.

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NOTES

ALTERATION AND ZONATION IN THE KALZAS W-Sn-Mo PORPHYRY-VEIN DEPOSIT 105 M 7, YUKON

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INTRODUCTION

The Kalzas W-Sn-Mo deposit is located in central Yukon (134^{0} 42'W, 63^{0} 16'N) 77 km south of Keno Hill, 71 km southeast of Mayo and 282 km north of Whitehorse. It is on the northern side of Big Kalzas Lake and occupies both peaks of the Kalzas Twins (1923 m elevation) (Figure 1).

Wolframite-molybdenite-cassiterite mineralization occurs in sets of large planar quartz veins which crosscut Selwyn Basin clastic rocks of the Upper Proterozoic Windermere Supergroup, or "Grit" unit. The deposit has a concentric alteration halo with an outer sericite dominated zone, an inner "potassic" core and intense tourmalinization throughout the potassic zone and part of the sericite fringe. Intense fracture and quartz-tourmaline veinlet stockworks are present. No plutonic rocks are exposed in the local area though an underlying pluton is suspected.

Kalzas has similarities to many wolframite deposits throughout the world, including those of Southeast Asia which contain the bulk of world tungsten reserves (Yan et al 1980, So et al 1983). In contrast North American tungsten mines having wolframite as the dominant tungsten phase are not as common as scheelite skarn deposits which produce most of our domestic tungsten. This trend is also true for the Yukon with many impressive scheelite deposits, including the world's largest known scheelite skarn at Macmillan Pass (Meinert, 1983). These deposits, and others (Kalzas included) are located in a tungsten belt delineated by Abbott (1982), which may also be referred to as the "Selwyn Tungsten Belt" due to its close spatial relation to the Selwyn Basin (Cathro 1969). Seven other Yukon wolframite occurrences are briefly discussed by Cathro (1969) - three of which occur considerably north of the above mentioned tungsten belt.

Kalzas is a relatively new discovery, found in 1978 by J.D. Randolph of Mayo (Morin and Debicki, 1982). Although Kalzas is situated within an already well known, but broadly defined tungsten sector, recognition and better understanding of the new style of occurrence may lead to further discoveries.

GENERAL GEOLOGY

The host lithology is comprised of interbedded phyllite, shale, sandstone, and conglomerate. The phyllite is dark green and chloritic. It may be slightly pyritiferous and weathers to a brown rusty colour. Chlorite and microfabrics are maintained only in rocks outside of the alteration zones. The shale is dark grey and less common than the phyllite. Both may grade to siltstone where flame structures, cross-bedding, graded bedding, and laminations are common.

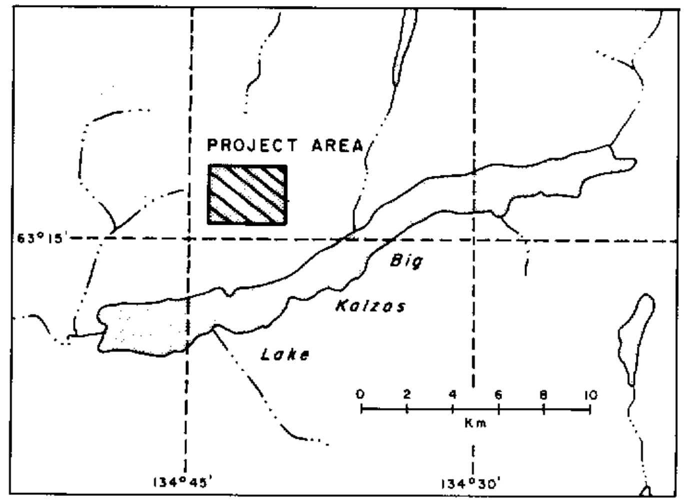


Figure 1. Index map showing location of Kalzas area.

The sandstone, dominantly feldspathic quartzite, is also green and chloritic with some grayish varieties. It weathers to a dull beige colour. The sandstone is moderately to poorly sorted, containing fine to coarse sand-sized grains. Some are pebbly. It shows no fabric and is very competent as opposed to the softer shale, phyllite, and siltstone. Quartz-feldspar pebble conglomerate is also present, but in lesser amounts. A continuous marker bed of the conglomerate strikes northwest through the center of the map (Figure 2).

The strata are steeply dipping to vertical and strike to the northwest (Figure 3). Small scale folds are occasionally found, these are tight and appear to be upright and are usually moderately plunging to the southeast (Figure 4). Tightly folded shale and sandstone of Selwyn Basin commonly have cleavage and show a variety of structural trends although the main trend is northwesterly (Eisbacher, 1981). Folding of these ancient continental margin sediments occurred during Late Jurassic and Early Cretaceous time (Tempelman-Kluit, 1981).

ECONOMIC GEOLOGY

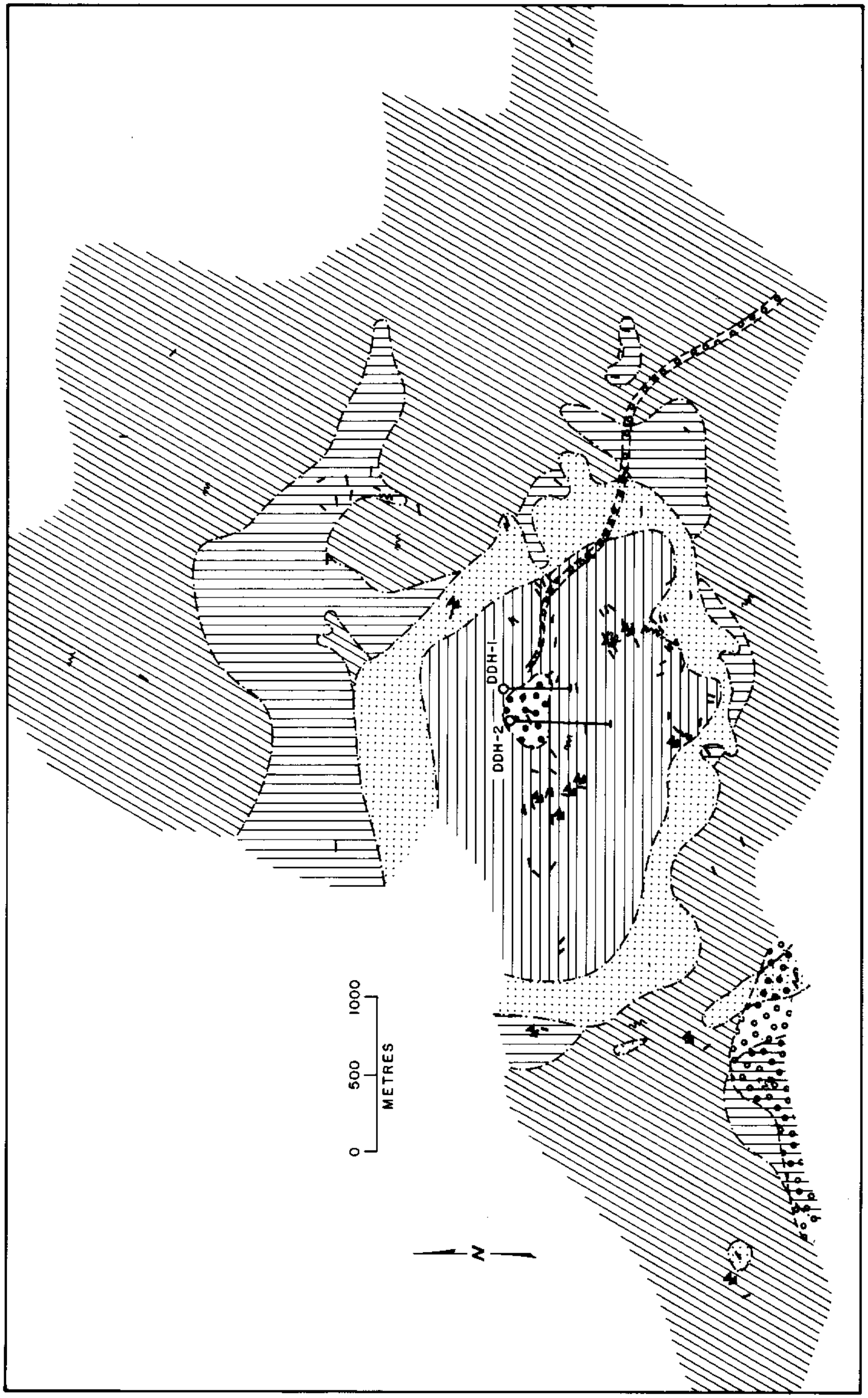
Large Mineralized Quartz Veins

At Kalzas, large quartz veins crosscut the strata and contain tungsten mineralization in the form of wolframite with minor scheelite. Other minerals that may be present in these veins, depending on their position in the deposit, are cassiterite, molybdenite, tourmaline, potassium feldspar, muscovite, pyrite, galena, beryl, and native bismuth (?). The veins are up to 60 cm in thickness but are more commonly about 10 cm wide. They are typically planar and of even thick-

Yukon Exploration and Geology 1983, p. 79-87

KALZAS PORPHYRY-VEIN W-Sn-Mo DEPOSIT,

YUKON TERRITORY.



LEGEND

ALTERATION TYPES

CRETACEOUS or YOUNGER (?)

- Sericitization - silicification - (pyrite).
- Tourmalinization - sericitization - silicification - (pyrite).
- W-(Sn) mineralization with tourmalinization - sericitization - silicification - (pyrite).
- W-(Mo) mineralization, K - feldspar in veins, biotitization - tourmalinization - sericitization - silicification - (pyrite).

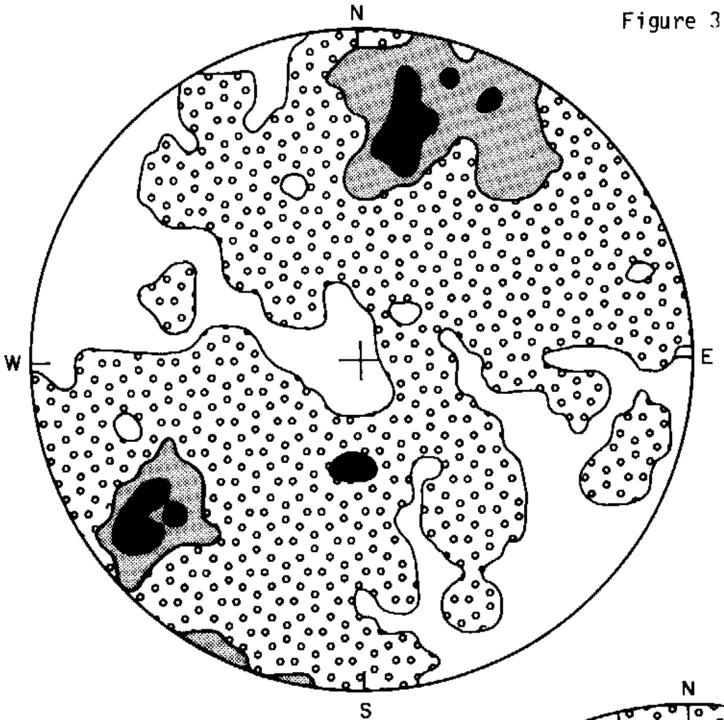
HOST ROCK LITHOLOGY (GRIT UNIT)

UPPER PROTEROZOIC

- Interbedded chloritic phyllite, shale, siltstone, and sandstone.
- Quartz and quartz-feldspar pebble conglomerate.

- Large quartz vein (strike indicated).
- Slip surface (strike indicated).
- Gradational alteration contact (approximate, inferred from talus mapping).
- Bedding contact (approximate).
- Hydrothermal breccia.
- Diamond drill hole.

Figure 2. Geological and alteration map of the Kalzas deposit.



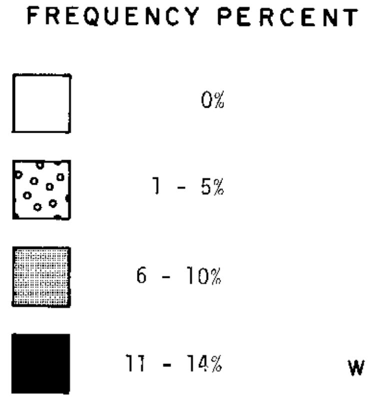


Figure 3. Stereographic frequency contour plot of poles to bedding, Kalzas deposit (242 data points).

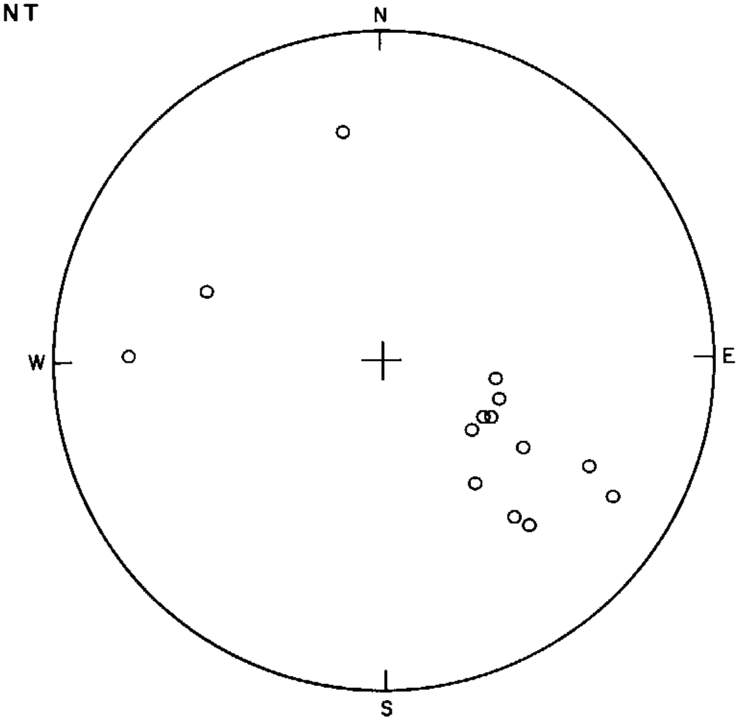
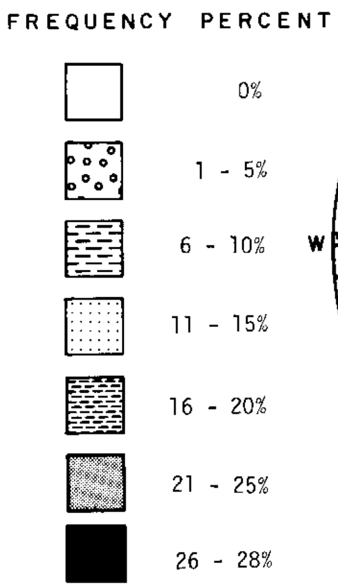


Figure 4. Stereographic plot of axes to minor folds, Kalzas deposit, (14 data points).



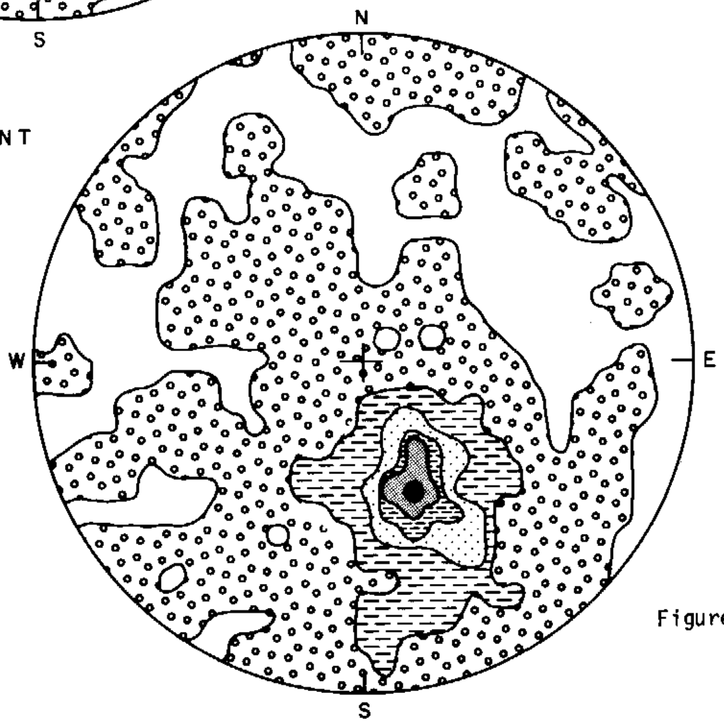


Figure 5. Stereographic frequency contour plot of poles to large quartz veins with thicknesses of 1 cm or greater, Kalzas deposit, (237 data points).

ness but may pinch-out or be slightly sinuous. In outcrop sets of several veins are present which are subparallel in orientation and moderately dipping to the northwest (Figure 5), though individual veins may deviate considerably from this trend. Some of the parallel veins are branching and interconnect (Figure 6 and 7). The style appears to be similar to the large quartz wolframite veins at Panasqueira (Kelly and Rye, 1979). Geometrically, the veins are oriented roughly perpendicular to the plunge of the minor fold axes, and this relationship is demonstrated by comparing the stereo-net plots of Figures 4 and 5.

The veins were formed in large planar open gaps. Criteria for open gap veining have been outlined by Park and MacDiarmid (1975, p. 119) and those present at Kalzas include the following: many vugs and cavities in the veins, finer grained minerals along the vein walls with coarsening towards the center, zonation (i.e.feldspar along the vein walls and quartz in the center), comb structure, and growth of minerals perpendicular to the vein walls. Full lateral extent of individual veins is not known, however, some are certainly longer than ten meters.

Wolframite, tourmaline, and feldspar when present, usually line the walls of the veins. Of the vein mineralogy, wolframite is the most spectacular as it occurs in coarse euhedral blades which are perpendicular to the vein walls and are mildly radiating when in bundles. The largest wolframite crystals found to date are 16 cm in length. Secondary scheelite may be found as a coating on the wolframite crystals. Most quartz crystals are also well formed and coarse grained.

Alteration

Five subdivisions are drawn on the map of which three are major alteration types (Figure 2). The most areally extensive alteration is the sericite zone. It extends across a distance of about 2.2 km and is located around the periphery of the system but also extends to the center of the deposit. The rock is pervasively altered to fine grained quartz-sericite-(pyrite), giving it a white colouration. Original quartz clasts are preserved or recrystallized. Large quartz veins are sparsely distributed in the zone and are generally barren of other minerals except for one occurrence of galena. Thin quartz-pyrite veinlets may be found but are not greatly abundant. At surface, leached cubic cavities are all that normally remain of the pyrite. Some disseminated arsenopyrite is also present.

Between alteration zones, the contacts are diffuse and somewhat gradational. As well, the alteration distribution from outcrop to outcrop may be patchy and discontinuous.

The next alteration zone in from the sericite zone is marked by the first appearance of tourmaline. Here, the previous assemblage is maintained but the rocks

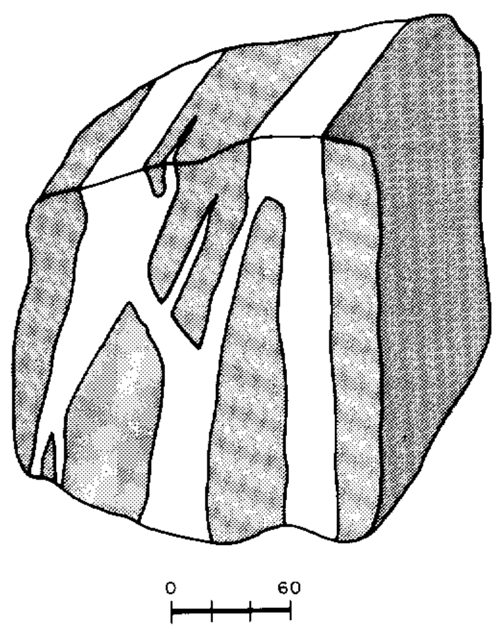


Figure 6. Sketch showing style of large quartz veins.

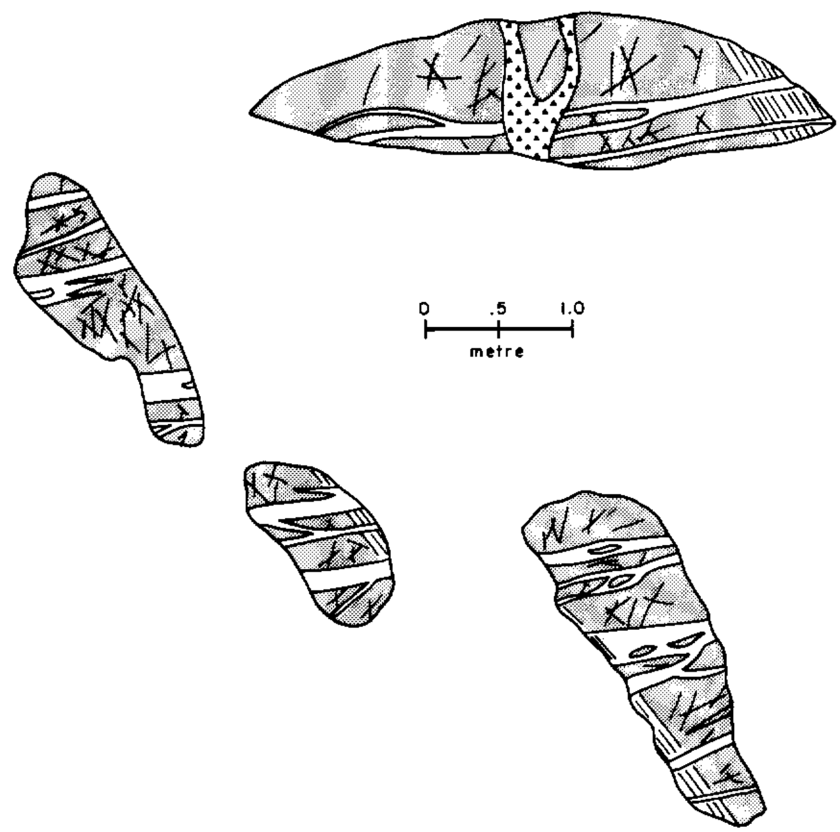


Figure 7. Outcrop sketch of large quartz veins.

become darker due to fine grained tourmalinization. The shale and phyllite are pervasively altered while tourmalinization of the more brittle sandstone is fracture and veinlet controlled. Stockworks of tourmaline and quartz-tourmaline veinlets are present in the sandstone. Large quartz veins 1 cm or more in thickness become more common and acquire medium to coarse grained tourmaline needles as an accessory mineral. Tourmaline-bearing veins have well developed tourmaline-rich halos.

Closer to the center of the system, the next zone is roughly marked by the first appearance of wolframite which is found in the large veins. Here, quartz-tourmaline stockworks are very intense and the large quartz veins are more abundant. Tourmalinization and silicification in some cases may be so intense that the rock is completely black and very hard. It is interesting to note that on a large scale wolframite is most abundant where tourmalinization is greatest, however, on a smaller scale they do not appear to coexist. A vein with wolframite is almost always devoid of tourmaline while an adjacent and apparently intercon-necting vein may be rich in tourmaline and have a strong tourmaline halo about it.

Cassiterite occurs along the edge of the wolframite zone in a few of the larger veins as well as in some of the stockwork veins, with or without muscovite and tourmaline. A preliminary soil geochemistry survey appears to corroborate this cassiterite distribution (Forster, pers. com.). A similar outward tin zonation is found in the Chicote tungsten deposit of Bolivia (Ahlfeld, 1945).

The central zone is the "potassic" zone which is spatially quite restricted compared to the other alteration types. Fine grained pervasive purplish biotitization is sparsely found since sericite and tourmaline alteration types are still strong. The large quartz veins here are conspicuous in that they contain molybdenite and coarse grained potassium feldspar which are not seen in the other zones. The veins may also contain tourmaline, wolframite, and the other accessory vein minerals found elsewhere (except for galena and cassiterite).

Relative timing of the different alteration types is not yet firmly established due to the pervasive nature of the biotitization and sericitic alteration. Rather, 'vein-cutting-vein' relations are needed. However, the large veins appear to be of a single generation - their mineralogy and intensity of occurrence directly reflects the local host rock alteration type and intensity, suggesting contemporaneity of all the alteration types. Change in alteration would then be a function of proximity to the core of the deposit and not timing. Further petrographic work will clarify some of these relations.

Several small hydrothermal breccias are dispersed throughout the deposit. They have goethite, or tourmaline, or quartz as a cementing agent. Clasts are generally identical to the wallrock surrounding the breccia. Some appear to have formed quite late, since large quartz vein fragments are locally present.

Drill Hole Geology

The drill hole diagrams illustrate the patchy distribution of the alteration types. They also show that the large quartz veins are most intense in zones of pronounced tourmalinization and/or silicification (Figures 8 and 9).

Extension calculated from quartz vein thickness (using veins of 1 cm or greater thickness) in the 254 m drill hole was found to be a minimum of 6.4% with a vein frequency maximum of 37/20 meter section down the drill hole. This is significant because at Panasqeira, a similar large quartz vein wolframite deposit, a typical 300 meter drill hole through the ore zone has a true extension of 0.9% as calculated from quartz vein thickness (veins of 1 cm or greater) and a vein frequency maximum of only 6/20 meter sections (Kelly and Rye, 1979).

It should also be mentioned that minor chalcopyrite in quartz veinlets was observed in the drill holes.

DISCUSSION

Although igneous rocks are not exposed in the immediate area of the Kalzas deposit the circular form of the alteration halo, the intense degree of alteration, the veinlet stockworks and the hydrothermal breccias, as well as the worldwide association of this type of deposit with intrusive bodies are indications that a hidden causative pluton likely underlies the deposit. Also, borosilicate components necessary for the formation of vast amounts of tourmaline (as at Kalzas) can be carried in large amounts by magmatic derived hydrothermal systems (Allman-Ward et al 1982). It is interesting that the alteration pattern at Kalzas is partly analogous to that of classic porphyry copper deposits i.e. with an outer "phyllic" zone and a "potassic" core.

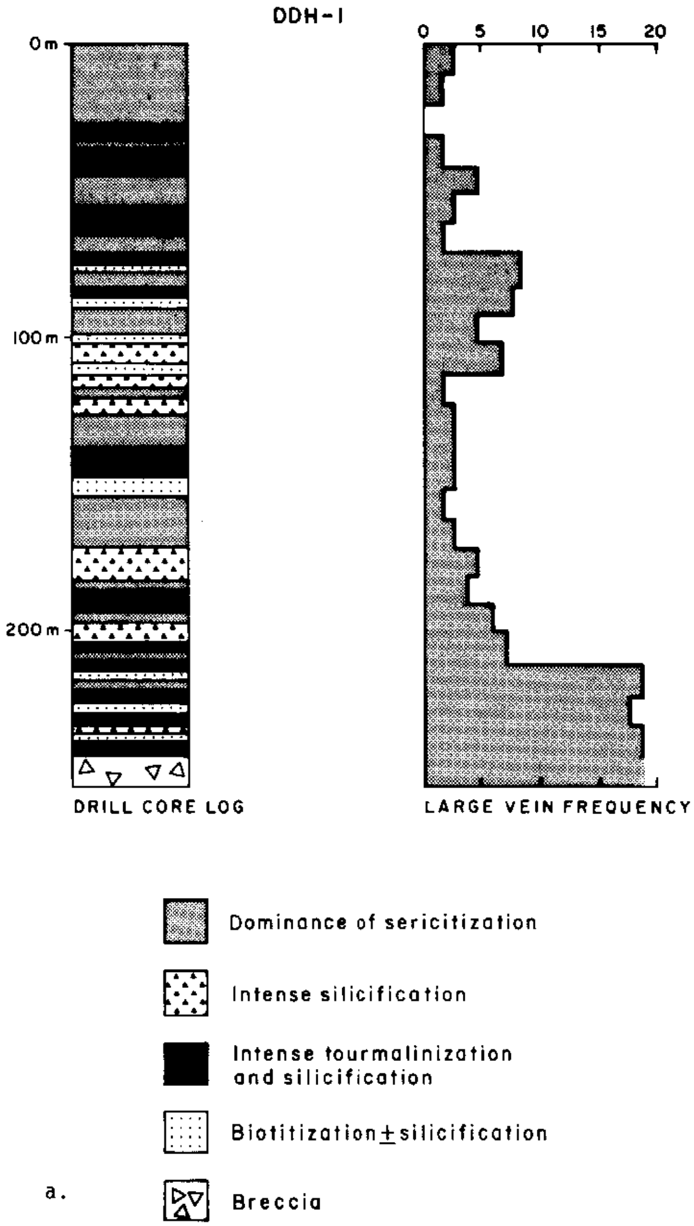
Another noteworthy feature of the Kalzas deposit is the metallic mineral zonation: molybdenite is in the core area while cassiterite is located outwards of this. Wolframite is located in both the molybdenite and cassiterite sectors. One substantial occurrence of galena is found beyond these areas in the sericite zone. Pyrite is disseminated throughout the deposit but is most abundant with sericitization.

The mineralized veins are undeformed, and thus are considered to be Cretaceous in age or younger(?). They show a considerable degree of uniformity in orientation and are geometrically related to the minor folds Their position is similar to A-C joint fillings (joints perpendicular to the fold axis). However joints that are geometrically related to folds, such as A-C joints, may or may not originate during folding (Hobbs et al, 1976,p. 299). When produced during folding they may reflect extension along the hinge line. If they are produced later than the folding and by forces unrelated to the folding, such as an intruding pluton, their repetitive orientation is accounted for by mechanical anisotropy of the folded rocks. This anisotropy however is likely set-up during folding. Quartz veining appears to have taken advantage of this direction of weakness.

Similar deposits related to unexposed plutons are Panasqueira in Portugal (Kelly and Rye 1979) and Chicote in Bolivia (Ahleld, 1945).

ACKNOWLEDGEMENTS

This report is based entirely on field observations. Further laboratory investigations to be conducted will include thin section petrography, fluid inclusion studies, chemistry of wolframite, tourmaline, and possibly other minerals. Stable isotope studies might also be included. The writer is presently pursuing a Masters degree in geology at Washington State Uni-



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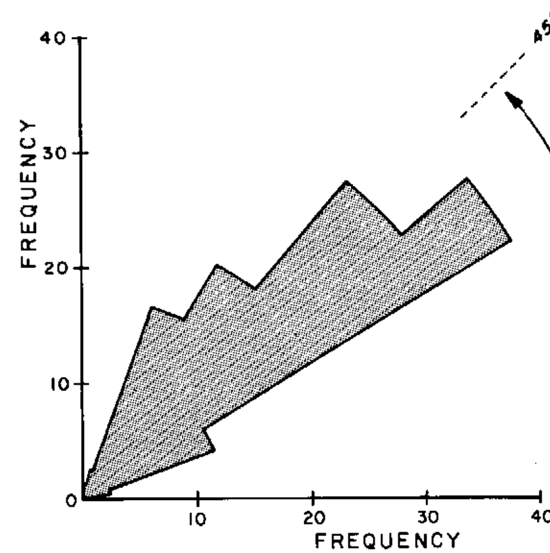
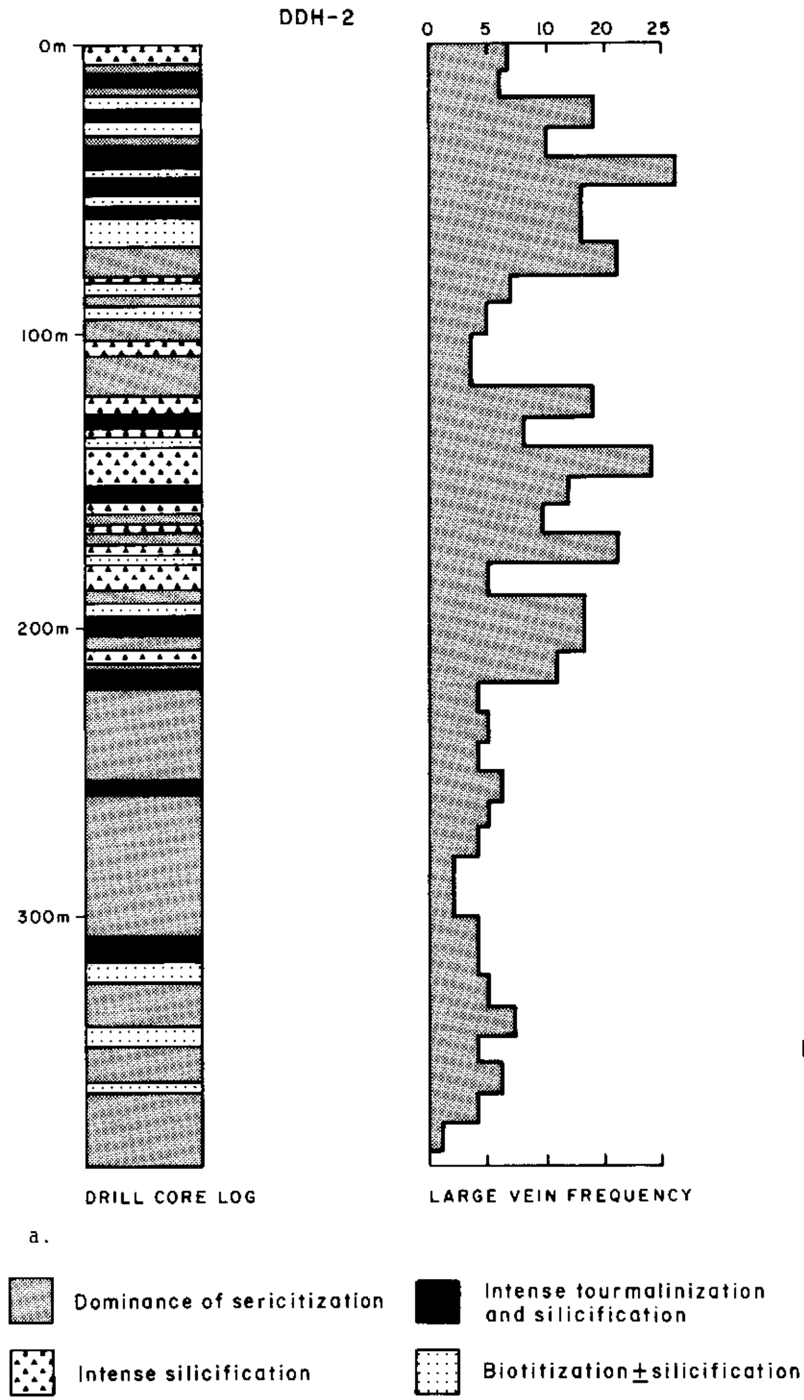


b.

Figure 8. Diamond drill hole - 1. 8a - Alteration drill core log and frequency histogram of large veins per 10 metre interval. 8b - Frequency diagram showing distribution of measured angles of large quartz veins with drill core axis for DDH-1 (135 measurements).



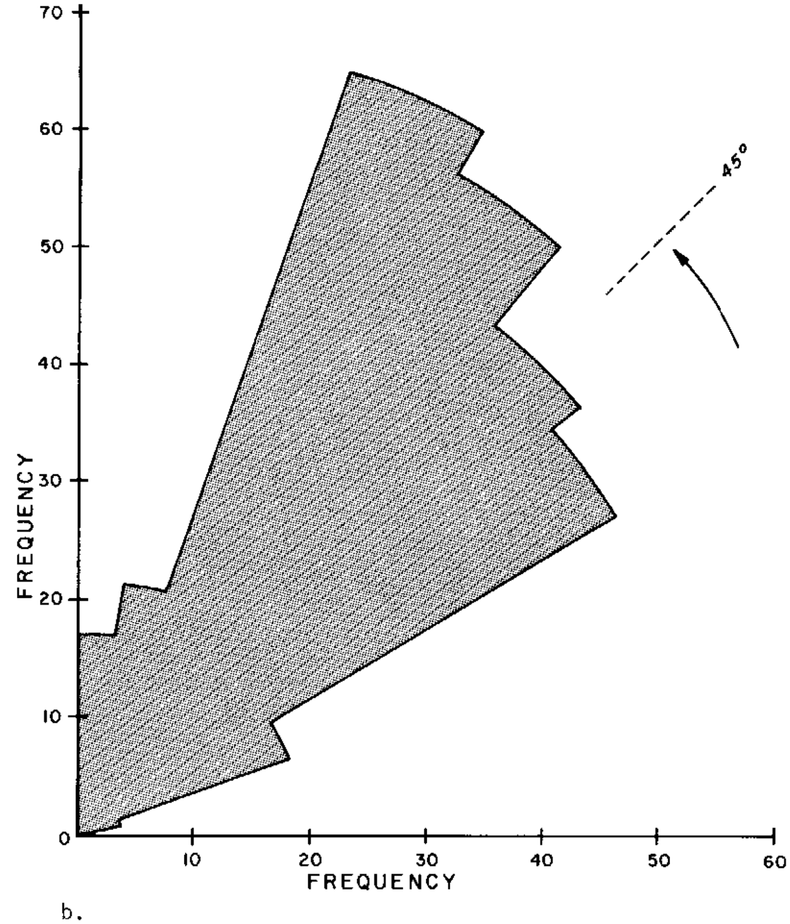


Figure 9. Diamond drill hole - 2. 9a - Alteration drill core log and frequency histogram of large veins per 10 metre interval. 9b - Frequency diagram showing distribution of measured angles of large quartz veins with drill core axis for DDH-2 (303 measurements).

versity under the supervision of Professor L.D. Meinert.

I am very grateful to C.N. Forster of Union Carbide, Chief Geologist in charge of Kalzas exploration, for supplying me with food and shelter, good company and encouragement, as well as expert advice on ore deposits and the mineral industry.

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PLACER DEPOSITS OF CLEAR CREEK
DRAINAGE BASIN 115P, CENTRAL YUKON
by

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INTRODUCTION

Placer gold in Clear Creek drainage basin (Figure 1) is found in a variety of gravel deposits, each of which is associated with a specific geological setting. The schematic profile of Clear Creek drainage basin (Figure 2) illustrates the distribution of these gravel deposits, and indicates both known deposits and favourable sedimentologic conditions for placer mineral accumulation. Known placer gold deposits include creek and gulch placers, as well as preglacial fluvial gravel or buried channels. Favourable placer deposit settings include alluvial fans, gravelly sediments similar to the Pliocene (?) White Channel gravel of the Klondike area, and specific glacially derived sediments. This paper describes each of the above placer deposit settings, and outlines the associated stratigraphy and sedimentology of placer gold deposits.

GENERAL GEOLOGY

A short discussion concerning the bedrock geology, surficial materials and Quaternary history of Clear Creek drainage basin was presented by Morison (1983a). A terrain classification map at a scale of 1:50,000 has also been published (Morison,1983b). This map illustrates the distribution of Quaternary landforms, and may be used as an exploration tool for types of placer deposits which have not been traditionally exploited.

Bedrock in Clear Creek drainage basin consists of Late PreCambrian metasedimentary rocks intruded by Cretaceous granitic rocks (Bostock,1964). Clear Creek drainage basin is beyond both the Reid and McConnell glacial limits of the Cordilleran ice sheet (Bostock, 1966; Hughes et al, 1969). Thus, the drainage basin was predominantly undergoing fluvial erosion and downcutting during those glacial intervals. Glacial erratics are found on slopes up to 945 metres (3100 feet) in elevation (a.s.l.), and surfaces above that level are unglaciated (Figure 2). Remnant landforms and deposits attributed to a pre-Reid advance of the Cordilleran ice sheet (Bostock,1966; Hughes et al,1969) are below that level. Although the upper reaches of Clear Creek stood above the maximum level of the Cordilleran ice sheet, the region was high enough to support independant montane glaciers during the Reid glacial advance. Alpine glacial drift attributed to Reid glacial activity is present at the headwaters of Left Clear Creek. Surficial deposits in Clear Creek drainage basin include Reid alpine drift, pre-Reid glacial landforms, Quaternary valley bottom and buried alluvium, slope colluvium and late Tertiary (Pliocene?) clastic sediments (below pre-Reid glacial drift).

KNOWN PLACER DEPOSITS

Creek and gulch placer deposits

Creek and gulch placer deposits in Clear Creek drainage basin (Figure 2) are the result of downcutting

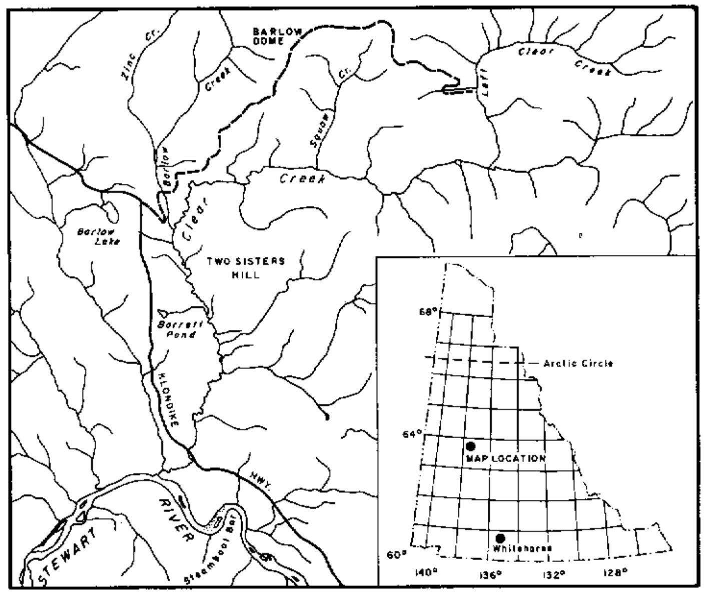


Figure 1. Location map for Clear Creek drainage basin.

and subsequent gravelly stream sedimentation during the Reid and McConnell glacial intervals. The fluvial gravel for both the gulch and creek placer deposits is fundamentally similar in lithofacies characteristics. A sedimentologic description and fluvial environment of deposition for Clear Creek valley bottom sediments has been outlined by Morison (1983a). It was concluded that a braided river environment was responsible for the deposition of Clear Creek gravel. Both proximal and distal lithofacies characteristics present in braided stream environments have been observed in Clear Creek gravel (Morison,1983a).

Creek and gulch placer deposits are the result of hydraulics and concentrating mechanisms which are related to the fluvial environment of deposition. For example, the braided river environment interpreted for Clear Creek gravel suggests that in proximal positions discrete concentrations of placer gold should occur vertically throughout the sequence. This is the result of aggraded gravelly sediments through channel deposition as either unit bars or diffuse gravel sheets (Morison, 1983a). In addition the concentration of gold in distal positions will be laterally discontinuous which is reflective of the multi-channelled river environment, (Morison, 1983a). Thus, a continuous "paystreak" on the bedrock surface is not possible in Clear Creek gravel when one considers the fluvial environment of deposition.

Yukon Exploration and Geology 1983, p. 88-93

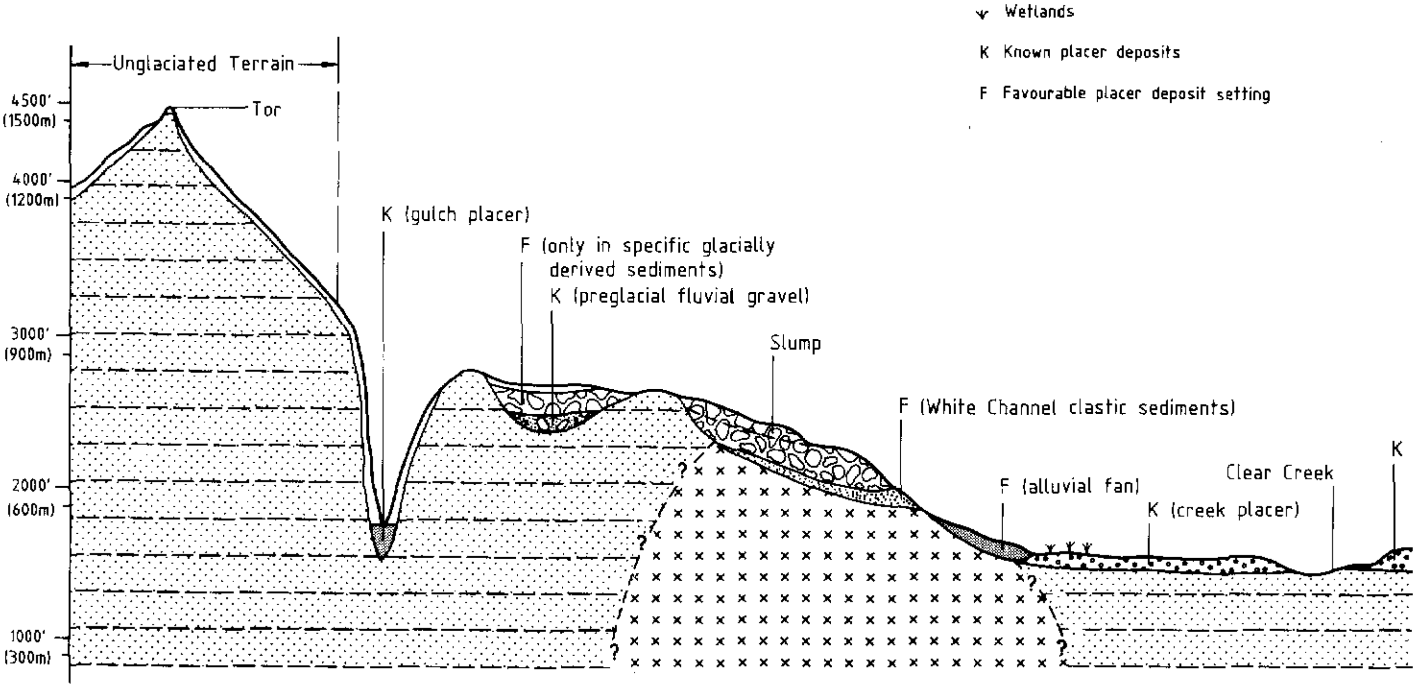


Figure 2. Schematic profile of Clear Creek drainage basin showing types of placer deposits and surficial materials.

LEGEND FOR SCHEMATIC PROFILE

QUATERNARY

Recent

Alluvium (Clear Creek sediments)

Alluvium (including gulch alluvium with abundant colluvial material from valley sides and alluvial fans and aprons)

Colluvium

Pleistocene

Pre-Reid glacial drift (this represents a pre-Wisconsin Cordilleran ice advance (Hughes et al, 1969) and includes till deposits, resedimented till sequences and glaciofluvial sediments)

Alluvium (preglacial fluvial gravel)

TERTIARY

Pliocene (?)

Fine and coarse clastic sediment ("White Channel Gravel")

CRETACEOUS

Granite, granodiorite, quartz monzonite (after Bostock, 1964); commonly disintegrated and crumbly

ORDOVICIAN (?) or EARLIER

Schists, quartzite, phyllite, limestone (after Bostock, 1964)

The distribution of detrital gold in gulch gravel should be laterally more consistent. This is the result of minimal lateral stream migration in an incised, narrow valley (i.e. base level has not been reached).

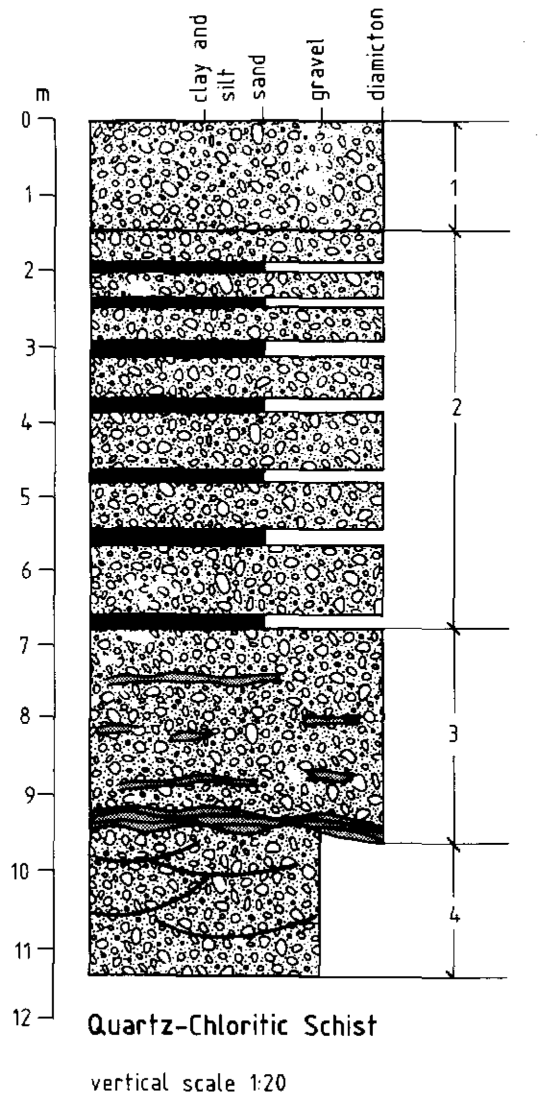
Thus an understanding of both the fluvial processes and geomorphology of both creek and gulch placer deposits should predict the distribution of detrital gold and can enhance the interpretation of results from testing programs (i.e. drilling and trench sampling).

Preglacial fluvial gravel

The upper reaches of right and left Clear Creek contain scattered benches which outline remnant occurrences of pre-Reid glacial drift (Morison,1983b). Preglacial fluvial gravel or "buried channels" may be preserved below these benches. This type of buried placer deposit at the mouth of Left Clear Creek is discussed in this section of the paper.

The auriferous preglacial gravel is clast supported and matrix filled with occasional openwork pockets (unit 4; Figure 3). The gravel is broadly trough cross-stratified and is similar to the gravelly facies Gm,t described by Morison (1983a) for Clear Creek valley bottom sediments. Sandy beds which are also trough cross-stratified (facies S,t; Morison 1983a) may be found associated with the gravelly trough cross-stratified facies. It is envisaged that the preglacial fluvial system was multi-channelled in nature, and represents a period of high level gravelly stream sedimentation before the pre-Reid glacial interval.

It is important to understand that the depositional processes involved with the sedimentation of pre-Reid glacial drift is associated with the preservation of the preglacial fluvial gravel. Figure 3 illustrates



Unit 1- Diamicton which has a silt to sand matrix, and contains both local bedrock fragments and glacial erratics. The bottom contact is sharp and follows underlying slope morphology. This unit is interpreted as colluvium.

Unit 2- Stratified sequence of massive diamicton and sorted fine clastic sediments. The diamicton has a matrix texture which ranges from silty sand to fine sand, and contains subangular to subrounded clasts. The fine clastic interbeds range from clay to fine sand, and the lower contact for this unit is gradational. This sequence is interpreted as a series of resedimented melt-out till units.

Unit 3- Diamicton which has a matrix texture of clayey silt, and contains subrounded to rounded clasts. Sedimentary structures include intrabeds and lenses of sorted sand and silt. The bottom contact is characterized by an irregular bed of laminated silt and fine sand. This unit is interpreted as a melt-out till.

Unit 4- Preglacial fluvial gravel which is auriferous. The gravel is clast supported, matrix filled, and trough cross-stratified. Occasional disorganized openwork gravelly beds, and trough cross-stratified sandy beds are also present. These gravels were deposited in a multi-channelled river environment.

Figure 3. Stratigraphy and sedimentology of a buried placer deposit at the mouth of Left Clear Creek.

that stratigraphically a 2.0 metre thick pre-Reid glacial unit (unit 3) overlies the preglacial auriferous gravel. This diamicton is typically pebbly clayey silt with indistinct intrabeds and discontinuous lenses of sorted sand and silt. The bottom contact (Figure 4) is distinct, irregular and characterized by sorted laminated silt and fine sand which may be up to 20 cm thick (Figure 5). The lithofacies characteristics described above resemble variations of glacial melt-out till from basal ice at the margin of Matanuska Glacier in Alaska (Lawson,1981). It is thought that the diamicton which overlies the preglacial gravel was formed by passive melt-out processes from debris laden basal(?) ice. The bottom contact in particular indicates a minimally erosive sedimentation process whereby water was available through upward movement of the horizon of melting such that sorting and stratification of sediment was possible. Furthermore, the absence of lodgement features such as sole casts, lodged boulders in underlying sediments, and truncation of underlying sedimentary structures (Shaw, 1982) supports deposition through melt-out processes.

Overlying the melt-out till is a 5.5 metre thick stratified sequence of massive diamicton and sorted fine clastic sediments (unit 2; Figure 3). The lower contact for this sequence is gradational and often difficult to discern. The massive diamicton is sandy silt to fine sand, contains subangular coarse clasts (distinctly lacking in underlying melt-out till), and is found in beds up to 1.0 metre thick. The sorted, fine clastic interbeds are up to 10 centimetres thick, and range from fine sand to grey clay. The general lithofacies characteristics suggest a series of resedimented melt-out till units (i.e. massive

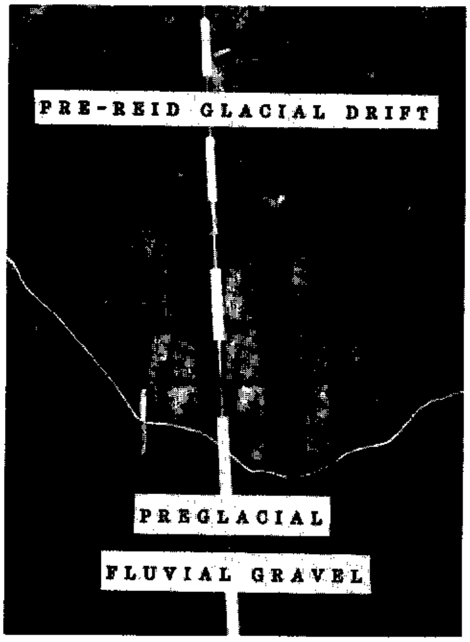


Figure 4. The contact (at knife) between preglacial fluvial gravel and pre-Reid glacial drift.

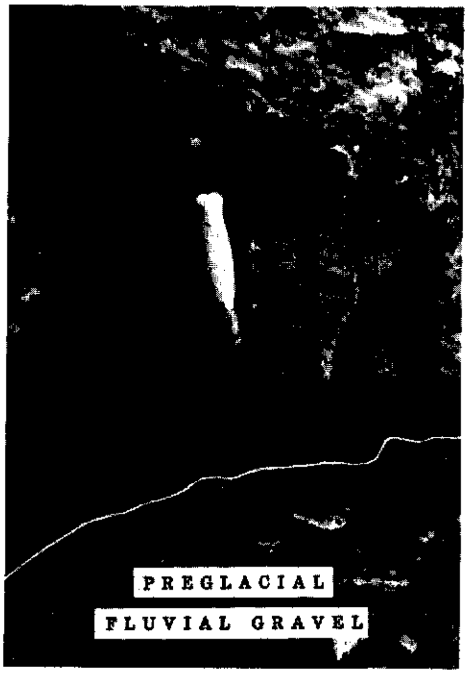


Figure 5. Laminated silt and fine sand (at knife) characterizes the bottom contact of the melt-out till unit.

diamicton) on ice marginal surfaces with ponding (i.e. clay beds) and/or meltwater reworking in sheets or rills (i.e. fine sand and silt) between sediment flow events (Lawson, 1982).

Overlying the above sequence of fine and coarse clastic sediments is a colluvial unit up to 1.5 metres thick (unit 1; Figure 3). This unit has a silt to sand matrix and contains both local bedrock fragments and glacial erratics. The bottom contact is sharp, and follows underlying slope morphology.

The benches of pre-Reid glacial drift in the upper reaches of Clear Creek are close in elevation to the upper limit of glaciation (945 metres). Ice near the upper limits of glaciation is characterized by decreased basal transport and minimal subglacial erosion. The sequence of glacial drift which overlies the preglacial gravel suggests glacier stagnation with melt-out processes depositing debris-rich basal (?) ice which was buried by ice marginal sediments (i.e. resedimented till sequence). Glacial drift in this sequence is not auriferous which indicates minimal erosion and incorporation of the preglacial placer gravel. It is thus apparent that both the geomorphic setting plus the depositional processes associated with glacial benches are important factors which determine the preservation potential of auriferous preglacial gravel during a glacial interval.

FAVOURABLE PLACER DEPOSIT SETTINGS

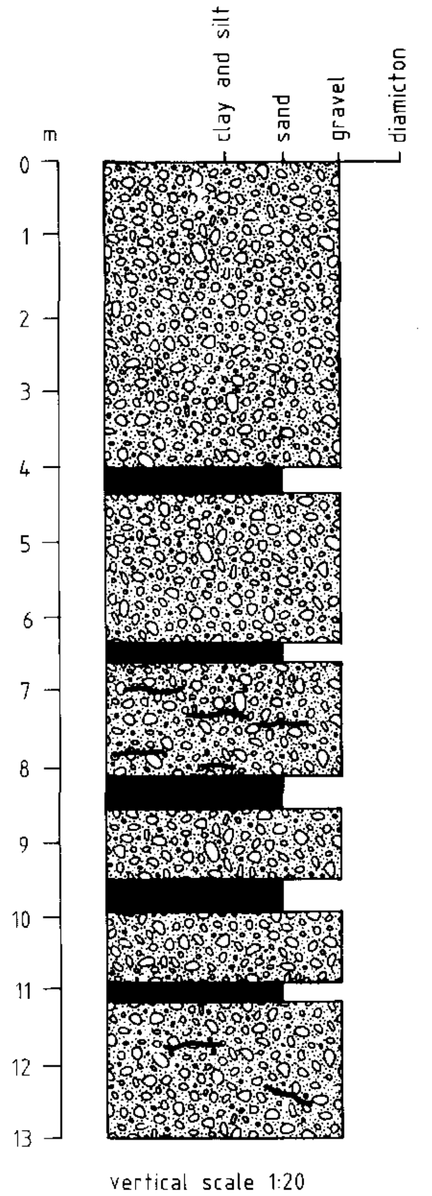
Glacial placer deposits

Test sampling indicates that placer gold is present in glaciofluvial sediments which were deposited during the pre-Reid glacial interval (Morison,1983b). Pre-Reid glaciofluvial gravel is typically clast supported and matrix filled, with a high matrix content of silty sand to coarse sand. Glaciofluvial sediment in Clear Creek drainage basin ranges from rusty-orange, massive, poorly sorted gravel with preserved fossil sand and ice wedge pseudomorphs to distinctly planar and trough cross-stratified sequences of sand and gravel. In both situations trace amounts of detrital gold may be found throughout.

Figure 6 illustrates a sequence of pre-Reid gravelly sediments which have been exposed in a trench at the mouth of Left Clear Creek (Figure 1). The entire sequence represents a thick aggradation of ice marginal, interbedded sand and gravel. The gravel is clast supported, matrix filled (typically silty sand matrix) and poorly sorted (Figure 6). The gravel clasts include both glacially transported erratics and rock types typical of Clear Creek drainage basin. In this situation ice marginal gravel has incorporated auriferous preglacial gravel into a thick glacial placer deposit. The grade of this type of placer deposit is lower than creek, gulch or buried fluvial placer deposits because of the incorporation of detrital gold into a large volume of poorly sorted, glacial gravel.

White Channel clastic sediments

Test sampling has shown that outcrops of Pliocene (?) sediments (Morison, 1983b) may contain gold. Pliocene (?) sediments in Clear Creek drainage basin are covered by pre-Reid glacial drift and can be thought of as a type of buried placer deposit (Figure 2). The stratigraphy and lithofacies characteristics of these sediments are similar in many respects to the White Channel Gravel deposits of the Klondike area.



Sequence of auriferous glacial sediments at the mouth of Left Clear Creek. These clastic sediments are summarized as an interbedded sequence of poorly sorted, massive to crudely stratified gravel, and massive to laminated sand and silt. The gravel is clast supported with a silty sand matrix, and contains subrounded to subangular clasts which are both regionally and locally derived.

Figure 6. Sequence of pre-Reid ice marginal gravel.

Fluvial erosion during downcutting after the pre-Reid glacial interval has removed these sediments such that they are found only in the mid to lower reaches of Clear Creek. An outcrop of "White Channel Gravel" (Unit 19A) mapped by Bostock (1964) was mined to limited tent (during the 1940's) with unknown results. This outcrop is bleached with decomposed gravel clasts, and contains secondary clays in the gravel matrix. These characteristics indicate post depositional alteration. The contentious issue concerning the genesis of gold in these Late Tertiary clastics (i.e. detrital versus authigenic or supergene migration of gold) is beyond the scope of this paper and is largely the justification for labelling these sediments as favourable for the occurrence of placer(?) gold.

Alluvial fan deposits

McGowen and Groat (1971) demonstrated that alluvial fan settings which are dominated by channel processes (i.e. braided distributary sequences), are hydraulically suitable for placer mineral deposition and concentration. They developed an alluvial fan prospecting model, showing that heavy mineral accumulations in the Van Horne Sandstone (West Texas) are concentrated in the distal areas of the fan sequence. This prospecting model may be applicable on a smaller scale to alluvial fan landforms in the Clear Creek drainage basin (Morison, 1983b). Alluvial fan sedimentation in

Clear Creek drainage basin is believed to have occurred during downcutting associated with the formation of creek and gulch placer deposits. It is for this reason that these landforms are favourable exploration targets.

SUMMARY

Creek placer deposits are the result of downcutting and gravelly sedimentation after the pre-Reid glacial advance. A braided stream environment deposited the creek gravels, and placer gold is found in discrete concentrations throughout the gravel sequence. There is no continuous "paystreak" on the bedrock surface. Gulch gravels were deposited in an incised restrictive valley. Stream migration was minimal, and placer gold concentration is laterally consistent. In creek and gulch gravel the distribution of placer gold is reflective of the fluvial processes and valley geomorphology.

Buried placer deposits include preglacial fluvial gravel and Pliocene(?) gravel. The preglacial fluvial gravel was deposited in a multi-channelled stream environment before the pre-Reid glacial advance. Preservation of fluvial gravel below a glacial drift sequence is dependant upon subglacial erosional characteristics and sedimentation processes of the ice sheet. Ice near the limits of glaciation is characterized by decreased basal transport and minimal subglacial erosion. At the mouth of Left Clear Creek auriferous fluvial gravel is preserved below a pre-Reid glacial drift sequence. The lithofacies characteristics of the overlying glacial drift suggests ice marginal depositional processes such as melt-out and resedimentation. Pre-Reid glacial benches proximal to the limit of glaciation (945 metres) are promising areas for the location of buried fluvial gravel. Pliocene (?) gravel is also found below substantial thickness of pre-Reid glacial drift. These buried clastic sediments are only present in the mid to lower reaches of Clear Creek, and are similar to White Channel Gravels in the Klondike area.

Glacial placer deposits are found in pre-Reid glaciofluvial sediments, and ice marginal gravel. The grade is low due to the incorporated nature of the placer gold, and large quantity of glacial sediment.

Alluvial fans were deposited during the formation of creek and gulch placer deposits, and are promising exploration targets.

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INTERLAYERED SEDIMENTARY-VOLCANIC SEQUENCE
MT. SKUKUM VOLCANIC COMPLEX

BY

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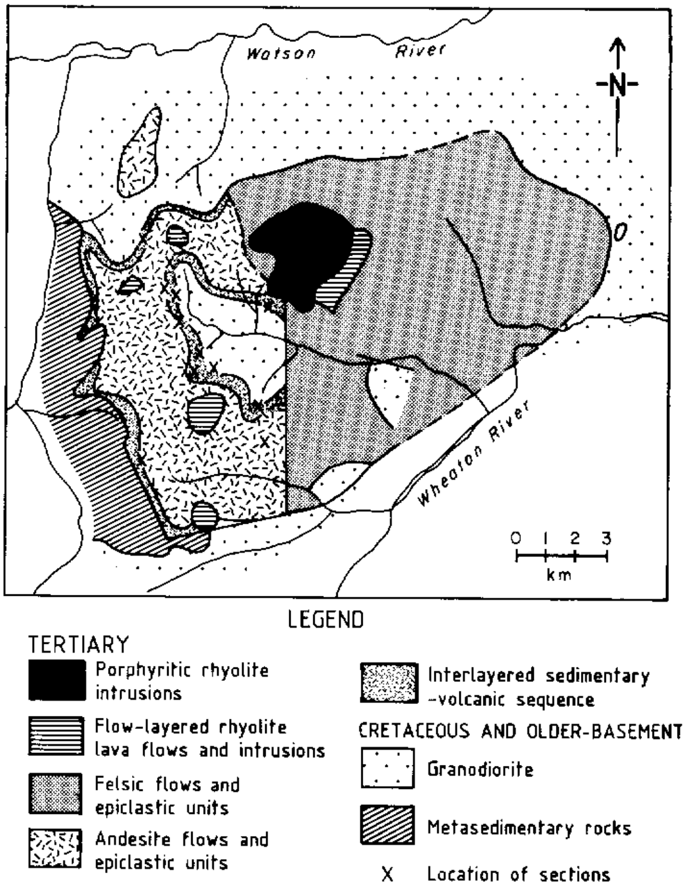


Fig. 1 Geology and major subdivisions of the Skukum volcanic complex.

INTRODUCTION

The Eocene (52.6 ± 1.3 Ma; Clark, 1983 unpublished data) Skukum volcanic complex, 60 km south-southwest of Whitehorse, is elliptical in plan, covers an area of about 140 km^2, and unconformably overlies Cretaceous granitic rocks and Precambrian metasedimentary rocks (Fig. 1). The complex is fault-bounded and in places has been intruded by felsic dykes and stocks. A major north-trending fault divides the area into two parts: a western part which includes a lower interlayered sedimentary-volcanic sequence (Formation 1), and an upper unit, approximately 500 m thick, characterized by andesite lava flows, pyroclastic flows and sedimentary units (Formation 2); and an eastern part which comprises about 800 m of altered felsic pyroclastic flows and brecciated, flow layered and spherulitic felsic lava flows (Formation 3). The east and west parts of the complex are probably genetically related, but as yet a precise correlation has not been made. The remainder of the paper will concentrate on the interlayered sedimentary-volcanic sequence.

INTERLAYERED SEDIMENTARY-VOLCANIC SEQUENCE

Most described fluvial sediments are from stable intraplate settings, and sedimentary deposits in more dynamic environments such as convergent plate margins largely have been ignored. Recently, several researchers (Kuenzi et al., 1979; Vessel and Davies, 1981; Mathisen and Vondra, 1983), studying more dynamic plate margin sedimentation, have noted that fluvial sedimenmentation in those tectonic environments differs significantly from that of intraplate sedimentation. The difference largely is attributed to active volcanic eruptions associated with convergent plate margins, and the rate of fluvial aggradation is a function of location, magnitude and frequency of nearby volcanic eruptions. Terrestrial volcanism in areas away from convergent plate margins will have a similar effect on sedimentation, and such sedimentary sequences will differ significantly from those of stable environments. In the Mt. Skukum sedimentary-volcanic sequence, nearby volcanism has affected fluvial sedimentation.

Study of the interlayered sedimentary-volcanic formation provides a control on the paleotopography of the Skukum area, and the depositional environment and provenance of the formation. This report is based primarily on field evidence because detailed petrographic investigations are still in progress.

Twelve sections, ranging in thickness from 5 to 115 m, have been measured through the interlayered sedimentary-volcanic sequence of formation 1 and overlying units (Fig. 1), and seven members have been recognized (Fig. 2). Because of numerous post-depositional faults and rapid changes in member thickness reflecting original relief, members cannot be traced readily along strike. However, using the distinctive, densely to moderately welded pyroclastic flow of member 5, seven sections (located on Figure 1), have been restored to their original paleotopographic position (Fig. 2). In the restoration, it was assumed that the pyroclastic flow had a relatively level top surface (Ross and Smith, 1961) and could be used as a marker. This assumption is supported by the fact that the member could be traced with confidence between sections and therefore represents a continuous cooling unit.

The paleotopography is characterized by valleys of greater than 80 m relief. The three lowermost units are discontinuous along strike, range in thickness from 0 to 80 m, and filled much of the valley system, producing a considerable reduction of relief. The four upper members, on the other hand, which range in thickness from 5 to 45 m and are more continuous, were deposited on a relatively level surface.

Members can be divided into two groups: 1) those that are relatively simple and show minor lithological variability and 2) those that are complex and show extreme compositional and/or textural variability. Group 1 comprises members 1, 3, 4 and 5 and is described in Table 1. Group 2 includes members 2, 6 and 7 and, because of their complexity, the members are more easily described graphically using simplified stratigraphic sections (Fig. 3 a, b, c).

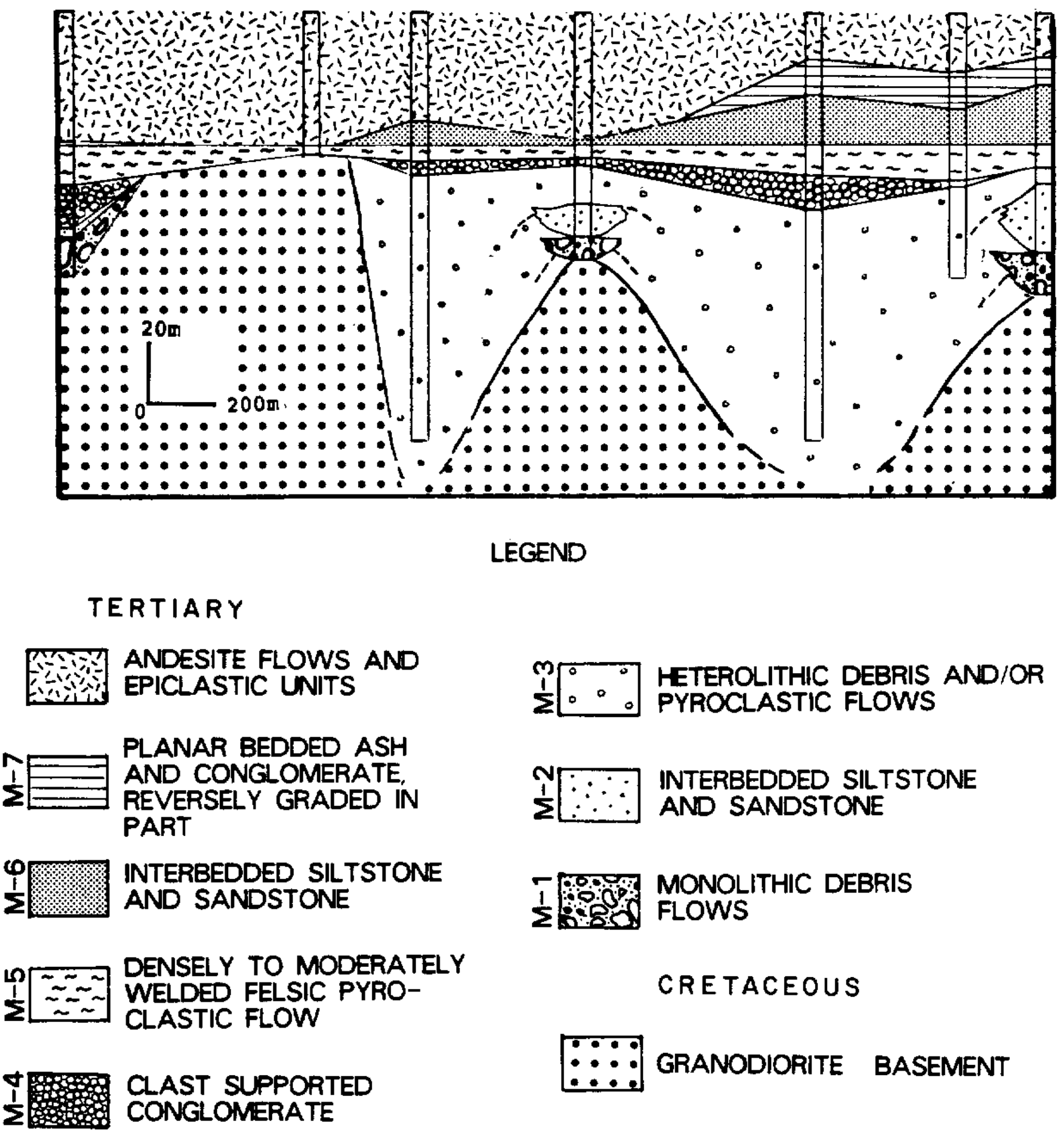
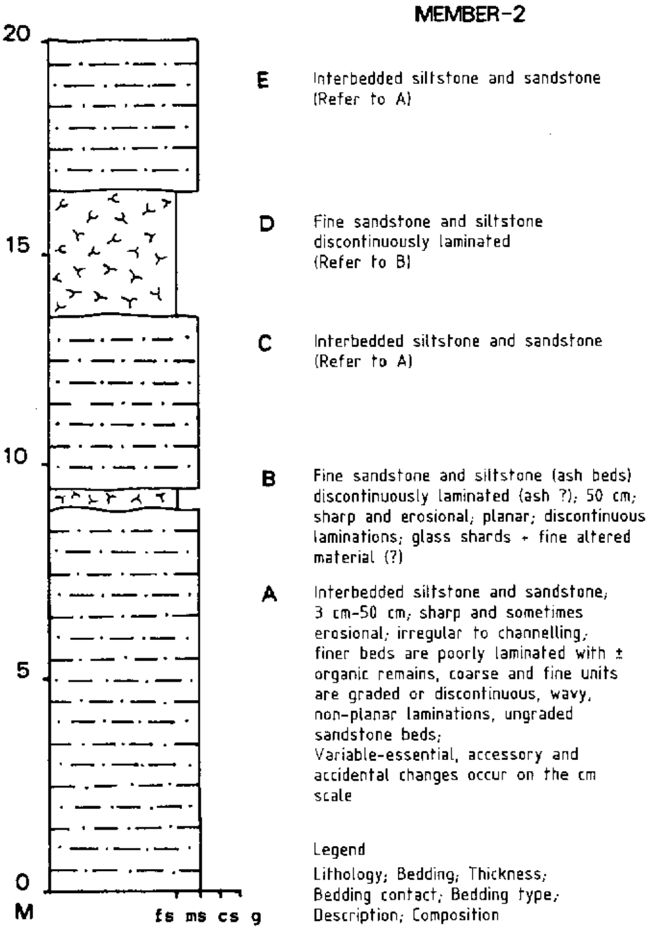


Fig. 2 Stratigraphic sections restored to their original paleotopographic position.

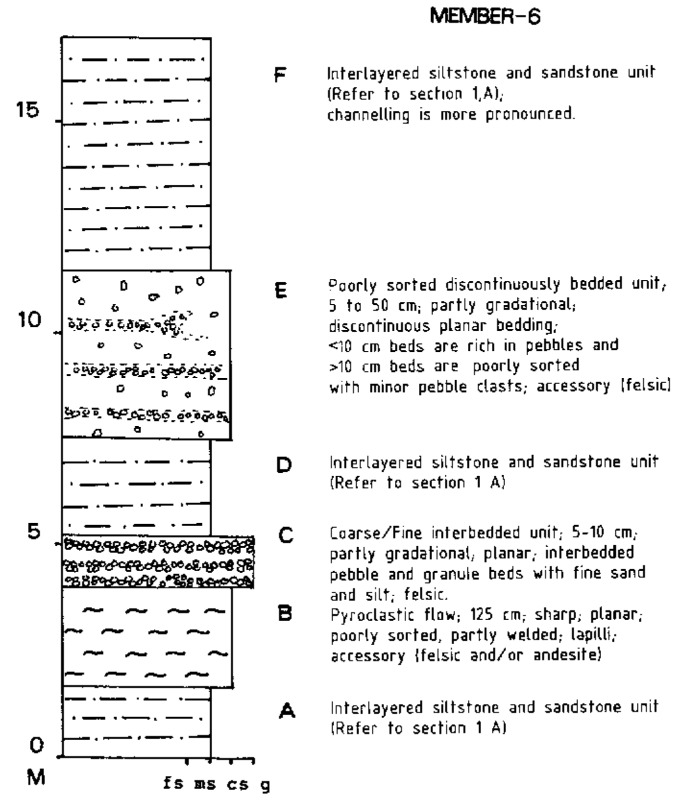
Beds in member 1, (Table 1) are poorly sorted, and matrix supported; they contain 30 to 60% granitic, cobble to pebble size subrounded to rounded clasts and occasional large anomalous boulders (Fig. 4a, 4b). The member represents a sequence of 3 m thick debris flows, which in places show reverse to normal grading. In the restored stratigraphic section (Fig. 2), the monolithic debris flows occur on top of paleo-hills. This anomaly is an important factor in understanding the depositional history of formation 1 and will be discussed further in a later section.

Member 2 (Fig, 3a), is composed of thin, irregular to channelled, interbedded siltstone and sandstone beds of variable composition (Fig. 5a, 5b, 5c), that are interlayered with thick discontinuously laminated, ash beds that possibly represent reworked airfall and/or surge deposits and reflect increases in available volcanic material. In units A, C and E channels suggest fluvial deposition, organic remains suggest periods of nondeposition, and the variable composition and texture reflect rapid changes in source and sediment load durring deposition. This member does not represent any classic fluvial depositional model, and because of the limited data on sedimentary deposits associated with distal volcanic activity, it is difficult to determine the origin of the sequence.

Member 3 (Table 1), is poorly sorted, and matrix supported; it contains about 30% subrounded to sub-



a.



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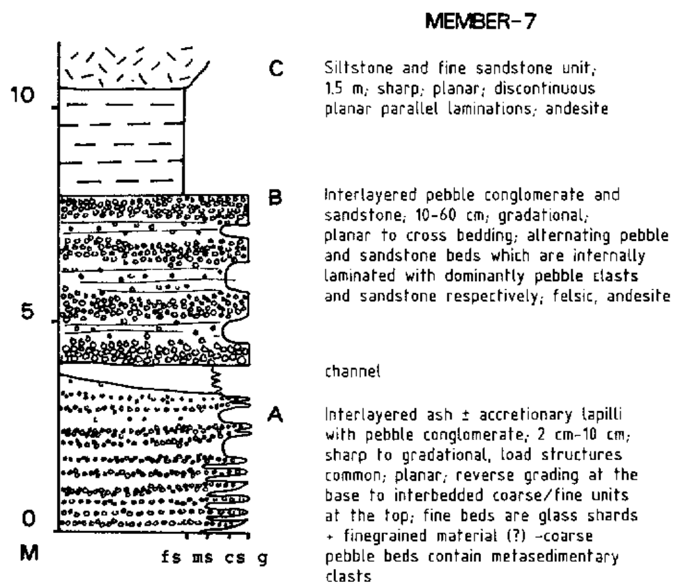


c.

Fig. 3 Stratigraphic sections of interlayered sedimentary-volcanic rocks.
a. Section 1
b. Section 2
c. Section 3

fs-fine sand
ms-medium sand
cs-coarse sand
g -gravel

angular, andesitic, felsic volcanic, granitic and pumiceous pebbles in a glass-rich matrix (Fig. 6). Member 3 represents a sequence of debris and/or unwelded pyroclastic flows. The characteristics of debris flows and unwelded lapilli pyroclastic flows in the geological record are very similar and as yet cannot be differentiated with confidence. The presence of pumice fragments and glass shards in these flows supports a pyroclastic flow origin.

Member 4 (Table 1), is moderately well sorted, and clast supported; it consists of 85-90% subrounded, andesite, granite, and felsic volcanic cobbles and pebbles, in a glass rich matrix (Fig. 7). The sorting and clast shape indicate fluvial deposition, but a precise analysis of the depositional environment has not yet been made.

Member 5 (Table 1) is a moderately to densely welded pyroclastic flow sequence containing about 60% blocks and lapilli that are mainly pumice but include minor andesite and granite, and about 25% feldspar and quartz crystals (Fig. 8). Relatively continuous 3-5 cm layers of lithic fragments are commonly found within the pyroclastic flow. These layers may represent erosional surfaces suggesting that member 5 is composed of several thin pyroclastic flows.

Member 6 (Table 2), is similar to member 2, but shows greater variability within units. Units A, D, and F are similar to unit A in section 1 and probably represent deposition in a fluvial environment. Units B, C, and E show abrupt increases in volcanic components and are poorly sorted and crudely bedded (Fig. 9), in-

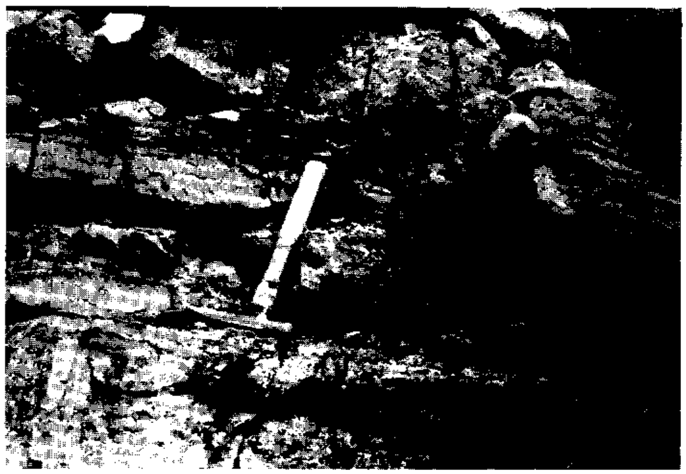
TABLE 1

MEMBER	MEMBER 1	MEMBER 3	MEMBER 4	MEMBER 5
LITHOLOGY	debris flow	debris and/or pyroclastic flow	clast supported conglomerate	welded felsic pyroclastic flow
MEMBER THICKNESS	7-13 m	5-115 m	1-10 m	pyroclastic flow 3-10 m
LOWER CONTACT	sharp and irregular	sharp	sharp	sharp
UPPER CONTACT	sharp	sharp to gradational	sharp to gradational	sharp
GRAIN SIZE	boulder to silt	pebble to silt	cobble to silt	block to ash
SORTING	poorly sorted	poorly sorted	moderately to well sorted	poorly sorted
FABRIC	matrix supported	matrix supported	clast supported	-
FLOW THICKNESS	3 m	5-20 m	-	-
GRADING	some flows show reverse to normal grading	-	-	-
STRUCTURE	-	aligned charred wood fragments at the base of flows	-	3 cm thick continuous beds of concentrated granite andesite clasts
CLAST %	30-60%	30%	85-90%	55-70%
SIZE	pebble to cobble boulder	granule to pebble	pebble to cobble	lapilli block
SHAPE	rounded - subrounded	subangular - subrounded	rounded to subrounded	elongate and subangular
			andesite granite felsic volcanic metasediments	pumice granitic andesite pyroclastics
TYPE	granite (some sections contain 10% andesite in the upper part of the member)	andesite felsic volcanic granite ± pumice, charred wood	-	20-30% feldspar quartz, 1-4 mm.
CRYSTALS	-	10% altered feldspar 1-2 m	10-15% glass shards + altered fine material (?)	variable - glass shard rich, or altered (?)
MATRIX	40-70% poorly sorted, granitic, granule to silt (some sections contain glass shards in the upper part of the flow)	60% glass shards + fine altered material	-	-

4a

5a

4b



5b

Fig. 4 Photographs of the monolithic debris flow of member 1.

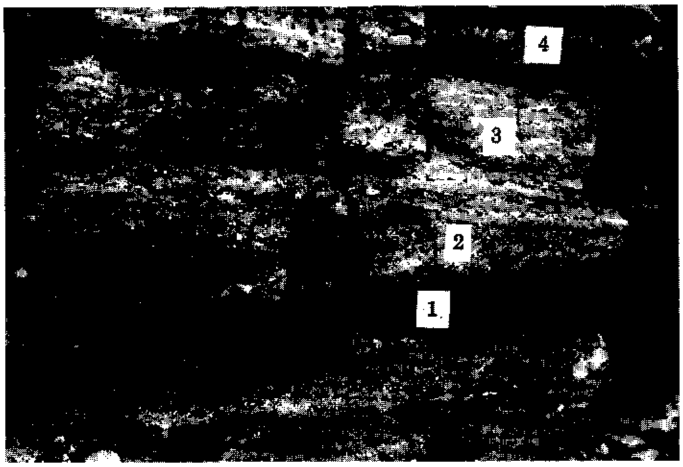
a A nongraded, poorly sorted and matrix supported debris flow containing an anomalous large boulder.

b Photograph showing the poorly sorted nature of the matrix, the rounded to subrounded clasts and granitic composition. Scale is 15 cm.

Fig. 5 Photographs of the interbedded siltstone and sandstone of member 2.

a Irregular bedded siltstone and sandstone

b Channelled interbedded siltstone and sandstone



5c

c Four interbedded beds
1 Discontinuous, planar, parallel interlaminated siltstone and fine sandstone beds containing organic remains.

2 Discontinuous, curved, non-parallel interbedded siltstone to granule conglomerate.

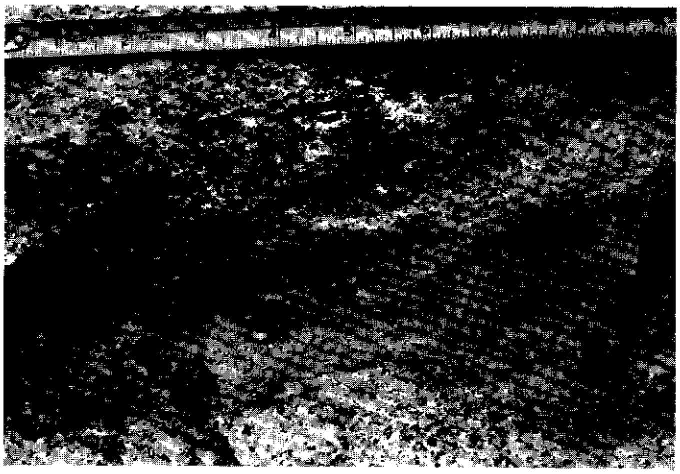
3 Massive sandstone.

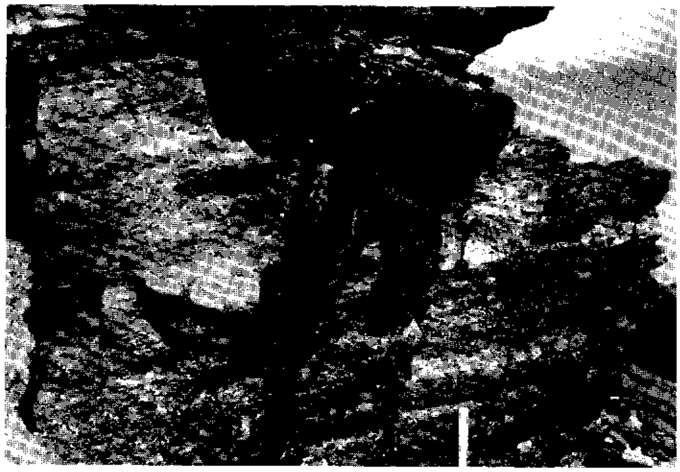
4 Planar, parallel interlaminated siltstone and coarse sandstone graded to nongraded. Top scale is 15 cm.

Fig. 7 Photograph of the clast supported conglomerate of member 4. The member is clast supported, moderately to well sorted and contains 85-90% subrounded to rounded pebbles and cobbles of variable composition.

Fig. 8 Photograph of a moderately to densely welded blocky pyroclastic flow of member 5.

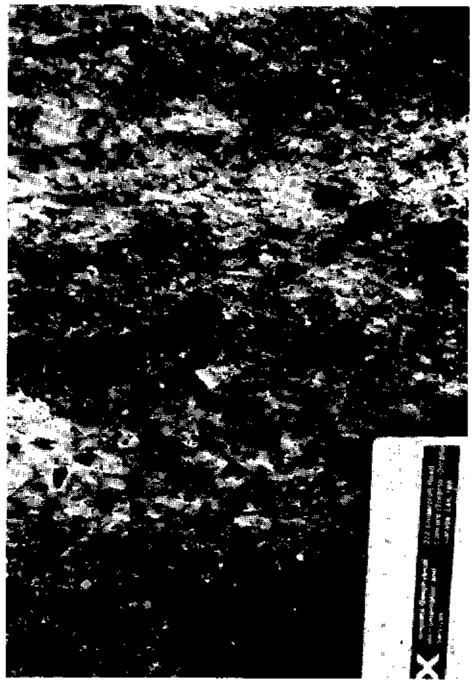
Fig. 6 Photograph of the debris and/or pyroclastic flow of member 3. The flow is poorly sorted, and matrix supported, and it contains about 30% subrounded to subangular pebbles of variable composition.





10a

Fig. 9 Photograph of the volcanic-rich units in member 6, showing discontinuous planar parallel, interbedded ash ± accretionary lapilli with felsic volcanic pebble conglomerate (arrows point to accretionary lapilli). View is 22 cm wide.



10b

10c

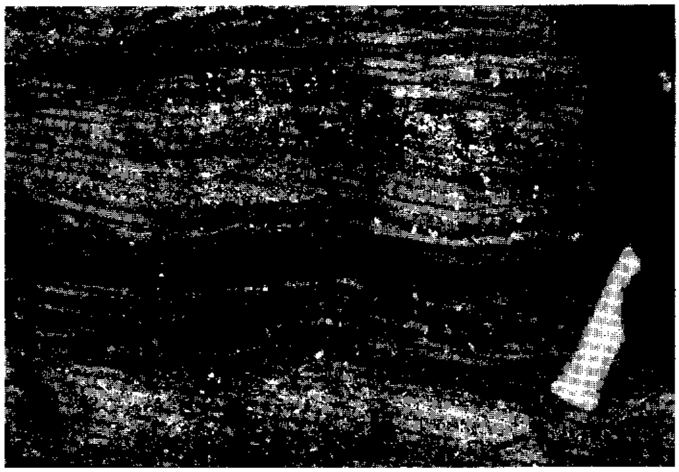
Fig. 10 Photographs of the planar bedded ash and conglomerate, reversely graded in part.

a crudely planar interbedded pebble conglomerate and siltstone, reversely graded at the base of Unit A.

b Crudely planar interbedded ash and pebble conglomerate, upper part of Unit A.

c Reversely graded ash to conglomerate possibly representing overbank or levee deposits (lower part of Unit A). Scale is about 4 cm wide.

10d.



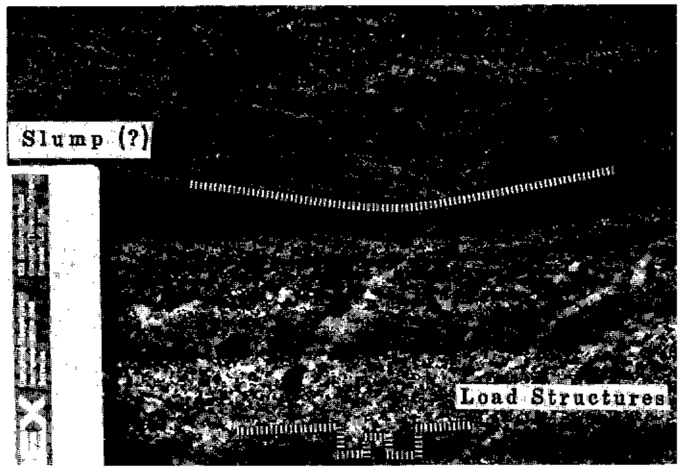
10d.

Fig. 10 (cont'd).

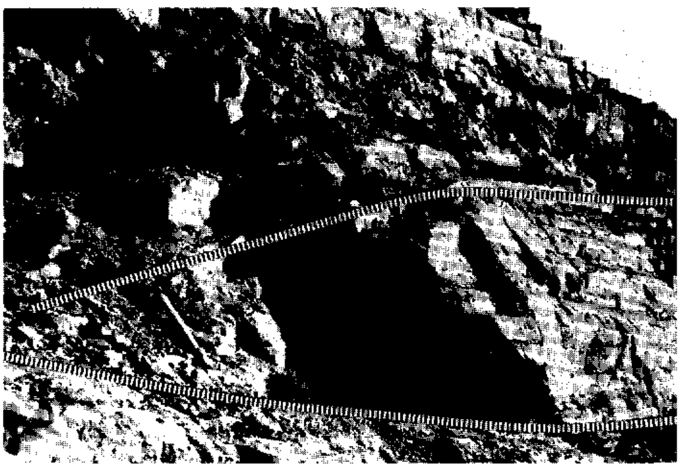
d Interbedded pebble conglomerate and sandstone beds which are in turn internally bedded.

e Reversely and normally graded sandstone showing slump and load structures.

f Large crosscutting channel.



10e.



10f.

ferring rapid deposition with a continuous, volcanic sediment supply.

Member 7 (Fig. 3c), is restricted to the northern part of the stratigraphic section. Unit A of member 7 is composed of interbedded pebble conglomerate and fine siltstone and sandstone, and is crudely planar bedded (Fig. 10a, 10b). Clast size and structures reflect high energy conditions and rapid deposition with continuous sediment supply. The lower part of unit A is reversely graded, and is composed of fine ash with or without accretionary lapilli grading upward into rounded pebble beds in which the clasts are mainly metasedimentary (Fig. 10c). Reverse grading is uncommon in typical fluvial deposits, but could develop where sedimentation is partly controlled by volcanism. Volcanic eruptions producing large volumes of volcanic ash may yield high concentration flows in distal fluvial systems, mixing the fine ash with nonvolcanic clasts that are already being transported in the river beds. The resulting overbank and levee deposits from these concentrated flows may result in inverse grading. Unit B comprises interbedded pebble conglomerate and sandstone, both of which are internally bedded and laminated, the bedding and laminations being gradational in nature (Fig. 10d). The sandstone beds are planar or shallowly crossbedded, and show reverse and normal grading, load structures and slump features (Fig. 10e, 10f), whereas the coarser beds are planar bedded. Large crosscutting channels indicate deposition in a fluvial environment (Fig. 10g). Unit C is a discontinuously interlaminated siltstone and sandstone bed, composed primarily of andesite, and is capped by andesite lava flows.

DISCUSSION AND CONCLUSION

From field observations several conclusions can be made about the interlayered sedimentary-volcanic sequence:

1. Clastic sedimentary sequences are ephemeral features. The preservation of this sequence is probably a result of the overlying resistant andesite lava flows.

2. The variability in composition and texture on all scales throughout the stratigraphic section, and the presence of essential volcanic clasts (pumice and glass shards) is evidence that the sediments were associated with a distal volcanic vent or vents.

3. The sequence does not represent a typical sedimentary deposit in a stable intraplate setting. It seems likely that the amount of sediment introduced by volcanic activity had a major effect on fluvial deposition.

4. The interlayered sedimentary-volcanic sequence reveals information on the type of volcanism. The presence of both andesite and felsic volcanic clasts is evidence of bimodal volcanism, with a large pyroclastic component. More detailed work on the clast type may resolve the problem in understanding the significance of the felsic volcanics of formation 3. The presence of basement clasts indicate that the basement was exposed at various times throughout deposition, with granitic clasts dominantly in the lower part of the sequence and metasedimentary rock clasts in the upper members. Because metasedimentary rocks occur as roof pendants within the granitic batholiths, it is difficult to use this data as evidence of a changing source position.

5. Because of lack of paleocurrent indicators, a precise direction of provenance has not yet been established. The limited data available based on channels and alignment directions of charred wood indicate a N-NW direction of provenance. The paleocurrent direction should have remained relatively constant throughout deposition, as the nearby volcanic center would have provided a constant paleoslope.

6. Three possible volcanic centers may have provided the volcanic debris in formation 1: the Bennett Lake cauldron complex (Lambert, 1974), Montana Mountain (Roots, 1982), or another complex which has now been completely eroded. Comparison of the felsic moderately to densely welded pyroclastic flows in formation 1 with those in the Bennett Lake cauldron complex may help determine the source of the volcanic debris.

Deposition was probably largely controlled by nearby volcanism, which provided a constant paleoslope direction. Coupling this assumption with the data available on the seven members, a model for the depositional history of the interlayered sedimentary-volcanic sequence can be made (Fig. 11):

1. STAGE 1 - Initiation of volcanic activity resulted in instability, producing debris flows (M-1). Volcanic eruptions produced large volumes of volcanic debris which were then transported down the flanks of the volcano, forming distal sedimentary deposits (M-2).

2. STAGE 2 - Major faulting occurred which produced the paleotopography of Figure 2.

3. STAGE 3 - Eruptions producing large volumes of nonwelded pyroclastic flows were deposited on the slopes of the volcano filling in major valleys. With an addition of water, the flows would have been displaced further down the paleoslope, producing debris flows of similar composition (M-3).

4. STAGE 4 - Faulting produced a change in slope, resulting in the deposition of the conglomerates (M-4). This was followed by the eruption of the blocky moderately to densely welded pyroclastic flows (M-5).

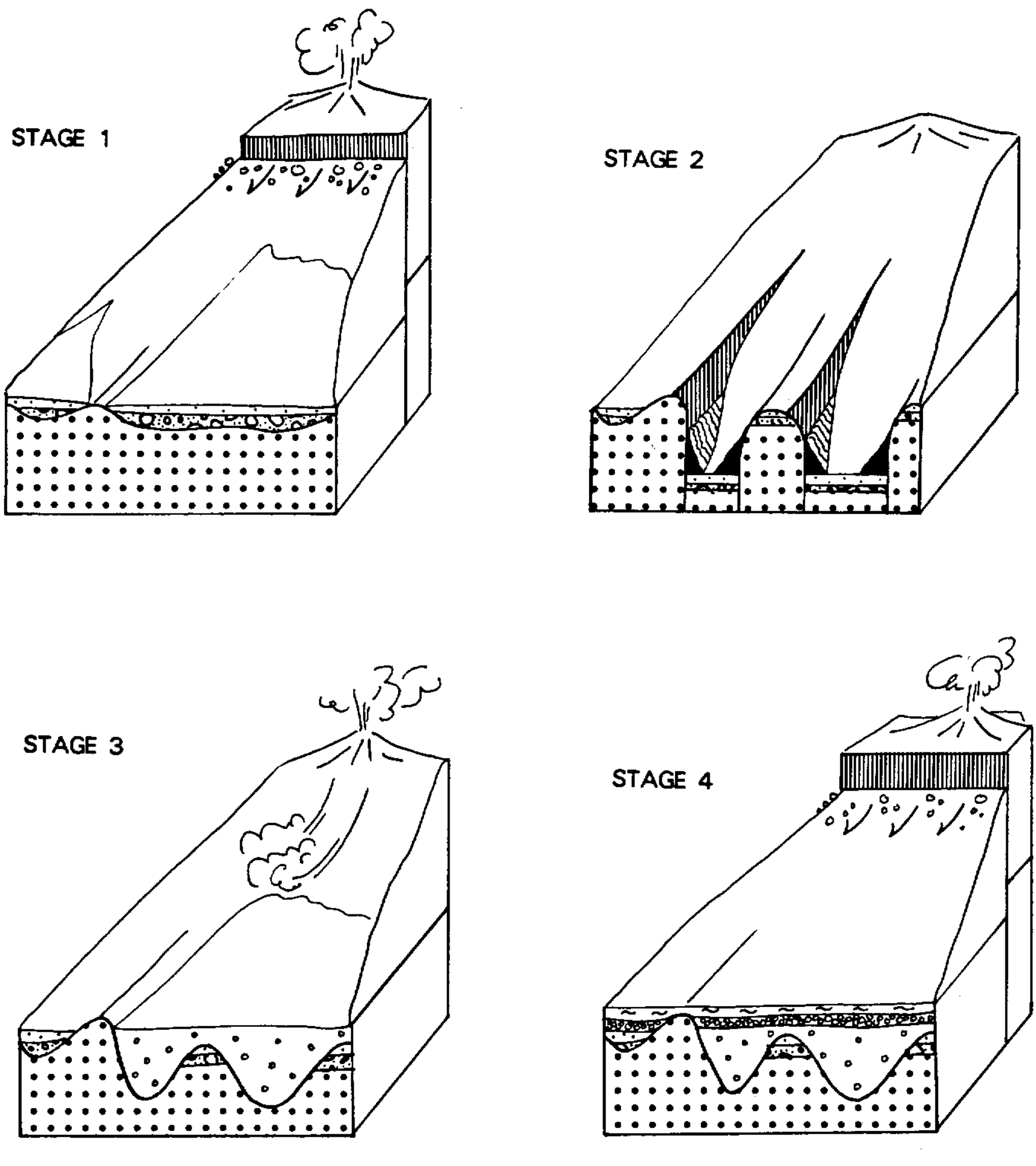


Fig. 11 . A model for the depositional history of the interlayered sedimentary-volcanic sequence at Mt. Skukum (see text for exolanation of Stages 1-4).

ACKNOWLEDGMENTS

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GEOLOGY OF THE SOUTH ZONE DEPOSITS
JASON PROPERTY, MACMILLAN PASS AREA, YUKON

By

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INTRODUCTION

Mineralized zones on the Jason property, Yukon are stratiform, sediment hosted Pb-Zn-barite deposits that occur in a Late Devonian age marine carbonaceous shale and turbidite sequence. The Jason property is located 400 km northeast of Whitehorse near Macmillan Pass on the Canol Road (Fig. 1). Since the discovery of mineralization in 1975, eighty-nine diamond drill holes have delineated three mineral deposits. In order of their discovery, they are known as the Main (1975), South (1978) and End (1980) zones. Geological reserves indicated and inferred for the three zones total 14.1 million tonnes averaging 7.1% Pb, 6.6% Zn and 79.9 g/t Ag. (Bailes et al, This Volume. Published work on the Jason deposits includes Smith (1978), Winn et al (1981), Longstaffe et al (1982), and Gardner (1983).

This paper presents the results of a detailed study of diamond drill core from the South zone. The work represents part of a Ph.D study at Stanford University by the author on the geology of the mineralized zones of the Jason property. The following questions are the focus of the study: 1) What is the stratigraphic position and setting of the South zone? 2) What is the geological relationship of the South zone to the Main zone? 3) What is the geometry of the South zone? 4) How can the mineralization in the South zone be described in terms of mineralogical and textural facies? 5) What constraints on the processes of ore formation can be demonstrated by utilizing the above studies?

A total of 10 months were spent on the property by the author during the summers of 1981 to 1983. During that time, diamond drillhole (DDH) core from all mineralized intersections in the South, Main and End zones was logged at 1:100 scale and all unmineralized drill core was logged at various larger scales. Fifteen surface stratigraphic sections were measured on or near the property for the purpose of stratigraphic correlation. Petrographic study was conducted at Stanford University. Work in progress includes further petrographic work, analytical work (XRD, XRF, electron microprobe), vitrinite reflectance, fluid inclusion study and thermodynamic modelling of the ore forming hydrothermal system.

GENERAL GEOLOGY

Geology of the Macmillan Pass area is described by Abbott (1982, 1983b). An east trending set of open to tight folds and high angle reverse faults of Mesozoic age deform the Late Proterozoic to Triassic miogeoclinal sequence. The regional metamorphic grade is sub-greenschist, except in narrow aureoles around post tectonic Late Cretaceous granitic intrusives.

At least ten stratiform barite and four stratiform sulphide-barite deposits have been discovered within the Late Devonian age Lower Earn Group strata exposed in the Macmillan Pass area. These stratiform deposits are part of a family of like deposits of Late Devonian to Early Mississippian age that occur along the entire North American Cordillera from Yukon to Mexico. Seven of these stratiform deposits are localized along the trace of a west-northwest striking fault (Abbott, 1983a, b), referred here, informally, as the Hess Fault (Fig. 2).

Stratigraphy of the Lower Earn Group changes dramatically across the Hess fault (Fig. 2). On the south side of the fault, a condensed section less than 120 m thick of silty turbidite and siliceous organic shale is referred to here as the horst block (South block of Abbott, 1982). Immediately north of the fault, the Lower Earn Group consists of a section of thin-bedded silty turbidite, turbidite channel deposits and siliceous organic shale up to 1000 m thick referred to here as the graben block (part of Central block of Abbott, 1982). Though likely reactivated during Mesozoic deformation (Winn et al, 1981), Devonian movement on the fault is suggested by several lines of evidence: (1) debris flows occur adjacent to the fault zone in the graben block and increase in total thickness toward the fault (Fig. 3); (2) paleo-current measurments taken from the channel sediments (Teal and Teal, 1978) of the graben facies are parallel to the trend of the fault, suggesting the latter exerted a bathymetric control on sediment transport; and (3) stratiform deposits are localized along the trace of the fault suggesting the fault acted as a flow path for hydrothermal fluids during Late Devonian times.

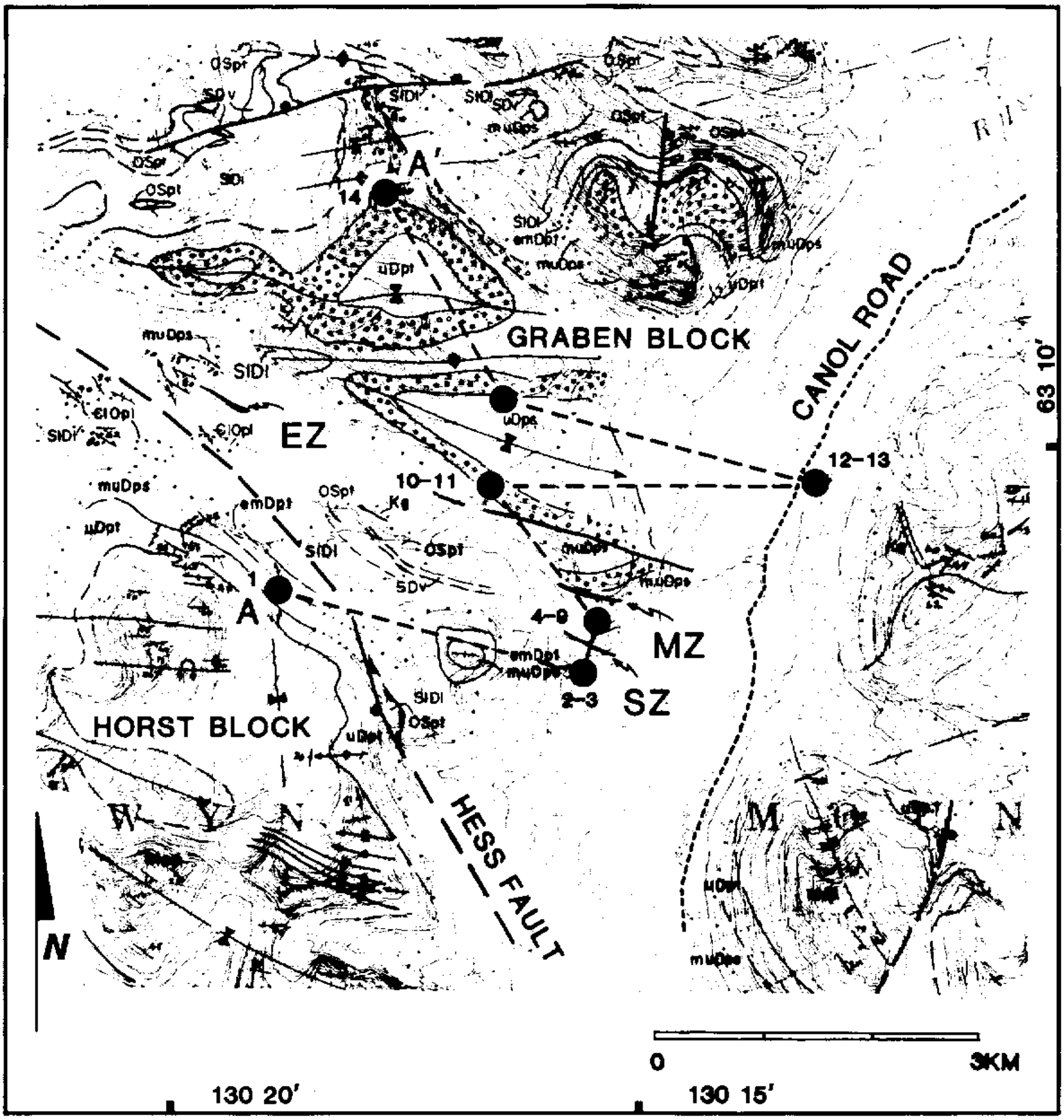
STRATIGRAPHY

The Jason property straddles the Hess fault (Fig. 1). On the Jason property, Road River Group slope to basin facies carbonaceous chert and shale (emDpt), silty limestone (SlDl) and mafic, alkaline volcanic flows (SDv) are overlain by the Lower Earn Group. This contact is regionally interpreted to be unconformable in the Macmillan Pass area (Abbott, 1982). On the Jason property, this contact is clearly unconformable where exposed on the north side of Jason Mountain (Fig. 2, stratigraphic section 14) but is apparently conformable just south of the Hess fault (Fig. 2, stratigraphic section 1).

The Lower Earn Group sedimentary sequence reflects the onset of extensional faulting. In the Macmillan Pass area, slope to basin plain strata were cut by high angle faults forming an irregular horst and graben seabottom. Coarse detritus shed from uplifted basinal strata to the west (S. Gordey, pers. comm., 1983) was deposited as thick turbidite fill. It is notable that the Macmillan Pass area is a centre of mafic alkalic volcanism of Silurian to Early Devonian age (Abbott, 1982) as well as a locus of stratiform mineralization in the late Devonian. This may suggest that the structures that localized the earlier magmatic activity may have focused later geothermal activity.

The stratigraphy of the Lower Earn Group on the Jason property is composed of four major lithofacies: turbidite channel complex, channel lateral turbidite, fault scarp debris apron and starved basin siliceous shale (Fig. 2). The turbidite channel complex lithofacies (muDcg of Abbott, 1982) is restricted to the graben block. It occurs as (1) a lower channel complex

Yukon Exploration and Geology 1983, p. 105-115



LEGEND

LOCATION OF STRATIGRAPHIC SECTION(S) ●

LINE OF CROSS SECTION (FIG. 2) — — — —

Figure 1 Geological map of the Jason property area (modified after Abbott, 1983). Lithology cropping out in the area includes the Ordovician to Early Devonian Road River Group (OSpt, Sp, SIDl); Silurian-Devonian volcanic rocks (SDv); early to middle Devonian Lower Earn Group (muDps, muDcg, uDpt); Mississippian Upper Earn Group (Msp) and Cretaceous quartz monzonite and granite (Kg). The location of stratigraphic sections in Figure 2 is indicated.

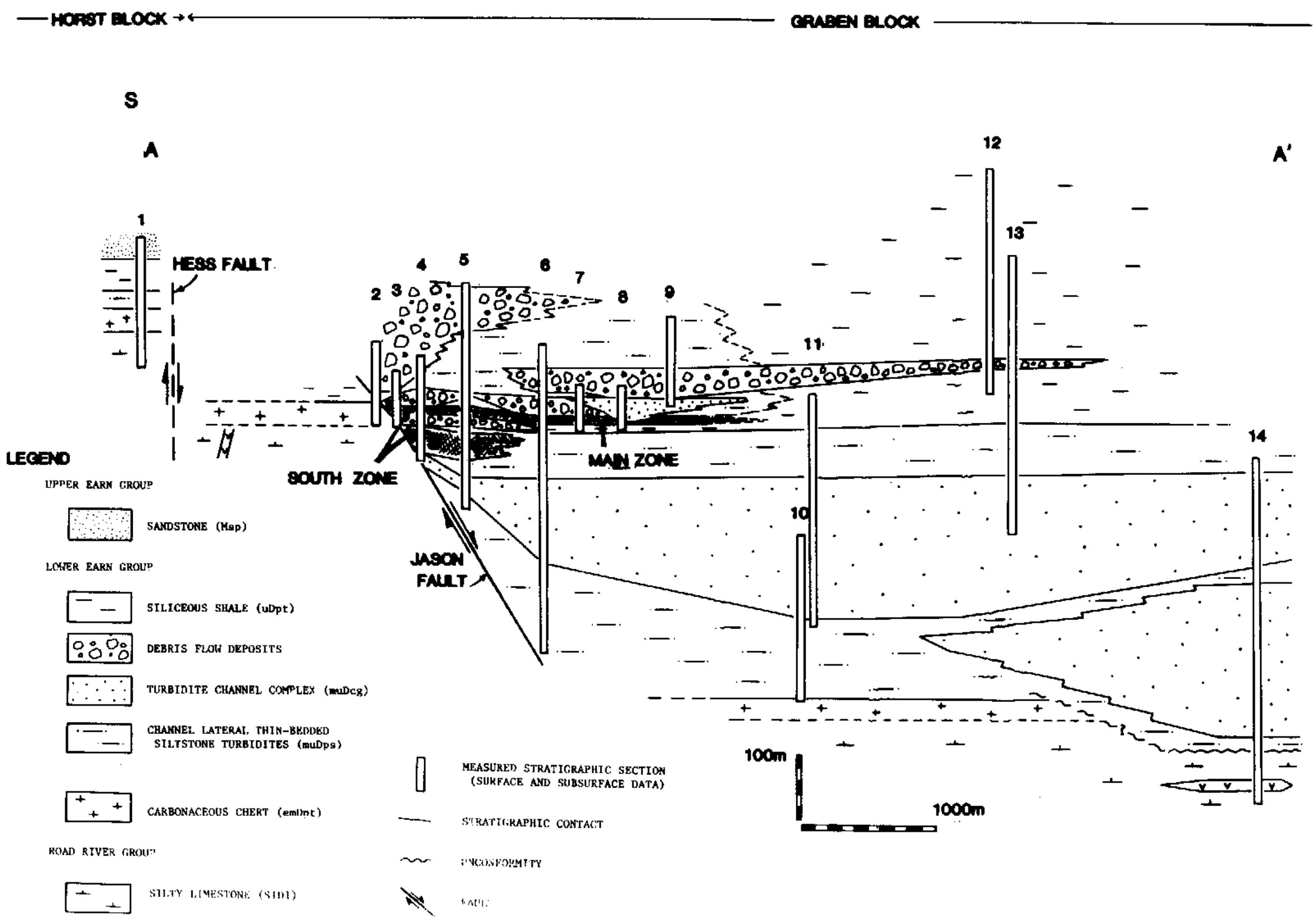


Figure 2 Structurally restored stratigraphic cross-section from south to north across the Jason property. Stratigraphic sections are from both diamond drill hole data (Sections 2 to 9) and surface measured sections (Section 1, 1 to 14). Five times vertical exaggeration.

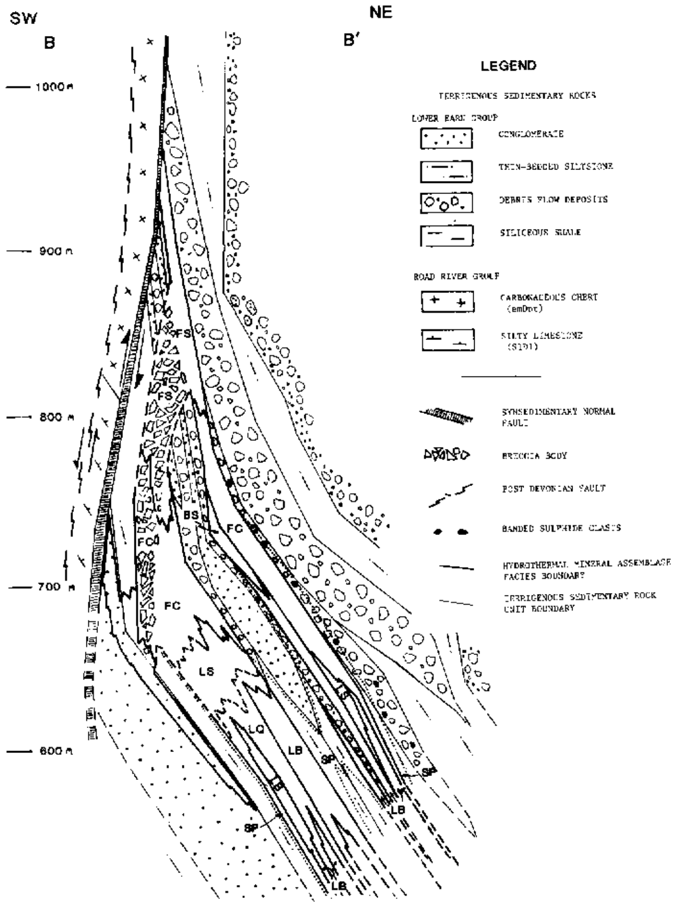


Figure 3 Structural cross-section of the South zone deposits looking to the northwest. Elevation is indicated in meters. Hydrothermal mineral facies are indicated: Fe sulphide (FS), Fe carbonate (FC), banded sulphide (BS), laminated quartz-sulphide and quartz-sulphide (LS), laminated barite-quartz-sulphide (LB), laminated quartz (LQ) and silica-pyrite (SP). The extent of the silica pyrite zone is indicated by the dotted line.

up to 250 m thick composed of 1 to 5 m thick thinning and fining upward sequences of massive conglomerate and sandy conglomerate beds interbedded with thin-bedded siltstone turbidite; and (2) an upper channel complex up to 220 m thick composed of massive amalgamated conglomerate beds with very minor interbeds of siliceous shale and siltstone. In the area of the Jason South zone, this unit thins to 20 m and is interbedded with sandy turbidites. Southeasterly oriented paleocurrent indicators (Teal and Teal, 1978) and a thinning and fining of the channel conglomerates to the east suggest transport from west to east (Winn et al, 1981).

The channel lateral turbidite lithofacies (muDps of Abbott, 1982) is composed of thin-bedded (.5 to 3 cm) quartz siltstone turbidites interbedded with thin laminae (.1 to 1 cm) of carbonaceous shale. Fine grained cross laminated starved ripple chert-quartz sandstone beds to 3 cm thick are commonly interbedded with the siltstone turbidite. Graded chert-quartz sandstone beds 5 to 200 cm thick compose less than one percent of the lithofacies. The rocks of this lithofacies encase the channel complex lithofacies. Using the criteria in Mutti (1977), this lithofacies is interpreted to represent overbank turbidite flows and hemipelagic sedimentation on levee flank and interchannel areas.

The fault scarp debris apron lithofacies occurs within the graben block immediately north of the Hess fault. It is best developed in the area of the South and Main zones and is characterized by debris flow deposits composed predominantly of slumped thin-bedded siltstone turbidite of the channel lateral lithofacies and slumped sandstone and conglomerate of the channel lithofacies. The source of these slump deposits must be uplifted Lower Earn Group sediments within the graben block. The debris flow deposits thin northward and interfinger with carbonaceous siliceous shale (Fig. 2). The debris flows are likely related to slope failure on scarps associated either with the Hess fault or with the small intragraben normal fault (Jason fault) that controls the location of the Jason mineralization (see below).

The starved basin siliceous shale lithofacies overlies the channel complex lithofacies and interfingers to the south with stratiform mineralization, channel lateral turbidites and debris flows. This suggests that transport of coarse-grained sediment from the west was cut off suddenly and that hemipelagic sedimentation continued away from the fault scarps where debris flow deposits and stratiform mineralization accumulated.

ECONOMIC GEOLOGY - SOUTH AND MAIN ZONE DEPOSITS

Two stacked stratiform Pb-Zn-Ba deposits, referred to here as the upper deposit and the lower deposit, occur at the base of the debris flow package (Fig. 2). Both deposits are texturally and mineralogically zoned away from a crosscutting breccia body that is interpreted to be the fluid conduit for the stratiform mineralization. The proximal part of the upper deposit (with respect to the breccia body) and the entire lower deposit, both located on the south limb of a west-northwest trending, east plunging faulted syncline (Fig. 1) are known collectively as the South zone. The Main zone, located on the north limb of the syncline is interpreted here to be the distal part of the upper deposit. This interpretation is based on the excellent correlation between the strata of the South zone (Fig. 2, stratigraphic section 5) and that of the Main zone (Fig. 2, stratigraphic section 6). The remainder of this paper will focus on the upper and lower deposits proximal to the breccia body (ie. the South zone).

Geology of the South Zone Deposits

The South zone was discovered in 1979 by exploratory drilling and has been intersected by 23 diamond drill holes. It does not crop out on surface. The South zone is composed of two stratigraphically distinct stratiform ore bodies that are mineralogically and texturally zoned outwards from an inclined tabular breccia body (Fig. 3, 4). The breccia body lies immediately above, and roots downwards into, a normal fault (Jason Fault) that juxtaposes the upper part of the Lower Earn Group against the Road River Group with

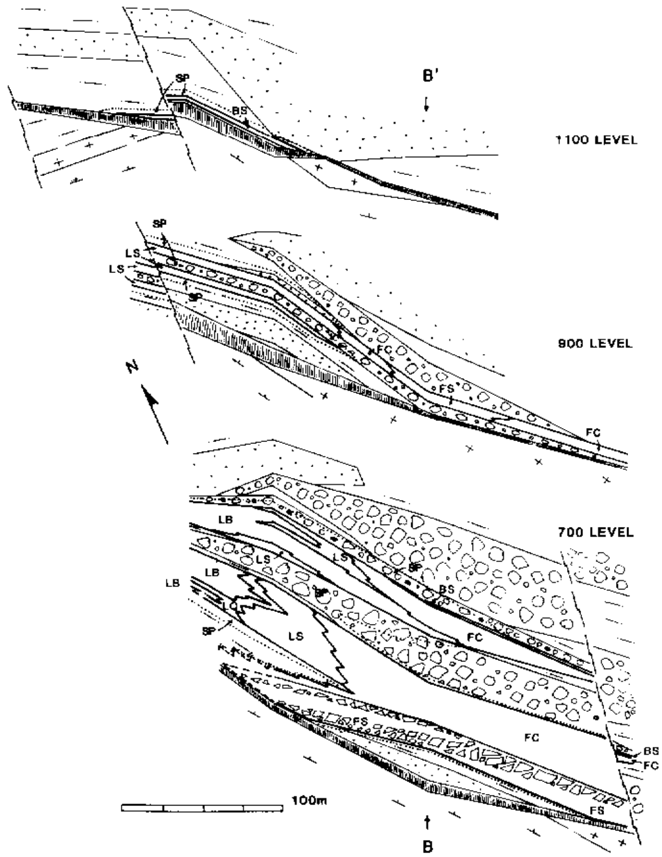


Figure 4 Horizontal plan sections of the South zone deposits at 700 m, 900 m, and 1100 m elevation. See Figure 3 for legend. Line of section in Figure 3 (B-B') is indicated.

a minimum apparent vertical throw of 400 m. The fault dips at 20 degrees with respect to the orientation of bedding in the hanging wall turbidites. The Jason Fault is interpreted to have been active in the Late Devonian for the following reasons: (1) the fault zone is texturally similar to debris flows and possesses soft sediment deformation features (Fig. 5); (2) debris flow deposits interbedded with the mineralization thicken toward the fault (Fig. 3) and (3) the fault zone is mineralized and appears to control the location of the breccia body which in turn controls Late Devonian stratiform mineralization.

Drilling has not delineated the complete extent of either deposit. Both terminate up dip against either the synsedimentary fault or breccia body. However, both deposits are open laterally and down dip. The minimum dimensions of the upper deposit are 410 m (dip), 270 m (strike) and the stratigraphic thickness varies from 1.5 to 20 m. Including the Main zone as the distal equivalent to the upper zone, the minimum dip dimension is approximately 1000 m. The minimum dimensions of the lower deposit are 310 m (dip), 290 m (strike) and the stratigraphic thickness varies from 0 to 40 m. Geometry of the two deposits is distinctly different. The upper deposit is sheetlike, thinner and much more extensive; the lower zone is thicker, prismatic,and less extensive (Fig. 2). Stratiform mineralization in the lower deposit is intercalated with 10 to 90 percent thin siltstone turbidite beds (1-3 cm). This turbidite sequence overlies the conglomerate channel complex lithofacies. Stratigraphically separating the lower deposit from the upper deposit is a package of debris flows composed of slumped thin-bedded silty turbidites that, with increasing distance away from the fault, thin and interfinger with carbonaceous siliceous shale. The base of the upper deposit is interbedded with siliceous carbonaceous shale. The proximal part of the upper deposit is overlain by debris flows which thin outwards from the fault into siltstone turbidites. The siltstone turbidite sequence hosting the lower deposit is interpreted to reflect relatively high rates of terrigenous sedimentation. The upper deposit, in contrast, is interbedded with carbonaceous cherts reflecting starved basin conditions.

The South zone dips steeply northwards on the south limb of a west-northwest trending, east plunging, tightly folded syncline (Fig. 1). An early set of steeply dipping west-northwest trending faults are offset by a later set of north-south trending subvertical cross faults. The South zone appears to be generally planar except where offset by cross faults (Fig. 4). Small scale tight folds coaxial with the west-northwest trending map scale syncline are not common except in the laminated barite facies of the deposits. Extension veins filled with quartz are common in the silicified siltstone and chert interbeds in the baritic facies (Fig. 7c). Locally, a slaty cleavage or spaced dissolution cleavage is strongly developed, commonly near faults and best developed in nonsilicified siltstones and mudstone matrix slump deposits.

Figure 5 Synsedimentary normal fault zone (Jason Fault). Fragments of coarse grained ankerite veins (white) exhumed from their original host sediment and fragments of mudstone cross-cut by ankerite veins occur in a silicified mudstone matrix. Centimeter scale.

Mineralogical and Textural Facies, Upper Deposit

Though distinct from each texturally, both the upper and lower deposits show the same general mineralogical zoning. From proximal to distal, the metal zoning in the sulphide minerals is: (Fe+Cu)-(Pb)-(Zn)-(Fe). Likewise, zoning of the gangue phases is:

(siderite+ankerite)-(ferroan calcite)-(silica)-(barite)-(silica).

The upper deposit can be divided into seven mineralogical and textural facies (Fig. 3, 4). From proximal to distal, they are these: (1) Fe sulphide; (2) Fe carbonate; (3) banded sulphide; (4) laminated quartz-sulphide; (5) laminated barite-quartz-sulphide; (6) laminated quartz and (7) silica-pyrite.

Fe sulphide facies: This facies dominates the most proximal part of the stratiform body and occurs immediately above the breccia body (Fig. 3). Two distinct subfacies are noted. The first is a massive, fine-grained pyrite crosscut by subvertical, 1 to 2 mm quartz veinlets with minor galena, sphalerite and chalcopyrite. Stratigraphically underlying this subfacies are debris flows largely replaced by siderite and pyrrhotite and crosscut by subvertical pyrite and pyrobitumen veins. This vent zone subfacies is interpreted to have formed from hydrothermal fluids rising from the breccia zone through overlying unconsolidated sediments. The absence of a terrigenous sediment component in the massive pyrite and the very sharp contact of the massive pyrite with overlying terrigenous sediment, suggests this facies may represent a chemical sediment precipitated from exhaled hydrothermal fluids overlying the vent.

Fe carbonate facies: This facies lies immediately outboard of the Fe sulphide facies and is coextensive in lateral extent with the underlying breccia zone. The facies varies from 5 to 20 m in thickness and is a composite of at least 5 similar cycles measuring in thickness from .5 to 2.5 m. Each cycle is composed of three parts: 1) a lowermost bed of massive medium-grained ankerite crosscut successively by an early lacework of galena cut in turn by later Fe calcite (Fig. 6a) veins cut in turn by veins of pyrrhotite, sphalerite, and galena. The abundance of the late sulphide vein set increases upwards towards the top of the ankerite bed; 2) an overlying banded galena-sphalerite-pyrite bed (1 to 50 cm thick) (banded sulphide facies) and (3) an upper fine-grained quartz bed(1 to 3 cm thick). It is interpreted that each cycle represents the following sequence of events: 1) formation of an early ankerite (?) chemical sediment; 2) subsequent upward flow of hydrothermal fluids through the ankeritic mud forming sequentially: network galena, veins of ferroan calcite and veins of pyrrhotite-galena-sphalerite. The hydrothermal fluid entered the overlying seawater and precipitated galena and sphalerite, then silica as the hydrothermal cycle waned.

Banded sulphide facies: This facies occurs interbedded with the Fe sulphide, Fe carbonate, laminated barite-sulphide-quartz and laminated quartz-sulphide facies. The banded sulphide occurs as massive beds 1 to 50 cm thick composed of discontinuously laminated to crudely banded galena, dark red sphalerite and pyrite. These beds are interpreted to represent syngenetic sulphide sediments. This interpretation is supported by evidence of scour by overlying debris flows of the banded sulphide (Fig. 6b).

Laminated quartz-sulphide facies: This facies occurs outboard of the banded sulphide facies at the west end of the deposit and outboard of the Fe carbonate and banded sulphide facies at the east end of the deposit (Fig. 3, 4). It is characterized by very fine laminae. 1 to 1 mm thick of quartz or quartz and sphalerite interlaminated with lesser carbonaceous siliceous argillite. Compositional assymmetry in individual lamina, thinning upward laminae packets and

Figure 6a Fe carbonate facies, upper deposit. Ankerite and lace-work galena (grey) crosscut by irregular ferroan calcite veins (white). Dime for scale. Arrow indicates stratigraphic tops.

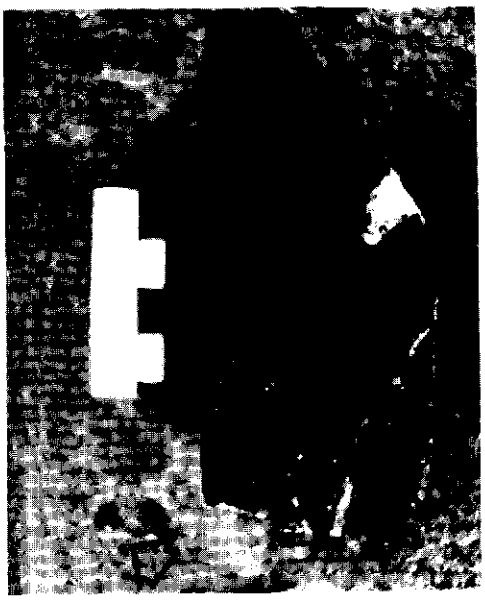


Figure 6b The contact of the banded sulphide facies with the overlying debris flow unit at the top of upper deposit. The bands in the sphalerite-galena-pyrite-calcite (lower right) are truncated by an irregular scour surface at the base of the debris flow. Clasts of massive sulphide are entrained in the debris flow. Arrow indicates stratigraphic tops. Centimeter scale.

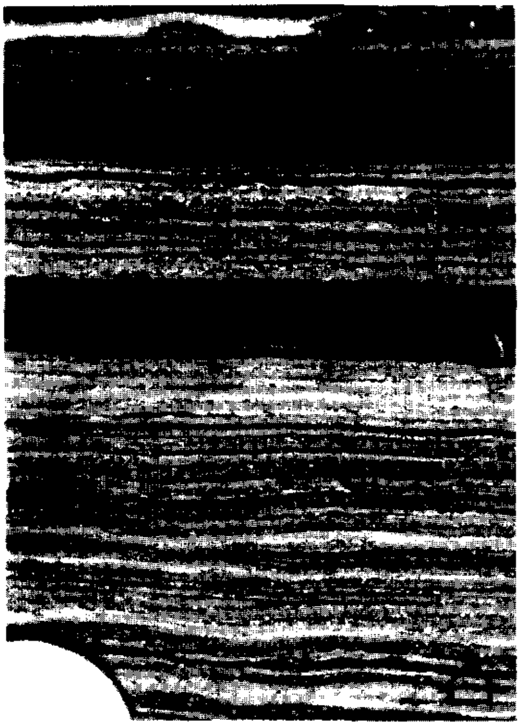


Figure 6c Laminated quartz-sulphide facies, upper deposit. Packets of quartz-sphalerite laminae (white) interbedded with carbonaceous siliceous shale (black). Stratigraphic tops upwards. Note the assymmetric laminae at the top of the lower packet as well as the low angle disconformity truncating laminae in the lower packet. Arrow indicates stratigraphic tops. Dime for scale.

small scale scour of laminae (Fig. 6c) suggest formation by precipitation or sedimentation of the silica and sulphide at the sea bottom. Fe carbonate replaces sphalerite-quartz laminae along a sharp front at the distal edge of the Fe carbonate facies. This suggests that at least some Fe carbonate mineralization post dates, and grew outwards into, the laminated silica-sulphide facies. Laminated quartz-sphalerite becomes increasingly interlaminated with barite laminae outwards. This change is interpreted to reflect the progressive mixing away from the vent of the Ba-rich hydrothermal fluids with sulphate-rich seawater.

Laminated barite-sulphide-quartz facies: This facies occurs outboard of the laminated quartz-sulphide and Fe carbonate facies and is characterized by the presence of barite. Laminae (1 to 5 mm) of barite +/- galena, sphalerite-pyrite, sphalerite-quartz and sphalerite-galena-pyrite form packets of laminae 10 to 150 cm thick that are interbedded with carbonaceous fine-grained quartz beds 5 to 50 cm thick. Calcite and barium carbonates (Gardner, 1983) are locally interlaminated. Euhedral celsian (.1 to 1 mm) is abundant along contacts between barite laminae and fine-grained quartz beds. The celsian disrupts and crosscuts sulphide, quartz, and barite laminae and is interpreted to have formed during early diagenesis.

Laminated quartz facies: This facies is characterized by discontinuous laminae of quartz (2 to 8 mm) that occur in association with bands of disseminated fine-grained sphalerite, framboidal pyrite and celsian in a silicified argillite matrix. This facies occurs stratigraphically above and below the laminated barite-sulphide facies. It is best developed below the laminated barite-sulphide facies where it occurs as a series of upward thickening packets of laminae.

Silica-pyrite facies: An aureole of silicified terrigenous sediment extends vertically 1 to 10 m above and below the laminated quartz facies. It is notably absent adjacent to the Fe carbonate-Fe sulphide facies. Associated with the silicification is disseminated pyrite (3 to 5%), celsian and ankerite, that decrease in abundance away from the laminated quartz facies.

Mineralogical and Textural Facies, Lower Deposit

The lower deposit can be divided into six mineral logical and textural facies (Fig. 3, 4). Facies in the lower zone from proximal to distal are these: (1) Fe sulphide; (2) Fe carbonate; (3) quartz-sulphide (4) laminated barite-sulphide-quartz; (5) laminated quartz and (6) silica-pyrite facies.

Fe sulphide facies: The assemblage of pyrite and/ or pyrrhotite dominates the upper part of the breccia body and the most proximal stratiform mineralization. Two distant subfacies are noted. A breccia subfacies is composed of angular fragments (up to 20 cm) bleached of organic matter and silicified siltstone turbidite in a matrix of pyrrhotite +/- siderite-chalcopyrite or pyrite +/- pyrrhotite-chalcopyrite (Fig. 7a). A second subfacies occurs immediately adjacent to the breccia pipe. Bleached and silicified, thin-bedded siltstone turbidite is interbedded with bands of pyrrhotite +/- siderite; pyrite and pyrrhotite; or pyrite. A consistent paragenetic order occurs in both subfacies; early siderite is replaced by pyrrhotite which is in turn replaced by pyrite. The early siderite clearly replaces earlier terrigenous sediment (quartz siltstone). Therefore, it is interpreted that in spite of its bedded appearance the sulphide and carbonate were introduced after the formation of the turbidite sediments.

Fe carbonate facies: Two subfacies equivalent to those in the Fe sulphide facies exist. An Fe carbonate breccia subfacies exists in the deeper part of the breccia pipe. It is texturally similar to its Fe sulphide counterpart with the exception that the breccia matrix is composed of medium-grained siderite and pyrrhotite, or siderite-pyrrhotite crosscut by coarse-grained siderite veins with galena and pyrrhotite. Adjacent to the deeper part of the breccia pipe and outboard of the Fe sulphide facies at higher levels is a banded Fe carbonate subfacies. Bands of fine-grained siderite and pyrrhotite from 2 to 100 cm thick are interbedded with silicified and bleached thin-bedded silty turbidite. Coarse-grained siderite +/- galena, pyrrhotite and pyrobitumen veins parallel bedding within the fine-grained siderite bands (Fig. 7b). Hand specimen and thin section scale textures exhibit the following paragenetic order: 1) siltstone turbidite sequence; (2) fine-grained siderite; (3) pyrrhotite and 4) coarse-grained siderite +/- galena, pyrrhotite and pyrobitumen. This textural evidence suggests both the Fe sulphide and Fe carbonate facies, though possessing a strikingly banded character, formed within and partially replaced the earlier formed siltstone turbidite sequence. This mineralization likely took place prior to compaction of the sediment with much of the hydrothermal mineralogy

Figure 7a Fe carbonate facies, breccia subfacies, lower deposit. Fragments of silicified siltstone (grey) in a matrix of siderite (dapped grey) and pyrrhotite (dark grey). Arrow indicates stratigraphic tops. Centimeter scale.

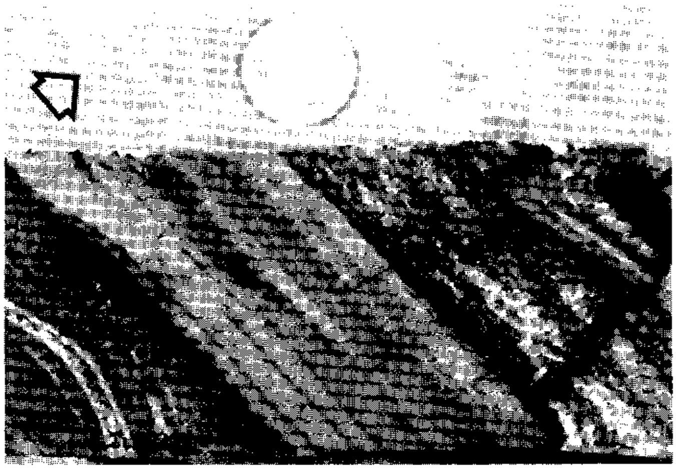


Figure 7b Fe carbonate facies, stratiform subfacies, lower deposit. Bleached, silicified siltstone turbidite (light grey) interbedded with fine-grained siderite (dark grey) beds and bedding parallel veins of coarse-grained siderite. The coarse-grained siderite vein on the lower right has inward terminating siderite crystals and vein center galena. A pyrrhotite vein (dark grey) is both parallel to bedding and crosscuts bedding (upper half). Arrow indicates stratigraphic tops. Dime for scale.

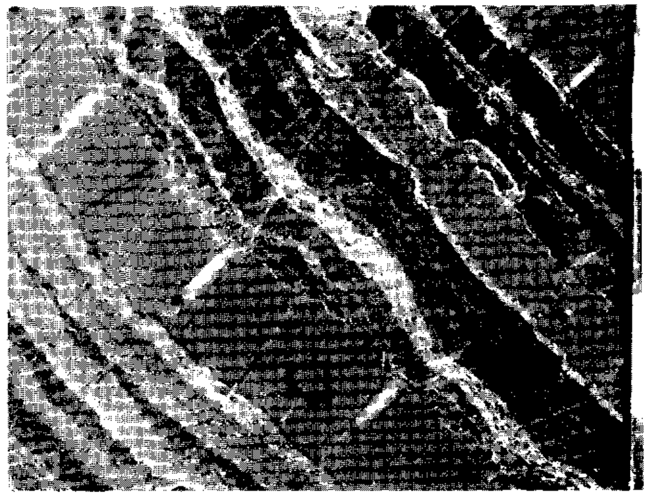


Figure 7c Laminated barite-sulphides-silica facies, lower deposit. Silicified siltstone turbidite (light grey) is interbedded with packets of laminae of barite +/- galena (medium grey) and sphalerite-quartz (white). Quartz filled tensional fractures in silicified siltstone are interpreted to relate to Mesozoic deformation. Centimeter scale. Arrow indicates stratigraphic tops.

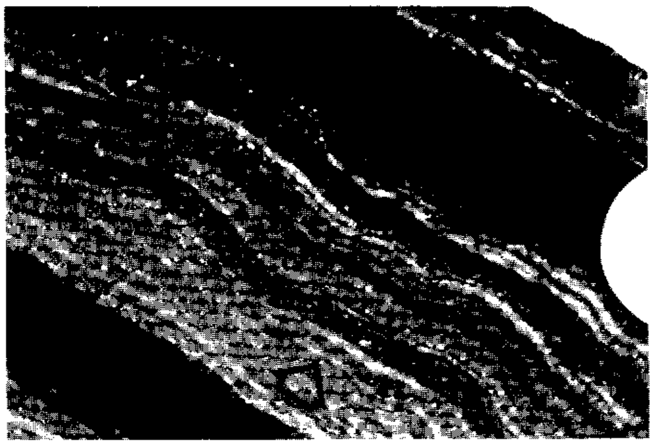


Figure 7d Laminated quartz facies, lower deposit. Discontinuous quartz laminae (white) occur with bands of disseminated medium grained sphalerite and pyrite (grey). Black interbeds are silicified carbonaceous shale. Arrow indicates stratigraphic tops. Dime indicates scale.

precipitating within interstitial pore space.

Quartz-sphalerite-galena facies: This facies appears to represent a transition zone between the Fe carbonate and baritic facies and lacks a well developed stratiform texture. Silicified and bleached thin-bedded siltstone turbidite beds (1-3 cm thick) host 3 to 10 percent medium-grained disseminated siderite. Bleached argillaceous interbeds (0.5 to 1 cm) host disseminated sphalerite, galena, pyrite and discontinuous quartz laminae. It is not clear whether this facies is always present between the Fe carbonate and the baritic facies.

Laminated barite-sulphide-quartz facies: Silicified and bleached thin-bedded siltstone turbidite is interbedded with packets, 1 to 20 cm thick, of barite, barite-galena +/- sphalerite-pyrite, sphalerite-silica, sphalerite-pyrite-galena, calcite, and pyrite laminae. Average grain size is from .05 to .1 mm. Individual laminae vary from 0.1 to 10 mm. Fine-grained celsian euhedra occur adjacent to barite laminae. The paragenetic order is: 1) early barite, celsian, sphalerite, galena, 2) sphalerite and 3) late calcite.

Laminated quartz-sulphide facies: This facies is very similar to its counterpart in the upper zone. Discontinuous medium grained quartz-celsian laminae and disseminated sphalerite and pyrite occur in silicified, carbonaceous, thin bedded siltstone turbidite. This facies envelopes the baritic facies. The paragenetic order noted among phases is 1) early celsian; 2) quartz,sphalerite, pyrite.

Silica-pyrite facies: This facies is similar to its counterpart in the upper zone. The silicified halo extends 1 to 8 m vertically above and below the laminated quartz facies. Disseminated pyrite (to 10%), celsian (to 30%) and ankerite (to 3%) decrease in abundance away from the orebody.

Comparison of the Upper and Lower Deposits

Though the mineral zoning in the lower deposit is the same as that in the upper deposit, the lower deposit differs from the latter in the following aspects:
1) Banded sulphide and laminated silica sulphide facies, both interpreted to represent the product of syngenetic processes and both present in the upper zone, are not noted in the lower zone.
2) The lower deposit is lateral to, rather than overlying, the breccia body.
3) The lower deposit thins away from the breccia zone and is much less extensive than the upper deposit (prismatic vs. sheetlike).
4) On the basis of textural evidence, the proximal part of the lower deposit is interpreted to have formed after the host terrigenous sediments.
5) On the basis of the orientation of veins, the fluid flow within the proximal part of the lower deposit was horizontal and parallel to bedding rather than subvertical as in the upper deposit.

This geometric and textural evidence suggests that at least a component of the stratiform mineralogy of the lower deposit (Fe sulphide, Fe carbonate, quartz sulphide facies) formed by precipitation from hydrothermal fluids infiltrating laterally through the siltstone turbidite sequence. The similarity in mineralogy with the upper deposit suggests the infiltration took place synchronously with the formation of the upper orebody.

Jason Fault

The Jason Fault is characterized by the presence of 1 to 30% rounded to angular fragments of (1) coarse-grained ankerite +/- sphalerite, chalcopyrite, galena, pyrrhotite and/or (2) silicified shale or siltstone clasts crosscut by coarse grained ankerite-sulphide veins. Silicified siltstone and argillite clasts texturally similar to those noted in debris flows (but distinct from the angular clasts in the breccia body) usually compose 50 to 80% of the fault zone and are hosted in a matrix of silicified mudstone with up to 5% pyrite, pyrrhotite, chalcopyrite, sphalerite and galena. These textures suggest that the Jason Fault was a conduit for mineralizing hydrothermal fluids and that ankerite and sulphides precipitated in fractures within unlithified sediment in the fault zone. Continued movement on the fault fragmented the veins. Soft sediment deformation textures in the fault zone suggest movement on the fault occurred prior to the consolidation of the sediments. The rooting of the breccia body into the Jason fault and the mineralization of the fault zone suggests the hydrothermal fluids flowed up the fault. The breccia body may reflect the rupture of silicified sediments due to movement on the fault or explosive release of overpressured fluids below a self sealed cap of silicification. Data from fluid inclusion study (Gardner, 1983) suggests boiling did not take place.

INTERPRETATION

The following conclusions are drawn from the present data:
1) Extension related to regional rifting or transcurfaulting (Abbott 1983a, Eisbacher 1983) during the Late Devonian is represented in the Macmillan Pass area by synsedimentary normal faulting, the formation of a local fault bound basin (graben block), the deposition of coarse-grained turbidite detritus and geothermal activity resulting in the formation of stratiform sulphide-barite and stratiform barite deposition.
2) A north east trending normal fault (Jason Fault), subsidiary to the east-west trending Hess Fault, localized rising hydrothermal fluids on what is now the Jason property. This fault was active during sedimentation and formed a scarp that served as the source for debris flows.
3) Hydrothermal flow in the Jason hydrothermal system was further localized by the development of a breccia pipe in the immediate hanging wall of the Jason Fault, immediately below the sea bottom.
4) Hydrothermal fluids both vented into the overlying anoxic seawater as well as infiltrated laterally from the breccia pipe through uncompacted terrigenous sediments or earlier formed hydrothermal sediments.
5) Stratiform mineral deposition coincides stratigraphically with the first evidence of movement on the Jason Fault (debris flows) and the shut off of the flow of coarse chert detritus (channel complex) into the graben block.
6) The upper deposit mineralization reflects the combined result of the following processes: (a) precipitation or mechanical accumulation of hydrothermal sediment on the sea floor (eg. fine-grained massive pyrite in the Fe sulphide facies, the banded sulphide facies, the laminated silica-sulphide facies, the laminated barite-sulphide-silica facies); (b) deposition within or replacement of, earlier formed hydrothermal deposits by later hydrothermal assemblages (eg. quartz - sulphide veining of the fine-grained massive pyrite of the Fe sulphide facies; disseminated galena, Fe calcite veins and sulphide veins in the early siderite of the Fe carbonate facies; Fe calcite replacement of laminated quartz-sulphide or laminated barite at the outer edge of the Fe carbonate facies; formation of quartz laminae in the laminated quartz facies) and (c) precipitation within earlier formed terrigenous sediment of hydrothermal minerals (eg. silicification of terrigenous sediments in the silica-pyrite facies).
7) The lower deposit reflects the combined result of the following processes: (a) precipitation or mechanical accumulation of hydrothermal sediment on the sea floor (eg. ? barite, sphalerite and galena in the laminated barite-sulphide-quartz facies); (b) deposition within or replacement of, earlier formed hydrothermal deposits (eg. replacement of barite by calcite in the laminated barite-sulphide-quartz facies) and (c) deposition within earlier formed terrigenous sediment (eg. Fe sulphide facies, Fe carbonate facies, quartz sulphide facies, ? laminated barite-sulphide facies; lam-inated quartz facies, silica - pyrite facies).
8) Therefore the zoning of sulphides, carbonates, sulphates and silicates is not only a reflection of

chemical or thermal gradients in the overlying seawater during hydrothermal exhalative activity. It reflects the superposition of metasomatic processes on the primary hydrothermal and terrigenous sediment during the ore forming process.
9) The very high temperatures (181 to 283.7 degrees Celsius) of the hydrothermal solutions as interpreted from fluid inclusion study of the vent proximal part of the deposits (Gardner, 1983) reflect a very elevated geothermal gradient in the Macmillan Pass area during the late Devonian. Accordingly, origin of the hydrothermal fluids may be due to a hydrothermal convective system associated with relatively shallow level igneous activity at that time rather than a simple basin dewatering mechanism proposed by others (Badham, 1980).

ACKNOWLEDGEMENTS

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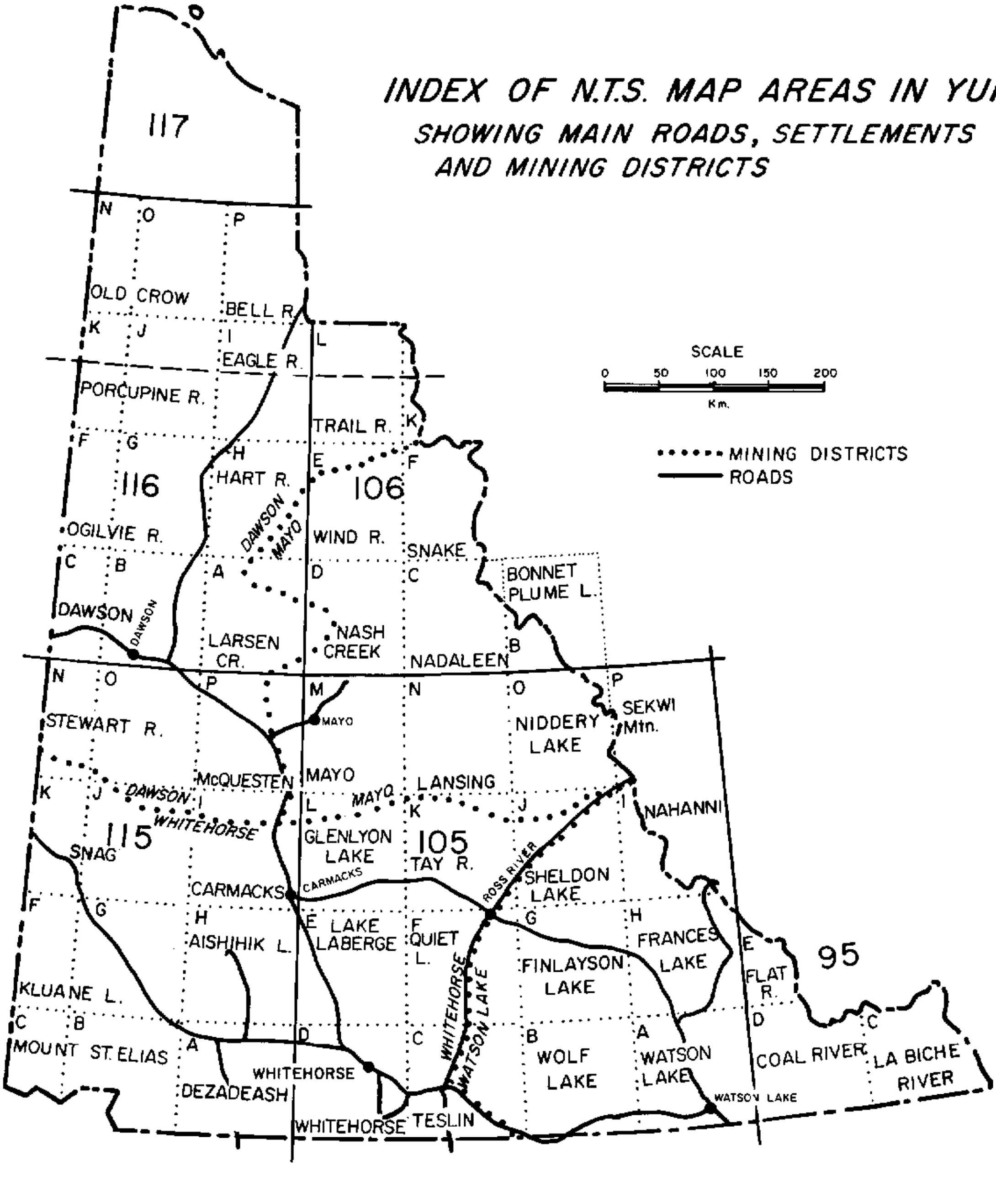
NOTES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SUMMARIES OF ASSESSMENT WORK,
DESCRIPTION OF MINERAL PROPERTIES,
AND MINERAL CLAIMS STAKED IN 1983

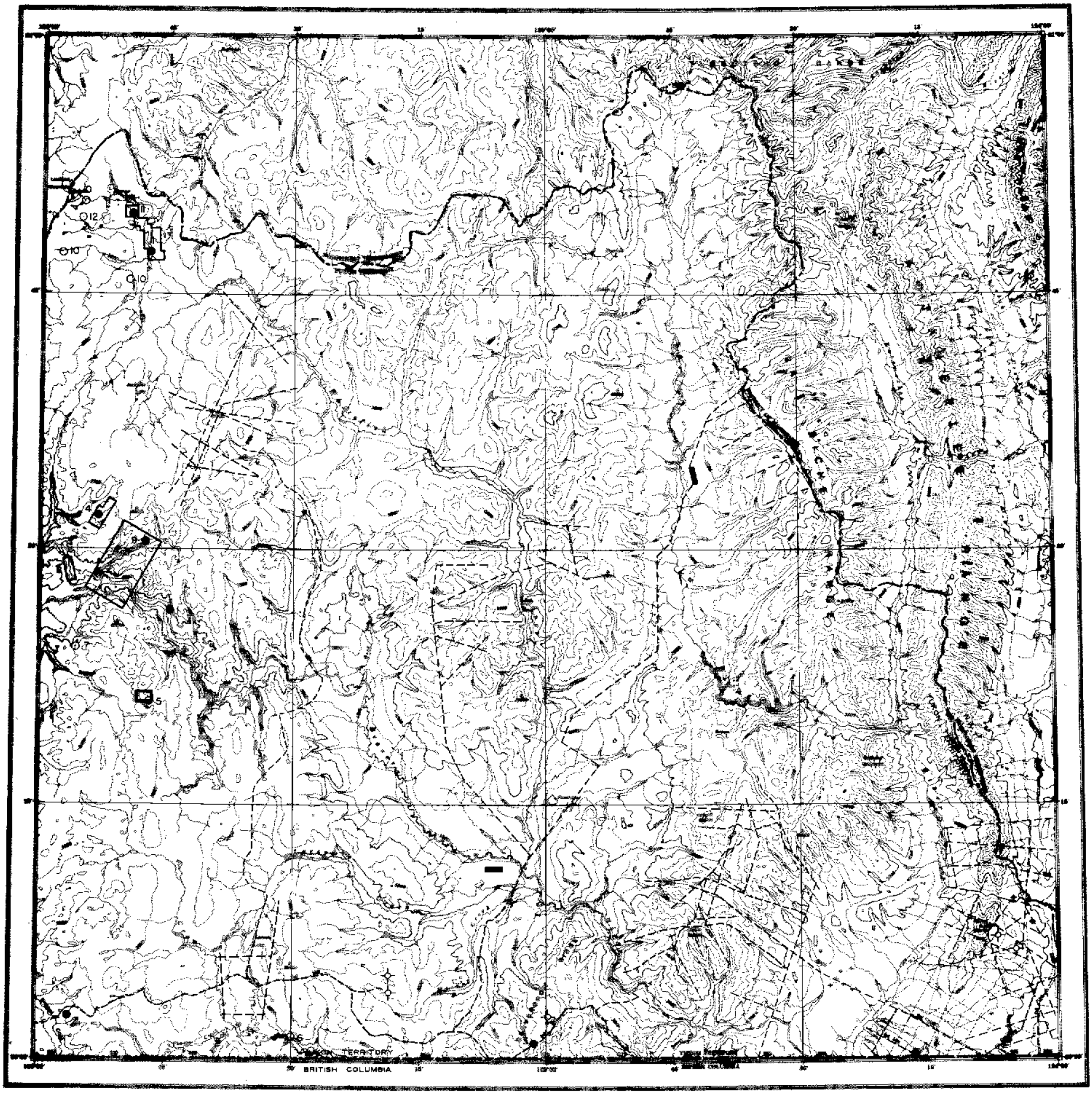
The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. They also give the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1983 are distinguished from those located earlier to emphasize areas that will focus future exploration. Also shown are lands withdrawn from staking due to Native Land Claims. The mineral claim information derives from maps of the Mineral Rights Division,and Native land claims information from maps of the Land Resources Division, both D.I.A.N.D., Yukon. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes a section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

The mineral occurrence list next the maps includes the occurrence type, the 50,000 N.T.S. map sheet number, the status of the property and a major reference. The status is number coded and closely follows the CANMINDEX "status" for the commodities present. These are coded and classified as follows: 1) the commodity is being produced; 2) the commodity has measurable reserves (ie. three dimensional data and grade) but has never produced; 3) the commodity has been produced and measurable reserves are present, but there is no present production; 4) the commodity has been produced and there are no measurable reserves; 5) two-dimensional data (e.g. length and width) and grade are available (public) but not enough to calculate reserves; 6) one-dimensional data (e.g. a drill hole, one trench); 7) commodity is present but insufficient data are available (public) to classify the status; and 9) a work target (no public information on presence of a commodity).

Further information concering the properties may be obtained from several sources. The National Mineral Inventory (NMI) is maintained by Department of Energy, Mines and Resources as a looseleaf file of property descriptions grouped according to the NTS system and within that according to commodity. A copy of the inventory is available for consultation at the D.I.A.N.D. Geology office in Whitehorse. The Northern Cordillera Mineral Inventory is an accurate and thorough private system maintained by Archer, Cathro and Associates (1981) Ltd. and is available from them on a fee and subscription basis.

95 C



LA BICHE RIVER

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

Mineral Deposit or Occurence see Key on facing page

Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

General Reference: GSC Map 1380A by: R.J.W. Douglas, 1976.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	POOL	Vein Ba	95 C 5	7	
2	TROPICAL	Occurrence Ba Pb Zn	95 C 4	7	
3	BEAVERCROW	Unclassified	95 C 3	7	D.I.A.N.D. Files, Log of SOBC Shell Beavercrow Well K-2 (Drilled 1963)
4	TING	Vein Pb Ag Zn	95 C 12	7	D.I.A.N.D. (1981, p. 131)
5	VISTA	Unclassified	95 C 5	9	D.I.A.N.D. (1982, p. 83); This Report
6	DUFFY	Unclassified	95 C 3,4		D.I.A.N.D. (1982, p. 83)
7	THOR	Occurrence Pb Zn	95 C 5	7	D.I.A.N.D. (1982, p. 83)
8	TRANZ	Unclassified	95 C 5	9	This Report
9	BEAV	Unclassified	95 C 5	9	This Report
10	DEEK	Unclassified	95 C 13		D.I.A.N.D. (1983, p. 81)
11	MARS	Unclassified	95 C 13	9	This Report
12	RUSH	Unclassified	95 C 13	9	D.I.A.N.D. (1983, p. 81)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

TRANZ — Geochemical Target
Archer, Cathro and Associates (1981) Limited — 95 C 5 (8)
(60°29'N,125°56'W)

Reference: D.I.A.N.D. (1983, p. 81).

Claims: TRANZ (14)

Source: Summary by P. Watson from assessment report 091459 by R.J. Cathro.

Description:

The claims were staked in 1982 by ZX Joint Venture (Chevron Canada Limited, Enterprise Exploration Limited and SMD Mining Company Limited) to cover a 1.5 km long string of tufa and ferricrete gossans anomalous in zinc, nickel and cobalt.

The lowermost unit mapped in the area is dolostone (300 m) of the Ordovician Sunblood Formation. This is overlain by up to 100 m of Ordovician - Silurian gritty quartz sandstone and quartz pebble grit. The Ordovician to Devonian Road River Formation graptolitic shale, cherty shale, dolomitic siltstone, silty limestone and minor coaly beds is up to 600 m thick. It is overlain by Devonian carbonate rocks, and Devono-Mississippian Lower Earn Group siliceous to cherty, carbonaceous shales (up to 900 m thick). Quartz arenite at the base of the overlying Carboniferous to Permian Mattson Formation grades upward into quartz sandstone and grit, shale and siltstone.

Current Work and Results:

The anomalous gossans appear to be associated with the Ordovician-Silurian sandstone-grit unit. A total of sixty-seven soil, eleven gossan and three rock samples were collected from the gossans. Values up to 2.7% Zn, 6,500 ppm Ni and 1,500 ppm Co were returned from the iron-rich gossans. Soil results were generally poor, possibly because of alluvial material in the area. Thirty rock chip samples were collected from the Road River Formation shales near the gossans. These were analyzed for copper, molybdenum, lead, zinc, silver, nickel, cobalt and vanadium. Results were generally low. No lead-zinc mineralization was seen on the property.

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BEAV — 95 C 5,12 (9)
Utah Mines Limited — (60°29'N,125°50'W)

Reference: D.I.A.N.D. (1983, p. 81).

Claims: BEAV 1-180

Source: Summary by P. Watson from assessment report 091486 by P. Burt.

History:

The claims, located approximately 170 km east-northeast of Watson Lake, on the Beaver River, were staked in 1982.

Description:

The claims lie along the eastern margin of the Selwyn Basin, near the facies boundary between platformal carbonate rocks and basinal shales.

The property is underlain by Upper Silurian to mid-Devonian and possibly younger sedimentary rocks. Eleven units have been tentatively identified. The lower nine are from 58 to 385 m thick and are: limestone, dolostone, quartzite, platey shale, siltstone, dolostone, mudstone, siliceous mudstone and shale. These are overlain by 1,300 m of interbedded limestone and shale, and 500 m of black shale.

Minor galena and sphalerite was found in unit 3 - quartzite and minor sphalerite occurs in unit 8 - dolostone. No sulphides were visible in unit 10 (interbedded limestone and shale) although these rocks contain high concentrations of zinc.

Current Work and Results:

Geochemical, geophysical and geological surveys were carried out in 1983. Approximately 2,000 soil samples and 100 rock chip samples, collected on a grid across the main anomalous zone, were evaluated for their silver, lead and zinc contents.

A pulse EM survey located one major EM conductor coincident with the main soil geochemical anomaly (lead-zinc-silver) which lies above a 50 m thick porcellanite (siliceous dolostone) unit. No surface mineralization was seen.

Several other lead-zinc-silver, lead-zinc or lead-silver soil anomalies were also delineated on the claims.

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MARS
Archer, Cathro and Associates (1981) Limited

Bedded Barite
95 C 13 (11)
(60°49'N,125°47'W)

Reference: D.I.A.N.D. (1983, p. 81).

Claims: MARS (49)

Source: Summary by P. Watson and K. Grapes from assessment report 091458 by R.J. Cathro.

Description:

The claims were staked in 1982 by ZX Joint Venture (Chevron Canada Limited, Enterprise Exploration Limited and SMD Mining Company Limited) to cover a carbonaceous mud flow associated with a vegetation kill zone. The claim block is located near the N.W.T. border, 180 km northeast of Watson Lake.

The Road River Formation in the area consists of up to 600 m of graptolitic shale, cherty shale, dolomitic siltstone, silty limestone and minor coaly beds with a unit of volcanic breccia and quartz feldspar porphyry in the upper portion.

The Devono-Mississippian Lower Earn Group consists of up to 900 m of siliceous to cherty, carbonaceous shales. The upper part of this unit contains orange-weathering septarian nodules. Two subdivisions were recognized in the Lower Earn Group. One is a soft, non-siliceous black shale. The second is an exhalite unit which occurs stratigraphically below the soft shale andconsists of siliceous, pyritic shale with thin barite laminations and anomalously high barium and iron. Outcrops weather a distinctive rusty-orange.

The 200 m thick, Carboniferous to Permian Mattson Formation overlies the Lower Earn Group. The lower quartz arenite and quartzite of this formation grade upward into quartz sandstone and grit, shale, sandstone and siltstone.

Current Work and Results:

During mapping in 1982, the exhalite unit was found to contain minor barite and pyrite at three occurrences.

All three occurrences consist of 2 mm thick laminae of barite, 1 to 2 cm apart, over a 70 m thickness. At occurrence A, visual estimates of 10% barite were reported. Soil samples collected in the vicinity were weakly anomalous in lead (63 ppm Pb), with background zinc values. At occurrence C, pyrite is interlaminated with barite over a thickness of 3 m. Pyrite and barite each comprise approximately 10% of the rock. Assays for silver, lead and zinc were uniformly low.

Soil, stream sediment, rock (140) and water (14) samples were collected in 1982. Lead values were consistently low with a maximum of 63 ppm Pb in soils; zinc values were weakly anomalous, up to 3,100 ppm Zn in ferricrete and 1,600 ppm Zn in rock; and silver values were variable, up to 6.6 ppm Ag. Streams draining the kill zone were strongly anomalous in iron, sulphate, zinc, lead and copper.

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1983 MINERAL CLAIMS STAKED

VISTA | 95 C 5 (5)
(60°21'N,125°38'W)

Claims 1983: KID 1-18

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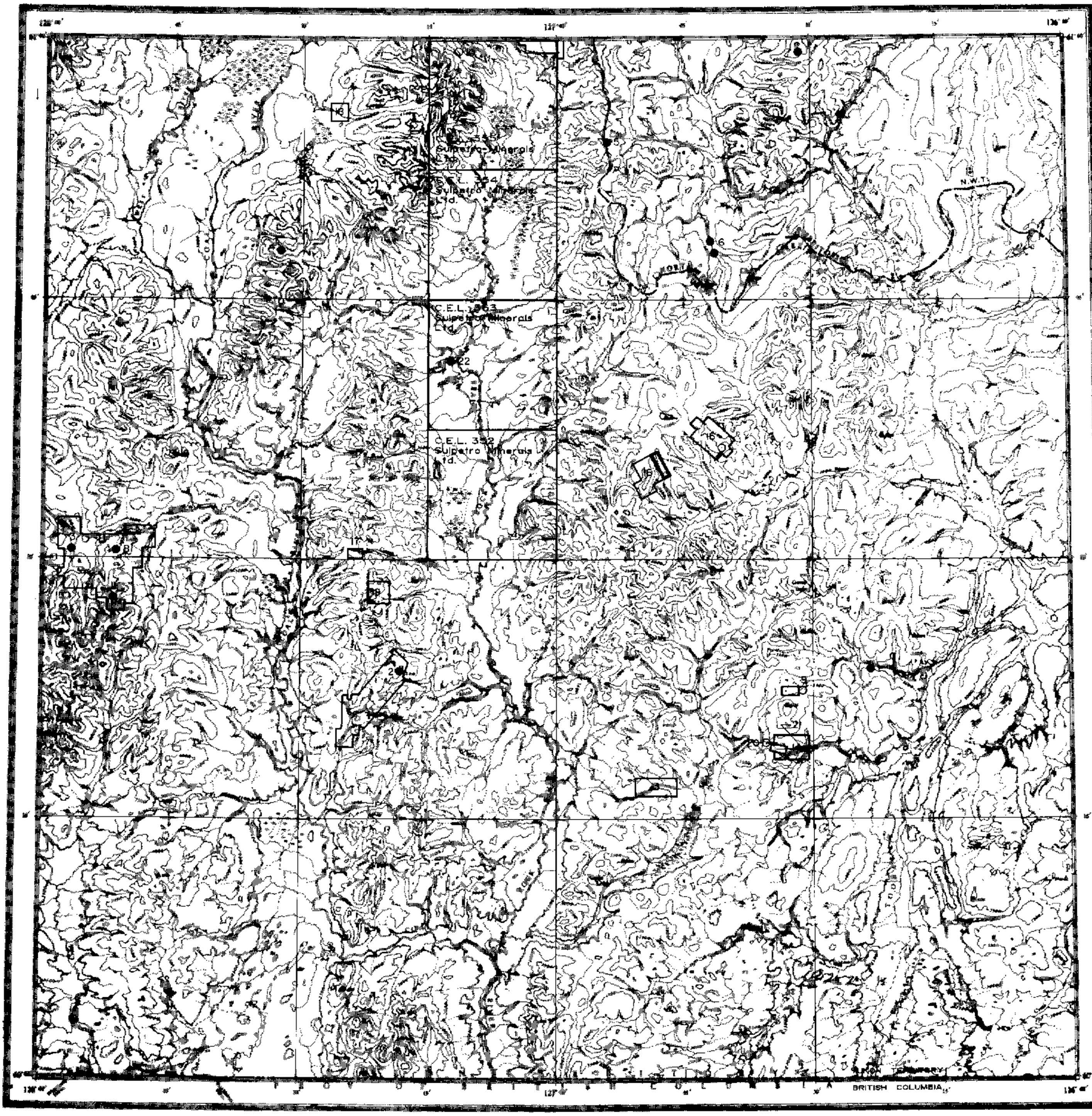
95 D



COAL RIVER

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

- Mineral Deposit or Occurence see Key on facing page
- Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

COAL RIVER MAP-AREA (NTS 95 D)

General Reference: GSC Map 11-1968 by: H. Gabrielse, 1969.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	GUSTY	Unclassified	95 D 8	7	Gabrielse & Blusson (1969, p. 16)
2	MEL-HOSER	Stratabound, Vein Pb Zn Ba	95 D 6	2	This Report; Miller and Wright (This Report)
3	McMILLAN	Stratabound Pb Zn Ag	95 D 12	2	D.I.A.N.D. (1982, p. 85); Vaillancourt (D.I.A.N.D., 1983, p. 73-77)
4	CHU	Skarn Pb Zn	95 D 13	7	
5	GABE	Unclassified	95 D 15	9	Gabrielse & Blusson (1969, p. 16), D.I.A.N.D. (1981, p. 133)
6	LAST	Unclassified	95 D 15	9	Lambert (1969, p. 21-23)
7	STONEMARTEN	Unclassified	95 D 15	9	Lambert (1969, p. 21-23)
8	PORKER	Unclassified	95 D 12	9	D.I.A.N.D. (1983, p. 83-84,87)
9	WOLF	Unclassified	95 D 7	9	D.I.A.N.D. (1982, p. 86)
10	SPORK	Unclassified	95 D 14	9	D.I.A.N.D. (1981, p. 133); D.I.A.N.D. (1982, p. 87)
11	CUZ	Unclassified	95 D 5	9	D.I.A.N.D. (1983, p. 83-84)
12	PLAY	Unclassified	95 D 12	9	D.I.A.N.D. (1983, p. 83,87)
13	LOOTZ	Unclassified	95 D 7	9	D.I.A.N.D. (1983, p. 83-84)
14	JT	Unclassified	95 D 7	9	D.I.A.N.D. (1983, p. 83-85)
15	OUDDER	Unclassified	95 D 10	9	D.I.A.N.D. (1983, p. 83,85)
16	DK	Unclassified	95 D 10	9	D.I.A.N.D. (1983, p. 83,85-86)
17	STAR	Unclassified	95 D 11	9	D.I.A.N.D. (1982, p. 86)
18	HERPES	Unclassified	95 D 14	9	D.I.A.N.D. (1983, p. 83,85-86)
19	QUO	Unclassified	95 D 6	9	D.I.A.N.D. (1983, p. 83,86)
20	LOBO	Unclassified	95 D 7	9	D.I.A.N.D. (1983, p. 83,86)
21	SPRUCE	Stratiform Zn Ba	95 D 7	7	This Report
22	ROCK RIVER COAL	Coal	95 D 11	2	D.I.A.N.D. (1982, p. 83,86); Long (This Report); Wright and Miller (This Report)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

MEL-HOSER — Lead,Zinc,Barite
Sulpetro Minerals Limited — 95 D 6 (2)
(60°23'N,127°20'W)

Reference: D.I.A.N.D. (1983, p. 83-84).

Claims: 96 claims: JONI (8), KELI (8), HOSE (8), EDY (7), JERI (8), SIN (8), OTT (8), TOMI (8), YANG (6), RALFO (7), MUMBO (8), CHUNGO (8), BOZ (4)

Source: Summary by P. Watson from assessment report 091471 by D.C. Miller.

Current Work and Results:

In 1983, work was carried out on the 96 claims that were added to the northeast of the MEL block in 1981.

A total of 228 soil, 10 stream sediment and 10 rock samples were collected and analyzed for zinc, lead and silver. This was part of a geochemical sampling and geological mapping program on the southern extension of the MEL-East grid, and on smaller grids on the RALFO, MUMBO and JONI claims.

On the JONI claims, 10 mineralized rock samples of approximately 2 kg each, taken over 1.0 to 1.7 m true width, contained 0.05 to 4.70% Zn, 9 to 110 ppm Pb and 0.4 to 1.0 ppm Ag. Mineralization consists of intensely silicified rock containing small grains of brown smithsonite pseudomorphs of sphalerite.

Soils were considered anomalous if they contained greater than 340 ppm Zn or 136 ppm Pb. Several anomalous values occur on the MEL-East grid extension and on the western part of the RAFLO claims. Silver values up to 1.2 ppm were determined, with the higher values generally associated with high lead values.

SPRUCE
SEREM Limited

Zinc, Barite
Stratiform
95 D 7 (21)
(60°19'N,126°32'W)

Reference: D.I.A.N.D. (1983, p. 83, 86).

Claims: SPRUCE 1-48

Source: Summary by P. Watson from assessment report 091453 by M.A. Stammers.

History:

The claims were staked in 1982 to cover zinc-barite soil geochemical anomalies and shale-hosted occurrences of barite, hydrozincite, pyrite and rare sphalerite.

Description:

The area is underlain by Ordovician to Devonian carbonaceous shale, siltstone and argillite of the Road River and Besa River Formation, with Ordovician Sunblood Formation dolomite to the northeast.

Current Work and Results:

Geological exposure is limited to stream canyons and a ridge to the north of the claim block. Sunblood Formation dolomite outcrops north of Spruce Creek, where it is fault-bounded on the west by younger shale and quartzite. Approximately 350 m of Road River Formation shale, siltstone and argillite contain minor showings of hydrozincite and pyrite in graphitic shale. Black clastic sedimentary rocks of the Devonian - Mississippian Besa River Formation outcrop north of the claims, and are overlain by quartzite and siltstone of the Carboniferous Mattson Formation.

Thin-bedded barite, as nodules or as semi-massive lenses, hydrozincite, pyrite and rare sphalerite were the only types of mineralization noted on the property.

Ninety-nine of one hundred and nineteen soil and stream sediment samples collected were analyzed for lead, zinc, silver and barite. The other 20 samples were analyzed for lead, zinc and silver. A coincident zinc-barite-silver soil anomaly covers a 300 m wide area in the eastern part of the sampling grid.

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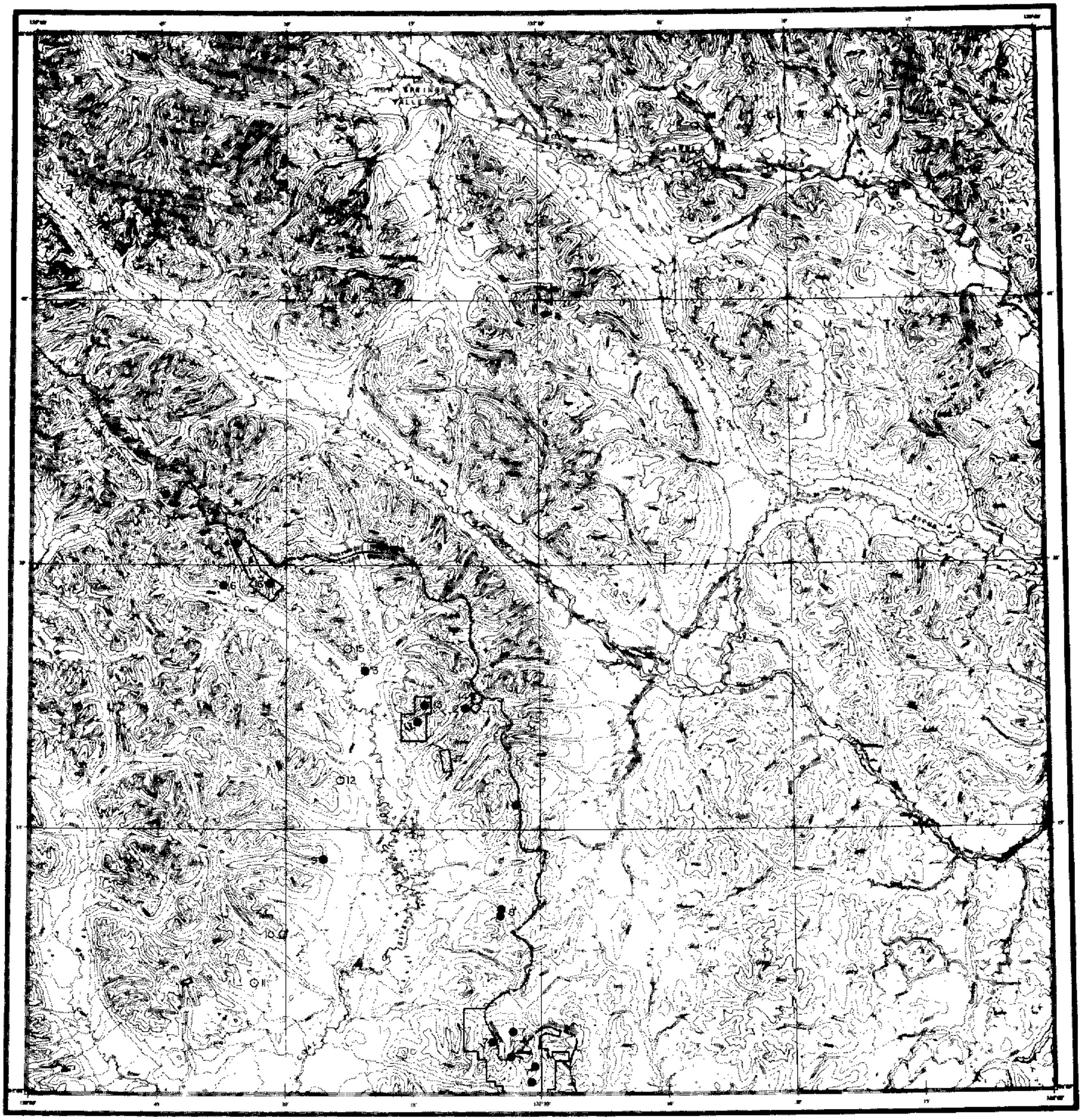
NOTES

95 E



FLAT RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

- Mineral Deposit or Occurence see Key on facing page
- Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

FLAT RIVER MAP-RIVER (NTS 95 E)

General Reference: GSC Map 1313A and Memoir 366 by:
H. Gabrielse, J.A. Roddick, S.L.
Blusson, 1973.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	TWIN (SUNSET)	Vein Cu Ag Pb Zn Au	95 E 6	6	Morin et al (1980, p. 50)
2	KOMISH	Skarn W	95 E 6	7	
3	MARION	Vein Ag Pb Zn	95 E 6	7	Mulligan (1964, p. 81); Gabrielse et al (1965, p. 28)
4	HEATHER	Skarn Zn Pb (Ag Sn)	95 E 12	7	
5	CAESAR	Skarn W	95 E 12	7	
6	CHARLIE	Skarn W Mo	95 E 5	7	D.I.A.N.D. (1981, p. 135)
7	IVO	Skarn W	95 E 3	6	D.I.A.N.D. (1983, p. 89)
8	SNEET	Skarn W	95 E 3	7	D.I.A.N.D. (1981, p. 136)
9	FYIQ	Skarn Pb Zn Cu	95 E 3	7	D.I.A.N.D. (1981, p. 136-137)
10	JOSE	Unclassified	95 E 4		D.I.A.N.D. (1981, p. 137)
11	NOWA	Unclassified	95 E 4		D.I.A.N.D. (1981, p. 137)
12	HOGIE	Unclassified	95 E 6		D.I.A.N.D. (1981, p. 137)
13	CREAM	Skarn W	95 E 6	7	D.I.A.N.D. (1983, p. 89)
14	LABELLE	Unclassified	95 E 6		D.I.A.N.D. (1981, p. 137)
15	ROSE	Skarn W	95 E 6	6	D.I.A.N.D. (1982, p. 90)
16	RIO	Skarn Ag Pb Zn	95 E 5	5	D.I.A.N.D. (1982, p. 90)
17	VNER	Unclassified	95 E 6		D.I.A.N.D. (1982, p. 90)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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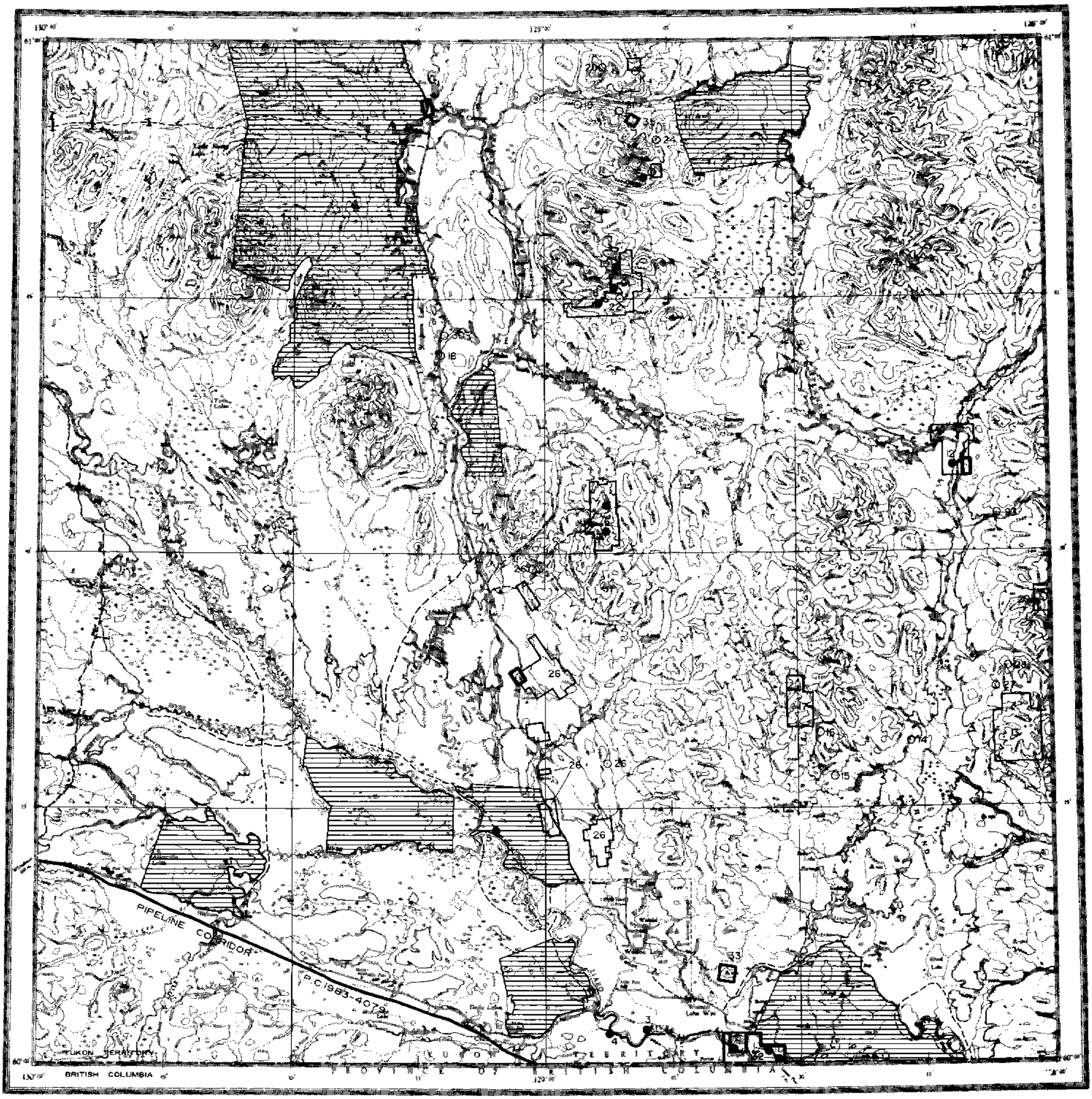
105 A



WATSON LAKE
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- Mineral Deposit or Occurence see Key on facing page
- Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

WATSON LAKE MAP-AREA (NTS 105 A)

General Reference: GSC Map 19-1966 by: H. Gabrielse, 1966.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	WATSON	Vein Ag Pb Zn	105 A 2	7	This Report
2	NAZO	Vein Ag Pb Ba	105 A 2	5	This Report
3	CAROL	Unclassified	105 A 2	9	Lord (1944, p. 19)
4	ALBERT	Unclassified	105 A 2	9	Lord (1944, p. 19)
5	SAWMILL	Unclassified	105 A 3	9	Lord (1944, p. 19)
6	HUNDERE	Skarn Pb Zn Ag	105 A 10	2	This Report
7	RITCO	Unclassified	105 A 10	9	Findlay (1967, p. 65-66)
8	OSCAR	Skarn W Cu Mo	105 A 10	7	
9	PAT	Skarn W Cu	105 A 15	2	D.I.A.N.D. (1981, p. 140)
10	MARTIN	Skarn W Cu	105 A 15	7	
11	NOTT	Vein Cu Pb W	105 A 15	7	D.I.A.N.D. (1982, p. 93-94)
12	WARBURTON	Vein Ag Cu Pb Zn	105 A 9	7	This Report
13	HYLAND	Unclassified	105 A 8	9	D.I.A.N.D. (1982, p. 94)
14	TILL	Unclassified	105 A 8		D.I.A.N.D. (1981, p. 141)
15	LING	Unclassified	105 A 8		D.I.A.N.D. (1981, p. 141)
16	TOMMY	Unclassified	105 A 8		D.I.A.N.D. (1981, p. 141)
17	CELESTIAL	Unclassified	105 A 8	9	D.I.A.N.D. (1982, p. 94)
18	FALSE	Unclassified	105 A 11		D.I.A.N.D. (1981, p. 141)
19	KLUNK	Unclassified	105 A 15		D.I.A.N.D. (1981, p. 141)
20	BLACK	Unclassified	105 A 15	9	D.I.A.N.D. (1982, p. 94-95)
21	MURRAY (RAY)	Unclassified	105 A 15	9	D.I.A.N.D. (1981, p. 140)
22	PEGASEUS	Unclassified	105 A 15	9	D.I.A.N.D. (1981, p. 141)
23	GUM BEE	Unclassified	105 A 9	9	Morin et al (1980, p. 51)
24	EMILY	Unclassified	105 A 15	9	Morin et al (1980, p. 52)
25	MARK	Vein W	105 A 15	7	Morin et al (1980, p. 52)
26	GE	Unclassified	105 A 7	9	This Report
27	CJ	Unclassified	105 A 8		D.I.A.N.D. (1982, p. 95)
28	MJM	Unclassified	105 A 8		D.I.A.N.D. (1982, p. 95)
29	AUP	Unclassified	105 A 8	9	D.I.A.N.D. (1983, p. 91-92)
30	CASHBOX	Unclassified	105 A 11		D.I.A.N.D. (1982, p. 95)
31	MOLLY	Vein Mo	105 A 15	7	D.I.A.N.D. (1982, p. 95)
32	P.D.	Unclassified	105 A 2		This Report
33	MEL	Unclassified	105 A 2		This Report
34	PUG	Unclassified	105 A 14		This Report
35	JACK	Unclassified	105 A 15		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

WATSON
P. Christopher
V. Legake
J. Micheal

Silver,Lead,Zinc
Vein
105A 2 (1)
(60°00'N,128°34'W)

Reference: Dawson (1899, p. 99).

Claims: MAN 1-24; PD 1-6

Source: G. Abbott briefly visited the property in 1983.

History:

The MAN claims were staked in early summer, 1983, and the PD claims were added by J. Legare and J. Micheal in the fall of 1983. J. Melnychuk, a previous owner, has extensively prospected the property and assayed selected samples. No physical work has been undertaken.

Description:

Galena- and sphalerite-bearing quartz veins are well exposed on the south bank of the Liard River about 200 meters downstream from the B.C.-Yukon border. Black, graphitic phyllite and olive green, thin bedded chert contain the veins. The black shales and chert are part of the Ordovician-Silurian Road River 'Group', and overlie thin-bedded, silty limestone of the Cambro-Ordovician Kechika Group.

Two phases of penetrative fabrics occur, the older being a foliation parallel, or sub-parallel to bed-ding. No related folds are present. The second fabric is a spaced cleavage that strikes southerly to southeas-terly and dips moderately westward. It is axial planar to assymetric, locally overturned folds.

Many lenses and veins of white bull quartz form a complex network within the host rocks. Most are less than 3 cm across, but a few are as wide as a metre. Coarse grained galena and sphalerite are erratically distributed in a few of the veins. Spectacular high grade specimens can be found, but overall grades are low. Malachite stains some specimens, but no primary copper mineral was identified.

The following evidence suggests that the veins were locally derived from their host rocks during both phases of regional deformation and low grade meta-morphism. Some veins parallel bedding, or phase 1 foliation, and are clearly deformed by phase 2 folds. Others parallel the early foliation, but connect to veins that parallel phase 2 cleavage. These veins are therefore younger than the others, and parallel the old foliation because it is a plane of weakness. No veins can be traced far, and none clearly crosscut the youngest penetrative fabrics. The quartz veins are confined to the graphitic shale and chert of the Road River 'Group'. Silty limestone of the Kechika Group hosts veins which have similar morphology, but compositions reflective of their host rock. These veins contain carbonate in addition to quartz and are barren. If the quartz veins are derived from their host rocks, the sulphides may come from metal-rich beds within that sequence.

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<u>NAZO</u>
C. Pete, M. Lutz
P.A. Christopher

Silver,Lead,Barite
Vein
105 A 2 (2)
(60°01'N,130°08'W)

Reference: D.I.A.N.D. (1982, p. 95,98); Abbott (this report).

Claims: ROMAN (1-20); ROM (25-44)

Source: G. Abbott briefly visited the property in 1983.

History:

The ROM (25-44) claims were staked in 1983.

Description:

Two veins of galena-bearing barite in black graphitic shale of probable Ordovician age are exposed on the south bank of the Liard River. Bedding dips moderately westward and is cut by a strong cleavage that strikes at 160° and dips steeply to the southwest. The veins parallel the cleavage. One vein is about 0.5 to 1.0 m wide and the other is about 0.3 m wide. The wider vein contains coarse grained, erractically distributed patches of galena and sphalerite in coarse grained white barite. The other vein is barren. A quartz feldspar porphyry dyke about 1 m wide parallels the mineralized vein along one edge. Other dykes and barren veins are known to occur nearby, on the north side of the river. The dykes resemble those near silver- and lead-bearing veins and replacements in the Rancheria District (Abbott, this report).

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<u>HUNDERE</u>
Cima Resources Limited

Lead, Zinc, Silver
Skarn
105 A 10 (6)
(60°31'N,128°53'W)

Reference: D.I.A.N.D. (1982, p. 93).

Claims: CIMA; MICA

Source: Summary by P. Watson from assessment report 091470 by A.D. Mutch.

Current Work and Results:

During July to September, 1982, nine NQ diamond drill holes, totalling 422.3 m, were drilled within a 50 by 50 m area on the eastern end of the south zone. In each hole, the upper and/or lower mineralized zones were intersected over 2.7 to 14.3 m, while in one hole, a third, deeper zinc-rich zone was intersected over 15.3 m.

In March, 1982, drill-indicated open pit reserves were estimated as:

West Zone 80,000 tonnes 15.6% Pb, 18.9% Zn, 80.91 g Ag/t,

East Zone 80,000 tonnes 6.8% Pb, 4.9% Zn, 323.32 g Ag/t.

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WARBURTON
Warburton Minerals Inc.

Silver, Copper
Vein
105 A 9 (12)
(61°33'N,127°27'W)

Reference: D.I.A.N.D. (1982, p. 95).

Claims: GREEN 1-4; RIVER 1-76

Source: Summary by K. Grapes from assessment reports 091519 by D.G. Mark and 091520 by H.J. Keyser.

History:

The GREEN claims were staked in 1965 and subsequently prospected. Trenching and reconaissance soil and silt sampling were conducted in 1981.

Description:

The GREEN and RIVER claims are located at the confluence of the Green and Hyland Rivers, 75 km northeast of Watson Lake.

The property is underlain by a conformable sequence of early Paleozoic shales and limestones, folded into a series of northwest-trending anticlines and synclines. The oldest exposed rocks are Hadrynian Grit Unit which are unconformably(?) overlain by a thick sequence of black argillaceous and calcareous sedimentary rocks of Cambrian and Ordovician age that occurs as an outlier in the "Grit Unit".

Black, carbonaceous, calcareous, silty shale is the predominant rock type on the property. It is rhythmically interbedded with black carbonaceous limestone, less than 2 m thick. The units are tightly folded with axial planes dipping to the northeast.

Current Work and Results:

In the summer of 1983, low-level airborne magnetic and VLF-EM surveys, and reconnaissance geological mapping were conducted.

The magnetic and VLF-EM surveys have outlined several lineations striking northeast across the property, indicative of faults, shear zones and/or contacts. Two broad magnetic highs, possibly indicative of intrusions underlying the sedimentary rocks, and several small anomalies, possibly reflecting intrusive dykes, were outlined.

Pyrite, galena, chalcopyrite, arsenopyrite, malachite, azurite and tetrahedrite have been found on the property. Tetrahedrite occurs in a 1.4 m wide quartz-carbonate vein in interbedded limestones and shales. A grab sample assayed 7,131 g Ag/t and 17.6% Cu. A chip sample across 60 cm of the vein returned 1,817 g Ag/t and 4.6% Cu with significant values in zinc, arsenic and antimony.

Quartz-carbonate veins are stratiform, stratabound and crosscutting. The largest veins (up to 1 to 2 m across) are of the stratiform and stratabound type. Some of the veins display zoning, with carbonate (+ limy inclusions) toward the margin and quartz in the middle.

A total of four soil and stream sediment samples were collected and analyzed for silver, copper and arsenic.

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GE
George R. Kent & Associates Ltd.

Geophysical Target
105 A 2,3,6,7 (26)
(60°17'N,128°55'W)

Reference: D.I.A.N.D. (1983, p. 91-92).

Claims: GE (943)

Source: Summary by P. Watson and K. Grapes from assessment report 091450 by Ager, Barretta and Ellis Inc.

Current Work and Results:

In August-September 1982, gravity surveys were carried out on parts of seven grids. Variations in topography and corresponding depth of overburden cover can account for most of the anomalous results, however surveys on three grids indicated potential mass at depth, or possibly a fault.

In the summer of 1983 Kerr Addison Mines Limited drilled five BQ holes, totalling 309.07 m, on GE 6 and two holes, totalling 297.5 m, on GE 639. Three of the holes did not reach the targeted depth.

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1983 MINERAL CLAIMS STAKED

WATSON — 105 A 2 (1)
P. Christopher and Associates Inc. — (60°01'N,128°38'W)

Claims 1983: ROM 17-20; 33-44; MAN 1-32

P.D. — 105 A 2 (32)
J. Legare — (60°00'N,128°33'W)

Claims 1983: P.D. 1-16

MEL — 105 A 2 (33)
J. McGrath — (60°05'N,128°38'W)

Claims 1983: MEL 1-16

GE
G.R. Kent and Associates Ltd.
105 A 6 (26)
(60°23'N,129°03'W)

Claims 1983: GE 612-884, 891-950

WARBURTON
Warburton Minerals Inc.
105 A 9 (12)
(60°35'N,128°09'W)

Claims 1983: RIVER 77-84

PUG
W. Taylor
105 A 14 (34)
(60°56'N,129°14'W)

Claims 1983: PUG 1-8

JACK
A. Black
105 A 15 (35)
(60°55'N,128°49'W)

Claims 1983: JACK 1-4

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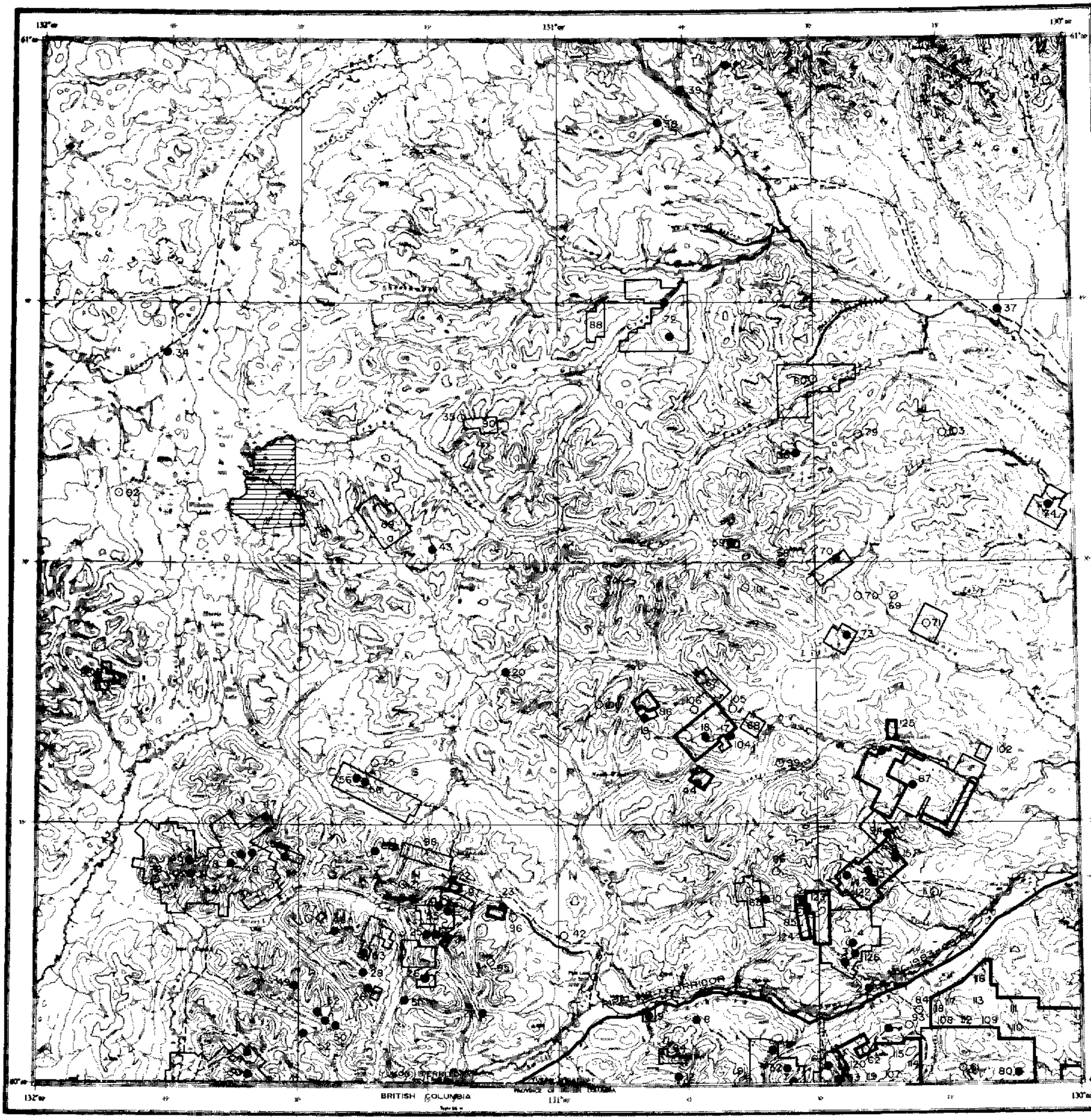
NOTES

105 B



WOLF LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30

Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

WOLF LAKE MAP-AREA (NTS 105 B)

General Reference: GSC Map 10-1960 by: W.H. Poole, J.A. Roddick and L.H. Green, 1960.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	LORD (IDAHO)	Vein, Replacement Au Ag Pb Zn	105 B 1	6	This Report
2	STERLING	Vein Ag Pb Zn	105 B 1	7	This Report
3	LUCK	Replacement Pb Zn Ag	105 B 1	6	D.I.A.N.D. (1981, p. 144)
4	FIDDLER	Vein Pb Zn Ag, Skarn W Mo	105 B 1	6	D.I.A.N.D. (1981, p. 144)
5	LENA	Vein Pb Zn Ag	105 B 1	7	This Report
6	DALE	Vein Pb Zn Ag	105 B 1	5	This Report
7	HOLLIDAY	Vein Ag Pb Zn	105 B 1	7	This Report
8	TROY	Occurrence Cu	105 B 2	7	
9	CARLICK	Unclassified	105 B 2	9	This Report
10	SHILSKY	Skarn Cu	105 B 2	7	
11	KUBIAK	Vein Pb Zn	105 B 1	7	
12	BLACK ROCK	Vein Ag Pb Zn Cu	105 B 2	7	
13	KODIAK	Vein, Replacement Pb Ag Zn	105 B 1	7	This Report
14	HARDTACK	Vein Pb Zn Ag	105 B 1	7	This Report
15	KERNS	Vein Ag Pb Zn Cu W	105 B 1	7	This Report
16	MEISTER	Vein Cu	105 B 8	7	
17	NITE	Skarn W Mo Zn	105 B 7	7	
18	MIDNIGHT (MID)	Skarn Pb Ag	105 B 7	7	This Report
19	AURORA	Vein, Skarn Ag Pb Zn Cu	105 B 7	7	This Report
20	ALMOST	Occurrence W	105 B 6	7	
21	HIDDEN (PONT B)	Skarn Pb Zn Cu W	105 B 3	7	Morin et al (1980, p. 56)
22	ATOM	Skarn Zn	105 B 3	7	D.I.A.N.D. (1981, p. 144); This Report
23	BAR	Skarn Zn Pb Ag	105 B 3	6	D.I.A.N.D. (1981, p. 144); D.I.A.N.D. (1983, p. 95,101); This Report
24	BOM	Skarn Zn Pb Ag	105 B 3	7	D.I.A.N.D. (1983, p. 95-96); This Report
25	MUNSON	Vein/Breccia Sn (W Mo Cu), Skarn Zn Pb W Cu	105 B 3	7	D.I.A.N.D. (1981, p. 145)
26	PARTRIDGE (VAL A)	Vein Sn, Skarn Zn	105 B 3	7	D.I.A.N.D. (1981, p. 147)
27	GEM	Pegmatite Topaz	105 B 3	7	D.I.A.N.D. (1981, p. 147)
28	VAL B	Skarn Sn Zn	105 B 3	7	D.I.A.N.D. (1983, p. 95-97)
29	LOGJAM	Vein Au Ag Pb Zn	105 B 4	5	D.I.A.N.D. (1983, p. 95,97,101); This Report
30	LOGTUNG (BERYL)	Porphyry W Mo	105 B 4	2	D.I.A.N.D. (1982, p. 98,105)
31	J.C. (VIOLA)	Skarn Sn	105 B 4	6	D.I.A.N.D. (1983, p. 95,97); Layne and Spooner (This Report)
32	POG	Vein Ag Pb Zn	105 B 1	7	This Report
33	TROUT	Vein Fe	105 B 12	7	
34	MUNG	Porphyry Cu	105 B 12	7	
35	IRVINE	Unclassified	105 B 11	9	D.I.A.N.D. (1981, p. 149)
36	TUNG	Skarn W	105 B 10	7	D.I.A.N.D. (1981, p. 149)
37	MOOSELICK	Vein Cu	105 B 9	6	Craig and Laporte (1972, Vol. 1, p. 138-139)
38	DOME	Vein Cu	105 B 15	7	Green (1966, p. 84)
39	OLD GOLD	Vein Cu	105 B 15	7	Findlay (1967, p. 64)
40	RAINBOW	Vein Cu	105 B 15	7	
41	PORCUPINE	Asbestos	105 B 16	7	D.I.A.N.D. (1982, p.106)
42	OULETTE	Unclassified	105 B 2	7	D.I.A.N.D., Mines and Minerals Activities (1971, p. 73); D.I.A.N.D. (1983, p. 95,101)
43	ZAK	Vein Ag Pb Zn Cu	105 B 11	7	Sinclair & Gilbert (1975, p. 80)

44	BOY	Vein Pb	105 B 7	7	D.I.A.N.D. (1981, p. 150); This Report
45	M.C. (SWIFT)	Vein Sn, Skarn Zn	105 B 4	6	D.I.A.N.D. (1982, p. 98-99)
46	DU	Vein Sn	105 B 4	6	D.I.A.N.D. (1982, p. 99)
47	I	Skarn Cu W Mo	105 B 5	7	D.I.A.N.D. (1982, p. 99,105)
48	SIN	Vein Sn	105 B 3	7	D.I.A.N.D. (1981, p. 152); D.I.A.N.D. (1982, p. 105)
49	VH	Skarn W	105 B 3	7	D.I.A.N.D. (1981, p. 152)
50	SLOUCE	Skarn Sn	105 B 3	7	D.I.A.N.D. (1982, p. 99,105)
51	SKIN	Vein Sn	105 B 3	7	D.I.A.N.D. (1981, p. 152)
52	MW	Skarn Sn Zn	105 B 3	7	D.I.A.N.D. (1982, p. 99)
53	MUN	Skarn Sn W	105 B 3	7	D.I.A.N.D. (1983, p. 95,97)
54	CAN	Skarn Sn	105 B 4	6	D.I.A.N.D. (1982, p. 100)
55	STQ	Vein Sn (Greisen)	105 B 3	6	D.I.A.N.D. (1981, p. 145)
56	HL	Replacement W	105 B 6	5	D.I.A.N.D. (1982, p. 100)
57	FUR	Unclassified	105 B 4	9	D.I.A.N.D. (1981, p. 155)
58	COM (54-59)	Occurrence Pb Zn	105 B 10	7	D.I.A.N.D. (1981, p. 155)
59	BINGY (COM (45-53))	Vein Pb Ag	105 B 10	7	This Report
60	CABIN	Unclassified	105 B 9,10	9	D.I.A.N.D. (1982, p. 100)
61	MIDWAY (TOOT)	Carbonate-hosted Pb Zn Ag, Stratiform Ba	105 B 1	2	D.I.A.N.D. (1983, p. 95,97-98); This Report
62	IDAHO				This occurrence is hereforth combined with the 1 LORD.
63	LUCKY (ANT)	Vein Ag Pb Zn	105 B 1	7	This Report
64	LICK	Unclassified	105 B 2	9	D.I.A.N.D. (1982, p. 101-102)
65	GOAT	Skarn W Mo Cu, Vein Zn Pb Ag	105 B 2	7	D.I.A.N.D. (1982, p. 102)
66	BESSEY	Unclassified	105 B 2		D.I.A.N.D. (1981, p. 159)
67	CARIBOU	Porphyry Mo	105 B 7	7	D.I.A.N.D. (1981, p. 156)
68	OAKE	Unclassified	105 B 7	9	D.I.A.N.D. (1981, p. 156)
69	URSUS	Unclassified	105 B 8	9	D.I.A.N.D. (1982, p. 103)
70	LOGAN	Vein Zn Ag Sn	105 B 9	6	This Report
71	MOOSE	Unclassified	105 B 8	9	D.I.A.N.D. (1981, p. 156)
72	TEAM	Skarn Zn W	105 B 10,15	7	D.I.A.N.D. (1982, p. 103,105)
73	LITTLE MOOSE	Vein Zn Pb Cu	105 B 8	7	D.I.A.N.D. (1981, p. 157)
74	WOLF	Stratiform Zn Pb Cu Ag	105 B 9	6	D.I.A.N.D. (1982, p. 103)
75	ICE	Unclassified	105 B 6	9	D.I.A.N.D. (1982, p. 103)
76	PLUG	Unclassified	105 B 4	9	D.I.A.N.D. (1981, p. 158)
77	PONT	Unclassified	105 B 3	9	D.I.A.N.D. (1981, p. 158)
78	ZINC	Unclassified	105 B 4	9	D.I.A.N.D. (1981, p. 158)
79	ELLE	Unclassified	105 B 9	9	D.I.A.N.D. (1981, p. 158)
80	HOT	Skarn W	105 B 1	7	D.I.A.N.D. (1981, p. 159)
81	BINGY				This occurrence was formerly misplotted, now see 59 COM (45-53).
82	GULL	Skarn Zn Pb (Ag Sn)	105 B 3	7	Morin et al (1980, p. 56); D.I.A.N.D. (1983, p. 95,101)
83	ANNI	Skarn Sn Zn	105 B 5	7	D.I.A.N.D. (1983, p. 95,98,101); This report
84	MAC	Unclassified	105 B 1		D.I.A.N.D. (1983, p. 95,101); This Report
85	LOST	Unclassified	105 B 2		D.I.A.N.D. (1982, p. 105)
86	PINESOL	Unclassified	105 B 7		D.I.A.N.D. (1982, p. 105)
87	MR	Replacement (?) Pb Zn Ag	105 B 8	7	This Report
88	STONEAXE	Unclassified	105 B 10	9	D.I.A.N.D. (1982, p. 104,105)
89	THRALL	Porphyry Mo	105 B 11	7	D.I.A.N.D. (1983, p. 95,99-100)
90	SOURCE	Vein, Skarn Pb Zn	105 B 11	7	D.I.A.N.D. (1983, p. 95,100)
91	BORDER	Unclassified	105 B 2	9	D.I.A.N.D. (1982, p. 104)
92	CO	Unclassified	105 B 12	9	D.I.A.N.D. (1982, p. 105)
93	LYDIA	Unclassified	105 B 1		D.I.A.N.D. (1983, p. 95,101); This report
94	CER	Unclassified	105 B 1		D.I.A.N.D. (1983, p. 95,101)
95	SEA	Unclassified	105 B 3		D.I.A.N.D. (1983, p. 95,101)
96	PARK	Unclassified	105 B 3		D.I.A.N.D. (1983, p. 95,101)
97	FALL	Unclassified	105 B 3		D.I.A.N.D. (1983, p. 95,101)
98	CRE	Unclassified	105 B 3		D.I.A.N.D. (1983, p. 95,101)
99	BEA	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)
100	SAB	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)

101	MEI	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)
102	GLEN	Unclassified	105 B 8		D.I.A.N.D. (1983, p. 95,102)
103	TOD	Unclassified	105 B 9		D.I.A.N.D. (1983, p. 95,100,102)
104	MAR	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)
105	OTH	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)
106	BRX	Unclassified	105 B 7		D.I.A.N.D. (1983, p. 95,101)
107	STAR	Unclassified	105 B 1		This Report
108	SUN	Unclassified	105 B 1		This Report
109	RUN	Unclassified	105 B 1		This Report
110	ERIC	Unclassified	105 B 1		This Report
111	CARL	Unclassified	105 B 1		This Report
112	WIND	Unclassified	105 B 1		This Report
113	DILL	Unclassified	105 B 1		This Report
114	MOON	Unclassified	105 B 1		This Report
115	BLUE	Unclassified	105 B 1	9	This Report
116	ZAM	Unclassified	105 B 1		This Report
117	CORD	Unclassified	105 B 1		This Report
118	XL	Unclassified	105 B 1		This Report
119	GARRETT	Unclassified	105 B 1		This Report
120	POND	Unclassified	105 B 1		This Report
121	ALAN	Vein Ag Pb	105 B 1	7	This Report
122	AG	Unclassified	105 B 1		This Report
123	SPENCER	Unclassified	105 B 1,2		This Report
124	JOHN	Unclassified	105 B 2		This Report
125	TONI	Unclassified	105 B 8		This Report
126	PETE	Unclassified	105 B 1		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

LORD (IDAHO)
Butler Mountain
Minerals Corporation

Gold,Silver,Lead
Vein, Replacement
105 B 1 (1)
(60°03'N,130°22'W)

References: Lord (1944); Abbott (this report).

Claims: YP 1-4; IDAHO (19)

Source: J.G. Abbott briefly visited the property in 1983 and examined some drill core with Barry Furneaux. Assessment report 091501 by B. and G.E. White was also summarized.

History:

Gossans were first reported by Lord in 1944. Since then the property has been intermittently staked and explored with bulldozer trenching, geochemical and geophysical surveys, and prospecting. A number of small, scattered gossans and galena veins were discovered. Several tonnes of high grade silver-bearing galena were mined, but never shipped.

Description:

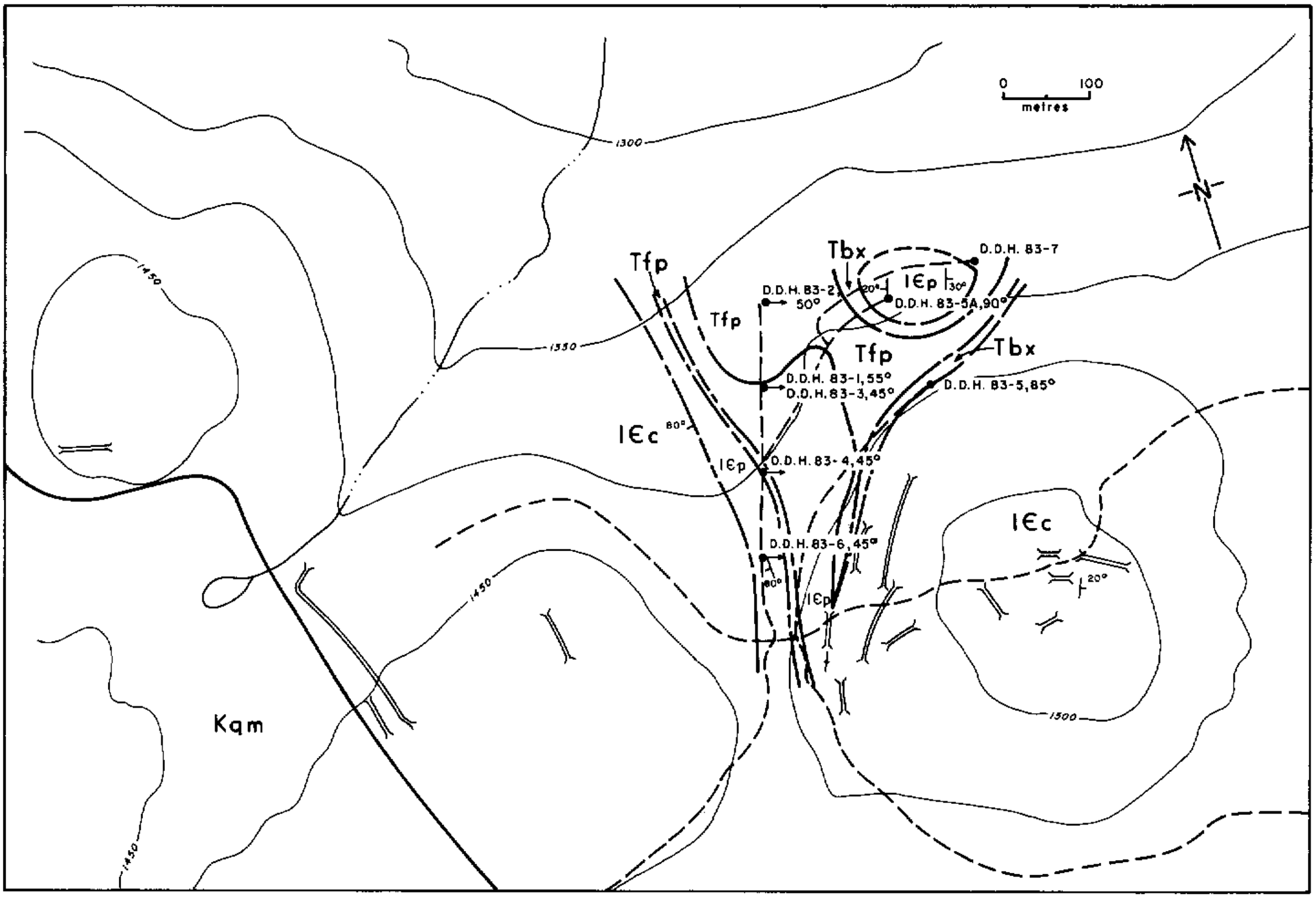
Drill holes intersected a north-trending, steeply-dipping zone of quartz porphyry dykes and related, erratically distributed breccias (Tbrx) and sulphides (Figures 1, 2 and 3). The dykes cut a lower unit of recessive limestone with interbedded phyllite, and an upper unit of resistant, massive dolomite and limestone (Cc). Poole (1960) considered the resistant upper unit to be Lower Cambrian; the recessive lower unit is not exposed. Mid-Cretaceous quartz monzonite (Kgm) of the Cassiar Batholith cuts the carbonate rocks about 500 m west of the mineralized zone but is older than and unrelated to the quartz porphyries and to the sulphides.

Breccias associated with the porphyries comprise angular fragments, 1 to 3 cm across, of carbonate, quartz porphyry, phyllite and sulphides. In most breccias, there is little or no matrix and open spaces commonly separate fragments. Clast composition varies and some breccias are mainly carbonate fragments whereas others are mainly quartz porphyry. Feldspars in porphyries are locally altered to clay but alteration is otherwise not obvious.

Pyrrhotite, pyrite, black sphalerite and lesser chalcopyrite, arsenopyrite and galena occur in quartz veins and as massive, coarse grained, vuggy aggregates. Mineral ratios vary widely, with some sulphide assemblages rich in pyrrhotite, and others rich in sphalerite. Grade and thickness are equally erratic.

The orientation and shape of sulphide lenses and their relationship to host rocks is unclear. Sulphides occur adjacent to quartz porphyries and within breccias and sedimentary rocks. Breccias contain sulphide fragments and are, at least in part, younger.

Bands of pyrrhotite that preferentially replace certain layers of a tectonic fabric were observed in a few pieces of core. These bands are folded and cut by another younger axial plane cleavage.



TERTIARY

Tbx breccia containing fragments of quartz porphyry, limestone, dolomite and phyllite

Tfp buff weathering quartz porphyry

CRETACEOUS

Kqm CASSIAR BATHOLITH- quartz monzonite

LOWER CAMBRIAN (?)

lЄc massive, buff weathering limestone and dolomite

lЄp recessive limestone interbedded with calcareous phyllite

—1500— elevation in metres

— — — road

bulldozer trench

●→ D.D.H. 83-2 diamond drill hole

geological contact defined, approximate

Figure 1 Geological map of the LORD (Butler Mountain) Property, modified from original by B. Furneaux and G. White.

Current Work and Results:

The claims were explored with geological mapping, geochemical surveys and a Vector pulse EM survey. Nine holes, totalling 2,381 m, were drilled in 1983.
The following are the sulphide intersections with significant precious metal content.

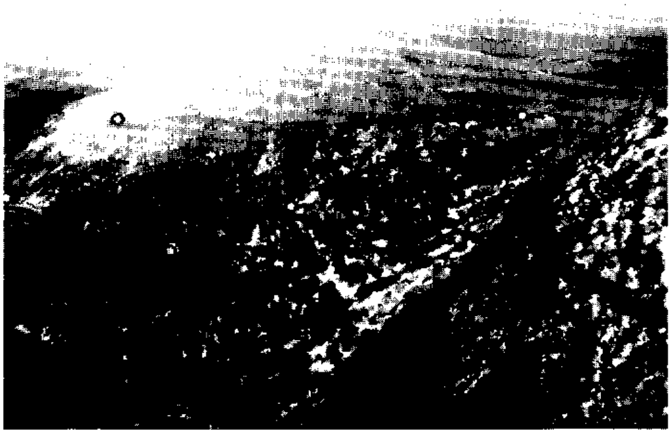


Figure 2 Looking southeast across the property. The main sulphide zone is parallel and directly east of the straight road in the trees. Drill sites are visible along it.

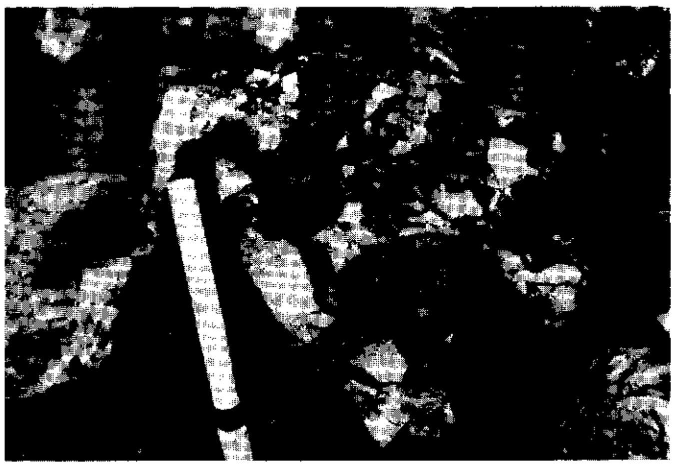


Figure 3 These breccias are exposed in trenches east of drill-hole 83-1. Manganiferous oxides cement angular fragments of phyllite, limestone and quartz porphyry.

DDH	SECTION FROM	TO (m)	WIDTH (m)	g Ag/t	ASSAYS g Au/t	% Pb	% Zn	% Cu
83-3	222.7 -	226.3	3.6	37.29	Tr	0.32	6.20	0.09
83-3	231.5 -	234.9	3.4	12.66	15.26	0.07	0.82	0.08
83-4	201.9 -	202.5	0.6	95.10	Tr	0.94	3.85	0.09
83-5	37.8 -	42.1	4.3	55.42	Tr	3.56	3.01	-
83-5	53.7 -	56.4	2.7	109.47	Tr	5.92	2.40	-
83-6	200.2 -	200.7	0.5	80.05	Tr	0.95	0.66	0.04
83-6	206.2 -	208.3	2.1	104.00	Tr	-	10.70	0.15
83-6	209.2 -	211.4	2.2	337.31	Tr	-	5.06	0.18

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<u>STERLING</u>

Silver,Lead,Zinc,
Copper,Gold Vein
105 B 1 (2)
(60°05'N,130°24'W)

References: Abbott (this report).

Claims: unstaked

Source: J.G. Abbott briefly visited the property in 1983.

Description:

Two small mineralized breccias and several scattered hand pits and small bulldozer trenches expose traces of oxidized, gossanous material. Showings and workings are exposed on a steep, open, south-facing slope. Mineralization is hosted by massive Lower Cambrian(?) dolomite within 200 m of the north-trending contact between the carbonate and the Cretaceous Cassiar Batholith. The upper showing is veinlike, vertical, about 1 m wide, exposed for about 60 m and trends at 065°. It is comprised of dark brown weathering carbonate fragments of white dolomite. A few specks of galena and possibly tetrahedrite occur within the carbonate. The vein is enclosed by a brecciated envelope about 2 m wide on either side. The breccia is made of buff dolomite fragments up to 2 cm across in a similar matrix.

A second breccia located 200-300 m down slope from the first, is exposed in a large hand trench. Within the breccia, a chaotic assortment of angular clasts 2-20 cm across are supported by a matrix of coarse grained white calcite. Clasts include buff dolomite, massive grey limestone and well foliated, dark and light grey limestone. The breccia is exposed over an area about 2 by 4 m. Along the north wall of the trench, breccia on the east side is in sharp vertical contact with massive white marble on the west side. The shape and size of the breccia is not certain, but enough barren carbonate outcrops are exposed within 50 m of the trench to suggest that it is small. Most of the breccia is barren but fragments in the dump show that coarse grained sphalerite, galena and pyrite form irregularly shaped, erratically distributed patches within the calcite matrix.

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LENA | Lead,Zinc,Silver
Canadian Occidental Petroleum | Vein
105 B 1 (5)
(60°10'N,130°33'W)

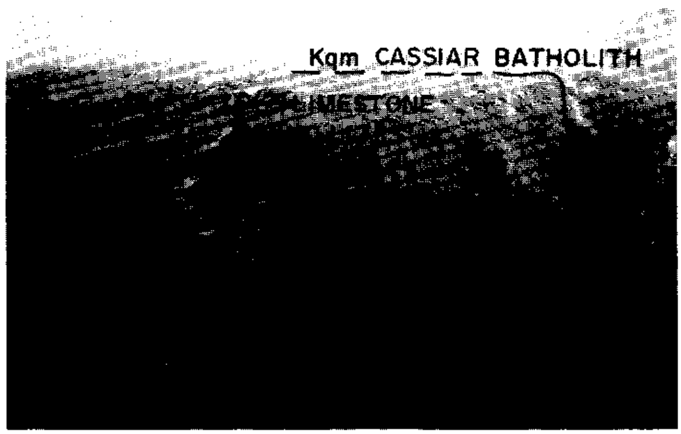
References: D.I.A.N.D. (1982, p. 105); Abbott (this report).

Claims: GARY 1-4

Source: J.G. Abbott briefly visited the property in 1983.

Description:

The GARY 1-4 claims are underlain by well laminated impure limestone, interbedded with massive grey marble and brown mica schist of probable Lower Cambrian age. The Cretaceous Cassiar Batholith intrudes the sedimentary rocks along the western margin of the claims. One of several old, partially overgrown bulldozer trenches (see photograph) exposes a few large boulders of vein material containing coarse grained black sphalerite, galena, pyrite and chalcopyrite in a matrix of fine grained, sugary quartz or coarse grained, light brown carbonate. Distribution of sulphides is erratic and many pieces of gangue are barren. Mineralized boulders reach 2 m across, but most are small, and there are few of them. No sulphides were seen in place and their setting is not known. Several prominent, north-trending lineaments that cross the property may be faults related to mineralization.



Looking west across the LENA Property.

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DALE | Lead,Zinc,Silver
Butler Mountain Minerals Ltd. | Vein
105 B 1 (6)
(60°01'N,130°29'W)

References: Green (1966, p. 79); D.I.A.N.D. (1983, p. 96; 1982, p. 97,105); Abbott (this report).

Claims: LOLA (18); L 1-4, GARRETT 1-36; GP 1-8

Source: J.G. Abbott briefly visited the property in 1983 and summarized a news release by Butler Mountain dated July 26, 1983.

Description:

A bulldozer trench across the crest of the ridge west of the east branch of Freer Creek exposes a galena-bearing quartz vein over a strike length of about 20 m (see photograph). The vein is less than 20 cm wide, strikes 75°, dips 60° north and cuts granodiorite of the Cassiar Batholith. A mafic dyke about 1 m wide roughly parallels the vein and cuts it in one place. Feldspars in the enclosing granodiorite are weakly altered to clay.

At least two diamond drill sites are less than 200 m east of the exposed vein. An adit, possibly as long as 200 metres, is collared in fresh intrusive rock east of the showing, near the base of the ridge. The adit is well below the hanging wall of the projected vein. The history and results of this work are unknown.

Current Work and Results:

Butler Mountain explored with a Vector pulse electromagnetic survey that showed several weak anomalies.

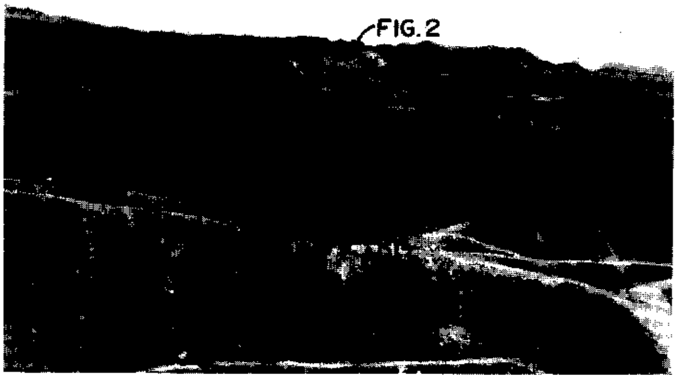

Figure 1 Looking west to the Dale Property. The vein is exposed in the trench along the ridgeline Note the adit on the hillside.

Figure 2 On the Dale Property, narrow, galena-bearing quartz vein and mafic dykes cut altered granitioid rocks of the Cassiar Batholith.

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HOLLIDAY (SWITCHBACK)
Klondike Silver Mines Ltd.

Silver,Lead,Zinc
Vein
105 B 1 (7)
(60°00'N,130°33'W)

References: Abbott (this report).

Claims: TONI 1-4; WILLY 1-4; ROLLY 1-8; ANT 13-64; BULL 1-8; A 1-4; REG 5-8; PHIL 5-8

Source: J.G. Abbott briefly visited the Discovery (Switchback) and Shipment (Chinese Trench) Veins in 1983 and summarized a private report entitled 'Detailed Exploration and Diamond Drilling on the Klondike Silver Property' for Terra Mining and Exploration Ltd. by Wayne Darch, Nov., 1981 and notes by F.J. Hemworth, Minister of Mines, B.C. Annual Report 1949, p. 69, 70.

History:

The Discovery (Switchback) Vein is one of several that are located at the headwaters of Freer Creek. The Shipment (Chinese Trench), Pit, Saddle and Lake veins are others. All are in British Columbia.

Allan F. Halliday and Roy R. Rouson first staked claims in 1947 when Halliday discovered two galena-bearing quartz veins. One, at the top of a mountain, was called the Discovery Vein; the other, at the foot of the east slope of the same mountain was called the Shipment Vein. In 1948, Yukon Ranges Exploration Syndicate optioned the property. A horse trail was constructed from the Alaska Highway and 4.5 tonnes of hand-sorted, high grade ore was mined and shipped to the Trail Smelter. The shipment assayed: 1.37 g Au/t, 1,374.98 g Ag/t, 65.4% Pb and 1.5% Zn. One hole of unknown length was drilled on the Shipment Vein during the 1950's. Since 1959, the showings have been staked repeatedly by Mr. Bruno Poulin of Klondike Silver Mines. In 1971, Bob Bailey discovered the Lake occurrence and in 1979, a road was completed from the Alaska Highway. In 1979 and 1980, Poulin trenched the Switchback and Pit prospects, and shipped 14 tonnes of high grade ore to the Trail Smelter. The shipment assayed 1.30 g Au/t, 532.01 g Ag/t, 0.16% Cu, 29.1% Pb and 13.9% Zn.

Description:

The Discovery Vein is on a steep north-facing slope. A vein of argentiferous galena and sphalerite is exposed in the uppermost of a series of switchback bulldozer trenches, and in outrcrop, 300 m southwest and 275 m above the trench. The vein strikes about 027°, dips about 55° east, and cuts altered granodiorite of the Cassiar Batholith. Alteration minerals include chlorite, sericite and some kaolinite with added quartz and pyrite. Alteration is intermittent, but locally, 30 m wide. Mafic dykes, as wide as 1 m, parallel the vein.

The Shipment Veins are 500 m southeast of the Discovery Vein. Five narrow veins containing galena and sphalerite strike 065° to 090° and are vertical.

The main vein is exposed for about 30 m in trenches, and is estimated by Darch to be as wide as 15 cm. Selected samples assayed as high as 2,071.05 g Ag/t, 70.0% Pb and 0.32% Zn.

The Pit Vein is 200 m north of the Shipment Veins. A vein of massive galena and sphalerite less than 15 cm wide is exposed in a trench about 15 m long and 2.5 m deep. The vein strikes 100° and dips 50° south. Gently plunging slickensides are visible in granodiorite along the margin of the vein.

The Lake and Saddle Veins are located between the Pit Veins and a small lake 2 km to the south. Boulder trains containing galena and sphalerite are associated with steeply dipping faults, alteration zones and mafic dykes that strike about 070° and 100°. The size and amount of mineralized float indicates that the veins are less than about 20 cm wide.

The Shipment Vein is exposed at the base of the far wall of this trench. It is about 20 cm wide.

Current Work and Results:

Terra Mining optioned the property in 1981, and explored with prospecting, geological mapping, rock assaying and VLF surveys. On the Discovery Vein, three holes, totalling 346.5 m, gave best intersections of 42.51 g Ag/t, 3.24% Pb, 0.24% Zn over 0.2 m; 4.11 g Ag/t, 0.1% Pb, 0.18% Zn over 1.0 m; and 4.80 g Ag/t, 0.44% Pb and 0.28% Zn over 1.0 m. The upper vein exposure assayed 185.16 g Ag/t, 6.89% Pb and 4.35% Zn over 0.5 m. Alteration associated with the vein averaged 3.43 g Ag/t, 0.38% Pb and 0.23% Zn in a series of 1 m chip samples across 30 m.

On the Shipment Veins, Terra drilled three holes, totalling 321.3 m. The best intersections were 4.11 g Au/t, 0.06% Pb and 0.28% Zn over 0.3 m; 17.49 g Ag/t, 0.43% Pb, 2.0% Zn over 0.4 m; and 137.16 g Ag/t, 15.4% Pb and 4.38% Zn over 0.1 m.

Terra drilled one hole 68.6 m long on the Pit Vein and intersected 17.14 g Ag/t, 3.48% Pb, and 2.94% Zn over 0.2 m. Samples from the Lake and Saddle Veins assayed as high as 1,200.11 g Ag/t, 2.38% Pb and 3.14% Zn, but most were less than 136.71 g Ag/t.

The Discovery, Shipment, Pit and Lake Veins were explored with VLF geophysical surveys.

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CARLICK 105 B 2 (9)
H. Hibbing (60°04'N,130°50'W)

References: Abbott (this report).

Claims: KIRK 1-4

Source: J.G. Abbott briefly visited the property in 1983.

History:

Hibbing staked the KIRK 1-4 claims in 1974, and later explored with bulldozer trenching.

Description:

A bulldozer trench about 75 m long, and nearby outcrops along the east side of Carlick Creek expose black and brown weathering mylonite within the Cassiar Fault Zone. The black rocks are graphitic, and similar to shales of the Road River Formation and the Nasina Series. They are tectonically interleaved with quartz muscovite chlorite 'schist' that is probably tectonized quartz monzonite of the Cassiar Batholith. The schist is variably altered to clay. The relationship between the two rock types is uncertain. Mylonite fabric dips moderately to gently westward and is cut by discrete faults that dip steeply westward. Slickensides on the faults plunge steeply. The black graphitic rocks contain a 1 m wide lens of white bull quartz that is oriented parallel to the late shears and cannot be traced laterally or vertically for more than 2 m. Light coloured, coarse grained pyrite forms a network of veinlets up to 3 cm wide within the quartz.

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KODIAK
Hardy International
J. Trace
McCrory Holdings

Lead,Silver Vein, Replacement
105 B 1 (13)
(60°11'N,130°24'W)

Reference: Green (1966, p. 44); D.I.A.N.D. (1983, p. 100); Abbott (this report).

Claims: DANE (1-11); JACK (33-79); AG (1-32)

Source: J.G. Abbott briefly visited the property in 1983.

Description:

Several small, galena-bearing veins and stratabound lenses are exposed in hand and bulldozer trenches over a 2 km segment of the ridge north of Spencer Creek. Calcareous phyllite and interbedded limestone of probable Lower Cambrian age host the showings. Steeply dipping fractures and faults (?) with strikes between 035° and 075° contain veins. Most veins are less than 2 cm wide and are oxidized to black or rusty coloured wad. Mafic dykes near the showings strike about 020°, dip about 075° southeasterly and are about 1 m wide.

In the most northwesterly trenches, two conformable lenses of black wad replace limestone beds. One end of each lens terminates abruptly against a northeasterly-trending fracture or fault which contains a narrow, intermittent 2-3 cm wide vein of similar material. One lens is about 4 m long and gradually decreases in thickness away from the vein, where it is about 30 cm wide. It consists of coarse grained, vuggy, black oxides that contain a few coarse grains of galena. The second lens is exposed in the end wall of a large trench, and most of it has been mined. The remaining portion is about 2 m long and 1 m wide. The mineralized zone is coarse grained, light brown carbonate (probably siderite) that is partially oxidized to black wad. Galena and some sphalerite occur as coarse disseminated grains within the oxides. Unlike the first lens, relict bedding and metamorphic layering are visible and can be traced from the mineralized black weathering carbonate into barren limestone. Boundaries of the mineralized zone are diffuse.

Elsewhere along the ridge, several other small patches, (less than 2 m²), of black oxidized material with some galena and sphalerite occur. Some of this material has a bedded appearance which most likely results from selective replacement of certain beds. None of these other zones clearly show a close relationship to faults or fractures.

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HARDTACK
D. Schellenberg

Lead,Zinc,Silver Vein
105 B 1 (14)
(60°12'N,130°26'W)

Reference: Green (1965, p. 44); Abbott (this report).

Claims: ORO 1-26

Source: J.G. Abbott briefly visited the property in 1983.

Description:

Several mafic dykes are exposed in a series of old bulldozer trenches that cross the crest of a ridge (see Figure 1). The green medium grained dykes cut gently-dipping, thin-bedded, phyllitic limestone of probable Lower Cambrian age, strike 030° to 050° and dip vertically. They range from 0.5 to 1 m in thickness, are weakly altered and weather orange.

Black manganiferous oxides replace limestone in zones up to a metre wide along the dyke margins. The oxides may derive from coarse grained, red weathered carbonate that is visible in some specimens. Breccias, comprised of altered fragments of wall rock(?) in an oxide matrix, are common. In places, breccias with a vuggy, milky white, quartz matrix also border the dykes. Wallrock is intensely fractured and invaded by stringers and coatings of orange carbonate alteration. No sulphides were seen.

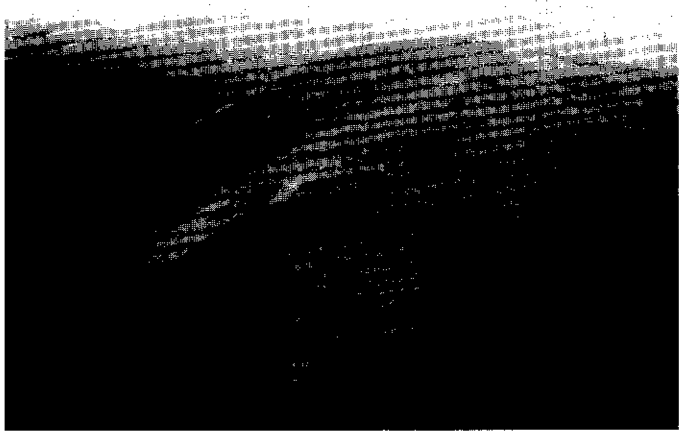

Figure 1 View looking northwest across the Hardtack Property. Dykes and alteration trend across the ridge, perpendicular to the trenches.

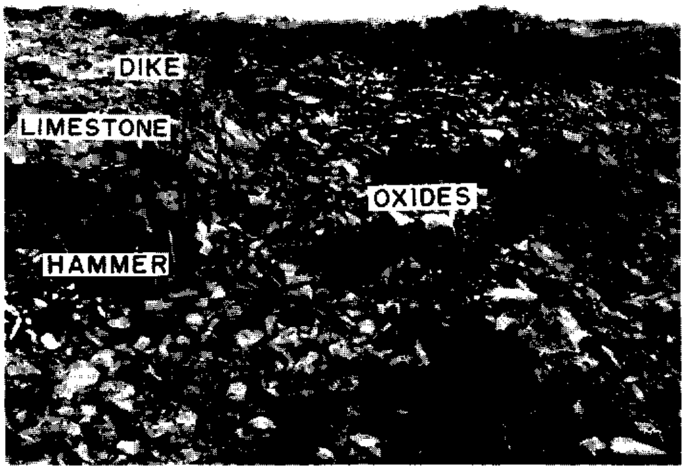

Figure 2 A vertical dyke (next to the hammer) cuts flat lying limestone. Manganiferous oxides replace limestone near the dyke.

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KERNS
McCrory Holdings Ltd.

Manganiferous Gossan
105 B 1 (15)
(60°13'N,130°20'W)

References: Abbott (this report).

Claims: JACK 1-32

Source: J.G. Abbott briefly visited the property. in 1983.

Description:

Near timberline, at the end of a ridge, two small pits have been blasted through talus into limestone bedrock. The limestone is probably Lower Cambrian. In one trench, a black and rusty gossan about 2 m^2 cuts sharply across bedding in limestone. No sulphides were observed. The second trench, about 20 m away exposes barren limestone. Fragments of mafic intrusive rocks are scattered throughout nearby talus.

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MIDNIGHT (MID)
McCrory Holdings Ltd.;
W. Hyde

Lead,Silver Vein, Replacement
105 B 7 (18)
(60°20'N,130°44'W)

References: D.I.A.N.D. (1983, p. 96); Abbott (this report).

Claims: CMC 1-104

Source: Property visit by J.G. Abbott in 1983.

Description:

Black manganiferous gossans occupy a fault and replace limestone beds within a Lower Cambrian schist and carbonate sequence at the eastern margin of the Cretaceous Cassiar Batholith. The mineralized fault dips steeply and strikes 045°. An apparent sinistral displacement of about 150 m is indicated by offset of northwest-trending bedding and the intrusive contact. Normal movement could also account for the offset. At least one other parallel fault was identified. Prominent airphoto lineaments mark these structures and indicate the presence of many others nearby. None have been explored.

Patches of vuggy, fine grained, black, manganiferous material up to 10 m wide can be traced for about 200 m along the fault. Similar material also forms conformable lenses within two limestone beds that intersect the fault. These lenses are about 50 m long and up to 5 m wide. Thickness of the lenses decreases away from the faults. Coarse galena, in rare patches up to 3 cm across, is the only sulphide mineral seen. In nearby outcrops, manganiferous veinlets a few centimetres wide occupy vertical, northeast-trending fractures and clearly crosscut older sphalerite bearing, garnet, pyroxene skarn that is likely related to the Cassiar Batholith. Scheelite and molybdenite are reported from this skarn (D.I.A.N.D., 1983, p. 96).

A second zone, parallel to, and about 50 m southeast of the first, is in altered biotite quartz monzonite. Two small trenches expose a galena-bearing quartz vein about 4 cm wide and a related zone of silicification and alteration 3 to 4 m wide and at least 50 m long. The silicified zone is poorly defined and is interspersed with altered intrusive rocks in which mafic minerals are altered to chlorite, and feldspars to clay. Quartz-rich zones are fine grained and vuggy. They may replace wall rock or fill open spaces. All of these rocks are intensely fractured. Black manganiferous wad, a pale green (scorodite?) and brown boxwork, and some fine grained galena coat most surfaces.

Current Work and Results:

Four small hand trenches were blasted in 1984. Two are across zones that replace limestone and two are across the vein within the intrusion. A 0.6 m chip sample across the vein assayed 4,135.9 g Ag/t, 18.3%

Pb and 0.72% Zn. Grab samples have assayed as high as 9,920.9 g Ag/t, 60.5% Pb, 0.93% Zn (T. McCrory, pers. com.).

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AURORA
B.A. Resources Limited

Silver,Lead,Zinc, Copper Vein
105 B 7 (19)
(60°21'N,130°50'W)

References: D.I.A.N.D. (1981, p. 159; 1983, p. 95,101); Abbott (this report).

Claims: RINGO 1-12

Source: J.G. Abbott briefly visited the property in 1983 and summarized assessment report 090849 by R.S. Adamson.

Description:

On the property, steep east-dipping, Lower Cambrian marble and overlying quartz mica schist are intruded by Cretaceous quartz monzonite of the Cassiar Batholith. In places the limestone is, altered to pale coloured calc-silicate minerals. The granitic rocks underlie the southwestern edge of the claims and also form a small outlier in the southeast corner.

An east-trending and steeply north-dipping vein about 30 cm wide is exposed in a hand trench about 10 m long. Barren outcrops near both ends of the trench indicate that the vein is short. It cuts limestone and consists of coarse grained black sphalerite, with some galena and chalcopyrite in a quartz and siderite gangue. Some parts of the vein are clearly banded, other parts are an erratic mixture of sulphides and gangue. Some vein material is slickensided.

Elsewhere within the area underlain by marble, fragments of black manganiferous oxide are common in felsenmeer. Adamson reports that the oxides replace marble and contain fine grained sphalerite, galena, and some pyrite and chalcopyrite. A few zones are exposed in outcrop, but none are more than 1 m across. The writer observed manganese staining on factures within the granitic rocks.

Current Work and Results:

In 1983, the property was explored with soil sampling, geological mapping and hand trenching. Approximately 400 soil samples were collected at 50 m intervals and at fill-in 25 m intervals. Several zones within a 200 by 300 m area are anomalous in lead, zinc, silver and manganese. Most anomalies are underlain by marble and calc-silicate rock; some are underlain by quartz monzonite.

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POG
Klondike Silver Mines Ltd.

Silver,Lead,Zinc Vein
105 B 1 (32)
(60°01'N,130°33'W)

References: Abbott (this report).

Claims: WILLY 5-8

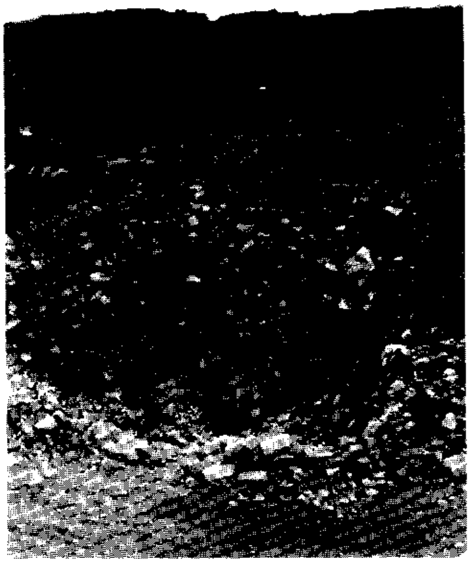
Source: J.G. Abbott visited the property in 1983 and summarized a private report entitled 'Detailed Exploration and Diamond Drilling on the Klondike Silver Property' by Wayne Darch for Terra Mining and Exploration Ltd.

History:

Chuck Willman was granted a five year lease on the WILLY 5-8 claims in 1980. The lease was cancelled in 1981. An adit was collared in 1982 but not driven far.

Description:

A narrow vein striking 080° and dipping 75° north cuts the Cassiar Batholith. The vein is in an east-facing cirque wall and is exposed for 60-90 m vertically and for an unknown horizontal distance. The vein may be a continuation of the Dale Vein, located on strike, 4 km to the east. Vein thickness reaches 50 cm. Coarse grained galena and sphalerite are erratically distributed within vuggy, milky white bull quartz. Vein contacts are sharp and the enclosing granodiorite is intensely fractured for about 50 cm on either side. These fractures parallel both the vein and a weakly developed fracture system that is widespread within the intrusion.



Looking west to the sulphide-bearing quartz vein on the POG Property. The vein occupies the recessive notch in the center of the icture. Note the collapsed adit at the base of the slope.

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BINGY (COM 45-53) | Lead,Silver Vein
P. Versluce estate | 105 B 10 (59)
(60°31'N,130°39'W)

References: Sinclair et al (1976, p. 159-160); D.I.A.N.D. (1981, p. 155); Abbott (this report).

Claims: AG 1-2

Source: J.G. Abbott briefly visited the property in 1983.

Description:

The BINGY (105 B (81)) occurrence was misplotted in previous YEG reports (D.I.A.N.D., 1983).It is the same as the COM 45-53 (105 B (59) occurrence. The claims are underlain by granodiorite of the Cretaceous Cassiar Batholith. Fragments of massive galena up to 10 cm across, black and rusty oxide fragments and black manganese coated intrusive fragments comprise the dumps of two small hand pits dug into felsenmeer and overburden. Weak airphoto lineaments suggest the possibility that the galena and alteration are related to north-trending faults.

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LUCKY (ANT) | Silver,Lead,Zinc
Klondike Silver Mines Ltd. | Vein
105 B 1 (63)
(60°00'N,130°26'W)

References: Abbott (this report).

Claims: ANT 1-16

Source: Summary by J.G. Abbott from a private report entitled 'Detailed Exploration and Diamond Drilling on the Klondike Silver Property' for Terra Mining and Exploration Ltd. by Wayne Darch, Nov., 1981.

History:

In 1972, Cone Mountain Mines explored the headwaters of the east branch of Freer Creek with a soil geochemical survey that resulted in anomalies as high as 31 ppm Ag. Two trains of silver-rich boulders were discovered in talus. A road was constructed, and an attempt to reach bedrock on the east side of the valley, in a single switchback bulldozer trench, failed.

Description:

At least six trains of boulders, containing fine grained argentiferous galena with lesser amounts of sphalerite, chalcopyrite, bornite and pyrite, and others of highly altered granodiorite boulders are in fresh granodiorite talus from the Cassiar Batholith. One train of boulders is on the B.C./Yukon border, the others are within 1 km of the border on the B.C. side. All but one are on the west side of east Freer Creek.

A zone of alteration within granodiorite is reported by Darch to occur in a blasted trench about 1 km north of the border, on the ridge crest west of east Freer Creek.

Current Work and Results:

Terra optioned the property in 1981 and explored with VLF geophysics, prospecting and diamond drilling. One hole, 91.4 m long, was drilled but failed to intersect significant mineralization. Forty-three assays from different mineralized boulders averaged

9,252.1 g Ag/t, 0.03 g Au/t, 0.43% Cu, 57.9% Pb and 0.74% Zn.

LOGAN
Regional Resources Ltd.;
Cordilleran Engineering

Zinc,Copper,Silver
Tin Vein
105 B 7,8,9 (70)
(60°30',130°28'W)

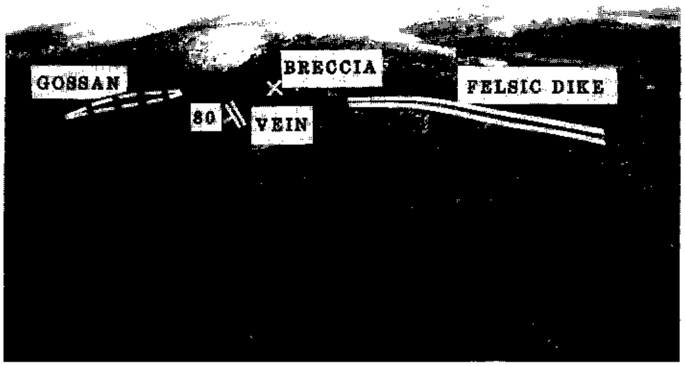
References: D.I.A.N.D. (1981, p. 156; 1983, p.98); Abbott (this report).

Claims: LOGAN 1-36

Source: J.G. Abbott briefly visited the property in 1983.

Description:

This property is underlain by coarse grained, pegmatitic muscovite granite of Cretaceous age. An east-northeast trending felsic dyke 5 to 10 m wide and at least 500 m long cuts the granite (see photograph). One hand trench exposes a vein about 1.5 m wide that trends at 073° and dips 080° south. Vein float can be traced for about 75 m and is then lost beneath overburden. A prominent gossan about 200 m west of the trench suggests that the vein continues in that direction.



View looking west across the Logan Property. A quartz breccia vein and felsic dyke cut Cretaceous, coarse-grained, muscovite-rich granotoid rocks.

Within the vein, crudely banded, coarse grained, black sphalerite, chalcopyrite, pyrite and arsenopyrite occur within a gangue of milky white quartz. In places arsenopyrite is segregated in the hangingwall side of the vein. Wall rocks are weakly altered to clay and are cut by iron-bearing quartz veins. Chip samples across the vein, collected in 1979, averaged 7.22% Zn, 65.74 g Ag/t and 0.73% Cu.

A small amount of vuggy quartz breccia float is located about 100 m northwest of the trend. A grab sample of this material assayed 1.42% Sn in 1979.

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MR
Regional Resources Ltd.
Getty Canadian Metals Ltd.
Cordilleran Engineering

Lead,Zinc,Silver
105 B 1, 8 (87)
(60°17'N,130°18'W)

References: D.I.A.N.D. (1983, p. 98-99); Abbott (this report).

Claims: MR 1-390

Source: Summary by J.G. Abbott based on a property visit in 1983 with M. Sanguinetti and assessment report 091518 by M. Sanguinetti.

Description:

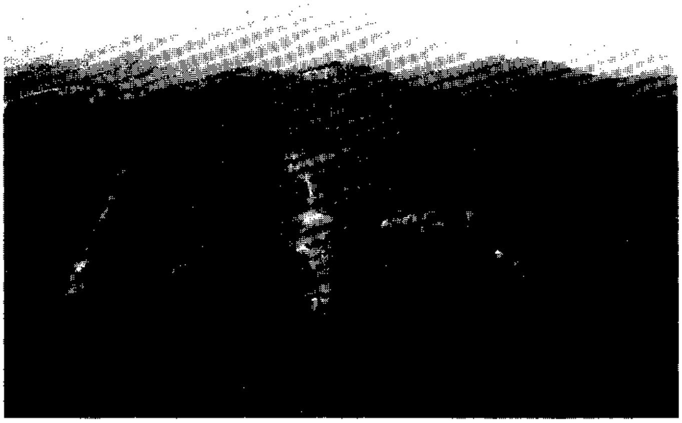
Significant mineralization is located in the West Zone which on surface is a north-trending, discontinuous gossan, vegetation kill zone and a lead-zinc-silver geochemical anomaly about 1 km long. Trenching and drilling revealed a steeply west-dipping, lead-, zinc- and silver-rich zone, 0-18 m thick comprised of layered, red, black, brown, purple iron and manganese oxides. The oxides include earthy, botryoidal and crystalline forms. Primary sphalerite and pods of massive galena are locally preserved.

The oxide zone is subparallel to the contact between an underlying unit of thick-bedded grey marble about 50 m thick and an overlying unit of grey, buff and orange sericite, chlorite, quartz phyllite. In detail, the oxide zone crosscuts bedding. Angular fragments of wall rock and zones of crushed white vein quartz in the oxides and foliation in galena suggest that the oxide zone is along a fault.

Current Work Results:

A road 19 km long was constructed into the property. Exploration work included geological mapping; 40.65 km of line-cutting; 2,532 soil, 98 stream sediment, 6 water and 93 chip samples; reconnaissance gravity surveys; electromagnetic and induced polarization tests and 50 small reconnaissance backhoe test pits on geochemical anomalies called the

South, Far West and Northwest zones. The West Zone was explored with seventeen trenches and five diamond drill holes, totalling 1076.6 m. A better than average trench intersection gave assay values of 47.55 g Ag/t, 0,32% Pb and 12.01% Zn over 14 m. A grab sample of galena assayed 2599.96 g Ag/t, 67.32% Pb and 0.23% Zn.



Looking east across the West Zone. Resistant west-dipping quartzite along the ridge is overlain by recessive limestone and phyllite which is host to the mineralization.

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BLUE
Acorn Resources Corporation

105 B 1 (115)
(60°02'N,130°24'W)

Claims: BLUE 1-8

Source: Summary by D. Emond from assessment report 091510 by P. Christopher.

History:

The BLUE claims were staked in February, 1983.

Description:

The claims straddle the contact of the Cassiar Batholith with sedimentary rocks of possible Cambrian age.

Current Work and Results:

In 1983, mapping was carried out at 1:5,000 scale, mainly on the BLUE 25 and 26 claims. Soil samples and VLF-EM readings were taken at 50 m intervals on lines spaced at 250 m. The samples were analyzed for lead, zinc and silver.

A north-striking fault runs through the saddle on BLUE 26, bringing limestone on the east (dipping steeply eastward) into contact with interbedded quartzite and phyllite on the west (dipping steeply westward). On the west side, the quartzite and phyllites are overlain by a 70 m thick black argillite or siltstone unit which is intruded by biotite quartz monzonite of the Cassiar Batholith. Several tan weathering, fine grained, leucocratic dykes intrude both the quartz monzonite and the sedimentary rocks.

A significant silver-lead-zinc anomaly has been located with a strike length of almost 2 km. Silver values range up to 5.2 ppm (0.5 ppm Ag threshold); lead ranges up to 168 ppm (21 ppm Pb threshold); and zinc ranges up to 350 ppm (100 ppm Zn threshold). In addition, several conductive structures were indicated by the VLF-EM survey.

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ALAN
Klondike Silver Mines

Silver,Lead Vein?
105 B 1 (121)
(60°02'N,130°35'W)

References: Abbott (this report).

Claims: S 1-4; REG 1-4; BABY P 1-6; BRU 1-36

Source: Summary by J.G. Abbott of a private report entitled 'Detailed Exploration and Diamond Drilling on the Klondike Silver Property' for Terra Mining and Exploration Ltd. by Wayne Darch, Nov., 1981.

History:

During the early 1970's, B. Poulin constructed a tote trail to the property and blasted some small trenches.

Description:

Granodiorite of the Cassiar Batholith is weakly altered, in part, to chlorite and sericite over an area of undetermined size. Within the altered zone, limonite stained patches are exposed in several closely spaced pits. Quartz and pyrite content of the granodiorite is higher within the stained patches. Assay values of samples taken from these patches ranged from 0.77 g Ag/t to 24.26 g Ag/t.

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1983 MINERAL CLAIMS STAKED

HARDTACK — 105 B 1 (14)
G. Boisvert — (60°12'N,130°27'W)

Claims 1983: ORO 1-26

MIDWAY — 105 B 1 (61)
Regional Resources — (60°03'N,130°03'W)

Claims 1983: TIM 1-160

MR — 105 B 1,8 (87)
Regional Resources — (60°17'N,130°18'W)

Claims 1983: MR 231-390

STAR — 105 B 1 (107)
W.E. England Drilling Co. Ltd. — (60°00'N,130°21'W)

Claims 1983: STAR 1-32; ACE 1-24

SUN — 105 B 1 (108)
W.E. England Driling Co. Ltd. — (60°04'N,130°16'W)

Claims 1983: SUN 1-30

RUN — 105 B 1 (109)
W.E. England — (60°04'N,130°11'W)

Claims 1983: RUN 1-28

ERIC — 105 B 1 (110)
Rio Alto Silver Resources Inc. — (60°03'N,130°07'W)

Claims 1983: ERIC 1-46

CARL — 105 B 1 (111)
L. Martin — (60°04'N,130°07'W)

Claims 1983: CARL 1-40

WIND — 105 B 1 (112)
Beaver Resources Inc. — (60°04'N,130°13'W)

Claims 1983: WIND 1-30

DILL — 105 B 1 (113)
Goldform Resources Ltd. — (60°05'N,130°12'W)

Claims 1983: DILL 1-32

MOON — 105 B 1 (114)
Oroteck Resources Corp. — (60°02'N,130°19'W)

Claims 1983: MOON 1-28

BLUE — 105 B 1 (115)
Acorn Resources Inc — (60°01'N,130°24'W)

Claims 1983: BLUE 1-38

ZAM — 105 B 1 (116)
M. Gardner — (60°06'N,130°12'W)

Claims 1983: ZAM 1-36

CORD — 105 B 1 (117)
Bellabon Resources Ltd. — (60°05'N,130°15'W)

Claims 1983: CORD 1-38

XL — 105 B 1 (118)
R. Ellwood — (60°04'N,130°17'W)

Claims 1983: XL 1-8

GARRETT — 105 B 1 (119)
Butler Mountain Minerals Corp — (60°01'N,130°26'W)

Claims 1983: GARRETT 1-36

ALAN — 105 B 1 (121)
T. McCrory — (60°13'N,130°22'W)

Claims 1983: JACK 1-75; 78-79

AG — 105 B 1 (122)
G. Clark — (60°10'N,130°25'W)

Claims 1983: AG 1-37

SPENCER — 105 B 1,2 (123)
Regional Resources — (60°10'N,130°30'W)

Claims 1983: SPENCER 1-60

JOHN — 105 B 2 (124)
B. Bailey — (60°20'N,130°32'W)

Claims 1983: JOHN 1-16

ATOM — 105 B 3 (22)
D. Schellenberg — (60°11'N,131°13'W)

Claims 1983: QUEEN 1-4

BAR — 105 B 3 (23)
H. Hibbing — (60°10'N,131°07'W)

Claims 1983: BEST 1-8

BOM — 105 B 3 (24) (60°09'N,131°12'W)

Claims 1983: MOD 1-4

ANNI — 105 B 5 (83) (60°23'N,131°52'W)
J.C. Stephen Exploration Ltd.

Claims 1983: JAR 9-12; 17-19; 21-22; 31-32

AURORA — 105 B 7 (19) (60°22'N,130°50'W)
B.A. Resources

Claims 1983: RINGO 13-26

MIDNIGHT, BOX — 105 B 7 (18, 44) (60°20'N,130°44'W)
W. Hyde;
T. McCrory

Claims 1983: CMC 25-120

TONI — 105 B 8 (125) (60°20'N,130°21'W)
B. Poulin

Claims 1983: TONI 1-8

COM — 105 B 10 (59) (60°32'N,130°40'W)

Claims 1983: AG 1-2

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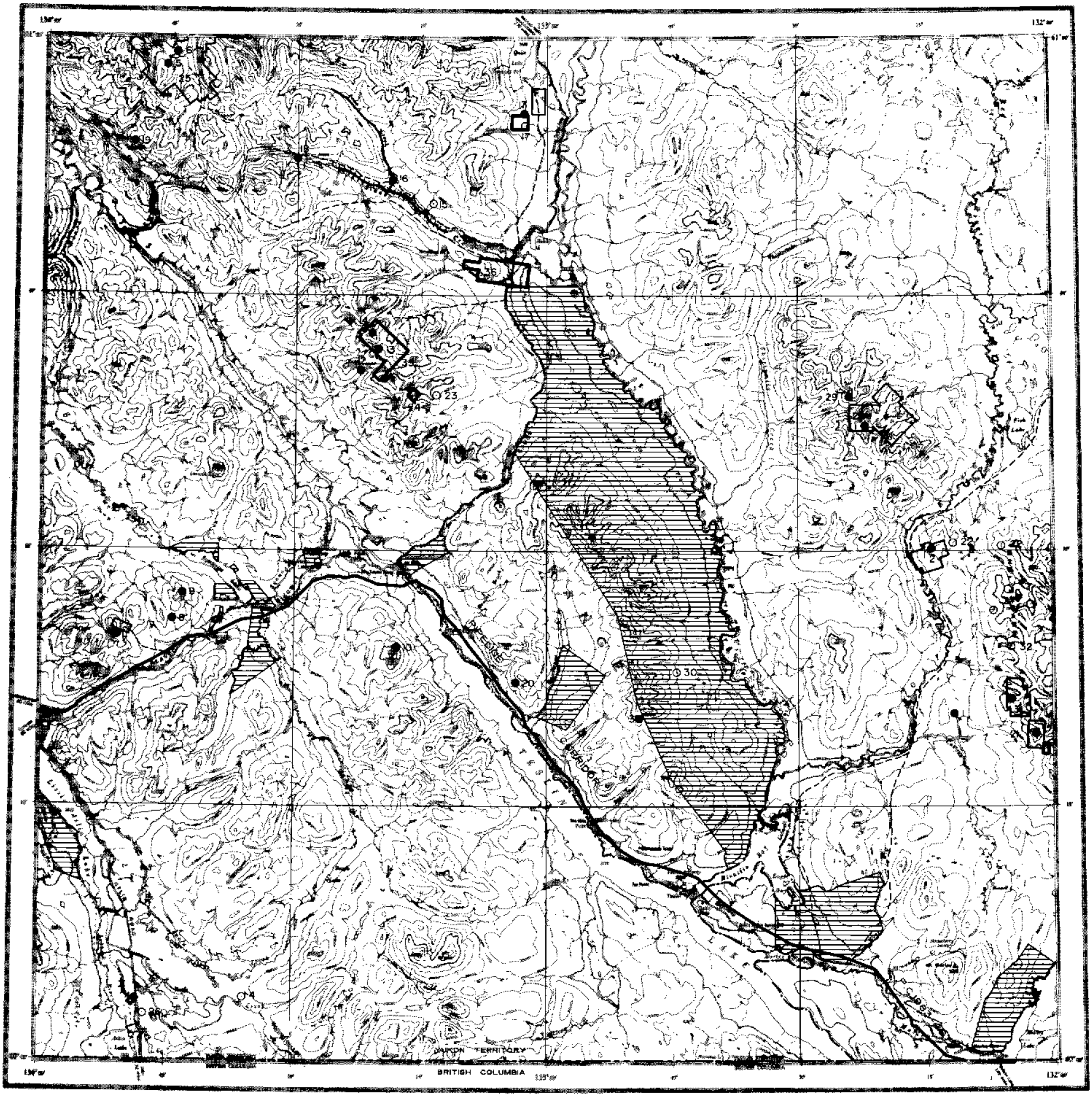
NOTES

105 C



TESLIN

YUKON TERRITORY

5 0 5 10 15 20 25 30

Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

⊙ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

TESLIN MAP-AREA (NTS 105 C)

General Reference: GSC Map 1125A and Memoir 326 by:
R. Mulligan, 1963.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	KITCHEN	Vein Ag Pb	105 C 8	7	
2	BAR (SMEG)	Stratiform Pb Zn Ag Ba	105 C 9,8	6	This Report
3	LINCOLN	Unclassified	105 C 7	9	Mulligan (1963, p. 78)
4	TARFU	Unclassified	105 C 4		
5	SLATE (SM)	Vein Ag Pb Zn	105 C 13	7	
6	RED MOUNTAIN	Porphyry Mo	105 C 13	2	D.I.A.N.D. (1983, p. 105-106)
7	RIBA	Asbestos	105 C 5	7	
8	SEAFORTH	Asbestos	105 C 5	7	
9	SQUANGA	Asbestos	105 C 5	7	
10	HAYES PEAK	Asbestos	105 C 6	7	Mulligan (1963, p. 78); D.I.A.N.D. (1982, p. 111)
11	GUNSIGHT	Asbestos	105 C 11	7	D.I.A.N.D. (1981, p. 162)
12	MOOSE HILL	Vein Pb	105 C 11	7	Lees (1936, p. 24); D.I.A.N.D. (1982, p. 111)
13	MARLIN	Occurrence Mn	105 C 11	6	This Report
14	MT. GRANT	Vein Cu	105 C 11	7	This Report
15	DRY	Unclassified	105 C 14		
16	IRON CREEK	Occurrence Ag Au	105 C 14	7	
17	LINDSAY	Unclassified	105 C 14	9	D.I.A.N.D. (1981, p. 162); This Report
18	SIDNEY	Unclassified	105 C 14,13	9	Mulligan (1963, p. 77)
19	ROSY	Unclassified	105 C 13	7	Bostock (1936, p. 6)
20	DEADMAN	Vein Ag Pb	105 C 6	7	
21	JACKALOO	Skarn Cu Fe	105 C 8	7	This Report
22	ABBA	Skarn Fe, Granite-associated U	105 C 9	7	D.I.A.N.D. (1983, p. 105-106,109)
23	FORSURE	Unclassified	105 C 11		D.I.A.N.D. (1981, p. 162)
24	CHRIS	Unclassified	105 C 11		D.I.A.N.D. (1981, p. 162); This Report
25	NW	Occurrence Mo Cu	105 C 13	7	D.I.A.N.D. (1983, p. 105,107)
26	LISA	Unclassified	105 C 14		D.I.A.N.D. (1981, p. 162)
27	MICH	Unclassified	105 C 8	9	D.I.A.N.D. (1981, p. 162)
28	ORK	Skarn Sn W Cu Ag	105 C 9	7	This Report
29	MINDY	Skarn W Sn	105 C 9	6	D.I.A.N.D. (1983, p. 105,107,109)
30	STARTIP	Unclassified	105 C 7	9	Morin et al (1979, p. 78-79)
31	DB	Skarn Sn W	105 C 8	6	This Report
32	BAS	Skarn Cu Fe	105 C 8	7	D.I.A.N.D. (1982, p. 111)
33	GRIZZLY	Unclassified	105 C 13	9	D.I.A.N.D. (1983, p. 105,108-109)
34	SAYEH	Unclassified	105 C 6	9	D.I.A.N.D. (1983, p. 105,108)
35	CAT	Unclassified	105 C 11		This Report
36	ED	Unclassified	105 C 14		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

BAR (SMEG)
Cambac Resources Ltd.

Lead,Zinc,Silver,
Barite Stratabound
105 C 8,9 (2)
(60°30'N,132°14'W)

Claims: BAR 1-36, 39-46

References: D.I.A.N.D. (1983, p. 105).

Current Work and Results:

Cambac Resources Ltd. conducted geological mapping, geophysical surveying and trenching in 1983. The north part of the claims was mapped at 1:5,000 scale while the BAR 21 and 22 claims were mapped at 1:500 scale. Nineteen soil samples and seventeen rock samples were collected and analyzed for zinc, lead, gold and silver. An IP anomaly located in 1976 was resurveyed using VLF-EM, IP and Pulse EM methods. The anomaly was extended to approximately twice its original size. Three trenches were blasted and hand dug to an average depth of 1.2 m on the BAR 21 and 22 claims.

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JACKALOO — Copper, Iron Skarn
J.C. Stephen Exploration Ltd.; D.C. Syndicate
105 C 8 (21)
(60°19'N,132°02'W)

Reference: D.I.A.N.D. (1983, p. 105,106).

Claims: CAL 1-26

Source: Summary by P. Watson from assessment report 091488 by J.C. Stephen and H. Awmack.

Current Work and Results:

In 1983, detailed geological and magnetometer surveys were carried out on these claims.

The magetometer survey was conducted over an area indicated by previous United Keno Hill Mines Limited sampling to have anomalous copper values in soil. The survey was conducted to test east-northeast trending fractures, however, the results were masked by magnetite in the volcanic rocks.

The main showing was re-examined and found to consist of small chalcopyrite and bornite pockets exposed over less than 10 m and estimated to grade 1.5% Cu over 1.5 m.

Two tourmaline and garnet skarns containing low tin and tungsten values appear to follow the sedimentary rock - batholith contact, rather than a sedimentary unit.

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ORK — Tin, Tungsten, Copper, Silver Skarn
J.C. Stephen Explorations Ltd.; D.C. Syndicate
105 C 9 (28)
(60°38'N,132°22'W)

References: D.I.A.N.D. (1983, p. 15,105,107,109).

Claims: ORK 1-44

Current Work and Results:

Two trenches, blasted and sampled on the ORK 44 claim, returned subeconomic values in 1983. Claims 39-44 were surveyed with magnetometer, I.P. and Pulse EM. Reconnaissance mapping at 1:5,000 scale was conducted over the claims, with detailed mapping (1:500) conducted on the ORK 43, and 44 claims (Waterfall Zone).

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DB — Tin, Tungsten Skarn
J.C. Stephen Explorations Ltd.; D.C. Syndicate
105 C 8 (31)
(60°22'N,132°05'W)

Reference: D.I.A.N.D. (1983, p. 105, 107).

Claims: FF 1-46

Source: Summary by P. Watson from assessment report 091485 by J.C. Stephen.

Current Work and Results:

Additional magnetometer and geological surveys were conducted in 1983 to investigate the apparent down dip extension of the main skarn exposure and to search along strike to the east and west.

A wide variety of small skarn occurrences were mapped, ranging from unmineralized calc-silicate skarn to massive, fine grained magnetite with scheelite skarn pods.

The magnetometer survey indicated that the magnetite - rich portion of the skarn extends at least 200 m to the east of the outcrop exposures. To the west, either because of lack of magnetite or due to the severe topography, the skarn was not well defined by the magnetometer survey.

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1983 MINERAL CLAIMS STAKED

JACKALOO (McCLEERY) — J.C. Stephen Exploration Ltd.
105 C 8 (21)
(60°18'N,132°01'W)

Claims 1983: CAL 1-2

MARLIN, MT. GRANT, CHRIS
McCrory Holdings (Yukon) Ltd;
A. Thom

105 C 11 (13,14, 24)
(60°42'N,133°20'W)

Claims 1983: EVE 1-76

CAT
Harvest Resources Ltd.

105 C 11 (35)
(60°40'N,133°20'W)

Claims 1983: CAT 1-6

LINDSAY
M. Lindsay

105 C 14 (17)
(60°55'N,133°03'W)

Claims 1983: LINDSAY 1-8; 23-30

ED
B. Poulin

105 C 14 (36)
(60°46'N,133°05'W)

Claims 1983: ED 1-80

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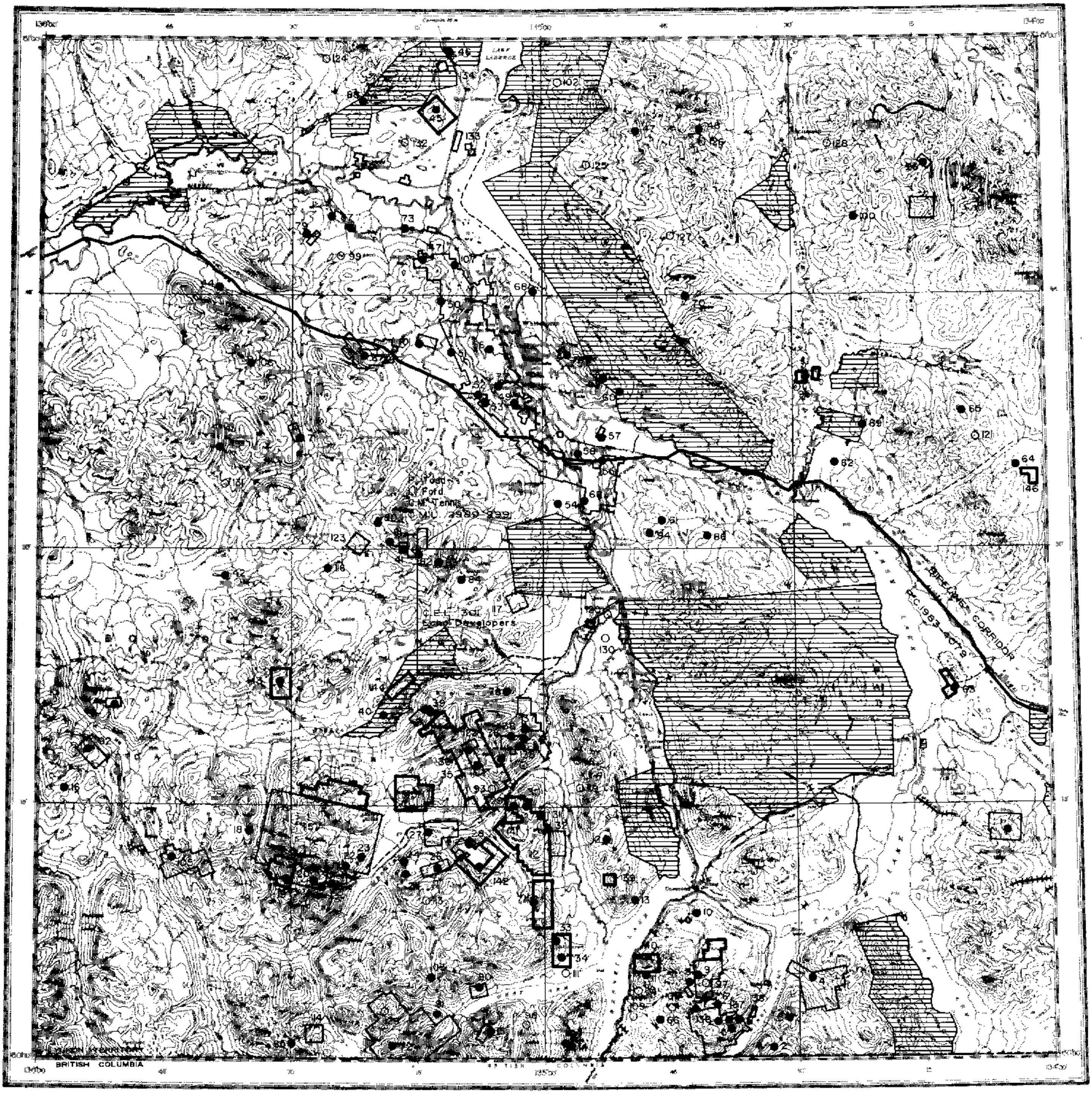
105 D



WHITEHORSE

YUKON TERRITORY

5 0 5 10 15 20 25 30

Kilometres

(horizontal hatching)	Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
●	Mineral Deposit or Occurence see Key on facing page
○	Unmineralized Target
(box)	Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
(heavy box)	Mineral Claims staked in 1983
(line)	Placer Leases in good standing (Jan. 1984)
(ticked line)	Placer Claims in good standing (Jan. 1984)
CEL	Coal Exploration Licence
CML	Coal Mining Lease
(dashed line)	Tote Trail
(line)	Driveable Road
(symbol)	Oil or Gas Well
(bar)	Airstrip

WHITEHORSE MAP-AREA (NTS 105 D)

General Reference: GSC Map 1093A and Memoir 312 by: J.O. Wheeler, 1961.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	JUBILEE	Vein Au	105 D 1	5	This Report
2	LULU	Vein Au Ag	105 D 2	7	Findlay (1969b, p. 39)
3	MILLET	Occurrence Cu	105 D 2	7	
4	LIME	Porphyry Mo	105 D 1	6	D.I.A.N.D. (1981, p. 165)
5	VENUS	Vein Au Ag Pb Zn	105 D 2	3	D.I.A.N.D. (1982, p. 7,18,113, 116)
6	MONTANA	Vein Au Ag	105 D 2	4	Findlay (1969a, p. 60-61)
7	THISTLE	Vein Au Ag Pb Zn Cu	105 D 2	7	
8	JEAN	Vein Au Ag	105 D 2	6	Green & Godwin (1964, p. 39-40); Findlay (1969a, p. 61)
9	BIG THING (ARCTIC)	Vein Au Ag	105 D 2	3	D.I.A.N.D. (1981, p. 167)
10	CARCROSS	Vein Cu Mo	105 D 2	6	Findlay (1969a, p. 62); D.I.A.N.D. (1982, p. 117)
11	KNOB HILL	Unclassified	105 D 2	7	Bostock (1941, p. 143)
12	WABONA	Vein Zn	105 D 2	7	
13	COLLEGE GREEN	Vein Cu	105 D 2	7	
14	FINGER	Occurrence Cu	105 D 2	7	
15	LATREILLE	Porphyry Cu Mo	105 D 3	7	D.I.A.N.D. (1981, p. 165)
16	PRIMROSE	Skarn Zn	105 D 5	7	D.I.A.N.D. (1982, p. 117)
17	ROSE	Vein Au Ag	105 D 5	7	D.I.A.N.D. (1983, p. 111-112,118)
18	BOSTOCK	Vein Sb	105 D 4	7	Bostock (1941, p. 38)
19	CHARLESTON	Vein Au Ag	105 D 4,3	5	D.I.A.N.D. (1982, p. 114); This Report
20	BERNEY	Unclassified	105 D 3	7	D.I.A.N.D. (1981, p. 166,168)
21	MT. REID	Vein Au Ag Sb	105 D 3	6	D.I.A.N.D. (1982, p. 114)
22	SKUKUM	Vein Au Ag Sb, Breccia pipe Cu Ag	105 D 3	5	This Report
23	MORNING	Vein Sb Zn	105 D 3	7	Bostock (1941, p. 36-37); D.I.A.N.D. (1982, p. 117)
24	GODDELL	Vein Sb Ag	105 D 3	6	Morin et al (1977, p. 150)
25	PORTER	Vein Sb Pb Zn Ag	105 D 3	7	Bostock (1941, p. 37-38); D.I.A.N.D. (1981, p. 168)
26	BECKER-COCHRAN	Vein Sb Au Ag	105 D 3	5	This Report
27	FLEMING	Skarn Cu Fe	105 D 3	6	Morin et al (1977, p. 150)
28	MT. ANDERSON	Vein Au Ag	105 D 3	3	D.I.A.N.D. (1981, p. 166); D.I.A.N.D. (1982, p. 117)
29	TALLY-HO	Vein Au Ag Pb	105 D 3,6	4	This Report
30	MT. WHEATON	Vein Au Ag	105 D 3,6	7	Wheeler (1961, p. 122-123); This Report
31	BUFFALO	Vein Au Ag	105 D 3	7	D.I.A.N.D. (1982, p. 117); This Report
32	MT. STEVENS	Vein Au Ag	105 D 2	7	This Report
33	CROMWELL	Vein Ag Pb Cu	105 D 2	7	D.I.A.N.D. (1982, p. 117); This Report
34	MILLHAVEN	Vein Ag Pb Zn	105 D 2	7	D.I.A.N.D. (1982, p. 117)
35	GOLD HILL	Vein Au Ag	105 D 6	6	Cairnes (1916, p. 43)
36	GOLD REEF	Vein Au Ag	105 D 6	4	Cairnes (1912, p. 111-112); Wheeler (1961, p. 123); This Report
37	UNION MINES	Vein Ag Pb Zn	105 D 6	5	Wheeler (1961, p. 135-136); This Report
38	MT. BUSH	Coal	105 D 6	5	Cairnes (1916, p. 145-147)
39	LEGAL TENDER	Vein Ag Pb Zn	105 D 6	6	Cairnes (1912, p. 112-113)
40	ALLIGATOR	Porphyry Cu Mo	105 D 6	7	Craig & Milner (1972, p. 44)
41	WHITEHORSE COAL	Coal	105 D 6,11	6	Craig & Laporte (1972, p. 158)
42	MUD	Unclassified	105 D 5	9	Findlay (1969a, p. 54-55)

43	ARKELL	Porphyry Mo	105 D 12	7	Craig & Milner (1975, p. 43)
44	INGRAM	Vein Ag Pb Zn	105 D 13	7	Wheeler (1961, p. 136-137)
45	CUTOFF	Vein Ag Au	105 D 14	7	D.I.A.N.D. (1982, p. 118); This Report
46	EFFIE	Asbestos	105 D 14	7	
47	POW	Skarn Cu W	105 D 15	7	D.I.A.N.D. (1981, p. 166)
48	ACE	Vein Ag Au Pb Zn Cu	105 D 15	7	D.I.A.N.D. (1982, p. 118)
49	WHITEHORSE COPPER	Skarn Cu Au Ag	105 D 11	3	D.I.A.N.D. (1983, p. 111-113)
50	TREMAR	Unclassified	105 D 11	9	Craig & Laporte (1972, p. 113)
51	WING	Unclassified	105 D 11		
52	QUINALTA	Skarn Cu	105 D 11	7	
53	POLAR	Unclassified	105 D 11	7	Kindle (1964, p. 35-36)
54	VAL	Occurrence Cu Mo	105 D 10	7	
55	DUGDALE	Unclassified	105 D 10	9	Findlay (1969a, p. 54)
56	TOPAZIOS	Unclassified	105 D 11	9	Findlay (1969b, p. 34)
57	LEWES RIVER	Unclassified	105 D 10	9	Findlay (1969b, p. 34-35)
58	WALCOTT	Unclassified	105 D 10		
59	GOLCONDA	Unclassified	105 D 10	7	
60	GRONK	Unclassified	105 D 10	7	
61	NIP	Unclassified	105 D 10	7	
62	M'CLINTOCK	Occurrence Cu	105 D 9	7	Wheeler (1961, p. 143); Craig & Milner (1975, p. 45)
63	MARSH	Mafic/ultramafic associated Ni Co Cu	105 D 8	7	D.I.A.N.D. (1983, p. 111,114); This Report
64	LAVALEE	Asbestos	105 D 9	7	
65	MICHIE	Mafic/ultramafic associated Cr, Asbestos	105 D 9	7	
66	RAILROAD	Vein Ag	105 D 2	7	
67	GROUSE	Skarn Au Ag	105 D 11	5	This Report
68	IMP	Occurrence Cu	105 D 14	7	
69	BUCHANAN	Unclassified	105 D 10	9	D.I.A.N.D. (1981, p. 168)
70	WHEELER	Unclassified	105 D 10,15		
71	HARNIAK	Vein Cu Ag Au	105 D 11	7	
72	SHAW	Vein Cu Pb Zn Ag Au	105 D 3	5	D.I.A.N.D. (1982, p. 116,117)
73	ALLISON	Unclassified	105 D 14		
74	OPULENCE	Vein Sb	105 D 3	7	This Report
75	BOBO	Unclassified	105 D 10		
76	DONKEY	Vein Ag Pb Zn Au Cu	105 D 6	7	D.I.A.N.D. (1982, p. 117)
77	DAWN	Unclassified	105 D 11		
78	INCO	Porphyry Cu Mo	105 D 6	7	
79	SUITS (KING LAKE)	Porphyry Cu Mo	105 D 14	5	Sinclair et al (1975, p. 144-145)
80	FISH LAKE	Coal	105 D 11	7	
81	LUSCAR	Coal	105 D 11	7	
82	PTARMIGAN	Coal	105 D 6	7	Cairnes (1908, p. 20-21)
83	COAL RIDGE	Coal	105 D 6	7	
84	BERESFORD	Coal	105 D 6	7	Cairnes (1908, p. 20-21)
85	BOUDETTE	Coal	105 D 3,4	7	Wheeler (1961, p. 143)
86	COMBS	Vein Au	105 D 10	7	
87	MIDGETT	Vein Cu	105 D 14	7	
88	GEE	Volcanic red bed Cu	105 D 14	7	D.I.A.N.D. (1981, p. 168)
89	TONY	Vein Pb Ag Zn	105 D 3,4	7	D.I.A.N.D. (1982, p. 118)
90	WEST	Unclassified	105 D 3	9	D.I.A.N.D. (1981, p. 166)
91	PART	Occurrence Ag Au Pb	105 D 3	7	D.I.A.N.D. (1981, p. 167)
92	PROSE (DEB)	Skarn Pb Zn Ag	105 D 5	6	D.I.A.N.D. (1983, p. 111,114)
93	POMPEI	Unclassified	105 D 6		D.I.A.N.D. (1981, p. 168)
94	LORNE	Unclassified	105 D 10		D.I.A.N.D. (1981, p. 168)
95	JAVA	Unclassified	105 D 9		D.I.A.N.D. (1981, p. 168); This Report
96	GAMMON	Unclassified	105 D 16	9	D.I.A.N.D. (1983, p. 111,114)
97	ART	Vein Au Ag	105 D 3	7	D.I.A.N.D. (1981, p. 167)
98	MUNROE	Unclassified	105 D 3	9	D.I.A.N.D. (1981, p. 167)
99	UNTILL	Unclassified	105 D 14	9	Sinclair et al (1976, p. 104)
100	ABI	Vein Ag Pb Zn	105 D 16	7	Sinclair et al (1976, p. 108)
101	TOP	Unclassified	105 D 11	9	Morin et al (1979, p. 61)
102	LABE	Unclassified	105 D 15		D.I.A.N.D. (1982, p. 118)
103	CRO	Unclassified	105 D 3	9	Morin et al (1980, p. 33)

104	BEN	Unclassified	105 D 2	9	Morin et al (1980, p. 33)
105	RAM	Skarn Zn Pb Ag	105 D 4	5	D.I.A.N.D. (1983, p. 111,114-115)
106	RAMING	Unclassified	105 D 12	9	Morin et al (1980, p. 36)
107	OJ	Unclassified	105 D 14	9	Morin et al (1980, p. 36)
108	ATHES	Unclassified	105 D 2		D.I.A.N.D. (1982, p. 116)
109	DUNK	Unclassified	105 D 2	9	D.I.A.N.D. (1983, p. 112,115)
110	UNDAL	Unclassified	105 D 2		D.I.A.N.D. (1982, p. 117)
111	TROLL	Unclassified	105 D 2		D.I.A.N.D. (1982, p. 117)
112	ODD	Vein Cu Ag	105 D 3	7	D.I.A.N.D. (1983, p. 112,115-116); This Report
113	BACHUS	Unclassified	105 D 3		D.I.A.N.D. (1982, p. 117)
114	NAIAD	Vein Pb Ag	105 D 3	9	D.I.A.N.D. (1983, p. 112,116)
115	MT SKUKUM	Vein Au	105 D 3	7	D.I.A.N.D. (1983, p. 112,116, 118); This Report
116	DAYIR	Skarn Cu Fe	105 D 6	9	D.I.A.N.D. (1983, p. 112,116)
117	EVIEW	Vein Pb Zn Ag	105 D 6	9	D.I.A.N.D. (1983, p. 112,117)
118	TIKA	Unclassified	105 D 7		D.I.A.N.D. (1982, p. 117)
119	ILLIA	Unclassified	105 D 7		D.I.A.N.D. (1982, p. 117)
120	AMN	Unclassified	105 D 7		D.I.A.N.D. (1982, p. 117)
121	ICHIE	Unclassified	105 D 9		D.I.A.N.D. (1982, p. 118)
122	ALBATROS	Unclassified	105 D 6		D.I.A.N.D. (1982, p. 117)
123	BEXI	Unclassified	105 D 11		D.I.A.N.D. (1982, p. 118)
124	FLAT	Unclassified	105 D 14		D.I.A.N.D. (1982, p. 118)
125	ERGE	Unclassified	105 D 15		D.I.A.N.D. (1982, p. 118)
126	UNCER	Unclassified	105 D 15		D.I.A.N.D. (1982, p. 118)
127	SLEWE	Unclassified	105 D 15		D.I.A.N.D. (1982, p. 118)
128	UTSHIG	Unclassified	105 D 16	9	D.I.A.N.D. (1983, p. 112,117)
129	GLENLIVET	Unclassified	105 D 3	9	This Report
130	RAVEN	Unclassified	105 D 7		D.I.A.N.D. (1983, p. 112,118)
131	MINK	Unclassified	105 D 12		D.I.A.N.D. (1983, p. 112,118)
132	LAKE	Unclassified	105 D 14		D.I.A.N.D. (1983, p. 112,118)
133	POOLY	Unclassified	105 D 14		D.I.A.N.D. (1983, p. 112,118)
134	A+B,C+D	Unclassified	105 D 14		D.I.A.N.D. (1983, p. 112,118)
135	OLLIE	Unclassified	105 D 6	9	D.I.A.N.D. (1983, p. 112,118)
136	JOE PETTY	Vein Au Ag	105 D 2	4	Bostock (1957, p. 151-156,211-213,252-256,606-609)
137	URANUS	Vein Au Ag	105 D 2	4	Bostock (1957, p. 151-156,211-213,252-256,606-609)
138	M & M	Vein Au Ag	105 D 2	4	Bostock (1957, p. 151-156,211-213,252-256,606-609)
139	GRAY	Unclassified	105 D 2		This Report
140	WATSON	Unclassified	105 D 2		This Report
141	MED	Unclassified	105 D 3		This Report
142	TYCON	Unclassified	105 D 3		This Report
143	LATER	Skarn Au Ag As	105 D 5	7	This Report
144	CR	Unclassified	105 D 6		This Report
145	BEAR	Unclassified	105 D 6		This Report
146	CUP	Unclassified	105 D 9		This Report
147	BEE	Vein Pb Zn Ag Au	105 D 14	7	This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

JUBILEE
Logan Mines Limited
Golden Slipper Resources Inc.

Gold
105 D 1 (1)
(60°14'N,134°07'W)

References: D.I.A.N.D. (1982, p. 113-114; 1983, p. 118).

Claims: JUBILEE (6); JM (34); J (8); M (14)

Source: Summary by P. Watson from assessment report 091451 by V. Cukor and assessement report 091169 by D.A. Yeager and C.K. Ikona.

Current Work and Results:

In 1982, five diamond drill holes, totalling 404.2 m, were completed to test the arsenopyrite-bearing shear zone cutting intermediate volcanic rocks. Several sections of arsenopyrite +/- chalcopyrite mineralization were intersected. The average assay over 21.8 m in one hole was 0.72 g Au/t, 7.71 g Ag/t and 0.34% Cu.

In 1983, five trenches were excavated and sampled, returning up to 5.8 g Au/t and 0.79 g Ag/t over 3 m sections. The main structure, defined by drilling, trenching and mapping, is a 1,700 m long vertical shear zone up to 3 m wide, containing massive arsenopyrite, pyrrhotite and chalcopyrite veins ranging from 7 cm to 2 m wide.

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BECKER-COCHRAN — Antimony,Gold, Silver
Berglynn Resources Inc. — 105 D 3 (26)
(60°11'N,135°13'W)

Reference: Morin et al (1979, p. 60); Smith (1982).

Claims: POP 1-14

Source: Summary by K. Grapes from assessment report 091473 by T.M. Elliott.

History:

Antimony and gold-quartz showings were first discovered in 1893 by two prospectors from Juneau who subsequently died without disclosing their location. The occurrences were rediscovered in 1906 and actively explored until about 1915. Since then there has been intermittent work on the property. Yukon Antimony Corporation Limited carried out a program of geological mapping, trenching, diamond drilling and the driving of three adits along the mineralized zone. By 1973, the claims had lapsed and were restaked by E. Bergvinson. In 1974 an estimate of the probable and possible reserves were calculated to be approximately 140,000 metric tons of 4% Sb. Geological mapping and a VLF-EM survey were conducted in 1976 and 17 diamond drill holes were drilled for a total of 1,255.5 m.

Description:

The claims are located near Carbon Hill, on the south side of the Wheaton River, 83 km southeast of Whitehorse. Metamorphic rocks are intruded by a rhyolite porphyry plug of Eocene age (Smith, 1982).

Lenses of massive stibnite in quartz gangue occur in a black, pyritic shear zone at the southern margin of the plug.

Current Work and Results:

The 1982 program consisted of a rock geochemical survey in and near the old adits (3) and trenches on POP 10. Twenty-nine rock samples were collected and analyzed for gold and/or silver. Several of these, collected from the adits and trenches, contained greater than 1 ppm Ag and/or 10 ppb Au.

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TALLY-HO — Gold,Silver,Lead
Tally Ho Exploration Co. Ltd. — Vein
105 D 3,6 (29)
(60°15'N,135°04'W)

Reference: Wheeler (1961, p.123).

Claims: TH 1-20; CR 19-88, 97-104, 107-200; TALLY HO 1-22 and Crown Grants

Current Work and Results:

A reconnaissance geological mapping program was conducted on the Tally-Ho property. Soil sampling, and VLF-EM and magnetometer surveys were conducted on the Tally-Ho 5-12 claims. One trench 15 by 1.5 by 1.5 m was excavated on the Tally-Ho 7 claim. The geophysical and geochemical surveys delineated east-northeast trending anomalies in highly altered rhyolites associated with chalcedonic quartz veins and breccia zones.

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MT. STEVENS — Geochemical Target
Canadian Nickel Company Limited — 105 D 2,3 (32)
(60°13'N,135°01'W)

Reference: D.I.A.N.D. (1982, p. 113,115).

Claims: TON 1-16

Current Work and Results:

The TON claims were staked in the Mt. Stevens area as a follow up to geochemical anomalies generated in 1974-75 reconnaissance programs. The claims cover an area of brecciated Tertiary rhyolite dykes with quartz stockwork that are intrusive into chlorite schist of the Triassic Lewes River Group. The TON 11-14 claims were geologically mapped (1:2,500) and soil sampled for geochemistry. Several old trenches were mapped and sampled.

Six parallel, northwest-trending rhyolite dykes, 5-10 m wide were located. The dykes cover an area of

200 by 200 m. Rock and soil samples returned anomalous gold, silver, lead, zinc and mercury values.

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GROUSE (Kreft-Takacs option)
M.Nichiporik

105 D 11 (67)
(60°41'N,135°22'W)

Reference: Morin et al (1977, p. 152); D.I.A.N.D. (1983, p. 111).

Claims: GROUSE; ROY; LUNAR; GEAR; APEX

Source: Summary by K. Grapes from assessment report 091479 by P.W. Percival.

History:

Copper mineralization was discovered and staked in 1969 by S. Takacs and E. Kreft. New Jersey Zinc Corporation optioned the property in 1972 and drilled six holes, totalling 457 m. The best assay was 0.26% Cu. In 1975, six holes, totalling 427 m, were drilled by Whitehorse Copper Mines Limited, one of which intersected a 6 m section of 5.60% Cu and 272 g Ag/t. In 1976, Whitehorse Copper drilled four holes,totalling 470 m, intersecting 0.4 m grading 87.4 g Au/t and 5.8% Bi.

Current Work and Results:

Three diamond drill holes, totalling 92.5 m, were drilled to test magnetite skarn zones for gold and silver values. Diopside-garnet-magnetite-serpentine skarn was intersected for 5.8, 5.0 and 12.9 m, respectively in the three holes. Assays up to 0.55 g Au/t and 34.6 g Ag/t over 0.9 m were reported.

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GLENLIVET
Agip Canada Limited

Geochemical Target
105 D 3 (129)
(60°03'N,137°17'W)

Reference: Lambert (1974); D.I.A.N.D. (1983, p. 112, 117-118).

Claims: GLENLIVET 1-46

Source: Summary by P. Watson from assessment report 091482 by R. Hulstein.

History:

The staking of the GLENLIVET 1-46 claims and preliminary prospecting were carried out in 1982.

Description:

The property is located near the south end of the west arm of Bennett Lake, 77 km south of Whitehorse. It covers part of the northern portion of the Bennett Lake Cauldron subsidence complex, and is located between the margins of two nested calderas. Skukum Group felsic to intermediate volcanic rocks of Eocene age unconformably overlie a basement of Lower Precambrian to Lower Paleozoic Yukon Group metasedimentary rocks intruded by Cretaceous Coast Plutonic Complex rocks.

Current Work and Results:

In 1983, the property was geologically mapped, and 35 rock and 76 soil samples were collected for gold and silver analysis.

Four units (as delineated by Lambert, 1974) have been mapped on the claims. The lowermost unit, Partridge Lake Formation non- to partially-welded tuffs, is exposed on the south side of the property. It is overlain by moderately to densely-welded ignimbrite of the Macauley Creek Formation. Crozier Formation epiclastic breccias and Crozier Formation tuffs and lavas make up the upper two units on the property. Rhyolite and dacite flows, sills and dykes that overly and cut the Macauley and Crozier Formations are part of the eruptive center on the property.

Three areas on the property were examined in detail. The first of these is a red and orange weathering area of rhyolite that contains disseminated pyrite, patches of silicification, minor quartz veining and weak clay alteration along fracture surfaces. The second zone consists of strong argillic alteration with 1-2 mm wide quartz veining containing disseminated galena and pyrite. This zone extends 150 m along a fault lineament trending 170°. A third area of interest is composed of 2-4 cm wide quartz veining with minor calcite, limonite and fluorite in weakly altered rhyolite.

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LATER
Agip Canada Ltd.

105 D 5 (143)
(60°22'N,135°31'W)

Claims: LATER 1-35

Source: Summary by K. Grapes from assessment report 091526 by R. Robertson.

Description:

The LATER claims were staked in May, 1983. They are located 45 km southwest of Whitehorse, and 18 km north of Mt. Skukum.

The claims cover a small, outlying Early Tertiary volcanic centre of the Skukum Group which lies unconformably on isolated sections of Late Precambrian Yukon Group metasedimentary rocks and Cretaceous granitic rocks of the Coast Crystalline Complex.

Current Work and Results:

Preliminary geological mapping, prospecting and geochemical sampling were carried out in the summer of 1983.

Geological mapping indicates that the relatively flat lying Skukum Group volcanic rocks represent part of a distal eruptive centre outlying from the main Skukum complex to the south. The rocks consist of a sequence of tuffs, flows, dykes, and sills of rhyolite and andesite composition. Epithermal activity associated with dyke intrusion has formed propylitic, argillic and skarn alteration and gold-silver mineralization in the volcanic rocks and underlying metasedimentary rocks. Three zones of potential gold-silver mineralization have been delineated, two associated with a northeast-trending rhyolite porphyry dyke (one is a calc-silicate garnet-diopside skarn in limestone, intruded by the rhyolite dyke). The third zone is associated with a northeast-trending andesite porphyry dyke.

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BEE
L. Patnode

105 D 14 (147)
(60°47'N,135°12'W)

Claims: BEE (27)

Source: Summary by P. Watson from assessment report 091489 by G. MacDonald.

Description:

The claims are located on the east flank of Haeckel Hill, northwest of Whitehorse.

Current Work and Results:

Two diamond drill holes, totalling 58.5 m, were completed on the BEE claims in 1982 to test a coincident magnetometer and EM anomaly over mineralization exposed in a nearby trench. Subeconomic mineralization was intersected in a quartz-filled fracture zone in tuffaceous sedimentary rock. Assays returned 1.8% Pb, 1.58% Zn, 33.6 g Ag/t, and 0.34 g Au/t over 1.5 m.

Mt. Skukum
Agip Canada Limited

Gold Veins
105 D 3 (22,115)
(60°12'N,135°25'W)

References: D.I.A.N.D. (1983, p. 111-112,116,118); Smith (1983).

Claims: KUKU 1-331; CHIEF 1-106; EARL 1-32; SAID 1-16; THE 1-48; WOOF 1-40; Pup fractions 1-85

Source: Summary by P. Watson and K. Grapes from assessment reports 091462 and 091474 by R.A. Doherty and from assessment report 091481 by L.K. Bertrand and R.A. Doherty.

Current Work and Results:

Mapping carried out in 1982 and 1983 at a scale of 1:10,000 indicates that the flat-lying to gently-dipping volcanic rocks in the area can be divided into two cycles. Cycle I consists of laharic breccias and intermediate to felsic, moderately to densely welded tuffs capped by andesitic tuffs and flows. Cycle II includes rhyolitic flows, spherulitic flows, lapilli tuff and densely welded rhyolitic ash tuff. Cycle II volcanic rocks appear to be thickest in the northeast part of the claim block while Cycle I material is thickest at Mt. Skukum. North-northeast trending quartz latite dykes (along with minor microdiorite, diabase and basalt dykes) and Tertiary quartz feldspar porphyry plugs have intruded the volcanic units (see Pride, this report).

Geological mapping and rock and soil sampling on the KUKU claims have outlined five mineralized zones. Resampling of trenches on the Main Zone returned values up to 20.9 g Au/t over 1 m. Soil sampling outlined an anomalous zone with values up to 3,845 ppb Au on strike with a fault zone delineated by geological mapping and a magnetometer survey. On the Lake zone, an average of 11 assays from a 400 m long zone covering vein and stockwork exposures was 27.8 g Au/t, over an average width of 1 m. Forty NQ diamond drill holes, totalling 4,545 m, were drilled on the KUKU 17, 19 and 21 claims while five bulldozer trenches were excavated (1,300 m^3) on the KUKU 18, 19 and 20 claims.

Another anomalous zone occurs on the CHIEF claims, where veins have not been located yet, but where 45 soil samples, collected over an 1,100 m area, averaged 206 ppb Au, with a high of 2,620 ppb Au.

The WOOF claims, located to the south of the KUKU claims, between Skukum and Berney Creeks, were examined by geological mapping, and rock and soil sampling in 1983. A 1:10,000 scale orthophoto base was produced. Nineteen rock samples, mainly from quartz-calcite veining along the Berney Creek Fracture, did not contain significant gold values, although some anomalous copper values were present. Similarly, 94 soil/talus fine samples returned low and erratically distributed gold values.

General geological information and drill results from the Mt. Skukum property were released to the public in May, 1984: "The discovery resulted from regional grass roots exploration programs. Geochemical anomalies defined in 1980 were followed up by surface work in 1981 and by diamond drilling in both 1982 and 1983. To date 7866 meters of drilling in 69 holes have been completed on the property.

Five separate zones of gold-silver mineralization have been identified and drill testing has been carried out on two of these, the Main and Lake Zones" (see Figure 1). "In addition other structures and geochemical anomalies remain to be tested.

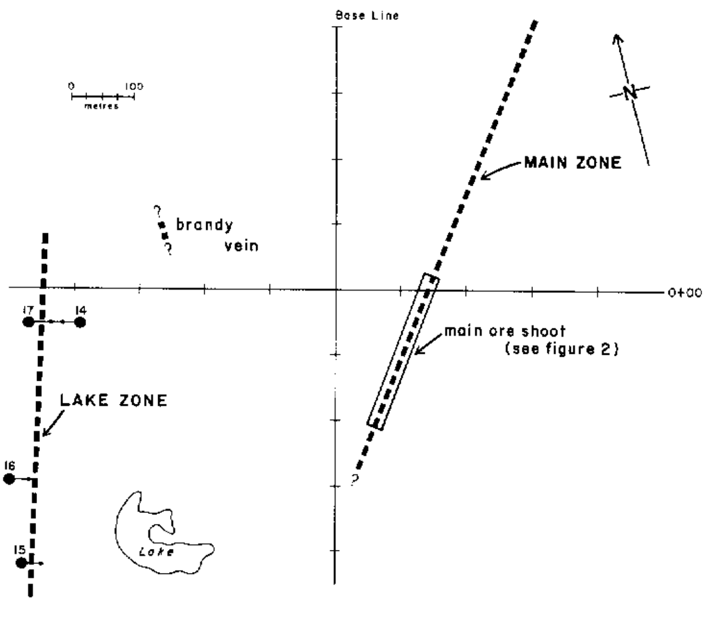

Figure 1. Plan map of the Mount Skukum gold-silver deposit showing the location of the Main and Lake Zones.

The Main Zone, consisting of quartz-calcite veining occupying a NE-trending fault, has been traced for about 1 km" (see Figure 2). "Emphasis has been placed on testing an ore shoot - the Main Ore Shoot - which extends approximately 225 m along this structure, and this has been blocked out on 25 m centres to a vertical depth of 75 to 105 m. Significant drill results are reported below" (see Table I). "Mineralization intercepts are uncut and not corrected for true structure width, which varies

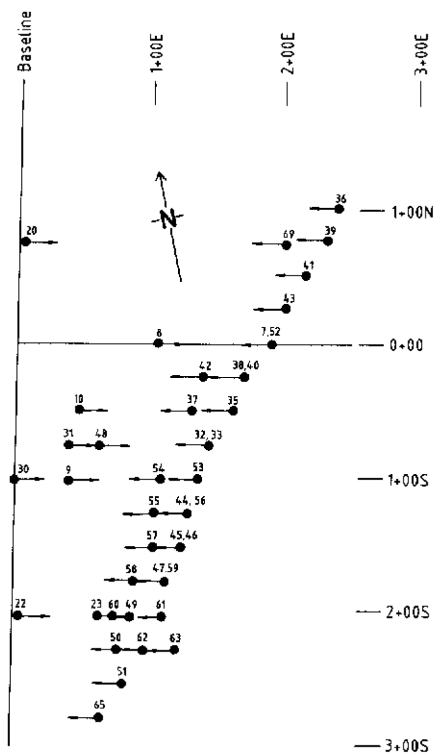

Figure 2. Diamond drill hole location map over the Main ore shoot of the Mount Skukum deposit.

from 55 % to 75 % of intersected width.

A study prepared by Wright Engineers Ltd. indicates that proven, probable and possible geological reserves exceed 450,000 tonnes. Of this amount, approximately 235,000 tonnes of recoverable mine reserves at a grade of 20 grams gold per tonne have been proven in the Main Zone.

Six drill holes have been completed on the Lake Zone, a system of north-trending quartz-calcite veins located 500 m west of the Main Zone. Four of these drill holes intersected mineralization over 400 m of strike. Significant results are " ... reported in Table II.

"The Brandy Vein, discovered late in the 1983 season, was stripped and sampled along a 30 meter strike length. The average grade of seven chip samples spaced 5 meters apart is 45.7 g/t gold and 37.3 g/t silver across a one meter vein width.

Detailed exploration of the property is continuing. Of immediate priority is exploration for further ore shoots on the Main Zone structure and delineation of reserves on the Lake Zone. Surface evaluation of other mineralized zones and geochemical anomalies is also planned."

Table I

Hole	Dip	From (m)	To (m)	Core Width (m)	Gold (g/t)	Silver (g/t)
82- 3	-45^{o}	20.1	21.1	1.0	4.46	1.6
82- 8	-45^{o}	42.0	45.0	3.0	2.65	4.4
82- 9	-45^{o}	61.0	66.0	5.0	13.94	8.5
82-10	-45^{o}	57.2	62.9	5.7	2.12	1.6
	-45^{o}	78.3	84.8	6.5	13.52	5.9
83-30	-45^{o}	149.7	152.7	3.0	7.14	7.9
	-45^{o}	159.5	160.5	1.0	8.04	4.0
83-31	-55^{o}	93.6	97.6	4.0	1.44	3.2
83-32	-45^{o}	17.1	18.6	1.5	2.26	7.5
		36.7	37.1	0.4	134.26	62.3
		74.9	86.7	11.8	39.48	67.7
83-33	-60^{o}	97.0	103.0	6.0	2.28	3.1
83-37	-45^{o}	9.3	10.2	0.9	14.34	11.5
		38.7	41.9	3.2	21.00	14.1
		44.1	47.4	3.3	4.60	9.6
		64.5	65.2	0.7	7.62	5.4
83-38	-45^{o}	80.7	85.6	4.9	39.55	20.0
83-42	-45^{o}	22.8	23.8	1.0	8.37	5.5
		30.0	31.3	1.3	3.22	5.1
		32.3	34.3	2.0	2.52	2.9
83-44	-50^{o}	81.2	82.3	1.1	12.70	9.0
83-45	-45^{o}	74.9	79.4	4.5	43.11	32.4
83-46	-55^{o}	97.9	100.8	2.9	3.87	5.9
83-47	-45^{o}	71.5	78.8	7.3	8.51	8.8
83-48	-45^{o}	36.0	37.8	1.8	27.1	19.3
83-49	-60^{o}	57.6	63.9	6.3	1.33	3.6
83-54	-45^{o}	30.5	44.2	13.7	42.80	34.3
83-55	-50^{o}	43.8	46.6	2.8	4.28	5.1
	-50^{o}	50.6	52.5	1.9	7.52	6.7
83-57	-45^{o}	42.9	51.2	8.3	78.95	64.8
	-45^{o}	56.7	61.4	4.7	9.81	11.8
83-58	-45^{o}	37.2	39.7	2.5	9.06	11.7
83-60	-45^{o}	24.5	26.8	2.3	23.13	21.8
83-61	-65^{o}	91.7	93.7	2.0	11.19	15.6
83-62	-60^{o}	76.5	77.8	1.3	2.22	9.7

Table II

Hole	From (m)	To (m)	Core Width (m)	Gold (g/t)	Silver (g/t)
82-14	90.8	91.7	0.9	63.92	18.0
82-15	79.3	81.8	2.5	3.2	3.8
82-16	87.8	89.0	1.2	11.8	18.0
82-17	68.9	69.5	0.6	5.64	2.8
	72.1	73.3	1.2	25.72	11.5

1983 MINERAL CLAIMS STAKED

CROMWELL — 105 D 2 (33)
S. Chretien — (60°06'N,134°58'W)

Claims 1983: MIL 1-32

GRAY — 105 D 2 (139)
J. McCrory — (60°10'N,134°52'W)

Claims 1983: GRAY 1-4

ODD — 105 D 2,3 (112)
Agip Canada Ltd. — (60°11'N,135°02'W)

Claims 1983: MAX 1-39

WATSON — 105 D 2 (140)
G. MacDonald — (60°06'N,134°48'W)

Claims 1983: WEST 1-24

TALLY-HO — 105 D 3,6 (29)
Tally Ho Exploration Co. Ltd. — (60°13' - 60°15'N 135°03' - 135°37'W)

Claims 1983: TH 1-20; TALLY-HO 1-22

MT. WHEATON — 105 D 3 (30)
G. MacDonald — (60°15'N,135°02'W)

Claims 1983: NOT 1-2

BUFFALO — 105 D 3 (31)
K. Mulloy — (60°14'N,135°01'W)

Claims 1983: Buffalo 1-12

MT. STEVENS — 105 D 3 (32)
Canadian Nickel Company Ltd. — (60°13'N,135°01'W)

Claims 1983: TON 1-16

OPULENCE — 105 D 3 (74)
T. McCrory — (60°09'N,135°00'W)

Claims 1983: MIN 1-44

MED — 105 D 3 (141)
D. MacLean — (60°13'N,135°04'W)

Claims 1983: MED 1-32

TYCON — 105 D 3 (142)
W. Hyde — (60°11'N,135°08'W)

Claims 1983: TYCON 17-52

CHARLESTON — 105 D 4 (19)
Agip Canada Ltd. — (60°11'N,135°31'W)

Claims 1983: EARL 1-32

LATER — 105 D 5 (143)
Agip — (60°22'N,135°31'W)

Claims 1983: LATER 1-35

GOLD REEF — 105 D 6 (36)
G. Reynolds — (60°18'N,135°07'W)

Claims 1983: SR 1-7

UNION MINES — 105 D 6 (37)
D. Baird — (60°19'N,135°02'W)

Claims 1983: SAIL 11-16

KUKU — 105 D 6 (115)
Agip Canada Ltd. — (60°16'N,135°27'W)

Claims 1983: SAID 1-16; THE 1-48; PUP 1-85

CR — 105 D 6 (144)
Tally Ho Exploration Co. Ltd — (60°19'N,135°10'W)

Claims 1983: CR 19-88; 97-104; 107-200

BEAR — 105 D 6 (145)
Agip Canada Ltd. — (60°16'N,135°16'W)

Claims 1983: BEAR 1-56

MARSH — 105 D 8 (63)
(60°22'N,134°12'W)

Claims 1983: BON 1-4; BOG 1-6

JAVA — 105 D 9 (95)
H. Fierro — (60°40'N,134°29'W)

Claims 1983: GALENA 1-6

CUP — 105 D 9 (146)
H. Rail — (60°34'N,134°02'W)

Claims 1983: CUP 9-16

CUTOFF — 105 D 14 (45)
T. McCrory — (60°56'N,135°14'W)

Claims 1983: SCOT 1-42

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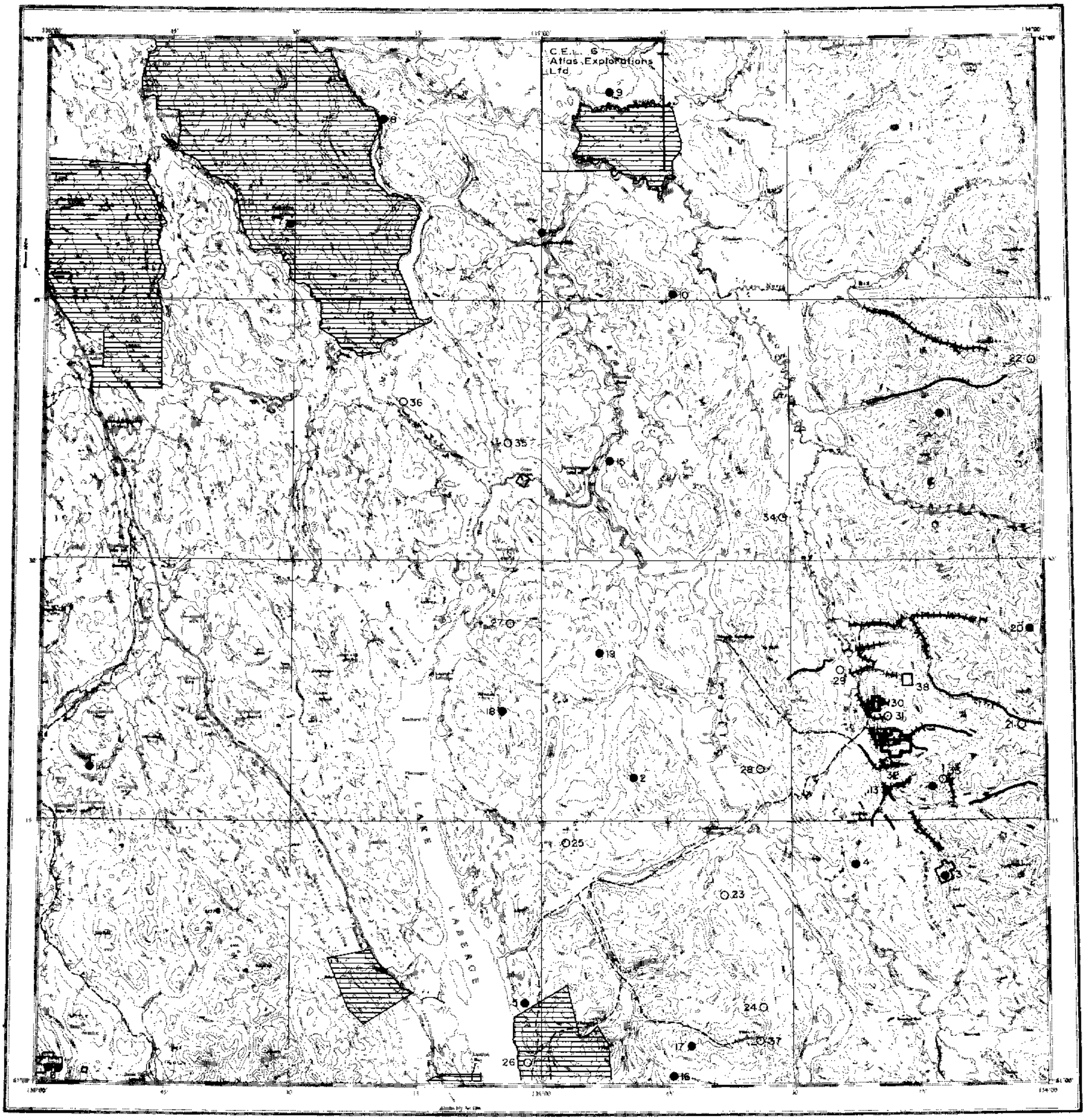
105 E



LABERGE
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

LABERGE MAP-AREA (NTS 105 E)

General Reference: GSC Open File 578 by:
D.J. Tempelman-Kluit, 1978.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	FLOAT	Vein Au Ag Cu Pb	105 E 8	7	This Report
2	TUV	Porphyry Cu Mo	105 E 7	7	
3	LOON	Metamorphosed Cu deposit of uncertain origin	105 E 1	6	Craig & Laporte (1972, p. 119-120)
4	BEE	Occurrence Cu	105 E 1	7	
5	LABERGE	Skarn Cu Fe	105 E 3	7	Findlay (1969a, p. 55-56)
6	TAKHINI	Skarn Cu	105 E 4	7	
7	PACKERS (BAND)	Skarn Cu Fe	105 E 13	7	Sinclair _et al_ (1976, p. 112-113)
8	CLAIRE	Coal	105 E 14	7	Bostock & Lees (1938, p. 16)
9	WALSH	Coal	105 E 15	7	Bostock & Lees (1938, p. 16)
10	SEMENOF	Vein Cu Au Ag	105 E 15	7	
11	ILLUSION	Asbestos	105 E 9	7	D.I.A.N.D., Mines and Minerals Activities (1971, p. 19)
12	CASSIAR BAR	Volcanic red bed Cu Ag	105 E 15,14	7	
13	SYLVIA	Vein Pb Zn Au Ag Cu	105 E 8	7	
14	CORDUROY	Coal	105 E 5	7	
15	HOOTALINQUA	Coal	105 E 10	7	
16	HIG	Unclassified	105 E 2		D.I.A.N.D. (1981, p. 170)
17	LORI	Porphyry Mo Cu	105 E 2	7	Sinclair _et al_ (1976, p. 110)
18	MUSTARD (GEM)	Vein Au	105 E 6	7	Sinclair _et al_ (1976, p. 111)
19	BACON (BOND)	Porphyry Mo Cu	105 E 6	7	Sinclair _et al_ (1976, p. 111)
20	HAL	Skarn W	105 E 8	7	D.I.A.N.D. (1981, p. 170)
21	YETI	Unclassified	105 E 8		D.I.A.N.D. (1981, p. 170)
22	FOG MOUNTAIN	Skarn Zn Pb	105 E 9	7	D.I.A.N.D. (1982, p. 121)
23	CROST	Unclassified	105 E 2		D.I.A.N.D. (1982, p. 121)
24	SLINE	Unclassified	105 E 2		D.I.A.N.D. (1982, p. 121)
25	AURIER	Unclassified	105 E 2		D.I.A.N.D. (1982, p. 121)
26	AKEL	Unclassified	105 E 3		D.I.A.N.D. (1982, p. 121)
27	OVOAS	Unclassified	105 E 6		D.I.A.N.D. (1982, p. 121)
28	ENOF	Unclassified	105 E 7		D.I.A.N.D. (1982, p. 122)
29	GERM	Unclassified	105 E 8		D.I.A.N.D. (1982, p. 122)
30	REN	Unclassified	105 E 8		D.I.A.N.D. (1982, p. 122); This Report
31	NC	Unclassified	105 E 8		D.I.A.N.D. (1982, p. 122)
32	MARBEE	Unclassified	105 E 8		D.I.A.N.D. (1982, p. 122)
33	MAYBE	Unclassified	105 E 8	9	D.I.A.N.D. (1983, p. 121)
34	SBS	Unclassified	105 E 10		D.I.A.N.D. (1982, p. 122)
35	HOOT	Unclassified	105 E 11		D.I.A.N.D. (1982, p. 122)
36	RANKL	Unclassified	105 E 11		D.I.A.N.D. (1982, p. 122)
37	TES	Unclassified	105 E 2	9	D.I.A.N.D. (1983, p. 121)
38	RIM (OWL)	Unclassified	105 E 8		D.I.A.N.D. (1983, p. 121)

* Unclassified is the term used for properties for which there is no public data other than location, of for which public data exists, but not enough to classify the occurrence.

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1983 MINERAL CLAIMS STAKED

FLOAT 105 E 8 (1)
(61°20'N,134°17'W)
A. Serafinchon;
Archer, Cathro & Associates
(1981) Limited

Claims 1983: LIV 1-20; SPRING 1-2; SUMMER 1-2; LODI 1-2

RIM (OWL) 105 E 8 (38)
(61°23'N,134°15'W)

Claims 1983: RIM 1-4

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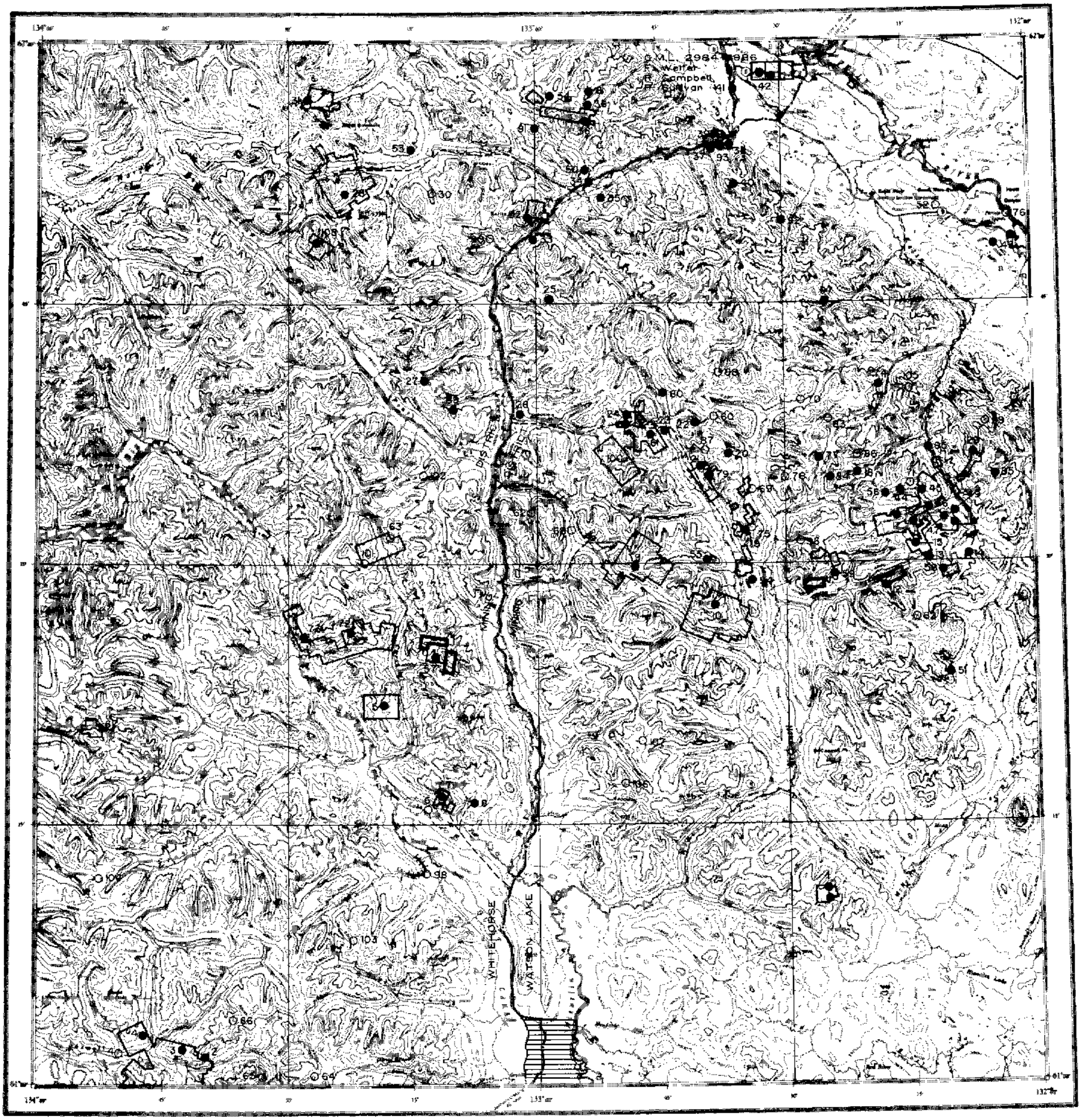
<u>NOTES</u>

105 F



QUIET LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

	Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
●	Mineral Deposit or Occurence see Key on facing page
○	Unmineralized Target
▭	Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
▭ (bold)	Mineral Claims staked in 1983
———	Placer Leases in good standing (Jan. 1984)
┼┼┼┼	Placer Claims in good standing (Jan. 1984)
CEL	Coal Exploration Licence
CML	Coal Mining Lease
- - - - -	Tote Trail
———	Driveable Road
⌖	Oil or Gas Well
▬	Airstrip

QUIET LAKE MAP-AREA (NTS 105 F)

General Reference: GSC Open File 486 by:
D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	MOLLY	Skarn Mo W	105 F 1	6	D.I.A.N.D. (1982, p.126)
2	MOBS	Vein Ag Pb Zn	105 F 4	7	Green (1966, p. 60-62)
3	WOPUS	Vein Au Ag	105 F 4	7	D.I.A.N.D. (1981, p. 177); D.I.A.N.D. (1982, p. 133)
4	GOPHER	Vein Au Ag	105 F 4	7	Green (1966, p. 60-62); D.I.A.N.D. (1983, p. 123-124)
5	IOLA	Occurrence Cu Pb Zn	105 F 6	7	D.I.A.N.D. (1983, p. 123-124)
6	VODKA	Asbestos	105 F 6	7	
7	TOWER PEAK	Asbestos, Vein Cu	105 F 6	7	D.I.A.N.D. (1982, p. 126-127)
8	DODY	Asbestos	105 F 6	7	
9	STORMY (PM)	Skarn Mo W	105 F 7	2	D.I.A.N.D. (1982, p. 173)
10	MM	Stratiform Pb Zn Cu Ag (Ba)	105 F 7	6	Morin et al (1980, p. 60)
11	CPA	Vein Ag Pb Zn	105 F 8	7	Morin et al (1979, p. 80-81); This Report
12	SONNY	Vein Ag Pb	105 F 8	7	This Report
13	KAY	Vein Ag Pb Zn	105 F 9	7	Findlay (1969a, p. 76-77)
14	SHARON (KET)	Unclassified	105 F 9	7	Findlay (1969a, p. 76-77)
15	OXO	Vein Au Ag	105 F 9	7	Green (1965, p. 42-43)
16	KOPINEC	Vein Cu	105 F 9	7	D.I.A.N.D. (1982, p. 133)
17	BOOM (KON)	Vein, Replacement Au	105 F 9	7	D.I.A.N.D. (1982, p. 127)
18	OPERATION	Occurrence Cu	105 F 9	7	
19	BOX (JD)	Unclassified	105 F 10	9	D.I.A.N.D. (1981, p. 173)
20	GRAYLING	Stratiform, Vein Pb Ag Zn	105 F 10	6	D.I.A.N.D. (1982, p. 127, 133)
21	COXALL (BID)	Vein Cu	105 F 10	7	Morin et al (1979, p. 84)
22	TYRO	Vein Zn Ag Cu Pb	105 F 10	7	
23	HADYN	Vein Ag Pb Cu Zn Au	105 F 10	7	
24	GROUNDHOG	Vein Ag Pb Zn	105 F 10	5	Findlay (1969b, p. 46-47)
25	ROCKY	Asbestos	105 F 15	7	
26	PONY	Vein Ag Pb Zn	105 F 11	7	Kindle (1945, p. 24)
27	HAM	Skarn W	105 F 11	7	
28	RISBY	Skarn W	105 F 14	2	D.I.A.N.D. (1983, p. 123-124)
29	AMBROSE	Vein Cu Ag	105 F 9	7	
30	TUB (BRIE)	Occurrence Pb Zn Cu W	105 F 14	7	Sinclair et al (1976, p. 112)
31	EVA	Skarn W	105 F 14	7	D.I.A.N.D. (1981, p. 173)
32	BARITE MOUNTAIN	Vein Ba	105 F 14	2	D.I.A.N.D. (1983, p. 123-124)
33	McNEE	Vein unclassified	105 F 14	7	Kindle (1945, p. 24)
34	CANUSA	Vein Pb Ag Au	105 F 15	7	
35	CYR	Unclassified	105 F 15	7	Wheeler et al (1960)
36	MT. COOK (GREW)	Occurrence Zn Mo	105 F 15	7	D.I.A.N.D. (1983, p. 123-124)
37	LAPIE	Vein Au Ag	105 F 15	7	Kindle (1945, p. 25)
38	WATERFALL	Vein Au Ag	105 F 15	7	Kindle (1945, p. 25)
39	DANGER	Unclassified	105 F 15	7	Kindle (1945, p. 25)
40	MT. ROSS	Vein Au Ag	105 F 15	7	Kindle (1945, p. 25)
41	TRENCH	Unclassified	105 F 15	7	Kindle (1945, p. 21)
42	WHISKEY LAKE	Coal	105 F 15	7	Findlay (1967, p. 89)
43	BRUCE LAKE	Unclassified	105 F 16	9	Green & Godwin (1964, p. 42-43)
44	MT. MISERY	Vein Ag Pb Cu	105 F 9	7	
45	KEY 3	Vein Ag Pb Zn	105 F 9	7	Green (1966, p. 64-68); Findlay (1969b, p. 44-46)
46	LAP 10	Vein Ag Pb Zn	105 F 9	6	Findlay (1969, p. 44-46)
47	HOEY	Vein Ag Pb Zn	105 F 9	6	Findlay (1969, p. 44-46)
48	STUMP	Vein Ag Pb Zn	105 F 9	2	Findlay (1969, p. 44-46)
49	KETZA RIVER	Vein Ag Pb Au	105 F 9	2	D.I.A.N.D. (1981, p. 174)
50	MAGUNDY	Vein Ag Pb	105 F 15	7	
51	HOGG	Vein Cu	105 F 8	7	
52	CALGAL (CHUNG)	Unclassified	105 F 16		Morin et al (1980, p. 64)

53	ASKIN	Stratiform Ba	105 F 14	7	
54	DIRK	Stratiform Ba	105 F 15	7	
55	CONNELL	Unclassified	105 F 10		
56	FURY	Unclassified	105 F 9		
57	OBVIOUS	Skarn W	105 F 6	7	This Report
58	NOKLUIT	Syenite breccia pipe REE, Th Nb	105 F 8	7	D.I.A.N.D. (1981, p. 175)
59	GUANO	Skarn REE, Nb	105 F 8	7	D.I.A.N.D. (1981, p. 55-59,175)
60	TAKU	Occurrence Pb Zn	105 F 10	7	D.I.A.N.D. (1981, p. 175)
61	H (PEAK)	Vein Pb Zn Ag	105 F 10	6	D.I.A.N.D. (1981, p. 175); D.I.A.N.D. (1983, p. 123,125)
62	FIRST	Unclassified	105 F 11	9	D.I.A.N.D. (1981, p. 176)
63	LAST	Unclassified	105 F 11	9	D.I.A.N.D. (1981, p. 176)
64	B.R.	Unclassified	105 F 3	9	D.I.A.N.D. (1982, p. 128-129)
65	MMM (MURPHY)	Unclassified	105 F 4	9	D.I.A.N.D. (1982, p. 129)
66	TIM	Unclassified	105 F 4	9	D.I.A.N.D. (1982, p. 129)
67	RPP	Unclassified	105 F 5	9	D.I.A.N.D. (1982, p. 129)
68	ADDY	Unclassified	105 F 10		D.I.A.N.D. (1981, p. 177)
69	JDX	Unclassified	105 F 10		D.I.A.N.D. (1981, p. 177)
70	McCASH	Unclassified	105 F 9		D.I.A.N.D. (1981, p. 177)
71	TOOTS	Unclassified	105 F 9		D.I.A.N.D. (1981, p. 177)
72	HIDDEN	Skarn W	105 F 6	6	D.I.A.N.D. (1982, p. 129-130)
73	AYDUCK	Skarn W	105 F 6	6	D.I.A.N.D. (1982, p. 129-130)
74	CLO	Unclassified	105 F 9	9	D.I.A.N.D. (1981, p. 176)
75	GULL	Vein Pb Zn Ag (Ba)	105 F 10	7	Sinclair et al (1976, p. 162)
76	HOOLEO	Unclassified	105 F 16	9	Sinclair et al (1976, p. 162)
77	CHZERPNOUGH	Stratiform Pb Zn Cu Ag (Ba)	105 F 9	7	Morin et al (1979, p. 81)
78	BNOB	Stratiform Pb (Ba)	105 F 9,10	7	Morin et al (1979, p. 83)
79	SUN	Unclassified	105 F 10	9	Morin et al (1977, p. 195)
80	ANISE	Unclassified	105 F 10	9	Morin et al (1979, p. 83)
81	WIMP	Unclassified	105 F 15	7	Morin et al (1979, p. 62)
82	MUMS	Unclassified	105 F 8	7	Morin et al (1979, p. 80)
83	TREE	Unclassified	105 F 9	7	Morin et al (1980, p. 61)
84	DROC	Unclassified	105 F 9	7	Morin et al (1979, p. 81)
85	HOWRU	Stratabound Pb Zn Cu Ag	105 F 9	6	Morin et al (1980, p. 62)
86	EROS	Unclassified	105 F 9	7	Morin et al (1979, p. 82)
87	NOT	Unclassified	105 F 10	7	Morin et al (1979, p. 82)
88	RAM	Unclassified	105 F 10	7	Morin et al (1980, p. 62)
89	LAP	Skarn W Cu	105 F 11	7	Morin et al (1980, p. 37)
90	PIM	Skarn W Cu	105 F 14	7	Morin et al (1980, p. 37)
91	GK	Stratiform Ba	105 F 14,13	7	Morin et al (1980, p. 38)
92	ANGIE	Stratiform Zn Ag	105 F 16,15	6	Morin et al (1980, p. 38)
93	BOB	Unclassified	105 F 15	7	Morin et al (1980, p. 39)
94	GRAY	Unclassified	105 F 7	7	Morin et al (1980, p. 60)
95	IGLE	Unclassified	105 F 9	7	Morin et al (1980, p. 61)
96	SEATU	Unclassified	105 F 9	9	Morin et al (1980, p. 62)
97	TOM	Vein Cu Zn	105 F 16,9	7	Morin et al (1980, p. 63)
98	FER	Unclassified	105 F 3	9	D.I.A.N.D. (1982, p. 133)
99	NCC	Unclassified	105 F 9	9	D.I.A.N.D. (1982, p. 133)
100	LORNE	Occurrence Pb Ag	105 F 10	7	D.I.A.N.D. (1982, p. 130,133)
101	MOX	Skarn, Vein Cu Pb Zn Ag	105 F 11	7	D.I.A.N.D. (1982, p. 130-131,133)
102	SNERD	Unclassified	105 F 11		D.I.A.N.D. (1982, p. 133)
103	PISA	Unclassified	105 F 3	9	D.I.A.N.D. (1982, p. 131)
104	SAL	Unclassified	105 F 4	9	D.I.A.N.D. (1982, p. 131-132)
105	TIER	Unclassified	105 F 9	9	D.I.A.N.D. (1982, p. 132)
106	OXY	Unclassified	105 F 7	9	D.I.A.N.D. (1982, p. 132)
107	BIG OX	Unclassified	105 F 7	9	D.I.A.N.D. (1982, p. 132-133)
108	BIG SAM	Skarn W	105 F 14	7	This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

OBVIOUS
Cub Joint Venture
Archer, Cathro and
Associates (1981) Limited

Tungsten Skarn
105 F 6 (57)
(61°24'N,133°15'W)

References: D.I.A.N.D. (1982, p. 125,128; 1983, p. 125).

Claims: OBVIOUS(32)

Source: Summary by P. Watson from assessment report 091505 by C.A. Main.

Current Work and Results:

The 1983 program consisted of bulldozer trenching, geochemical sampling and geophysical surveying in order to locate and evaluate the source of mineralized float and geochemical anomalies.

High grade magnetite-muscovite-scheelite float at two showings is believed to be related to the effects of a pervasive quartz-feldspar porphyry dyke system along the contact of the Nisutlin Batholith with lower to middle Paleozoic Nasina Facies sedimentary rocks. In the vicinity of the float, host rocks are thin and discontinuous pelitic limestone, interbedded with pelitic quartzite. Approximately 4 km of bulldozer trenches were excavated on the OBVIOUS 2, 4, 11 and 41 claims. Trenching was generally unsuccessful in exposing the source of the skarn float in these two localities, due to steep talus and permafrost. However, in one location, a zone of scheelite-bearing, pyrrhotite-diopside skarn up to 3 m thick was exposed about 10 m from the granite contact. The grade was less than 0.36% WO_3 over 1 m.

Trenching at a third geochemical anomaly, exposed a roof pendant of calcareous quartzite interbedded with hornfels containing patches and lenses of scheelite - bearing diopside-plagioclase skarn.

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BIG SAM
Hudson Bay Exploration and
Development Company Limited

Tungsten Skarn
105 F 14 (108)
(61°48'N,133°25'W)

References: D.I.A.N.D. (1983, p. 123,125).

Claims: BIG 17-68; SAM 1-16

Source: Summary P. Watson from assessment report 091472 by E.W. Yarrow.

Description:

The BIG and SAM claims were staked in 1982. They are located 55 km southwest of Ross River within the Yukon Cataclastic Complex. The claims are underlain by Proterozoic and/or Late Cambrian schist, gneiss and marble intruded by Cretaceous quartz monzonite of the Big Salmon Batholith. Limy horizons within the sedimentary rocks are locally altered to skarn near intrusive contacts.

Current Work and Results:

Geological mapping in 1982 classified skarns found on the property into two types. Garnet-diopside skarns occur as long, northwest-striking bands, parallel to the intrusive contacts, and contain little or no scheelite. Pyrrhotite-diopside skarns are more localized and host the best scheelite mineralization found to date. At the main zone on the northern part of the claims, these skarns are up to 3 m wide. Samples of irregularly disseminated to massive pyrrhotite with associated scheelite assayed up to 1.8% WO_3 over 2.2 m.

In addition to geological mapping, magnetometer and VLF-EM surveys were conducted, outlining the main showing. Detailed magnetometer studies indicated that the showing lacked lateral continuity, but three follow-up targets were defined for future work.

Twenty-two rock samples (grab) were analyzed for copper and tungsten while twenty-nine rock samples (grab and chip), collected at or near the showings, were tested for tungsten.

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1983 MINERAL CLAIMS STAKED

OBVIOUS — 105 F 6 (57)
Archer Cathro & Associates (1981) Limited — (61°25'N,133°12'W)

Claims 1983: OBVIOUS 25-32; 38; 40; 42; 44-48

CPA — 105 F 8 (11)
A. Mercier — (61°28'N,132°27'W)

Claims 1983: AM 1-8

SONNY — 105 F 8 (12)
M. Tremblay — (61°29'N,132°17'W)

Claims 1983: JO 1-8

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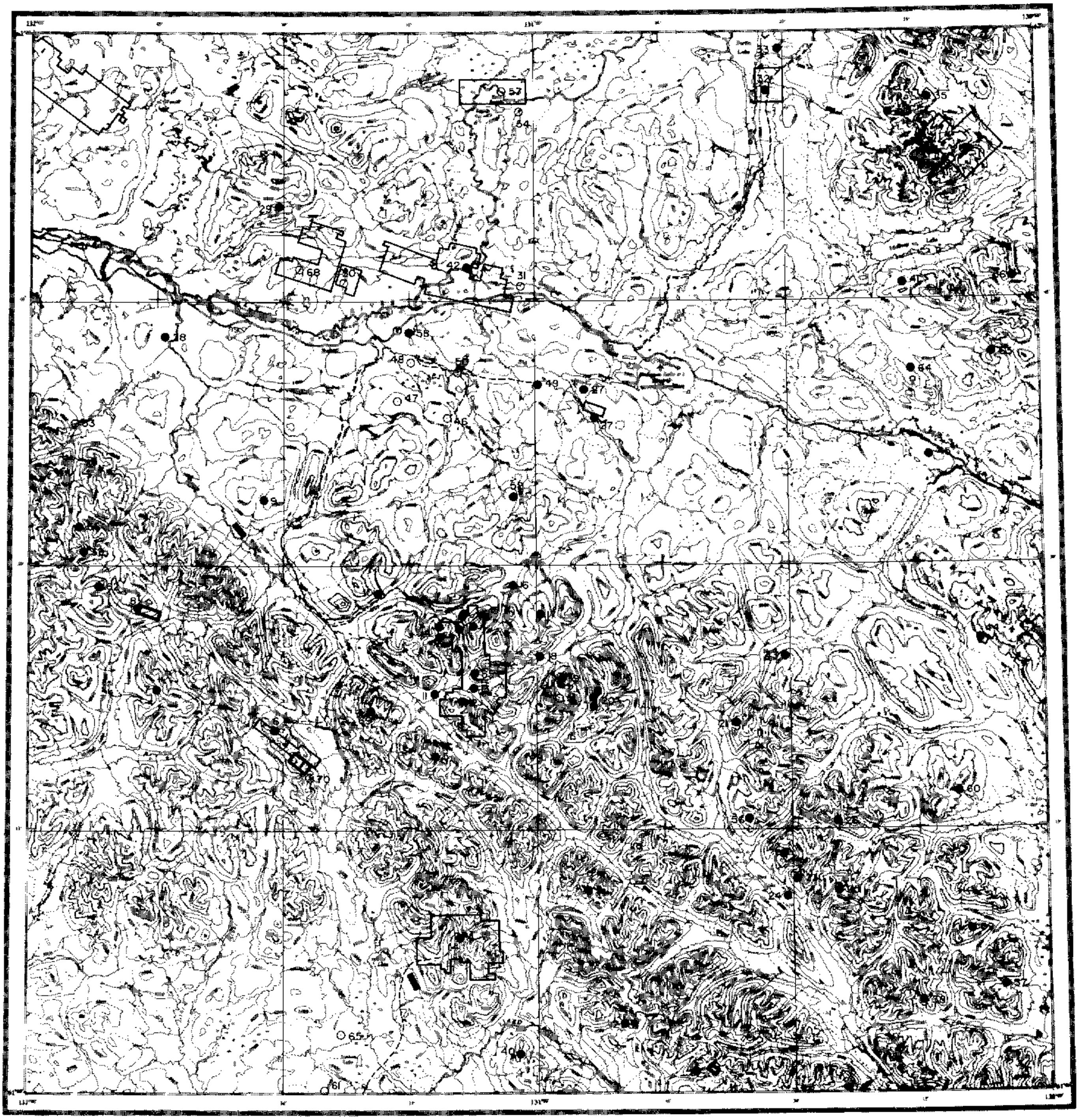
105 G



FINLAYSON LAKE
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- Mineral Deposit or Occurence see Key on facing page
- Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

FINLAYSON LAKE MAP-AREA (NTS 105 G)

General Reference: GSC Open File 486 by:
D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	MONT	Vein Cu	105 G 2	7	Findlay (1967, p. 64-65); D.I.A.N.D. (1982, p. 136)
2	BLUEBERRY	Vein Ag Pb Zn Cu W	105 G 2	7	
3	SLAM	Vein Zn Cu	105 G 2	7	
4	TINTINA (EAGLE)	Vein, Replacement Ag Pb Zn	105 G 3	2	Morin et al (1977, p. 199-203)
5	PLUMB (NOLE)	Vein Pb Zn Ag	105 G 6	7	Morin et al (1979, p. 86)
6	FH (JOE)	Stratiform Ag Pb Zn Cu Ba	105 G 5	7	This Report
7	McNEIL	Volcanic red bed Cu	105 G 5	7	
8	AXE	Volcanic red bed Cu, Vein Ba	105 G 5	7	This Report
9	HOO	Float Zn Pb Cu	105 G 12	7	Sinclair & Gilbert (1975, p. 85-86)
10	EL	Unclassified	105 G 6	7	Findlay (1969a, p. 79)
11	PICK	Vein Ag Pb	105 G 6	7	
12	GRASS	Vein Mo W	105 G 6	7	
13	SANDERS	Skarn Pb Zn Cu	105 G 6	7	
14	RILEY	Vein Cu Pb	105 G 6	7	
15	ZIELINSKI	Vein Pb Zn Cu Ag	105 G 6	7	
16	RIVIERA	Occurrence Cu Zn	105 G 6	7	
17	GYP	Vein Pb Zn Cu	105 G 7	7	
18	GEE	Vein Pb	105 G 7	7	
19	PIT	Vein Zn Cu Ag Au	105 G 7	7	
20	ROB	Vein Cu Pb Ag	105 G 7	7	
21	PACK	Stratabound Zn Cu	105 G 7	6	D.I.A.N.D. (1981, p. 180); Morin (1981b, in D.I.A.N.D., 1981, p. 91-97)
22	FYRE	Stratabound Pb Zn Cu Ag (Ba)	105 G 2	7	D.I.A.N.D. (1982, p. 135); Morin (1981b, in D.I.A.N.D., 1981, p. 91-97)
23	TOP	Vein Ag Pb Zn	105 G 1	7	
24	DUB	Unclassified	105 G 2	7	Findlay (1967, p. 59-60)
25	MM	Skarn Cu	105 G 1	7	
26	VINCENT	Vein Cu	105 G 8	7	
27	BOT	Asbestos	105 G 10	7	Morin et al (1979, p. 85)
28	PUP	Asbestos	105 G 12	7	
29	CHOW	Vein Pb Zn Ag	105 G 13	7	Morin et al (1979, p. 88)
30	DOL	Unclassified	105 G 14		
31	CAMPBELL	Coal	105 G 14	7	Keele (1910, p. 50)
32	PHIL (BOB)	Stratabound Pb Zn Cu	105 G 15	6	D.I.A.N.D. (1981, p. 180,182)
33	PAY	Vein, Replacement Au Ag Pb Zn	105 G 15	7	Findlay (1969a, p. 81-83)
34	RIS	Vein Cu	105 G 16		
35	SPUD	Unclassified	105 G 16	7	Tempelman-Kluit (1974c, p. 44)
36	JAKE	Vein Ag Pb Zn	105 G 16	7	
37	MAP	Vein Ag Pb	105 G 1	7	
38	WATERS	Vein Ag Pb	105 G 1	7	
39	ZIMMER	Occurrence Cu	105 G 12	7	
40	INGS	Vein Cu	105 G 3	7	
41	HARMAN	Unclassified	105 G 16	7	Sinclair & Gilbert (1975, p. 88)
42	ELECTRIC	Stratiform Pb Zn	105 G 14	7	This Report
43	MYDA	Skarn W	105 G 7	7	D.I.A.N.D. (1981, p. 180)
44	FETISH	Stratabound Cu Zn Pb	105 G 8	7	Morin (1981b, in D.I.A.N.D., 1981, p. 91-97); This Report
45	QUANDARY	Unclassified	105 G 9		
46	FREGERG	Unclassified	105 G 11		
47	FLIN	Unclassified	105 G 11		

48	FLON	Unclassified	105 G 11		
49	HUDSON	Unclassified	105 G 10		
50	AIRBORNE	Unclassified	105 G 11		
51	TOKE	Unclassified	105 G 7	9	D.I.A.N.D. (1981, p. 180)
52	FOG	Skarn W	105 G 11	6	D.I.A.N.D. (1981, p. 181)
53	STARR	Unclassified	105 G 12		D.I.A.N.D. (1981, p. 182)
54	GONZO	Unclassified	105 G 14		D.I.A.N.D. (1981, p. 182)
55	BOOT	Skarn W	105 G 6	6	D.I.A.N.D. (1981, p. 181)
56	HOWDEE	Skarn W	105 G 7	7	D.I.A.N.D. (1981, p. 182)
57	DWONK	Unclassified	105 G 14	9	D.I.A.N.D. (1981, p. 182)
58	EAGLE (FRED)	Stratabound Pb Zn	105 G 11	7	D.I.A.N.D. (1981, p. 182)
59	PY	Unclassified	105 G 1	7	Sinclair et al (1976, p. 164)
60	MONEY	Unclassified	105 G 8	7	Sinclair et al (1976, p. 166)
61	BOW	Unclassified	105 G 3	9	Morin et al (1979, p. 85)
62	NMT	Unclassified	105 G 5	7	Morin et al (1977, p. 203)
63	TIL	Unclassified	105 G 9	7	Morin et al (1980, p. 65)
64	IRENE	Unclassified	105 G 9	7	Morin et al (1980, p. 67)
65	PAT	Unclassified	105 G 3	9	Morin et al (1979, p. 85)
66	NEW	Unclassified	105 G 12	7	Morin et al (1979, p. 87)
67	SAS	Unclassified	105 G 16		D.I.A.N.D. (1982, p. 136)
68	LEACH	Unclassified	105 G 14	6	D.I.A.N.D. (1983, p. 128-129)
69	CYR	Unclassified	105 G 6	7	Morin et al (1980, p. 64)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

FH
Canamax Resources Inc.

Barite
105 G 5, 6 (6)
(61°20'N,131°30'W)

References: Morin et al (1980, p. 64-65); D.I.A.N.D. (1983, p. 127,129).

Claims: ZAP 1-6, ZOO 1-28

Source: Summary by P. Watson from assessment report 091465 by F. Harris.

Description:

The property, staked in 1982, is located 88 km southeast of Ross River, in the St. Cyr Range of the Pelly Mountains. Newmont and Asamera Oil drilled three holes (523 m) on their previously staked JOE claims in 1978.

The claims are underlain by northwest-trending Devono-Mississippian felsic volcanic breccias and flows. Silurian-Devonian carbonate rocks underlie the volcanic rocks to the northwest and are thrust over the volcanic rocks to the southwest. A 30 to 200 m wide, 7 km long stratiform zone of schistose, pyritic volcanic rocks hosts the mineralization and dips steeply southwest. Small pods or lenses of barite, exposed intermittently within the altered volcanic rocks, are 1 to 2 m thick and can be traced along strike for a few tens of metres. In places, the finely crystalline barite is interbedded with fine grained pyrite, and trace to several percent galena and sphalerite.

Current Work and Results:

The 1982 program consisted of prospecting, mapping (1:10,000 scale) and soil sampling. A total of 32 chip samples, 10 stream sediment samples and 300 soil samples were collected and analyzed for copper, manganese, iron, silver, lead, zinc and barium.

Three types of mineralization were distinguished on the property. The first type, minor sphalerite and/or galena with pyrite in brecciated felsic volcanic rocks, was found in two irregular zones up to 5 m wide. The second type, bedded galena and sphalerite in schistose altered volcanic rock, was found in four locations. One of these assayed 0.3% Pb, 0.26% Zn and 34.3 g Ag/t over 1.5 m. The third type of mineralization is associated with vuggy chert within the altered volcanic rock zone. Vugs contain pyrite with trace galena and sphalerite.

Lead values in soil are anomalous within and near the altered volcanic rock zone, with values commonly greater than 100 ppm Pb over a 800 by 400 m area. The only area with anomalous silver values lies within the lead anomaly and contains values from 1 to 13.2 ppm Ag. Zinc anomalies are less pronounced. A 200 by 100 m zone contains values from 1,000 to 2,200 ppm Zn and a 800 by 200 m zone coincident with the lead anomaly contains scattered values greater than 1,000 ppm Zn. The barium anomaly follows the altered zone and is discontinuous and is consistent with the presence of barite as discontinuous lenses in the volcanic rocks.

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ELECTRIC
Hudson Bay Exploration and Development Company Limited

Lead,Zinc
105 G 14 (42)
(61°46'N,131°12'W)

References: D.I.A.N.D. (1982, p. 135-136).

Claims: EAGLE (55); BINGO (16); SHALE (83); FRED (4); RENO (66); BIG (38)

Current Work and Results:

The 1983 exploration program on the RENO 29 claim consisted of five, five-inch diameter auger, overburden holes, totalling 18 m. The holes were located on the edge of an EM conductor.

******

FETISH
Esso Resources Canada Limited; Archer, Cathro and Associates (1981) Limited

Copper,Zinc,Lead
105 G 8 (44)
(61°25'N,130°07'W)

Reference: D.I.A.N.D. (1983, p. 127, 129); Morin (1981 in D.I.A.N.D. 1981, p. 91-97).

Claims: KINK 1-8

Source: Summary by P. Watson from assessment report 091480 by G. Cooper.

History:

Mineralization was first discovered in 1973, when mapping, geochemical sampling, hand pitting and magnetometer surveys were carried out. In 1974, two diamond drill holes, totalling 215 m, intersected banded copper-zinc-lead sulphides conformable to the foliation in a unit of talcose schist, possibly representing Besshi-type mineralization.

Current Work and Results:

In 1982, 13 line-km of HLEM and magnetometer surveys were conducted by Esso Resources Canada Ltd. under a brief option. The five magnetic anomalies defined the location of banded iron formation exposures. Three of the six HLEM conductors were attributed to graphitic sedimentary rocks whereas the other three were single conductors. One of the latter was on the projected outcrop of two shale units found in the 1974 drilling. There was no EM response in areas where sulphides were known or predicted.

1983 MINERAL CLAIMS STAKED

AXE
A. Mercier

105 G 5 (8)
(61°28'N,131°46'W)

Claims 1983: RAM 1-8

FH
Canamax Resources Inc.

105 G 6 (6)
(61°19'N,131°28'W)

Claims 1983: ZOO 29-38

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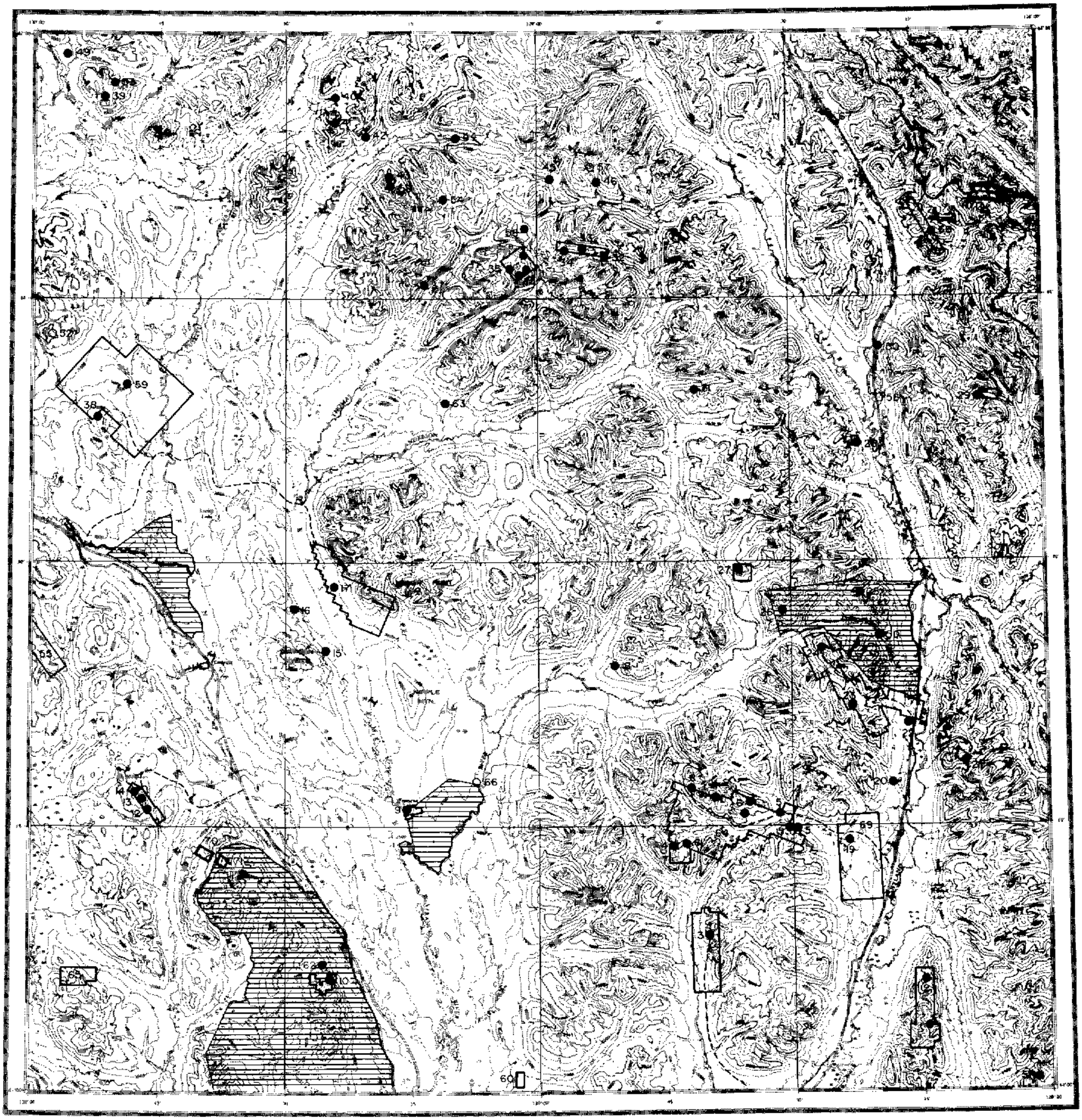
105 H



FRANCES LAKE

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30

Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

Mineral Deposit or Occurence see Key on facing page

Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

FRANCES LAKE MAP-AREA (NTS 105 H)

General Reference: GSC Map 6-1966 by: S.L. Blusson, 1966.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	JAN	Skarn Au Cu	105 H 1	7	D.I.A.N.D. (1983, p. 131)
2	MIDAS	Unclassified	105 H 1	7	D.I.A.N.D. (1982, p. 139-140,145)
3	FLIP (MTB)	Skarn Ag Pb Zn Cu W	105 H 2	6	D.I.A.N.D. (1981, p. 185)
4	DC	Skarn Zn Pb (Ag Sn)	105 H 2	7	Green (1966, p. 72)
5	MIKO	Skarn Pb Zn Ag	105 H 7	5	D.I.A.N.D. (1982, p. 140)
6	GLENNA	Skarn Ag Pb Zn Cu	105 H 7	6	D.I.A.N.D. (1982, p. 141)
7	STEELE	Unclassified	105 H 7	9	Sinclair & Gilbert (1975, p. 81-82)
8	RIETA (MAX)	Skarn W	105 H 7	7	Sinclair & Gilbert (1975, p. 81-82)
9	FRANCES	Vein Cu	105 H 6	7	
10	LIND	Asbestos	105 H 3	7	D.I.A.N.D. (1983, p. 131,133)
11	DOUG	Vein Cu	105 H 4	7	
12	TUCHITUA	Asbestos	105 H 5	7	D.I.A.N.D. (1981, p. 185)
13	EKO (GREEN STUFF)	Asbestos-Jade	105 H 5	7	Morin et al (1977, p. 209)
14	DIM	Asbestos	105 H 5	7	
15	MAY	Unclassified	105 H 6	7	Green (1966, p. 72)
16	MAPEL	Vein Cu Pb Zn	105 H 6	7	
17	MATT BERRY	Stratabound Pb Zn Ag	105 H 6	5	D.I.A.N.D. (1982, p. 141)
18	FLUKE	Skarn Pb Zn Ag W	105 H 7	7	D.I.A.N.D. (1981, p. 186)
19	CANYON	Skarn Ag Pb Zn	105 H 1	7	D.I.A.N.D. (1983, p. 131-132)
20	STU	Unclassified	105 H 8	7	Blusson (1966)
21	TERRY	Skarn W	105 H 8	7	D.I.A.N.D. (1982, p. 145)
22	CORRIE	Occurrence Cu	105 H 8	7	
23	BLACK JACK	Skarn Zn Pb	105 H 8	7	D.I.A.N.D. (1982, p. 141-142)
24	FIR TREE	Skarn Zn Pb	105 H 8	7	D.I.A.N.D. (1982, p. 141-142)
25	MONTSE	Skarn W	105 H 8	7	
26	RON	Skarn Zn Pb (Ag Sn)	105 H 7	7	Green (1966, p. 68-71); D.I.A.N.D. (1982, p. 145)
27	HELEN	Unclassified	105 H 7	7	Blusson (1966); D.I.A.N.D. (1982, p. 145)
28	BROD	Skarn Pb Zn Ag	105 H 9	7	D.I.A.N.D. (1981, p. 186)
29	RAIN	Skarn Cu Fe	105 H 9	6	D.I.A.N.D. (1981, p. 188); D.I.A.N.D. (1982, p. 145)
30	ROAD	Unclassified	105 H 9	9	Green (1968, Figure 1); D.I.A.N.D. (1981, p. 188)
31	TOY (REA)	Skarn Ag Pb Zn Cu	105 H 10	7	Morin et al (1977, p. 210)
32	BR	Skarn W Cu	105 H 15	7	
33	TANYA	Skarn W Cu	105 H 15	7	Craig & Milner (1975, p. 117)
34	GUY	Skarn W Cu	105 H 15	7	Green (1968, Figure 1)
35	THOR	Porphyry Mo	105 H 14	7	D.I.A.N.D. (1982, p. 142)
36	BROTEN	Skarn W Cu Mo	105 H 14	7	
37	TUSTLES	Occurrence Cu	105 H 14	7	
38	TED	Stratabound, Vein Ba (Ag Pb Zn Au)	105 H 12	5	D.I.A.N.D. (1982, p. 142)
39	NARCHILLA	Skarn W Cu Pb Zn	105 H 13	7	
40	LEE	Skarn Zn Pb (Ag Sn)	105 H 14	7	D.I.A.N.D. (1981, p. 188)
41	YUSEZYU	Unclassified	105 H 14	7	Blusson (1966)
42	DODGE	Skarn Mo	105 H 14	7	
43	TILLEI	Porphyry Mo W	105 H 14	7	
44	HITCH HIKER	Vein Ag Pb Zn	105 H 14	7	
45	ZEUS	Skarn W Mo	105 H 15	7	D.I.A.N.D. (1982, p. 143)
46	CHAP	Skarn W Mo	105 H 15	7	D.I.A.N.D. (1982, p. 143)
47	ALM	Skarn Pb Zn	105 H 16	7	
48	BUS	Unclassified	105 H 16		Skinner (1961, p. 46)

49	TIM	Skarn Pb Zn Cu	105 H 13	7	
50	SUSAN	Skarn W	105 H 8	7	D.I.A.N.D. (1982, p. 142)
51	LAN	Skarn Pb Zn Ag	105 H 1	7	D.I.A.N.D. (1981, p. 187)
52	TIN	Unclassified	105 H 12	9	D.I.A.N.D. (1981, p. 187)
53	VIKING	Skarn Ag Pb Zn	105 H 13,14	7	D.I.A.N.D. (1981, p. 187)
54	WOAH	Skarn W	105 H 14	5	D.I.A.N.D. (1981, p. 187)
55	JULIA	Occurrence Cu Zn Ag	105 H 5	7	D.I.A.N.D. (1982, p. 143)
56	TINY	Unclassified	105 H 9	9	D.I.A.N.D. (1981, p. 188)
57	AURORA	Skarn W Mo	105 H 15	7	D.I.A.N.D. (1982, p. 143)
58	TAI	Skarn W	105 H 14	7	D.I.A.N.D. (1981, p. 187)
59	FIN	Stratiform Pb Zn Ba	105 H 12	7	D.I.A.N.D. (1983, p. 131-132)
60	HAWK	Occurrence W	105 H 3	9	D.I.A.N.D. (1982, p. 144)
61	SUZANNE	Skarn Zn Pb (Ag Sn)	105 H 2	7	Morin et al (1977, p. 207)
62	KING ARCTIC	Unclassified	105 H 3	5	Morin et al (1977, p. 208)
63	MAXI	Stratiform Pb Zn Cu Ag (Ba)	105 H 11	7	Morin et al (1980, p. 67-68)
64	ON	Unclassified	105 H 2	9	D.I.A.N.D. (1982, p. 145)
65	KNEIL	Stratiform Fe Zn Pb	105 H 4	9	D.I.A.N.D. (1983, p. 131-133)
66	TYER	Unclassified	105 H 6	9	D.I.A.N.D. (1982, p. 145)
67	LYNX	Unclassified	105 H 16	9	D.I.A.N.D. (1982, p. 145)
68	TUNA	Skarn,Vein W Mo Cu	105 H 16	7	D.I.A.N.D. (1983, p. 131,133)
69	GEL	Unclassified	105 H 1	9	D.I.A.N.D (1982, p. 144-145)
70	BEANS	Unclassified	105 H 4		This Report
71	PICA	Unclassified	105 H 4		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

RIETA (MAX) — Tungsten Skarn
Score Resources Ltd. — 105 H 7 (8)
(61°17'N,128°14'W)

Reference: Sinclair and Gilbert (1975, p. 81-82); D.I.A.N.D. (1981, p. 186, note previously misplotted and call FLUKE).

Claims: RIETTA 1-24

Description:

The area is underlain by complexly-deformed pelitic sedimentary rocks of Devono-Mississippian age which are intruded by Cretaceous biotite granodiorite and minor quartz monzonite.

Tremolite-epidote skarn, developed at the contact of granodiorite and impure limestone, host scattered galena and sphalerite with minor amounts of pyrrhotite, chalcopyrite and scheelite. Disseminated galena, and locally chalcopyrite and sphalerite occur in vuggy altered zones of granodiorite.

Current Work and Results:

A&M Exploration Ltd. conducted geological mapping and geochemical sampling programs. Tungsten values occur in skarns along the contact of quartz monzonite with limestone and phyllite. Geological mapping (1:50,000) and a reconnaissance magnetometer survey were also conducted.

1983 MINERAL CLAIMS STAKED

BEANS — 105 H 4 (70)
C. Dick — (61°13'N,129°40'W)

Claims 1983: BEANS; ACE 3; APE 5; COW 6; DENA; BINGO 8; DIAMOND; LUCKY

PICA — 105 H 4 (71)
H. Caesar — (61°13'N,129°38'W)

Claims 1983: PICA 1-4

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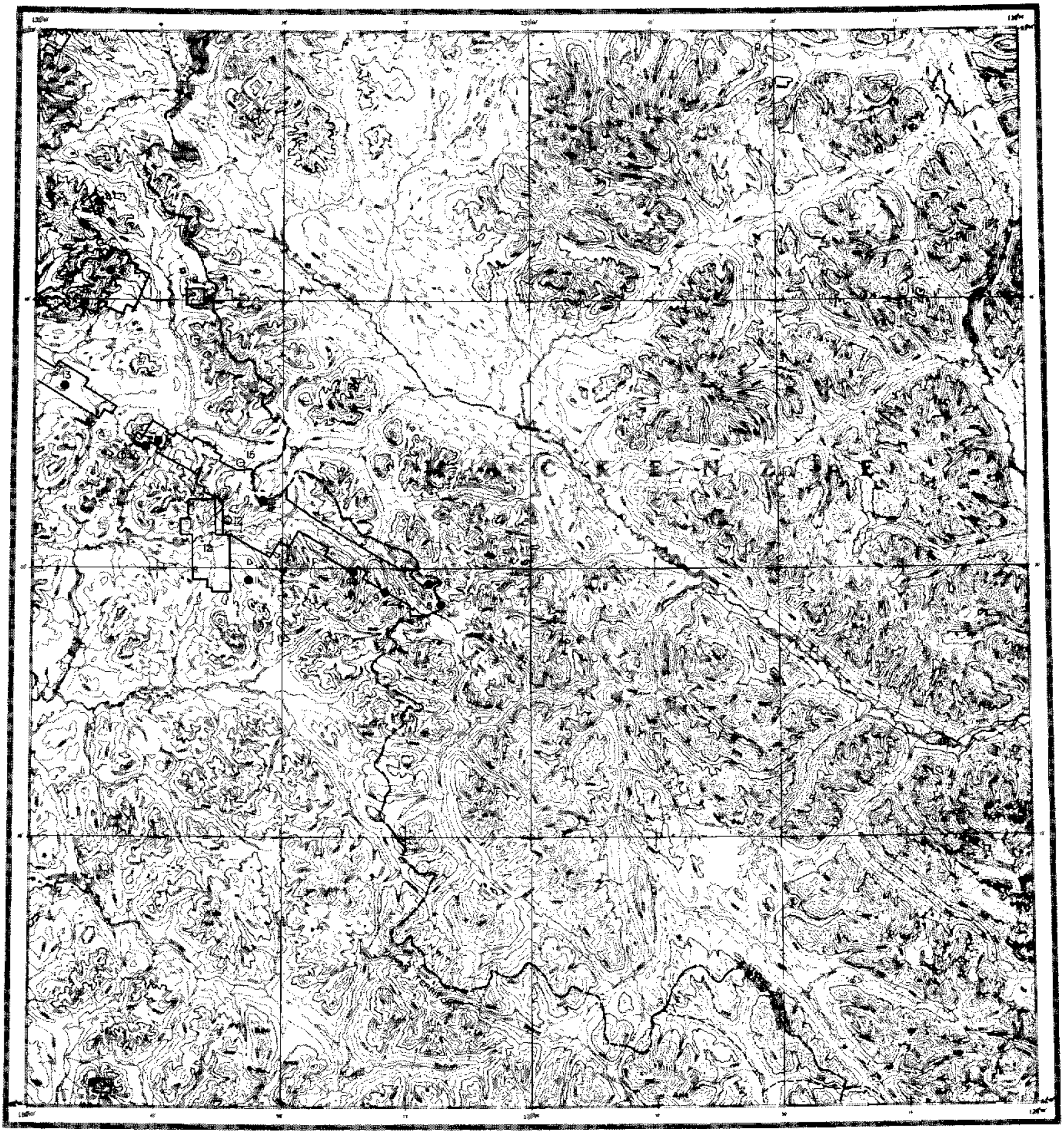
NOTES

105 I



NAHANNI

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30

Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

⊙ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

NAHANNI MAP-AREA (NTS 105 I)

General Reference: GSC Open File 780 and GSC Open File 809 by: S.P. Gordey, 1981.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	NAR	Vein, Skarn Cu Pb Ag Zn	105 I 4	7	
2	OMO	Skarn W Cu Zn	105 I 13	6	D.I.A.N.D. (1982, p. 147)
3	BIRR (BEE)	Skarn Cu Fe	105 I 13	7	Findlay (1969b, p. 50)
4	SEL	Vein Au	105 I 13	7	This Report
5	HOWARD'S PASS	Stratiform Pb Zn (Ag)	105 I 6	2	MIR (N.W.T.), 1973; D.I.A.N.D. (1981, p. 7,18); Morganti (This Report); Goodfellow and Jonasson (This Report); Jonasson and Goodfellow (This Report)
6	SHIELD	Stratiform Pb Zn	105 I 6	7	Sinclair et al (1975, p. 160-161)
7	ORO	Stratiform Ba	105 I 12	7	Sinclair & Gilbert (1975, p. 96-98)
8	WISE	Stratiform Pb Zn Ag	105 I 12	7	
9	WINKIE (ROSS)	Unclassified	105 I 6	7	Sinclair et al (1975, p. 161-162); D.I.A.N.D. (1983, p. 135)
10	NESS (MAD)	Vein Cu	105 I 6	7	Sinclair & Gilbert (1975, p. 96-97)
11	DIANNE	Unclassified	105 I 5		MIR, 1974, p.163
12	RITZ	Unclassified	105 I 12	9	D.I.A.N.D. (1981, p. 190)
13	ABBEY	Stratiform Pb Zn	105 I 12	6	D.I.A.N.D. (1981, p. 190)
14	TANG	Stratiform Ba	105 I 12	7	Morin et al (1979, p. 92)
15	OHNO	Unclassified	105 I 12	9	Morin et al (1980, p. 69)
16	ROOK	Unclassified	105 I 13,12	9	Morin et al (1980, p. 70)
17	FAST	Unclassified	105 I 12		D.I.A.N.D. (1983, p. 135)
18	SAND	Unclassified	105 I 12,13	9	This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

SEL
Trident Resources Inc. 105 I 13 (4)
(62°51'N,129°53'W)

References: D.I.A.N.D. (1981, p. 191; 1983, p. 135).

Claims: SEL 1-2, 4-6

Current Work and Results:

Quartz stringers and narrow zones of silicification cutting black argillite were geologically mapped (1:1,000), and two trenches, totalling 10 m^3, were excavated.

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SAND
Placer Development Limited 105 I 12,13 (18)
(62°45'N,129°30'W)

Claims: SAND 1-16

Source: Summary by K. Grapes from assessment report 091513 by P. Parcor.

History:

The SAND claims are approximately 15 km south of Mt. Wilson, west of the border with the Northwest Territories. They were staked in 1982 based on results from heavy mineral sampling conducted in 1982, as a follow up to the Geological Survey of Canada regional silt sampling program in 1981.

Description:

The SAND claims are underlain by hornfelsed sedimentary rocks and the Pelly River Pluton. The contact between the sedimentary rocks and the intrusive is sharp and near vertical. Fine grained clastic sedimentary rocks of the Earn Group occur away from the hornfels zone.

Current Work and Results:

Eight heavy mineral, four bulk, and twelve silt samples were collected from streams draining the area around the claims. All samples were analyzed for tungsten, gold, antimony, arsenic, zinc, lead, tin and copper. Of the heavy mineral samples collected, five out of seven returned anomalous tungsten values (greater than 500 ppm).

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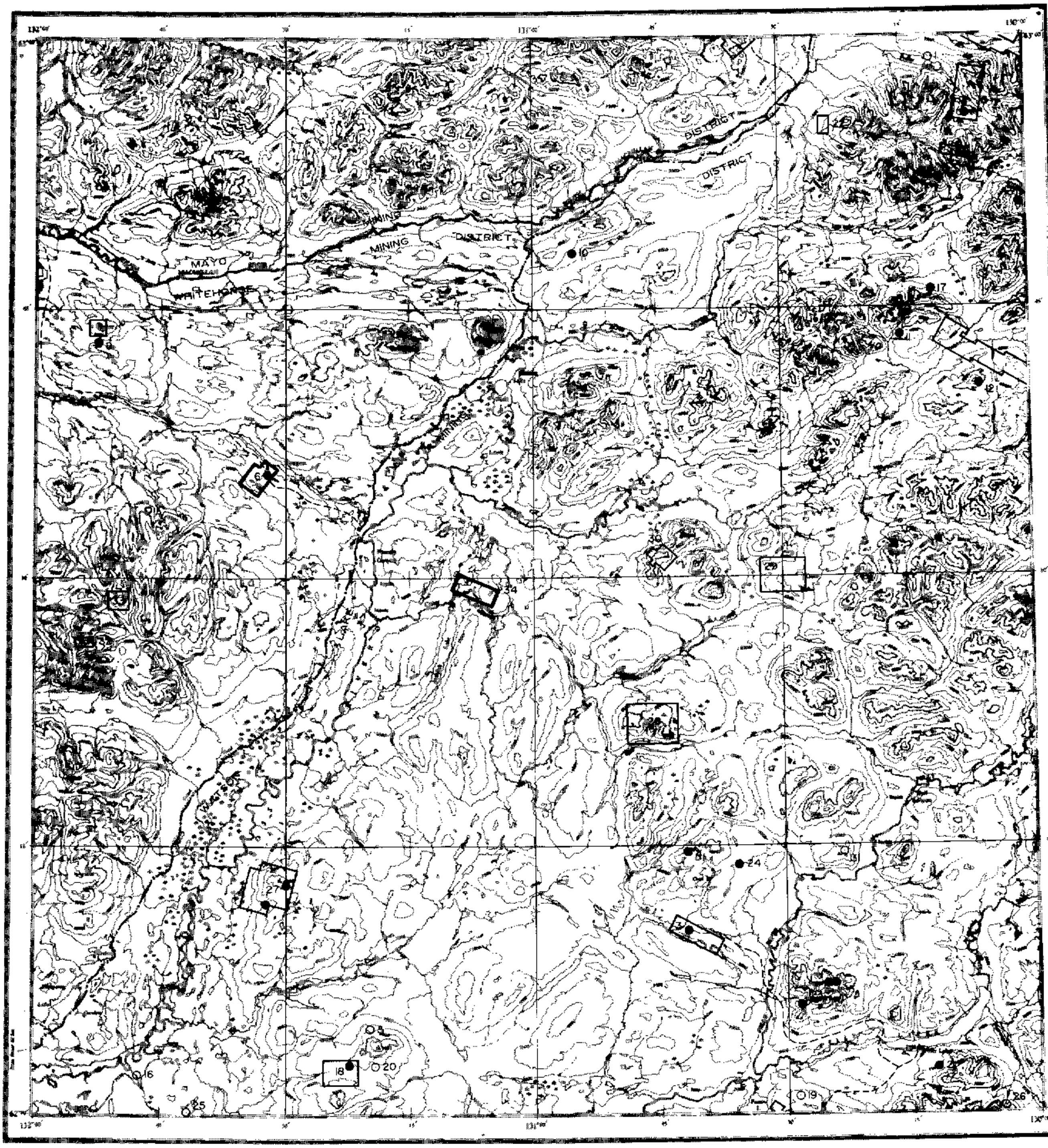
NOTES

105 J



SHELDON LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30

Kilometres

(horizontal ruled box)	Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
●	Mineral Deposit or Occurence see Key on facing page
○	Unmineralized Target
(box)	Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
(heavy box)	Mineral Claims staked in 1983
(line)	Placer Leases in good standing (Jan. 1984)
(hatched line)	Placer Claims in good standing (Jan. 1984)
CEL	Coal Exploration Licence
CML	Coal Mining Lease
(dashed line)	Tote Trail
(line)	Driveable Road
⌖	Oil or Gas Well
■	Airstrip

SHELDON LAKE MAP-AREA (NTS 105 J)

General Reference: GSC Map 12-1961 by:
J.A. Roddick and L.H. Green, 1961.
GSC Open File 212 by:
D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	FULLER	Unclassified	105 J 16	9	
2	BILL	Vein Pb Zn	105 J 1	7	Findlay (1969a, p. 81)
3	PIKE	Porphyry Cu Ag	105 J 2	2	D.I.A.N.D. (1982, p. 149)
4	NORKEN	Unclassified	105 J 2	7	Sinclair et al (1976, p. 169)
5	TAC	Porphyry Cu Mo	105 J 3	7	
6	DRAGON	Skarn, Vein Au Ag	105 J 12	7	This Report
7	MT. SHELDON	Vein Cu	105 J 11	7	Kindle (1945, p. 25)
8	RIDDELL	Unclassified	105 J 12	7	Craig & Milner (1975, p. 105-106)
9	SPEARHEAD (PDM)	Skarn Cu Fe	105 J 13	7	Craig & Milner (1975, p. 33)
10	ROG	Unclassified	105 J 15	7	Craig & Milner (1975, p. 123)
11	CLYDE	Unclassified	105 J 9	7	Craig & Laporte (1972, p. 128)
12	PREVOST	Unclassified	105 J 9	7	Sinclair & Gilbert (1975, p. 118-119); D.I.A.N.D. (1981, p. 195)
13	GUN	Skarn Cu Fe	105 J 16	7	Findlay (1969b, p. 166-167); D.I.A.N.D. (1981, p. 151)
14	ITSI	Vein Ag Pb Zn Cu As Sn	105 J 16	5	D.I.A.N.D. (1981, p. 193)
15	COSTIN	Vein Ag Pb Zn	105 J 16	7	
16	CAROLYN	Coal	105 J 4	7	
17	VARISCITE (MS)	Unclassified	105 J 16	9	Sinclair et al (1975, p. 166-167)
18	HENCH	Vein Pb Zn Ag	105 J 3	7	D.I.A.N.D. (1981, p. 193)
19	PPR	Unclassified	105 J 1		D.I.A.N.D. (1981, p. 195)
20	CLINGON	Unclassified	105 J 3		D.I.A.N.D. (1981, p. 195)
21	WILSON	Unclassified	105 J 16	9	D.I.A.N.D. (1981, p. 194)
22	EMPTY	Unclassified	105 J 16	9	D.I.A.N.D. (1981, p. 194)
23	TRAFFIC	Vein Ag Pb Zn Cu	105 J 1	7	D.I.A.N.D. (1981, p. 194)
24	PIG	Stratabound Pb Zn Cu Ag	105 J 2	7	Morin et al (1979, p. 93)
25	BOJO	Unclassified	105 J 4	9	Morin et al (1980, p. 71)
26	LH	Unclassified	105 J 1	9	D.I.A.N.D. (1982, p. 151)
27	AM	Porphyry Cu Mo	105 J 4	7	D.I.A.N.D. (1983, p. 137-139)
28	SHERPA	Unclassified	105 J 7	9	D.I.A.N.D. (1982, p. 150,151)
29	DYAK	Unclassified	105 J 9,10	9	D.I.A.N.D. (1982, p. 150,151)
30	RUDY	Unclassified	105 J 10	9	D.I.A.N.D. (1983, p. 137,139)
31	GREGGIE	Unclassified	105 J 1	9	D.I.A.N.D. (1982, p. 150-151)
32	RAGS	Unclassified	105 J 5	9	This Report
33	WENDY	Float - vein Au Ag	105 J 5	9	This Report
34	NARL	Unclassified	105 J 6,11	9	This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

DRAGON
Canamax Resources Inc.
Canada Tungsten Mining Corporation

Gold,Silver,Skarn Vein
105 J 12 (6)
(62°41'N,132°32'W)

References: Skinner (1961, p. 48); D.I.A.N.D. (1981, p. 195).

Claims: NURF 1-38

Current Work and Results:

The NURF claims were staked in 1983 to cover minor gold and silver values in pyroxene-pyrrhotite skarn pods and quartz-arsenopyrite veins in the 'Grit Unit' south of a quartz monzonite stock. The claims were geologically mapped (1:12,000) and geochemical soil samples were collected on Nurf 33-36 claims.

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RAGS
Agip Canada Limited | 105 J 5 (32) (62°28'N,131°50'W)

Reference: D.I.A.N.D. (1983, p. 137, 139).

Claims: RAGS 1-8

Source: Summary by P. Watson from assessment report 091484 by A.D. McLaughlin.

Description:

The claims, located 60 km northeast of Ross River, are underlain by South Fork volcanic rocks and intruded by Cretaceous granodiorite and quartz monzonite. The mid-Cretaceous, subaerial, calc-alkaline volcanic rocks consist of a lower sequence of andesite and basalt flows, and an upper sequence of dark dacite flows and tuffs.

Current Work and Results:

Geological mapping, prospecting and geochemical sampling programs were carried out in 1983. The rock units observed on the property are dark coloured dacite, with phenocrysts of quartz, biotite, feldspar and rarely hornblende, and some volcanic breccia units. Several fault zones, trending northeast serve as foci for increased zeolite, calcite, quartz and gypsum veining, and locally contain clay gouge up to 1 m wide. Wall rocks are locally bleached and hematitic.

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WENDY
Agip Canada Limited | Gold,Silver 105 J 5 (33) (62°30'N,131°47'W)

Reference: D.I.A.N.D. (1983, p. 137,139).

Claims: WENDY 1-16

Source: Summary by P. Watson from assessment report 091483 by A.D. McLaughlin.

Description:

The claims are located 60 km northeast of Ross River. They are underlain by mid-Cretaceous, South Fork volcanic rocks and intruded by Cretaceous granodiorite and quartz monzonite. The subaerial calc-alkaline volcanic rocks consist of a lower sequence of andesite and basalt flows, and an upper sequence of dark dacite flows and tuffs.

Current Work and Results:

Geological mapping, prospecting and geochemical sampling programs were carried out in 1983. Dark coloured dacite, with quartz, biotite, feldspar and minor hornblende phenocrysts, is cut by a single fault trending 160°. Minor quartz, quartz-calcite and calcite veining occurs at, or near the fault zone. Along the fault, the wall rock is weakly microfractured, with poorly developed propylitic alteration present locally. Quartz veins are more ubiquitous, but still not common.

Samples of float of silicified and pyritic dacite contained up to 305 ppb Au, 2.8 ppm Ag and 750 ppm As.

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NARL
Canamax Resources Inc. | 105 J 6, 11 (34)
Canada Tungsten Mining Corporation | (62°30'N,131°07'W)

Claims: NARL 1-40

Current Work and Results:

The NARL claims were staked in 1983 to cover hornfels in interbedded Cambrian limestone and limy argillite. The claims were geologically mapped (1:12,000) and soil sampled for geochemical analysis (355 samples).

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1983 MINERAL CLAIMS STAKED

NARL | 105 J 6,11 (34)
Canamax Resources Ltd. | (62°29'N,131°07'W)

Claims 1983: NARL 1-40

DRAGON | 105 J 12 (6)
Canamax Resources Ltd. | (62°36'N,131°33'W)

Claims 1983: NURF 1-38

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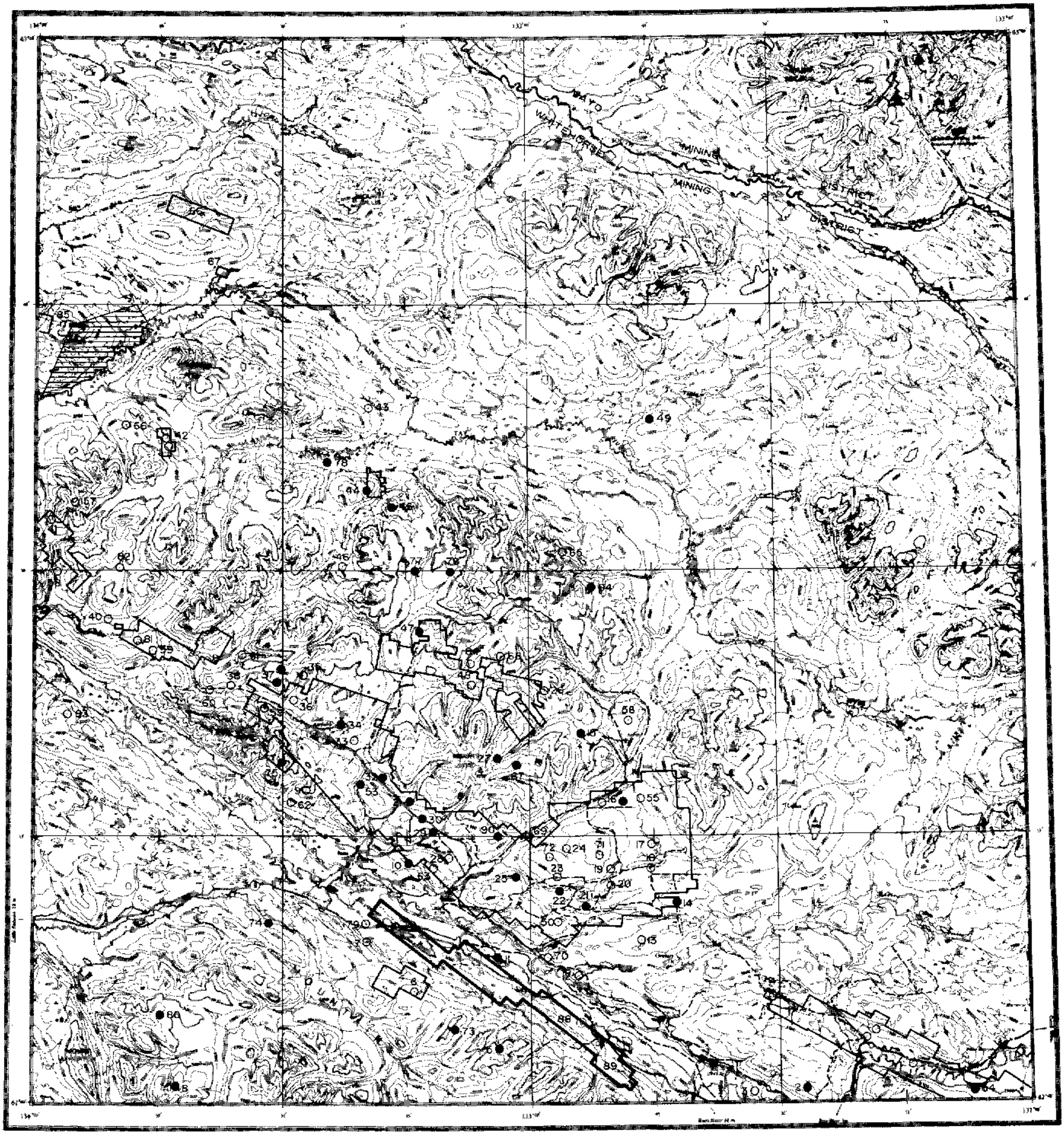
NOTES

105 K



TAY RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- ● Mineral Deposit or Occurrence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

TAY RIVER MAP-AREA (NTS 105 K)

General Reference: GSC Map 13-1961 by: J.A. Roddick and L.H. Green, 1961. GSC Open File 212 by: D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	TENAS	Unclassified	105 K 1	9	D.I.A.N.D. (1982, p. 154)
2	RAGS (ROSS RIDGE)	Vein Cu	105 K 1	7	Johnston (1936, p. 18)
3	PEN	Unclassified	105 K 2	9	
4	OLGIE (TER)	Unclassified	105 K 2	7	Sinclair et al (1976, p. 114)
5	FARGO	Stratiform Pb Zn	105 K 3	7	Morin et al (1979,p. 64)
6	LYN	Unclassified	105 K 3	9	D.I.A.N.D. (1981, p. 197)
7	CASCA (RIDGE)	Unclassified	105 K 3	9	Sinclair et al (1975, p. 135-136)
8	THOMAS	Skarn Zn	105 K 4	7	
9	TAKU	Unclassified	105 K 6		
10	NESBITT	Occurrence Cu	105 K 3	7	
11	BOBCAT	Limestone Stratabound	105 K 3	7	
12	HOLLY	Unclassified	105 K 2	9	
13	SOCK	Unclassified	105 K 2	9	Findlay (1967, p. 36); D.I.A.N.D. (1983, p. 141,145)
14	SPUR	Unclassified	105 K 2	7	Findlay (1969a, p. 47-48)
15	ADAMSON	Unclassified	105 K 7	7	Tempelman-Kluit (1968, p. 43-52); Sinclair et al (1975, p. 132)
16	BETA	Unclassified	105 K 7	9	Green (1965, p. 36-37)
17	BLIND (FOTO)	Unclassified	105 K 2	9	Findlay (1967, p. 40-41); Sinclair & Gilbert (1975, p. 54)
18	CUB	Unclassified	105 K 2	9	Green (1965, p. 36-37)
19	NASTY	Unclassified	105 K 2	9	Green (1965, p. 36-37); Craig & Milner (1975, p. 92-93)
20	ABRAHAM	Unclassified	105 K 2	9	Craig & Milner (1975, p. 92-93)
21	SEA	Stratiform Pb Zn Ag	105 K 2	7	Green (1965, p. 36-37); D.I.A.N.D. (1982, p. 18,154-155)
22	BS	Stratiform Pb Zn Cu Ag (Ba)	105 K 2	7	Sinclair & Gilbert (1975, p. 58)
23	BLACKWOOD (CIVI)	Unclassified	105 K 2	9	Morin et al (1977, p. 155)
24	BEA (FOX)	Unclassified	105 K 2	9	Findlay (1969a, p. 46-47)
25	SWIM	Stratiform Pb Zn Ag	105 K 3,2, 6,7	2	Tempelman-Kluit (1972, p. 42-43); D.I.A.N.D. (1982, p. 18, 154-155)
26	O'CONNOR	Unclassified	105 K 7	9	Findlay (1967, p. 39-40)
27	MUR	Vein Ag Pb Zn	105 K 6	7	
28	SHRIMP	Unclassified	105 K 3	9	Green (1965, p. 37-38)
29	VANGORDA	Stratiform Pb Zn Ag	105 K 6	2	Tempelman-Kluit (1972, p. 46-47)
30	GRUM	Stratiform Pb Zn Ag	105 K 6	7	D.I.A.N.D. (1983, p. 141-142)
31	KULAN	Stratiform Pb Zn Cu Ag (Ba)	105 K 6	7	Tempelman-Kluit (1972, p. 32)
32	KIM	Unclassified	105 K 6	7	Findlay (1969a, p. 45)
33	LOKO	Unclassified	105 K 6	9	Morin et al (1977, p. 161)
34	FARO	Stratiform Pb Zn Ag	105 K 6	1	This Report
35	FLAGSTONE	Unclassified	105 K 6	9	
36	BRIDEN	Unclassified	105 K 6	9	Findlay (1969a, p. 45)
37	JACOLA	Vein Ag Pb Zn	105 K 5,6	7	
38	CROWN	Unclassified	105 K 5	9	D.I.A.N.D. (1982, p. 155,158)
39	LORNA	Unclassified	105 K 5	7	Morin et al (1979, p. 66)
40	RESERVE	Unclassified	105 K 5	9	Craig & Milner (1975, p. 98-99)
41	COWARD	Occurrence Pb Zn	105 K 12	7	
42	COLT	Unclassified	105 K 12	9	D.I.A.N.D. (1983, p. 141,143)
43	OWL	Vein Ag Pb Zn	105 K 11	7	Craig & Laporte (1972, p. 93-94)
44	KEGLOVIC (HAL)	Unclassified	105 K 11	7	Sinclair et al (1975, p. 133)
45	IVAN (DANA)	Unclassified	105 K 11	7	Sinclair et al (1975, p. 133)

46	SHANNON	Unclassified	105 K 11	9	Findlay (1969a, p. 45)
47	REBEL	Unclassified	105 K 6	6	Craig & Milner (1975, p. 93-95)
48	KANGAROO	Unclassified	105 K 6	9	Sinclair et al (1975, p. 129); D.I.A.N.D. (1983, p. 141,145)
49	TEDDY	Skarn Zn	105 K 10	7	
50	SIROLA	Unclassified	105 K 2	9	
51	LAD	Vein Ag Pb Zn Cu	105 K 16	7	
52	SOLO	Vein Ag Pb Zn Sn Sb	105 K 16	7	Craig & Laporte (1972, p. 97-98)
53	CESSNA	Unclassified	105 K 6		
54	CHAPLIN (ARO)	Vein Cu Fe	105 K 1	7	Sinclair et al (1975, p. 137)
55	RUTH	Unclassified	105 K 7	9	D.I.A.N.D. (1981, p. 198)
56	DOT (TEL)	Unclassified	105 K 7	9	D.I.A.N.D. (1981, p. 198)
57	BRAB	Skarn Cu Zn Ag W	105 K 12	7	D.I.A.N.D. (1982, p. 155)
58	FISHHOOK	Unclassified	105 K 5,12	9	D.I.A.N.D. (1982, p. 155-156)
59	HEK	Unclassified	105 K 5	9	Sinclair et al (1976, p. 118)
60	MULTI	Unclassified	105 K 5	9	Sinclair et al (1976, p. 118-119)
61	JOE	Unclassified	105 K 5	9	Sinclair et al (1976, p. 120)
62	TSS	Unclassified	105 K 6	9	Sinclair et al (1976, p. 120)
63	DG	Unclassified	105 K 3	9	Sinclair et al (1976, p. 121)
64	NORK	Stratiform Pb Zn	105 K 7	7	Sinclair et al (1976, p. 124)
65	ZED	Unclassified	105 K 10	9	Sinclair et al (1976, p. 124)
66	LOLO	Unclassified	105 K 12	9	Sinclair et al (1976, p. 126)
67	RAZ	Unclassified	105 K 6	9	Morin et al (1977, p. 160)
68	MING	Unclassified	105 K 6	9	Morin et al (1977, p. 161)
69	CAT	Unclassified	105 K 2,3 6,7	9	Morin et al (1980, p. 45)
70	TAR	Unclassified	105 K 2	9	Morin et al (1979, p. 63)
71	MN	Unclassified	105 K 2	7	D.I.A.N.D. (1983, p. 141,143-144)
72	RACHEL	Unclassified	105 K 2	7	D.I.A.N.D. (1983, p. 141,143-144)
73	SIR JOHN A	Stratiform Pb Zn	105 K 3	7	Morin et al (1980, p. 41)
74	DEV	Stratiform Pb Zn Cu	105 K 4	7	Morin et al (1980, p. 42)
75	URN	Stratiform Ba	105 K 6	5	D.I.A.N.D. (1983, p. 141,144)
76	KD	Unclassified	105 K 6,11	6	Morin et al (1980, p. 44)
77	CON	Unclassified	105 K 6,11	7	Morin et al (1979, p. 68)
78	IRMA	Unclassified	105 K 11	9	Morin et al (1979, p. 68)
79	LOU	Unclassified	105 K 3	9	Morin et al (1980, p. 41)
80	MAY	Skarn Zn Pb (Ag Sn)	105 K 5	9	Morin et al (1980, p. 42)
81	EVA	Unclassified	105 K 5	9	Morin et al (1980, p. 43)
82	LU	Unclassified	105 K 12	9	Morin et al (1980, p. 43-44)
83	DELAY	Unclassified	105 K 5	9	D.I.A.N.D. (1982, p. 156)
84	FOO	Unclassified	105 K 6	9	D.I.A.N.D. (1983, p. 141,144)
85	WAD	Unclassified	105 K 12	9	D.I.A.N.D. (1983, p. 141,144-145)
86	LADY DI	Stratabound Pb Zn Ag	105 K 13	7	D.I.A.N.D. (1983, p. 141,145)
87	CHUCK	Unclassified	105 K 13	9	D.I.A.N.D. (1982, p. 156)
88	CANYON	Unclassified	105 K 2,3		This Report
89	HELL	Unclassified	105 K 2		This Report
90	DY	Stratiform Pb Zn Ag	105 K 3,6	2	Tempelman-Kluit (1972, p.); D.I.A.N.D. (1983, p. 143)

* Unclassified is the term used for properites for which there is no public data other than location, of for which public data exists, but not enough to classify the occurrence.

FARO
Cyprus Anvil Mining Corporation

Lead, Zinc, Silver
Stratabound
105 K 6 (34)
(62°22'N,133°23'W)

References: D.I.A.N.D. (1983, p. 141-143).

Claims: FARO

Current Work and Results:

Four diamond drill holes, totalling 968.4 m, were drilled on the FARO 66 claim as part of a program to explore for a geologically inferred extension of the main Faro orebody to the southwest of the open pit area. Forty-five samples of split core were analyzed for copper, lead, zinc, silver, gold, iron, manganese and barium.

1983 MINERAL CLAIMS STAKED

HELL 105 K 2 (89)
(62°01'N,132°44'W)
E. Wagantall;
A. Gougven

Claims 1983: ERN 1-8; REN 1-3; HELL 1-8; TAR 1-8

CANYON 105 K 2,3 (88)
(62°06'N,133°05'W)
A. Carlos;
Hudson Bay Exploration and
Development Co. Ltd.

Claims 1983: CANYON 1-40

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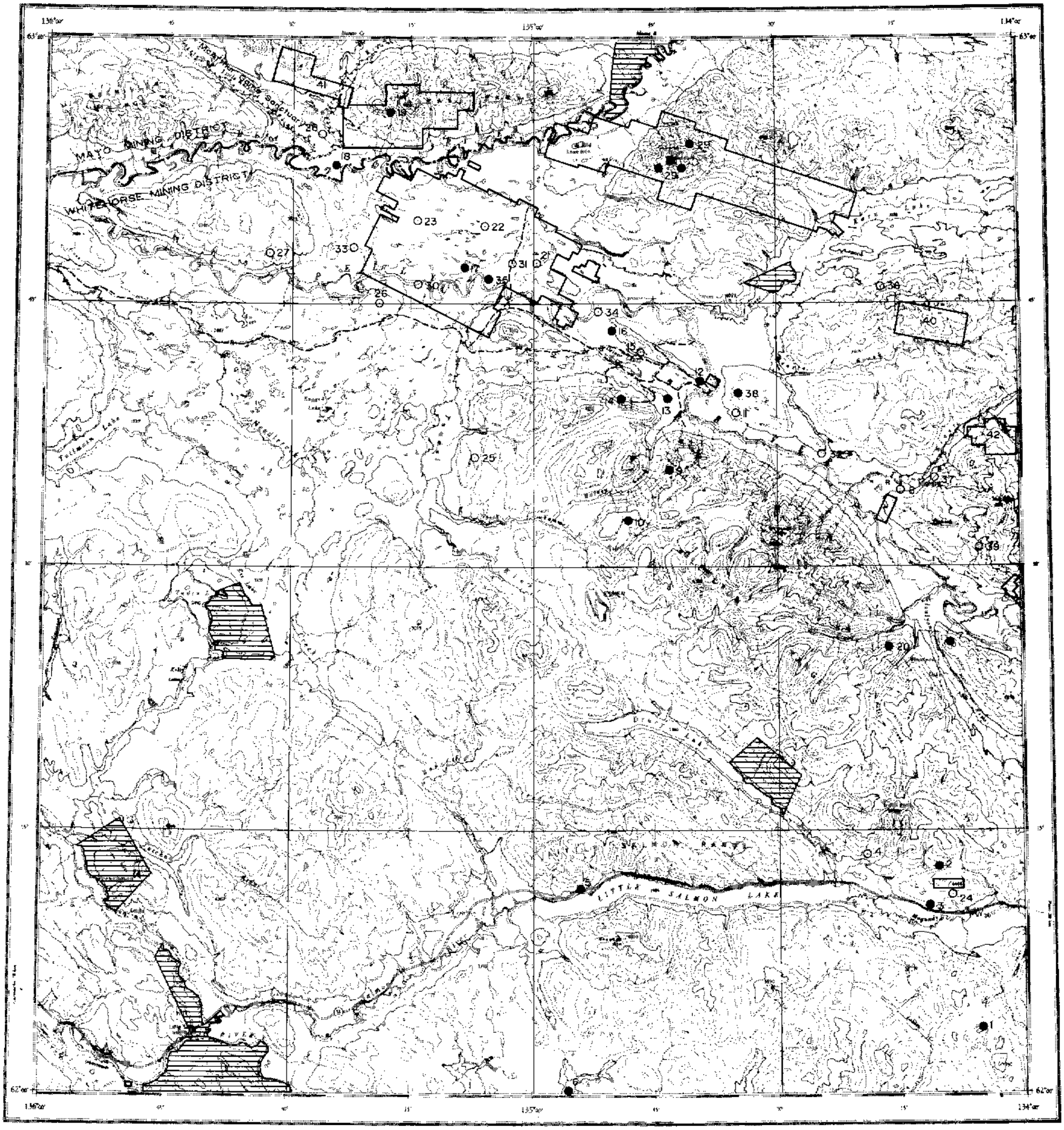
105 L



GLENYON
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page
○ Unmineralized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
CEL Coal Exploration Licence
CML Coal Mining Lease

Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

GLENLYON MAP-AREA (NTS 105 L)

General Reference: GSC Map 1221A and Memoir 352 by:
R.B. Campbell, 1967.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	LOKKEN	Skarn Zn	105 L 1	7	
2	LITTLE SALMON	Skarn Zn Pb (Ag Sn)	105 L 1	7	Green (1965, p. 38-40)
3	MOULE	Unclassified	105 L 1		Campbell (1967, p. 81); D.I.A.N.D. (1982, p. 163)
4	TRUITT	Unclassified	105 L 1		
5	BRANDY	Unclassified	105 L 2		Campbell (1967, p. 81)
6	JUMPONT	Coal	105 L 2	7	Craig & Laporte (1972, p. 156)
7	GLENLYON LAKE	Vein Cu Pb	105 L 8	7	
8	HODDER	Unclassified	105 L 9		
9	HARVEY	Vein Cu	105 L 10	7	Johnston (1936, p. 18)
10	TUMMEL	Unclassified	105 L 10		Campbell (1967, p. 81)
11	MUIR	Unclassified	105 L 10	9	D.I.A.N.D. (1981, p. 200)
12	HUB	Unclassified	105 L 10	7	Findlay (1969b, p. 28-29); D.I.A.N.D. (1983, p. 147,150)
13	SEARFOSS	Unclassified	105 L 10	7	Findlay (1969b, p. 28-29)
14	FRONT	Vein Cu Ag	105 L 10	7	
15	GE	Unclassified	105 L 10	9	D.I.A.N.D. (1981, p. 200)
16	McCOWAN	Unclassified	105 L 10	7	Findlay (1969b, p. 28-29)
17	CLEAR LAKE	Stratiform Pb Zn Ag Ba	105 L 14	6	This Report
18	DUO	Coal	105 L 14	7	
19	MACARTHUR	Occurrence Mo Cu W	105 L 14	7	D.I.A.N.D. (1983, p. 147-148)
20	FELIX	Skarn Zn	105 L 8	7	Sinclair et al (1976, p. 126)
21	KELLY	Unclassified	105 L 15,14		
22	TREDGER	Unclassified	105 L 14		
23	CONWEST	Unclassified	105 L 14		
24	DRURY	Skarn Zn Pb Ag	105 L 1	7	D.I.A.N.D. (1983, p. 147-149)
25	PETER	Unclassified	105 L 11	9	D.I.A.N.D. (1981, P. 201)
26	GRAF	Unclassified	105 L 11,14	9	D.I.A.N.D. (1981, P. 201)
27	HUGH	Unclassified	105 L 13	9	D.I.A.N.D. (1981, P. 201)
28	HANK	Unclassified	105 L 14	9	D.I.A.N.D. (1981, P. 201-202)
29	ONE HUMP	Skarn Cu W, Stratiform Ba, Vein Ag Pb Zn	105 L 15	5	This Report
30	TUM	Unclassified	105 L 14	9	This Report
31	PELLY	Unclassified	105 L 14	9	D.I.A.N.D. (1981, p. 202)
32	SAP	Unclassified	105 L 9	9	D.I.A.N.D. (1981, p. 202)
33	RSVP	Unclassified	105 L 14	9	D.I.A.N.D. (1981, p. 202)
34	WHIP	Unclassified	105 L 10	9	D.I.A.N.D. (1981, p. 202)
35	HACHEY	Occurrence Pb Zn Cu	105 L 14	7	
36	JAR	Stratiform Ba	105 L 16	7	D.I.A.N.D. (1983, p. 147,149)
37	LOBO	Unclassified	105 L 9	9	Sinclair et al (1976, p. 127)
38	END	Vein Cu	105 L 10	7	Sinclair et al (1976, p. 128)
39	AM-PM	Unclassified	105 L 9	9	Morin et al (1980, p. 45)
40	RABBIT	Unclassified	105 L 9	9	This Report
41	BUM	Unclassified	105 L 14	9	This Report
42	SUE	Occurrence Pb Zn	105 L 9	7	This Report

* Unclassified is the term used for properties for whcih there is no public data other than location, of for which public data exists, but not enough to classify the occurrence.

CLEAR LAKE
Getty Canadian Metals Limited
Essex Minerals Canada

Lead,Zinc,Silver
Stratiform
105 L 14,15 (17)
(62°49'N,135°05'W)

References: D.I.A.N.D. (1983, p. 147-148).

Claims: SUE; GET

Source: Summary by K. Grapes from assessment report 091511 by D.R. Hawke.

Current Work and Results:

During June to September, 1983, linecutting and overburden drilling was carried out in 12 selected areas. A total of 159 line-km of grid was cut and chained. Sixty-nine overburden holes were drilled for a total of 531 m.

In the fall, two diamond drill holes, totalling 2,045.5 m, were drilled to test the down dip continuity of the Clear Lake massive sulphide deposit. Both of the holes failed to intersect the mineralized zone.

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ONE HUMP
Anaconda Canada Exploration Limited

Copper, Tungsten
Skarn, Bedded Barite
105 L 15,16 (29)
(62°54'N,134°50'W)

Reference: D.I.A.N.D. (1983, p. 147,149).

Claims: ACE (756); EARN (6); CLARE (76); BUSH (48)

Source: Summary by P. Watson and K. Grapes from assessment report 091468 by R.D. Hall and A. Scott.

Current Work and Results:

Detailed geological, geochemical and geophysical studies were carried out on seven selected grids within the claim block in 1983. For geology of the claims, see D.I.A.N.D. (1982).

A total of 3,500 grid soil samples were collected and analyzed for copper, lead, zinc, silver and selectively for mercury and/or barium. Soil anomalies on the western slope of Lone Mountain occur in an area characterized by numerous barren, fetid, quartz-carbonate veins, and one flat-lying, narrow, quartz-arsenopyrite-galena vein. A trend of anomalous lead values in soils on the Main East Extension, Canyon and Scooter grids appear to be associated with a Mississippian (?) sequence of chert, siltstone and shale, containing abundant pyrite as disseminations and thin massive beds.

The Lone Mountain grid is underlain by interbedded slate, phyllite, marble and calc-silicate hornfels representing carbonate facies of the Cambrian-Ordovician Kechika Group. Non-calcareous beds were found to contain approximately 1% pyrrhotite as disseminated grains and thin stringers parallel to the cleavage. Quartz-chlorite-actinolite-pyrrhotite skarn contains minor chalcopyrite.

The Francois grid is located in an area of low topography and little outcrop, between Lone Mountain and Dromedary Mountain. Two thrusts mapped on Dromedary Mountain are believed to extend across this grid. The northern thrust separates conductive strata (folded Mississippian chert and Permo-Triassic units) from a 250 m thick section of high magnetic relief, believed to indicate Earn Group fine clastic rocks. South of this is a third package correlated with the carbonate facies of the Kechika Group on Lone Mountain and Dromedary Mountain.

The Main East Extension, Canyon and Scooter grids were mapped from stream exposures and three diamond drill holes. These grids are underlain by carbonate and phyllite facies of the Kechika Group, a lens of Kalzas Formation, the Mississippian chert-siltstone unit and the Permo-Triassic clastic sequence. The Lower Paleozoic assemblage is allochthonous. Mississippian orange weathering chert, black chert with disseminated and thin beds of pyrite, graphitic shale and mudstone, and dark grey carbonate occur in the fault panel structurally below the Kechika Group. They are conductive, have strong magnetic relief and are associated with a trend of gravity anomalies.

A massive barite lens, bedded pyrite, skarn and vein mineralization were found on these grids in 1982. The lens of interbedded grey barite and lesser black chert, on the north slope of Dromedary Mountain, is associated with Mississippian, thinly interbedded chert and siltstone. The baritic unit outcrops over a strike length of 400 m, and is up to 50 m thick.

Beds of pyrite up to 10 cm in thickness also occur on the Canyon and Francois grids.

Skarn-related and structurally controlled lead-zinc-silver mineralization is overprinted on hornfels (derived from calcareous facies of the Kechika Group) within the thermal aureole on Dromedary Mountain. Seven showings are known along a 2 km strike length. Skarn lenses range up to 1 m in thickness and several tens of metres in strike length. These contain some pyrrhotite with lesser pyrite, sphalerite, galena and chalcopyrite.

A narrow quartz-arsenopyrite-galena vein in hornfels of Kechika Group rocks on Lone Mountain is 0.3 m wide. The average of two chip samples over 0.3 m is 32 ppm Cu, 1.24% Pb, 0.41% Zn, and 2,012.6 g Ag/t.

Scheelite was found in streams draining the south slope of Dromedary Mountain, but has not been found in outcrop.

Magnetometer, Horizontal Loop EM and gravity surveys were carried out on seven grids. The magnetometer anomalies and EM conductors indicate the strike of the underlying sedimentary rocks and graphitic horizons. On the Lone Mountain and Francois grids, 40 line-km of magnetometer and EM and 23 line-km of gravity surveys were run. Four gravity anomalies were indicated - three with coincident magnetometer and EM responses and a fourth, less well-defined anomaly, with a flanking EM anomaly. A total of 31 line-km of EM and magnetometer and 10 line-km of gravity surveying was completed on the Banana, Canyon, Scooter and Main grids. The strong gravity anomaly found on these grids was partially tested by 1981 diamond drilling, revealing a thick bedded pyrrhotite zone with minor magnetite and low base metal values. On the Roger grid, 16 line-km of magnetometer and EM and 7 line-km of gravity surveys indicated one magnetic high with a flanking and partially coincident EM conductor.

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TUM
Cominco Limited — 105 L 11,14 (30) (62°44'N,135°10'W)

Reference: D.I.A.N.D. (1981, p. 202; 1982, p. 163).

Claims: TUM 1-198

Source: Summary by P. Watson from assessment report 091491 by M.R. Murrell.

Current Work and Results:

A 149 m long NQ diamond drill hole was drilled on the TUM 150 claim in 1983 to test a well defined EM anomaly a few kilometers south of the Clear Lake deposit.

The hole intersected black mudstone interbedded with minor siltstone, and streaky, thin-bedded, pyritic limestone or dolomite and a 3 m thick tuffaceous bed. The mudstone is often carbonaceous, with graphite developed on fracture surfaces. Graphite is common in several fault zones in the lower part of the hole. Sphalerite was observed at three localities, two in mudstone and one in limestone. Graptolites were found near the top of the hole.

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RABBIT
Anaconda Canada Exploration Limited — Geophysical Target, 105 L 9 (40) (62°43'N,134°12'W)

Reference: D.I.A.N.D (1983, p. 147,149-150).

Claims: RABBIT 1-128

Source: Summary by P. Watson from assessment report 091469 by R.D. Hall.

Current Work and Results:

Detailed geological mapping show the claims to be underlain by south-dipping, highly deformed mid-Mississippian strata. The sedimentary units consist of a resistant, thinly-bedded chert-siltstone unit, and a recessive, interbedded sandstone-shale-limestone unit, intruded by a small biotite-hornblende granodiorite stock. A contact aureole is defined by calc-silicate hornfels and lesser biotite-(andalusite-) pyrrhotite hornfels. Quartz stringers containing galena and chalcopyrite were noted in the northeast corner of the claim block.

A total of 589 soil samples were collected and analyzed for copper, lead, zinc and silver. An anomalous lead zone (20-60 ppm) occurs in the eastern part of the claim block.

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BUM
Anaconda Canada Exploration Limited — Geophysical Target, 105 L 14 (41) (62°52'N,135°25'W)

Reference: D.I.A.N.D. (1983, p. 147,150).

Claims: BUM (106)

Source: Summary by P. Watson from assessment report 091461 by R.D. Hall and A. Scott.

Current Work and Results:

Geological mapping in 1982 indicates that the strata young to the north, and have a strike of 100° with moderate dips to the south. Fine clastic rocks of the Kechika Group, Road River Group and Earn Group are represented in thrust panels bounded by east-striking, south-dipping thrust faults. Strata are also progressively hornfelsed to the north, in proximity to the margin of the McArthur Batholith. No mineralization (except minor iron sulphides) was noted on this grid.

The 852 samples collected were analyzed for copper, lead, zinc and silver, and selectively for mercury or barium (77 samples). Lead thresholds were used to define possible anomalous areas, but the distribution of these areas appears to be tied to the distribution of Road River Formation slates rather than the presence of mineralization.

Twenty-four line-km of magnetometer and horizontal loop EM surveys and eleven line-km of gravity surveys helped to delineate the location of graphitic horizons, but did not produce any significant anomalies.

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SUE
Kidd Creek Mines Limited

Lead,Zinc
105 L 9 (42)
(62°38'N,134°03'W)

Reference: D.I.A.N.D. (1983, p. 147,150).

Claims: SUE 1-62

Source: Summary by K. Grapes from assessment report 091457 by G. Hendrickson.

History:

The claims were staked in 1982, following the discovery of lead-zinc mineralization in an area of several conductive and magnetic anomalies outlined by a 1977 airborne EM and magnetometer survey.

Current Work and Results:

Fifteen kilometres of linecutting, Horizontal Loop EM and magnetic surveying were conducted in 1982. The results of the surveys delineated a northwest-trending fault in the northeast corner of the grid, as well as a few coincident magnetic anomalies and conductors. Magnetite- and pyrrhotite-bearing horizons have been identified and are commonly continuous enough to provide structural information. The HLEM survey indicated that small folds and faults repeat horizons across the grid. Convergence of some of the conductors in the center of the grid may indicate that the folds pinch out due to a gentle eastward plunge.

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NOTES

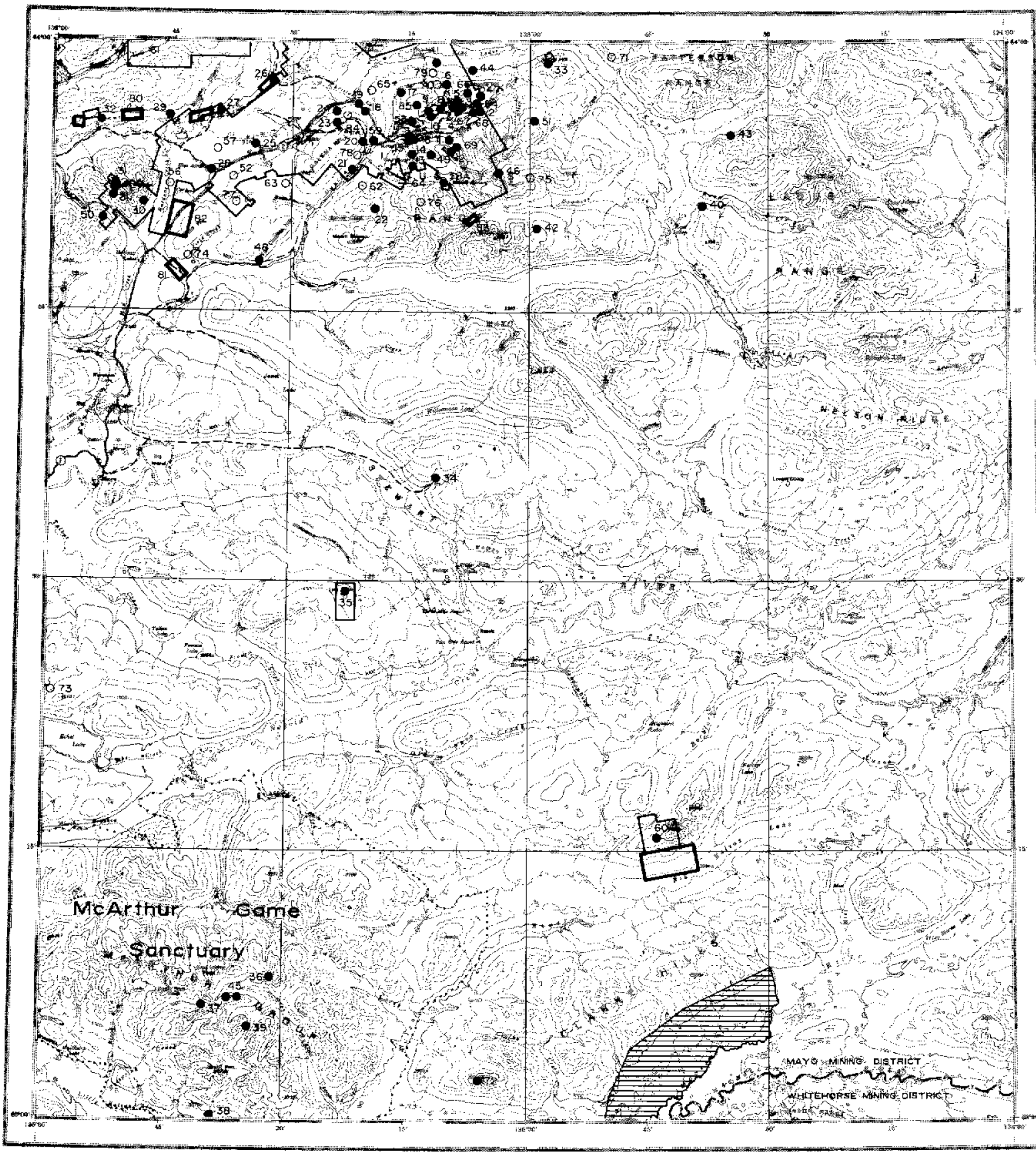
105 M PLACER

MAYO
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)		
●	Mineral Deposit or Occurence see Key on facing page	
○	Unmineralized Target	
	Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983	
	Mineral Claims staked in 1983	
	Placer Leases in good standing (Jan. 1984)	
	Placer Claims in good standing (Jan. 1984)	
CEL	Coal Exploration Licence	
CML	Coal Mining Lease	
	Tote Trail	
	Driveable Road	
	Oil or Gas Well	
	Airstrip	

105 M QUARTZ



MAYO
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

MAYO MAP-AREA (NTS 105 M)

General Reference: GSC Map 890A by: H.S. Bostock, 1947.
GSC Open File 710 by: M.P. Cecile, 1980a.
Bulletin 111 by: R.W. Boyle, 1965.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	UNITED KENO HILL	Vein Ag Pb Zn	105 M 14,13	1	This Report
2	FAITH	Vein Ag Pb	105 M 14	7	D.I.A.N.D. (1981, p. 206)
3	DUNCAN	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 56)
4	GOLD QUEEN	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 52); Green (1966, p. 18-19)
5	SILVER BASIN	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 51)
6	NABOB #2	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 51); This Report
7	LADUE FRACTION	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 40)
8	COMSTOCK	Vein Ag Pb Zn	105 M 14	3	Boyle (1965, p. 39,40,42); Green (1966, p. 15)
9	APEX	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 42-43)
10	VANGUARD	Vein Ag Pb Zn	105 M 14	4	Green & Godwin (1963, p. 11); Boyle (1965, p. 47)
11	HOMESTAKE	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p.52-53); Findlay (1967, p. 22)
12	CHRISTINE	Vein Ag Pb Zn	105 M 14	7	Findlay (1969a, p. 25)
13	MO	Vein Ag Pb Zn	105 M 14	7	
14	MAYBRUN	Vein Au Ag	105 M 14	7	D.I.A.N.D. (1981, p. 206)
15	HOGAN	Vein Ag Pb Zn	105 M 14	7	Boyle (1965, p. 46-47)
16	RUNER	Vein Ag Pb Zn	105 M 14	4	Boyle (1965, p. 46-47)
17	WERNECKE	Vein Ag Pb Zn	105 M 14	7	Findlay (1969b, p. 12)
18	FORMO	Vein Ag Pb Zn	105 M 14	3	D.I.A.N.D. (1982, p. 167)
19	PADDY	Vein Ag Pb Zn	105 M 14	3	Craig & Laporte (1972, p. 14)
20	EAGLE	Vein Ag Pb Zn	105 M 14	5	D.I.A.N.D. (1981, p. 206)
21	FISHER	Unclassified	105 M 14	9	D.I.A.N.D. (1981, p. 207)
22	PARENT	Unclassified	105 M 14	9	D.I.A.N.D. (1982, p. 169)
23	CREAM AND JEAN	Vein Ag Pb Zn	105 M 14	4	Boyle (1965, p. 78)
24	NORD	Vein Ag Pb Zn	105 M 14	7	Craig & Laporte (1972, p. 13-14)
25	GERLITZKI	Vein Ag Pb Zn	105 M 13	7	Green & Godwin (1963, p. 8); D.I.A.N.D. (1982, p. 165)
26	UR	Vein Ag Pb Zn	105 M 13	7	Green & Godwin (1964, p. 13); D.I.A.N.D. (1982, p. 165); This Report
27	SHANGHAI	Vein Ag Pb Zn	105 M 13	5	Findlay (1967, p. 24-25); This Report
28	WAYNE	Skarn Zn Pb, Vein W Au Ag	105 M 13	6	This Report
29	ARGENT	Vein Ag Pb Zn	105 M 13	7	D.I.A.N.D. (1981, p. 211)
30	STREBCHUCK (JOUMBIRA)	Vein Ag Pb Cu Sn W	105 M 13	7	D.I.A.N.D. (1983, p. 151,156-157)
31	MT. HALDANE	Vein Ag Pb	105 M 13	5	D.I.A.N.D. (1981, p. 207,211)
32	LAYSIER	Vein Ag Pb Zn	105 M 13	7	D.I.A.N.D. (1981, p. 211); This Report
33	COBALT	Vein Ag Pb Zn	105 M 15	7	Green (1971, p. 61)
34	GORDON	Vein unclassified	105 M 11	6	Sinclair & Gilbert (1975, p. 16-17)
35	TWO BUTTES	Skarn W	105 M 6	7	Garrett (1971); D.I.A.N.D. (1982, p. 167)
36	SIDE SLIP	Skarn Cu	105 M 4	7	
37	PIMA	Skarn W Cu Zn	105 M 4	7	
38	HOT SPRING	Vein Ag Pb	105 M 4	7	
39	LOST WERNECKE COPPER	Unclassified	105 M 4	7	
40	ROOP	Skarn W Cu	105 M 15	7	Little (1959, p. 36-37)
41	MOON	Vein Ag Pb	105 M 14	7	D.I.A.N.D. (1982, p. 169)

42	MT. ALBERT	Vein Ag Pb	105 M 15	7	
43	McKIM	Vein Ag Pb	105 M 15	7	
44	NERO	Vein Ag Pb	105 M 14	7	
45	FREISEN	Skarn Cu W Mo Ag Au	105 M 4	7	
46	MT. HINTON	Vein Ag Pb Zn	105 M 14	7	Findlay (1969a, p. 23)
47	AVENUE	Unclassified	105 M 14		Craig & Milner (1975)
48	CHANCE	Vein Sb	105 M 13	7	
49	YONO	Vein Ag Pb	105 M 14	7	
50	SUNDOWN	Unclassified	105 M 13	9	D.I.A.N.D. (1981, p. 211)
51	GUSTAVUS	Vein Ag Pb	105 M 15	7	
52	NEWRY	Unclassified	105 M 13		
53	CHRISTAL	Vein Ag Pb	105 M 14	7	D.I.A.N.D. (1981, p. 208)
54	SEGSWORTH	Vein Ag Pb Zn	105 M 14	4	
55	IRONCLAD	Vein Ag Pb Zn	105 M 14	7	
56	SINISTER	Unclassified	105 M 13	9	D.I.A.N.D. (1981, p. 208); D.I.A.N.D. (1983, p. 151,158)
57	ZAP	Vein Ag Pb Zn	105 M 13	7	D.I.A.N.D. (1982, p. 168)
58	W	Unclassified	105 M 14	9	D.I.A.N.D. (1981, p. 209)
59	AZTEC	Unclassified	105 M 14		
60	FLO	Vein W	105 M 7	7	This Report
61	WEASEL	Unclassified	105 M 13		D.I.A.N.D. (1981, p. 211)
62	FEEBLE	Unclassified	105 M 14		D.I.A.N.D. (1981, p. 211)
63	CLEAVES	Unclassified	105 M 13		D.I.A.N.D. (1981, p. 211)
64	ROSS	Unclassified	105 M 14		D.I.A.N.D. (1981, p. 211); D.I.A.N.D. (1982, p. 169)
65	GAMBLER	Unclassified	105 M 14	9	D.I.A.N.D. (1981, p. 209)
66	BE NO. 1	Vein Ag Pb Zn	105 M 14	7	D.I.A.N.D. (1982, p. 168)
67	BE NO. 2	Vein Ag Pb Zn	105 M 14	7	D.I.A.N.D. (1982, p. 168)
68	BE NO. 3	Vein Ag Pb Zn	105 M 14	7	D.I.A.N.D. (1983, p. 151,157)
69	BE NO. 4	Vein Ag Pb Zn	105 M 14	7	D.I.A.N.D. (1983, p. 151,157)
70	DIAMOND	Vein Ag Pb Zn	105 M 14	9	D.I.A.N.D. (1981, p. 210)
71	HEART	Unclassified	105 M 15	9	Morin et al (1980, p. 8)
72	DOPE	Unclassified	105 M 3		D.I.A.N.D. (1982, p. 168); D.I.A.N.D. (1983, p. 151,157)
73	DRILL	Unclassified	105 M 5		D.I.A.N.D. (1982, p. 169); D.I.A.N.D. (1983, p. 151,157)
74	SWIFT BANANAS	Unclassified	105 M 13		D.I.A.N.D. (1982, p. 169)
75	TUF	Unclassified	105 M 15,14		D.I.A.N.D. (1982, p. 169)
76	LEETEE	Unclassified	105 M 14		D.I.A.N.D. (1982, p. 169)
77	ISABEL	Unclassified	105 M 13		D.I.A.N.D. (1982, p. 169); D.I.A.N.D. (1983, p. 151,158)
78	GOLDEN DUKE	Unclassified	105 M 14		D.I.A.N.D. (1983, p. 151,158)
79	ORE	Unclassified	105 M 14		D.I.A.N.D. (1983, p. 151,158)
80	ARGENT	Unclassified	105 M 13		This Report
81	NO CREEK	Unclassified	105 M 13		This Report
82	MAG	Unclassified	105 M 13		This Report
83	HIKE	Unclassified	105 M 14		This Report
84	SWENSON LEASES	Unclassified	105 M 14	9	This Report
85	SADIE-LADUE	Vein Ag Pb	105 M 14	1	This Report
86	SILVER KING	Vein Ag Pb (Zn)	105 M 13	4	Nat. Min. Inv., 105 M 13, AG 1
87	HUSKY (UKM)	Vein Ag Pb	105 M 13	1	Nat. Min. Inv., 105 M 13, AG 7
88	REX	Vein Au Ag Pb Sb (Zn)	105 M 13	5	Nat. Min. Inv., 105 M 13, AG 4
89	RUBY FRACTION (UKM)	Vein Ag Pb	105 M 14	1	Nat. Min. Inv., 105 M 14, AG 7
90	KLONDYKE-KENO (BLUE ROCK)	Vein Ag Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 8
91	TOWNSITE	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 18
92	HIGHLANDER, CUB & BUNNY	Vein Ag Pb (Zn)	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 13
93	BLACK CAP & SHEPPARD (UKM)	Vein Ag Pb	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 15
94	BELLEKENO MINE	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 16
95	HECTOR-CALUMET	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 19
96	MOTH	Vein Ag Zn Pb	105 M 14	2	Nat. Min. Inv., 105 M 14, AG 20
97	NO CASH	Vein Ag Pb Zn	105 M 14	3	Nat. Min. Inv., 105 M 14, AG 21
98	CARIBOU	Vein Ag Pb	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 24

99	BERMINGHAM MINE (ARCTIC & MASTIFF)	Vein Ag Pb	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 25
100	SHAMROCK	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 26
101	DIXIE	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 29
102	GAMBLER	Vein Ag Pb	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 30
103	ELSA	Vein Ag Pb (Zn)	105 M 14	3	Nat. Min. Inv., 105 M 14, AG 32
104	KENO MINE	Vein Ag Pb (Zn)	105 M 14	3	Nat. Min. Inv., 105 M 14, AG 31
105	ONEK	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 33
106	LUCKY QUEEN	Vein Ag Pb (Zn)	105 M 14	3	Nat. Min. Inv., 105 M 14, AG 34
107	GALKENO	Vein Ag Pb	105 M 14	3	Nat. Min. Inv., 105 M 14, AG 38
108	DRAGON	Vein Ag Pb Zn	105 M 14	5	Nat. Min. Inv., 105 M 14, AG 40
109	CROESUS	Vein Ag Pb	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 42
110	LAKE	Vein Ag Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 44
111	DEVON	Vein Pb	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 28
112	KIJO	Vein Pb	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 45
113	BLUEBIRD	Vein Pb	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 46
114	TIN CAN	Vein Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 47
115	DUNCAN CREEK	Vein Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 48
116	STONE	Vein Ag (Pb Zn)	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 50
117	NO.1 VEIN FAULT	Vein Ag Pb Zn	105 M 14	4	Nat. Min. Inv., 105 M 14, AG 51
118	HELEN FRACTION	Vein Ag Pb (Sb)	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 53
119	GOLD HILL NO.2	Vein Ag (Pb Zn)	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 54
120	FOX	Vein Ag Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 55
121	ALICE	Vein Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 57
122	DIVIDE	Vein Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 58
123	OK	Vein Ag Pb	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 62
124	PORCUPINE	Vein Ag	105 M 14	2	
125	RUNNER	Vein Ag	105 M 14	4	
126	BETTY	Vein Ag Pb Zn	105 M 14	7	Nat. Min. Inv., 105 M 14, AG 9
127	CRO-MUR (GAMBLER)	Vein Ag Pb	105 M 14	5	Nat. Min. Inv., 105 M 14, AG 37

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

A data gap exists in previous YEG maps for N.T.S. 105 M - about 40 occurrences (all silver-bearing) are not shown. The maps in this report rectify the situation somewhat, but are hampered by the large number of occurrences (some on the same vein), the proprietary nature of much of the information, and the sometime confusing and contradictory reference sources. These all point to a need for an improved medium with which to depict the occurrences that will be provided in the 1984 YEG.

The Keno Hill area is host to numerous occurrences - too many to depict sensibly on the common map scale used in this part. The larger scale maps below show all precious metal occurrences and veins in the area. Vein distribution is after Gleeson and Boyle (1980). Showings 86 and on are not depicted on the index map 105 M, but are shown below in the inset map.

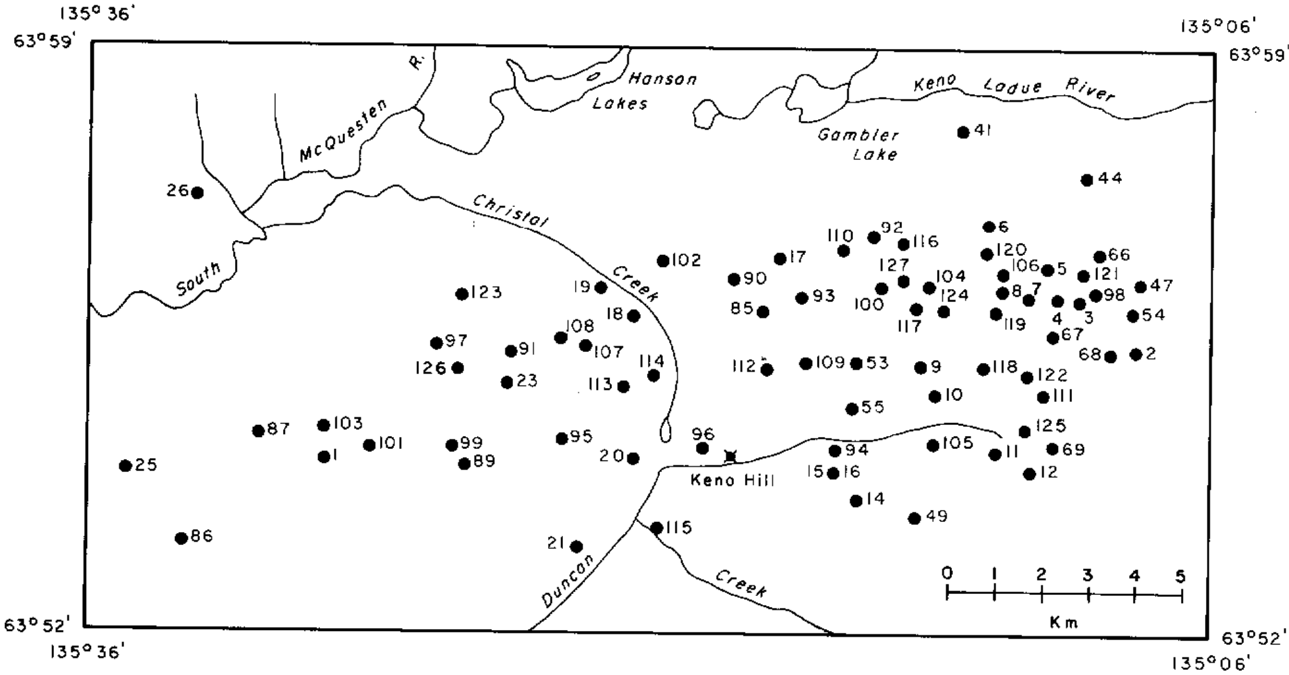


Figure shows generalized distribution of mines and prospects in the Keno Hill area.

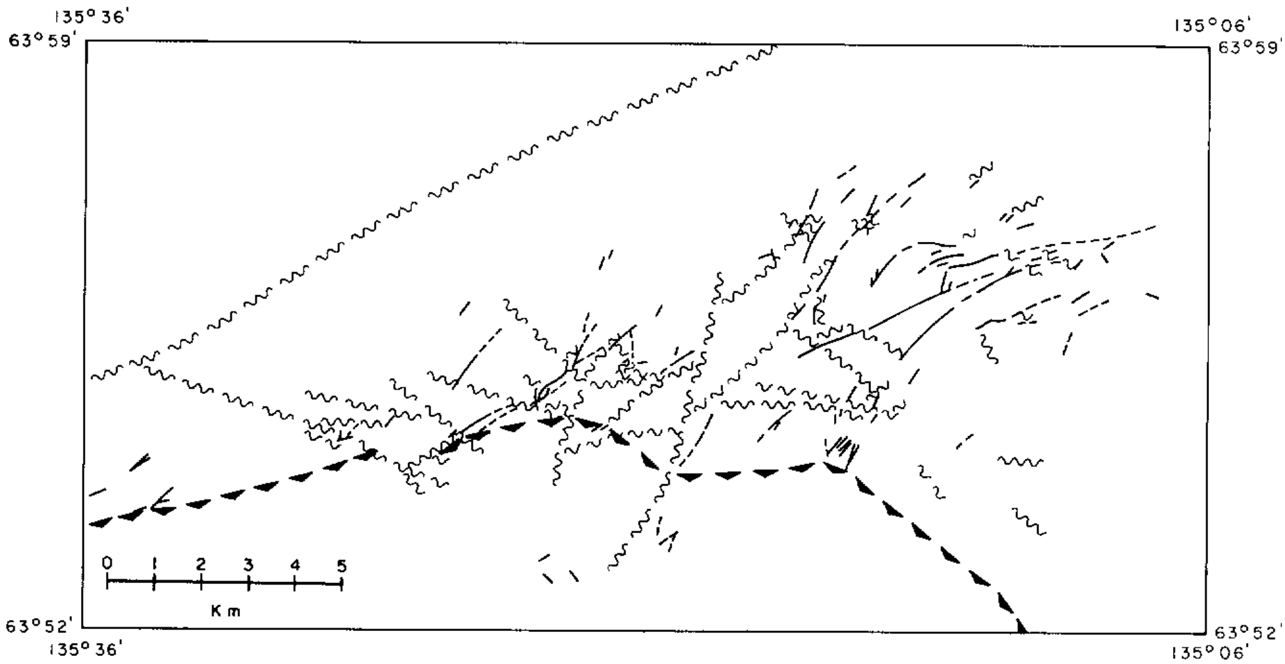


Figure shows generalized distribution of veins (solid and dashed lines), faults (wavy lines) and thrust fault (line with teeth) in the Keno Hill area. Modified after Gleeson and Boyle (1980).

ORE RESERVES*

In Situ Proven and Probable at December 31, 1983.

ELSA AREA:

	1982			1983		
	tonnes	Silver g/t	Lead %	tonnes	Silver g/t	Lead %
Underground Ore Reserves						
Proven	34,103	1,176	4.6	32,017	1,196	5.7
Probable	61,948	1,018	4.3	72,832	1,063	4.3
Sub-total	96,051	1,076	4.4	104,849	1,097	4.7
Open Pit						
Probable	70,655	720	3.1	61,676	699	3.0
Total Ore Reserves	166,706	926	3.9	166,525	926	4.1
Stockpile Reserves	23,128	579	2.8	15,237	744	4.4
Total Ore in Reserve and Stockpile	189,835	884	3.7	181,763	936	4.1

Reserves of Individual Mines at Year End:

Mine	1979		1980		1981		1982		1983	
	Reserves (tonnes)	Silver Grade (g/t)	Reserves (tonnes)	Silver Grade (g/t)	Reserves (tonnes)	Silver Grade (g/t)	Reserves (tonnes)	Silver Grade (g/t)	Reserves (tonnes)	Silver Grade (g/t)
ELSA	19,051	---	11,714	1,008	8,769	1,131.4	10,972	1,100.6	16,330	1,155.4
COMSTOCK KENO	8,372	1,029	8,372	1,029	---	---	---	---	---	---
KENO	39,114	830	27,668	809	26,305.5	840	20,324	881.2	20,324	881.2
NO CASH	13,182	902	17,518	819	17,015	822.8	9,756	812.6	9,756	812.6
RUBY	12,734	1,128	10,836	998	8,535	970.3	3,672	1,076.6	2,740	816.0
HUSKY	50,850	1,505	47,258	1,330	1,385	44,432.7	35,842	1,296.0	30,067	1,501.7
SIME & BERMINGHAM	104,738	790	73,188	904	---	---	---	---	---	---
PORCUPINE	---	---	---	---	---	---	13,531	956.6	13,531	956.6
HUSKY S.W.	---	---	---	---	---	---	---	---	10,203	898.3

* Information from United Keno Hill Mines Annual Report, 1983.

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WAYNE
Island Mining and Exploration Company Limited

Lead,Zinc Vein, Tungsten,Gold, Silver Skarn
105 M 13 (28)
(63°53'N,135°40'W)

Reference: D.I.A.N.D. (1982, p. 165,167).

Claims: WAYNE(5); DON(7); MARY E(2)

Source: Summary by P. Watson and D. Emond from assessment report 091497 by T.M. Elliot.

Current Work and Results:

Seven NQ diamond drill holes, totalling 795.5 m, were drilled on the DON 7 and 8 claims in 1983. Most holes intersected several skarn zones between schist and quartzite units, and in one hole a vein fault was

UNITED KENO HILL
United Keno Hill
Mines Limited

Silver,Lead,Zinc
Veins
105 M 13,14 (1)
(63°53' - 63°58'N,
135°04' -135°35'W)

Reference: D.I.A.N.D. (1983, p. 151,154-156).

Claims: SILVER KING; RUBY MINE; GALKENO-SUGIYAMA; BERMINGHAM S.W. (1075)

Current Work and Results:

During 1983, United Keno Hill Mines Limited drilled seven diamond drill holes, totalling 899.2 m, and eighty-four percussion drill holes, totalling 4,093.5 m, at the Silver King Mine. Three new veins were intersected with values ranging from 240 to 3,360 g Ag/t. Thirty-four percussion holes, totalling 1,123.2 m, were drilled in the Ruby Mine, revealing a small potential ore shoot.

A total of 51,256 m^3 of overburden was stripped by bulldozer from the GALKENO-SUGIYAMA and BERMINGHAM S.W. properties. On the GALKENO, a narrow galena ore vein was exposed over a strike length of 500 m.

SUMMARY OF OPERATIONS OF UNITED KENO HILL MINES LTD.

Summary of Production from Keno Hill - Galena Hill Mines:

	1978	1979	1980	1981	1982	1983
Tonnes Mined	127,424	155,361	95,067	63,478	50,355	31,105
Tonnes Milled	81,72	111,685	79,655	60,840	50,355	29,595
Daily Average Milled (tonnes)	326	406	388*	367	360	2
Mill Heads:						
Silver (gm/tonne)	1,224	818	789	754	843	782
Lead (%)	5.5	3.7	3.4	2.5	---	---
Zinc (%)	0.8	0.6	0.8	---	---	---
Metal Productions:						
Silver (gm)	90,741,633	78,907,533	58,963,139	36,020,435	37,283,765	19,911,092
Lead (kg)	3,448,912	2,726,862	2,212,353	1,019,649	778,135	484,218
Zinc (kg)	11,971	379,164	413,043	---	---	63,161
Cadmium (kg)	171	---	---	---	---	---
Metal Sales:						
Revenues from Shipments ($)	18,162,909	53,226,219	31,742,000	12,561,000	---	8,560
Ore Reserves at your end:						
Tonnes	99,517	299,951	435,811	242,636	189,835	181,763
Silver (gm/tonne)	1,364	998	846	926	885	936
Lead (%)	4.9	4.3	3.4	4.1	3.7	4.1
Zinc (%)	0.9	---	---	---	---	---

* adjusted for strike of 122 days.

also intersected. Skarn bands were up to 9 m wide and contained up to several percent each of pyrrhotite and arsenopyrite. Scheelite occurs locally. Assays up to 2.29 g Au/t and 0.052% W with less than 1.7 g Ag/t over 3.05 m, and up to 27.1 g Ag/t with 0.48 g Au/t and less than 0.005% W over 2.95 m were reported. The vein material is mainly quartz with minor siderite and pyrite, and trace sphalerite and galena.

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FLO	Tungsten Vein,
Union Carbide	Stockwork
Canada Limited	105 M 7 (60)
	(63°16'N,134°42'W)

Reference: D.I.A.N.D. (1983, p. 151,157); Lynch (this report).

Claims: WOLF; DAVID; PAT; BLACKIE; FRAM (119)

Current Work and Results:

The FRAM claims were added on to the claim group in March, 1983. That season, all claims were mapped at 1:5,000 scale, and the WOLF, PAT, DAVID and BLACKIE claims at 1:2,000 scale. On the WOLF claims, a road cut was blasted, exposing 750 m of continuous outcrop faces and two diamond drill holes, totalling 667.8 m, were completed. Quartz veins with variable quantites of wolframite have been exposed in bedrock over a 1.0 by 0.8 km area and are encountered down to at least 300 m below surface.

Drilling intersected interbedded quartzite, sandstone, siltstone and phyllite cut by abundant coarse quartz-wolframite veins with tourmaline-rich envelopes. Other minerals found in these veins are scheelite, K-feldspar, chlorite, beryl, and molybdenite. Thin chlorite-pyrite veins and some limonite stained fracture zones were also encountered. Sericitization and silicification are the main pervasive alteration types, the former predominant.

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SWENSON LEASES	
Canada Tungsten Mining	105 M 14 (84)
Corporation Limited	(63°56'N,135°24'W)

Reference: Boyle (1965).

Claims: CAIN; PRO; ABEL; REX; HORSE-SHOE

Source: Summary by P. Watson from assessment report 091464 by G.M. Rodgers.

History:

These five claims are all held in 21 year mining leases. They are located on the north slope of Galena Hill, 3 km northeast of Elsa, between the NO CASH - BETTY and FORMO veins. The only reported work was hand and bulldozer trenching carried out by N. Swenson in 1961-1962. In 1980, Bema Industries Limited conducted work on the property for Canada Tungsten Mining Corp. Ltd.

Description:

The property was not geologically mapped during the 1980 program. Boyle (1965) indicates that the property is underlain by the Lower Schist unit (graphitic phyllite, quartz chlorite schist and thinnly-bedded quartzite) which has been intruded by greenstone lenses. The Central Quartzite unit which is the major host for economic silver-lead veins in the Keno Hill Camp is inferred to underlie the southern tip of one of the claims in this block.

Current Work and Results:

In 1980, 357 soil samples were collected at 50 m intervals and analyzed for lead, zinc, silver and copper. Samples containing greater than 26 ppm Pb, 0.56 ppm Ag, 124 ppm Zn or 36 ppm Cu were considered anomalous.

Five anomalous zones were recognized, two on the PRO claims and one each on CAIN, ABEL and HORSE-SHOE. These zones ranged from 50 m by 100 m to 100 m by 400 m in area, and were weak to strong lead-silver (+/- weak zinc), lead-zinc with weak silver, lead-zinc-silver, and zinc-copper (+/- weak lead-silver) anomalies.

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SADIE-LADUE	Silver,Lead
Archer Cathro and	Vein
Associates (1981) Limited	105 M 14 (85)
(leased from UKHM)	(63°53' - 63°58'N,
	135°04' -135°35'W)

Reference: D.I.A.N.D. (1983, p. 151,154-156).

Claims: SADIE-LADUE (4)

Current Work and Results:

In 1983, SADIE-LADUE was leased from United Keno

Hill Mines Limited to a consortium involving Archer Cathro and Associates as managers. That year, 376.59 dry tonnes of ore, averaging 8,743.46 g Ag/t and 40.82% Pb, were mined.

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1983 MINERAL CLAIMS STAKED

NABOB #2 — 105 M 2,7 (6)
Union Carbide Canada Ltd. — (63°14'N,134°43'W)

Claims 1983: FRAM 1-60

UR — 105 M 13 (26)
B.J. Stewart — (63°58'N,135°33'W)

Claims 1983: CATHY 1-8

LAYSIER — 105 M 13 (32)
D. Allen — (63°55'N,135°57'W)

Claims 1983: LAZIER 7-10

ARGENT — 105 M 13 (80)
K. Horoscoe — (63°56'N,135°50'W)

Claims 1983: ARGENT 1-8

NO CREEK — 105 M 13 (81)
D.B. Palmer — (63°47'N,135°44'W)

Claims 1983: NO CREEK 1-8

MAG — 105 M 13 (82)
D.J. Bergvinson — (63°50'N,135°44'W)

Claims 1983: MAG 1-32

UNITED KENO HILL — 105 M 14 (1)
United Keno Hill Mines Ltd. — (63°56'- 63°58'N,)
(135°04'-135°35'W)

Claims 1983: BERRNAT; ALICE; OLGA; SOMETHING; LIBERTY; BELL; RAY; NINA; HILL; BEANPOT

SHANGHAI — 105 M 14 (27)
R. Mooney — (63°56'N,135°42'W)

Claims 1983: LAURA 1-8

HIKE — 105 M 14 (83)
(63°50'N,135°07'W)

Claims 1983: HIKE 1-2

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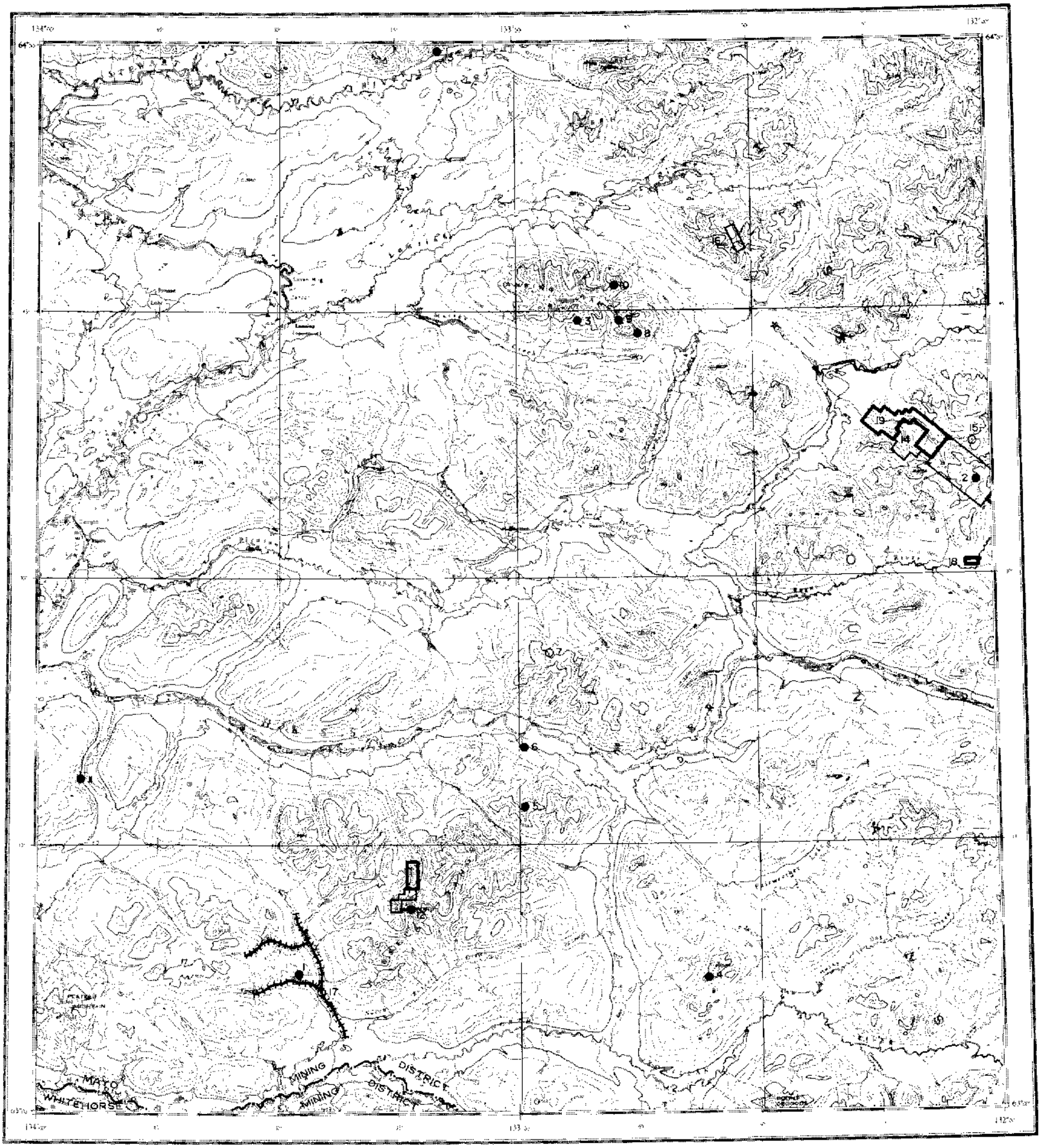
105 N



LANSING
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

LANSING MAP-AREA (NTS 105 N)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974.
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	ARMSTRONG	Skarn W Cu	105 N 3	7	Mulligan (1975, p. 74)
2	PLATA	Vein Ag Pb Zn	105 N 9	5	This Report
3	JOY	Occurrence Cu	105 N 10	7	
4	GOLF	Skarn Cu	105 N 2	7	
5	ETZEL	Vein Cu	105 N 7	7	
6	BRODELL	Vein Cu	105 N 7	7	
7	PEBBLE	Occurrence Pb	105 N 7	7	
8	DEAN	Vein Pb	105 N 10	7	
9	AUREOLE	Vein Cu	105 N 10	7	
10	BLOOM	Vein Cu Mo Pb Co	105 N 15	7	
11	PLEASANT	Skarn Cu W Ag	105 N 5	7	
12	TONGUE	Skarn W Cu Sn	105 N 3	7	This Report
13	KIDD	Stratabound Zn	105 N 15	7	Morin et al (1977, p. 119)
14	FLATASA	Unclassified	105 N 9	9	D.I.A.N.D. (1982, p. 171)
15	SPIS	Unclassified	105 N 9	9	D.I.A.N.D. (1981, p. 213)
16	ANDREA	Stratiform Ba	105 N 15	7	D.I.A.N.D. (1982, p. 171)
17	RAM	Unclassified	105 N 3		D.I.A.N.D. (1983, p. 161)
18	STRIP	Unclassified	105 N 9		This Report
19	ROGUE	Unclassified	105 N 9		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

PLATA - INCA
Dawson Eldorado Gold Explorations Limited (operator)
Ebony Resources Limited
Silver Crest Resources Corp.

Silver,Lead, Zinc
105 N 9,O 12 (2)
(63°35'N-63°42' N, 132°02'W-131°57'W)

Reference: Morin et al (1977, p. 111), P.S White (personal communication).

Claims: PLATA (136); INCA (40)

Current Work and Results:

The 1983 exploration program on the property consisted mainly of bulk sampling, geochemistry and geology. A 408 t bulk sulphide-rich sample was taken from three known PLATA veins using normal surface vein mining methods with compressed air drills and chippers. From 8,163 to 18,140 t of overburden were removed by bulldozer.

One hundred ninety tonnes were mined from two vein zones on the adjoining INCA claims. Ten new showings were found over both properties.

Mineralogical and mill testing of the PLATA No. 2 (tension fracture) and PLATA No. 4 (thrust fault) Zones were conducted on the bulk sample material. Results are as follows (P.S. White, personal communication): the PLATA No. 2 Zone is amenable to flotation concentration up grading to recover 92% of the contained silver in 70% of the sulphide material treated; the PLATA No. 4 Zone was not immediately amenable to flotation concentration due to interlocking of small marcasite and pyrite crystals with the silver-rich sulphides.

The PLATA No. 2 Zone lots averaged 4,080 g Ag/t and 59% Pb, and the INCA lots averaged 4,800 g Ag/t and 75% Pb.

The overall average for the 599 tonnes of 1983 bulk sample was 4,251 g Ag/t and 62.5% Pb.

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1983 MINERAL CLAIMS STAKED

TONGUE
Union Carbide Canada Ltd.

105 N 3 (12)
(63°13'N,133°13'W)

Claims 1983: PIL 1-14

FLATASA
P.S. White

105 N 9 (14)
(63°38'N,132°13'W)

Claims 1983: ROGUE 1-92

STRIP
L. Brault

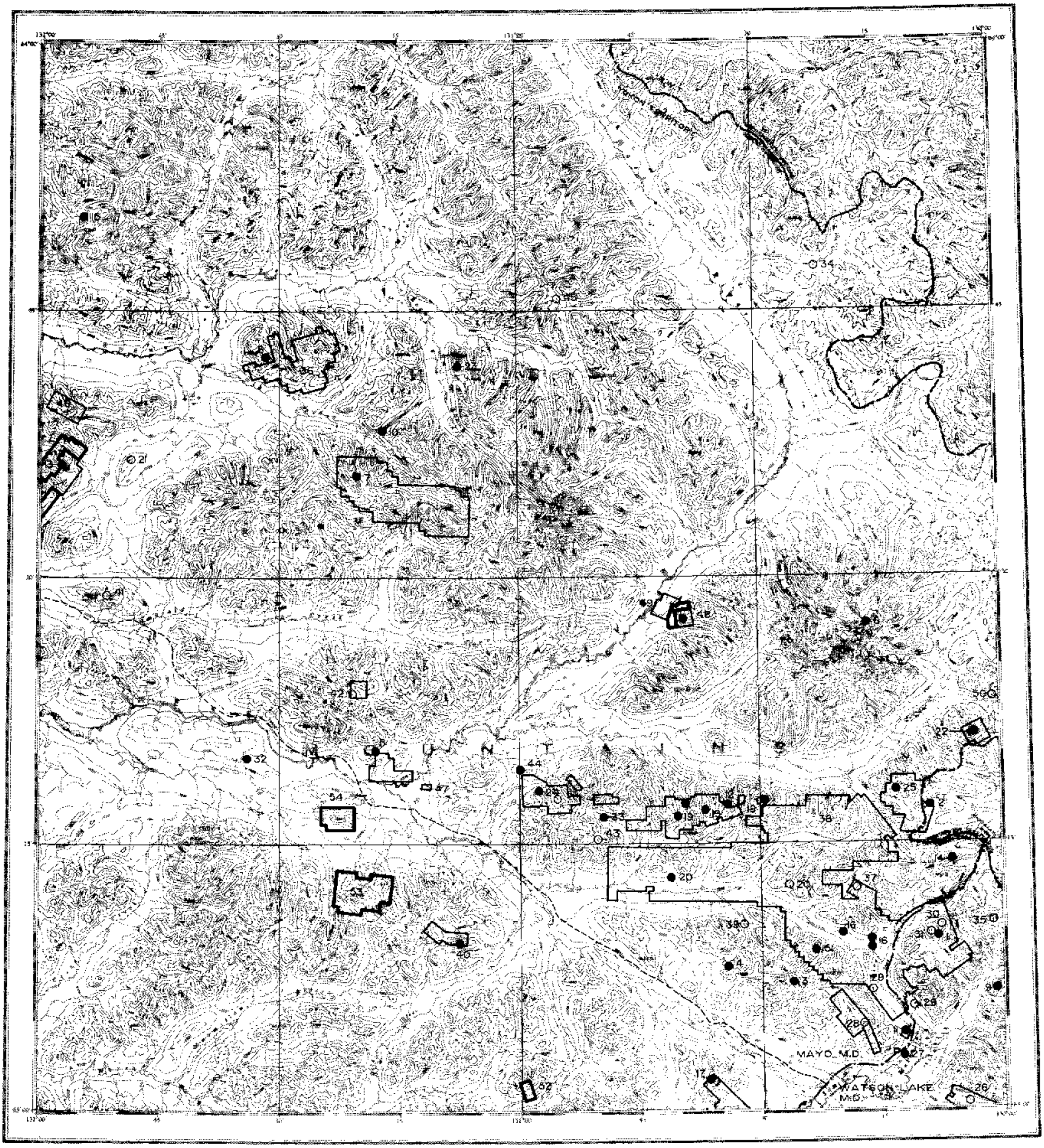
105 N 9 (18)
(63°30'N,132°03'W)

Claims 1983: STRIP 1-2

******

NOTES

105 O



NIDDERY LAKE
YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

NIDDERY LAKE MAP-AREA (NTS 105 O)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974.
GSC Open File 765 by: M.P. Cecile, 1981.
GSC Open File 807 by: S.P. Gordey, 1981.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	TOM	Stratiform Ag Pb Zn	105 O 1	2	This Report; McClay and Bidwell (This Report)
2	MACTUNG	Skarn W Cu	105 O 8	2	Morin et al (1977, p. 20-22); Atkinson and Baker (This Report)
3	JEFF	Unclassified	105 O 1	7	Garrett (1971, p. 73)
4	ALP	Vein Au Ag	105 O 1	7	D.I.A.N.D. (1983, p. 163,168)
5	SCOT	Unclassified	105 O 6	7	Craig & Milner (1975, p. 18)
6	KEELE	Unclassified	105 O 8	7	Garrett (1971, p. 73)
7	EMERALD	Porphyry Cu Mo	105 O 11	7	This Report
8	HORN	Vein Cu	105 O 12	7	Craig & Milner (1975, p. 17)
9	BEN	Carbonate-hosted Zn	105 O 1	7	
10	ARROWHEAD	Vein Cu	105 O 11	7	
11	MOOSE	Stratiform Ba	105 O 1	2	Sinclair et al (1975, p. 21-22); Morin et al (1979, p. 31)
12	HESS	Stratiform Ba (Pb Zn Ag)	105 O 7	7	This Report
13	INCA	Vein Ag Pb Zn	105 O 12	5	Sinclair et al (1975, p. 18); This Report
14	STANDARD	Occurrence Pb Zn Ag	105 O 1	7	
15	ODD	Carbonate-hosted Pb Zn	105 O 13	6	
16	JASON	Stratiform Pb Zn Ag Ba	105 O 1	6	D.I.A.N.D. (1983, p. 163,169); Bailes, Blackadar and Smee (This Report)
17	BROCK	Stratiform Ba	105 O 2	7	
18	WALT	Stratiform Ba	105 O 7,8	2	D.I.A.N.D. (1981,p. 216)
19	TRYALA	Stratiform Ba	105 O 7	7	D.I.A.N.D. (1983, p. 163,169)
20	NIDD	Occurrence Zn Pb Ag	105 O 1,2	7	This Report
21	BOBNOB	Unclassified	105 O 12	9	D.I.A.N.D. (1981, p. 217)
22	BORD	Vein Au Ag	105 O 8	7	This Report
23	BEAUCHAMP	Vein Mo	105 O 11	7	D.I.A.N.D. (1981, p. 217)
24	NEVE	Vein As Sb Au Ag	105 O 7	7	This Report
25	KEN	Skarn W Cu	105 O 8	7	Sinclair et al (1976, p. 30)
26	PETE	Stratiform Ba Pb Zn	105 O 1	7	Morin et al (1979, p. 94)
27	MOONLIGHT	Unclassified	105 O 1	9	Morin et al (1979, p. 32)
28	ESS	Unclassified	105 O 1	9	Morin et al (1979, p. 32)
29	FETCH	Unclassified	105 O 1	9	This Report
30	CREE	Unclassified	105 O 1	9	Morin et al (1979, p. 33)
31	ARGO	Unclassified	105 O 1	9	Morin et al (1980, p. 9)
32	MV	Unclassified	105 O 1	9	Morin et al (1980, p. 10)
33	MAC	Unclassified	105 O 5	7	D.I.A.N.D. (1983, p. 163,165)
34	DUO	Stratiform Ba	105 O 7	6	D.I.A.N.D. (1982, p. 178)
35	FOG	Unclassified	105 O 16		D.I.A.N.D. (1982, p. 177)
36	OLD CABIN	Vein Au Cu Pb	105 O 1	9	D.I.A.N.D. (1983, p. 163,165,169)
37	FUN	Vein Au Mo, Skarn W	105 O 11	7	This Report
38	FAN	Unclassified	105 O 1	7	D.I.A.N.D. (1983, p. 163,166)
39	SIM	Unclassified	105 O 8	7	D.I.A.N.D. (1982, p. 176,177); D.I.A.N.D. (1983, p. 163,166)
40	SUN	Unclassified	105 O 3	9	D.I.A.N.D. (1983, p. 163,166)
41	EMERA	Unclassified	105 O 5		D.I.A.N.D. (1982, p. 176,177)
42	EMMY	Vein Ag Au Pb	105 O 6	7	D.I.A.N.D. (1983, p. 163,166-167)
43	FAL	Unclassified	105 O 7	9	D.I.A.N.D. (1982, p. 177); D.I.A.N.D. (1983, p. 163,167)

44	BAR	Stratiform Ba	105 O 7	7	D.I.A.N.D. (1983, p. 163,167)
45	URSA	Unclassified	105 O 15	9	D.I.A.N.D. (1982, p. 177)
46	ETZEL	Vein Pb Zn Sb	105 O 12	7	D.I.A.N.D. (1983, p. 163,167-168)
47	ANDY	Stratiform Ba	105 O 6	7	D.I.A.N.D. (1982, p. 177)
48	NUT	Skarn, Vein W Cu Pb Zn Au Ag	105 O 7	7	This Report D.I.A.N.D. (1983, p. 163,169)
49	SMOKEY	Unclassified	105 O 7		D.I.A.N.D. (1983, p. 163,168-169)
50	BBOB	Unclassified	105 O 8	9	D.I.A.N.D. (1983, p. 163,168)
51	J.K.	Stratiform Ba	105 O 1	7	This Report
52	NUKE	Unclassified	105 O 2		This Report
53	DALL	Unclassified	105 O 3	9	This Report
54	LEAF	Unclassified	105 O 6	9	

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

TOM
Hudson Bay Exploration and Development Company Limited

Silver,Lead,Zinc
Stratiform
105 O 1 (1)
(63°08'N,130°06'W)

Reference: D.I.A.N.D. (1982, p. 173-174, 177).

Claims: TOM 147-183

Source: Summary by P. Watson from assessment report 091496 by G. Bidwell.

History:

The TOM South Group (147-183) was staked in 1979, and geological and geophysical surveys were conducted in 1980 and 1981. Bulldozer trenching was also undertaken in 1981, but failed to reach bedrock.

Current Work and Results:

In 1983, the old trench was deepened and extended in an attempt to reach bedrock. The trench was deepened an average of 2.8 m over a 67 m section, but stopped in permafrost and did not reach bedrock. A second trench was excavated 150 m away along the apparent strike,but it also failed to reach bedrock. A total of 1,635 m^3 of material was removed from the two trenches. Soil samples were collected at 5 m intervals in the first trench and at 10 m intervals in the second. Samples were analyzed for lead, zinc and barium and returned consistent values with no anomalies. Analyses ranged from 14 to 38 ppm Pb, 23 to 70 ppm Zn and 1,440 to 2,170 ppm Ba.

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EMERALD
Agip Canada Limited

Uranium, Copper, Molybdenum, Gold, Tungsten
105 O 11 (7)
(63°34'N,131°16'W)

Reference: D.I.A.N.D. (1983, p. 163-164).

Claims: FIRE 1-3,9-28; ICE 1-143; SUN 1-139

Current Work and Results:

The 1983 exploration program consisted of airborne EM and magnetometer surveys, geological mapping of the SUN and FIRE claims at 1:10,000 scale, and geochemical analysis of rock chip and soil samples. Gold values are associated with bismuthinite and arsenopyriterite which fills joints and fractures in the syenite intrusion and adjacent hornfelsed sedimentary strata.

******

HESS
Cominco Limited

Barite,Lead, Zinc,Silver
105 O 7 (12)
(63°17'N,130°41'W)

Reference: D.I.A.N.D. (1982, p. 173-174).

Claims: HESS (88)

Source: Summary by P. Watson from assessment report 091490 by M.R. Murrell.

Current Work and Results:

One N and B size diamond drill hole was drilled to a depth of 105.5 m on the HESS 61 claim in 1983. The hole was drilled to test for the possible down dip extension of high grade zinc-lead surface mineralization that has surrounding lower grade mineralization.

The hole intersected cherty mudstone and three zones of barite-witherite-limestone. Trace to minor galena and rare sphalerite occur scattered throughout the baritic sections.

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NIDD
Cominco Ltd.

Zinc,Lead,Silver
105 O 1,2 (20)
(63°12'N,130°21'W)

References: D.I.A.N.D. (1983, p. 163-164).

Claims: NIDD (636)

Source: Summary by D. Emond from assessment report 091509 by T.W. Hodson and I. Jackisch.

Current Work and Results:

The 1983 exploration program consisted of upgrading the access road, geochemical and geophysical surveys, and diamond drilling. Nine hundred soil samples were collected and analyzed for lead, zinc and silver. Lead values were low; zinc values were anomalous (greater than 1,000 ppm) in an area of 350 by 450 m; and silver values were anomalous (greater than 1 ppm) in a 150 by 200 m area. Magnetometer and horizontal loop EM surveys were carried out on the property, the latter outlining a 100-190 m conductive zone in the northeastern grid area. Five diamond drill holes were bored, totalling 1,758.1 m, in order to test the extension of lead-zinc mineralized stratigraphy encountered in the 1982 drill program. These holes intersected volcanic rocks and calcareous mudstones of the Road River Group, and volcanic rocks, conglomerates, diamictites and mudstones of the Earn Group. Minor sporadic sphalerite occurs in the conglomerate and diamictite, and core assays are up to 2.96% Zn and 1.9 ppm Ag over 1.5 m. Lead values are low.

******

BORD
Agip Canada Limited

Gold, Silver
Vein
105 O 8 (22)
(63°21'N,130°04'W)

Reference: D.I.A.N.D. (1983, p. 163,169).

Claims: WALL 1-24

Source: Summary by P. Watson from assessment report 091494 by A.D. McLaughlin.

History:

The WALL claims were staked in 1982 to cover gold-bearing arsenopyrite veins.

Description:

The claims are located in the Macmillan Pass area adjoining the northeast corner of the Mactung property, approximately 20 km from the Macmillan Pass airstrip. They cover the contact between a Cretaceous, biotite quartz monzonite pluton and Hadrynian or Cambrian shales and siltstones. Hornfels extends up to 1 km from the pluton.

Current Work and Results:

Geological mapping at 1:10,000 and 1:2,000 scale in 1983 indicated that the gold-bearing quartz - pyrite veins occur only in the hornfels and are restricted to concentric fractures that parallel the intrusive contact. Radial fractures developed perpendicular to the contact contain quartz and tourmaline locally, but are barren of mineralization.

The main system is located within 100 m of the intrusion and can be traced for a strike length of 325 m, with an average width of 10 to 20 cm. It is very discontinuous and pinches and swells both horizontally and vertically. The vein consists of arsenopyrite, quartz and clay with minor pyrite, muscovite and tourmaline. Gold is present in arsenopyrite and as native gold. The wall rock is altered up to 1 m from the vein with muscovite, clays and iron oxides.

Other gold-bearing arsenopyrite veins are also very erratic and discontinuous, and all extend for less than 50 m along strike.

A grab sample of quartz-pyrite-arsenopyrite-galena vein breccia collected on the BORD claims by J. Morin in 1981 assayed 2,400 ppb Au, 3.0 ppm Ag, 10 ppm Sn, 150 ppm Sb, 90 ppm Pb and less than 10 ppb Hg.

******

NEVE
Agip Canada Limited

Arsenic,Antimony,
Precious Metals
105 O 7 (24)
(63°17'N,130°55'W)

Reference: D.I.A.N.D. (1983, p.163-164).

Claims: NEVE (35); BRICK (37)

Source: Summary by P. Watson and D. Emond from assessment report 091455 by T. Garagan.

Current Work and Results:

One hundred and seventeen overburden drill holes were completed in 1982 to test the soil/rock interface in three zones of anomalous precious metal values in soils. Holes were drilled on 5 m centers and sampled at a depth of 1 to 1.5 m. All samples were analyzed for gold, and 13 were also analyzed for silver, antimony and arsenic. Fifty-six holes were considered anomalous and returned values of 95 to 4,020 ppb Au. Those analyzed for other elements contained up to 14.5 ppm Ag, 1,300 ppm As and 378 ppm Sb. Values from drilling were all generally higher than values from surface samples. These anomalies are also more erratically distributed, but still follow outcroppings and talus of clay-altered quartz feldspar porphyry sills.

The 1983 exploration program consisted of geochemical and geophysical surveys, geological mapping and trenching. The BRICK 1-12 claims were surveyed with a CEM horizontal loop EM system and a proton magnetometer and mapped at 1:2,000 scale. Three trenches were excavated on the BRICK 4 claim, stripping 640 m^3 of earth.

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FETCH
Cominco Limited

105 O 1 (29)
(63°06'N,130°12'W)

Reference: D.I.A.N.D. (1983, p. 163-164).

Claims: HASTEN; FETCH; BASIN (85 claims)

Source: Summary by P. Watson from assessment report 091476 by M.R. Murrell.

Current Work and Results:

A 301.8 m diamond drill hole was completed on the HASTEN 22 claim in 1982, in order to test a low value lead geochemical anomaly near the contact of the Road River Formation with the overlying Earn Group. A road was built to the drill site. Mudstone, minor sandstone and grit, and several magnetic dykes were intersected. Sphalerite mineralization was present in trace amounts in a thin (1 m) grit unit and as interstitial infillings around mudflow clasts. The bottom part of the hole was slightly calcareous.

FUN
Canamax Resources Inc.

Geochemical Target
105 O 1 (37)
(63°15'N,130°20'W)

References: D.I.A.N.D. (1983, p. 163,165).

Claims: FUN 1-25

Source: Summary by P. Watson from assessment report 091500 by C.W. Jefferson and F.R. Harris.

Current Work and Results:

In 1983, a portion of the claim group was mapped at 1:5,000 scale and 85 soil and rock chip samples were collected and analyzed for lead, zinc and silver to complete the 1982 grid.

An east-striking fault that cuts through the claims is a major structural break. It separates Hadrynian to Ordovician shale and siltstone of the Road River Group to the north from Ordovician to Mississippian shale and conglomerate of the Earn Group to the south, and may be a growth fault.

Soil samples were not anomalous in zinc. Lead and silver anomalies appear to be related to high background values in the underlying Road River shale.

******

NUT
Amax Northwest Mining Company
Canada Tungsten Mining Corporation

Tungsten,Copper, Lead,Zinc,Gold, Silver Skarn and Vein
105 O 7 (48)
(63°28'N,130°40'W)

Reference: D.I.A.N.D. (1983, p. 163,169).

Claims: NUT 1-22,24,26-30

Source: Summary by P. Watson and D. Emond from assessment report 091493 by G. Booth and C.J. Hodgson.

History:

The NUT 1-16 claims were staked in 1982, and the remaining claims were added on in 1983.

Description:

The NUT claims, located 40 km north-northwest of

Macmillan Pass, cover a previously unmapped, porphyritic biotite quartz monzonite stock approximately 400 m in diameter. The stock is surrounded by a discontinuous zone of contact breccia up to 100 m wide that consists of angular, bleached calc-silicate fragments in a clastic matrix. The country rock consists of clastic and carbonate strata (chiefly argillite and calcareous argillite) of lower Paleozoic age. A contact hornfels aureole extends 800 to 1,000 m from the stock.

Current Work and Results:

Geological mapping and soil sampling programs were carried out in 1983.

The NUT 1-16 claims were mapped at 1:5,000 scale. Three types of mineralization are present 1) pyrrhotite - pyroxene skarn lenses up to several metres wide, with accessory chalcopyrite, scheelite, galena and arsenopyrite in three areas; 2) quartz-sericite veins up to 12 cm wide, containing galena, arsenopyrite, sphalerite and chalcopyrite occur near the margins of the stock, within breccia and immediately adjacent unbrecciated hornfels; 3) galena as interstitial disseminations in the contact breccia.

The gold, silver, lead, zinc, copper and tungsten content was determined for the 540 soil samples collected at 25 m intervals along 100 m spaced lines.

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DALL
Agip Canada Limited

Stratiform Barite
105 0 3 (53)
(63°12'N,131°25'W)

Claims: DALL 1-112

History:

The DALL claims were staked in June, 1983.

Description:

The country rock, consisting of clastic rocks of the Road River, Lower Earn and Upper Earn Groups, are cut by a small Cretaceous intrusion of intermediate composition.

Current Work and Results:

The property was mapped at 1:10,000 scale. Stream sediment, soil and rock samples were taken for geochemical testing.

Two showings of interbedded barite and shale were located on the property.

Soil sampling returned values up to 1,870 ppm Pb, 5,290 ppm Zn and 20 ppm Ag in an area of shale and chert pebble conglomerate.

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LEAF
Agip Canada Limited

105 0 6 (54)
(63°16'N,131°21'W)

Claims: LEAF 1-39

History:

The LEAF claims were staked in June, 1983.

Description:

The area is underlain by sediments of the Road River Group. These are intruded by dykes and by Cretaceous granite.

Current Work and Results:

The entire claim block was mapped at 1:10,000 scale, and claims 12-15, 22 and 24 were also done at 1:2,000 scale. Rock and soil samples were collected for geochemistry.

******

1983 MINERAL CLAIMS STAKED

NUKE
Canamax Resources Inc.

105 0 2 (52)
(63°01'N,130°59'W)

Claims 1983: NUKE 1-8

DALL
Agip Canada Ltd.

105 0 3 (53)
(63°12'N,131°20'W)

Claims 1983: DALL 1-112

LEAF
Agip Canada Ltd.

105 0 6 (54)
(63°16'N,131°22'W)

Claims 1983: LEAF 1-39

NUT | 105 O 7 (48)
A. Hitchins | $(63^\circ 27'N, 130^\circ 39'W)$

Claims 1983: NUT 17-30

INCA | 105 O 12 (13)
Silvercrest Resources Corporation | $(63^\circ 35'N, 131^\circ 58'W)$

Claims 1983: PSW 1-40; AG 1-12

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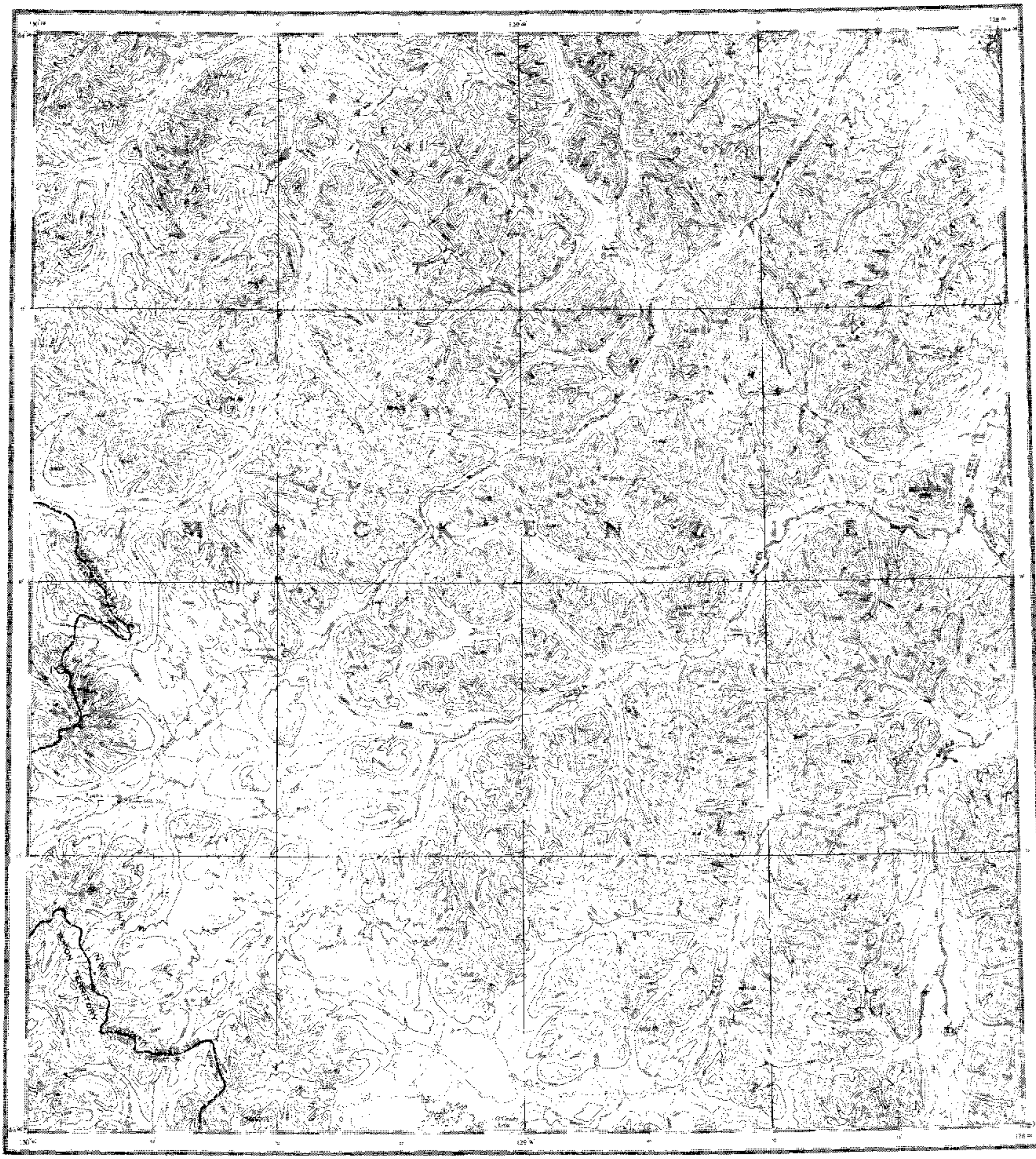
NOTES

105 P



SEKWI MOUNTAIN

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30

Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

Mineral Deposit or Occurence see Key on facing page

Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

SEKWI MOUNTAIN MAP-AREA (NTS 105 P)

General Reference: GSC Paper 71-22 by: S.L. Blusson, 1971.
GSC Open File 710 by: M.P. Cecile, 1980.
GSC Open File 807 by: S.P. Gordey, 1981.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	MEHITABEL	Skarn Cu W Mo	105 P 5	7	

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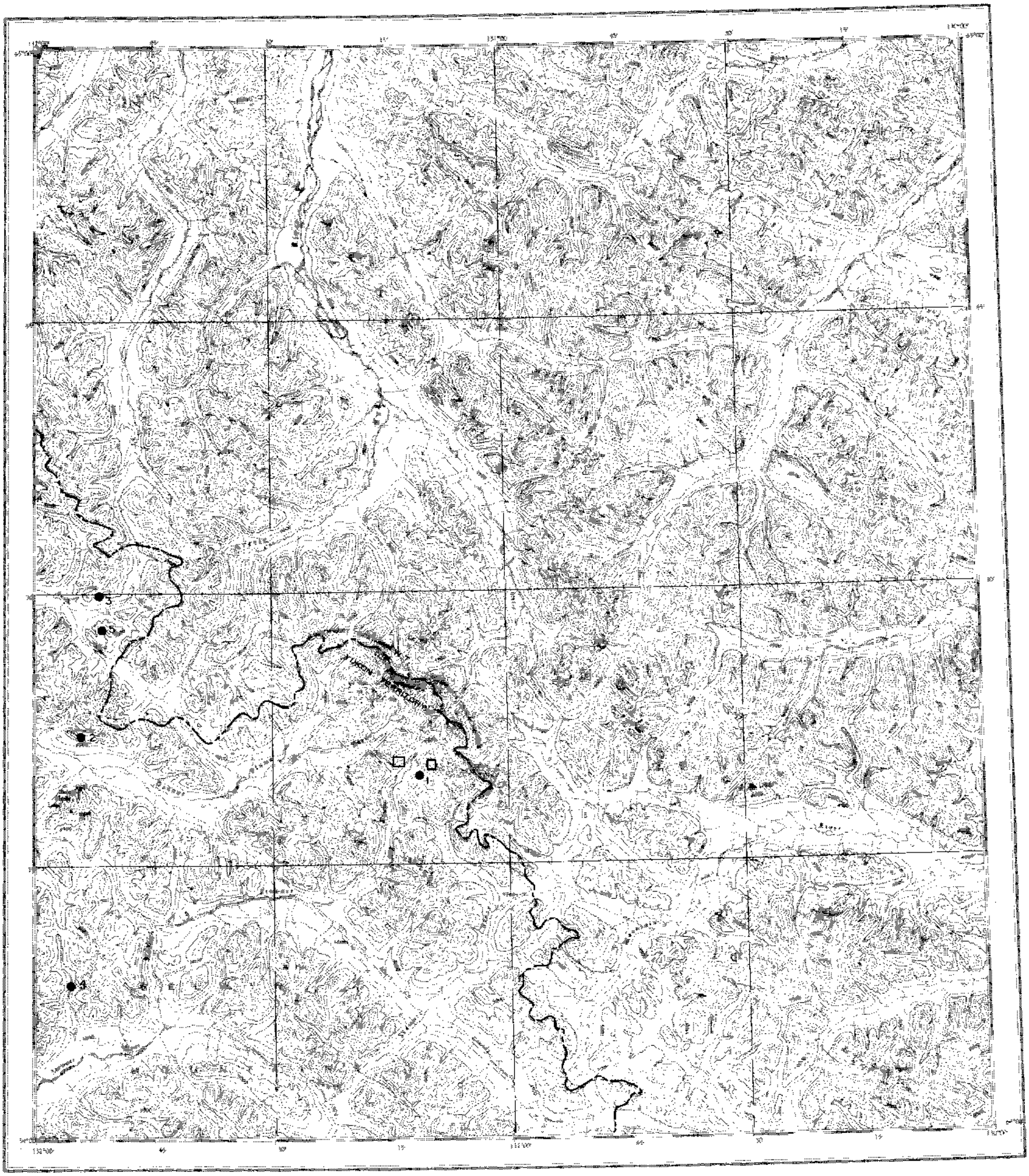
106 B



BONNET PLUME LAKE

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

BONNET PLUME MAP-AREA (NTS 106 B)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974.
GSC Open File 710 by: M.P. Cecile, 1980a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	ECONOMIC	Carbonate-hosted Zn Pb	106 B 6	7	Sinclair *et al* (1975, p. 19)
2	ANDY	Carbonate-hosted Zn Pb	106 B 5	7	Dawson (1975, p. 240-241)
3	NECO	Carbonate-hosted, Vein Zn Pb	106 B 5	7	
4	BIRKELAND	Carbonate-hosted Zn Pb	106 B 4	7	
5	PR	Unclassified	106 B 5	9	Morin *et al* (1977, p. 118)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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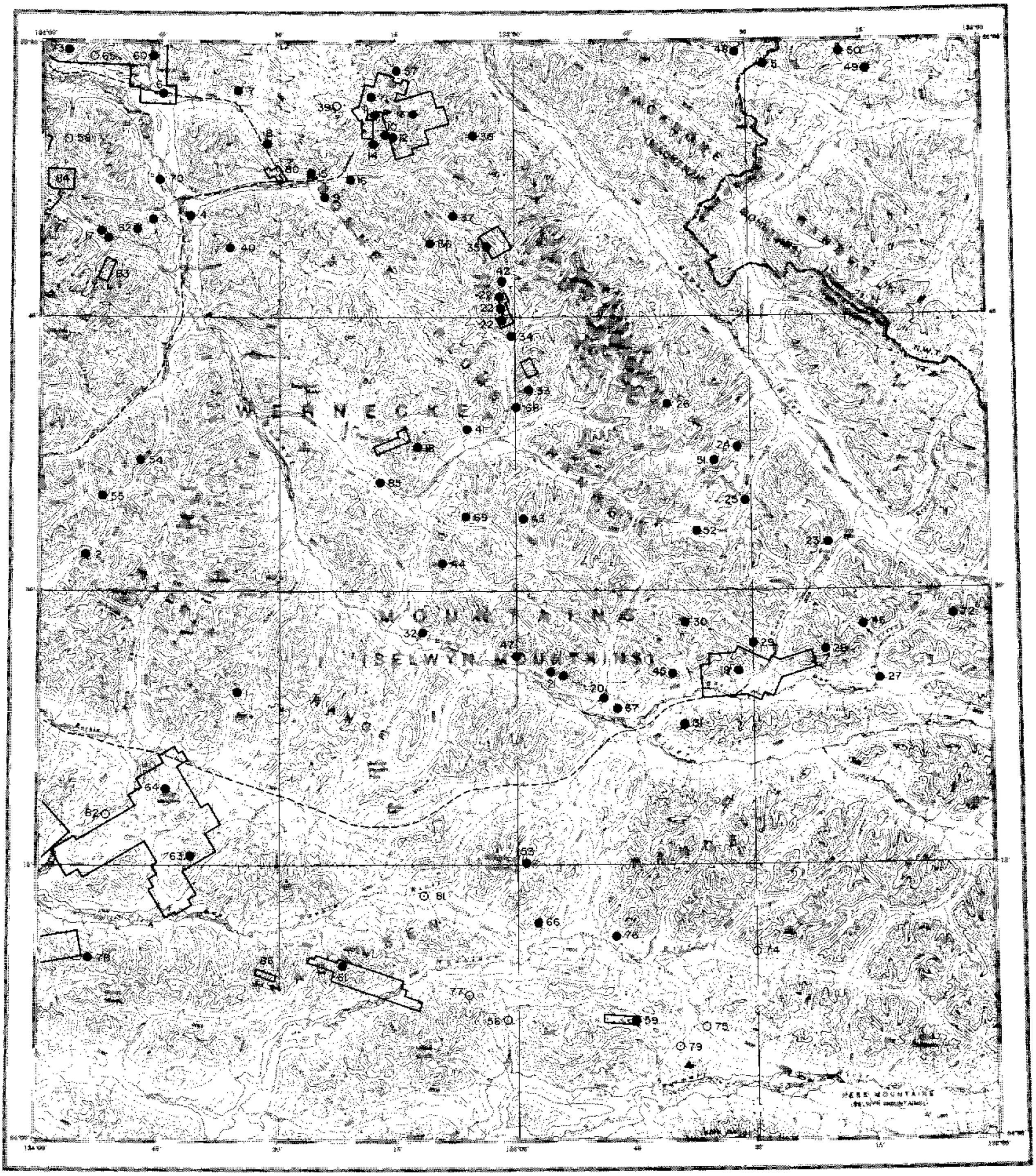
106 C



NADALEEN RIVER

YUKON TERRITORY - NORTHWEST TERRITORIES

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

NADALEEN RIVER MAP-AREA (NTS 106 C)

General Reference: GSC Open File 205, 206 by: S.L. Blusson, 1974.
GSC Open File 710 by: M.P. Cecile, 1980a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	KOHSE	Occurrence Cu	106 C 5	7	
2	SALUTATION	Vein Cu Co	106 C 12	7	
3	GILLESPIE	Carbonate-hosted, Vein Zn Pb	106 C 13	7	
4	GEORDIE	Occurrence Pb Zn Ag			
5	GILDERSLEEVE	Carbonate-hosted Zn Pb	106 C 16	7	Dawson (1975, p. 241)
6	FAIRCHILD	Breccia U Cu	106 C 13	7	D.I.A.N.D. (1983, p. 175-176)
7	BIBBER	Vein Cu	106 C 13	7	
8	DOLORES	Vein Cu Ag Co	106 C 13	7	
9	KEY MOUNTAIN (BARB)	Vein Cu Co	106 C 14	7	D.I.A.N.D. (1982, p. 185-186)
10	MAMMOTH	Unclassified	106 C 14	7	Findlay (1969b, p. 16-17)
11	CIRQUE	Vein Cu Co Ag	106 C 14	7	
12	PORPHYRY	Vein Cu	106 C 14	7	Findlay (1969b, p. 16-17)
13	TETRAHEDRITE CREEK (IOTA)	Vein Au Ag (Cu Pb Zn Sb)	106 C 14	6	This Report
14	AIRSTRIP	Occurrence Cu	106 C 14	7	
15	VULCAN	Breccia U Cu	106 C 14	7	D.I.A.N.D. (1982, p. 186)
16	DOBBY	Occurrence Cu	106 C 14	7	
17	KIDNEY	Vein Cu	106 C 13	7	
18	PING	Carbonate-hosted Zn Pb	106 C 11	5	Sinclair et al (1975, p. 53-54)
19	GOZ CREEK	Carbonate-hosted Zn Pb	106 C 7	2	Sinclair et al (1975, p. 23-24)
20	HARRISON	Carbonate-hosted Zn Pb	106 C 7	6	Sinclair et al (1975, p. 41-42)
21	MUELLER	Carbonate-hosted Zn Pb	106 C 7	5	Sinclair et al (1975, p. 42-43)
22	CORN CREEK	Carbonate-hosted Zn Pb	106 C 11,14	7	Sinclair & Gilbert (1975, p. 26)
23	ZOG	Occurrence Zn	106 C 9	7	
24	GOODMAN (AL)	Unclassified	106 C 10	7	Sinclair et al (1975, p. 64-65)
25	NEST	Carbonate-hosted Zn Pb	106 C 10	6	Sinclair et al (1975, p. 33-35)
26	TOPOROWSKI	Stratiform Zn Pb	106 C 10	7	
27	ANGLO	Unclassified	106 C 8	7	Sinclair et al (1975, p. 38,40)
28	GUS	Carbonate-hosted Zn Pb	106 C 8	7	Sinclair et al (1975, p. 36)
29	GENTRY	Carbonate-hosted Zn Pb	106 C 7	7	Sinclair et al (1975, p. 24-28)
30	CADET	Carbonate-hosted Zn Pb	106 C 7	7	Sinclair et al (1975, p. 29,46)
31	LOG	Unclassified	106 C 7	9	
32	MOUSE	Carbonate-hosted Zn Pb	106 C 6	7	Sinclair et al (1975, p. 40-41, 49-50)
33	STAR	Carbonate-hosted Zn Pb	106 C 10	7	Sinclair et al (1975, p. 55-56)
34	DEA	Carbonate-hosted Zn Pb	106 C 11	7	Sinclair et al (1975, p. 58-59)
35	PROFEIT	Carbonate-hosted Pb Ag Zn	106 C 14	6	D.I.A.N.D. (1982, p. 186,190)
36	POO	Vein Pb Zn	106 C 14	7	
37	EG	Carbonate-hosted Zn Pb	106 C 14	7	Sinclair et al (1975, p. 61-62)
38	DAN	Carbonate-hosted Zn Pb	106 C 14	7	Sinclair et al (1975, p. 61)
39	MAC (OTTO)	Unclassified	106 C 14	9	Sinclair et al (1975, p. 63)
40	LEARY	Vein Zn Pb Cu	106 C 13	7	
41	WX	Carbonate-hosted Zn Pb	106 C 11	6	Sinclair et al (1975, p. 56-57)
42	SUN	Carbonate-hosted Zn Pb	106 C 14	7	Sinclair et al (1975, p. 60)
43	BOB	Carbonate-hosted Zn Pb	106 C 10	7	
44	BRENDON (RAM)	Carbonate-hosted Zn Pb	106 C 11	7	Sinclair et al (1975, p. 51)
45	GAL	Unclassified	106 C 7	7	Sinclair et al (1975, p. 30-31)
46	RUM/RAF	Unclassified	106 C 8	7	Sinclair et al (1975, p. 37,39)
47	TAPIN	Unclassified	106 C 6		
48	CAB	Carbonate-hosted Zn Pb	106 C 15	7	Morin et al (1979, p. 41)
49	BAK	Carbonate-hosted Zn Pb	106 C 16	7	
50	MOGUL	Carbonate-hosted Zn Pb	106 C 16	7	Sinclair et al (1975, p. 66)
51	DUNE	Vein Zn Pb	106 C 10	7	

52	SNAKE	Carbonate-hosted Zn Pb	106 C 10	7	
53	McKELVIE	Vein Zn Pb Ba	106 C 7	7	
54	MARSHALL	Occurrence Cu	106 C 12	7	
55	ALGAE	Occurrence Cu	106 C 12	7	
56	LEAH	Unclassified	106 C 3	9	D.I.A.N.D. (1981, p. 224)
57	RAM	Breccia U Cu	106 C 14	7	D.I.A.N.D. (1981, p. 224)
58	LFV	Unclassified	106 C 13		D.I.A.N.D. (1981, p. 235)
59	SIAN	Carbonate-hosted, Vein Ag Pb Zn	106 C 2	7	D.I.A.N.D. (1981, p. 224)
60	OTTER	Vein Co Ni As	106 C 13	7	D.I.A.N.D. (1982, p. 186-187)
61	CRAIG	Vein Ag Pb Zn	106 C 3	2	D.I.A.N.D. (1981, p. 225-230)
62	TOW	Breccia U	106 C 13	7	D.I.A.N.D. (1981, p. 231)
63	VAL	Vein Ag Pb Zn	106 C 5	2	D.I.A.N.D. (1982, p. 187)
64	VERA	Vein Ag Pb Zn	106 C 5	2	D.I.A.N.D. (1982, p. 187)
65	ELGEA	Vein Cu Co	106 C 13	5	D.I.A.N.D. (1982, p. 187-188)
66	TARA (NADALEEN)	Carbonate-hosted Zn Pb	106 C 2	7	D.I.A.N.D. (1982, p. 188,190)
67	FUN	Carbonate-hosted Zn Pb	106 C 7	7	Sinclair et al (1976, p. 41)
68	DF	Carbonate-hosted Zn Pb	106 C 10,11	6	Sinclair et al (1976, p. 50)
69	MID	Unclassified	106 C 11	9	Sinclair et al (1976,p. 51)
70	ALE	Unclassified	106 C 11	7	Sinclair et al (1976, p. 56)
71	PTERD	Occurrence U	106 C 14	6	D.I.A.N.D. (1982, p. 188)
72	REP	Carbonate-hosted Zn Pb	106 C 8	5	Morin et al (1979, p. 39)
73	BROMADROSIS	Unclassified	106 C 13	7	Morin et al (1977, p. 122)
74	EIRA	Unclassified	106 C 1,2	9	Morin et al (1979, p. 35)
75	BLACK IDA	Unclassified	106 C 2	9	Morin et al (1979, p. 35)
76	JAM	Carbonate-hosted Zn Pb	106 C 2	7	Morin et al (1979, p. 36)
77	STAR	Unclassified	106 C 3	9	Morin et al (1979, p. 36)
78	COOKER	Vein Ag Pb Zn	106 C 4	7	Morin et al (1980, p. 37)
79	GLEN	Unclassified	106 C 2	9	Morin et al (1980, p. 10)
80	BONNET	Unclassified	106 C 13	9	D.I.A.N.D. (1982, p. 190)
81	STRIP	Unclassified	106 C 3	9	D.I.A.N.D. (1982, p. 190)
82	RAFE	Unclassified	106 C 5	9	D.I.A.N.D. (1982, p. 190)
83	JOLLY	Vein Pb Zn	106 C 13	5	D.I.A.N.D. (1983, p. 175-176)
84	APE	Vein Cu U Co Mo	106 C 13	7	D.I.A.N.D. (1983, p. 175-176)
85	DJ	Carbonate-hosted Zn Pb	106 C 11	7	Sinclair et al (1975, p. 52)
86	MEX	Unclassified	106 C 4		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

TETRAHEDRITE CREEK — Gold,Silver
Texaco Canada Resources Limited — 106 C 14 (13)
Zelon Enterprises Ltd. — (64°53'N,133°12'W)

References: D.I.A.N.D. (1982, p. 185-186; 1983, p. 175-176).

Claims: IOTA (128); GOLLUM (2); IRON (30); ADUB (24); HAIL (12); SAM (8); BARB (8)

Source: Summary by P. Watson from assessment reports 091456 and 091502 by P.G. Lhotka and R.A. Olson.

History:

Exploration was conducted on the IRON claims in the 1960's by Pacific Giant Steel Ores Ltd. (for iron), and to the west of the IOTA claims in the 1970's for copper and uranium. In 1980 and 1981, exploration on and near the current claim block, carried out by Zelon Enterprises Ltd. for Texaco Canada Resources Ltd., discovered several gold, silver, uranium and/or cobalt mineral occurrences. Exploration in 1982 and 1983 was carried out for Texaco by Trigg, Woollett Consulting Ltd.

Description:

The claim blocks are underlain by Proterozoic clastic and carbonate sedimentary rocks, divisible into a Helikian sequence, the Wernecke Supergroup, and an unconformably overlying Hadrynian sequence, comprised of Pinguicula and Rapitan Group rocks.

The Wernecke Supergroup is divided into 4,000 m of slate, siltstone, argillite and limestone of the Fairchild Lake Group; 5,000 m of slate, argillite, siltstone and minor limy beds of the Quartet lake Group; and 4,000 m of dolostone with minor argillite and limestone of the Gillespie Lake Group.

Hadrynian rocks which outcrop on the eastern margin of the IOTA claims can be divided into six units. The lower, Pinguicula Group consists of slate, shale and siltstone; dolostone; and dolostone and limestone; and the upper, Rapitan Group consists of shale and siltstone; dolostone with shale; and conglomerate and basal breccia.

Irregular, pipe-like breccia complexes are found in the Wernecke Supergroup strata.

Current Work and Results:

In 1982, prospecting, geochemical sampling, 1:10,000 and some 1:1,000 scale geological mapping, trenching, and scintillometer and VLF-EM surveys were carried out.

The IOTA and GOLLUM claims are underlain by numerous faults with two associated vein types: Type 1, tetrahedrite +/- pyrite and chalcopyrite in dark red weathering siderite; and Type 2, one or more of tetrahedrite, galena or sphalerite in quartz, calcite or dolomite.

At least four mineralized occurrences of gold- and/or silver-bearing veins are found along the easterly-trending IOTA Fault, also possibly outlined by the VLF-EM survey. At one of these, a quartz vein containing native gold, tetrahedrite, sphalerite and galena within an altered fault zone was trenched, and traced for 7 m.

A narrow siderite vein was located on the GOLLUM claims, along with tetrahedrite in siderite boulders.

A massive hematitic breccia located on the IRON claims did not contain significant gold values.

On the ADUB claims, chalcopyrite-bearing boulders and a small chalcopyrite-hematite outcrop were found.

Anomalously radioactive (to 1,300 ppm U) boulders on the HAIL claims are thought to be derived from a narrow shear zone in breccia.

In 1983, additional work was carried out on a 4.5 by 1 km area in the east-central part of the IOTA claims, where the four mineralized gold and/or silver occurrences were located in 1982. Mapping at 1:5,000 and 1:1,000 scales was conducted along with talus fine geochemical sampling, VLF-EM surveys and trenching.

Eight trenches were excavated, and twelve grab and ninety-six rock chip samples were collected. A total of 458 talus fine samples were collected and analyzed for gold, silver, antimony and arsenic. Values greater than 50 ppb Au and 2.0 ppm Ag were considered anomalous.

Trenching did not uncover any well-mineralized veins. At two of the four vein localities examined, geochemical anomalies and VLF-EM conductors have been attributed to known, unimportant veins, or to similar, small, undiscovered veins. In addition, unexplained coincident geochemical anomalies and VLF-EM conductors occur in two areas near the fault zone.

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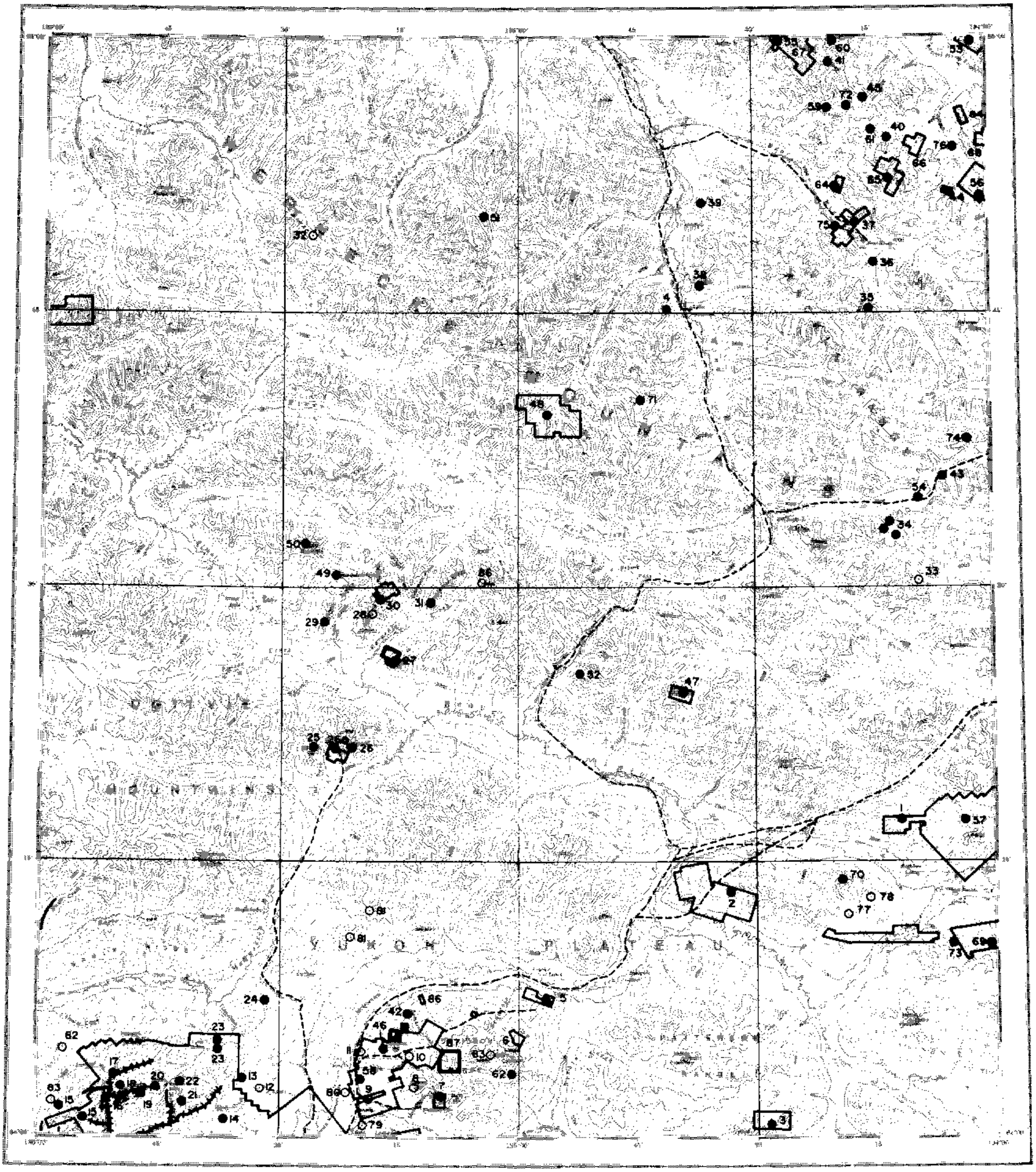
106 D



NASH CREEK
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

⊙ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

NASH CREEK MAP-AREA (NTS 106 D)

General Reference: GSC Map 1282A and Memoir 364 by: L.H. Green, 1972. GSC Open File 710 by: M.P. Cecile, 1980a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	KATHLEEN	Vein Zn Ag Pb	106 D 8	6	This Report
2	NOW	Vein Pb Zn Ag Au	106 D 2	6	D.I.A.N.D. (1981, p. 238)
3	MARG	Unclassified	106 D 1	7	This Report
4	WEN	Vein Cu	106 D 15	7	Green (1972, p. 139)
5	CLARK	Vein Ag Pb Zn	106 D 2	2	Craig & Laporte (1972, p. 19-20); Sinclair & Gilbert (1972, p. 15-16)
6	CAMERON (PAUL)	Vein Ag Pb Zn	106 D 3	7	Green (1971, p. 63-64); Sinclair et al (1975, p. 16-17)
7	STAND-TO	Vein Ag Pb Zn	106 D 3	7	Findlay (1969b, p. 13-14); D.I.A.N.D. (1982, p. 198)
8	FORBES	Unclassified	106 D 3	7	Cockfield (1922)
9	SPRING (HL)	Unclassified	106 D 3	7	Craig & Milner (1975, p. 30); D.I.A.N.D. (1982, p. 198)
10	RAMBLER	Vein Ag Pb Zn	106 D 3	7	Cockfield (1922, p. 4-5); Green (1971, p. 63); D.I.A.N.D. (1981, p. 244); This Report
11	RUSTY	Unclassified	106 D 3	9	
12	ERIN	Unclassified	106 D 4	7	Craig & Laporte (1972, p.16-17)
13	GWAIHIR	Vein W	106 D 4	7	D.I.A.N.D. (1981, p. 238)
14	SKATE	Vein Ag Pb Zn	106 D 4	6	D.I.A.N.D. (1982, p. 194)
15	PESO (REX)	Vein Aq Pb Zn	106 D 4	2	Green (1965, p. 20-22); D.I.A.N.D. (1981, p. 244)
16	BARKER	Vein unclassified	106 D 4	7	Boyle (1965, p. 84)
17	MEILECKE	Vein Ag Pb	106 D 4	7	
18	SHEPPARD	Unclassified	106 D 4	7	Mulligan (1975, p. 73-74)
19	DUBLIN GULCH	Skarn W	106 D 4	7	D.I.A.N.D. (1983, p. 179-180)
20	POTATO HILLS	Unclassified	106 D 4	7	Little (1959, p. 21-29,34-36); Craig & Milner (1975, p. 24-25)
21	RAY GULCH	Skarn W	106 D 4	2	D.I.A.N.D. (1981, p. 240); Lennan (This Report)
22	ELLIS	Vein Au	106 D 4	7	Green & Godwin (1963, p. 15)
23	LYNX	Unclassified	106 D 4	7	Green & Godwin (1963, p. 15); D.I.A.N.D. (1981, p. 244)
24	LUCKY STRIKE	Vein Ag Pb Zn	106 D 4	7	Green (1972, p. 137); D.I.A.N.D. (1982, p. 198)
25	WHITE HILL	Unclassified	106 D 6	9	Cockfield (1925, p. 1-18)
26	McKAY HILL	Vein Ag Pb Zn	106 D 6	4	Cockfield (1924, p. 22-28); Green (1972, p. 133-134); D.I.A.N.D. (1981, p. 244)
27	GREY COPPER HILL	Vein Ag Pb Zn	106 D 6	7	D.I.A.N.D. (1981, p. 240); This Report
28	CARPENTER	Unclassified	106 D 6		Cockfield (1925, p. 1-18)
29	ELLIOTT RIDGE	Vein Cu	106 D 6	7	Cockfield (1925, p. 1-18)
30	SILVER HILL	Vein Ag Pb Zn	106 D 6	7	Cockfield (1925, p. 1-18); Green (1972, p. 133)
31	SETTLEMEIR	Unclassified	106 D 6	9	
32	ROYAL	Unclassified	106 D 14	9	
33	ZULPS	Vein Cu	106 D 9	7	
34	McCLUSKY	Vein Cu	106 D 9	2	
35	GRAY	Unclassified	106 D 16	7	Findlay (1969a, p. 16)
36	NEW JERSEY	Unclassified	106 D 16	7	Findlay (1969a, p. 16)
37	PAGISTEEL	Breccia U	106 D 16	5	D.I.A.N.D. (1982, p. 195)

38	AHEARNE	Unclassified	106 D 15	7	Green (1972, p. 139); D.I.A.N.D. (1983, p. 179,181)
39	FRAN	Occurrence Fe	106 D 15	7	Green (1972, p. 143)
40	FORD	Vein Cu Pb	106 D 16	7	
41	SLATS	Vein Cu	106 D 16	7	
42	JEE	Unclassified	106 D 3	9	
43	DRESEN	Vein Cu	106 D 9	7	
44	FOUND	Vein Cu	106 D 16	7	D.I.A.N.D. (1982, p. 198)
45	BUT	Vein Cu	106 D 16	7	
46	NAT	Vein Pb Ag Zn Cu	106 D 3	7	D.I.A.N.D. (1982, p. 198)
47	BRAINE	Vein Zn Pb Cu Ag	106 D 7	5	This Report
48	BOND	Unclassified	106 D 10	6	Green (1972, p. 139)
49	LINGHAM	Vein Pb Zn	106 D 11	7	
50	NEWT	Vein Pb Zn	106 D 11	7	
51	SIHOTA	Vein Cu Zn	106 D 14	7	
52	CLOUTIER	Vein Pb Zn Ag Cu Au	106 D 7	7	
53	SLAB	Unclassified	106 D 16	7	Findlay (1969b, p. 17-18)
54	LOUIE	Vein Cu	106 D 9	7	
55	EATON	Breccia Cu U	106 D 16	7	D.I.A.N.D. (1983, p. 179-180)
56	CORD	Stratiform Pb Zn	106 D 16	6	D.I.A.N.D. (1982, p. 196,198)
57	ZAP	Vein Ag Pb Zn	106 D 8	7	D.I.A.N.D. (1981, p. 241)
58	J.T.	Vein Ag Pb Zn	106 D 3	7	D.I.A.N.D. (1983, p. 179-181)
59	ARCTOS	Breccia U Cu Co Ag	106 D 16	7	D.I.A.N.D. (1982, p. 196-197)
60	RAD	Breccia U Cu Au	106 D 16	7	D.I.A.N.D. (1982, p. 197)
61	URSUS	Breccia U Cu Ag	106 D 16	7	D.I.A.N.D. (1982, p. 197)
62	SPRING	Unclassified	106 D 3		D.I.A.N.D. (1981, p. 244)
63	DEAL	Unclassified	106 D 3		D.I.A.N.D. (1981, p. 244)
64	FACE	Occurrence U Cu Ag	106 D 16	7	D.I.A.N.D. (1982, p. 197-198)
65	ADUB	Unclassified	106 D 16		D.I.A.N.D. (1982, p. 195,198)
66	HAIL	Occurrence U	106 D 16	9	D.I.A.N.D. (1982, p. 195)
67	PIK	Unclassified	106 D 16		D.I.A.N.D. (1981, p. 244); D.I.A.N.D. (1982, p. 198)
68	SNOW STAR	Occurrence U	106 D 16	7	D.I.A.N.D. (1982, p. 195)
69	ROD	Vein Ag Pb	106 D 1	6	D.I.A.N.D. (1981, p. 242)
70	BLUE LITE	Skarn W	106 D 1	6	D.I.A.N.D. (1981, p. 243-244)
71	BOZO	Unclassified	106 D 10	7	Sinclair et al (1976, p. 62)
72	GNUCKLE	Unclassified	106 D 16	7	Morin et al (1977, p. 125)
73	BAG	Unclassified	106 D 1	7	Morin et al (1980, p. 13)
74	JAZ	Unclassified	106 D 9	7	Morin et al (1979, p. 43)
75	PITCH	Unclassified	106 D 16	7	Morin et al (1979, p. 44)
76	SER	Unclassified	106 D 16	7	Morin et al (1979, p. 45)
77	KATHY	Unclassified	106 D 1	9	Morin et al (1980, p. 14)
78	LEEN	Unclassified	106 D 1		D.I.A.N.D. (1982, p. 198)
79	D. BURKE	Unclassified	106 D 3		D.I.A.N.D. (1982, p. 198)
80	SHARON	Unclassified	106 D 3		D.I.A.N.D. (1982, p. 198)
81	BREFAULT	Unclassified	106 D 3		D.I.A.N.D. (1982, p. 198)
82	KISS	Unclassified	106 D 4		D.I.A.N.D. (1982, p. 198)
83	COLLEEN	Unclassified	106 D 4		D.I.A.N.D. (1982, p. 198)
84	SAM	Unclassified	106 D 16		D.I.A.N.D. (1982, p. 198)
85	FOHU	Unclassified	106 D 3		
86	NANCY	Unclassified	106 D 11,6		D.I.A.N.D. (1983, p. 179,181)
87	NDM	Unclassified	106 D 3		This Report
88	MIKE	Unclassified	106 D 3		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

KATHLEEN
Acheron Resources Limited

Zinc,Silver,Lead
106 D 8 (1)
(64°17'N,134°15'W)

Reference: D.I.A.N.D. (1982, p. 194).

Claims: BUD 1-28; DAGO 3 and 5; SCOTTY 1-32

Current Work and Results:

In 1983, the BUD 13,42,44 and 46, and DAGO 3 and 5 claims were mapped at 1:2,500 scale. A total of 370 samples were taken at 25 m intervals along grid lines for geochemical testing. Four trenches were dug, moving 40 m^3 of earth, and samples were collected and assayed for silver, lead and zinc. In September, another 14 trenches were blasted on the BUD 13 and 46 claims over lead-zinc soil geochemical anomalies. Four large outcrops of dolomite breccia were also blasted on the DAGO 3 claim. No further mineralization was outlined on the claim groups. However, minor coarse crystalline calcite, located in one of the pits on the BUD claims, suggests that more dolomite breccia may be present there.

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MARG
Archer, Cathro and
Associates (1981) Limited

Geochemical Target
106 D 1 (3)
(64°01'N,134°28'W)

Reference: D.I.A.N.D. (1983, p. 179-181).

Claims: TUDL (32)

Source: Summary by P. Watson from assessment report 091452 by R.J. Cathro and C.A. Main.

History:

Previous work on the MARG target (then the JACK, MARG and HEATHER claims) included geological, geochemical and hand trenching programs carried out in 1965 to 1967 by United Keno Hill Mines Ltd. and Canadian Superior Exploration Ltd. In 1982, ZX Joint Venture (ZX-JV), consisting of Chevron Canada Limited, Enterprise Exploration Limited and SMD Mining Company Limited, staked the lead-zinc-copper soil anomaly as the TUDL claims.

Description:

The TUDL claims are located 35 km northeast of Elsa, between the Keno Ladue and Beaver Rivers, along the southern margin of the Patterson Range. They are underlain by a quartzite sequence that may correlate with the Central Quartzite unit, or more likely the Lower Schist unit, as defined in the Keno Hill area. Three units, identified as the Quartzite, Chlorite and Graphite units, all contain varying amounts of quartzite, chlorite schist, graphite sericite schist and calcareous rocks that strike 060° and dip 40° southeast. The lowermost, recessive, pyritic graphite sericite schist contains at least one bed of pyritic feldspathic quartzite that appears to host the pyrite mineralization.

Current Work and Results

In 1982, old trenches that contained sphalerite and chalcopyrite in one heavy mineral concentrate, collected in the 1960's, were cleaned and resampled to examine the potential for hosting stratabound mineralization. Samples of pyrite-rich mineralization averaged 12.8% Cu, 8.0% Pb, 2.2% Zn, 160.1 g Ag/t and 2.3 g Au/t. Covellite was found in the pyrite by microscopy. The mineralogy suggests intense weathering and leaching.

Soil samples confirmed strong lead, zinc, copper, silver and gold values discontinuously distributed within a zone approximately 1,200 by 300 m that is generally conformable with the trend of stratigraphy. The anomalous metal association along with the geological setting suggests the MARG geochemical anomaly may have formed by deep weathering of a volcanogenic massive sulphide deposit.

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BRAINE
Archer, Cathro and
Associates (1981) Limited

Zinc,Lead,Copper,
Silver
106 D 7 (47)
(64°24'N,134°42'W)

Reference: D.I.A.N.D. (1982, p. 195-196,198).

Claims: BLENDE 1-15

Source: Summary by P. Watson and D. Emond from assessment report 091475 by W.D. Eaton.

Current Work and Results:

In 1982, rock and rock chip sampling was carried out in the vicinity of the main occurrences, and a program of prospecting took place peripheral to it.

Ten vein zones have been delineated to date. These consist mainly of coarse grained sphalerite, galena, pyrite, chalcopyrite and tetrahedrite with a gangue of secondary dolomite in orange weathering dolomite of the Gillespie Lake Group. The most important vein zone has been followed over a strike length of 900 m with widths of up to 15 m. The irregularly mineralized breccia zone strikes 110° and dips 80° south. The best mineralization was found in the competent dolomite and the breccia/veins generally were reduced to gouge zones in interbedded shaley horizons. A metal zonation of increasing lead, copper and silver, and decreasing zinc values with depth was noted. The silver:lead ratio increases from 15 to 31 g Ag/t:1% Pb.

Soil and stream sediment geochemical data provided from both the G.S.C. Open File 518 and from earlier assessment work by Cyprus Anvil was reviewed, and outlined a 3 by 5 km area of anomalous lead with some associated anomalous zinc and copper values.

An air photo interpretation of linear structures in the area was also completed, and identified other potential targets.

1983 MINERAL CLAIMS STAKED

RAMBLER — 106 D 3 (10)
J. Strebchuk — (64°05'N,134°16'W)

Claims 1983: MICHELLE 1-4; RABBIT 1-2

MIKE — 106 D 3 (87)
N. Kozak — (64°04'N,135°09'W)

Claims 1983: MIKE 1-16

GREY COPPER HILL — 106 D 6 (27)
H. Moritz — (64°26'N,135°15'W)

Claims 1983: NANCY-BEA 1-8

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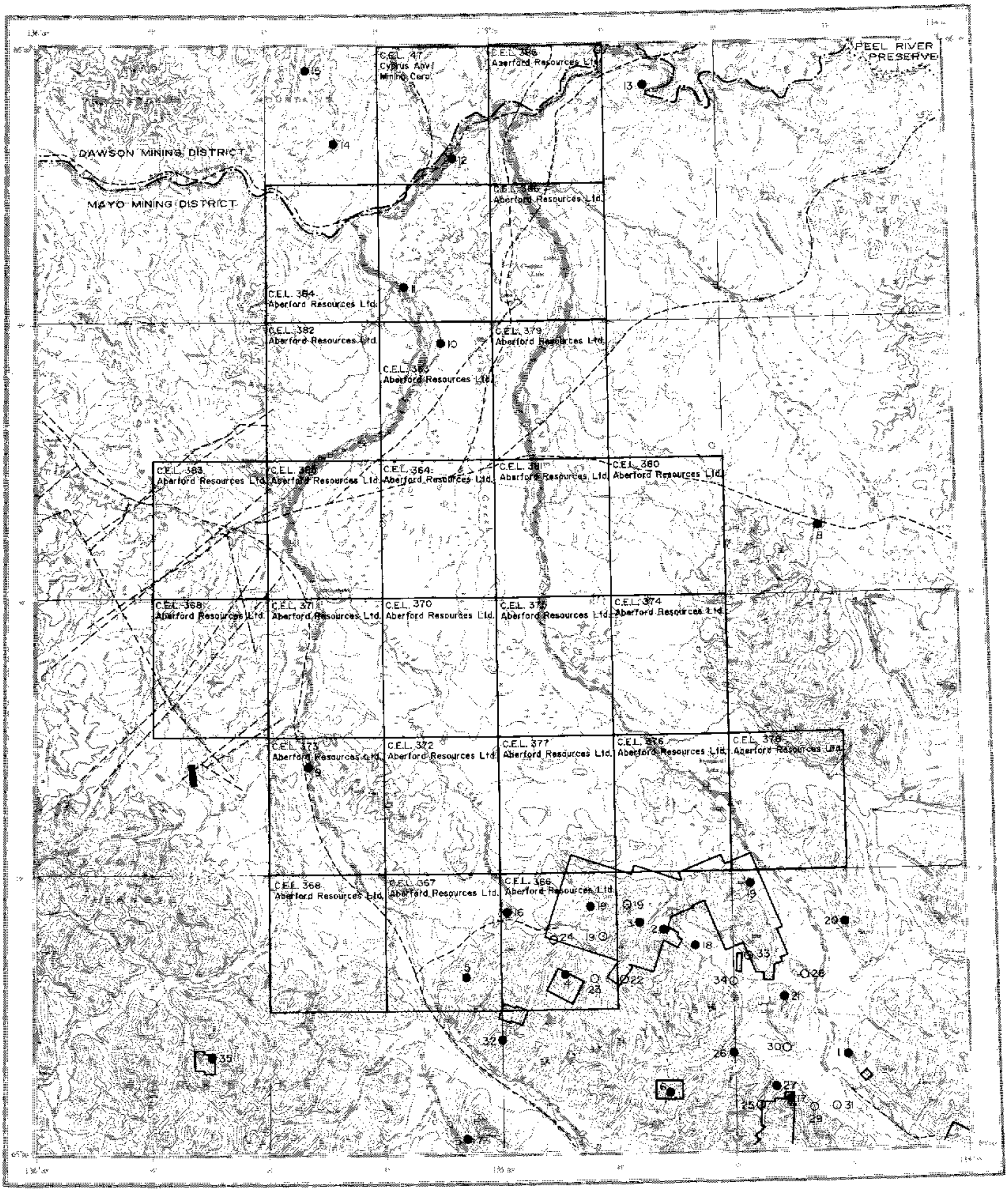
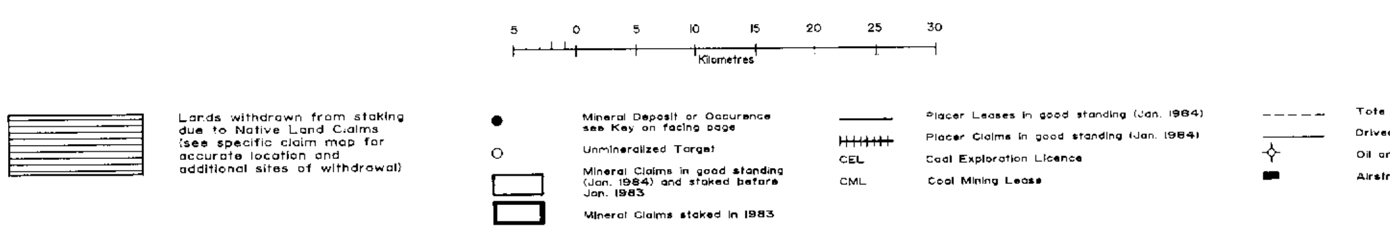
NOTES

106 E



WIND RIVER
YUKON TERRITORY



WIND RIVER MAP-AREA (NTS 106 E)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1528A by: D.K. Norris, 1982c.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	IRENE	Occurrence U Cu	106 E 1	7	Blusson (1976, p. 132)
2	GREMLIN	Breccia Cu Ag	106 E 2	7	D.I.A.N.D. (1983, p. 183-185)
3	CHLOE	Occurrence Pb Zn	106 E 2	7	
4	FLUNK	Carbonate-hosted Zn Pb	106 E 2	5	Sinclair et al (1976, p. 65-67)
5	FORSTER (MST)	Stratabound Pb Zn	106 E 3	7	Sinclair et al (1975, p. 67-68); Morin et al (1977, p. 133)
6	IGOR	Breccia Cu U	106 E 2	7	D.I.A.N.D. (1983, p. 183,184)
7	MAGIC	Unclassified	106 E 3	7	Sinclair et al (1975, p. 69)
8	HENDRY (DTS)	Vein Pb Zn Cu	106 E 9	7	Sinclair et al (1975, p. 63-64)
9	PRONGS, BONNET PLUME COALFIELD	Coal	106 E 6	7	Camsell (1907, p. 28); Morin et al (1979, p. 73); McKinney (This Report)
10	CHAPPIE	Coal	106 E 11	7	Camsell (1907, p. 27-30)
11	BASIN	Coal	106 E 14	7	Camsell (1907, p. 27-30)
12	SAINVILLE	Coal	106 E 14	7	Camsell (1907, p. 41-46)
13	LOPSTICK	Coal	106 E 14	7	Camsell (1907, p. 41-46)
14	ONCE	Unclassified	106 E 14	7	Sinclair et al (1975, p. 86-87)
15	TUKU	Carbonate-hosted Zn Pb	106 E 14	6	Sinclair et al (1975, p. 87)
16	SLATER	Coal	106 E 2	7	
17	OTIS	Breccia U	106 E 1	7	D.I.A.N.D. (1981, p. 246-247)
18	SCYLLA	Breccia U	106 E 2	7	D.I.A.N.D. (1981, p. 247)
19	DEER	Breccia U	106 E 1,2	7	Morin et al (1980, p. 18-20)
20	BEV	Occurrence Zn Pb	106 E 1	7	Sinclair et al (1976, p. 63)
21	WERNECKE	Occurrence Cu U	106 E 1	7	Morin et al (1980, p. 17)
22	YOGI	Unclassified	106 E 2	7	Morin et al (1980, p. 21)
23	JEANETTE	Unclassified	106 E 2	9	Sinclair et al (1976, p. 70)
24	WINDY	Unclassified	106 E 2	9	Sinclair et al (1976, p. 71)
25	CUS	Unclassified	106 E 1	9	
26	MARTET	Unclassified	106 E 2,1	9	Morin et al (1977, p. 128-129)
27	THORIUM	Unclassified	106 E 1	7	Morin et al (1977, p. 128)
28	MTR	Unclassified	106 E 1	9	Morin et al (1979, p. 48)
29	ORION	Unclassified	106 E 1	9	Morin et al (1979, p. 45-46)
30	GSTD	Unclassified	106 E 1	9	Morin et al (1979, p. 46)
31	POLARIS	Unclassified	106 E 1	9	Morin et al (1979, p. 47)
32	TAR	Unclassified	106 E 1	7	Morin et al (1980, p. 20)
33	RIN	Unclassified	106 E 1	7	Morin et al (1980, p. 18)
34	RAPI	Unclassified	106 E 2,1	9	Morin et al (1979, p. 49)
35	LWR	Vein, Carbonate-hosted Pb Zn	106 E 4	7	D.I.A.N.D. (1983, p. 183-185)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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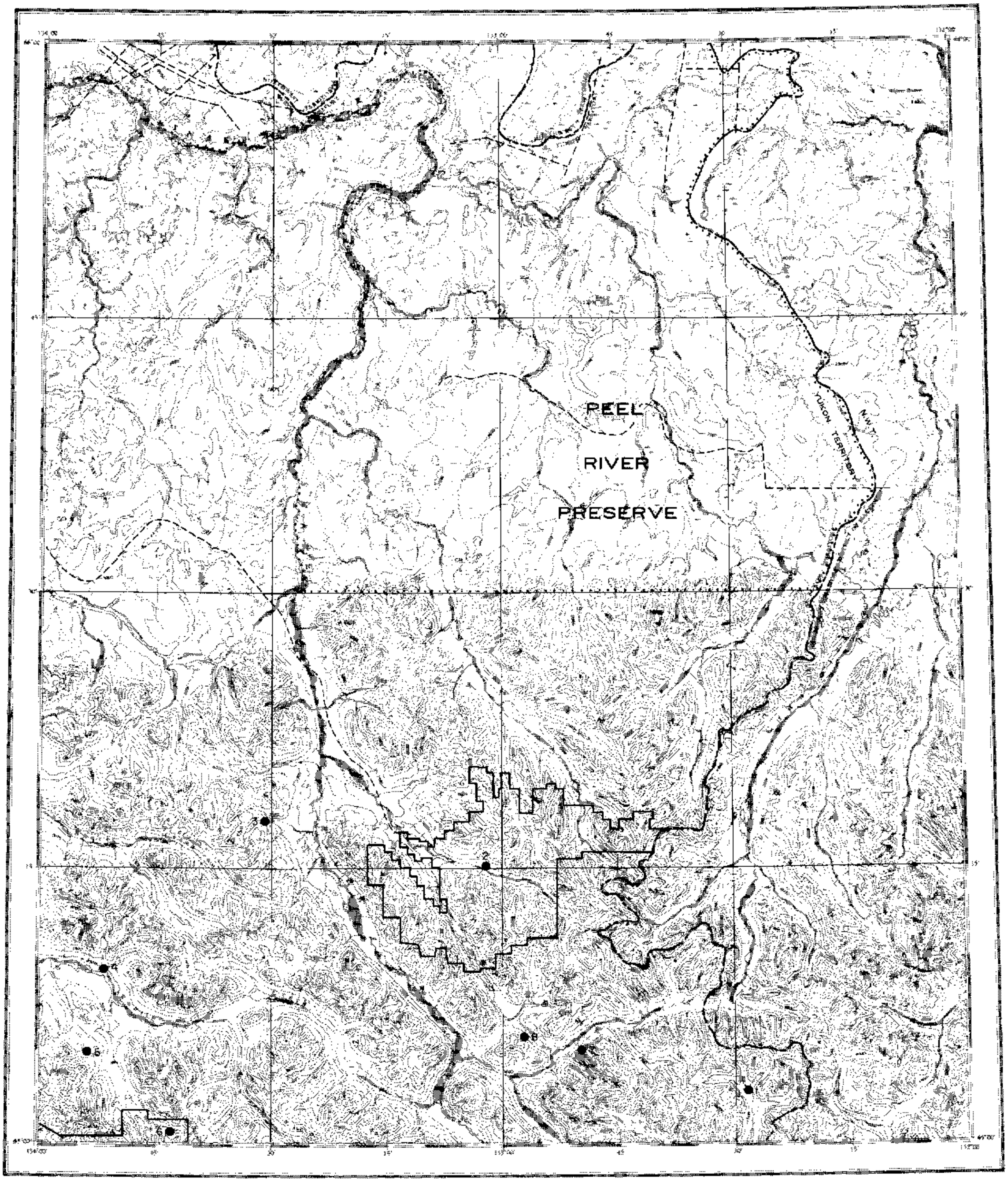
106 F



SNAKE RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

SNAKE RIVER MAP-AREA (NTS 106 F)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1529A by: D.K. Norris, 1982d.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	VYE	Carbonate-hosted Zn	106 F 1	7	
2	CREST	Iron formation and/or ironstone	106 F 6	2	Green & Godwin (1963, p. 15-18); Yeo (This Report)
3	HOME	Occurrence Zn	106 F 5	7	
4	PLAINS (KEN)	Carbonate-hosted Zn	106 F 4	6	Sinclair et al (1976, p. 73)
5	YUK	Occurrence Pb Zn	106 F 4	7	Sinclair et al (1976, p. 73)
6	VOLE	Vein Co Cu Ag	106 F 4	7	D.I.A.N.D. (1982, p. 203)
7	LAURA	Unclassified	106 F 2	7	Morin et al (1977, p. 134)
8	BUH	Carbonate-hosted Zn Pb	106 F 2	6	Morin et al (1977, p. 134)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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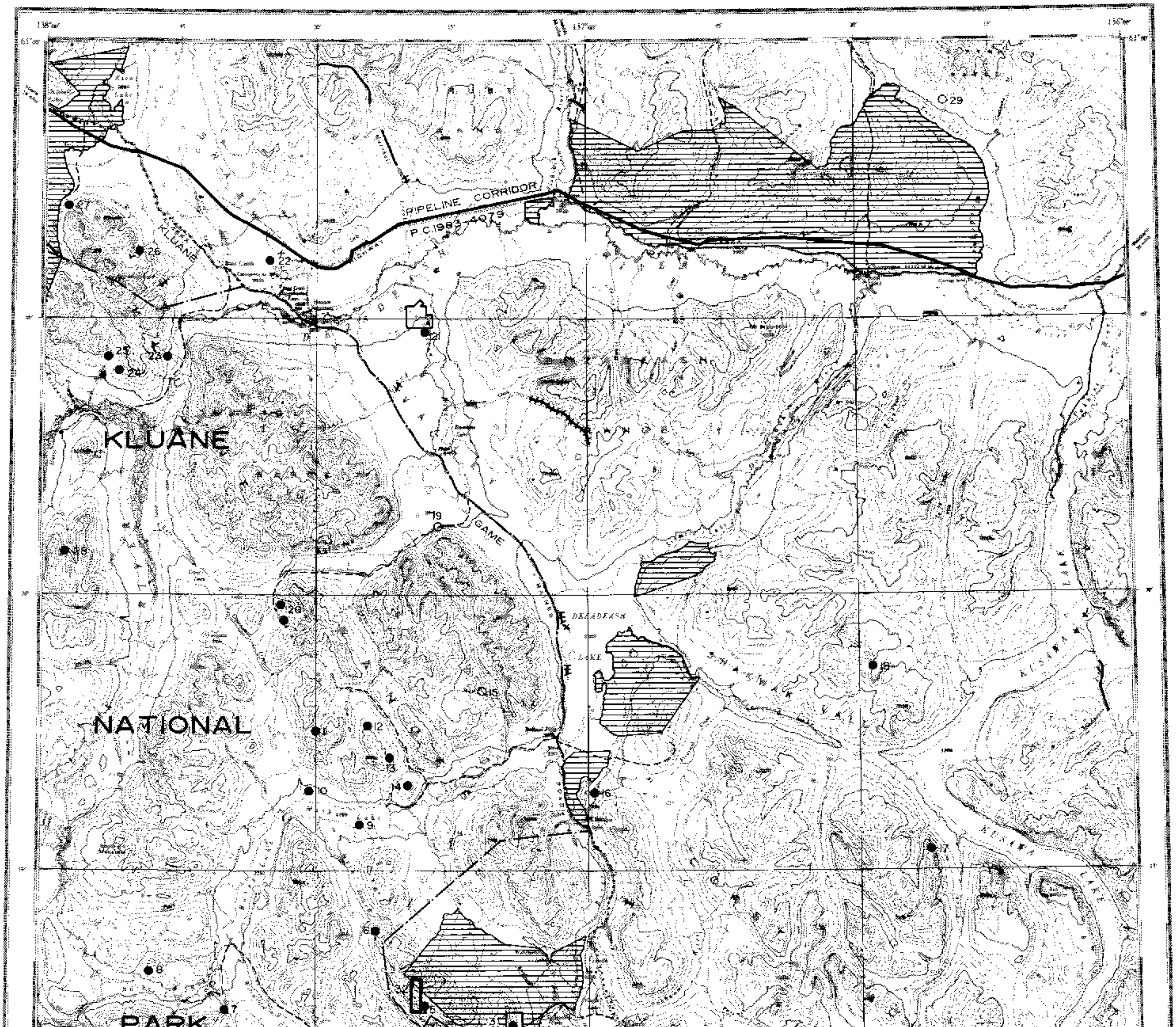
115 A



DEZADEASH

YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

(hatched)	Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
●	Mineral Deposit or Occurence see Key on facing page
○	Unmineralized Target
(thin box)	Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
(thick box)	Mineral Claims staked in 1983
(solid line)	Placer Leases in good standing (Jan. 1984)
(hatched line)	Placer Claims in good standing (Jan. 1984)
CEL	Coal Exploration Licence
CML	Coal Mining Lease
- - - -	Tote Trail
(line)	Driveable Road
(symbol)	Oil or Gas Well
▬	Airstrip

DEZADEASH MAP-AREA (NTS 115 A)

General Reference: GSC Map 1019A and Memoir 268 by: E.D. Kindle, 1952. GSC Open File 831 by: R.B. Campbell and C.J. Dodds, 1982c.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	JACKPOT	Vein Cu	115 A 3	5	Findlay (1969b, p. 43-44); Sinclair & Gilbert (1975, p. 72); This Report
2	DALTON	Unclassified	115 A 3	9	
3	KANE	Vein Ag Pb	115 A 3	5	D.I.A.N.D. (1981, p. 251)
4	CHICKALOON	Unclassified	115 A 3	9	
5	PHOTO	Serpentinized peridotite	115 A 3	7	Findlay (1969a, p. 74)
6	MUSH	Vein Cu	115 A 3	7	Skinner (1961, p. 37-38)
7	BATES	Vein Ag Pb	115 A 4	6	Kindle (1953, p. 56)
8	FENTON	Vein Cu	115 A 4	7	
9	CAVE	Volcanic red bed Cu, Vein Ag Cu	115 A 6	7	
10	SHAFT	Occurrence Cu	115 A 5	7	
11	BELOUD	Unclassified	115 A 6,5	7	Kindle (1952,p. 49-50,55)
12	HUSKY	Volcanic red bed Cu	115 A 6	7	
13	WREN	Occurrence Cu	115 A 6	7	
14	KEL	Volcanic red bed Cu	115 A 6	7	
15	SHORTY	Occurrence U	115 A 6	7	Kindle (1953, p. 49,55)
16	KLUKSHU	Occurrence Cu	115 A 7	7	
17	DEVILHOLE	Porphyry Cu Mo Pb	115 A 8	7	
18	KUSAWA	Skarn Cu	115 A 8	7	
19	MILLHOUSE	Unclassified	115 A 11	9	
20	JOHOBO	Volcanic red bed Cu	115 A 5	3	Findlay (1967, p. 55); Kirkham (1971, p. 85)
21	REX	Granite-associated U	115 A 11	2	Findlay (1967, p. 55); Sinclair & Gilbert (1975, p. 73)
22	ELGIN	Skarn Cu	115 A 13	7	
23	STRIDE	Unclassified	115 A 12	7	Kindle (1953, p. 56)
24	SUGDEN	Coal	115 A 12	7	Kindle (1953, p. 58)
25	FERGUSON	Occurrence Au?	115 A 12	7	Bostock (1936b, p. 12); Bostock (1937, p. 11)
26	DECOELI	Vein Cu, Asbestos	115 A 13	7	
27	KLOO	Vein Cu	115 A 13	5	Findlay (1967, p. 54)
28	SOUTHER	Porphyry Cu Mo	115 A 12	7	Souther & Stanciu (1975, p. 66-70)
29	SIFTON	Unclassified	115 A 16		D.I.A.N.D. (1981, p. 251)
30	CHARLIE	Unclassified	115 A 3		D.I.A.N.D. (1982, p. 205)
31	KID	Unclassified	115 A 3		D.I.A.N.D. (1983, p. 189)
32	CYPRIOT	Unclassified	115 A 3		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

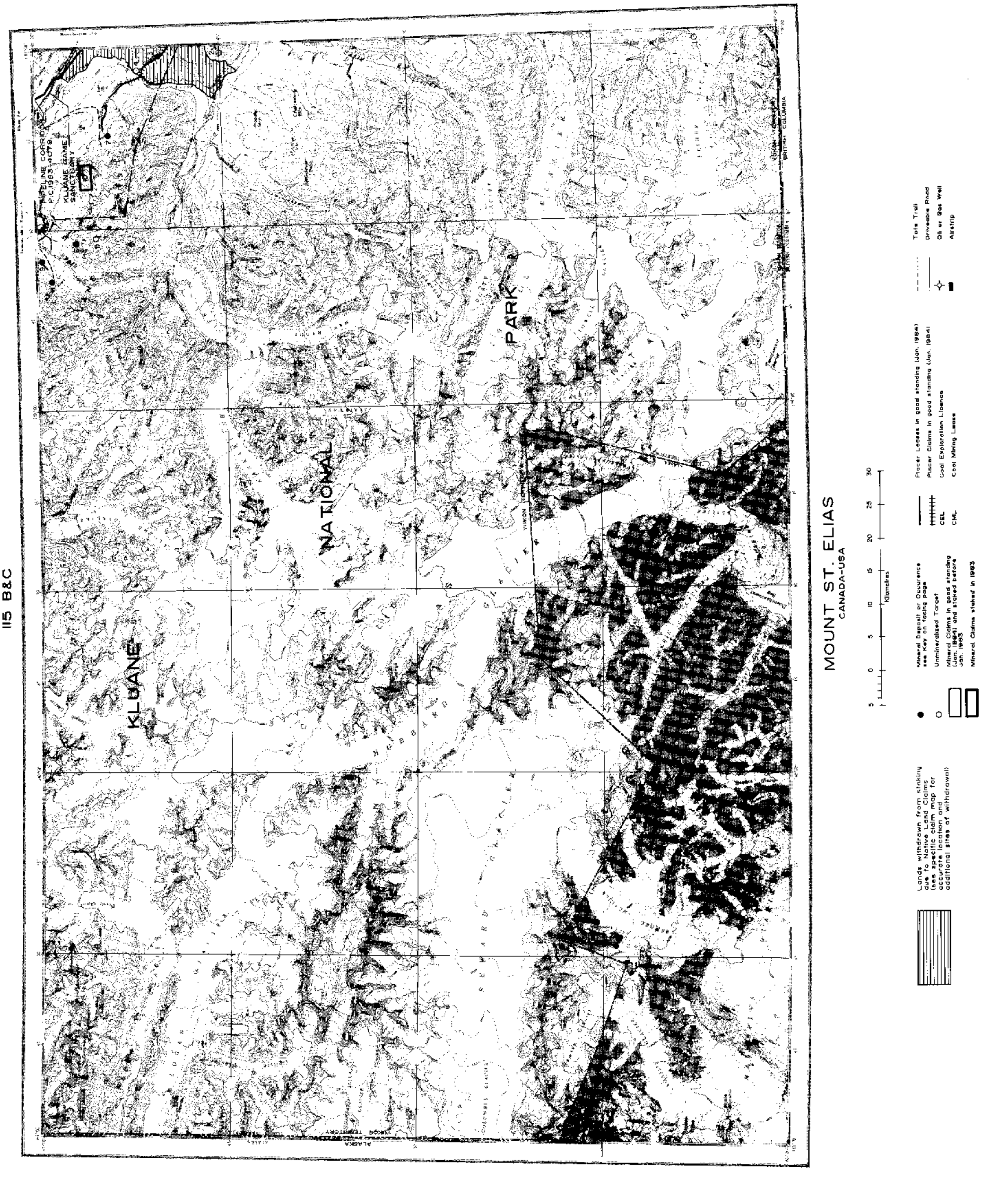
1983 MINERAL CLAIMS STAKED

JACKPOT — 115 A 3 (1)
K. Lanigan — (60°04'N,137°08'W)

Claims 1983: WILL 1-32

CYPRIOT — 115 A 3 (32)
Archer, Cathro & Associates (1981) Limited — (60°08'N,137°19'W)

Claims 1983: CYPRIOT 1-16


115 B&C
KLUANE
NATIONAL
PARK
MOUNT ST. ELIAS
CANADA-USA
Kilometres
Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
Mineral Deposit or Occurrence see Key on facing page
Unmineralized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983
Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
Coal Exploration Licence
Coal Mining Lease
Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

MOUNT ST. ELIAS MAP-AREA (NTS 115 B-C)

General Reference: GSC Map 1143A by: J.O. Wheeler, 1963.
GSC Open File 830 by: R.B. Campbell and C.J. Dodds, 1982b.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	PLUG	Occurrence Cu Ag	115 B 1	7	
2	KASKAWULSH	Occurrence Cu Ag	115 B 9,16	7	
3	KIMBERLEY	Coal	115 B 16	7	Kindle (1952, p. 58)
4	JARVIS	Unclassified	115 B 16	7	McConnell (1905, p. 1-18)
5	DULUTH	Mafic/ultramafic-associated Ni Cu	115 B 15	7	
6	GIBBONS	Mafic/ultramafic-associated Ni Cu	115 B 15	7	
7	TELLURIDE	Stratiform Cu Zn Ag Au Ni	115 B 16	7	
8	BULLION	Stratabound Gypsum Cu Pb	115 B 15	7	
9	SHEEP	Unclassified	115 B 15		McConnell (1905, p. 1-18)
10	KUL	Unclassified	115 B 16		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enoygh to classify the occurrence.

1983 MINERAL CLAIMS STAKED

KUL — 115 B 16 (10)
L. Brault — (60°55'N,137°28'W)

Claims 1983: KUL 1-32

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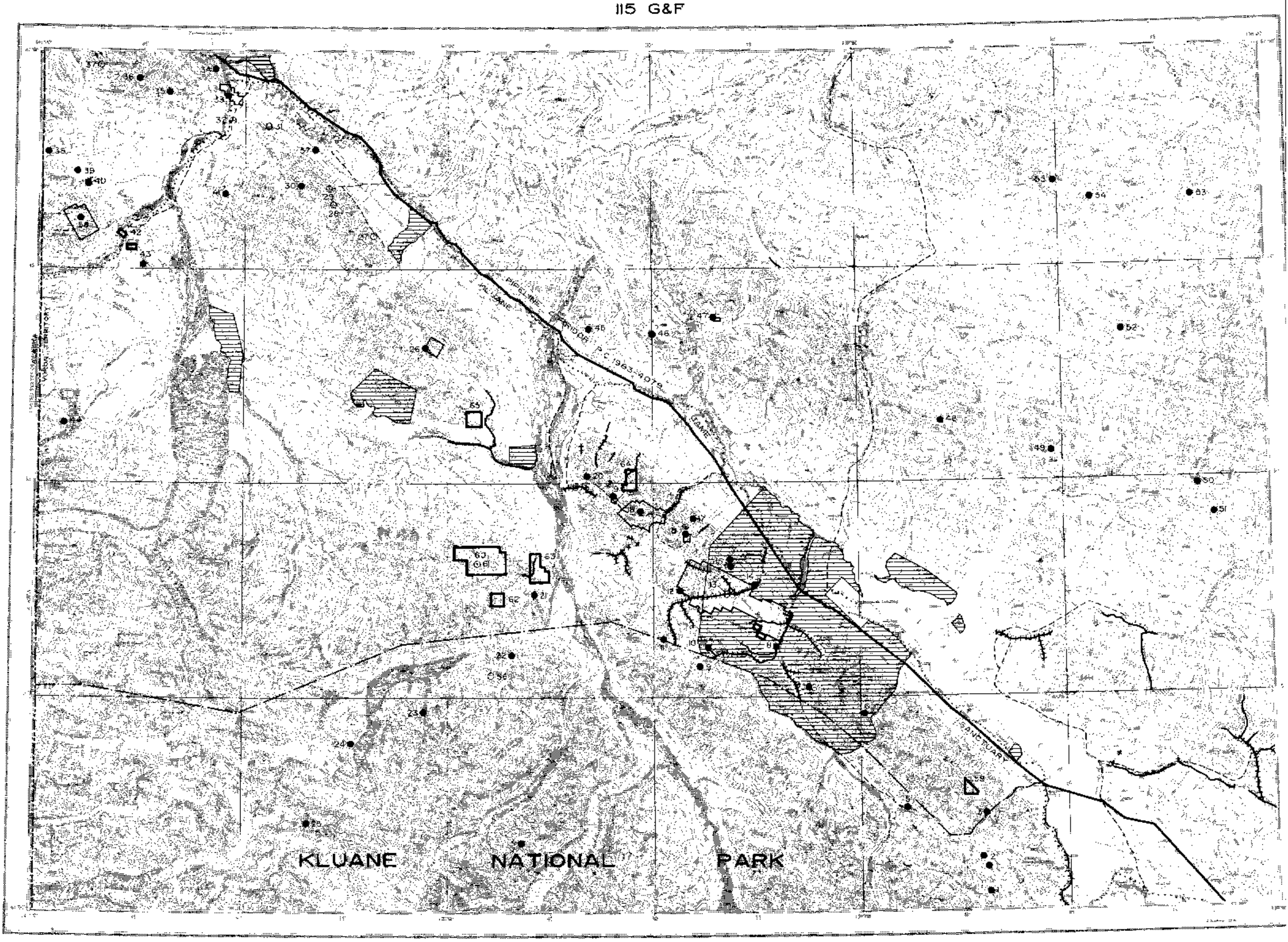
115 G&F



KLUANE LAKE
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page
⊙ Unminerdized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
CEL Coal Exploration Licence
CML Coal Mining Lease

Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

KLUANE MAP-AREA (NTS 115 F-G)

General Reference: GSC Map 1177A and Memoir 340 by: J.E. Muller, 1967. GSC Open File 829 by: R.B. Campbell and C.J. Dodds, 1982a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	METALLINE	Unclassified	115 G 2	7	McConnell (1905, p. 18)
2	STOVE	Coal	115 G 2	7	Muller (1967, p. 113-114)
3	CONGDON	Mafic/ultramafic-associated Ni Cu	115 G 2	7	Sinclair & Gilbert (1975, p. 66-67)
4	MULLER	Coal	115 G 4	7	Muller (1967, p. 112)
5	DICKSON	Mafic/ultramafic-associated Ni Cu Co	115 G 2	7	
6	DESTRUCTION	Mafic/ultramafic-associated Ni Cu	115 G 2	7	
7	WINDGAP	Asbestos	115 G 6	7	Craig & Laporte (1972, p. 153-154)
8	DUKE	Asbestos	115 G 6	7	
9	HOGE	Coal	115 G 6	7	Muller (1967, p. 113-115)
10	AMPHITHEATER	Coal	115 G 6	7	Muller (1967, p. 113-115)
11	WADE	Occurrence Cu Ag	115 G 6	7	
12	CORK	Porphyry Cu Mo	115 G 6	5	D.I.A.N.D. (1981, p. 256)
13	GLEN	Mafic/ultramafic-associated Ni Cu, Occurrence Au	115 G 6	7	This Report
14	BURWASH	Unclassified	115 G 6	7	Cairnes (1915b, p. 31)
15	JACQUOT	Volcanic red bed Cu	115 G 6	7	Kirkham (1971, p. 85); Craig & Laporte (1972, p. 103)
16	QUILL	Volcanic red bed Cu	115 G 6	7	Findlay (1969a, p. 70-72); Kirkham (1971, p. 85)
17	VERSLUCE	Unclassified	115 G 6	7	Findlay (1969a, p. 70-72)
18	WELLGREEN	Mafic/ultramafic-associated Ni Cu	115 G 5	3	Eckstrand (1972, p. 81-82); Sinclair & Gilbert (1975, p. 64-65)
19	AIRWAYS	Mafic/ultramafic-associated Cu Ni	115 G 5	7	D.I.A.N.D. (1983, p. 193,195)
20	MUSKETEER	Mafic/ultramafic-associated Cu Ni	115 G 12	7	
21	CEMENT	Coal	115 G 5	7	McConnell (1905, p. 18); McConnell (1906, p. 19-26)
22	ST. ELIAS	Occurrence Mo	115 G 5	7	Skinner (1961, p. 36)
23	SHARPE	Unclassified	115 F 1	7	Muller (1967, p. 112)
24	GALLOPING	Unclassified	115 F 1	7	Skinner (1961, p. 36)
25	ICEFIELD	Unclassified	115 F 1	7	Skinner (1961, p. 36)
26	GARLIC	Occurrence Cu Mo Au	115 F 9	7	D.I.A.N.D. (1983, p. 193-194)
27	LIBERTY	Occurrence Cu Ni	115 F 16	7	
28	DUENSING	Unclassified	115 F 16	9	
29	CATS AND DOGS	Occurrence Cu Ni	115 F 16	7	D.I.A.N.D. (1983, p. 193,195)
30	MEXICO	Skarn Cu	115 F 16	7	
31	PICKHANDLE	Unclassified	115 F 16	7	Kirkham (1971, p. 85)
32	SEVENSMA	Unclassified	115 F 15	9	
33	CANALASK	Mafic/ultramafic-associated Ni Cu	115 F 15	2	Findlay (1969b, p. 39); Eckstrand (1972, p. 81-82); Sinclair & Gilbert (1975, p. 60-61)
34	EPIC	Vein Cu Mo	115 F 15	7	
35	TAYLOR	Skarn Cu Mo	115 F 15	7	
36	SANPETE	Skarn Cu Fe	115 F 15	7	Craig & Milner (1975, p. 37-38)
37	HUMP	Unclassified	115 F 15	7	Johnston (1915, p. 193)
38	MEMOIR	Unclassified	115 F 15	7	Cairnes (1915b, p. 141)
39	MCLENNAN	Unclassified	115 F 15	7	Cairnes (1915b, p. 141)
40	RABBIT	Vein Cu	115 F 15	7	Cairnes (1915b, p. 123-124)
41	LEP	Unclassified	115 F 15	7	Craig & Milner (1975, p. 38-39)

42	WHITERIVER	Volcanic red bed Cu	115 F 15	6	Sinclair et al (1975, p. 138-139); D.I.A.N.D. (1982, p. 210); This Report
43	SHARE	Unclassified	115 F 15	9	
44	KLETSAN	Occurrence Cu	115 F 10	7	Moffit & Knopf (1910, p. 51-57); Findlay (1969b, p. 42)
45	ELEVENTHIRTY	Skarn W Cu	115 G 12	7	Bostock (1952, p. 40)
46	KENNEDY	Skarn W Cu	115 G 12,11	7	Bostock (1952, p. 40)
47	TINCUP	Asbestos	115 G 11	7	D.I.A.N.D. (1981, p. 256)
48	BROOKS	Occurrence Mo	115 G 10	7	Muller (1967, p. 112-113)
49	TALBOT	Occurrence Cu	115 G 10	7	D.I.A.N.D. (1981, p. 256)
50	RAFT	Porphyry Mo W	115 G 8	7	D.I.A.N.D. (1981, p. 256)
51	ROCKSLIDE	Unclassified	115 G 8	7	Muller (1967, p. 112-113); D.I.A.N.D. (1982, p. 210)
52	DWARF	Unclassified	115 G 9	7	Sinclair & Gilbert (1975, p. 70-71)
53	BIRCH	Unclassified	115 G 16	7	Craig & Milner (1975, p. 83)
54	BRUMMER	Unclassified	115 G 16	7	Craig & Milner (1975, p. 85-86)
55	RHYOLITE	Porphyry Cu Mo	115 G 15	7	Craig & Milner (1975, p. 83,87)
56	NICK	Mafic/ultramafic-associated Ni Cu	115 G 5	7	
57	KOIDERN (M)	Unclassified	115 F 16		Morin et al (1977, p. 165)
58	CAN	Vein Au Cu	115 F 15	7	This Report
59	BOCK	Unclassified	115 G 2		This Report
60	MAR	Unclassified	115 G 5		This Report
61	NORTH C	Unclassified	115 G 5		This Report
62	SOUTH C	Unclassified	115 G 5		This Report
63	EAST C	Unclassified	115 G 5		This Report
64	SJ	Unclassified	115 G 5,12		This Report
65	YNX	Unclassified	115 G 12		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

GLEN
Halferdahl and Associates Ltd. — Gold Target — 115 G 6 (13) — (61°22'N,139°23'W)

References: D.I.A.N.D. (1983, p. 193-194).

Claims: EL (67); JO (8); SUE (5); KAT (44); NAN (4); JAN (4); DEN (4); WEN (7); AND (7); JY (33)

Source: Summary by P. Watson from assessment report 091175 and 091495.

Current Work and Results:

In the fall of 1982, three diamond drill holes, totalling 272.8 m, were drilled on the WEN 5, JO 6 and WEN 3 claims. Felsic tuff, magnetite-bearing peridotite, mafic to felsic volcanic flows, and limestone (in one hole) were intersected. A pyritic tuff layer below a thick peridotite sill, contains trace amounts of gold. It appears that gold-bearing zones may occur within a thick section of volcanic and tuffaceous rocks.

In 1983, heavy mineral sampling, soil sampling and magnetometer surveying were carried out. A total of 583 soil samples and 59 panned concentrate samples (for heavy mineral analysis) were collected. Samples indicated that several creeks are anomalous in gold, and one is anomalous in nickel, copper, zinc, lead, gold and molybdenum near its headwaters. The magnetic survey helped to delineate the contact between Cretaceous granodiorite and strata of the Permian Skolai Group and Permo-Triassic ultrabasic rocks.

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CAN
Homestake Mineral Development Company — 115 F 15 (58) — (61°48'N,140°55'W)

Reference: D.I.A.N.D. (1983, p. 194-195).

Claims: CAN 1-52

Source: Summary by P. Watson from assessment report 091499 by R.T. Boyd and M. Flanagan.

History:

There is no evidence of previous work in the area. Placer claims have been recorded on Boulder Creek which cuts across the property from west to east, but no production has been documented.

Description:

The claims are located on the north side of the White River, 27 km west of Koidern and 2 km east of the Y.T. - Alaska border. They are underlain by Miocene to Pliocene Wrangell volcanic rocks, within the St. Elias Mountains in the Wrangell structural terrane. The property is bounded on the east by the Slaggard - Tschawsahmon, northwest-trending, transverse fault.

Current Work and Results:

In 1982, a large, pyrite-rich altered area, coincident with anomalous gold and base metal values in stream sediments, was discovered and staked. In 1982, a reconnaissance mapping program was carried out at 1:10,000 scale and 67 rock, 31 talus fine and 6 stream sediment samples were collected.

The thickest and most prevalent unit found on the property is an acid to intermediate, feldspar crystal tuff assemblage. It underlies the central part of the claim group and hosts much of the hydrothermal alteration found on the property. In the southeast corner of the property, a sequence of conglomerate, greywacke, arkose and pyroclastic tuff appears to underlie the crystal tuff assemblage. A multiphase intrusion of diorite to diorite feldspar porphyry intrudes the oldest unit on the property. Overlying the crystal tuff are feldspar porphyry intrusive rocks and andesite which are underlain by discontinuous beds of conglomerate, grit and greywacke, possibly representing stream channel deposits. Pliocene columnar basalt and andesite unconformably overlie the other units.

Two fault sets striking north and northwest are believed to be the controls for the alteration and silicification which covers an elliptical area of 2.1 by 0.75 km. Alteration ranges from weakly propylitic to strongly sericitic. Pervasive pyritization is associated with strong propylitic and sericitic alteration.

The mineralization noted to date consists of minor chalcopyrite and malachite associated with quartz vein stockworks and altered intrusive rocks. Chalcopyrite also occurs disseminated with pyrite in quartz veinlets in north-striking vein stockworks. The maximum gold assay value returned for rock samples was 240 ppb. Anomalous gold found in stream sediments in 1982 were not traced into the surrounding bedrock.

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1983 MINERAL CLAIMS STAKED

WHITERIVER — 115 F 15 (42)
D. Reghr — (62°46'N,140°48'W)

Claims 1983: DOUG 1-2; HEN 1-2

BOCK — 115 G 2 (59)
Agip Canada Ltd. — (61°11'N,138°48'W)

Claims 1983: BOCK 1-12

MAR — 115 G 5 (60)
G. Friebergs; — (61°22'N,139°54'W)
Noranda Exploration Company Ltd.

Claims 1983: MAR 1-4; CEM 1-91

NORTH "C" — 115 G 5 (61)
Agip Canada Ltd. — (61°24'N,139°56'W)

Claims 1983: NORTH "C" 1-9

SOUTH "C" — 115 G 5 (62)
Agip Canada Ltd. — (61°22'N,139°53'W)

Claims 1983: SOUTH "C" 1-16

EAST "C" — 115 G 5 (63)
Agip Canada Ltd. — (61°24'N,139°47'W)

Claims 1983: EAST "C" 1-31

S.J. — 115 G 5,12 (64)
Agip Canada Ltd. — (61°30'N,139°56'W)

Claims 1983: S.J. 1-20

GLEN — 115 G 6 (13)
C. Sayer — (61°20'N,139°15'W)

Claims 1983: JAN 53-56: 67-68

LYNX — 115 G 12 (65)
Agip Canada Ltd. — (61°34'N,139°56'W)

Claims 1983: LYNX 1-16

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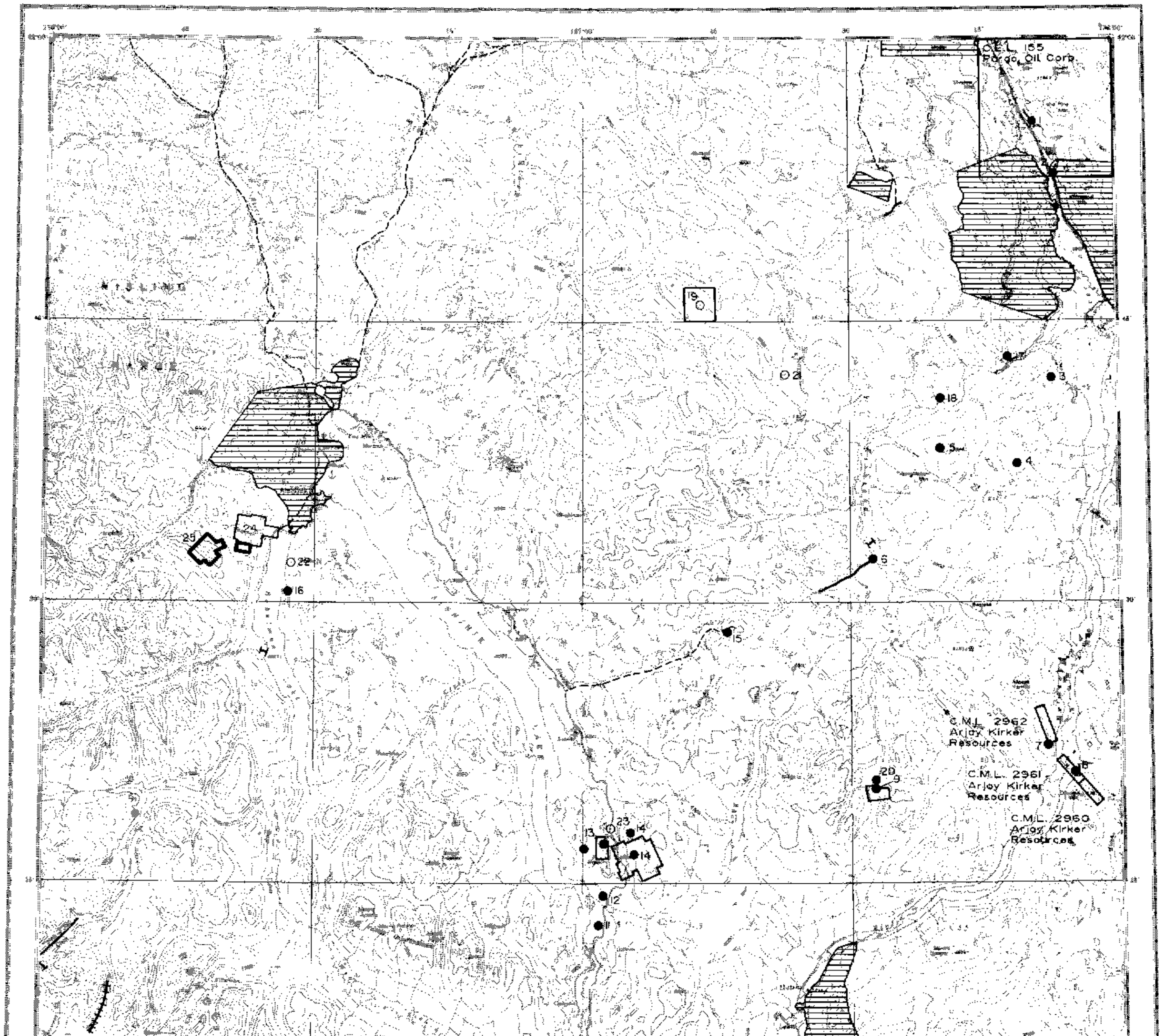
115 H



AISHIHIK LAKE

YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

AISHIHIK LAKE MAP-AREA (NTS 115 H)

General Reference: GSC Map 17-1973 and Paper 73-41
by: D.J. Tempelman-Kluit, 1974a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	LOSCH	Unclassified	115 H 16	7	Cairnes (1910, p. 49)
2	ANDESITE	Coal, Occurrence U	115 H 16	7	D.I.A.N.D. (1983, p. 197-198)
3	AH	Vein Cu	115 H 9	7	
4	MACK'S	Skarn Cu	115 H 9	7	Craig & Milner (1975, p. 80-81)
5	SNIPE	Occurrence Cu	115 H 9	7	
6	KIRK	Occurrence Cu	115 H 9	7	
7	VOWEL	Unclassified	115 H 8		Cairnes (1908, p. 10-15)
8	DIVISION	Coal	115 H 8	7	
9	LION	Occurrence Mo Pb	115 H 8	7	
10	MORAINE	Skarn Cu W	115 H 2	7	D.I.A.N.D. (1981, p. 258); D.I.A.N.D. (1983, p. 197)
11	GILTANA	Unclassified	115 H 2	9	D.I.A.N.D. (1981, p. 258)
12	AISHIHIK	Skarn Cu Fe	115 H 2	7	Sinclair & Gilbert (1975, p. 69-70); D.I.A.N.D. (1981, p. 258)
13	JANISIW	Skarn Cu	115 H 7	6	D.I.A.N.D. (1982, p. 213)
14	HOPKINS (ML)	Skarn Cu Fe Au	115 H 7	6	Morin et al (1980, p. 46)
15	SATO	Occurrence Cu Mo	115 H 7	7	Craig & Milner (1975, p. 88-89)
16	SEKULMUN	Skarn Zn Pb (Ag Sn)	115 H 12	7	
17	ORLOFF	Occurrence Au	115 H 9	7	D.I.A.N.D. (1982, p. 213)
18	SHAD	Occurrence Cu	115 H 9	7	
19	BUFFALO	Unclassified	115 H 15	9	D.I.A.N.D. (1981, p. 258)
20	BUN	Unclassified	115 H 8	7	Morin et al (1977, p. 167)
21	TOSH	Unclassified	115 H 10	9	Morin et al (1980, p. 46)
22	SEK	Unclassified	115 H 12	9	Morin et al (1980, p. 47)
23	SIDE	Unclassified	115 H 7		D.I.A.N.D. (1982, p. 213)
24	HATCH	Skarn Mo Cu W, Vein Au	115 H 12	7	D.I.A.N.D. (1983, p. 197-198); This Report
25	HIK	Unclassified	115 H 12		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

HIK — 115 H 12 (25)
Kerr Addison Mines Ltd. — (61°33'N,137°42'W)

Claims 1983: HIK 1-32; LEN 1-2

HATCH — 115 H 12 (24)
Canadian Occidental Petroleum Ltd. — (61°33'N,137°38'W)

Claims 1983: CATCH 2-4

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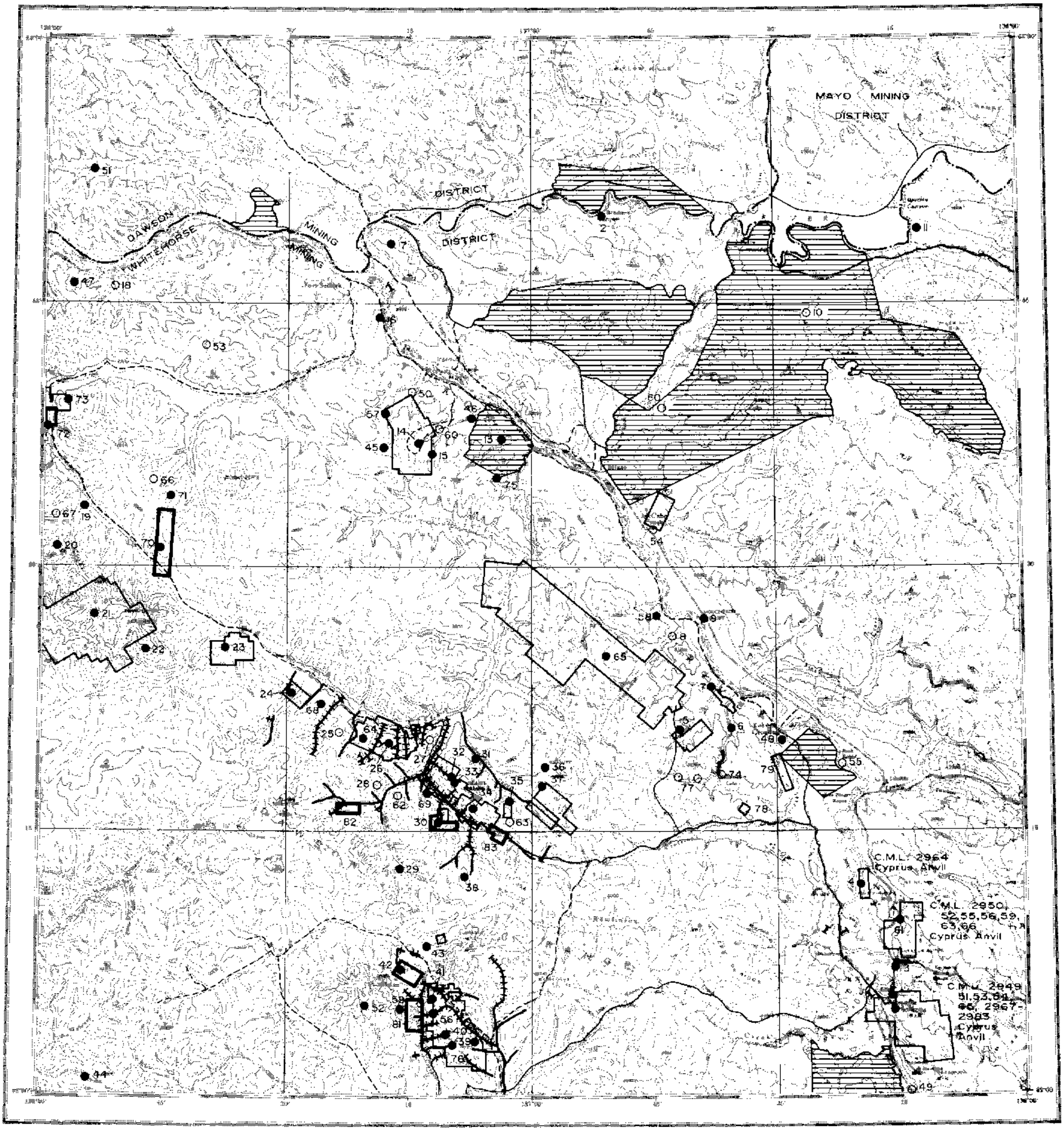
115 I



CARMACKS

YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

CARMACKS MAP-AREA (NTS 115 I)

General Reference: GSC Open File 200 by: D.J. Tempelman-Kluit, 1972.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	SOUTH TANTALUS	Coal	115 I 1	7	Findlay (1967, p. 89)
2	TANTALUS MINE	Coal	115 I 1	4	Cairnes (1910, p. 59-63); Bostock (1936, p. 58-59)
3	TANTALUS BUTTE	Coal	115 I 1	3	Cairnes (1910, p. 52-53); Findlay (1969a, p. 114); Sinclair et al (1975, p. 168)
4	FIVE FINGERS MINE	Coal	115 I 1	7	Bostock (1936, p. 62-63)
5	WILLIAMS CREEK	Metamorphosed Cu deposit	115 I 7	3	Sinclair (1977, p. 80-81 in Morin et al, 1977)
6	MERRICE	Vein Cu	115 I 7	7	Brock (1910, p. 14-26)
7	BONANZA KING	Vein Cu	115 I 7	7	Green (1966, p. 42-44)
8	MAUD	Unclassified	115 I 7		
9	HOOCHEKOO	Unclassified	115 I 7	7	Dawson (1889, p. 145 B)
10	TOWHATA	Unclassified	115 I 9		Bostock (1936, p. 63)
11	NEEDLEROCK	Coal	115 I 16	7	McConnell (1903, p. 31,38)
12	BRADENS CANYON	Occurrence Cu	115 I 15	7	Carriere et al (1981)
13	COIN	Unclassified	115 I 11	7	Sinclair & Gilbert (1975, p. 48-49)
14	MINTO	Metamorphosed Cu Ag Au deposit	115 I 11	2	Sinclair et al (1975, p. 96-100)
15	PAL	Metamorphosed Cu Ag Au Mo deposit	115 I 11	7	Sinclair et al (1975, p. 100-101)
16	GRENIER	Unclassified	115 I 11	7	Bostock (1936, p. 63)
17	PELLY	Occurrence Cu Mo	115 I 14	7	D.I.A.N.D. (1982, p. 216)
18	MINNESOTA	Unclassified	115 I 13	9	
19	TAD	Porphyry Cu Mo	115 I 12	6	Craig & Milner (1975, p. 77-79); D.I.A.N.D. (1982, p. 219)
20	PHELPS	Unclassified	115 I 12	7	Craig & Laporte (1972, p. 71-72)
21	FROG	Vein Ag Pb	115 I 5,J 8	7	This Report
22	STARBIRD	Unclassified	115 I 5		Craig & Milner (1975, p. 70-71)
23	CASH	Porphyry Cu Mo	115 I 5	2	Sinclair et al (1975, p. 111-112)
24	KLAZAN	Porphyry Au Cu Mo	115 I 6,5	6	D.I.A.N.D. (1983, p. 201-202)
25	COM	Unclassified	115 I 6	9	
26	REVENUE	Breccia Cu Au	115 I 6	6	D.I.A.N.D. (1982, p. 217)
27	COMBO	Unclassified	115 I 6	9	Craig & Laporte (1972, p. 83-84)
28	BOW	Unclassified	115 I 6	9	Craig & Laporte (1972, p. 82-83)
29	LIL	Vein Au Ag	115 I 3	7	
30	CARIBOU CREEK	Vein Au Ag	115 I 6	4	Bostock (1939, p. 15-16); Sinclair et al (1975, p. 118-119); This Report
31	KOOK (CAR)	Unclassified	115 I 6	9	Sinclair et al (1975, p. 117-118)
32	RED FOX	Vein Ag Pb	115 I 6	7	D.I.A.N.D. (1981, p. 261)
33	GUDER	Skarn, Vein Au	115 I 6	7	D.I.A.N.D. (1981, p. 261)
34	LAFORMA	Vein, Porphyry Au Ag	115 I 6	7	D.I.A.N.D. (1981, p. 261)
35	EMMONS HILL	Vein Au Ag Sb Ba	115 I 6	3	Johnston (1937, p. 19-20); Craig & Laporte (1972, p. 78-79)
36	GRANITE MOUNTAIN	Porphyry Cu Mo	115 I 7	6	Findlay (1969a, p. 34-35)
37	TINTA HILL	Vein Au Ag Pb Zn Cu	115 I 7	2	Skinner (1961, p. 35-36); Sinclair et al (1975, p. 120-121); D.I.A.N.D. (1982, p. 219)
38	FOSTER	Unclassified	115 I 3	7	Bostock (1937, p. 10-11)
39	BROWN McDADE	Vein Au Ag	115 I 3	2	Findlay (1969b, p. 23)

40	MT. NANSEN	Vein Au Ag Pb Zn	115 I 3	3	Morin et al (1977, p. 167-168)
41	CYPRUS	Porphyry Cu Mo	115 I 3	7	D.I.A.N.D. (1981, p. 261)
42	ESANSEE	Vein Ag Au Pb Zn	115 I 3	7	D.I.A.N.D. (1982, p. 217); D.I.A.N.D. (1983, p. 201,203)
43	DIVIDE	Vein Au Ag	115 I 3	7	Sinclair et al (1975, p. 126)
44	MALONEY	Porphyry Cu Mo	115 I 4	7	Craig & Laporte (1982, p. 76-78)
45	COMANCHE	Occurrence Cu	115 I 11	6	Sinclair et al (1975, p. 101-102)
46	NORTHAIR (AL)	Unclassified	115 I 11	9	Sinclair et al (1975, p. 107)
47	TUF	Unclassified	115 I 13		Sinclair et al (1975, p. 95)
48	CROSSING	Vein Cu	115 I 8	7	
49	EWING	Unclassified	115 I 1	9	
50	ORI (MAC)	Unclassified	115 I 11	9	Sinclair et al (1975, p. 108-109)
51	KERR	Occurrence Mo Cu	115 I 13	7	
52	LONELY	Occurrence Cu	115 I 3	7	
53	SAM	Unclassified	115 I 12	9	Sinclair et al (1976, p. 146)
54	McCABE	Unclassified	115 I 10	9	
55	RINK	Unclassified	115 I 8	7	McConnell (1903, p. 37-52)
56	GOULTER	Vein Au Ag	115 I 3	7	
57	GIANT (NAVAJO)	Metamorphosed Cu occurrence	115 I 11	6	Sinclair et al (1975, p. 102-103)
58	BLUFF	Unclassified	115 I 7	7	Sinclair et al (1975, p. 122-123)
59	RUSK	Porphyry Cu Mo	115 I 3	7	Sinclair & Gilbert (1975, p. 38-39)
60	BOYLEN (SUN)	Unclassified	115 I 11	9	Sinclair et al (1975, p. 103)
61	HLAVAY	Coal	115 I 6	9	Sinclair & Gilbert (1975, p. 120-121)
62	LETA	Unclassified	115 I 6	9	D.I.A.N.D. (1981, p. 262)
63	DART	Unclassified	115 I 6	9	D.I.A.N.D. (1981, p. 262)
64	NUCLEUS	Porphyry Au	115 I 6	6	This Report
65	STU	Metamorphosed Cu deposit	115 I 11	6	D.I.A.N.D. (1983, p. 201-204)
66	MUT	Unclassified	115 I 12		D.I.A.N.D. (1981, p. 263)
67	NIT	Unclassified	115 I 12	9	D.I.A.N.D. (1982, p. 218,219)
68	ROC	Unclassified	115 I 6	9	Morin et al (1977, p. 172)
69	ZIT	Porphyry Cu Au	115 I 6	7	D.I.A.N.D. (1982, p. 218,219)
70	PANTHER	Vein Au	115 I 12	7	Sinclair et al (1976, p. 142)
71	RAINBOW	Vein Au	115 I 12	7	Sinclair et al (1976, p. 143); This Report
72	NADA	Unclassified	115 I 12	7	Sinclair et al (1976, p. 144); This Report
73	SELKIRK	Unclassified	115 I 12	9	Sinclair et al (1976, p. 145)
74	ACE	Unclassified	115 I 7	9	D.I.A.N.D. (1982, p. 219)
75	FED	Unclassified	115 I 11	7	Morin et al (1977, p. 177)
76	DD	Unclassified	115 I 3		D.I.A.N.D. (1982, p. 219)
77	AL	Unclassified	115 I 7		D.I.A.N.D. (1983, p. 201,204)
78	POON	Occurrence Cu	115 I 7	7	D.I.A.N.D. (1983, p. 201,203-204)
79	TOOT	Occurrence Cu	115 I 8	7	D.I.A.N.D. (1983, p. 201,203-204)
80	DOME	Unclassified	115 I 10		D.I.A.N.D. (1983, p. 201,204)
81	J.BILL	Unclassified	115 I 3		This Report
82	KING	Unclassified	115 I 6		This Report
83	GOLDY	Unclassified	115 I 3,6		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

FROG
Archer, Cathro and Associates (1981) Limited

Silver,Lead Veins
115 I 5, J 8 (21)
(62°27'N,137°57'W)

References: D.I.A.N.D. (1982, p. 215-216,219; 1983, p. 260-261).

Claims: LILYPAD 1-429; NEWT (161)

Current Work and Results:

1983 saw a geochemical sampling program conducted on the property.

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NUCLEUS
NAT Joint Venture
Archer, Cathro and
Associates (1981) Limited

Gold,Copper
115 I 6 (64)
(62°20'N,137°20'W)

References: D.I.A.N.D. (1983, p. 14,201-202).

Claims: NUCLEUS 1-50

Source: Summary by K. Grapes from assessment report 091508 by W.D. Eaton.

Current Work and Results:

Bedrock geology in the trenches consists of numerous north-trending, steeply-dipping, intensely clay altered, brecciated and locally flow banded quartz-feldspar porphyry dykes cutting clay altered microgranitic rocks with large xenoliths of metamorphic rocks and biotite quartz monzonite. Quartz veinlets are best developed in the microgranite. The veinlets are 1 to 5 mm wide, white and massive forming widely-spaced stockworks. Open fractures coated with drusy quartz crystals and chaldedony veins occur in places.

Sulphide mineralization occurs as fine grained, partially oxidized pyrite disseminated in porphyry dykes and in rare veinlets, and rare euhedral tetrahedrite in a 1 cm wide, black manganiferous, limonite-filled veinlet cutting a porphyry dyke.

In 1983, three bulldozer trenches were cut to bedrock on Anomaly 2, a 400 by 200 m area exhibiting erractic anomalous gold soil values.

The trenches have a total length of 516 m, range from 1 to 4 m in depth and cut 0.5 to 2 m into the bedrock. Ninety channel samples, averaging 9 kg, were collected with sample intervals varying from 1 to 11 m in length. Anomalous gold values are accompanied by anomalous values of arsenic and copper with weakly anomalous tungsten and silver values.

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RAINBOW
Canadian Nickel Company
Limited

Gold Target
115 I 12 (71)
(62°32'N,137°46'W)

Reference: Tempelman-Kluit (1974a); Sinclair et al (1976, p. 143); Morin (1981) in D.I.A.N.D. (1981, p. 68-84).

Claims: RAIN 1-48

Source: Summary by K. Grapes from assessment report 091530 by W. Manson.

History:

D.C. Syndicate (Dome-Cominco) located the RAINBOW and PANTHER prospect in 1974 while conducting a regional reconnaissance program. The claims were staked, geologically mapped, soil sampled (for geochemical analysis) and bulldozer trenched (2000 m) in 1975. Results were not encouraging and the claims were allowed to lapse. The claims were restaked as the MUT 1-24 claims in 1980, by Stephen Explorations Ltd. During 1980, the bulldozer trenches were geologically and geochemically surveyed. A weak geochemical anomaly was determined over the RAINBOW prospect, however no follow-up work was carried out, and the claims were allowed to lapse. In March, 1983, Canadian Nickel Company Limited restaked the area as the RAIN 1-48 claims.

Description:

The geology of the area and economic mineralization is summarized by Tempelman-Kluit (1974a) and Morin (In D.I.A.N.D., 1981).

Current Work and Results:

Geological, geophysical and geochemical surveys were conducted on the claims in 1983 to locate and evaluate the economic potential of the hydrothermal alteration zones. A grid system, with lines at 500 m intervals and 50 m stations, was established to provide topographic control.

Two quartz-chalcedony vein structures were located. At the north end of the claim group (Rainbow Zone), a northwest-striking brecciated quartz-chalcedony zone, 1200 by 150 m, occurs in Triassic quartz monzonite. The north-striking Rubble Zone is exposed over a length of 100 m by 10 m wide and occurs in the central portion of the claims in Tertiary Carmacks Group volcanic rocks.

An electromagnetic survey delineated several zones of variable conductivity in the north and central portions of the claim group. A number of the conductive zones occur coincidental with the hydrothermal alteration zones (Rainbow and Rubble).

Gas chromatography surveys were conducted in areas of hydrothermal alteration on the Rainbow and Rubble Zones. The CO_2 data indicates fracture zones are present on both the zones. Variable sulphide content was detected by the total sulphur gas data on/and adjacent to both zones associated with fractures.

Forty-four rock samples were collected for multielement analysis from the Rainbow and Rubble Zones. The rocks were sporadically anomalous in arsenic, mercury and antimony, with anomalous gold values, up to 75 ppb, occurring on the Rainbow Zone.

X-Ray diffraction and fluid inclusion studies were also carried out. Kaolinite was identified as the major alteration mineral. Fluid inclusion studies indicate that the temperature of formation of the chalcedonic quartz veins was less than 200° C. These factors, plus field observation of brecciated host rocks, and the banded nature of the chalcedonic quartz veins, strongly indicate that both zones are upper portions of epithermal vein systems.

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LAFORMA
Arctic Red Resources Corp.

Gold Vein
115 I 6 (34)

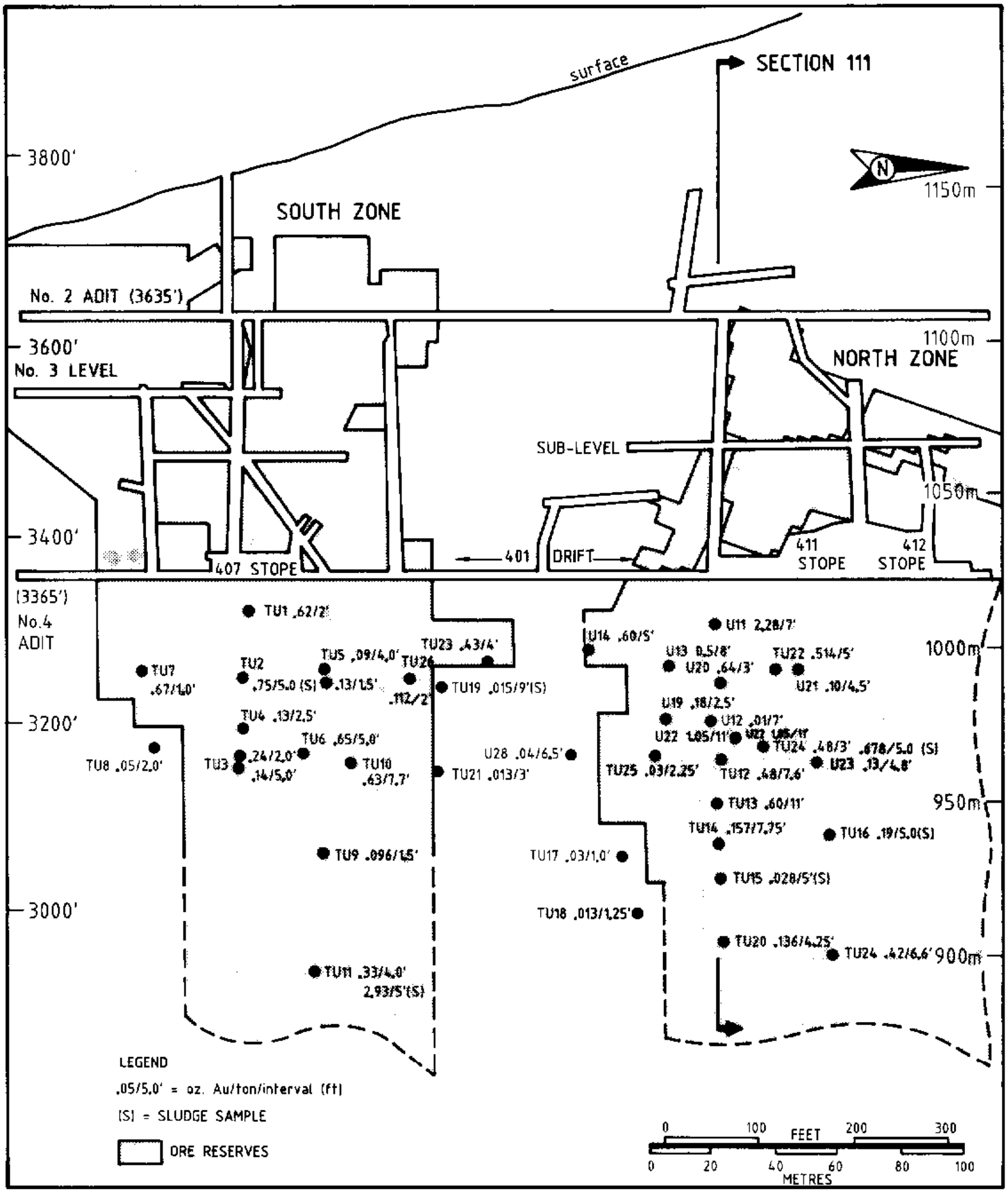
References: Morin (1981a); D.I.A.N.D. (1981, p. 26).

Claims: Leases and GNAT claims.

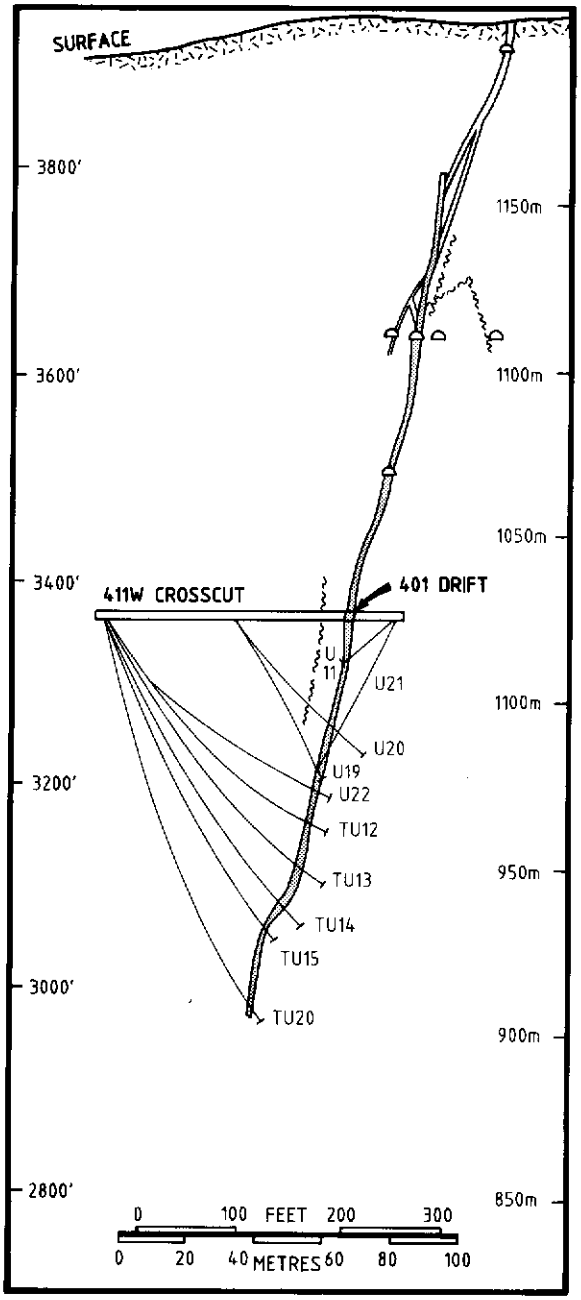
Source: Summary from 1983 Annual Report of Artic Red Resources Corp.

Current Work and Results:

During 1983, a total of 213.4 m of drifting and 1252.7 m of drilling in 15 holes was completed. The drilling tested the higher grade north zone below the No. 4 level. The program was successful in firming up and expanding reserves which stand at 200,000 tons of 0.33 oz/ton Au or 181,488 tonnes of 11.3 g/t Au (diluted to a minimum 5-foot or 1.52 m mining width) as of March, 1984.



Longitudinal section (looking west) through the Laforma deposit. Gold values in drillhole intersections are depicted in ounces gold per ton per interval.



Cross section III (looking north) through the Laforma deposit.

1983 MINERAL CLAIMS STAKED

J. BILL
J. Bill — 115 I 3 (81) (62°05'N,137°14'W)

Claims 1983: J. BILL 1-32

GOLDY — 115 I 3,6 (83) (62°15'N,137°04'W)

Claims 1983: GOLDY 1-8

RAINBOW
Canadian Nickel Company Limited — 115 I 5, 12 (71) (62°32'N,137°46'W)

Claims 1983: RAIN 1-48

CARIBOU CREEK
G. Harris — 115 I 6 (30) (62°15'N,137°11'W)

Claims 1983: CAMP 7-13

KING — 115 I 6 (82) (62°16'N,137°22'W)

Claims 1983: KING 1-8

NADA
Hudson Bay Exploration and Development Co. Ltd. — 115 I 12, J 9 (72) (62°38'N,137°58'W)

Claims 1983: SAM 99-122; 127-128

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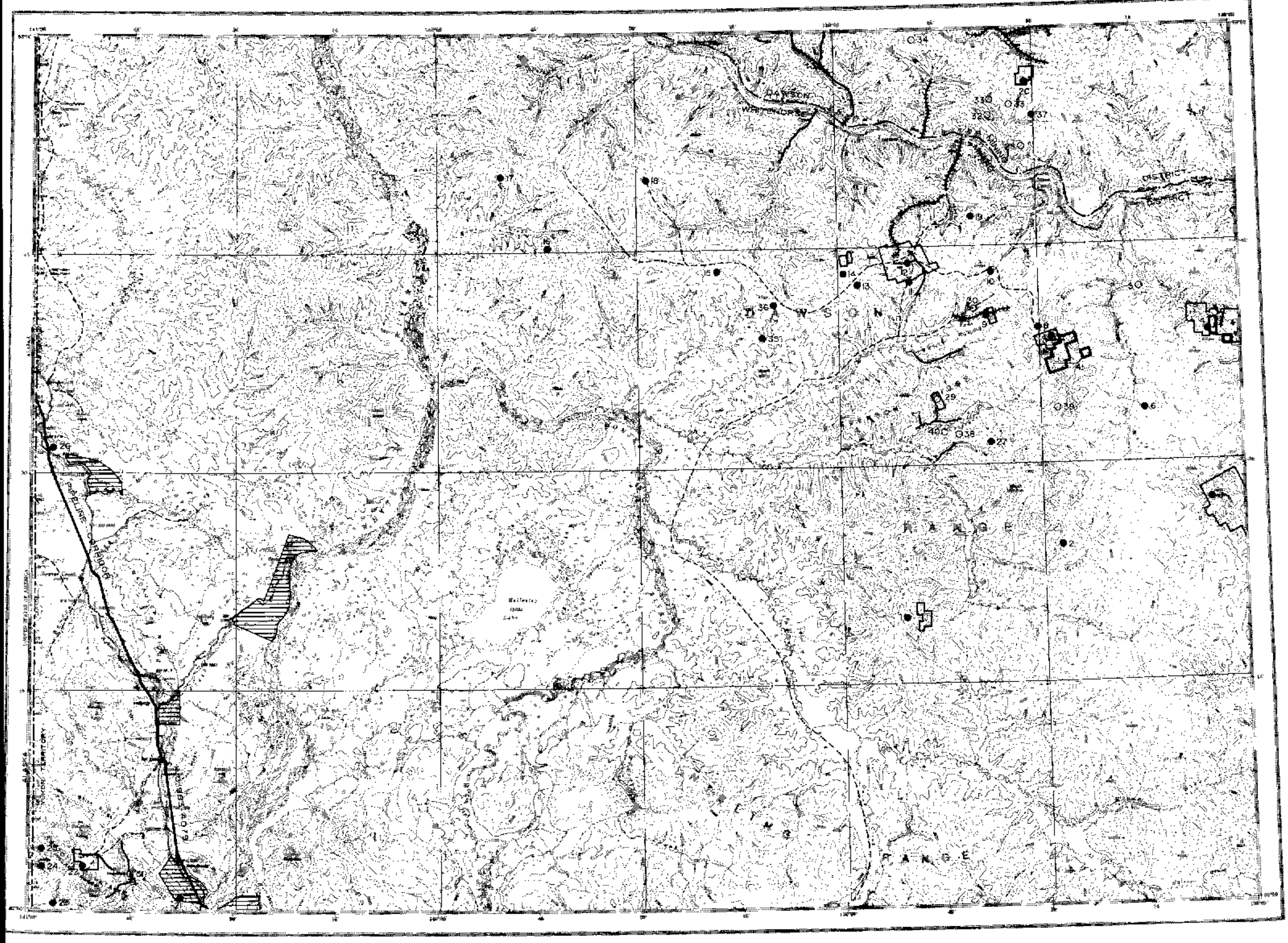
115 J&K



SNAG

YUKON TERRITORY

5 0 5 10 15 20 25 30

Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

Mineral Deposit or Occurence see Key on facing page

Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

SNAG MAP-AREA (NTS 115 J-K)

General Reference: GSC Map 10-1973 and Paper 73-41
by: D.J. Tempelman-Kluit, 1974a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	KLOT	Occurrence Cu Mo	115 J 7	7	Morin et al (1978, p. 72)
2	SOMME	Occurrence Cu Mo	115 J 8	7	Craig & Laporte (1972, p. 72)
3	PRIDE	Vein Cu	115 J 8	7	
4	HAYES (SWEDE)	Vein Au Ag	115 J 9	7	D.I.A.N.D. (1982, p. 22); This Report
5	SELWYN	Unclassified	115 J 9	7	Bostock (1944)
6	CROCK	Unclassified	115 J 9	7	Craig & Laporte (1972, p. 68)
7	COCKFIELD	Occurrence Cu Mo	115 J 9	7	D.I.A.N.D. (1981, p. 265)
8	CO	Porphyry Cu Mo	115 J 9,10	7	D.I.A.N.D. (1981, p. 266)
9	RUDE CREEK	Vein Ag Pb Zn	115 J 10	7	Cockfield (1928, p. 11-13); Craig & Laporte (1972, p. 63)
10	NORDEX	Vein Ag Pb	115 J 10	7	
11	BOMBER	Vein Ag Pb Zn	115 J 10	7	Findlay (1967, p. 32-34)
12	CASINO	Porphyry Cu Mo	115 J 10	2	Craig & Laporte (1972, p. 55-57)
13	AZTEC	Unclassified	115 J 10	7	Craig & Laporte (1972, p. 54-55)
14	ZAPPA	Porphyry Cu Mo	115 J 10	7	D.I.A.N.D. (1981, p. 266,267)
15	BOREAL	Unclassified	115 J 11	7	Craig & Laporte (1972, p. 42-43)
16	BID	Unclassified	115 J 13	7	Craig & Laporte (1972, p. 38-39)
17	VINA	Unclassified	115 J 13	7	Craig & Laporte (1972, p. 35-37)
18	TONI TIGER	Skarn Cu Fe	115 J 14	7	Craig & Laporte (1972, p. 40-41)
19	MARGUERITE	Unclassified	115 J 15	7	Craig & Laporte (1972, p. 51-52)
20	SCROGGIE	Disseminated Cu Mo	115 J 15	7	D.I.A.N.D. (1981, p. 266)
21	ONION	Mafic/ultramafic associated Ni Cu Mo	115 K 2	7	
22	NUTZOTIN	Skarn Cu Fe	115 K 2	7	D.I.A.N.D. (1983, p. 207)
23	CALIFORNIA	Occurrence Au	115 K 2	7	Cairnes (1915, p. 123)
24	TRUDI	Porphyry Cu Mo	115 K 2	7	
25	RIP	Vein Cu	115 K 2	7	Cairnes (1915, p. 121-122)
26	BATRICK	Vein Mn	115 K 10	5	Bostock (1952, p. 44-45)
27	PATTISON (PATT)	Occurrence Cu Mo	115 J 10	7	Sinclair et al (1976, p. 146)
28	BRI	Unclassified	115 J 15	9	D.I.A.N.D. (1981, p. 267)
29	STEVENSON	Unclassified	115 J 10		D.I.A.N.D. (1981, p. 267)
30	LESLIE	Unclassified	115 J 10		D.I.A.N.D. (1981, p. 267)
31	CHAIR	Unclassified	115 K 2		D.I.A.N.D. (1981, p. 267); D.I.A.N.D. (1983, p. 207)
32	NEF	Unclassified	115 J 15	9	D.I.A.N.D. (1981, p. 267)
33	MK	Unclassified	115 J 15	9	D.I.A.N.D. (1981, p. 267)
34	HASL	Unclassified	115 J 15	9	D.I.A.N.D. (1981, p. 267)
35	DOYLE	Unclassified	115 J 11	7	Sinclair et al (1976, p. 147)
36	COFFEE	Unclassified	115 J 11	9	Sinclair et al (1976, p. 147)
37	3 2 MANY	Unclassified	115 J 15,16	9	Morin et al (1980, p. 26)
38	WHISKEY JOE	Unclassified	115 J 10		D.I.A.N.D. (1982, p. 221)
39	WOE	Unclassified	115 J 9		D.I.A.N.D. (1982, p. 221)
40	PAT	Unclassified	115 J 10		D.I.A.N.D. (1982, p. 221)
41	KOE	Unclassified	115 J 9		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

1983 MINERAL CLAIMS STAKED

KOE 115 J 9 (41)
Kerr Addison Mines Ltd. (62°38'N,138°02'W)

Claims 1983: KOE 1-48

HAYES 115 J 9, I 12 (4)
Hudson Bay Exploration and Development Co. Ltd. (62°37'N,138°27'W)

Claims 1983: SAM 1-18

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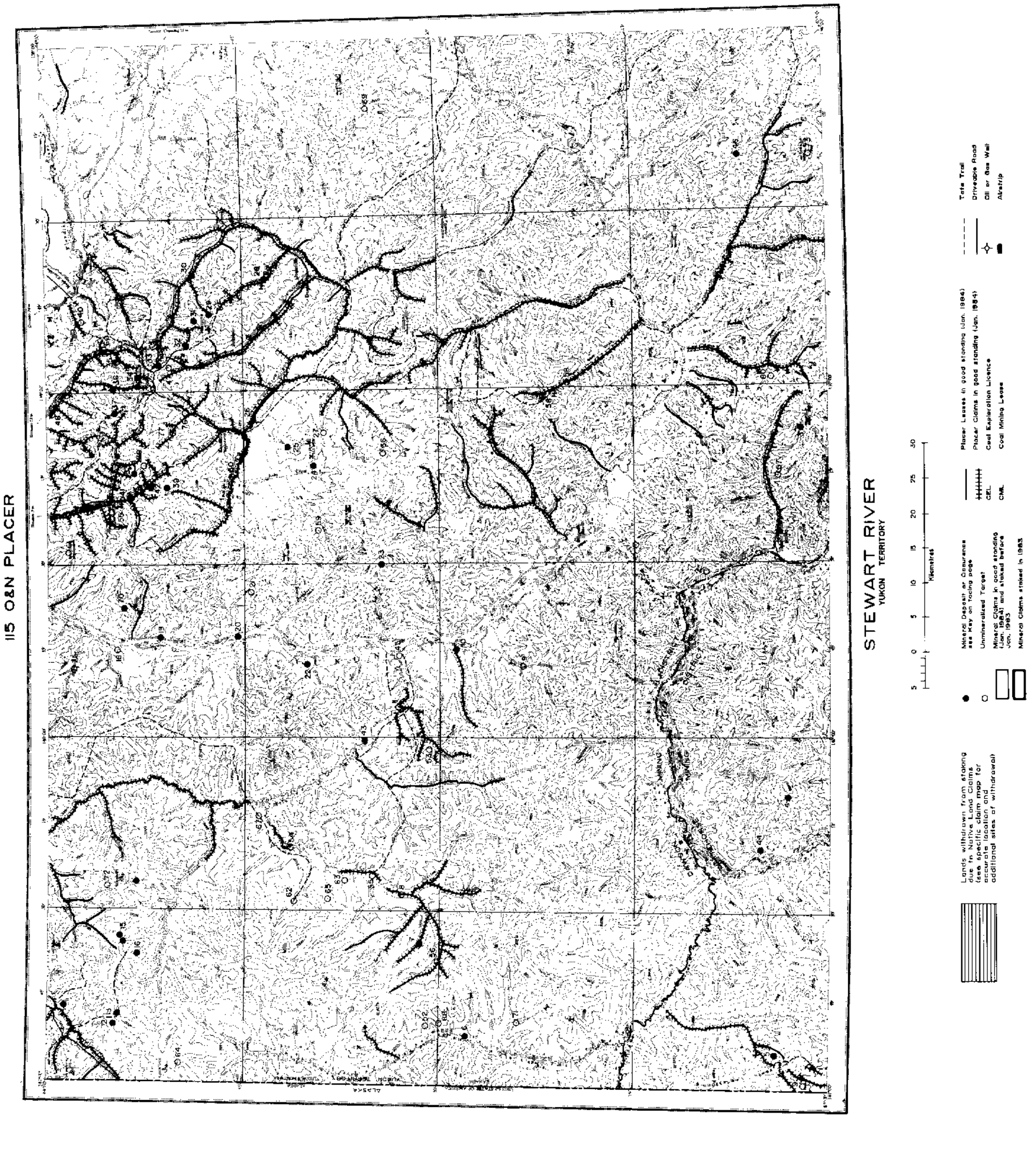
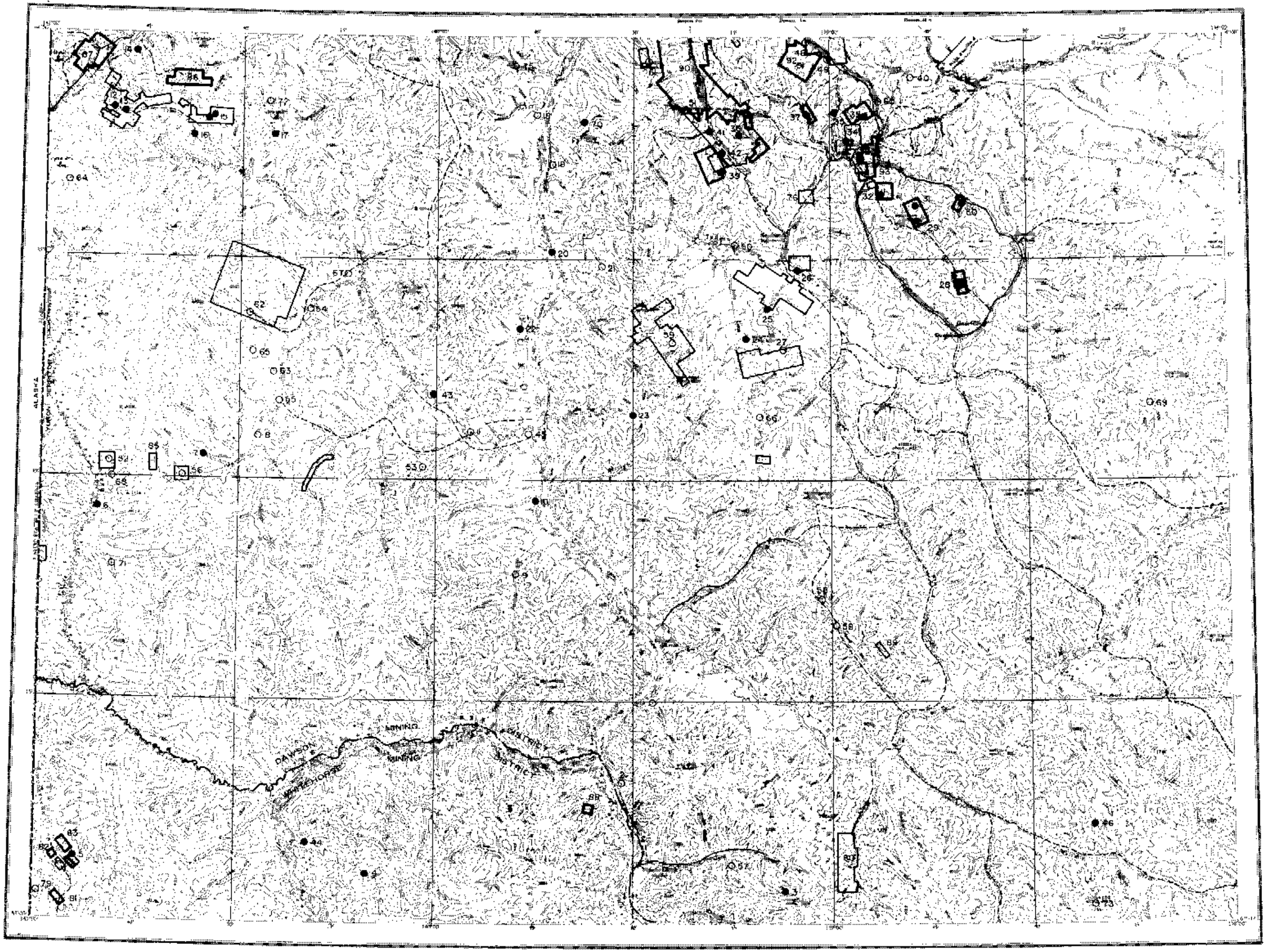

115 O&N PLACER
STEWART RIVER
YUKON TERRITORY
Kilometres
Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
Mineral Deposit or Occurence see Key on facing page
Unmineralized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983
Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
CEL Coal Exploration Licence
CML Coal Mining Lease
Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

115 O&N QUARTZ



STEWART RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page
○ Unmineralized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
CEL Coal Exploration Licence
CML Coal Mining Lease

Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

STEWART RIVER MAP-AREA (NTS 115 N-O)

General Reference: GSC Map 18-1973 and Paper 73-41 by D.J. Tempelman-Kluit, 1974a. GSC Map 711A by H.S. Bostock, 1942 (for 115 O); map of 115 O 14,15 and 116 B 2,3 by R.L. Debicki, 1984.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	TREVA	Unclassified	115 O 3,6	9	
2	NORTHERN LIGHTS	Unclassified	115 O 4	9	
3	BLACK FOX	Vein Pb Cu	115 O 3	7	Cairnes (1917, p. 33-34)
4	ARIES	Occurrence Cu Mo	115 N 1	7	
5	MOOSEHORN	Vein Au Ag	115 N 2	5	Morin et al (1977, p. 185)
6	LADUE	Occurrence Cu Mo	115 N 7	7	
7	SANTA	Vein Ag Pb Sn	115 N 10	7	
8	SVENN	Unclassified	115 N 9	7	Cockfield (1921, p. 52)
9	EXCELSIOR	Unclassified	115 O 5	7	MacLean (1914, p. 121)
10	COMET	Unclassified	115 O 5	9	
11	TENMILE	Vein Au Ag	115 O 12	7	McConnell (1902, p. 25-39)
12	LUBRA	Vein Ag Pb Au	115 N 15	7	Tempelman-Kluit (1974a, p. 74)
13	CONNAUGHT	Vein Ag Pb Cu Mo	115 N 15	5	D.I.A.N.D. (1982, p. 224)
14	PER	Vein Ag Pb Zn Au	115 N 15	6	Cockfield (1921, p. 52); Green (1966, p. 26-28)
15	BUTLER	Vein Ag Pb Zn	115 N 15	6	Cockfield (1919, p. 8); Craig & Laporte (1972, p. 32-34)
16	FIFTY	Skarn Cu	115 N 15	7	
17	ENCHANTMENT	Unclassified	115 N 16	7	Tempelman-Kluit (1973, p. 48-49)
18	MONTE CHRISTO	Unclassified	115 O 13	9	
19	PICKERING	Unclassified	115 O 13	7	MacLean (1914, p. 120)
20	INDIAN	Asbestos	115 O 13	7	
21	BISHOP	Unclassified	115 O 12	9	
22	WOOD	Skarn Cu	115 O 12	7	
23	LUCKY JOE (BURMEISTER)	Stratabound Cu	115 O 12,11	7	D.I.A.N.D. (1981, p. 271); McClintock and Sinclair (This Report)
24	HAYSTACK	Unclassified	115 O 11	7	MacLean (1914, p. 205)
25	MCKINNON	Consolidated placer Au	115 O 11	7	Lowey (This Report)
26	RAVEN	Occurrence Cu	115 O 11	7	Morin et al (1980, p. 28)
27	FOTHERGILL	Unclassified	115 O 11	9	D.I.A.N.D. (1983, p. 210-211)
28	AIME	Vein Au	115 O 10	7	This Report
29	GOLD RUN	Vein Au	115 O 15	7	This Report
30	PORTLAND	Vein Au	115 O 15	7	This Report
31	DOMINION	Vein Au Pb	115 O 15	7	MacLean (1914, p. 86-87); This Report
32	LLOYD	Vein Au	115 O 15	7	This Report
33	HUNKER DOME	Vein Au	115 O 15	7	D.I.A.N.D. (1983, p. 210-211)
34	MITCHELL	Vein Au	115 O 15	7	D.I.A.N.D. (1983, p. 210-211)
35	FAWCETT	Vein Au	115 O 15	7	This Report
36	BUM	Vein Ag Cu	115 O 15	7	Gleeson (1970, p. 14-15); Craig & Milner (1975, p. 13)
37	BOX CAR	Vein Au Ag Cu	115 O 14	7	This Report
38	LONE STAR	Vein Au	115 O 14	3	This Report
39	VIOLET	Vein Au Ag	115 O 14	7	This Report
40	LEOTTA	Unclassified	115 O 15	9	
41	RON (HILCHEY)	Vein Au	115 O 14	7	This Report
42	BUCKLAND	Vein Au Ag	115 O 14	7	Green & Godwin (1963, p. 19); Gleeson (1970, p. 16)
43	SUSTAK	Vein Fe	115 N 9, O 12	7	
44	PROSPECT	Occurrence Cu	115 N 1	7	

45	CRUIKSHANK	Coal	115 0 12	7	
46	MCMICHAEL	Occurrence Cu	115 0 1	7	
47	GOLDEN ROD	Unclassified	115 0 15	9	
48	HEFFRING	Unclassified	115 0 14	9	
49	TRILBY	Unclassified	115 0 14	9	
50	TORRANCE	Unclassified	115 0 14	9	
51	BALD EAGLE	Vein Ba	115 0 14	9	Debicki (1984)
52	STEVO	Unclassified	115 N 10	9	D.I.A.N.D. (1981, p. 271)
53	FLUME	Unclassified	115 N 9		D.I.A.N.D. (1981, p. 274)
54	TYRRELL	Unclassified	115 N 9		D.I.A.N.D. (1981, p. 274)
55	SNIP	Unclassified	115 N 9		D.I.A.N.D. (1981, p. 274)
56	DOLE	Unclassified	115 N 10		D.I.A.N.D. (1981, p. 274)
57	THIS	Unclassified	115 0 3		D.I.A.N.D. (1981, p. 274)
58	MAISY	Unclassified	115 0 6,7		D.I.A.N.D. (1981, p. 274)
59	RUBY	Unclassified	115 0 11		D.I.A.N.D. (1981, p. 274)
60	HUNK	Unclassified	115 0 15		D.I.A.N.D. (1981, p. 274)
61	MT. BRONSON	Vein Pb	115 0 14	9	This Report; Debicki (1984)
62	JOVE	Granite-hosted U	115 N 9	7	D.I.A.N.D. (1981, p. 272-273)
63	SON	Unclassified	115 N 9	9	D.I.A.N.D. (1981, p. 273)
64	CRAG	Occurrence U	115 N 15	9	D.I.A.N.D. (1981, p. 273)
65	DOORMAT	Unclassified	115 N 9	9	D.I.A.N.D. (1981, p. 273)
66	BISMARK	Unclassified	115 0 11	9	Morin et al (1977, p. 138-139)
67	HEC-TOR	Unclassified	115 N 9	9	Morin et al (1980, p. 27)
68	BORD	Unclassified	115 N 7,10	9	Morin et al (1980, p. 27)
69	LIL	Unclassified	115 0 9	9	Morin et al (1980, p. 27)
70	RON	Unclassified	115 0 13	9	Morin et al (1980, p. 28)
71	BUD	Unclassified	115 N 7		D.I.A.N.D. (1982, p. 224)
72	MT. HART	Unclassified	115 N 16		D.I.A.N.D. (1982, p. 224)
73	PYROXENE	Unclassified	115 0 1		D.I.A.N.D. (1982, p. 224)
74	CIM	Unclassified	115 0 14	9	This Report
75	HUNG	Unclassified	115 0 13		D.I.A.N.D. (1982, p. 224)
76	READFORD	Unclassified	115 0 14		D.I.A.N.D. (1982, p. 224)
77	EVING	Unclassified	115 0 14		D.I.A.N.D. (1982, p. 224)
78	ORO	Unclassified	115 0 14		D.I.A.N.D. (1982, p. 224)
79	LODE	Unclassified	115 N 2		D.I.A.N.D. (1983, p. 210,212)
80	DL	Unclassified	115 0 2		D.I.A.N.D. (1983, p. 210,212)
81	GIT	Unclassified	115 N 2		This Report
82	REEF	Unclassified	115 N 2		This Report
83	HIT	Unclassified	115 N 2		This Report
84	HILL	Unclassified	115 N 2		This Report
85	MAT	Unclassified	115 N 10		This Report
86	FOXY	Unclassified	115 N 15		This Report
87	MOLY	Unclassified	115 N 15		This Report
88	VANESSA	Unclassified	115 0 4		This Report
89	STAR	Unclassified	115 0 6		This Report
90	DAWSYND	Occurrence Au	115 0 14, 116 B 3	7	This Report
91	DAWSON	Occurrence Au	115 0 14	7	This Report
92	BREMNER	Unclassified	115 0 14		This Report
93	KLOOK	Vein Au	115 0 15	7	This Report

* Unclassified is the term used for properties for which there is no public data other than location, of for which public data exists, but not enough to classify the occurrence.

AIME
Archer, Cathro and Associates (1981) Limited

Gold
115 0 10 (28)
(63°44'N,138°40'W)

Claims: KLAM 1-12

History:

The claims were staked in June, 1983 and are tied on to the DEB claims of F. Burkhard, recorded in July, 1976. This property has a long history of exploration.

Description:

The claims are underlain by a thrust klippe of chlorite +/- quartz schist cut by several quartz veins containing pyrite and traces of galena.

Current Work and Results:

The property was mapped at 1:50,000 scale.

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PORTLAND | Gold
Archer, Cathro and | 115 O 15 (30)
Associates (1981) Limited | (63°49'N,138°40'W)
Dawson Eldorado Gold
Explorations Limited

Reference: MacLean (1914, p. 101-104).

Claims: KLORT 1-8

History:

The claims were staked in June, 1983.

Description:

The claims are underlain by chlorite schist and chlorite-actinolite-quartz schist. These rocks contain abundant metamorphogenic quartz veins which are locally cut by narrow quartz veins containing minor galena, pyrite and visible gold.

Current Work and Results:

The KLORT claims were mapped at 1:50,000 scale and were soil sampled for geochemical analysis.

******

GOLD RUN | Gold
Archer, Cathro and | 115 O 15 (29,31)
Associates (1981) Limited | (63°48'N,138°47'W)
Dawson Eldorado Gold
Explorations Limited

Reference: MacLean (1914, p. 83-87).

Claims: KLUN 1-32

History:

The property was staked in June, 1983 over the McKay, Pioneer, etc. claims which were recoreded in August, 1910 by W.D. MacKay and N.J. Donahue. They drove 30.5 m of shafts, and 22.9 m of drifts and did extensive trenching between 1910 and 1924.

Description:

The claims are underlain by muscovite quartzite, and quartz-muscovite and muscovite schists which are overthrust by chlorite schists. The underlying quartzite and schists are cut by quartz veins containing minor pyrite, galena and visible traces of gold.

Current Work and Results:

The property was mapped at 1:50,000 scale and soil sampled for geochemical analysis.

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LLOYD | Gold
Archer, Cathro and | 115 O 15 (32)
Associates (1981) Limited | (63°50'N,138°52'W)
Dawson Eldorado Gold
Explorations Limited

Reference: MacLean (1914, p. 76-82).

Claims: KLOYD 1-16

History:

The claims were staked in June, 1983.

Description:

The property is underlain by muscovite quartzite and quartz-muscovite schist which is overthrust by chlorite schist. The quartzite and schist of the lower section is cut by steeply dipping quartz veins containing minor pyrite and galena, and visible traces of gold.

Current Work and Results:

The claims were mapped at 1:50,000 scale and soil samples were collected for geochemical analysis.

******

FAWCETT | Gold
Archer, Cathro and Associates (1981) Limited | 115 O 15 (35)
Dawson Eldorado Gold Explorations Limited | (63°55'N,138°56'W)

Reference: MacLean (1914, p. 107-111).

Claims: KLAW 1-24

History:

The claims were staked in July, 1983.

Description:

The property is covered by chlorite schists which lie immediately above and below a thrust zone marked by strongly altered ultrabasic rocks. Quartz veins which cut the thrust zone and the overlying chlorite schists locally contain minor pyrite and galena. A placer miner working at the head of a small pup (Twenty-one pup, off the right fork of Hunker Creek) draining the claims is recovering coarse gold.

Current Work and Results:

The claims were mapped at 1:50,000 scale and soil samples were collected for geochemistry.

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BOX CAR | Gold,Silver, Copper
Archer, Cathro and Associates (1981) Limited | 115 O 14 (37)
Dawson Eldorado Gold Explorations Limited | (63°55'N,139°03'W)

References: MacLean (1914, p. 87-91); Gleeson (1970, p. 14).

Claims: KLOX 1-12

History:

The claims were staked in June, 1983 over an area which was originally staked in July, 1909. Previous work includes a 19.8 m shaft prior to 1912, and an 18.3 m shaft in 1920. The shafts were through a steep northwest-trending shear zone approximately 1.5 m wide. A 1.2 m lense of sulphide-bearing mineralization was encountered in the shaft with assays up to 35% Pb, 10% Cu, and 8.57 g Ag/t.

Description:

The property is underlain by quartz chlorite schist and muscovite quartzite. These rocks are cut by several parallel, steeply dipping shear zones, and are heavily stained with malachite and azurite. Disseminated chalcopyrite and small lenses of galena are present locally in the shear zones.

Current Work and Results:

The claims were mapped at 1:50,000 scale and soil samples were collected for geochemical analysis.

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LONE STAR (RJ) | Gold Vein
Dawson Eldorado Gold Explorations Limited | 115 O 14 (38)
(63°54'N,139°14'W)

References: D.I.A.N.D. (1983, p. 210-211).

Claims: RJ 1-32,39-60,62-63; AC 1-12,12-35; DE 1-14; ND 1-22; DN 1-33; RON 1-40; VICTORIA; ESTHER EDNA; NEW BONANZA 1-2; NIOBE FRACTION; LONE STAR; ZULU CHIEF; SWASTIKA; UDAD; CATO; THISTLE

Source: Summary by D. Emond from assessment report report 091535 by J.K. Mortensen.

Current Work and Results:

Work on the property in 1983 consisted of geological mapping at 1:5,000 scale, geochemical surveying, and the reopening and testing of recovery of the old Lone Star adit.

A thrust fault (the Lone Star Thrust) which passes beneath the mine area separates two distinct sequences. Above the thrust, and hosting gold mineralization, the rocks consist of muscovite quartzite, muscovite schist, quartz-eye schist and minor carbonaceous schists. Below the thrust are medium to dark green chlorite schist, fine grained muscovite and chlorite quartzite and minor rusty quartz muscovite schist. A narrow lense of talccarbonate altered serpentinite occurs along the thrust surface. The rocks are strongly deformed into northwest-trending, tight to isoclinal second phase folds that are overturned to the northeast.

Gold mineralization is confined to the muscovite schist unit and occurs in the discordant quartz and pyrite-quartz veins and stringers. In the Lone Star open-cut, these veins occur at several orientations, but mainly in two sets: a north-striking, vertically-dipping set; and a shallowly northeast-dipping set. Veining appears to be localized in a zone of shearing in the hinge region of a second-phase antiform cored by muscovite schist. The mineralized zone is expected to lie along the axial surface of this antiform, and should therefore dip moderately to the southwest.

A total of 313 soil samples was collected and analyzed for gold and arsenic, and also 48 sample pulps from a 1981 survey were reanalyzed for manganese, tungsten and barium. Three main areas of anomalous gold values have been outlined, corresponding to the Lone Star, Eldorado Dome and Hilchey showings. The Eldorado Dome anomaly is open to the east.

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VIOLET | Gold,Silver Vein
Silvercrest Resource Corp. | 115 O 14 (39)
(63°52'N,139°17'W)

Reference: D.I.A.N.D. (1983, p. 210, 212).

Claims: VI 1-47

Source: Summary by P. Watson from assessment report 091487 by P.S. White.

Current Work and Results:

In 1983, a short program of vein mapping, vein rock chip sampling, linecutting and soil sampling was carried out by two prospectors. Old pits and trenches were cleaned out and seven rock samples were collected from pits and dumps. Sixty-eight soil samples were collected at 150 m intervals along the claim lines, and at 100 m intervals on a grid centered on the main shaft.

Seven soil samples contained greater than background (5 ppb) values of gold (15 to 140 ppb Au). The rock samples returned from 3.1 to 43.5 g Ag/t and up to 3.9 g Au/t.

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RON (HILCHEY) | Gold
Klon Exploration Company Limited | 115 O 14 (41)
(63°54'N,139°38'W)

Reference: D.I.A.N.D. (1981, p. 270-271,274).

Claims: RON 1-40

Source: Summary by P. Watson and D. Emond from assessment report 091463 by G.J. McGinn.

Current Work and Results:

In 1980, linecutting, and geophysical and drilling programs were carried out on these claims. Four EM conductors were identified following VLF-EM and magnetometer surveys. Four diamond drill holes, totalling 497.7 m, and 24 overburden drill holes, totalling 742.5 m, were completed to test the geophysical anomalies for gold values in bedrock and gravels. Diamond drilling located several shear zones dipping moderately to the southwest. Fractures within are filled with quartz, chlorite, iron oxides and locally, sulphides. Assay results were unfavourable in both bedrock and gravels.

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MT. BRONSON | 115 O 14 (61)
Cominco Limited | (63°59'N,139°29'W)

Reference: D.I.A.N.D. (1981, p. 272, 274).

Claims: BRONSON 1-10.

Source: Summary by P. Watson from assessment report 091498 by I.A. Paterson.

Current Work and Results:

A trenching program was carried out in 1983 to investigate a copper-lead-zinc-silver soil geochemical anomaly underlain by Klondike Schist. Four trenches ranging from 150 to 270 m in length were excavated and a total of 5,807 m^3 of material was removed. Generally bedrock was not reached and the source of the anomaly was not determined.

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CIM
Dawson Eldorado Gold Explorations Limited — 115 O 14 (74) (63°55'N,139°14'W)

References: D.I.A.N.D. (1982, p. 223-224).

Claims: CIM (4)

Source: Summary by D. Emond from assessment report 091512 by P.S. White.

History:

The claims were staked in 1981 over two sulphide-rich float zones.

Description:

The property is located 27 km southeast of Dawson City, south of the mouth of O'Neil Gulch on Upper Bonanza Creek. The showings in float rock consist of bands of coarse pyrite with minor galena and sphalerite specks in deformed, laminated felsic schists.

Current Work and Results:

In the summer of 1983, two prospectors were hired to perform line-cutting, chaining and hand-pitting at several locations. Six hand specimens of the mineralized float were assayed, but no significant silver, gold, lead, nor copper values were determined.

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DAWSYND
Dawson Syndicate — Gold — 115 O 14 (90,91) (63°56'N,139°22'W)

Claims: SYNDICATE; DAWSON; WILLIAM; 83; 98; WILD (415 claims)

History:

These claims were staked in September, 1983.

Current Work and Results:

That year, heavy mineral concentrates were collected from creeks draining the SYNDICATE and WILLIAM claims. A reconnaissance VLF-EM survey was also carried out on the SYNDICATE claims.

Heavy mineral concentrates showed several areas of highly anomalous gold concentrations on the claims. A strong EM conductor striking northwest was traced for 1-2 km along the southwest side of Bonanza Creek.

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KLOOK
Archer, Cathro and Associates (1981) Limited
Dawson Eldorado Gold Explorations Limited — Gold,Silver — 115 O 15 (93) (63°52'N,138°55'W)

Claims: KLOOK 1,3,5-12,15-48

History:

The claims were staked in June, 1983.

Description:

The property is underlain by chlorite schists and muscovite quartzite cut by steeply dipping quartz veins which contain minor pyrite, galena, chalcopyrite and visible gold.

Current Work and Results:

These claims were mapped at 1:50,000 scale and soil samples were collected for geochemical analysis. A weak, but persistent gold-silver geochemical anomaly outlines a set of en echelon veins cutting the Mitchell vein.

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1983 MINERAL CLAIMS STAKED

GIT
G. Hartley — 115 N 2 (81) (63°01'N,140°56'W)

Claims 1983: GIT 1-8

REEF
I. Warrick — 115 N 2 (82) (63°04'N,140°58'W)

Claims 1983: REEF 1-4

HIT
B. Preston
115 N 2 (83)
(63°05'N,140°56'W)

Claims 1983: HIT 1-8

FOXY
Connaught Mines Ltd.
115 N 15 (86)
(69°57'N,140°45'W)

Claims 1983: FOXY 25-48

MOLY
C. Cote
115 N 15 (87)
(63°59'N,140°54'W)

Claims 1983: MOLY 1-56

HILL
J. Jobin
115 N 2 (84)
(63°03'N,140°55'W)

Claims 1983: HILL 1-8

VANESSA
F. Stretch
115 O 4 (87)
(63°08'N,139°37'W)

Claims 1983: VANESSA 1-4

AIME
Archer, Cathro & Associates
(1981) Limited
115 O 10 (28)
(63°43'N,138°40'W)

Claims 1983: KLAM 1-12

BOX CAR
Archer, Cathro & Associates
(1981) Limited
115 O 14 (37)
(63°55'N,139°03'W)

Claims 1983: KLOX 1-12

LONESTAR
Dawson Eldorado Gold
Exploration Ltd.;
Archer, Cathro & Associates
(1981) Limited
115 O 14 (38)
(63°54'N,139°15'W)

Claims 1983: RJ 39-70; AC 12-35

VIOLET
P. White
115 O 14 (39)
(63°51'N,139°18'W)

Claims 1983: VI 16-47

DAWSYND
Dawson Syndicate
115 O 14, (90)
116 B 3,
(63°56' - 63°59'N
139°18' - 139°24'W)

Claims 1983: DAWSON 1-96; 101-180; 201-248; SYNDICATE 1-83; 83 1-40; 98 1-60; WILD 1; WILD CAT; WILLIAM 1-8

BREMNER
I. Bremner
115 O 14 (92)
(63°59'N,139°07'W)

Claims 1983: BREMNER

PORTLAND
Archer, Cathro & Associates
(1981) Limited
115 O 15 (30)
(64°49'N,138°40'W)

Claims 1983: KLORT

GOLD RUN, DOMINION
Archer, Cathro & Associates
(1981) Limited
115 O 15 (29,31)
(63°48'N,138°47'W)

Claims 1983: KLUN 1-32

LLOYD
Archer, Cathro & Associates
(1981) Limited
115 O 15 (32)
(63°50'N,138°52'W)

Claims 1983: KLOYD 1-16

FAWCETT
Archer, Cathro & Associates
(1981) Limited
115 O 15 (35)
(63°55'N,138°55'W)

Claims 1983: KLAW 1-24

KLOOK
Archer, Cathro and Associates
(1981) Limited
115 O 15 (94)
(63°52'N,138°54'W)
Claims 1983: KLOOK 1-48

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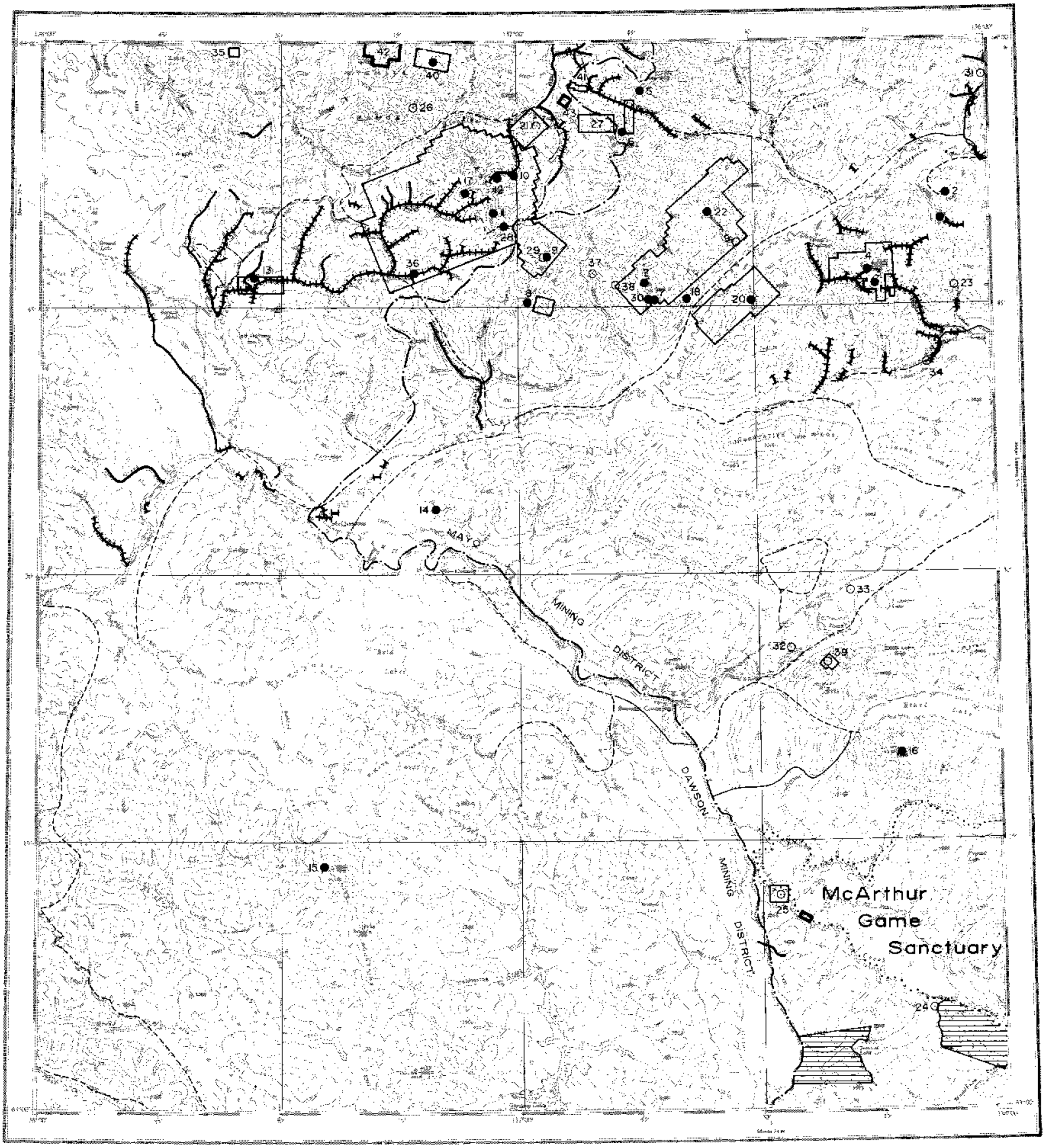
NOTES

115 P



McQUESTEN
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page

○ Unmineralized Target

Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983

Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)

Placer Claims in good standing (Jan. 1984)

CEL Coal Exploration Licence

CML Coal Mining Lease

Tote Trail

Driveable Road

Oil or Gas Well

Airstrip

McQUESTEN MAP-AREA (NTS 115 P)

General Reference: GSC Map 1143A by: H.S. Bostock, 1942.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	JAYBEE	Vein Ag Pb	115 P 16	7	
2	SEATTLE	Unclassified	115 P 16	9	Green & Godwin (1964, p. 16)
3	HAWTHORNE	Vein Sb Pb Ag Au	115 P 16	7	Bostock (1941, p. 33-34); Green (1966, p. 20-21)
4	SCHEELITE DOME	Skarn W Cu	115 P 16	6	D.I.A.N.D. (1983, p. 215)
5	HOBO	Vein Au Ag	115 P 15	7	D.I.A.N.D. (1981, p. 227)
6	SPRAGUE	Vein Ag Pb	115 P 15	7	Bostock (1948, p. 11)
7	EAST RIDGE	Occurrence Sn Pb Zn Ag	115 P 15	7	D.I.A.N.D. (1983, p. 215-216)
8	LUGDUSH	Skarn W Cu	115 P 15	6	D.I.A.N.D. (1983, p. 215-216)
9	RIDGE	Occurrence Sn	115 P 15	7	D.I.A.N.D. (1981, p. 278)
10	JOSEPHINE	Unclassified	115 P 14,15	7	D.I.A.N.D. (1983, p. 215-216)
11	RHOSGOBEL	Porphyry Mo W	115 P 14	7	D.I.A.N.D. (1983, p. 215-216)
12	PUKELMAN	Porphyry Mo W	115 P 14	7	D.I.A.N.D. (1983, p. 215-216)
13	CLEAR CREEK	Unclassified	115 P 13	7	Lang (1951, p. 14)
14	MOOSE RIDGE	Occurrence Ag Pb Fe	115 P 11	7	
15	ROSEBUD	Unclassified	115 P 3	9	Bostock (1948, p. 12)
16	SETHER	Unclassified	115 P 8	9	
17	LEWIS	Unclassified	115 P 14	7	D.I.A.N.D. (1983, p. 215-216)
18	BOULDER	Vein Cu	115 P 15	7	Bostock (1948, p. 11)
19	TOTH	Unclassified	115 P 15	9	
20	EPD	Vein Sn Ag	115 P 15	5	D.I.A.N.D. (1983, p. 215,217) Emond (in D.I.A.N.D., 1983, p. 26-33)
21	MOZI	Unclassified	115 P 15	9	D.I.A.N.D. (1981, p. 279)
22	SP	Occurrence Sn	115 P 15	7	D.I.A.N.D. (1983, p. 215,217)
23	BEN	Unclassified	115 P 16	9	D.I.A.N.D. (1981, p. 279-280)
24	WOODBURN	Unclassified	115 P 1		D.I.A.N.D. (1981, p. 280)
25	CROOKED	Unclassified	115 P 1		D.I.A.N.D. (1981, p. 280)
26	FIONA	Unclassified	115 P 14	9	D.I.A.N.D. (1982, p. 229)
27	MAHTIN	Vein, Skarn Sn W	115 P 15	7	D.I.A.N.D. (1982, p. 229-230)
28	JUBJUB	Unclassified	115 P 14	9	D.I.A.N.D. (1982, p. 228)
29	JABBERWOCK	Vein Sn Ag	115 P 15	7	D.I.A.N.D. (1982, p. 230)
30	MAY CREEK	Vein Ag Pb Zn	115 P 15	6	Morin et al (1980, p. 23)
31	SECRET CREEK	Unclassified	115 P 16	7	Morin et al (1980, p. 23)
32	WINSLOW	Unclassified	115 P 8		D.I.A.N.D. (1982, p. 231)
33	PAN	Unclassified	115 P 8		D.I.A.N.D. (1982, p. 231)
34	SAVY	Unclassified	115 P 9		D.I.A.N.D. (1982, p. 231)
35	ACE	Unclassified	115 P 13	9	D.I.A.N.D. (1983, p. 215,217)
36	MARY	Unclassified	115 P 14	9	D.I.A.N.D. (1983, p. 215-216)
37	BANDER	Vein Sn	115 P 15	7	D.I.A.N.D. (1982, p. 230)
38	SNATCH	Geochemical target Pb Ag	115 P 15	7	D.I.A.N.D. (1982, p. 231)
39	LJB	Unclassified	115 P 8	9	D.I.A.N.D. (1983, p. 215,217)
40	OMEGA	Unclassified	115 P 14	9	This Report
41	NIC	Unclassified	115 P 15		D.I.A.N.D. (1983, p. 215,217)
42	ZETA	Unclassified	115 P 14	9	This Report
43	TAT	Unclassified	115 P 15	9	This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

OMEGA
Noranda Exploration
Company Limited

Barite
115 P 14 (40)
(63°59'N,137°10'W)

References: D.I.A.N.D. (1983, p. 215,217).

Claims: OMEGA 1-32

Source: Summary by D. Emond from assessment report 091507 by J. Biczok.

History:

The claims were staked in 1982 following a regional stream sampling program.

Description:

The property is located 110 km east of Dawson City, in the Syenite Range Basin. The Ordovician-Silurian strata in the area lie in a probably fault-bounded basin, on top of "Grit Unit" clastic rocks and an Ordovician-Silurian limestone. Several Cretaceous syenite plutons intrude the folded sedimentary strata. The "Lost Horse's Stock" outcrops 1.5 km to the southwest, and two smaller stocks along with one dyke swarm also occur 2-4 km northeast of the OMEGA claims.

Current Work and Results:

In 1982, a minor amount of prospecting and geological mapping was carried out.

In 1983, geological mapping at 1:20,000 scale, the collection of over 300 soil, stream sediment and pan concentrate samples, and a VLF survey over 3 km were completed.

The Ordovician-Silurian clastic sequence is broken into ten members which become finer grained and more argillaceous up-section (northward). The OMEGA claim group covers strata in the upper portion of the local stratigraphic column. The oldest is the "Light Clastic Unit", consisting of lithic pebbly quartzite, chert pebble conglomerate and quartzite. Above this is the "Black Clastic Unit", consisting of greywacke, chert pebble conglomerate and quartzite, and containing isolated lenses of buff sandstone/quartzite. The uppermost member on the claim group is the "Black Shale Unit" which contains interbedded quartzite.

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1983 MINERAL CLAIMS STAKED

ZETA
Noranda Exploration Company Ltd.

115 P 14 (42)
(63°59'N,137°17'W)

Claims 1983: ZETA 1-40

TAT
M. McNabb

115 P 15 (43)
(63°56'N,136°53'W)

Claims 1983: TAT 1-6

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NOTES

116 A

LARSEN CREEK

YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)	●	Mineral Deposit or Occurence see Key on facing page		Placer Leases in good standing (Jan. 1984)	Tote Trail
	○	Unmineralized Target		Placer Claims in good standing (Jan. 1984)	Driveable Road
		Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983	CEL	Coal Exploration Licence	Oil or Gas Well
		Mineral Claims staked in 1983	CML	Coal Mining Lease	Airstrip

General Reference: GSC Map 1283A and Memoir 364 by: L.H. Green, 1972.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	TIMBERWOLF	Vein Cu	116 A 8	7	
2	WORM	Vein Cu	116 A 8	7	
3	RAMA	Vein Cu Ag Pb	116 A 9	7	
4	MATTSON	Vein Cu	116 A 9	7	
5	SOUP	Vein Cu	116 A 10	7	
6	REINDEER	Vein Cu Pb	116 A 10	7	
7	GRACE	Unclassified	116 A 10	9	Craig & Laporte (1972, p. 26-27)
8	HART RIVER	Stratiform Pb Zn Cu Au Ag	116 A 10	2	Morin et al (1979, p. 22-24); D.I.A.N.D. (1983, p. 219,221)
9	BELCARRA	Vein Cu Pb Zn	116 A 10	7	
10	ZEBRA	Vein Cu	116 A 10	7	Craig & Laporte (1972, p. 23-25); Green (1972, p. 140)
11	HAMILTON (MIKE)	Vein Au Cu Ag Bi Co	116 A 5	7	D.I.A.N.D. (1983, p. 219)
12	RIMROCK	Vein Ag	116 A 4	6	D.I.A.N.D. (1982, p. 233)
13	AUSTON	Unclassified	116 A 9	7	Green (1972, p. 140)
14	HOT	Vein Pb Zn Ag	116 A 13	7	Sinclair et al (1976, p. 82)
15	MICHELLE	Unclassified	116 A 13	7	Sinclair et al (1975, p. 71)
16	BRUK (VUG)	Vein Pb Zn	116 A 9	7	Sinclair et al (1976, p. 74)
17	PHILP	Skarn Cu Au Ag	116 A 5	7	
18	DALE	Vein Cu	116 A 16,9	7	D.I.A.N.D. (1982, p. 233); D.I.A.N.D. (1983, p. 219-220)
19	IDA	Disseminated Au	116 A 4	7	D.I.A.N.D. (1982, p. 234)
20	STROKER	Occurrence Au	116 A 8	7	D.I.A.N.D. (1982, p. 234)
21	ST. BRIDGET	Stratiform Ba	116 A 12	7	D.I.A.N.D. (1983, p. 219-220)
22	SUMI	Unclassified	116 A 7,10	9	Morin et al (1977, p. 135)
23	WERN	Skarn Cu Fe	116 A 15	7	Morin et al (1977, p. 135-136)
24	TIM	Unclassified	116 A 12	9	Morin et al (1979, p. 50)
25	SHAY	Occurrence Pb Zn Cu	116 A 12	7	Morin et al (1979, p. 50)
26	LEP	Unclassified	116 A 13	9	Morin et al (1979, p. 50)
27	LOMOND CREEK	Unclassified	116 A 12	7	Morin et al (1979, p. 49)
28	BOYLE	Stratiform Ba	116 A 12	7	D.I.A.N.D. (1983, p. 219-220)
29	MILK UM	Stratabound Ba	116 A 12	7	D.I.A.N.D. (1983, p. 219-221)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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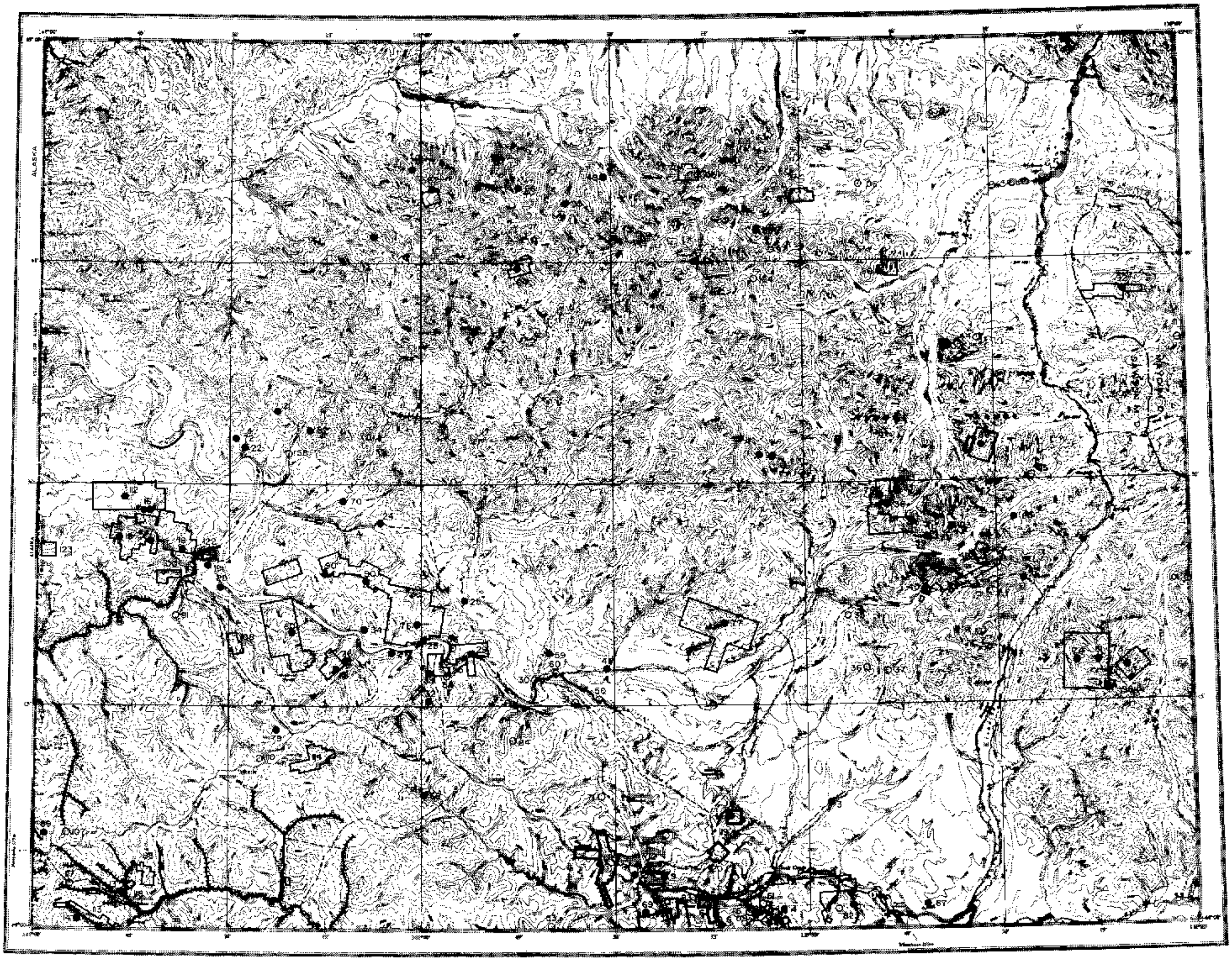
116 B&C



DAWSON
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

DAWSON MAP-AREA (NTS 116 B-C)

General Reference: GSC Map 1284A and Memoir 364 by:
L.H. Green, 1972.
Map of 115 O 14,15 and 116 B 2,3
by R.L. Debicki, 1984.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	INDEX	Vein Sb	116 B 8	7	Green (1972, p. 142)
2	GERMAINE	Occurrence Sn	116 B 2	9	Green (1965, p. 64-65)
3	COLLIERY	Coal	116 B 2	7	Bostock (1938, p. 13-14); Green (1972, p. 27); Dowling (1915)
4	UNEXPECTED	Occurrence U Sn	116 B 3	7	D.I.A.N.D. (1982, p. 238)
5	VIRGIN	Vein Au Ag	116 B 3	7	MacLean (1914, p. 41-49); D.I.A.N.D. (1981, p. 293)
6	MacLEAN	Occurrence Au	116 B 3	7	This Report
7	BOYLE	Unclassified	116 B 3	9	
8	LEPINE	Occurrence Au	116 B 3	7	This Report
9	FIBRE	Asbestos	116 B 3	7	
10	MIDNIGHT DOME	Asbestos	116 B 3	7	
11	BROAD-LEDGE	Unclassified	116 B 3		Brock (1910, p. 15)
12	WEST DAWSON	Skarn, Vein Cu Pb Ag	116 B 3	7	
13	HUNGRY	Unclassified	116 C 2	7	Cockfield (1921, p. 52)
14	MILLER	Vein Ag Pb Zn	116 C 2	7	Cockfield (1921, p. 51-52); D.I.A.N.D. (1981, p. 293)
15	SPHERE	Asbestos	116 C 7	7	D.I.A.N.D. (1983, p. 223-224)
16	FOXY	Asbestos	116 C 7	7	Green (1964, p. 27); This Report
17	CLINTON CREEK	Asbestos	116 C 7	3	This Report
18	ACHERON (RG)	Asbestos	116 C 7	7	Morin et al (1977, p. 144)
19	CONE HILL	Vein Ag Pb Au	116 C 7	7	D.I.A.N.D. (1981, p. 242)
20	MICKEY CREEK	Asbestos	116 C 7	7	
21	SHELL CREEK	Iron formation	116 C 9	6	Gross (1969, p. 111)
22	CLIFF	Coal	116 C 9	7	McConnell (1904, p. 39-41)
24	SOURDOUGH MINE	Unclassified	116 C 8	7	McConnell (1904); Green (1972, p. 146)
25	FIF	Unclassified	116 B 5	7	
26	CALEY	Asbestos	116 C 8	2	McConnell (1903, p. 39-41)
27	CASSIAR CREEK (SUBMARINE)	Vein, Carbonate-hosted Ag Pb Zn (Cu)	116 C 8	7	Green (1964, p. 27-28) Cockfield (1928, p. 9)
28	ROAL	Skarn Zn Pb (Ag Sn)	116 B 5	7	Cockfield (1928, p. 9)
29	SILVER CITY	Occurrence Ag Pb	116 B 5	7	Green (1966, p. 23-24); Craig & Milner (1975, p. 15)
30	OGILVIE	Unclassified	116 B 5	9	
31	KEYSTONE	Unclassified	116 B 5	9	
32	ASS	Asbestos	116 B 5	7	
33	WOODCHOPPER	Asbestos	116 B 5	7	D.I.A.N.D. (1982, p. 238-239,242)
34	ETHELDA	Skarn Cu	116 C 8	7	
35	HAY MEADOW	Unclassified	116 B 7	9	
36	JECKELL	Unclassified	116 B 7	9	
37	SNYDER	Unclassified	116 B 7	9	
38	FIREWEED	Unclassified	116 B 7	9	Tempelman-Kluit (1965, p. 36)
39	GRAVE	Vein Cu	116 B 7	7	D.I.A.N.D. (1981, p. 285)
40	SPOTTED FAWN	Vein Ag Pb Zn	116 B 7	7	Cockfield (1919, p. 15-17); Green (1972, p. 137-138); Sinclair et al (1975, p. 73-74)
41	SUBTRACT	Unclassified	116 B 7	9	D.I.A.N.D. (1981, p. 285)
42	ROBERT SERVICE	Unclassified	116 B 8	7	Tempelman-Kluit (1965, p. 36)
43	MULTIPLY	Unclassified	116 B 8	7	Tempelman-Kluit (1965, p. 36)
44	CRAWFORD	Vein Cu	116 B 10	7	
45	BLACKSTONE	Coal	116 B 16	7	
46	CHAPMAN	Unclassified	116 B 16	7	Green (1972, p. 138); Sinclair et al (1975, p. 76)

47	FIFTEEN MILE	Vein Cu Ag	116 B 14,11	7	
48	CHANDINDU	Unclassified	116 B 5		McConnell (1903, p. 39-41)
49	SHAND	Occurrence Cu	116 B 13	7	Morin et al (1977, p. 144)
50	JEROME	Coal	116 B 5	7	
51	PAULA	Occurrence Cu	116 C 10	7	Owen (1968, p. 8)
52	KRAUSE	Iron formation	116 C 9	7	
53	MASTADON	Unclassified	116 B 4	9	
54	RISCO	Unclassified	116 B 5	9	
55	WINAGE	Unclassified	116 B 5	9	
56	HEALY	Unclassified	116 B 5	9	
57	LAWRENCE	Unclassified	116 B 5	9	
58	LEDUC	Coal	116 C 9	7	
59	BARETTE	Coal	116 B 5	7	
60	THANE	Coal	116 B 5	7	
61	HATTIE	Unclassified	116 B 3	7	MacLean (1914, p. 124-125)
62	MONSTER (OG)	Vein, Carbonate-hosted Pb Zn	116 B 13	7	Sinclair et al (1976, p. 88)
63	TART	Occurrence Zn Pb	116 B 13	7	
64	OZ	Vein Zn Pb	116 B 12	7	Sinclair et al (1975, p. 74-75); D.I.A.N.D. (1983, p. 223, 227)
65	SEELA	Vein Pb Zn	116 B 14	7	
66	KIWI	Vein Pb Zn Ag	116 B 10	7	Sinclair et al (1975, p. 75)
67	MORRISON	Unclassified	116 B 2		G.S.C., Map 711A (1942)
68	LOWNEY	Unclassified	116 B 4,C 1	9	
69	HALIFAX	Unclassified	116 B 3		D.I.A.N.D. (1981, p. 293)
70	CHAIN	Coal	116 C 8	7	
71	HALE	Unclassified	116 B 4		
72	JEPHSON	Coal	116 C 9	7	
73	O'BRIEN (A.J.)	Vein Au	116 B 8	6	This Report
74	SANDOW	Vein Cu	116 B 8	7	Green (1972, p. 142)
75	UGLY	Carbonate-hosted, Vein Zn Pb	116 C 16	7	
76	TJOP	Asbestos	116 C 8	7	D.I.A.N.D. (1983, p. 223-225)
77	STYX	Unclassified	116 B 6	9	D.I.A.N.D. (1982, p. 239)
78	MARN	Skarn Cu Au	116 B 7	7	This Report
79	CLIP	Occurrence Pb Zn	116 C 1	7	D.I.A.N.D. (1981, p. 288)
80	PLUTO	Porphyry Mo W	116 C 8	7	D.I.A.N.D. (1983, p. 223,225)
81	THOR	Vein Au Cu	116 B 8	7	D.I.A.N.D. (1981, p. 289-291)
82	ETC	Unclassified	116 B 2		D.I.A.N.D. (1981, p. 293)
83	FROGGY	Unclassified	116 B 3		D.I.A.N.D. (1981, p. 293)
84	FRESNO	Unclassified	116 B 4		D.I.A.N.D. (1981, p. 293)
85	RIKI	Unclassified	116 B 9	9	D.I.A.N.D. (1982, p. 240)
86	TAK	Geochemical target Pb Ag	116 B 10	7	This Report
87	KITL	Occurrence Pb Zn	116 B 15,14	7	D.I.A.N.D. (1982, p. 240)
88	GUCH	Vein Pb	116 C 2	7	D.I.A.N.D. (1982, p. 241)
89	BALDY	Stratabound Pb Zn Cu	116 C 2	7	D.I.A.N.D. (1981, p. 292)
90	RAIL	Skarn W	116 C 8	7	This Report
91	MAIDEN (TING)	Granite-associated U	116 C 7	7	D.I.A.N.D. (1981, p. 292); Eaton (This Report)
92	REIN	Stratabound Ba	116 B 9	7	D.I.A.N.D. (1981, p. 292)
93	NEBULOUS	Occurrence U	116 B 7	7	D.I.A.N.D. (1981,p. 293)
94	DEM	Unclassified	116 B 13	7	Sinclair et al (1976, p. 85)
95	OD	Unclassified	116 B 13	7	Sinclair et al (1976, p. 86)
96	ID	Vein Cu	116 B 13	7	Sinclair et al (1976, p. 87)
97	KIMI (KIM)	Unclassified	116 B 14	9	Sinclair et al (1976, p. 88)
98	MONY	Unclassified	116 B 8	9	Morin et al (1977, p. 142)
99	GULCH	Granite-associated U	116 B 11	7	Morin et al (1977, p. 143)
100	ROSE (RG)	Unclassified	116 C 7		D.I.A.N.D. (1982, p. 242)
101	HOT	Unclassified	116 B 8	9	Morin et al (1979, p. 53)
102	TETA	Granite-associated U	116 B 7	7	Morin et al (1979, p. 54)
103	SUMTING	Unclassified	116 B 7	9	Morin et al (1979, p. 54)
104	BRX	Unclassified	116 B 11	7	Morin et al (1979, p. 55)
105	ROB	Unclassified	116 B 14	7	Morin et al (1979, p. 56)
106	DAWG	Unclassified	116 B 15	9	Morin et al (1979, p. 56)
107	PUB	Unclassified	116 C 2	9	Morin et al (1980, p. 29)
108	MICKEY	Unclassified	116 C 8	9	D.I.A.N.D. (1982, p. 241-242)
109	SPEC	Unclassified	116 B 3		D.I.A.N.D. (1983, p. 224,227)

110	SWEDE	Unclassified	116 C 1		D.I.A.N.D. (1982, p. 224)
111	GRAPS	Unclassified	116 B 9		D.I.A.N.D. (1982, p. 224)
112	TURK	Asbestos	116 C 7	9	This Report
113	MILLER CREEK	Unclassified	116 C 2	9	This Report
114	HOLLY	Unclassified	116 C 1	9	
115	TIZA	Asbestos	116 C 8	7	D.I.A.N.D. (1983, p. 224,226)
116	JOE "1"	Unclassified	116 B 3		D.I.A.N.D. (1983, p. 224,227)
117	CEDAR	Unclassified	116 C 2		D.I.A.N.D. (1983, p. 224,227)
118	PINE	Unclassified	116 C 2		D.I.A.N.D. (1983, p. 224,227)
119	SPEC-2	Unclassified	116 B 3	9	D.I.A.N.D. (1983, p. 224,227)
120	XL	Unclassified	116 B 3		This Report
121	TOP	Unclassified	116 B 4		This Report
122	SMOKEY	Unclassified	116 C 7		This Report
123	BH	Unclassified	116 C 7		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

VIRGIN — Gold — 116 B 3, 115 O 14 (5) — (64°00'N,139°14'W)
Archer, Cathro and Associates (1981) Limited
Dawson Eldorado Gold Explorations Limited

Claims: EASY 1-6; KLOT 1-8

History:

The EASY claims were staked in February, and the KLOT claims in June, 1983 over the former Virgin and Jean claims which were originally staked in 1901 and restaked several times in the early 1900's. Two shafts, one 10.7 m, and the other 4.6 m deep were sunk, and two adits, one 9.2 m and the other 45.8 m long were driven. Some milling was also done in the 1930's. More work was carried out in the early 1970's.

Description:

The property is underlain by quartz-muscovite-chlorite schist commonly containing clear to bluish quartz eyes and abundant metamorphogenic quartz veins. Discordant quartz veins containing minor pyrite, galena and visible traces of gold are present in several localities.

Current Work and Results:

The claims were mapped at 1:50,000 and soil samples were collected for geochemistry.

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MacLEAN — Gold — 116 B 3 (6) — (64°01'N,139°16'W)
Archer, Cathro and Associates (1981) Limited
Dawson Eldorado Gold Explorations Limited

Reference: MacLean (1914, p. 125).

Claims: KLEAN 1-12

History:

The KLEAN claims were staked in June of 1983.

Description:

In the area of the claims, the highly deformed carbonaceous schists and phyllites with intercalated chlorite and chlorite-biotite schist are overthrust by quartz-eye quartz-muscovite schist. Metamorphogenic quartz is abundant in these rocks, and discordant quartz stringers cut the metamorphic rocks locally.

Current Work and Results:

The KLEAN 3-8, 11 and 12 claims were mapped at 1:50,000 scale and soils samples were collected for geochemistry.

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LEPINE | Gold
Archer, Cathro and Associates (1981) Limited | 116 B 3 (8)
Dawson Eldorado Gold Explorations Limited | (64°08'N,139°02'W)

Reference: (MacLean (1914, p. 114-115); D.I.A.N.D. (1981, p. 293); Northern Cordillera Mineral Inventory (private file of Archer Cathro and Associate (1981) Limited, up dated 1983).

Claims: KLEP 1-16

History:

The claims were staked in June, 1983 over an area which had previously been staked as the Wells Group in the period 1899 to 1902. This area was intensely explored with over 230 shallow shafts, pits and open cuts and a 30.5 m adit before 1914.

Description:

The area is underlain by medium-green chlorite-quartz-muscovite and rusty-tan quartz-muscovite schist and minor carbonaceous quartzite, cut by dykes of altered, unfoliated quartz porphyry. The schists are locally silicified adjacent to the dykes. The nature of mineralization is uncertain. The mill test from the Tupper claim reportedly returned 6.86 to 8.57 g Au/t. MacLean assayed 19 samples from 4 of the claims in the Wells Group in 1912, of which one returned 0.34 g Au/t and the balance were trace.

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CLINTON CREEK | Asbestos
Archer, Cathro and Associates (1981) Limited | 116 C 7 (17)
(64°26'N,140°40'W)

Reference: D.I.A.N.D. (1983, p. 223-224,227).

Claims: TATER 29-68, 71-86

Source: Summary by P. Watson from assessment report 091460 by R.J. Cathro and J.S. Murray.

Current Work and Results:

The TATER 29-68, 71-86 claims were staked in 1982 for the Brinco Exploram Project (Brinco Mining Ltd. and Exploram Minerals Ltd.). They adjoin TATER 1-28 and cover a least five, poorly exposed serpentinite bodies within 5 km of the former Clinton Mine. The five bodies (named Acheron, Judy, Cripple, Tim and Lookout) were explored at various times in the 1960's and early 1970's with poor results due to extensive overburden cover.

In 1982, 1,289 soil and stream sediment samples were collected as part of a fibre dispersion study. Geological mapping, linecutting and some trenching were also carried out. Seven medium-sized asbestos fibre soil anomalies were defined, the largest extending for 1,500 m by 200-400 m. Five of these anomalies are associated with ultramafic bodies. A sixth has been attributed to airborne contamination, and no asbestos-bearing float or outcrop was found in the vicinity of the seventh anomaly.

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O'BRIEN (A.J.) | Gold
Conwest Exploration Company Ltd. | 116 B 8 (73)
Cody Hawk Resources | (64°17'N,138°10'W)

Reference: D.I.A.N.D. (1983, p. 223,225).

Claims: JA (1-36); AJ 3-6,15-16

History:

The JA claims were staked in 1982, surrounding the older AJ claims.

Current Work and Results:

In 1983, trenching was carried out on the AJ claims, removing 85 m^3 of earth. Four hundred samples were taken from the trenches for metallurgical testing. Geological mapping and an EM survey were carried out on the JA claims.

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MARN | Copper,Gold Skarn
Noranda Exploration Company Limited | 116 B 7,10 (78)
(64°29'N,138°48'W)

References: D.I.A.N.D. (1982, p. 237,239; 1983, p. 223,225).

Claims: MARN 1-108

Source: Summary by D. Emond from assessment report 091517 by J. Biczok.

History:

The MARN claims, located 55 km north-northeast of Dawson City, were originally staked in 1978, and were added to in 1979 and 1980.

Description:

Throughout most of the claims, the strata, consisting of Road River shales and cherts, Black Clastic shales, Takhandit limestone, Lower Schist quartzite and slate, and Keno Hill Quartzite, strike north and dip shallowly to the east. Within the northern claims, however, the strata curve to the northeast, and several kilometres northeast of the claims, they trend to the east. A large diorite sill, 800 m wide, extends northwest from the Mt. Brenner stock and intrudes the metasedimentary rocks at a slightly unconformable angle. Gold-copper skarn mineralization is developed beneath, and along the margins of this sill.

Current Work and Results:

In the summer of 1983, thirteen BQ diamond drill holes were completed, totalling 1,616.87 m. Eleven holes were drilled in the "Mini Grid" zone, on MARN 4, delineating the mineralized zone, on the north side of the diorite sill. The mineralized zone strikes 120° and dips 15-30° to the southwest. The northern edge marks the limit of the hydrothermal skarnification front, whereas the southern limit is defined by the intersection of two subparallel diorite sills which occur immediately above and slightly below the mineralized zone. To the northwest, the width and thickness of this zone remains uniform, however, this is cut off by the intersection of the upper and basal sills. The middle sill which appears to have acted as a cap rock to the mineralizing solutions dies out tc the northwest. The mineralized zone becomes more diffuse in this direction (ie. a lower grade over a greater thickness of rock).

An additional two holes were drilled on the southern margin of the diorite sill, on MARN 8, in a successful attempt to intersect Tahkandit limestone beneath it. A barren diopside-garnet, contact metamorphic skarn was also located, however this is completely distinct from the hydrothermal skarn at the "Mini Grid".

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TAK	Lead, Silver
Noranda Exploration	Geochemical Target
Company Limited	116 B 9,10 (86)
Mattagami Lake Exploration	(64°33'N,138°32'W)
Company Ltd.	

Reference: D.I.A.N.D. (1983, p. 223,226).

Claims: TAK 1-52

Source: Summary by D. Emond from assessment report 091506 by J. Biczok.

Current Work and Results:

The TAK 49-52 were added on to the claim group in July, 1983. Exploration work consisted of geochemical and geophysical surveys, diamond drilling, minor geological mapping and prospecting of the northern half of the claim block.

Geological mapping only defined the location of the Grit Unit/Road River Formation contact.

A grid was established on the property and 321 soil samples were collected at 25 m intervals. Sample results delineated several base metal anomalies. Fifty-three rock samples and eight silt samples were also collected.

Geophysical surveys, including 2.4 km of VLF, 1 km of Proton Magnetometer and 1.125 km of GENIE HLEM surveys were largely unsuccessful in delineating any mineralization.

Three diamond drill holes were completed totalling 50 m of BQ core. However, the steeply dipping, thinly-bedded chert intersected by the diamond drilling was badly fractured to at least 20 m depth and consequently, the target depth was not reached.

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RAIL	Tungsten Skarn
Noranda Exploration	116 C 8 (90)
Company Limited	(64°23'N,140°10'W)

Reference: D.I.A.N.D. (1983, p. 223,225,227).

Claims: RAIL 1-214; ROAD 1-4; TRACK 1-28; TIE 1-40; SPIKE 1-156

Source: Summary by D. Emond from assessment reports 091521 by J. Biczok and 091523 by L. Bradish.

Current Work and Results:

During the summer of 1983, the company cut 156 km of line, setting up three grids with 25 m spaced flags in the northern part of the RAIL claims. The grids were used for a detailed magnetometer survey, using a Proton Precession magnetometer. Earlier drilling of the northwesternmost grid area hints that tungsten mineralization is restricted to a small area within and along strike of the linear magnetic anomalies. The magnetometer surveys detected numerous small high amplitude anomalies in all three grid areas, and are thought to outline limy skarn horizons. A large anomaly, 900 by 400 m in area, is found in the northern central grid area.

Several soil trenches 2-3 m by 1-2 m were excavated by hand and blasting to a depth of 1-2 m, but did not reach bedrock. Panned soils from trench bottoms contained significant quantities of scheelite which is apparently developed within the local quartzite and limestone adjacent to porphyry dykes.

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TURK
Teslin Joint Venture

Asbestos
116 C 7 (112,16)
(64°29'N,140°47'W)

Reference: D.I.A.N.D. (1983, p. 223,225-227).

Claims: TURK 1-156

Source: Summary by P. Watson from assessment report 091454 by R.J. Cathro and J.S. Murray.

Current Work and Results:

The 1982 exploration program was managed by Archer Cathro and Associates (1981) Limited. Grid soil sampling, linecutting, geological mapping and trenching initiated in 1981 was continued.

The grid on the TURK 1-96 claims was extended to the remainder of the claim block, and 1,415 soil and stream sediment samples were collected on the TURK 97-156 claims. These samples were evaluated for asbestos fibre content.

The largest of four anomalies, also outlined by a 1970 ground magnetometer survey, covers four poorly defined ultramafic bodies marked by vegetation anomalies, and extends over 1,500 m by 250 m. Fibre quantities are generally higher where ultramafic rocks have thinnest soil cover.

The second fibre in soil anomaly covers a vegetation anomaly 500 m north of the largest anomaly. Two 1982 trenches in this area did not expose significant asbestos mineralization although fibres up to 11.5 mm in length occur in the soils.

The third anomaly coincides with a known ultramafic body and the early ground magnetometer survey.

The fourth and weakest anomaly has been attributed to airborne contamination from the Clinton Mine mill, however, the bedrock has not been tested there.

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MILLER CREEK
Homestake Mineral Development Company

116 C 2 (113)
(64°01'N,140°48'W)

Reference: D.I.A.N.D. (1983, p. 224,226-227).

Claims: GLAC 1-62

History:

These claims were staked in 1982 adjacent to the WY claims.

Current Work and Results:

In 1983, the exploration program consisted of reconnaissance mapping, and reconnaissance soil and rock sampling for geochemistry. The claims were also mapped at 1:10,000 scale.

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1983 MINERAL CLAIMS STAKED

VIRGIN
Archer,Cathro & Associates (1981) Limited

116 B 3 (5)
(64°00'N,139°14'W)

Claims 1983: KLOT 1-8

MacLEAN
Archer, Cathro & Associates (1981) Limited

116 B 3 (6)
(64°01'N,139°15'W)

Claims 1983: EASY 1-6; KLEAN 1-12

LEPINE
Archer, Cathro & Associates (1981) Limited

116 B 3 (8)
(64°07'N,139°11'W)

Claims 1983: KLEP 1-16

XL
L. Brault

116 B 3 (120)
(64°05'N,139°14'W)

Claims 1983: XL 1-34

TOP
Meri Resources Ltd.

116 B 4 (121)
(64°04'N,139°31'W)

Claims 1983: TOP 1-74

TAK
Noranda Exploration Company Ltd.

116 B 10 (86)
(64°32'N,138°34'W)

Claims 1983: TAK 49-52

1983 MINERAL CLAIMS STAKED

SMOKEY
T.P. Wylie

116 C 7 (122)
(64°25'N,140°33'W)

Claims 1983: SMOKEY 1-8

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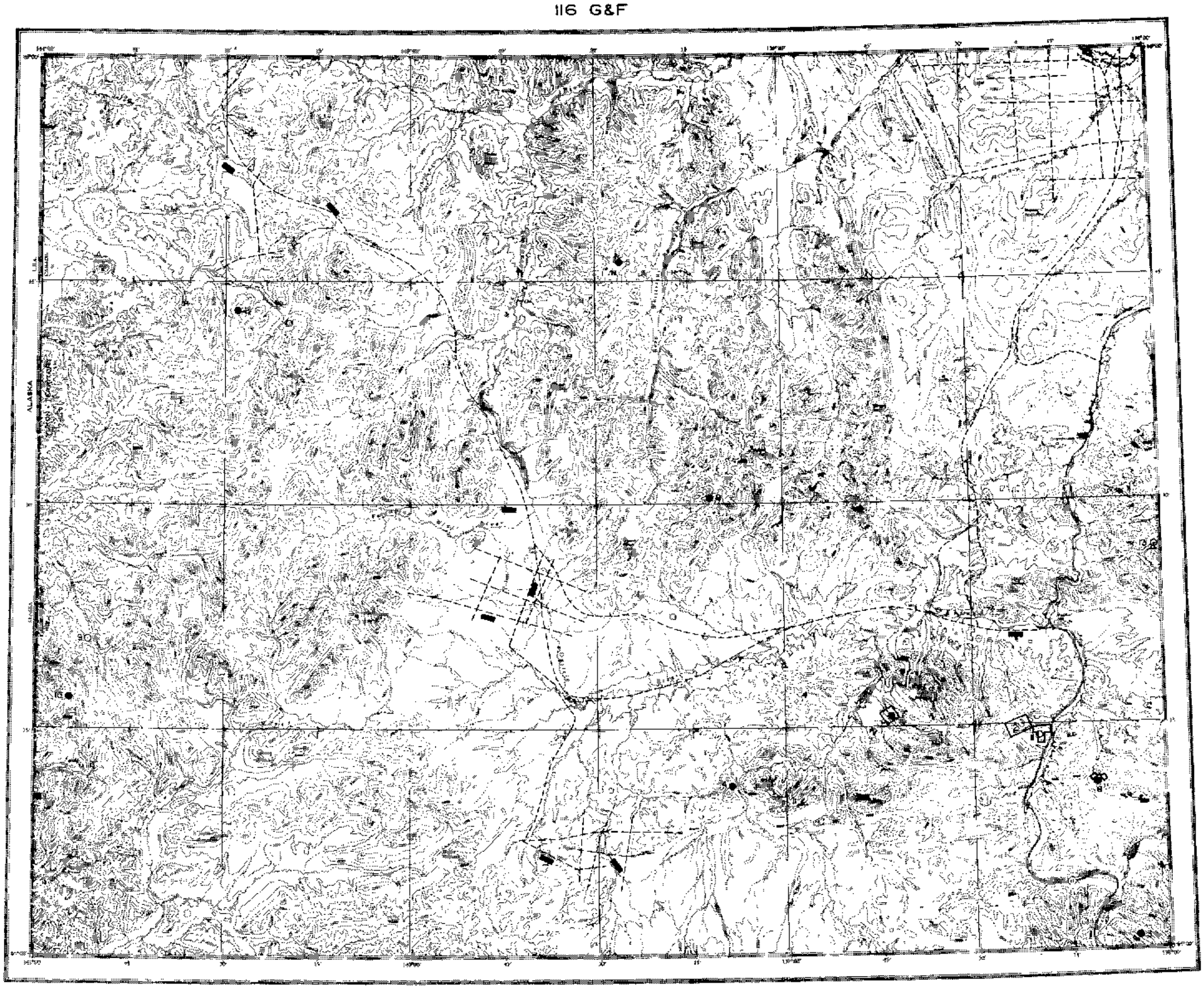
116 G&F



OGILVIE RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

- Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)
- ● Mineral Deposit or Occurence see Key on facing page
- ○ Unmineralized Target
- Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
- Mineral Claims staked in 1983
- Placer Leases in good standing (Jan. 1984)
- Placer Claims in good standing (Jan. 1984)
- CEL Coal Exploration Licence
- CML Coal Mining Lease
- Tote Trail
- Driveable Road
- Oil or Gas Well
- Airstrip

OGILVIE MAP-AREA (NTS 116 F-G)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1526A by: D.K. Norris, 1982a.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	BURGOYNE (KEPT)	Occurrence Zn	116 F 2	7	Sinclair et al (1976, p. 90)
2	SIT DOWN	Unclassified	116 F 9	7	Norris (1976, p. 459)
3	DYKE	Occurrence Cu, Asbestos	116 G 1	7	Norris (1974, p. 344)
4	NUCLEAR (BEAR)	Occurrence Pb Zn	116 G 3	7	Sinclair et al (1975, p. 77-78)
5	GIG	Vein Pb	116 G 14	7	
6	COOT	Vein Pb	116 G 11	7	
7	BIBLO	Carbonate-hosted Zn Pb, Vein Pb Ba	116 G 7	7	D.I.A.N.D. (1981, p. 295);
8	MILCH	Occurrence Ba	116 G 1	7	D.I.A.N.D. (1982, p. 245)
9	PL	Occurrence Pb Zn	116 F 7	7	Morin et al (1980, p. 30-31)
10	TIN	Occurrence U	116 F 7	9	Morin et al (1980, p. 30)
11	ELBOW	Occurrence Ba	116 G 1	7	Morin et al (1980, p. 31)
12	KZ	Unclassified	116 G 1	9	D.I.A.N.D. (1983, p. 229)
13	BANG ON	Vein Ba	116 G 8.	9	D.I.A.N.D. (1982, p. 245); D.I.A.N.D. (1983, p. 229)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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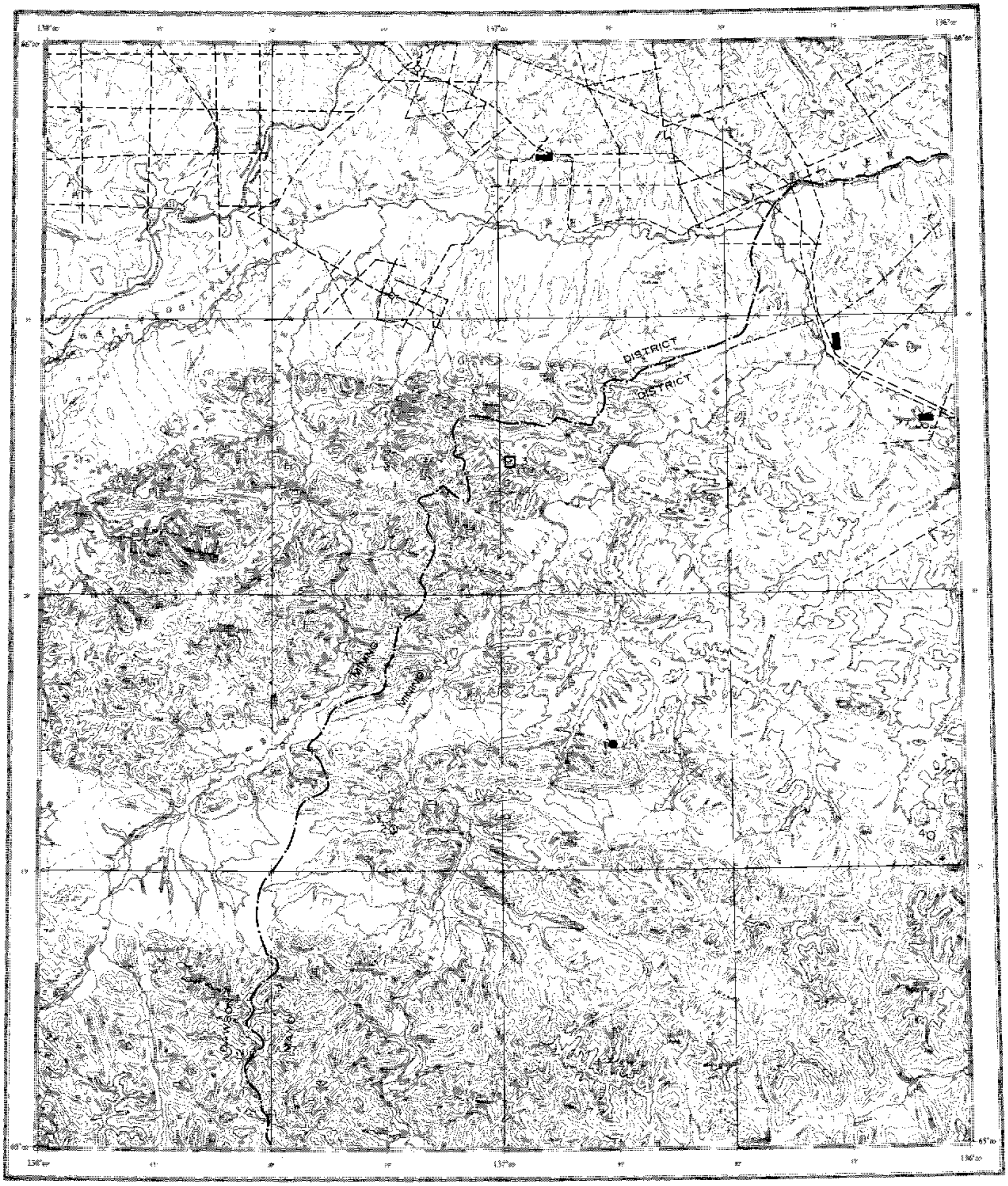
116 H



HART RIVER
YUKON TERRITORY

5 0 5 10 15 20 25 30
Kilometres

Lands withdrawn from staking due to Native Land Claims (see specific claim map for accurate location and additional sites of withdrawal)

● Mineral Deposit or Occurence see Key on facing page
○ Unmineralized Target
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983

Placer Leases in good standing (Jan. 1984)
Placer Claims in good standing (Jan. 1984)
CEL Coal Exploration Licence
CML Coal Mining Lease

Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

HART RIVER MAP-AREA (NTS 116 H)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1527A by: D.K. Norris, 1982b.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	CUNG	Vein Cu	116 H 7	7	Sinclair et al (1975, p. 69-70)
2	JANE	Unclassified	116 H 6	9	Sinclair et al (1976, p. 75); D.I.A.N.D. (1982, p. 247); D.I.A.N.D. (1983, p. 231)
3	CYLINDER	Unclassified	116 H 10	9	Morin et al (1980, p. 24)
4	HEIDI	Vein Ba	116 H 8	7	D.I.A.N.D. (1982, p. 247); D.I.A.N.D. (1983, p. 231)

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

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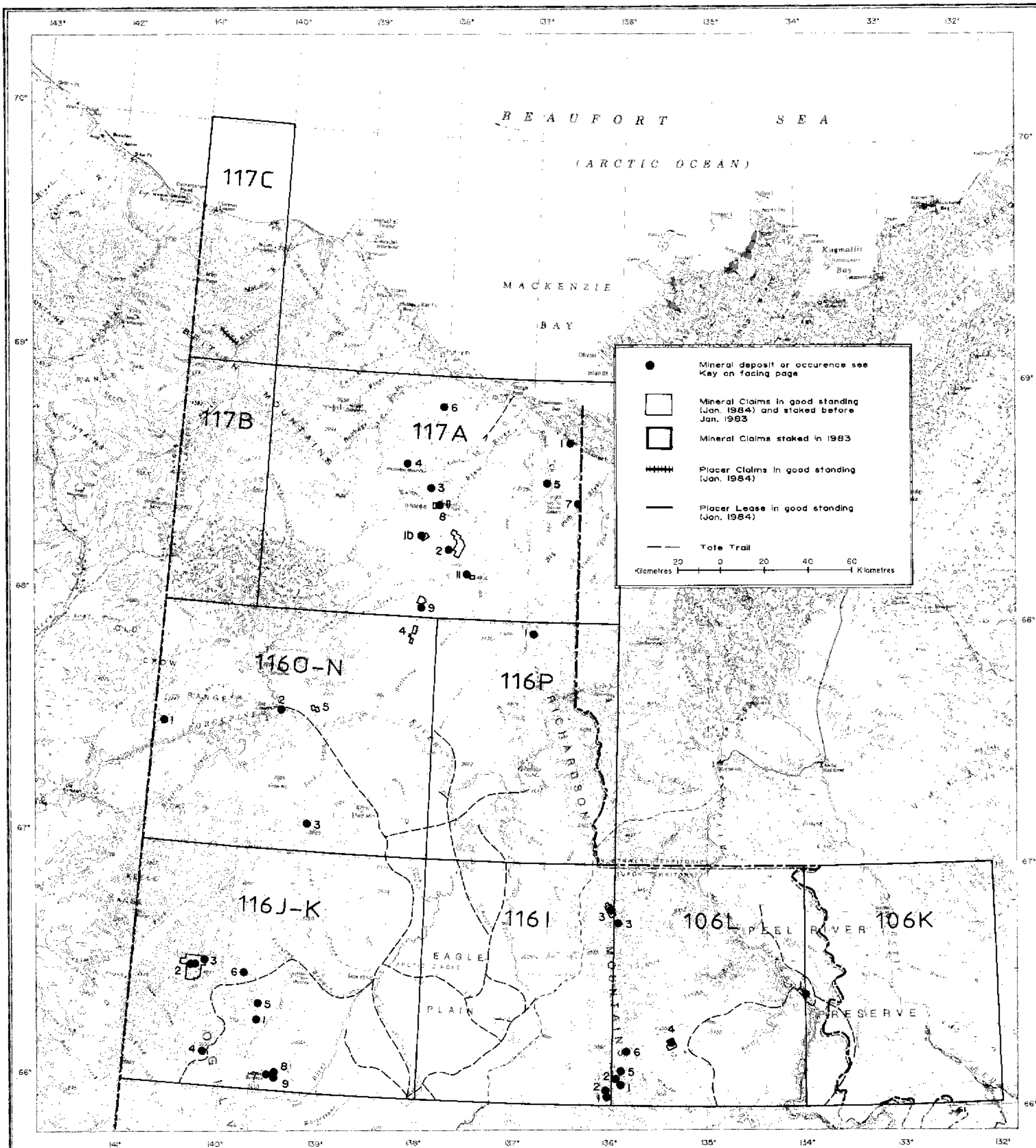
BEAUFORT SEA
(ARCTIC OCEAN)
MACKENZIE BAY
117C
117B
117A
116O-N
116P
116J-K
116I
106L
106K
EAGLE
PLAIN
PEEL RIVER
RESERVE
RICHARDSON
Mineral deposit or occurence see Key on facing page
Mineral Claims in good standing (Jan. 1984) and staked before Jan. 1983
Mineral Claims staked in 1983
Placer Claims in good standing (Jan. 1984)
Placer Lease in good standing (Jan. 1984)
Tote Trail
20 0 20 40 60
Kilometres
Kilometres

MARTIN HOUSE MAP-AREA (NTS 106 K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1525A by: D.K. Norris, 1981h.

NO.	PROPERTY NAME	OCCURRENCE TYPE	N.T.S.	STATUS	REFERENCE
1	CARIBOU BORN	Coal	106 K 5	7	

TRAIL RIVER MAP-AREA (NTS 106 L)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1524A by: D.K. Norris, 1981g.
GSC Open File 875 by: M.P. Cecile, I.F. Hutcheon, V. Gardner, 1982.

NO.	PROPERTY NAME	OCCURRENCE TYPE	N.T.S.	STATUS	REFERENCE
1	ML (PILON)	Carbonate-hosted Zn Pb	106 L 4	7	Sinclair et al (1975, p. 88-89)
2	TWICE	Carbonate-hosted Pb Zn	106 L 4	7	Sinclair et al (1975, p. 90-91)
3	TOUCHE	Occurrence Ba	106 L 12	7	D.I.A.N.D. (1983, p. 233)
4	NOR	Breccia U Cu	106 L 6	7	D.I.A.N.D. (1981, p. 300-301)
5	RAS	Carbonate-hosted Pb Zn	106 L 4	9	Sinclair et al (1976, p. 78)
6	PETE	Carbonate-hosted Pb Zn	106 L 5	7	Sinclair et al (1976, p. 79)

EAGLE RIVER MAP-AREA (NTS 116 I)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1523A by: D.K. Norris, 1981.
GSC Open File 875 by: M.P. Cecile, I.F. Hutcheon, V. Gardner, 1982.

NO.	PROPERTY NAME	OCCURRENCE TYPE	N.T.S.	STATUS	REFERENCE
1	LLOD	Carbonate-hosted Zn Pb	116 I 1	7	Sinclair et al (1975, p. 87-88)
2	HARIVAL	Carbonate-hosted Zn Pb	116 I 1	7	Sinclair et al (1975, p. 87-88)
3	TOUCHE	Occurrence Ba	116 I 16,13	7	D.I.A.N.D. (1983, p. 233-234)

PORCUPINE RIVER MAP-AREA (NTS 116 J-K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1522A by: D.K. Norris, 1981e.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	PEACH	Carbonate-hosted Zn Pb	116 J 5	7	Sinclair et al (1975, p. 81-82)
2	RUSTY SPRINGS (TERMUENDE)	Vein Ag Pb Zn Cu	116 K 8	5	This Report
3	ALTO	Iron formation and/or ironstone	116 K 9	2	Norris (1976, p. 461)
4	BERN	Unclassified	116 K 1	7	Sinclair et al (1975, p. 79-81)
5	FISHING BRANCH	Carbonate-hosted Zn Pb	116 J 5	7	Sinclair et al (1975, p. 81-82)
6	MOKO	Carbonate-hosted Zn Pb	116 J 5	7	Sinclair et al (1975, p. 81-82)
7	WART	Vein unclassified	116 J 4	7	Sinclair et al (1975, p. 84)
8	YUM	Carbonate-hosted Zn Pb	116 J 3	7	Sinclair et al (1975, p. 83-84)
9	BULLIS	Carbonate-hosted Zn Pb	116 J 3	7	Sinclair et al (1975, p. 85)

* Unclassified is the term used for properties for which there is no public data other than location, of for which public data exists, but not enough to classify the occurrence.

RUSTY SPRINGS (TERMUENDE)
Kenton Natural Resources Corporation

Silver,Lead,Zinc, Copper
116 K 8,9 (2)
(66°30'N, 140°25'W)

References: D.I.A.N.D. (1983, p. 15,233-234).

Claims: RIO 1-104; NATE 3-14; JP 1-54; CARB 1-16; HG 1-146; MOOSE 1-48

Source: Summary by D. Emond from assessment report 091504 by J.W. Davis and C. Aussant.

Current Work and Results:

In 1983, a new 427 m by 12 m airstrip was completed, and drill roads were put in to the top of Mike Hill for future use. On Mike and Orma Hills (see Figure), surface mapping was carried out at 1:2,500 scale, 315 soil samples were collected, 9 km of VLF-EM survey was completed, and two diamond drill holes, totalling 487 m, were bored.

Soil sampling extended and refined the previously outlined geochemical anomalous areas, especially on the fringes of the Mike Hill grid. The VLF-EM survey detailed the main areas of anomalous silver. Several weak to moderate strength conductors with coincident anomalous soil geochemistry were delineated (striking east) near the top of Mike Hill. Geochemical values remain anomalous to the base of Mike Hill.

No subsurface mineralization was intersected, but overall exploration was advanced by delineating a fundamental structural control for mineralization on Orma Hill. The vein is displaced westward along a low angle reverse fault by several hundred feet. New drill targets were thus outlined in both the Mike and Orma Hill areas.

Structurally, the property lies along the axes of two north-oriented anticlines. Locally, along their axes, a culmination or dome occurs in both the Mike and Orma Hill areas (see Figure 1). This domal structure may be the expression of one or more intrusives, emplaced along the axial portion of the anticlines. The axis of culmination is displaced in several places by the east-trending tear faults.

The latest ideas on genesis of the Rusty Springs silver-base metal deposit follow the model of "epithermal vein" formation. Mineralization is confined to vertical veins which were formed at an average temperature of 200°C. The widespread silicification, clay alteration and the vein mineralogy are typical of epithermal mineralization.

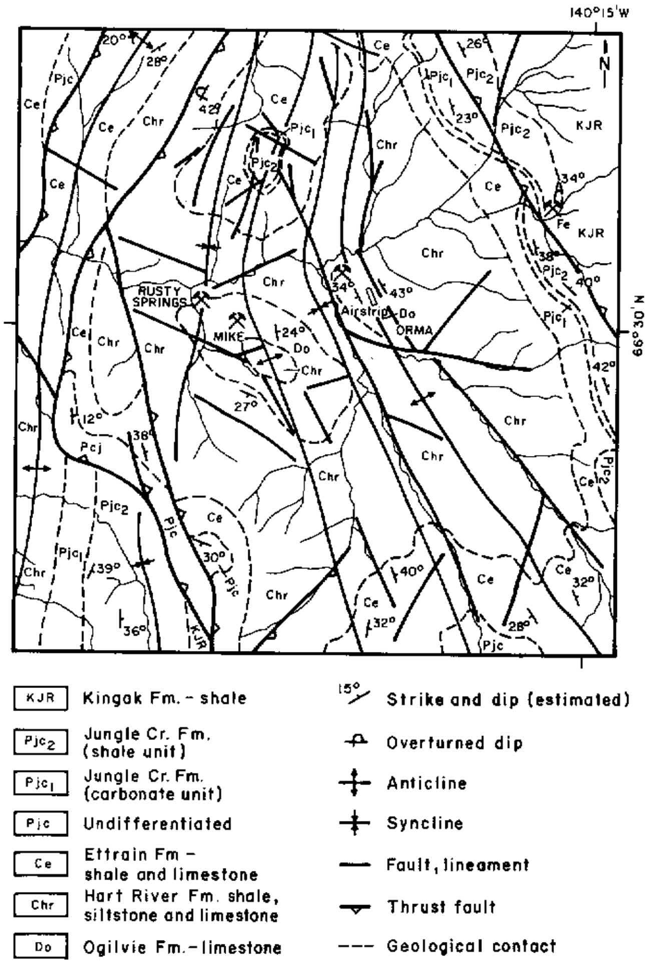

Figure 1 Geology of the Rusty Springs area (Scale approximately 1:75,000).

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OLD CROW MAP-AREA (NTS 116 N-O)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1518A by: D.K. Norris, 1981c.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	SUNAGHUN	Occurrence W Pb Zn	116 N 7	7	Green & Godwin (1964, p. 18)
2	TACK	Unclassified	116 0 12	7	McConnell (1890, p. 127-128)
3	SALEKEN	Carbonate-hosted Zn Pb	116 0 3	7	Sinclair et al (1975, p. 85-86)
4	BEAR	Unclassified	116 0 16	7	
5	NOR	Unclassified	116 0 11		This Report

* Unclassified is the term used for properties for which there is no public data other than location, or for which public data exists, but not enough to classify the occurrence.

BELL RIVER MAP-AREA (NTS 116 P)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Map 1519A by: D.K. Norris, 1981d.

NO.	PROPERTY NAME	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	NORRIS	Coal	116 P 15	7	Norris (1974, p. 348)

BLOW RIVER MAP-AREA (NTS 117 A)

General Reference: GSC Map 1516A by: D.K. Norris, 1981b.

NO.	PROPERTY	OCCURRENCE TYPE*	N.T.S.	STATUS	REFERENCE
1	MOOSE CHANNEL	Coal	117 A 9	7	Bostock (1953, p. 30)
2	BONNET	Coal	117 A 7	7	Jeletsky (1960)
3	HOIDAHL	Occurrence Mo W	117 A 11	7	Vokes (1963)
4	WELCOME	Coal	117 A 11	7	Bostock (1953, p. 26)
5	RAPID	Ironstone	117 A 9	7	Young (1972, p. 232)
6	SHINGLE	Coal	117 A 14	7	Norris (1972, p. 97)
7	STRADDLE	Ironstone	117 A 8	7	Young (1972, p. 232)
8	MAM	Skarn U W Mo	117 A 6	7	D.I.A.N.D. (1981, p. 304)
9	NET	Work Target U	117 A 3, 116 O 16	7	Morin *et al* (1979, p. 58) Morin *et al* (1979, p. 58)
10	BOU	Work Target U	117 A 6	7	Morin *et al* (1980, p. 31)
11	LIN	Work Target U	117 A 2	7	

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