

# 2388

**DOLMAGE, CAMPBELL & ASSOCIATES**

CONSULTING GEOLOGICAL & MINING ENGINEERS

1000 GUINNESS TOWER

VANCOUVER 1, B. C.

## **GEOLOGICAL AND TOPOGRAPHIC REPORT**

on

**YEDHE CREEK PROPERTY**

of

**DAVIS KEAYS MINES LTD.**

**Liard Mining Division  
58°40' N. Lat., 125°30' W. Long.**

**58° N. Lat., 125° W. Long.  
NW Quadrant**

**Mineral Claim Maps 94K/11W (M), 94K/12E (M)**

**Report by:**

**D.D. Campbell, P.Eng., Ph.D.**

**Work completed between August 1, 1969 and January 15, 1970.**

**March 26, 1970.**

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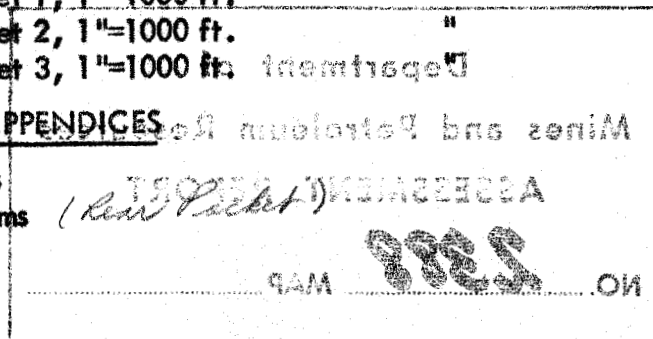
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VANCOUVER 1, B.C.

- 1 -

**INTRODUCTION**

In August, 1969, Dolmage Campbell & Associates Ltd. were engaged by Davis Keays Mines Ltd. to map the surface geology of the Yedhe Creek property owned by Davis Keays west of Ft. Nelson, B.C. It was intended that the consultants should not only produce a geological map of the property but also prospect the property for the continuation of known veins and the occurrence of unknown or potential vein structures. In August Mr. R. McCandless spent 10 days on the property mapping the surface geology on a scale of 1"=400 ft. Dr. Campbell spent two days on the property with Mr. McCandless, collaborating on surface and underground traverses and geological interpretations. In addition, Dr. Campbell studied various rocks from the property under the microscope (thin section) in Vancouver. In September Mr. McCandless was resident geologist on the property, attending to the geological requirements of the exploration being carried out both underground and on the surface.

This report has been compiled to accompany the map of the Surface Geology of the property that resulted from the above-described work, and to itemize the expenses incurred in the course of the work done. It includes the writer's observations as well as information from others including the Geological Survey of Canada and reports by Dolmage Campbell & Associates Ltd.

**MAP:**

The geological mapping was done on aerial photos as well as a preliminary (uncorrected) 400 scale, 25 ft. contour topographic plan of the property. In December, 1969, the data was transferred to a corrected topographic map on the same scale, provided by Northwest Survey Corp. Ltd. Prints of this map accompany this report and are presented in sets of two sheets, north and south as Figures 70-2 and 70-3.

As shown on the maps, much of the property is covered with overburden and therefore the mapping was done principally by traversing up creek beds and along ridges where outcrops are most abundant. Some cliff faces could not be mapped because of inaccessibility in the time available but the geology of such places, being well exposed, could be extrapolated to the general plan. It was impractical to precisely map every outcrop boundary at the time of this project; however, areas of predominant overburden or outcrop are so designated on the accompanying plans.

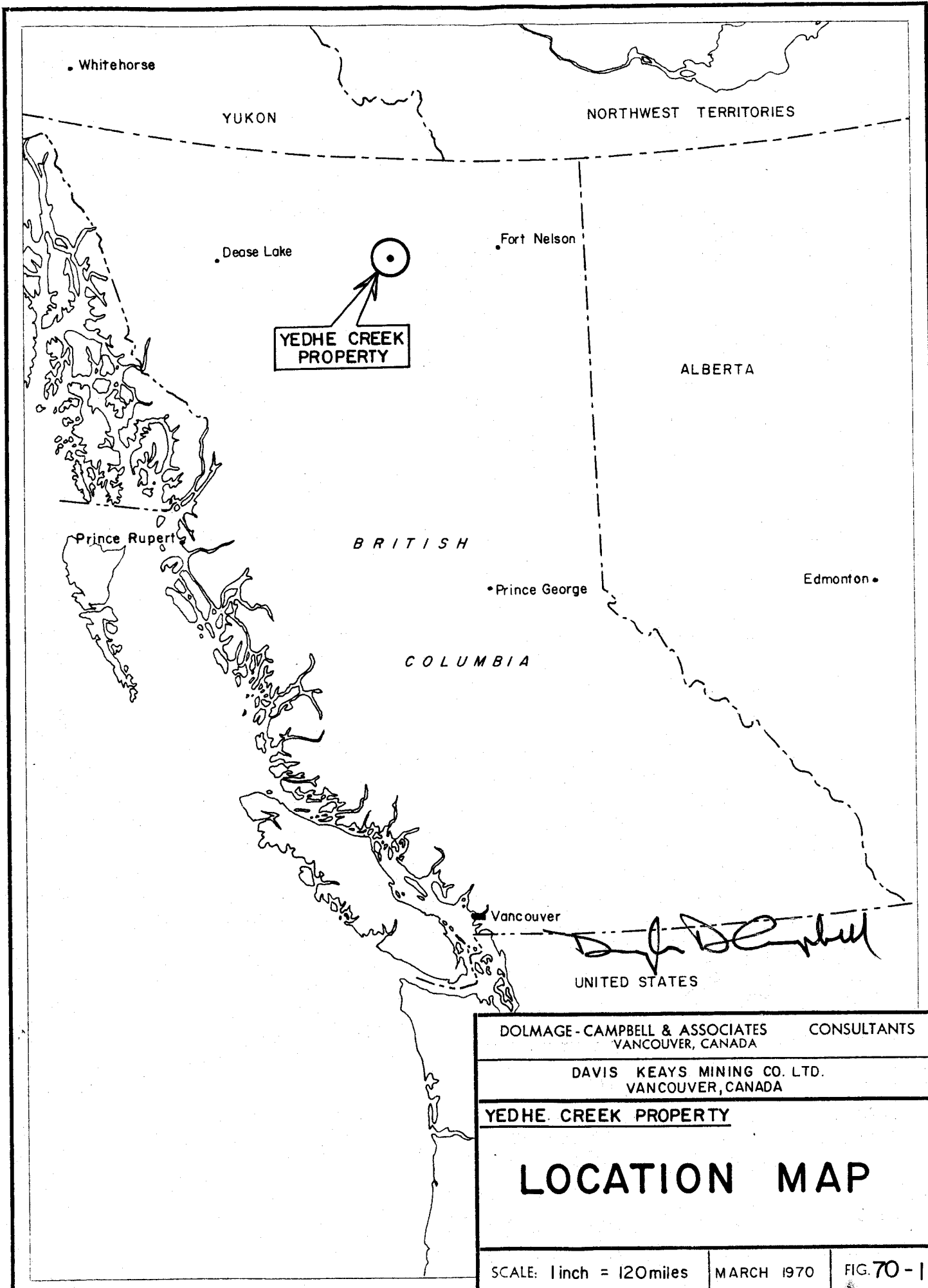
The general country rock underlying the entire property is silty, locally calcareous shale that is flat-lying in thin beds that range up to 3 feet in thickness. This sedimentary sequence forms a monotonous pile within which no units or layers differ enough to form mappable units. Some differences are suggested by discolouration due to weathering but these have not proven to be regular enough in the existing exposures to be useful map units. Similarly, compositional rock differences apparent under the microscope are not readily distinguishable megascopically and would require a prodigious amount of sampling for microscopic examination to verify properly. For the foregoing reasons the country rock on the property geology plan has been left plain, not distinguished by colour or pattern, and only the dikes and vein zones appear on the maps as particular patterns or symbols.

Additional maps showing a detailed road survey in the northern part of the property are presented in this report as Figures 70-4, 70-5 and 70-6 on a scale of 1" = 1000 feet.

#### PROPERTY:

The Yedhe Creek property of Davis Keays Mining Co. Ltd. lies within the Rocky Mountains, in the Tuchodi Lakes map area of British Columbia. (Fig. 70-1). The property includes approximately three hundred and ninety claims, some of which adjoin those of Churchill Copper Corp. Ltd. to the south. The terrain is comprised of rugged glaciated deep valleys and serrated ridges with most of the property lying between 4000 and 8000 feet in elevation. A permanent 50-man camp is established at an elevation of 4700 feet, in a valley below the mine. Access is by all-weather road from Fort Nelson and Mile 442 on the Alaska Highway to the north.

About 20-30% of the property is outcrop, the rest being scree slopes and glacial debris. The only significant vegetation is grass and buckbrush on the overburden-covered areas. Most of the outcrop areas are comprised of cliffs, many of which are largely inaccessible.



DOLMAGE - CAMPBELL & ASSOCIATES CONSULTANTS  
VANCOUVER, CANADA

DAVIS KEAYS MINING CO. LTD.  
VANCOUVER, CANADA

YEDHE CREEK PROPERTY

# LOCATION MAP

SCALE: 1 inch = 120 miles

MARCH 1970

FIG. 70 - 1

### SUMMARY AND RECOMMENDATIONS

The formations underlying the Davis Keays' property form a monotonous sequence of thin bedded limey shales that are typical of the northern Rocky Mountains over extensive areas. The shales are cut in places in near-vertical gabbroic dikes and quartz carbonate veins.

Copper mineralization is present in some of the veins as chalcopyrite and in the Eagle-Mike Vein the mineralization has proven to be economic. It is felt that the veins and dikes owe their origin to tension faulting within the folded rocks. The occurrence of ore grade mineralization in the veins appears to be dependent on:

- (1) long continuous vein structure
- (2) close proximity to large regional folds
- (3) a parallel zone of gouge or faulting.

Several unexplored veins on the property possess one or more of these features, therefore they warrant further exploration and this exploration is discussed in this report. The following general recommendations are discussed and presented in this report:

#### RECOMMENDATIONS:

##### A. Future Work:

- (1) Helicopter reconnaissance and sampling of all major vein structures that are now otherwise inaccessible.
- (2) Trenching over the Sheep, View and Ridge showings.
- (3) Drilling of short holes on favourable vein structures.
- (4) Drilling of 2 shallow holes between the Harris Vein and the View and Ridge showings.

##### B. Past Expenditures:

Expenditures by Davis Keays Mines Ltd. of \$17,930.27 on geological and topographical surveys of the Yedhe Creek claims are summarized in the Appendix 1 of this report. It is hereby recommended that these expenditures be applied for assessment credit on the five claim groupings as specified in Appendix 2.

## REGIONAL GEOLOGY

The entire area of the northern Rocky Mountains is underlain by sedimentary rocks that are largely unmetamorphosed but are extensively faulted, folded and intruded by gabbroic dikes. The ages of the rocks in this sedimentary sequence range from Proterozoic (?) to Cretaceous, with considerable confusion in continuity introduced by unconformities and abundant thrust faults. Dr. G.C. Taylor, who has mapped a portion of the general area for the Geological Survey of Canada, has stated that the gabbroic dikes are pre-Silurian and that the veins are related to the dikes. Observations by the writer of the Davis Keays veins and veins at the Churchill Copper and the Ft. Reliance properties indicate that the veins are younger than the dikes. /ds

A prime target for investigation in this mapping program was the possible control of the ore veins, or ore shoots on the veins, by folds in the enclosing formations.

## PROPERTY GEOLOGY

The following observations and discussions are derived from the examinations of the outcrops signified on the accompanying surface maps by strike-dip symbols etc. (Figs. 70-2, 70-3).

### SEDIMENTARY ROCKS:

There are two distinct sedimentary units of unknown thicknesses that have been distinguished on the Davis Keays property. However, since the oldest (bottom) unit is only very sparsely exposed in the bed of Bonanza Creek near the Davis Keays' camp it has not been differentiated in Figure 70-2. This older formation, or unit, is comprised of thin-bedded, relatively tough, dark gray to black shales. The shales are thin-bedded to laminated, firmly indurated and show heavy iron oxide staining on weathering. Fracturing occurs along slaty cleavage rather than bedding planes and the exposure shows no differential weathering within the formation.

Two relatively thick beds of buff-weathering argillaceous limestone mark the conformable contact with the upper shale formation. The upper formation has a thickness exceeding 4500 feet of thin bedded limy shales. The beds vary from one to ten inches in thickness and usually have alternating light and dark laminae. Composition of the shales may vary considerably beyond buff weathering, black limy shales. Other rocks occurring within this upper shale unit, but not differentiated in mapping because of their minor distribution, were black aphanitic argillaceous limestones and light grey argillaceous chert, as well as gradations between all types of shale, limestone and chert. All are shallow marine sediments. Microscopically, some shales contain up to 40% carbonaceous material in lacey bands parallel to the bedding. Other constituents are scattered silt-sized quartz grains, pyrite and minute veinlets of crystalline calcite. There was no evidence of fauna in any of the rocks. This fact lends some support to assigning a Precambrian age to the sequence.

**Structure:** Throughout the property occur numerous folds of variable dimension but very similar geometry and cleavage direction. All of the sedimentary units lie within a regional monocline with orientation  $040^{\circ}/15^{\circ}$  S. The local folds are normal to the monocline with the general attitude: strike  $130^{\circ}$ , plunge  $12^{\circ}$  S, axial planes inclined  $75^{\circ}$  S. Slaty cleavage where developed is always parallel to the closest axial plane and has a variable dip. Folding is best seen in the more limy beds where large synclines and anticlines have fold sets of related geometry on their limbs. Tight folds are commonly accompanied by dragfolds, thinning of layers at crests and rupturing and faulting along axial planes. Quartz has been injected into the fractured axes of some folds, forming rusty weathering shale breccia bodies of considerable local size and extent. The evidence exposed in the outcrops suggests that only one period of orogeny produced the folding of the sedimentary rocks on the Davis Keays' property and that this folding was closely genetically related to the thrust faulting. Subsequent fractures provided the passageways for the introduction of the gabbroic dikes and the ore vein material.

#### INTRUSIVE ROCKS:

The conspicuous dark ridges on the buff and grey coloured mountains are the most distinctive geological feature of the Davis Keays-Churchill area. These ridges are formed by steeply-dipping basic dikes that range in widths from 10 to 50 feet and are unusually continuous. Dr. Taylor has described the Proterozoic terrane 25 miles east of Davis Keays as having many large basic dikes. They are shown to be nearly vertical in dip and to strike northwest, or parallel to the fold axes in that area. The dikes are at least pre-Silurian in age. At Davis Keays at least seven such dikes have been mapped. All strike northeast and are normal to the fold axes of the country rock.

Compositionally, the dikes are generally fine crystalline, hard gabbro that is locally serpentinized.

Although uniform in width over great distances all of the dikes pinch out abruptly, and locally swell to twice the usual width. They are not uniform from contact to contact in grain size or mineralogy. Contact effects on the adjacent wallrocks are generally thermal only with a suggestion of drag folding in some shales. The wallrocks are firmly indurated. Quartz carbonate veinlets are present in most dikes, both within and along the contacts. Weak occurrences of pyrite, chalcopyrite and malachite were seen in one such veinlet at Davis Keays. The dikes have a similar orientation to the known ore veins at Davis Keays, but it is believed that they were emplaced earlier and are not genetically associated with the copper-bearing quartz-carbonate veins.



## ECONOMIC GEOLOGY

The only ore structures known to occur on the Davis Keays' property are copper-bearing veins. These veins are composed principally of quartz with lesser quantities of calcite and siderite. The only ore mineral known to occur in all of the veins throughout the district is chalcopyrite. The precious metal content of the ore veins is negligible. Not all of the quartz-carbonate veins are copper-bearing and many are discontinuous gash veins. Also, portions of extensive copper-bearing veins are barren of sulphides or pinch out to unmineralized fracture zones. All of the veins on the Davis Keays' property are similar in attitude to the gabbroic dikes and are therefore normal to the fold trends.

In the 1969 mapping program all veins mapped and examined, including those barren of copper sulphide, are recorded on the accompanying plan. (Fig. 70-2). Other veins probably occur on the property but are masked by overburden or are inaccessible. Also, of course, any of the veins mapped as "barren" could be sulphide-bearing at depth or along strike beneath overburden cover.

Because of the excellent underground and surface exposures of the Eagle-Mike Vein, presently being developed, this vein is used below as the type example of an ore vein for this district.

### VEIN STRUCTURES:

Over 2220 feet of strike length of the Eagle Vein are currently exposed in the 6900 Adit Level. Mapping and sampling have shown this length to be almost continuous ore at present copper prices. This vein should be considered curtain-like in structure, rather than as uniformly slab-like. In many places the vein splits into two or more members and becomes a vein-zone with branches commonly pinching off in the walls. The vein swells to widths of 10 feet or more and also pinches over short distances to a few inches in width. Sample results to date suggest that the total copper content is more or less uniform in any one section of the vein structure, thus where the vein zone widens the copper grade per foot of width generally decreases proportionately.

The Eagle Mike Vein is a mineralized shear-fracture zone that is generally characterized by a strong gouge plane on the northwest (hanging wall) side. This gouge plane ranges in width from less than an inch to over a foot and is generally flanked on its footwall side by extensive fracturing and shearing of the shale wallrock. It is this zone that

has been mineralized to form the ore vein structure. The gouge-shear zone is comprised of clayey gouge, chlorite and relict fragments of variously altered shale: all intensely stained with limonite from weathered pyrite. Brecciated vein material occurs very locally and suggests some post-ore movement on the vein.

Cross faults are relatively uncommon and where they do occur, their age relation to the mineralization is not well enough defined to be certain that the apparent offset is actual fault displacement, or simply a shift in the path of the mineralization.

The vein is vertical to steeply west-dipping.

In assessing the other possible ore-bearing veins on the property the presence of a strong gouge plane or shear zone is a generally positive indication of the continuity of the structure; conversely, mineralized fractures or zones that are not accompanied by evidence of persistent shearing (gouge) are not likely to be continuous vein structures.

#### ORE VEIN MATERIAL:

In the Eagle-Mike Vein copper occurs as chalcopyrite, both in massive lenses and veins as well as in disseminations within the quartz and carbonate gangue. Minute grains of chalcopyrite are not uncommonly disseminated in the wallrock, locally to ore grade, for distances up to 2-3 feet from the main fracture zone. On the 6400 Level and locally on the 6900 Level, the chalcopyrite is coated with covellite. Malachite is present, especially in the gougey sheared parts of the zone near the surface.

#### WALLROCK ALTERATION:

Within the vein zone, and up to 10 feet on one or both sides of it, the shale has been intensely ruptured, destroying the bedding planes and accommodating the strain on cleavage planes. Mineralogically, the shale has been hydrothermally altered by carbonates. New minerals include siderite, chlorite and possibly serpentine. Quartz and silicification appear to have followed the carbonates, with pyrite and chalcopyrite forming at this time, or slightly earlier. The shale fragments are shattered, disoriented and sharp-edged as in a true microbreccia. Alteration is not uniform and may be absent. There is no apparent relation between the alteration zone width and the grade of the adjoining vein. In places, the fault and alteration zones are wide enough to present support problems if wide drifts are required. The prominent white quartz veins with the obvious and abundant chalcopyrite are readily interpreted and followed. It is unlikely that widespread sloughing of wallrock would occur and present a dilution problem.

### ORIGIN OF ORE VEINS:

To explain the origin of the dikes and veins, the assumption can be made from the evidence available that the bedrock formations underlying Eagle Ridge and Bonanza Peak have been folded into a large plunging anticline and that the smaller folds at the mine are accessories to it. This assumption can be proved or disproved by a later helicopter-supported reconnaissance of the more inaccessible exposures in the general area. The Eagle Vein Zone could then be an anticlinal cross fracture or fault that formed to accommodate the strain generated by the curving plunge of the anticline. Swarms of such cross faults and peri-anticlinal fractures are common structural features of plunging anticlines. The intrusion of the basic dikes as well as the injection of vein material would obviously favour such persistent channelways, provided they are sufficiently open at the time. The size and extent of the dikes and veins are directly related to the persistence and openness of these channelways, whether they be faults or fracture zones; however, generally the faults are the more persistent and would therefore be better sites for major veins than would gash fractures, short peri-anticlinal faults or other local tension openings. If the major (vein) faults are directly related to the major anticlines then they will weaken away from the core of the large folds, and so would any veins that occupy the faults. Such a situation is suggested on the Eagle-Mike Vein at the 6400 portal where the vein curves away to a north-south strike and its copper content decreases markedly.

It would appear from the evidence noted to date that the ore potential of any of the veins on the property can be at least partially assessed if any of the following favourable features are characteristic of the vein in question:

1. Can the vein structure, barren or otherwise, be traced for at least several thousand feet of strike length with only minor deflections?
2. Does the vein structure cross or follow the axis of a major anticline?
3. Does the vein structure include gouge or shear planes?

It is important to realize that in this district even very short, narrow, innocuous fractures are sometimes host to copper mineralization without being commercial or even potentially so along strike or dip; therefore, the presence of copper minerals

on a vein structure is not a criteria of an ore vein if it is not accompanied by any of the above listed features.

### MINERALIZED OUTCROPS

Many outcrops of veins were examined in the course of this mapping, including those named on the accompanying map. There are several veins to the south of the property which were not mapped as they were inaccessible in the time allowed, without the use of a helicopter. The locations of two other reported showings were not known by the writers and were not found. All of the showings appear as float trains in scree or as small, short outcrops. In the light of 1969 surface drilling, interpretation of vein length and value becomes complex. Continuing underground development work has established the fact that the Eagle and Mike veins are the same structure and since the data on it is well known it will not be discussed further in this report.

**HARRIS AND KEAYS VEINS:** These veins are shown on the accompanying plan (Fig. 70-2), approximately one and one half mile southeast and south respectively, of the Davis Keays' Camp. The Harris Vein appears as a strong wide structure of quartz-carbonate in the canyon wall of Gold Creek. It was originally graded at 3.77% copper over a seven foot width and a strike length of 500 feet. Only 250 feet of strike is exposed as continuous outcrop. The vein stops abruptly at Gold Creek and to the northeast, vanishes beneath the overburden. The locations of the holes drilled in 1969 are shown on the plan. This drilling indicated that:

1. The vein does not continue beneath the overburden to the northeast and does not project to depth.
2. There is no related or parallel fault or gouge zone.

The Keays Vein occurs as a short quartz-carbonate structure in a cirque wall. It was originally interpreted to connect with Keays North beneath the overburden in the cirque, as the inferred strike is parallel to the dikes and veins on the property. Original grading of the Keays Vein was 3.57% copper over an eight foot width for a strike length of 220 feet. The 1969 drilling has shown that the Keays Vein:

1. Does not extend below the floor of the cirque and therefore does not connect to the Keays North Vein.
2. Does not continue to depth below the outcrop with the width or grade exposed on surface.
3. Has no related shear or gouge zone.

Drilling on the Keays North Vein gave only weak intersections at shallow depths beneath the outcrop.

The Harris and Keays veins have shown that the strike lengths of mineralized veins cannot be extrapolated, even for short distances unless the attendant fracture (shear) structures are strong. Because of the poor drilling results, it is recommended that the veins be abandoned as prospects for the time being while more promising vein structures are available for investigation.

PINK, CREEK, VIEW, RIDGE VEINS: These showings occur above the Harris Vein, on the southwest side of Bonanza Peak. They are small outcrops of marginal grade and it is thought they may be part of a fracture system through the area. None of the showings are large enough to warrant a detailed drill program. However exploration at depth between the veins may show them to be connected or replaced by fewer, larger veins. Bulldozer stripping of the Ridge and View veins may be of value in determining their length. It is worth noting that the Pink Vein carries fair values of cobalt as erythrite or cobalt bloom.

OSCAR AND SHEEP VEINS: These showings are seen only as trains of mineralized vein material in scree. Since the scree is close to being in place and quite thin, the veins probably lie only a few feet below surface. The Sheep Vein to the north of Eagle is the best prospect from evidence available at this time. The topography of the showing could allow nearly 1000 feet of stripping to trace continuity, with access from the mine road.

OTHER VEINS: Many quartz carbonate veins occur on the property and all mapped in 1969 are shown on the accompanying plans, some carrying weak chalcopyrite and malachite. Those occurring in conjunction with strong fault structures could be better mineralized at depth. Only the Rusty Vein near the Eagle at the 6400 level warrants diamond drilling on the basis of present exposures. All other exposed veins should eventually be drilled from surface or underground if convenient, to determine if they change at depth or along strike.

GENERAL: If the principal control of the ore shoot on the Eagle-Mike Vein is the major anticlinal fold through which the vein cuts at right angles to the axis, (see North Sheet of accompanying plans, (Fig. 70-3)), then it would follow that one of the better areas for prospecting for new ore veins is along the general axis of this fold. Thus, any vein structures WNW and ESE of the 6400 Portal should be thoroughly explored laterally and to depth.

## CONCLUSIONS

The economic geology of the Davis Keays Property is relatively simple; however, the determination of the potential economic worth of any single vein structure remains difficult to determine at this time because of the lack of regional information on the structural settings of all the existing ore veins. From the data available to date it is clear that any vein structure has probably more potential for ore if it has:

1. A traceable strike or dip length of several thousand feet.
2. An obvious geometric structural relation with a major fold, preferably an anticline, in the enclosing formations.
3. An associated shear or gouge zone.

From observations of other ore veins in the district it is also encouraging if the vein is spatially related to one of the gabbro dikes, lying preferably along the footwall of a dike.

Any vein structure possessing the above-described features warrants exploration even though its exposures may be devoid of copper minerals. If such a vein structure contains traces of copper minerals in its exposures then it definitely warrants further exploration.

The only vein structure on the Davis Keays property that has been proven to be ore-bearing thus far is the Eagle-Mike Vein. The potential for finding more ore along strike and down dip on this structure is excellent and this will be accomplished by routine underground exploration and development of the vein structure.

The potential for finding other ore veins on the property is excellent because the geological setting in which the Eagle-Mike Vein occurs is repeated throughout the property. The 1969 drill results indicate that the Harris and Keays vein structures are not as persistent at depth or along strike as had been hoped from the surface exposures; however, there are many other vein structures on the property that should be explored, the main problem is the method of accomplishing this in such rugged topography.

First stage exploration should consist of extensive sampling over long exposures wherever possible of all vein structures that:

1. Are parallel to the Eagle-Mike.
2. Show great lateral and/or vertical persistence.
3. Are associated with dikes.
4. Have accompanying gouge or shear zones.

This work must include the use of a helicopter in order to explore the several vein showings that are inaccessible by other means.

From the surface work and mapping done to date the following continuing exploration program is recommended:

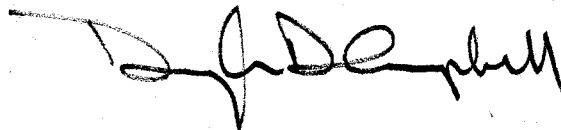
**RECOMMENDATIONS:**

1. **Reconnaissance vein examinations by helicopter.** Trace, map and sample all veins in the otherwise inaccessible parts of the property. Trace the known vein structures along strike by helicopter to check for continuity.
2. **Trenching:** Complete the Bonanza Peak road for access to the Ridge and View veins. Strip, trench and sample.  
  
Similarly, construct a road north from the Eagle Vein and strip the Sheep Showing.
3. **Drilling:** The diamond drill exploration of any vein showings should initially be by means of short, closely-spaced holes to provide dependable data regarding the trend of outcrop showings and the exact nature of the vein structure, (width, mineralization, alteration and presence of gouge and/or shearing).
4. Two shallow holes should be drilled at an elevation of 7000 feet in the creek above the Harris Vein to determine the potential of the Harris Showings in that area.



5. Eventually the comprehensive evaluation of the property must include the diamond drilling of every possible promising vein structure on the property, prioritized over the life of the mine. The priorities for this exploration should be based at least partially on the criteria for ore veins described in this report.
6. Expenditures by Day's Keays Mines Ltd. of \$17,930.27 on geological and topographical surveys of the Yedhe Creek claims are summarized in the Appendix 1 of this report. It is hereby recommended that these expenditures be applied for assessment credit on the five claim groupings as specified in Appendix 2.

Respectfully submitted,  
DOLMAGE CAMPBELL & ASSOCIATES LTD.



Douglas D. Campbell, P.Eng., Ph.D.

Vancouver, Canada.

**APPENDIX I**

APPENDIX I

STATEMENT OF EXPENDITURES

Wages

59½ man-days @ 48.45 (incl. holiday pay, contribution to Canada Pension Plan, Medical Plans, etc.) \$ 2,882.77  
(R. McCandless 59½ days Aug. 13/1969, intermittently through Jan. 5/1970).

Vehicle Transportation

On property Aug.-Dec. 1969 (70 hours @ 6.00) 420.00

Camp Costs

Food at 6.00 per man day (50 days) 300.00

Topographic Survey (Geological)

Map 1" = 400' (Invoices on file) 5,845.90

Topographic Survey (Road)

Map 1" = 1000' (Invoices on file). 6,561.00

Supervision and Geological Report

D.D. Campbell, P.Eng. Ph.D. 1,725.00

Typing, Secretarial, Reproduction, Drafting

225.60

TOTAL: \$17,930.27

Declared before me at the

*City*  
*Vancouver*, in the

Province of British Columbia, this *2nd*

of *April, 1970*, A.D.

*[Signature]*

*[Signature]*  
A Commissioner for taking Affidavits within British Columbia or  
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

DAVIS KEAYS MINES LTD.

SUPERVISION AND GEOLOGICAL REPORTS

SUPERVISORY PERSONNEL

			<u>Field Work</u>	<u>Reports &amp; etc.</u>	
<b>R.S. Adamson:</b>					
Invoice No.	737	3 days @ 100.00	300.00		300.00
	737	3 3/4 @ 100.00		375.00	
	880	1 @ 100.00		100.00	<u>475.00</u>
					<u>775.00</u>
 <b>Dr. D.D. Campbell:</b>					
Invoice No.	737	3 3/4 days @ 100.00		375.00	
	944	2 1/2 @ 150.00	375.00		
	944	1 @ 100.00		100.00	
	993	2 1/2 @ 100.00		250.00	
	1036	3 @ 100.00		300.00	
	1076	3/4 @ 100.00		75.00	
	1118	2 @ 100.00		200.00	
	1146	2 @ 100.00		200.00	
	1180	1 @ 100.00		100.00	1600.00
					<u>1975.00</u>

**A.J. Learmonth:**

Invoice No.	1180	1 @ 50.00		50.00	50.00
			<u>675.00</u>	<u>2125.00</u>	<u>2800.00</u>

Applied to Property re D.D. Campbell.

1725.00

Expenses:

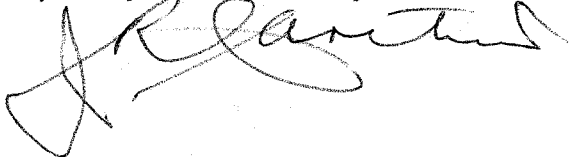
Invoice No.	737	64.60
	944	147.00
	993	255.38
	1036	62.40
	1076	16.50
	1118	21.10
	1146	29.82
		<u>596.80</u>

Applied to Property:

225.60

Summary of Supervisory and Expense charges from attached Invoices - supporting charges made for assessment work on Claim Groups for period covered by report of March 26th, 1970.

Prepaid by J.R.C. Arthur, Accountant.



May 1, 1969

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd.,  
#308 - 850 West Hastings Street,  
Vancouver 1, B.C.

Statement - CONSULTING SERVICES - April, 1969

FIELDWORK: R.S. Adamson (Apr. 9-11) - 3 days @ \$100. \$ 300.00

REPORTS & MEETINGS: R.S. Adamson & D.D. Campbell \$ 750.00

EXPENSES:

Drafting	\$45.00	
R.S. Adamson expenses	<u>19.60</u>	\$ <u>64.60</u>

TOTAL:- \$ 1,114.60

E & E O

727

For price 12/16/69

September 2nd, 1969.

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd.,  
#308-850 W. Hastings St.,  
Vancouver 1, B.C.

Statement  
CONSULTING SERVICES  
August 1969.

FIELDWORK: Property Map.

D.D. Campbell (Aug. 15-16) - 2 1/2 days @ \$150	\$ 375.00	△
R. McCandless (Aug. 13-22) - 10 days @ \$50	500.00	△

REPORT & MEETINGS: ( Map to be submitted in Sept. )

D.D. Campbell	100.00	△
R. McCandless	50.00	△

EXPENSES:

Aug. 13 - World Wide Travel	136.00	
Aug 14-16 - Dolmage, Campbell exps.	<u>11.00</u>	<u>147.00</u>

TOTAL: \$1,172.00

944

E & O E  
Encls.

*[Handwritten signature]*  
12/1/69

October 1st, 1969.

Mr. A. Charpentier, President,  
Davis - Keays Mines Ltd.,  
#308-850 W. Hastings St.  
Vancouver 1, B.C.

**Statement**  
**CONSULTING SERVICES**  
**September 1969.**

**FIELDWORK:** Mine geologist.

R. McCandless (Sept 4-30) - 27 days @ \$50	\$1,350.00 ✓
J. McLeod. (Sept. 30) - 1 day @ \$40	<del>40.00</del>

**REPORTS & MEETINGS:** ORE-HAUL REPORT

D.D. Campbell - 2 1/2 days @ \$100	250.00 ✓
H.O. Howey - 6 days @ \$100	<del>600.00</del>
J.D. Gunn - 1/2 day @ \$100	<del>50.00</del>
A.J. Learmonth - 8 1/3 days @ \$60	<del>500.00</del>

**EXPENSES:**

Wages - Drafting	15.00 ✓	
Aug. 8 - Sept. 7 - R. McCandless exp.	33.55 ✓	
Aug. 28 - S. Coats.	19.00 ✓	
Sept. 6 - World Wide Travel	136.00 ✓	
Sept. 10 - A.J. Learmonth exp.	2.00 ✓	
Sept. 12 - 6 copies @ 15¢ ea.	90 ✓	
Sept. 26 - 4 hrs. typing & compilation @ \$5	20.00 ✓	
Sept. 11 - Van Cal Reprod.	28.93 ✓	255.38

**TOTAL:** **\$3,045.38**

993

paid Dec 8/69

Mr. A. Charpentier, President,  
Davis-Kaays Mines Ltd.,  
#308-850 W. Hastings St.  
Vancouver 1, B.C.

October, 1969.

Invoice Date: November 4th, 1969.

FIELDWORK: Mine Geologists

R. McCandless (Oct. 1-3) - 3 days @ \$50	\$ 150.00
J.A. McLeod (Oct. 1-23) - 23 days @ \$40	920.00

REPORTS & MEETINGS:

D.D. Campbell - 3 days @ \$100	300.00
R. McCandless - 3 1/2 days @ \$50	175.00

EXPENSES:

Wages - Draughting:	\$10.00
Sept. 27- 58 Copies @ 15¢ each:	8.70
Oct. Van Cal Reproductions Ltd.:	6.45
Oct. 24 - J. McLeod expenses:	37.25
	<u>62.40</u>

TOTAL:

\$1,607.40

1036

*[Handwritten signature]*  
10/1/69

E & C E



Mr. A. Charpentier, Pres.,  
Davis-Kecys Mines Ltd.,  
#308 - 850 West Hastings Street,  
Vancouver 1, B.C.

Nov., 1969.

Invoice Date: Dec. 2, 1969.

REPORTS:

D.D. Campbell

\$ 75.00

R. McCandless

\$200.00

(Report to be submitted as soon as new topog. map is  
forwarded to us.)

EXPENSES:

November long distance

12.65

D.D. Campbell expense (long distance residence call)

3.85

\$ 16.50

TOTAL DUE:

\$291.50

E & O E  
Encls.

1076

38  
✓  
Jan 1/70

1st August, 1969.

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd.,  
#308-850 W. Hastings St.  
Vancouver 1, B.C.

Statement  
CONSULTING SERVICES  
June-July, 1969.

REPORTS, MEETINGS:

R. Adamson (June-July).

TOTAL:

\$100.00 ↗

---

880

E & O E

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd.,  
#806 - 1111 W. Hastings St.  
Vancouver, B.C.

December 1969.

Invoice Date: January 5th., 1970.

PROPERTY GEOLOGY: (Report and map to be submitted  
in January 1970).

D.D. Campbell (2 days):	\$200.00
R. McCandless (6 days):	360.00

EXPENSES:

Dec. - long distance charges:	<u>21.10</u>
-------------------------------	--------------

\$581.10

1118

40

PAID 10/70

E & O E

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd  
#806-1111 W. Hastings St.  
Vancouver, B.C.

January 1970  
February 3rd, 1970

GEOLOGY REPORT: Submitted Jan. 7th:

D.D. Campbell (2 days):	\$200.00	✓
R. McCandless (5 days):	300.00	✓

EXPENSES:

Jan. 7 - 3 hrs. typing and compilation @ \$5.:	15.00	
Jan. 5 - Van Cal Reproductions charges:	<u>14.82</u>	<u>29.82</u> ✓

TOTAL: \$529.82

200  
31500  
1482  

---

52982

1146

Feb 3rd 1970

41

Mr. A. Charpentier, President,  
Davis Keays Mines Ltd.,  
#806-1111 W. Hastings St.  
Vancouver 1, B.C.

Feb. 1970.

Mar. 2nd, 1970.

MEETINGS ETC: (Mc Intyre et al)

D.D. Campbell  
A.J. Learmonth

\$100.00

50.00

\$150.00

EXPENSES: Nil.

68

1180 ✓

# NORTHWEST SURVEY CORPORATION

AERIAL AND TERRESTRIAL PHOTOGRAPHY AND MAPPING

Telephone 403 - 453-1043

Telex: 037-2169

12918 - 127th Street  
EDMONTON 44, ALBERTA

DEC 15 1969

December 12, 1969

File 69-44

Davis Keays Mining Co. Ltd.,  
308, 850 West Hasting Street,  
Vancouver, B. C.

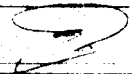
## STATEMENT OF ACCOUNT

TO: Supply Topographical map of Toad River, B. C.  
property at a scale of 400' = 1" with 20'  
contours as per our letter of November 27,  
1969

Our Fee

\$3,764.00

Invoice No. 96-69

DATE GOODS RECEIVED	
PRICES O. K.	
EXTENSION CHECKED	
O. K. FOR PAYMENT 	
	CODE



**OKANAGAN HELICOPTERS LTD.**

VANCOUVER AIRPORT, B.C.

TELEPHONE: 278-3502

TO

Davis-Keays Mining Company Limited  
P.O. Box 300  
Fort Nelson, B.C.

Date September 19, 1969

Invoice No. 9/83

AR 209

P.O. No.

Authority

To charter of Hiller FH1100 Helicopter CF-WMH  
Flying September 1, 7 & 8, 1969, as per  
attached reports

4 Hours 50 Minutes @ \$225.00 per hour \$1,087.49

4 Hours 35 Minutes @ \$215.00 per hour 985.41

Plus Fuel Purchased on your Behalf

45 Gallons @ \$.80 per Gallon \$36.00

Less Portion absorbed by Okanagan Helicopters  
Limited, as per a tariff rule 21(3)

27.00

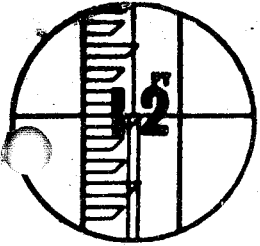
9.00

\$2,081.90

F/N

DUE & PAYABLE WITHIN 15 DAYS

DATE GOODS RECEIVED	Sept 19 1969
PRICES O. K.	J ✓
EXTENSION CHECKED	J ✓
O. K. FOR PAYMENT	[Signature]
	CODE



# NORTHWEST SURVEY CORPORATION

AERIAL AND TERRESTRIAL PHOTOGRAPHY AND MAPPING

GRAND PRAIRIE ALTA  
9922A RICHMOND AVE.  
TELEPHONE 403 532 5362  
TELEX 049 637

YELLOWKNIFE N.W.T.  
P.O. BOX 1409  
TELEPHONE 403-873-2082  
TELEX 037-4221

NOV 23 1969

WHITEHORSE YUKON  
P.O. BOX 1888  
TELEPHONE 403 668 2191  
TELEX 049-8224

Whitehorse, Y.T.  
2 September 1969.

## INVOICE FOR AERIAL PHOTOGRAPHS

WITH: DAVIS KEAYS MINES LTD. (N.P.L.)  
308 - 850 W. HASTINGS STREET  
VANCOUVER, B.C.

TO:	a) Stand-by for weather at Whitehorse to ensure 1969 snow-free coverage of road - 3 days	no charge
	b) To P.S. White travel Whitehorse - Ft. Nelson return for consultation with George Dvorak	no charge
	c) To ferry with CF-CLS, camera and 3 man crew	
	YQ - QH                    1.5 hours	
	QH - YE                    1.5 hours	
	YE - Mine - YE        3.25 hours	
	YE - QH <u>1.5 hours</u>	
	Total                        7.75 hours	

7.75 hours @ Tariff - \$175.00/hour                    \$ 1356.25

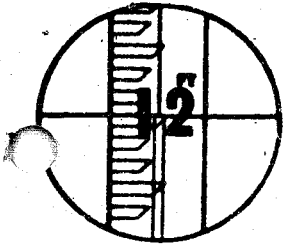
d) To aerial photography, processing, film shipment  
charges, telephone calls, 2 sets of prints                    393.75

TOTAL FEES                    \$ 1750.00

*Handwritten signature/initials*

OUR INVOICE NBR. 112-69W





# White, Hosford & Impey Limited

LEGAL SURVEYS - ENGINEERING - EXPLORATION SERVICES

GRANDE PRAIRIE, ALTA  
9922A RICHMOND AVE.  
TELEPHONE 403-532-5362  
TELEX 049-637

YELLOWKNIFE, N.W.T.  
P.O. BOX 1409  
TELEPHONE 403-873-2092  
TELEX 037-4221

WHITEHORSE, YUKON  
P.O. BOX 1888  
TELEPHONE 403-688-2191  
TELEX 049-8224

*Edmonton 453-1043*

Whitehorse, Y.T.  
5 September 1969.

1969

## STATEMENT OF ACCOUNT

WITH: DAVIS KEAYS MINES LTD. (N.P.L.)  
308 - 850 WEST HASTINGS STREET  
VANCOUVER, B.C.

TO: a) Supplying Minimal Ground Control for 3 Sections  
of road relocation on D.K. Mine access road as per  
manuscripts supplied to George Dvorak.

Crew

2 men - 5 days with overtime \$750.00

Transportation Pick-up truck  
500 miles @ \$0.20

100.00

4 days on job @ \$20.00/day

80.00

Subsistence

10 man days @ \$20.00

200.00

TOTAL GROUND SURVEY CHARGES

\$ 1130.00

b) Photogrammetric plotting of road, including  
making diapositives, resolving control, plotting,  
printing, communications, air express charges.

54 plotter hours @ \$17.50/hour

\$945.00

Misc. expenses above - at cost

236.00

\$ 1181.00

TOTAL JOB COST -----

\$ 2311.00

OUR INVOICE NBR. 115-69W

*OK JPK*

# NORTHWEST SURVEY CORPORATION

AERIAL AND TERRESTRIAL PHOTOGRAPHY AND MAPPING

Telephone 403 - 453-1043

Telex: 037-2169

12918 - 127th Street  
EDMONTON 44, ALBERTA

29100

December 23, 1969

File 69-44


Davis Keays Mining Co. Ltd.,  
806, 1111 West Hastings Street,  
Vancouver, B. C.

## STATEMENT OF ACCOUNT

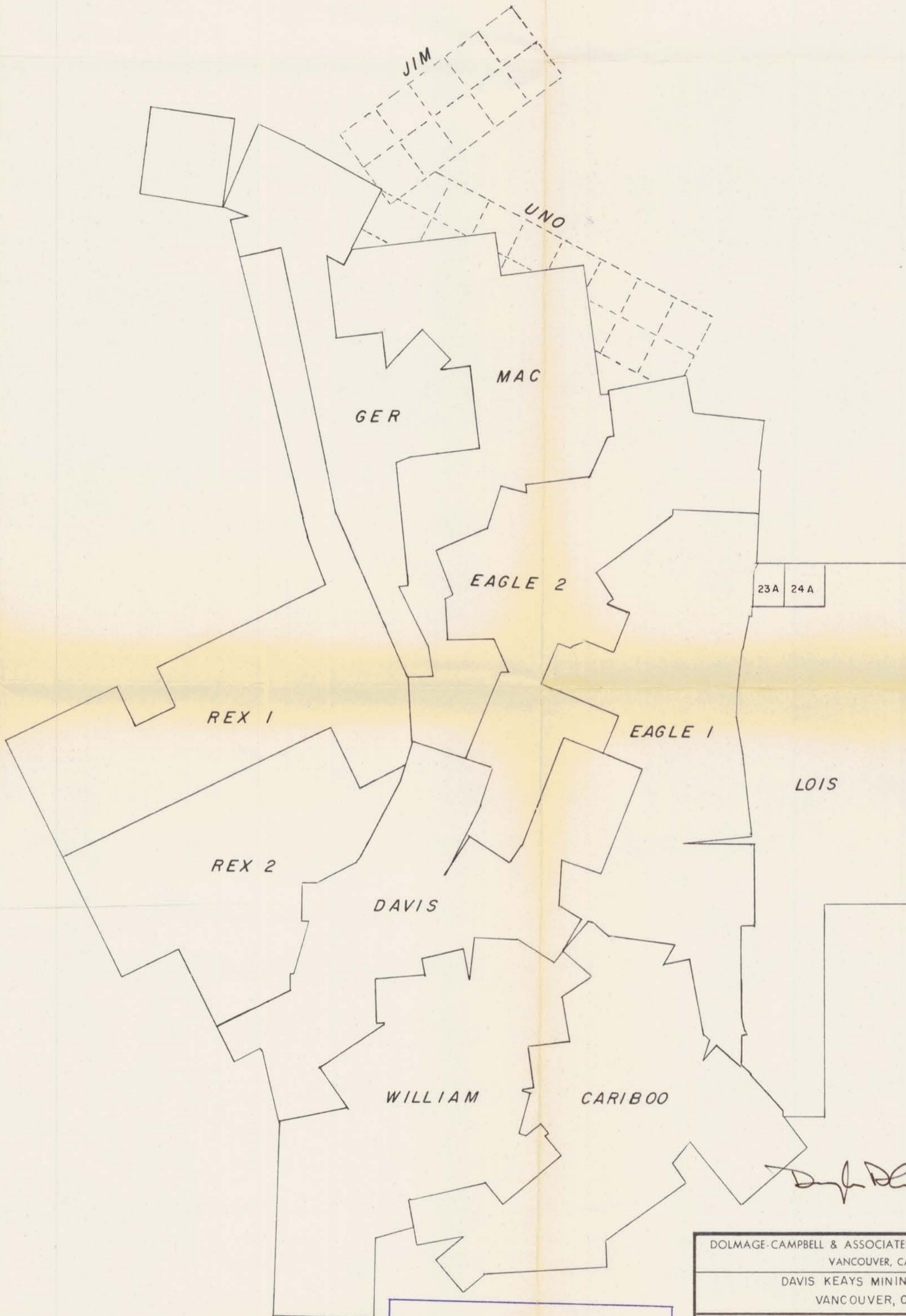
FOR: 1,000' = 1" mapping of Davis Keays  
Roads

Our Fee

\$2,500.00

DATE PAID	
RECEIVED	
PRICES O. K.	
EXTENSION CHECKED	
O. K. FOR PAYMENT 	
	CODE

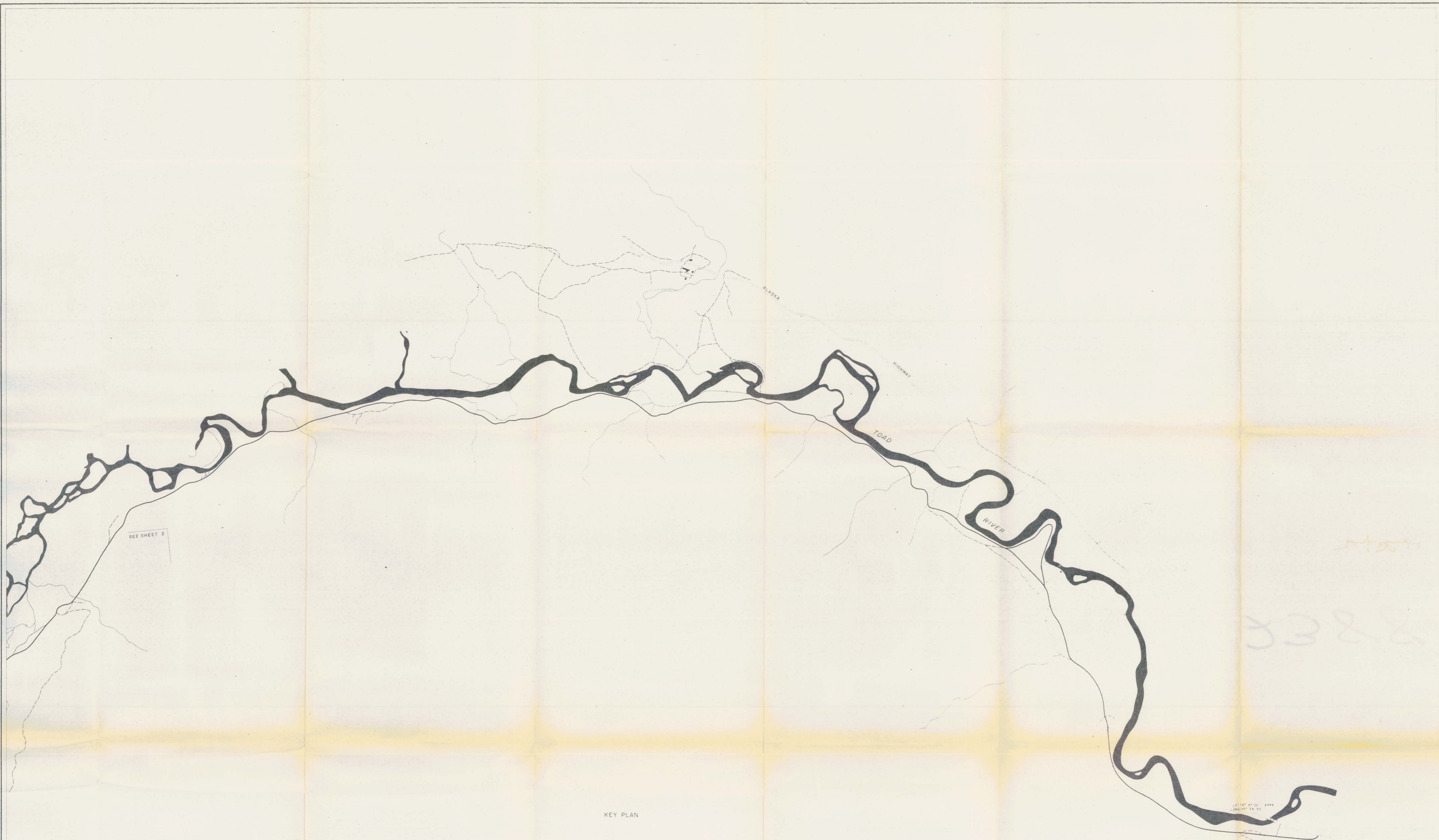
Invoice No. 104-69



EX 2388

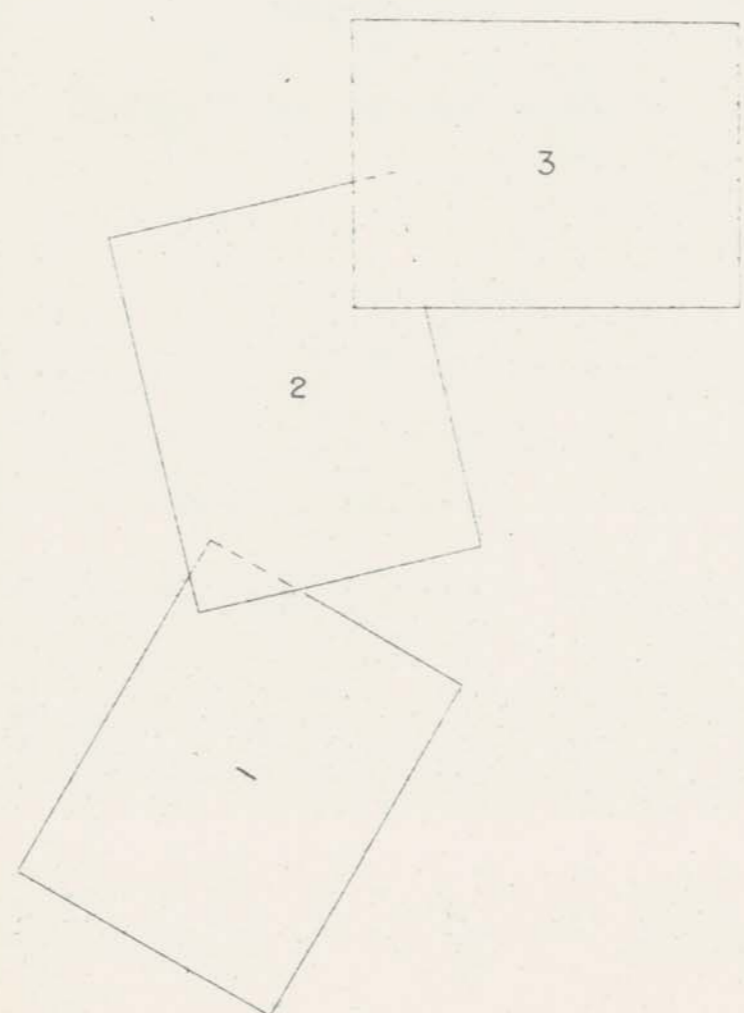
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **2388** MAP # **7**

DOLMAGE-CAMPBELL & ASSOCIATES VANCOUVER, CANADA		CONSULTANTS
DAVIS KEAYS MINING CO. LTD. VANCOUVER, CANADA		
YEDHE CREEK PROPERTY		
<b>PROPOSED GROUPING OF CLAIMS</b>		
SCALE: 1" = 1/2 mile	MARCH 1970	FIG. 70-7 (APPENDIX 2)



SEE SHEET 2

KEY PLAN



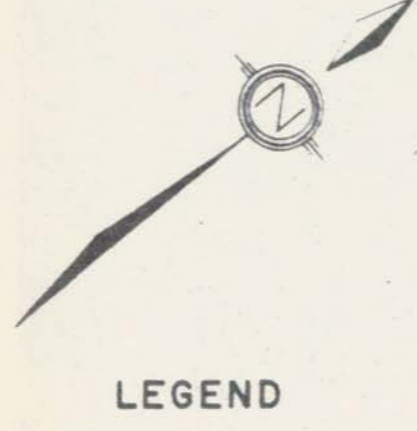
2388

2388

2388

Dough D. Duffell

Compiled by  
Northwest Survey Corp. Ltd.  
Edmonton, Grande Prairie, Yellowknife, Whitehorse



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2388 MAP #6

Highway  
Mine road  
Trail  
River  
Stream  
Intermittent stream

DAVIS KEAYS MINES LTD.  
TOAD RIVER AREA B.C.  
ROAD LOCATION PLAN  
SCALE 1"=1,000'  
Fig. 70-6  
DATE OF PHOTOGRAPHY JULY, 1969  
DATE OF MAPPING DECEMBER, 1969  
SHEET NO. 3

SEE SHEET 2



APPROXIMATE OUTLINE  
 OF FIG. 70-2 and 70-3 AS  
 SHOWN IN SCALE: 1" = 400'

Compiled by  
**Northwest Survey Corp. Ltd.**  
 Edmonton, Grande Prairie, Yellowknife, Whitehorse

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. **2388** MAP # **4**

**LEGEND**

--- Highway  
 --- Mine road  
 --- Stream  
 --- Intermittent stream

--- River

**2388**

*D. J. DePhill*

**DAVIS KEAYS MINES LTD.**  
 TOAD RIVER AREA B.C.

**ROAD LOCATION PLAN**  
 SCALE 1" = 1000' **Fig. 70-4**

DATE OF PHOTOGRAPHY JULY, 1969  
 DATE OF MAPPING DECEMBER, 1969

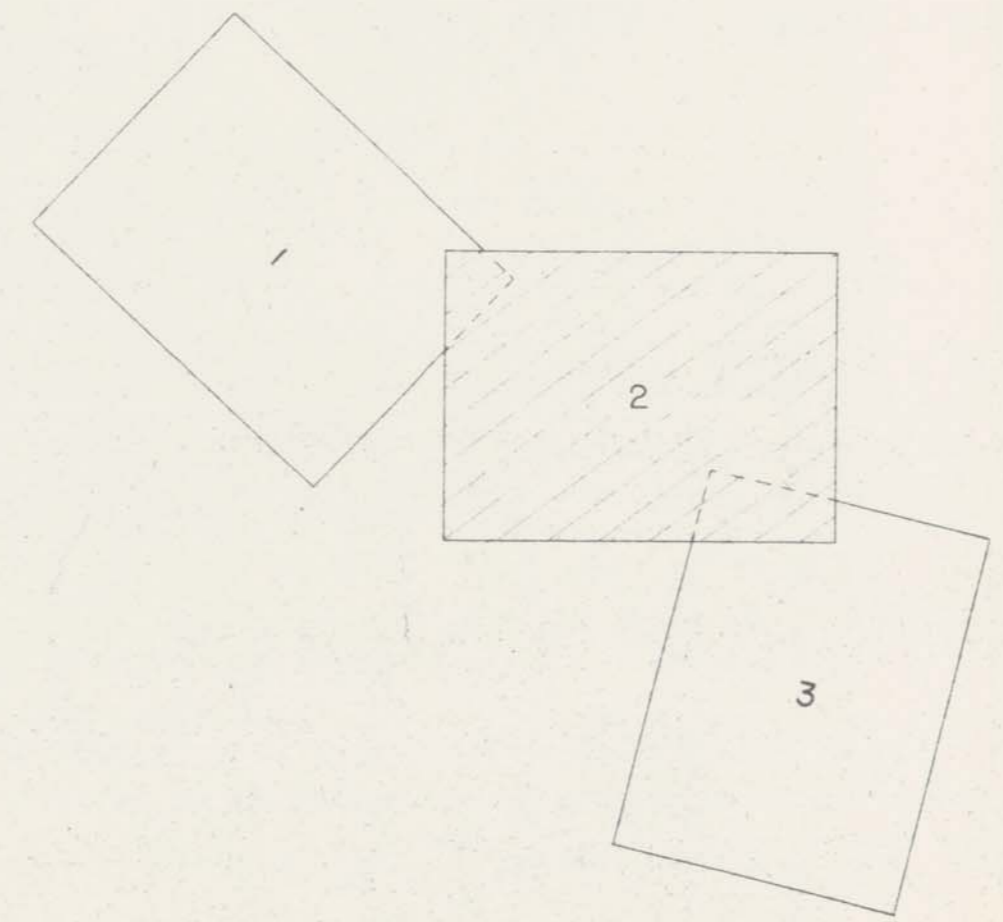
SHEET NO. 1



SEE SHEET 1

APPROXIMATE LOCATION OF AIRPORT

KEY PLAN

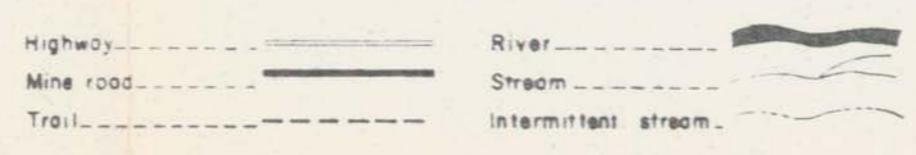


Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **2388** MAP #5

**2388**

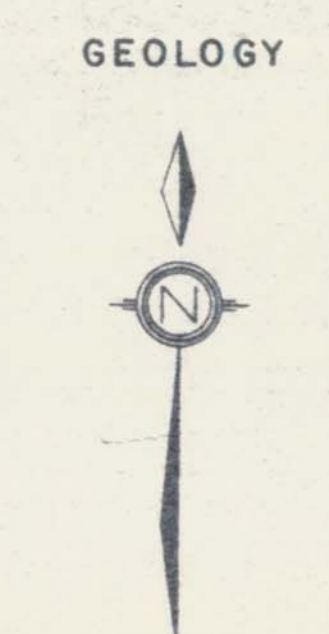
DAVIS KEAYS MINES LTD.  
TOAD RIVER AREA B.C.  
ROAD LOCATION PLAN  
SCALE 1"=1000'  
DATE OF PHOTOGRAPHY JULY, 1969  
DATE OF MAPPING DECEMBER, 1969  
SHEET NO. 2

LEGEND



Compiled by  
**Northwest Survey Corp. Ltd.**  
Edmonton, Grande Prairie, Yellowknife, Whitehorse.

*[Signature]*  
Fig. 70-5



STATION COORDINATES & BOUND ELEVATIONS

Station	North	East	Elevation
1	15,888.0	8,887.0	7,887.0
2	14,405.0	1,150.7	5,882.9
3	10,248.9	3,881.6	6,845.3
4	18,535.2	4,004.3	7,784.9
5	18,100.0	399.9	6,258.5
6	15,067.0	11,386.9	6,714.4
7	25,119.0	9,616.7	5,727.8
8	32,556.6	7,767.0	6,488.0
9	36,043.1	76,893.4	6,223.5
10	8,416.4	25,771.9	5,939.8
11	7,869.8	20,389.0	7,287.7
12	18,298.5	18,879.5	6,203.7
13	19,571.1	19,849.8	7,317.8
14	11,843.0	48,787.7	8,421.0
15	13,464.3	17,888.8	6,423.5
16	14,005.9	13,755.5	5,474.4
17	13,833.9	12,567.3	5,709.9

LIST OF ELEVATIONS OF UNITS IN THE AREA

Unit	Elevation	Target	Location
1	6,080	22	6,685 49 4,645
2	5,500	23	7,137 50 6,898
3	5,615	29	8,192 54 6,448
4	7,885	32	5,247 55 7,070
5	7,555	33	7,870 58 6,740
6	7,240	41	4,735 59 7,630
7	7,870	42	6,840 60 7,645
8	5,875	48	5,280 62 6,738

LEGEND

- Multiple folds:
- Bedding:
- Anticline:
- Slightly cleavage:
- Fault:
- Vein, mineralized:
- Vein, barren:
- Gabbro dike:
- River:
- Stream:
- Argillite:
- Scree & Overburden:
- Horizontal control:
- Drill hole:
- Spot elevation:

MAP SCALE  
0 200 400 600 800 1000 FT

CONTOUR INTERVAL 20

NOTE: HORIZONTAL & VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

DATE OF PHOTOGRAPHY JULY, 1969  
DATE OF MAPPING DECEMBER, 1969

SHEET INDEX

2388

Geology by  
R. G. McClelland  
Dalmage Campbell & Assoc. Ltd.

Compiled by  
Northwest Survey Corp. Ltd.  
Edmonton, Grande Prairie, Yellowknife, Whitehorse

Fig. 70-2

GEOLOGY



2388

STATION CO-ORDINATES & GROND ELEVATIONS

Station	North	East	Elevation
BP	15,888.0	19,857.0	7,885.0
1	7,405.1	7,156.7	5,882.8
2	19,248.9	3,651.6	6,845.3
3	18,335.2	4,013.3	7,754.5
4	31,101.1	1,951.9	6,556.6
5	18,528.70	11,395.9	6,744.1
6	25,119.0	5,816.7	6,273.3
7	32,656.6	12,187.9	6,498.0
8	30,243.1	26,893.8	6,703.5
9	13,210.2	20,089.0	6,778.2
10	5,416.4	25,171.9	7,439.8
11	7,889.6	20,535.0	7,257.1
12	18,298.5	16,875.5	6,303.7
13	19,571.1	19,949.8	7,311.8
14	11,543.0	6,879.7	5,421.0
15	13,464.3	17,868.6	6,403.2
16	14,008.9	15,755.5	5,874.4
17	13,939.5	12,567.3	5,709.8

LIST OF ELEVATIONS OF UNSURVEYED TARGETS

Target	Elevation	Target	Elevation	Target	Elevation
2	6,080	22	7,685	42	6,446
10	5,500	23	7,737	50	6,595
13	5,415	29	5,990	54	6,146
14	7,885	32	5,247	56	7,670
16	7,885	38	7,670	58	5,740
17	7,240	41	4,775	59	7,630
18	7,470	42	6,630	60	6,645
20	5,875	48	5,830	62	6,738

- LEGEND
- Multiple folds:
  - Bedding:
  - Anticline:
  - Syncline:
  - Slaty cleavage:
  - Fault:
  - Vein, mineralized:
  - Gabbro dike:
  - River:
  - Stream:
  - Argillite:
  - Scree & Overburden:
  - Horizontal control:
  - Drill hole:
  - Spot elevation:

MAP SCALE  
0 200 400 600 800 1000 FT  
CONTOUR INTERVAL 20'

NOTE - HORIZONTAL & VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPNEY LTD.

DATE OF PHOTOGRAPHY JULY, 1969  
DATE OF MAPPING DECEMBER, 1969

SHEET INDEX

Geology by  
R. G. McCordless

Damage Campbell & Assoc. Ltd.

Fig. 70-3  
Northwest Survey Corp. Ltd.  
Edmonton, Grande Prairie, Yellowknife, Whitehorse

