



PM 1-4 & MP 1-96 CLAIMS Y.Q.M.A.  
 STORMY MOUNTAIN MINERAL PROSPECT  
 SHEETS 105 F7 & 105 F10  
 UPPER SHEEP CREEK AREA  
 QUIET LAKE MAP SHEET  
 YUKON TERRITORY  
 Y93766-69 incl. & Y 36053-148 incl.



has been examined by the  
 Geological Evaluation Unit and is  
 recommended to the Commission  
 as a request for  
 20,000.00

Z. A. [Signature]

Section 5 of the Yukon Mining Act  
 and Regulations work under  
 the Mining Act

[Signature]

Commissioner of Yukon Territory

0 90 597



PM 1-4 & MP 1-96 CLAIMS Y.Q.M.A.  
 STORMY MOUNTAIN MINERAL PROSPECT  
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 Y93766-69 incl. & Y 36053-148 incl.



has been examined by the  
 Geological Evaluation Unit and is  
 recommended to the Commission to be  
 registered as a mineral prospect.

20,000.00

Z. A. M. A. Z.

Section 2 of the Yukon Mining Act  
 Considered in connection with work under  
 the Yukon Mining Act

Commissioner of Yukon Territory

0 90 597



REPORT  
OF  
1979 EXPLORATION PROGRAM  
OF

STORMY MOUNTAIN MINERAL PROSPECT  
UPPER SHEEP CREEK AREA  
QUIET LAKE MAP SHEET  
105F

FOR

RIO ALTO EXPLORATION LTD.  
CALGARY, ALBERTA

BY

PAUL S. WHITE, P. ENG., ( MINING)

10 October 1979

Whitehorse, Yukon Territory

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## INTRODUCTION

The molybdenum-tungsten skarn deposit known as the Stormy Mountain Property is located 12 miles east of Mile 98 South Canol Road and 36 miles south-easterly from Ross River, Yukon near the headwaters of Upper Sheep Creek ( $61^{\circ}29' 30''$  N and  $132^{\circ} 48' W$ ). The deposit is exposed on surface at 6,400' A.S.L. and in an adit at that elevation on the southerly slope of a 7,000' ridge. The property is accessible from Mile 837 Alaska Highway at Johnston's Crossing (80 miles south-east of Whitehorse, Mile 0 on the Canol Road). A 14 mile tote trail suitable for four wheel drive vehicles provides access from the Canol Road to the property. The claims are located on the boundary of Map Sheets 105 F7 and 105 F10.

## HISTORY

The original discovery was staked by Arnold Racicot, a prospector for ConWest Exploration Ltd. in 1955. The property was explored in 1958 by hand-trenching eleven trenches across the granodiorite-limestone contact by Racicot and disseminated molybdenum was encountered in the trenches. Four of the trenches gave assay results of 4.2% to 9.3% molybdenum.

Canol Metal Mines Limited of Toronto, Ontario was formed in September, 1958 to explore the prospect and spent two seasons 1959 and 1960 performing access road and camp construction, underground work and diamond drilling and a detailed geological survey. The work is described in "Report on Underground Exploration - Canol Metal Mines Limited - Stormy Group, Y.T." by W. E. Field, P.Eng., 1959 (Appencix 1). The work consisted of 1,050 feet of lateral drifting and cross-cutting, mostly below the flat-lying granodiorite-limestone contact and 3,460' of diamond drilling (A T X Core) from the underground workings. The drill core is stored in the south drift - 125' from portal.

The Canol work encountered three mineralized zones of interest.

- (1) A high grade (2-4% MoS<sub>2</sub>) pipe apparently limited to 1,000 tons located 100" inside the initial adit cross-cut.
  
- (2) A flat-lying deposit of approximately 15,000 tons of average thickness of 8.2 feet assaying 1.21% MoS<sub>2</sub>, calculated from weighted drill-hole assays believed to be conservatively low due to the friable nature of MoS<sub>2</sub> and the generally poor core recovery.
  
- (3) A second flat-lying deposit of approximately 17,000 tons of 1.05% WO<sub>3</sub> with an average thickness of 7.0 feet which is partially consistent with the MoS<sub>2</sub> deposit.

The diamond drilling is not believed to have exhausted the potential of the deposit, and the assay values utilized in the calculations by Field are believed unreliable and to err on the low side.

In 1967 and 1968, a Vancouver-based company (Jason Explorers Ltd.) performed surface trenching, prospecting, geochemical sampling and geological mapping on the property. Four new molybdenum occurrences were discovered by trenching but no new economic deposits were located. The work is described in two reports filed to cover representation work by Alex Smith as Field Engineer in 1967 and 1968.

The property remained in good standing until 1975, when it was permitted to lapse. Marvin Sherman, A Whitehorse prospector, staked it as the PM 1-4 group in September, 1975. In 1976 R. Gifford, P. Eng., performed a geological and geophysical reconnaissance survey using the slight radioactivity of the contact zone mineralization as a useable prospecting variable.

In 1977 Noranda Exploration Ltd. performed a geological reconnaissance and minor geochemical program on the prospect. In March of 1979 Rio Alto Exploration Ltd., of Calgary, Alberta, entered into a preliminary agreement with M. Sherman to option the property for 1979 exploration. Rio Alto staked 96 new claims surrounding the optioned group (PM 1-4) (Appendix Map 2).

### GEOLOGY AND DEPOSIT TYPE

The geology of the district has been described by Wheeler, Green and Roddick of the Geological Survey of Canada and their Map 7 - 1960 of the Quiet Lake map sheet is included herewith as Appendix Map 3. R. Skinner of the Department of Mines and Technical Surveys-Canada, reviewed the nature of the deposit in Paper 61-23, Mineral Industry of Yukon Territory and Southwestern District of Mackenzie - 1960, included with this report as Appendix "A". A. J. Schmidt reported an unpublished thesis for a Bachelor of Applied Science degree at the University of British Columbia in April, 1961, after employment with Canol Metal Mines Ltd. at Stormy Mountain in 1960. His thesis, entitled "The Stormy Mountain Molybdenum Prospect of Canol Metal Mines Ltd., Yukon Territory", is not included in this report, due to its length and detailed examinations of mineralogy and petrology.

The deposit itself is described by Skinner as a molybdenite showing at the north contact between a large granodiorite stock and the Middle and Upper Cambrian limestone and phyllite. The contact is conformable with the bedding of the overlying limestone and phyllite. A skarn zone is present in the limestone near the contact with the granodiorite. This zone is about 20 feet thick where the bedding is flat-lying from 75 to 250 feet northeast of the adit portal and dips approximately 40° to the southwest to the southwest of the adit. The molybdenum sulphide grade varied from 0.68% along 22 feet of

skarn in the contact to 8.4% in over 12 feet in the granodiorite adjacent to the skarn contact. The adit was driven under the flat-lying skarn zone encountered in original surface trenching and only cut the molybdenum mineralization in a high grade pipe-like body from 95 to 120 feet inside the access adit and its grade is estimated by Field to be 2.27% MoS<sub>2</sub> from 110 tons of muck samples and by Skinner and the prospector Racicot to be in excess of 4% MoS<sub>2</sub> in the pipe itself.

Tungsten in the form of scheelite and powellite is present in both the skarn zone and in the granodiorite near the contact and is of higher grade in the skarn zone as reported by Field and Schmidt. Numerous small faults have slightly displaced the mineral deposit, and the diamond drilling did not preclude the possibility of extension zones to the known deposit bodies, faulted off bodies further in to the Stormy Mountain than penetrated by the adit or drilling therefrom, or the presence of other bodies indicated by the 1967-1968 prospecting and trenching of Jason Explorers Ltd.

#### ECONOMICS OF DEPOSIT

The known molybdenum-tungsten mineralization of the Stormy Mountain deposit has remained undeveloped to date because of the small size of the known bodies, combined with relatively low prices for molybdenum and tungsten over much of the period 1955 to 1975. Dramatic increases in prices of both metals has occurred in the recent past, and a current two-year shortage of molybdenum is forecast due to a variety of factors. The current producer listed price of MoS<sub>2</sub> concentrates is \$9.50-\$11.50 U.S. (\$11.05-13.75 Cdn) per lb. contained Mo in a 50-60% MoS<sub>2</sub> concentrate and current spot prices range from \$29.00 (Cdn) to \$32.56 (Cdn) per lb contained Mo in a 50-60% MoS<sub>2</sub> concentrate. The following table illustrates the gross value of MoS<sub>2</sub> for the two known Stormy Mountain deposits with a range of values and grades to suite the variable prices of spot metal marketing and

ASSAY RESULTS

FROM "CHANNEL AND GRAB SAMPLES"

AT STORMY MOUNTAIN, SEPTEMBER 1979

ZONE B

1. Surface Moly - (Grab typical)  
Granite with Finely Disseminated Moly-0.625% Mo  
(not repres.)
2. Surface Moly High Grade Showing - 8.5% Mo (Typical)

ZONE A

3. Y Centre Adit Wall Shear (Adit Stub)  
(Channel) 5'-6' wide = 1.40% Mo  
(2.32% MoS<sub>2</sub>)
4. Y North Draft (Across Back)  
Samples A & B (combined) = 2.60% Mo  
(Channel) 8'-10' wide (4.32% MoS<sub>2</sub>)
5. Adit Y entrance - 6' at Sprag Cap Header- 4.85% Mo  
(Channel) 8'-10' wide (8.05% MoS<sub>2</sub>)

(Factor = 1.66 (MoS<sub>2</sub>VsMo))

ZONE A AVERAGE

Average (Arithmetical) = ( 4.90% )  
Assay Mean Samples 3 - 5 ( MoS<sub>2</sub> )

the possibility of varying mining production grades of MoS<sub>2</sub> which can be expected to differ from the original diamond drill core values.

Experience with MoS<sub>2</sub> in production mining generally results in increases of assay values for mined material compared to values obtained from drill holes, especially where the drill core material is fractured and ground up in the drilling process. High grade molybdenum deposits are especially vulnerable to loss of friable molybdenum in drilling through flotation of the sulphide mineral out of the drill hole in circulating drill water with drill rod grease as the carrier reagent. W. E. Field's evaluation of 15,000 tons of 0.73% Mo (1.21% MoS<sub>2</sub>) is postulated to be up to 50% low, although he does qualify his postulation with the possibility of contamination by MoS<sub>2</sub> resulting in higher values than may prove to be present on mining.

Examination of the high grade zone 95' inside the adit portal Zone A and the Zone B surface outcrop 125' from the adit portal were channel sampled and assayed in September 1979 by P. S. White, P. Eng. Careful review of the written reports and examination of the deposit(s) raise the distinct possibility that the ore body is reasonably continuous from surface to adit and that Field's 1959 drill results were of such poor recovery and assay value reliability that mining and shipping from the deposit from surface is required to properly assess the small economic deposit for continuity and reserves unknown with potential assay cut-off imminent at all times.

Preliminary assay results from five sample areas are shown in the accompanying summary table.

The opinion of the author, after examination of adit Zone A, Surface Zone B and a significant portion of the drill core after de-icing, is that the deposit is economic for immediate small scale mining and concentration to 50-60% MoS<sub>2</sub> with the object of extracting 20-50,000 tons of in situ ore.

TABLE I

GROSS VALUES - STORMY MOUNTAIN PROBABLE RESERVES (CONTAINED MOLYBDENUM)

DEPOSIT A - ADIT PIPE - ESTIMATED AT 1,000 TONS (W.E. FIELD - 1959) (Prices Effective 5 October 1979)  
(P.S. WHITE - 1979) (Placer Dev. Corp.)

GRADE % MoS <sub>2</sub>	Mo Contained LBS./TON	CURRENT PROD. PRICE			CURRENT MERCH. PRICE
		GROSS VALUE @ \$12.15/lb(Cdn)	GROSS VALUE @ \$20.00/lb(Cdn)	GROSS VALUE @ \$25.00/lb(Cdn)	GROSS VALUE @ \$32.56/lb(Cdn)
2.27%(bulk 110 ton sample)	28.4	\$345,060.	\$ 570,000.	\$ 710,000.	\$ 924,705.
3.0	37.5	455,625.	750,000.	937,500.	1,221,000.
3.5	43.75	531,562.	875,000.	1,093,750.	1,424,500.
4.0	50.0	607,500.	1,000,000.	1,250,000.	1,628,000.
4.5	56.25	683,437.	1,125,000.	1,406,250.	1,831,500.
5.0	62.5	759,375.	1,250,000.	1,562,500.	2,035,000.
		<u>PRODUCER PRICE</u>			<u>MERCHANT PRICE</u>

DEPOSIT B - FLAT LYING DEPOSIT - ESTIMATED AT 15,000 TONS BY W.E. FIELD - 1959

GRADE % MoS <sub>2</sub>	Mo Contained LBS./TON	PRODUCER PRICE			MERCHANT PRICE
		GROSS VALUE @ \$12.15/lb(Cdn)	GROSS VALUE @ \$20.00/lb(Cdn)	GROSS VALUE @ \$25.00/lb(Cdn)	GROSS VALUE @ \$32.56/lb(Cdn)
1.21%(Field) (Drill)	15.1	\$2,751,975.	\$4,530,000.	\$5,662,500.	\$7,374,840.
1.5%	18.75	3,417,187	5,625,000.	7,031,250.	9,157,500.
1.75%	21.88	3,987,630	6,564,000.	8,205,000.	10,686,192.
2.0%	25.0	4,556,250.	7,500,000.	9,375,000.	12,210,000.
3.27%	28.4	5,175,900.	8,520,000.	10,650,000.	13,870,560.
3.5%	43.75	7,929,697.	13,125,000.	16,406,250.	21,367,500.
4.0%	50.0	9,112,500.	15,000,000.	18,750,000.	24,420,000.
4.5%	56.25	10,251,563	16,875,000.	21,093,750.	27,472,500.
5.0%	62.5	11,390,625.	18,750,000.	23,437,500.	30,525,000.
		<u>PRODUCER PRICE</u>			<u>MERCHANT PRICE</u>

EXPLORATION PROGRAM - 1979

The following phases of exploration assessment of the property have been undertaken with results summarized in the Appendices to this Report.

- 1) Property Examination for Planning - July 1979.
- 2) Engineering Surveying and Line Cutting (50km<sup>±</sup>) and 400 m spacing over overburden areas - September 1979.
- 3) Conventional Prospecting of MP and PM claims - September 1979.
- 4) Soil Sampling and Assaying at 50 m intervals on 100 m spaced lines - September, October 1979
- 5) De-Icing and Removal of 20-100 tons of caved debris in adit with retimbering where necessary - September 1979.
- 6) Channel Sampling of Zone A underground to verify or determine approximate values of Zone A as MoS<sub>2</sub>.
- 7) Bulk Sampling of 600 - 1500 lbs of Zone A for mill testing - October 1979.
- 8) Sampling of surface outcrop of Zone B to justify further surface sampling.

The following crew personnel performed the above functions:

P. S. White, P. Eng.	Supervisory Engineer
G. Lietke	Examining Geologist
T. McRory (4 man Crew)	Adit Restoration
M. Barker (3 man Crew)	Survey Control
B. MacDonald (5 man Crew)	Line Cutting and Soil Sampling

P. S. White & M. Cloutier

M. Cloutier

Placer Development Lab  
(Vancouver, B. C.)

John Witham

Bulk Samplers

Prospector

Bulk Sample Mill Testers

TNTA Bell 206 Pilot

CERTIFICATE OF EXPENDITURES

I, Paul S. White, Professional Mining Engineer, of the City of Whitehorse in the Yukon Territory, do herewith certify that I have expended the following funds in the total amount of \$300,000.00, under my direct supervision and control.

PM 1-4 M.C.S.


MP 1-96 M.C.S.

all located on Map Sheets  
105F7 and 10

Watson Lake Mining District,  
Yukon Territory

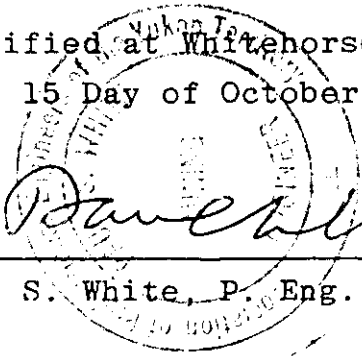
Line Cutting and Engineering	
Surveying	\$ 15,000.00
Soil Sampling, Prospecting and Rock Sampling	20,000.00
Underground Adit Restoration	20,000.00
Helicopter Transport	15,000.00
General Camp Support Costs	15,000.00
Supervision, Field Management and Miscellaneous Yukon Overhead	20,000.00
Mill Testing	5,000.00
	<hr/>
Subtotal (Yukon Field Cost)	\$110,000.00
	<hr/>
Plus Rio Alto Exploration Ltd. (Calgary) Travel and Administration	\$ 16,000.00
	<hr/>
TOTAL 1979 EXPENDITURES:	<u>\$126,000.00</u>

Certified at Whitehorse, Y.T.  
This 15 Day of October A.D., 1979.

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Paul S. White, P. Eng.



STORMY MOUNTAIN PROJECT

PRELIMINARY BUDGET RECOMMENDATIONS FOR 1980

1.	Restoration of Adit, Track and Mining Equipment Facilities for Production Mining	\$ 50,000.
2.	Bull Dozer Work to Upgrade 14 mile Access Road and to construct tote road from camp site to adit portal and surface showing	75,000.
3.	Mining of selected high grade portions of Zone A and B. 15,000 tons @ \$200/ton	300,000.
4.	Concentration on site to 50-60% (minimum) MoS <sub>2</sub> Concentrate at preliminary estimated cost	250,000.
	General Support of Camp, Transport, Supervision and administrative costs	125,000.
	Allowance for Production Contingencies	200,000.
		<hr/>
	TOTAL PRELIMINARY ESTIMATED 1980 PRODUCTION BUDGET	\$1,000,000. <hr/> <hr/>



## ASSESSMENT REPORTS

MAP No. 105-F-10 TYPE OF WORK: Underground Exploration

REPORT FILED UNDER	Canol Metal Mines Ltd.	060692
DATE PERFORMED	summer 1959	DATE FILED: Nov. 1959
LOCATION - LAT.	61°31'N	Stormy Mt., area, Yukon
LONG.	132°50'W	
CLAIM Nos.	Stormy 1-24, Y19310-33;	
WORK DONE BY	W. E. Field	
WORK DONE FOR	Canol Metal Mines Ltd.	
REMARKS	1050' of lateral underground work carried out as well as 3460' of drilling to test the contact above the adit. All samples, especially DDH samples, are taken to be unreliable. Muck samples assayed 1.37% Mo (2.77% MoS <sub>2</sub> ) from a 25' diameter pipe. Tungsten (scheelite) is associated with the MoS <sub>2</sub> , especially in the Skarn Zone.	

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## PURPOSE OF REPORT

The purpose of this report is to describe the work carried out during the summer of 1959 and to detail the results obtained.

No attempt will be made to outline the history of the mineral claims, or to comment on such factors as location, accessibility, topography and climatic conditions. These details may be obtained from previous reports of examining engineers.

## SUMMARY AND CONCLUSIONS

An adit was driven into the side of Stormy Mountain at an elevation generally lower than the potential ore zone, and a considerable amount of drifting, crosscutting, and underground diamond drilling was carried out. Molybdenite mineralization was encountered for the most part over a relatively large area near the contact of a granite mass and limestone which overlays it. No orebody was found which would be of sufficient size and grade to be commercial.

The following conclusions were reached:

1. The deposit is of the contact metamorphic type.
2. The granite-limestone contact over most of the area explored is almost horizontal.
3. The widths of the potential ore zone were exaggerated in appearance in the eleven trenches which were previously dug on the slope of Stormy Mountain.
4. Molybdenite occurs mainly in a "dioritic" phase of the granite which is at the top of the granitic mass and adjacent to a garnet-epidote skarn zone.
5. Some molybdenite occurs in the skarn zone which represents the lower altered side of the limestone beds.
6. Molybdenite occurs in small quantities at many scattered locations in the granite itself. The ore grade occurrence in the granite in the initial adit crosscut appeared to be an isolated occurrence.
7. Indicated tonnage of ore grade material for molybdenum is too small to warrant exploitation.
8. Nearly all the molybdenite bearing rock contains tungsten in the form of scheelite or powellite but again no commercial tonnage of ore grade material is indicated.

## FREIGHTING

Preparations for the underground exploration of the Stormy claims were commenced in January, 1959. During January and February all major equipment and supplies were purchased in Vancouver and shipped by water and rail to Whitehorse.

During February seven insulated plywood cabooses were built in Whitehorse. These were eventually loaded with freight and hauled intact to the property.

The cabooses and equipment and supplies were transported to the property by MacIsaac Construction of Whitehorse, who used trucks to Johnson's Crossing, tractor drawn sleighs to within a mile of the campsite, and a steel go-devil for the final and most difficult mile. Freighting took from the middle of March to the middle of May, a period of two months, and a total of 128 tons were moved.

## CAMP LAYOUT

The seven cabooses were set up on a fairly level area about 400 feet below the showing using one for an office, two for sleepers, one for kitchen, one for dining room, one for washroom, and one for a storeroom. In addition a compressor building, a machine shop, a sample grinding house, a powder magazine, a fuse and cap house, and three tent frames were constructed on the site.

Camp water supply came from a spring which fed a water hole located uphill from camp, and which overflowed to form a small stream running through the camp yard.

Sewage was discharged down the mountain below the camp.

## PREPARATORY WORK

Power was supplied by a Victor Coventry Diesel 10 KW lighting plant set on concrete in the compressor building.

Compressed air was supplied by a C.I.R. 315 Gyroflow compressor, later augmented by a C.I.R. 600 Gyroflow compressor, both located at camp.

A 3" aluminum compressed air line was run from camp to the adit site, a distance of 1600 feet angling up the side of Stormy Mountain.

A single drum reversible 5 x 6 air hoist was installed below the adit site and a 465 foot long trestle mounting 20 lb. rail was built up the slope to the site. All servicing was done with a flat car operating on this trestle.

## UNDERGROUND WORK

The adit was driven using O.I.R. JR38 Jackdrills, Carset tapered socket jackbits, and corresponding drill steel. Mucking was done with an Eimco 12-B loader and tramming with 26 cu.ft. side dump mine cars hauled by an Eimco 401 air locomotive. Track gauge was 16 inches.

Water supply for drilling came from melting snow higher up the mountain which made water from June to the end of September. Water from this snow was dammed up and led by gravity through plastic pipe to the portal. Air pressurized water tanks were used for actual drilling.

The adit was collared in frozen talus rock on June 13th, and between that date and September 24th a total of 1,050 feet of lateral work was carried out. Contract price for labour was \$11.50 per foot and the average advance per 8 hour crew-shift was 7.0 feet. Two shifts per day were operated for most of the period.

All underground work was on the Stormy No. 5 Mineral Claim. The initial adit crosscut went 146.0 feet straight into the mountain. This was followed by 663.7 feet of drifting and crosscutting east of this point, and 240.3 feet of drifting to the west or north-west.

The original intention was to drift on the favourable granite-limestone contact, represented specifically by the contact of the "diorite" with a garnet-epidote rock. This contact was at first believed to dip into the mountain from the trenches and for this reason the adit was collared well below the surface exposure of the contact. It developed later that the contact, in the area of the trenches, lay almost horizontal and only dipped down to the south-west to reach adit elevation to the west of the initial crosscut.

As a result of the attitude of the contact there were only 155 feet of the west drift actually on the contact, and all the drifting and crosscutting to the east was basically for the purpose of establishing diamond drill stations.

## DIAMOND DRILLING

Drilling was carried out using a Boyles JVA machine recovering AXI core. Water supply for the drill had to be conserved, and all drill water collected and re-circulated.

A total of 3,460 feet of drilling was completed in 36 holes. Of this 719 feet were in 4 flat holes probing for the contact, 102 feet were in 2 down holes testing the ore occurrence in the initial adit crosscut, and the remaining 2,639 feet were in 30 up holes to test the contact itself.

### SAMPLING

All samples were crushed and pulverized on the property and shipped for assay as pulps.

Muck samples were taken throughout the underground headings and face, wall and back chip samples taken where warranted.

All diamond drill core was split and sampled through the "diorite" and skarn zones and for most of the holes sludge samples were collected for corresponding sections.

(All diamond drill samples are considered to be unreliable.) The molybdenite is soft and friable and easily ground up, and core samples no doubt tend to be low. For sludge samples a certain proportion of the molybdenite actually floats on the sludge water using rod grease as reagent, and salting of samples also occurs by molybdenite coming from the walls of a hole at sections other than the one being sampled. These conditions make for inaccurate sample results which results might be too high or too low.

### ECONOMIC GEOLOGY

Most lateral work was in granite except as previously noted there was 155 feet of the west drift which followed the "diorite"-skarn contact.

The contact as explored was a narrow zone with the "diorite" generally only a few inches in width, and the garnet-epidote skarn varying up to only a few feet in width. The same zone as indicated by the trenches and the diamond drill hole intersections to the north-west of the trenches showed widths up to 35 feet. Best molybdenite mineralization appears to occur where the zone of alteration is the widest. The molybdenite mineralization in the portion of the contact seen in the west drift was spotty and erratic, occurring disseminated in both the "diorite" and the skarn. Individual high grade specimens were found but the muck samples showed no possibility of the presence of ore grade material.

Occasional flecks of molybdenite were seen at scattered locations in the granite, usually associated with a fine grained aplitic granite sometimes appearing to be in the form of dykes.

Ore grade material was encountered in a fracture zone in the granite in the initial adit crosscut. This zone has the shape of a pipe some 25 feet in diameter and located about 15 feet below the contact where it dips down to the south-west. Muck samples from the section of the adit passing through this zone assayed 1.57% Mo ( $2.27\% \text{MoS}_2$ ) for 110 tons. The zone probably extends upwards to the contact or to the surface under the contact, but two drill holes put down under it failed to show any downward extension. Even if it extended downward it would not be important with the known small area it has. The occurrence probably contains no more than 1,000 tons and available evidence suggests that it is an isolated occurrence.

Of the 30 diamond drill holes drilled up to the contact one was in a fault and one was entirely in granite. Of the 28 remaining holes which passed through the contact zone or at least passed out of the granite there were only two holes containing intersections which could be regarded as being of ore grade. These were U7 and U8.

The following tabulation shows all diamond drill hole intersections with core sample assays over 0.10% Mo. Core lengths in most cases represent true widths.

Hole No.	%Mo	Core Length	Hole No.	%Mo	Core Length
U3	0.44	12.5	U15	0.75	2.5
U7	2.08	8.6 ✓	U21	0.15	5.3
U8	1.15	19.1 ✓	U31	0.15	17.5
U9	1.52	0.4	U32	0.25	6.0
U10	0.52	2.0	U35	0.48	7.5
U13	0.40	10.0			

Disregarding U13 and U35 as being isolated from the others at the east end of the area, and calculating with assays from the other 9 holes one can arrive at an average weighted assay of 0.75% Mo, an average width or thickness of 8.2 feet, and a relatively flat area covering 18,000 square feet.

The above figures indicate an available tonnage of 14,760 tons assaying 0.75% Mo. This could not be extracted economically and is not commercial.

The writer's opinion is that the actual grade would be higher than shown by the samples but even an increase of 50% would not change the overall picture.

Tungsten was found to be associated with the molybdenum and either scheelite or poxellite are present almost everywhere that molybdenite is visible. Drill hole samples were all assayed for  $WO_3$  and the following tabulation shows all diamond drill hole intersections containing assays of over 0.10%  $WO_3$ .

Hole No.	% $WO_3$	Core Length	Hole No.	% $WO_3$	Core Length
U3	0.53	5.5	U8	1.00	9.0
U7	2.44	5.2	U8	0.37	2.3
U8	4.46	8.4			
U9	0.24	4.5	U12	1.33	3.3
U21	0.86	14.3	U15	0.67	4.0
U31	0.19	18.5	U20	0.68	4.5
U32	0.21	6.0	U35	0.56	2.0

Calculating with the assays from U2 and U6 one can arrive at an average weighted assay of 0.87%  $WO_3$  and an average thickness of 5.6 feet over an area of 2,000 square feet representing a tonnage of 1,120.

Similarly for holes U3, U7, U8, U9, U21, U31 and U32 the average assay would be 1.12%  $WO_3$ , the average thickness 9.3 feet, and the applicable area would be 13,000 square feet or representing 12,090 tons.

For holes U12, U15, U20 and U30 the average assay would be 0.90%  $WO_3$ , the average thickness 3.4 feet, and the tonnage figure would be 3,620.

Combining all of the above one could speculate on the presence of 16,830 tons averaging 1.07%  $WO_3$  and contained in a deposit with an average thickness of 7.0 feet.

In view of the small tonnage, the isolated location, and the milling difficulties associated with tungsten there is no doubt that the above material cannot be considered as ore at this time.

The value per ton based on molybdenum values and that based on tungsten values cannot be added directly together for a total value since the core sections containing molybdenum do not coincide exactly with the sections containing tungsten. Also the portions of the contact zone which contain significant molybdenum values do not coincide with the portions which contain tungsten.

### CONCLUSIONS AND RECOMMENDATIONS

The work carried out was extensive enough to give the showing a fair test and the twenty four Stormy claims are in good standing until May, 1966.

No orebody of economic significance was discovered by virtue of the underground work carried out this year.

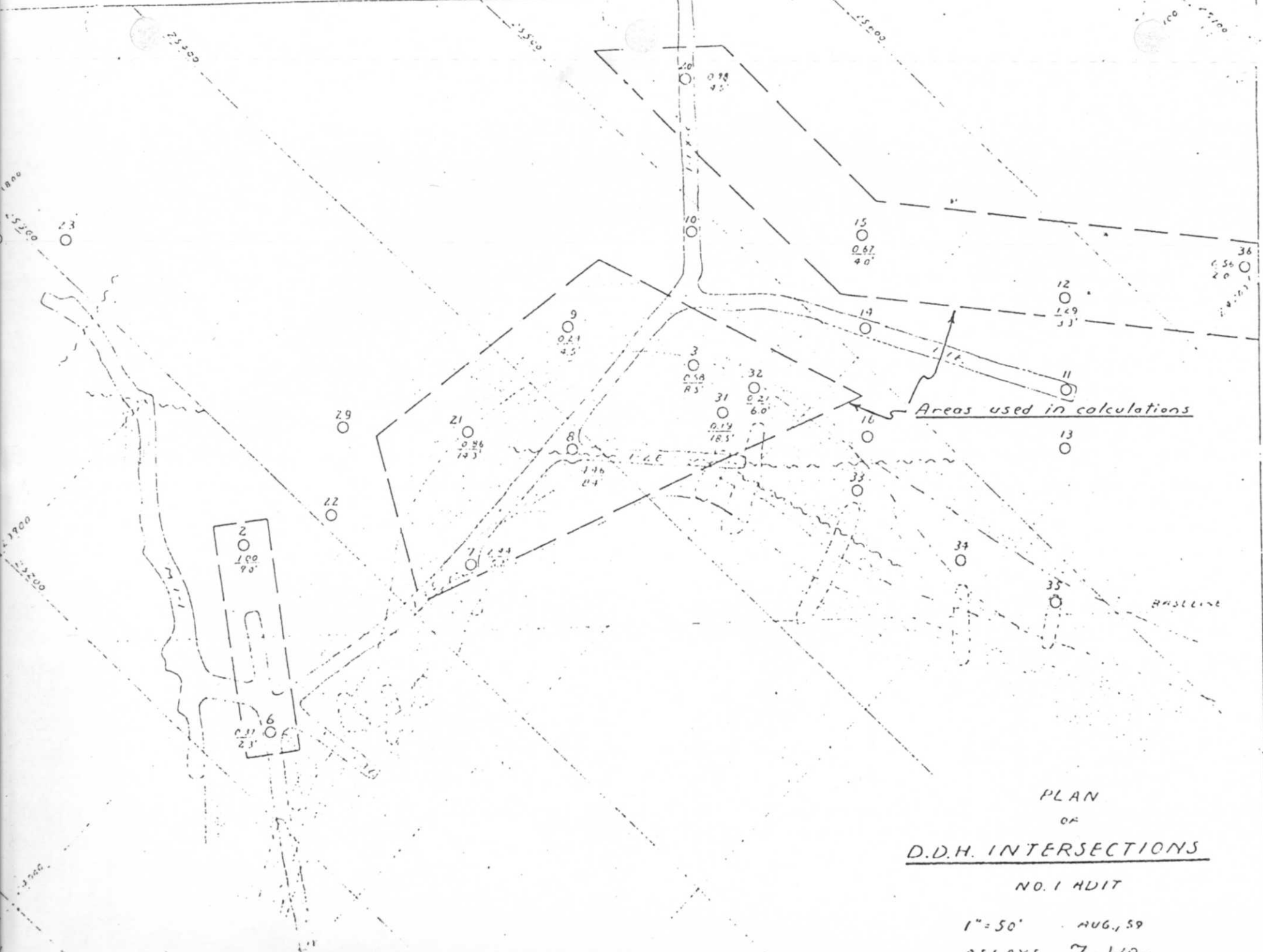
The property has sufficient merit to warrant further study.

It is recommended that:

1. One cabin be left on the campsite for future use.
2. A limited amount of prospecting be carried out on the claims, especially on the top and opposite side of the cirque to the north-west of the adit.
3. Further surface discoveries, if any, be checked by trenching, by bulldozer if possible.
4. No further underground work be undertaken unless new surface discoveries supply sufficient encouragement to warrant it.

Edmonton, Alberta,  
November 10th, 1959.

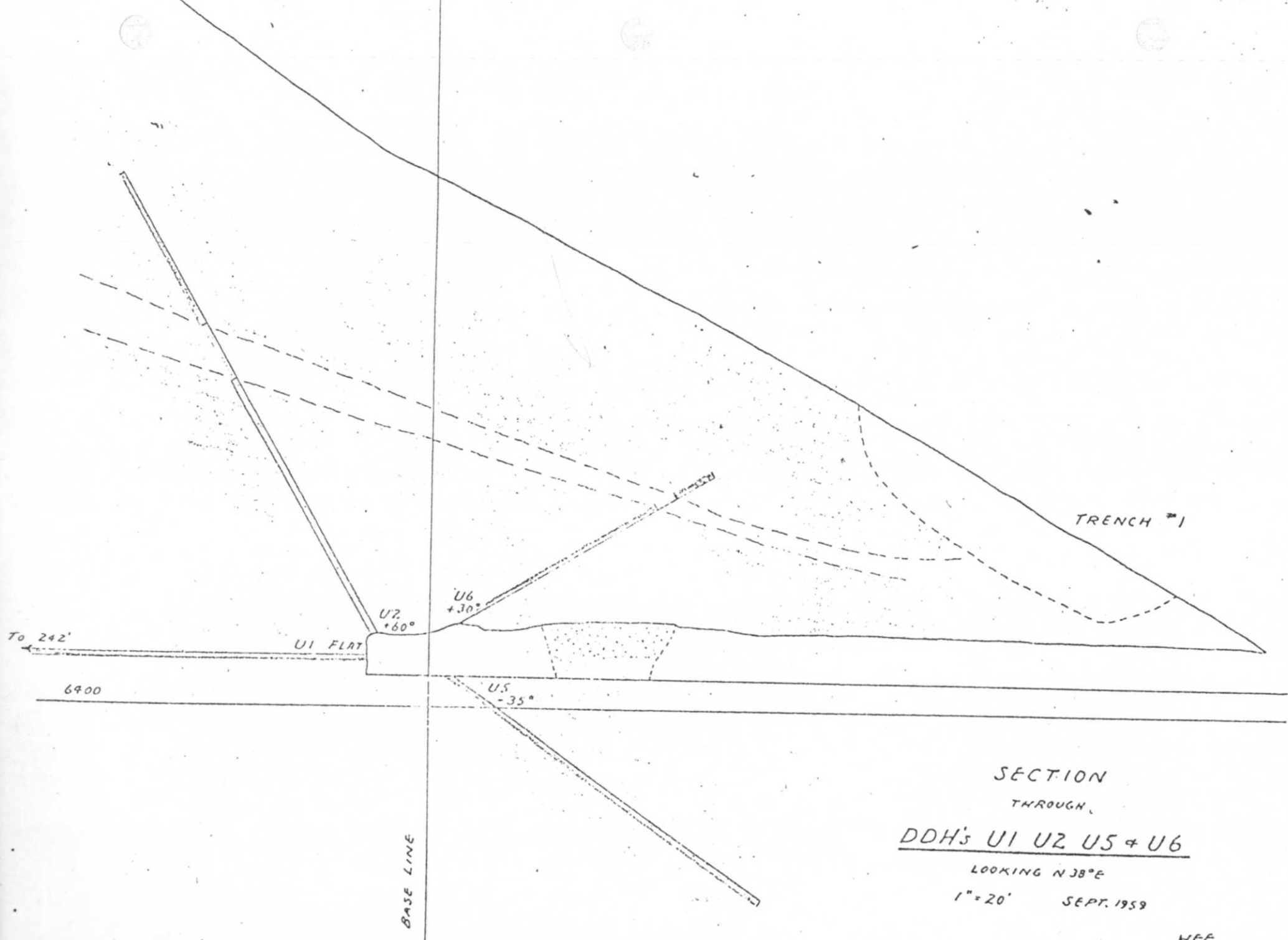
*W. E. Field*  
W.E. Field, B.Sc. P.Eng.



PLAN  
OF  
D.D.H. INTERSECTIONS

NO. 1 ADIT

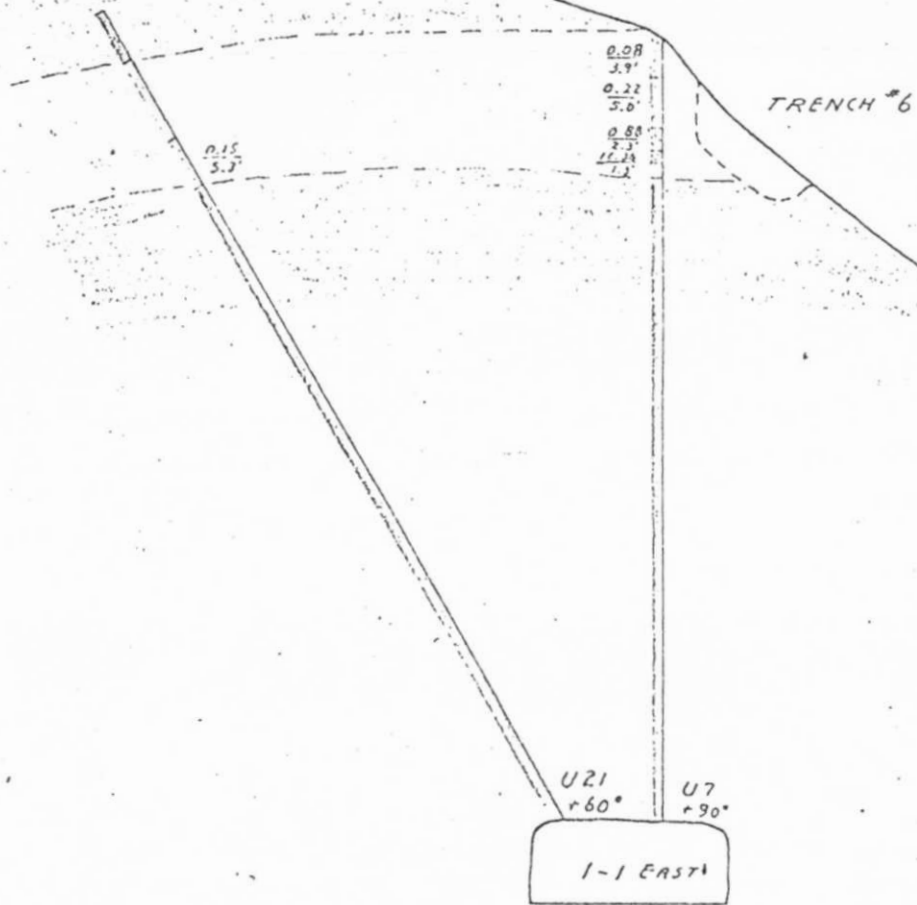
1" = 50'    AUG., 59  
ASSAYS 7 W02



SECTION  
 THROUGH  
DDH's U1 U2 U5 & U6

LOOKING N38°E  
 1" = 20'    SEPT. 1959

W.F.F.



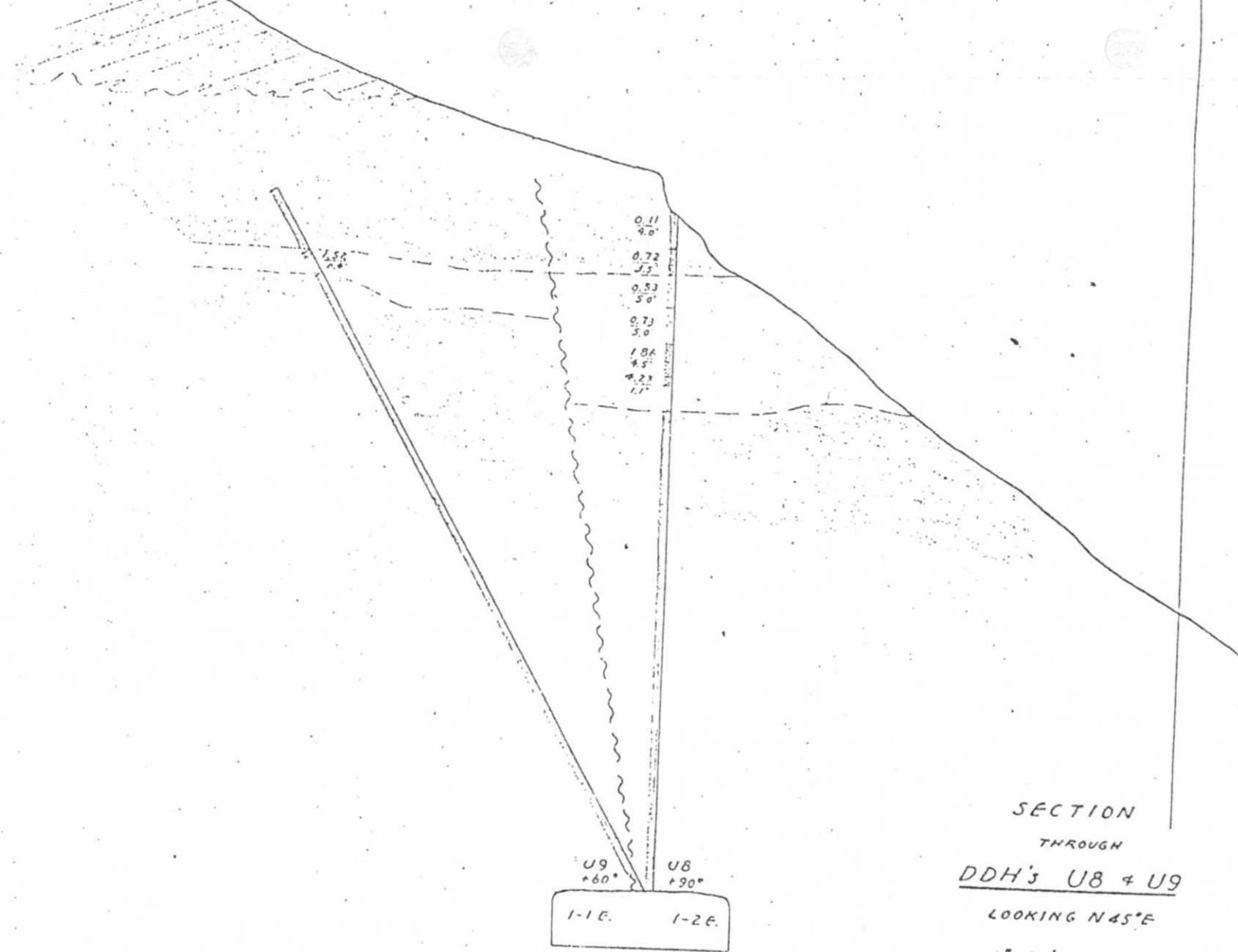
SECTION  
 THROUGH  
DDH U7 & U21  
 LOOKING N45°E

1" = 20' AUG. 1959

W.E.A.

6900

All assays on sections in % Mo (Total)



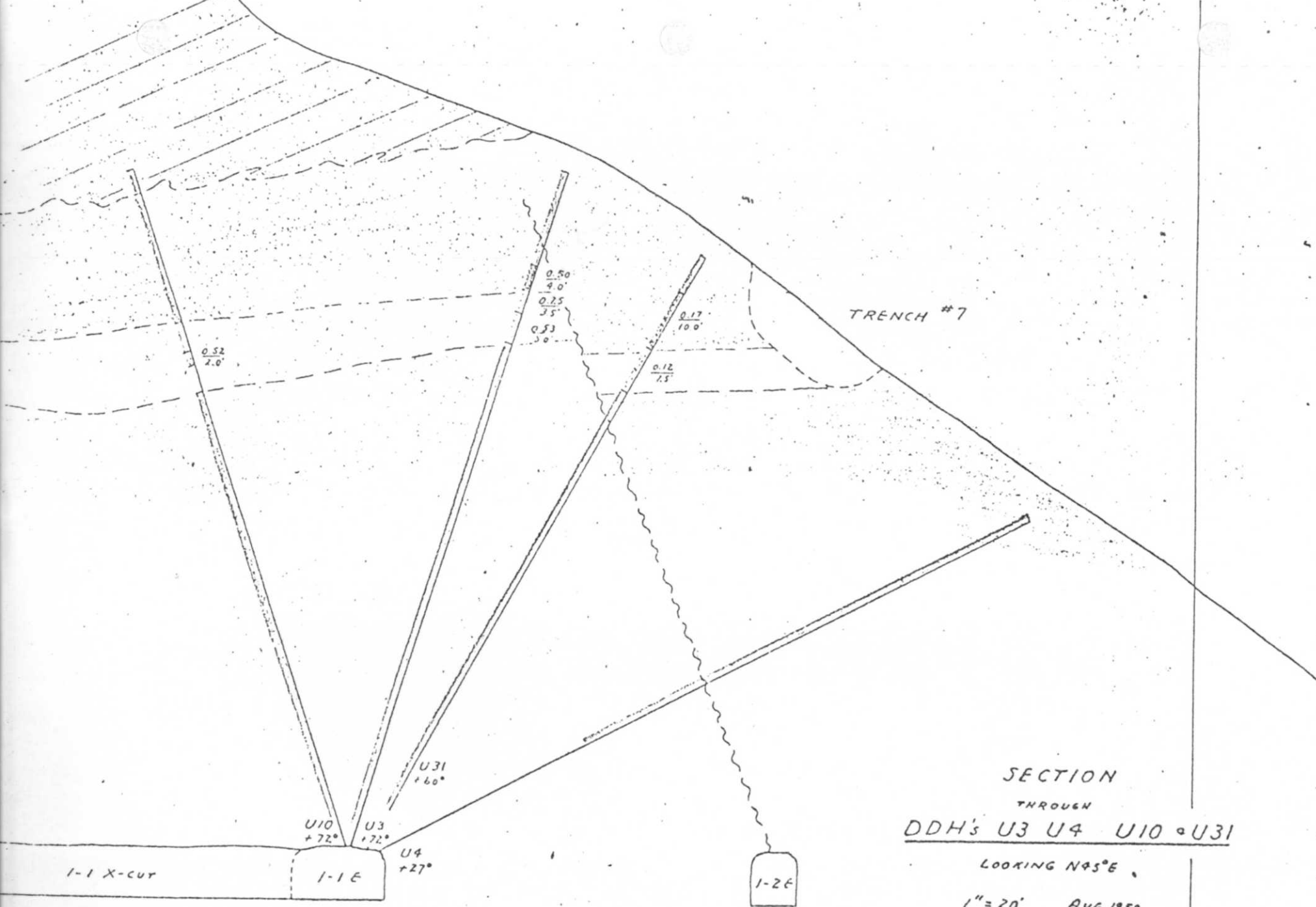
SECTION  
 THROUGH  
 DDH's UB & U9  
 LOOKING N45°E  
 1" = 20' JULY, 1959

U9 +60°    UB +90°  
 1-1 E.    1-2 E.

6900

W.F.F.

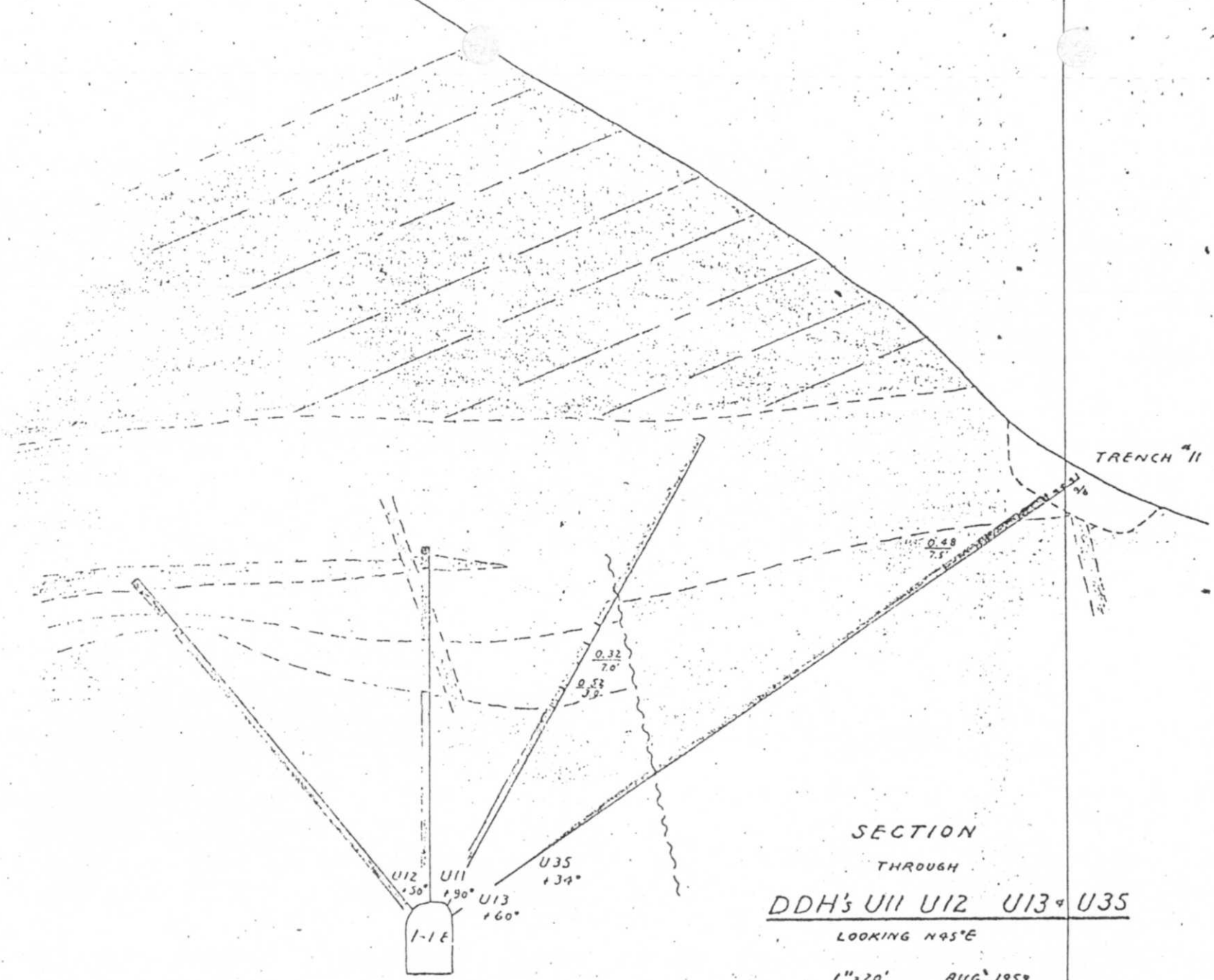
Base Line



SECTION  
 THROUGH  
 DDH's U3 U4 U10 = U31  
 LOOKING N45°E  
 1" = 20' AUG. 1959

6400

W.E.P.  
 B.L.

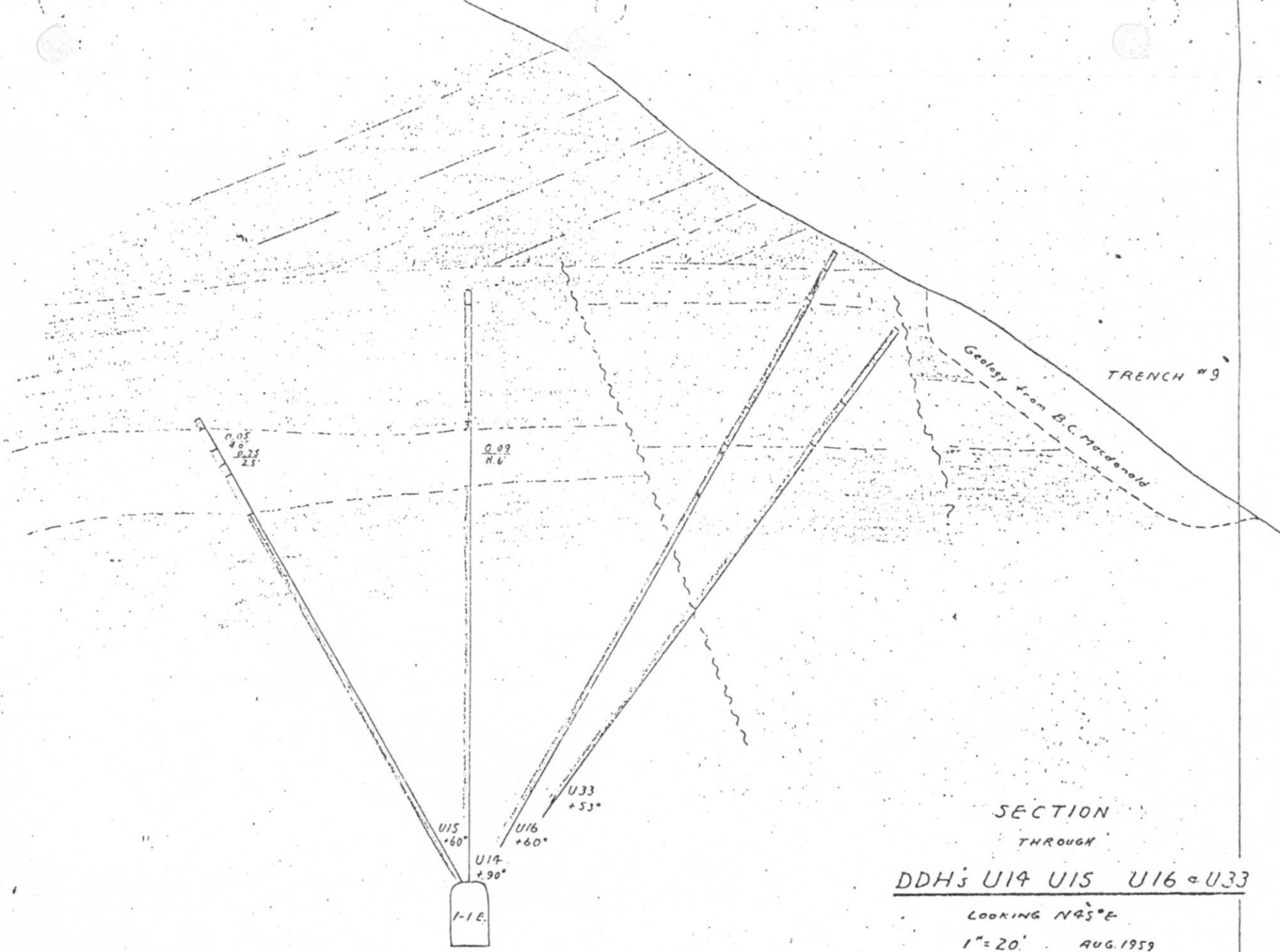


SECTION  
 THROUGH  
 DDH's U11 U12 U13 & U35  
 LOOKING N45°E  
 1"=20' AUG. 1953

6400

W.F.

B.L.

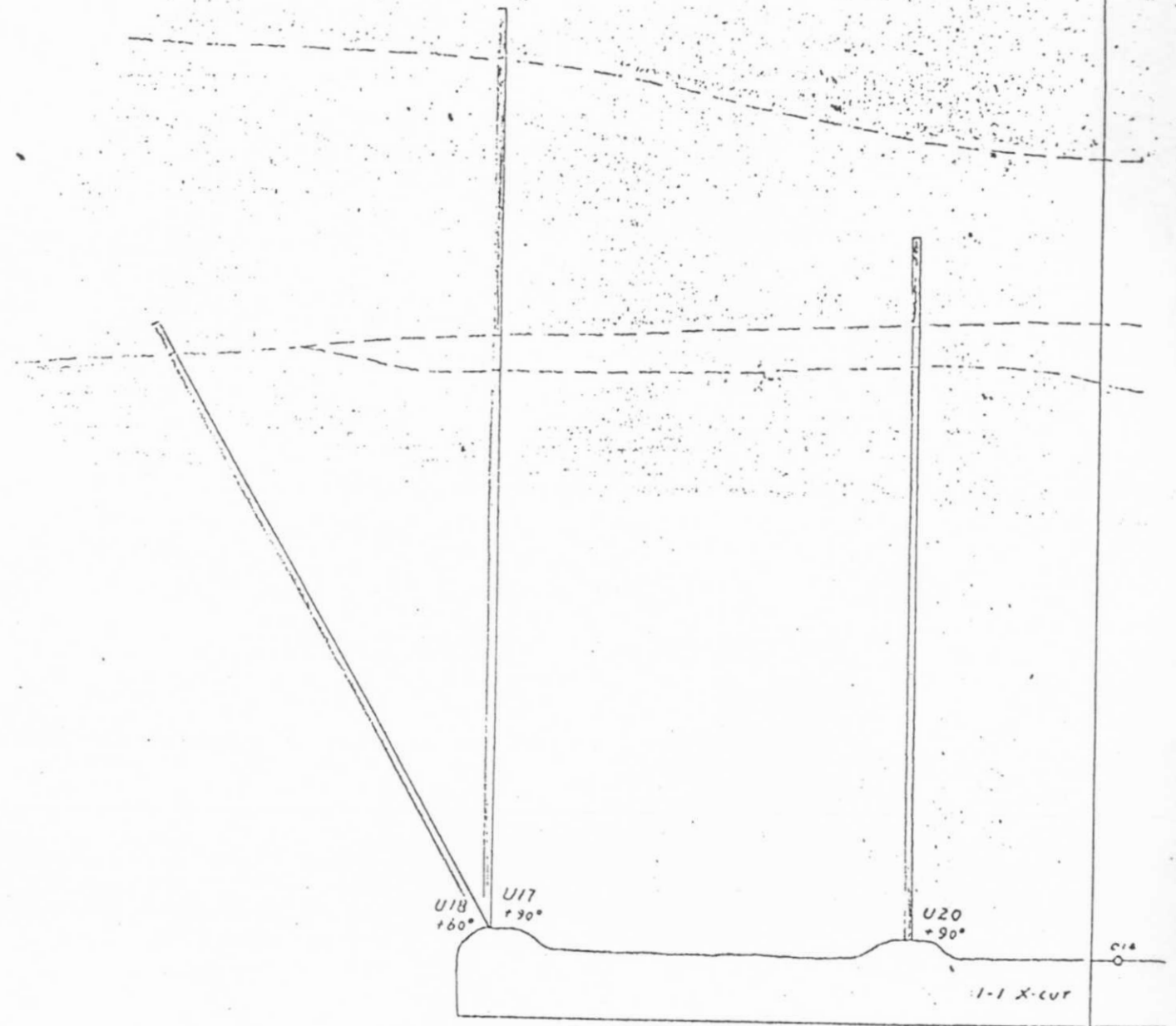


SECTION  
 THROUGH  
 DDH's U14 U15 U16 & U33  
 LOOKING N45°E  
 1" = 20' AUG. 1959

SECTION  
THROUGH  
DDH's U17 U18 AND U20

LOOKING N 45° E

1" = 20' AUG. 1959



6400

W.F.F.

10' NW  
D.L.

150

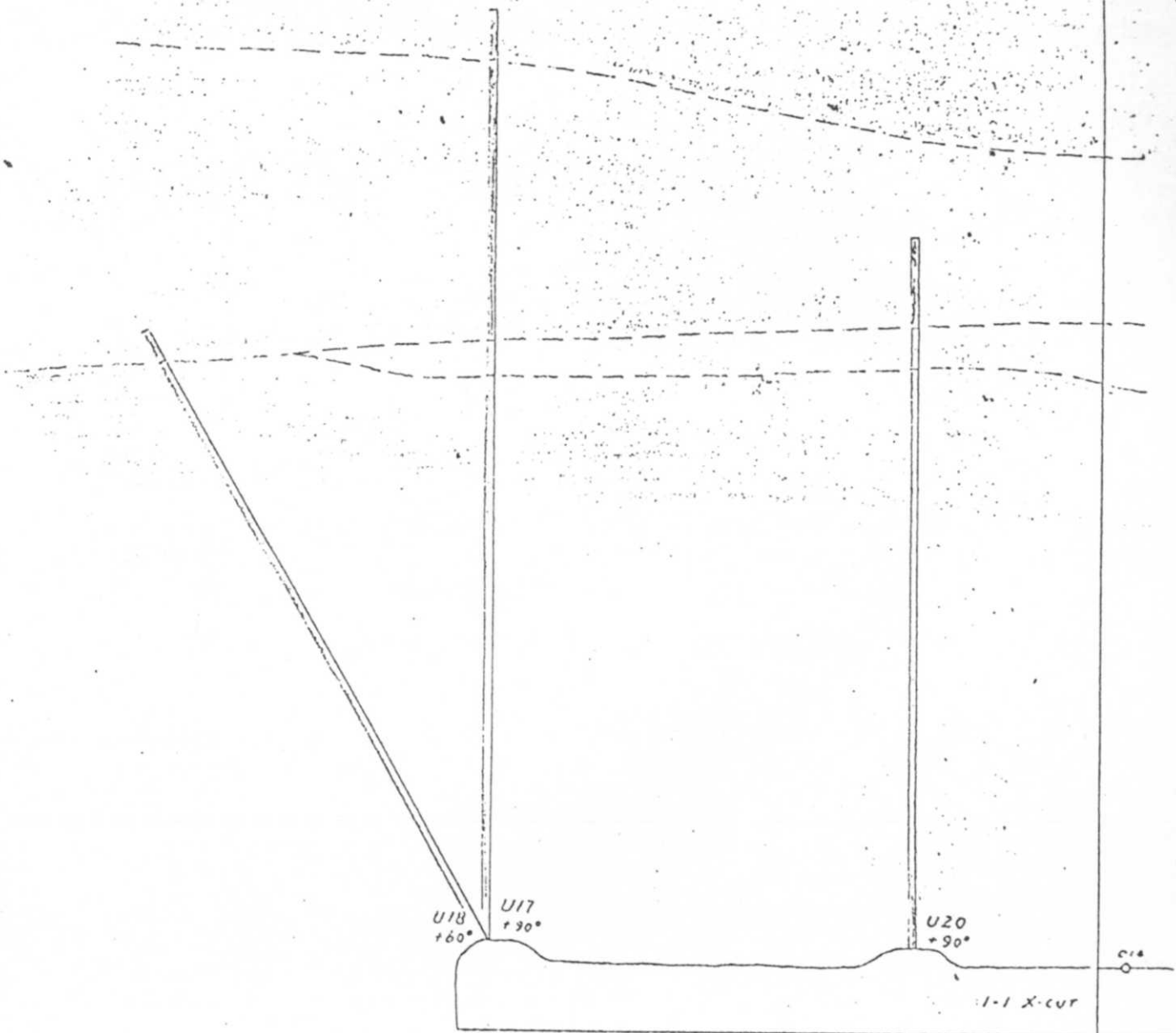
SECTION

THROUGH

DDH's U17 U18 AND U20

LOOKING N45°E

1" = 20' AUG. 1959



U18  
+60'

U17  
+90'

U20  
+90'

C14

1-1 X-CUT

6400

W.E.F.

10' NW

B.L.

1950

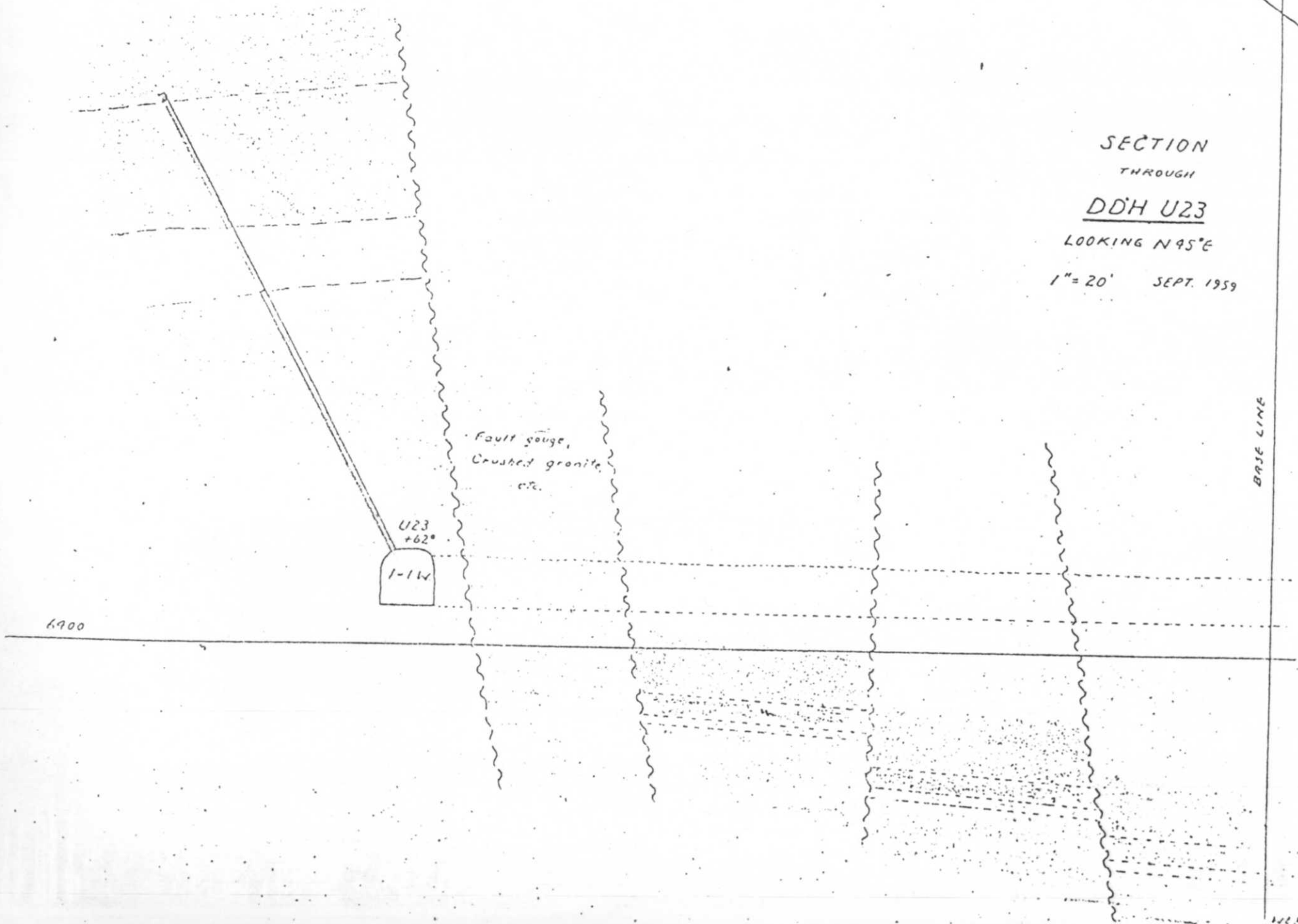
SECTION

THROUGH

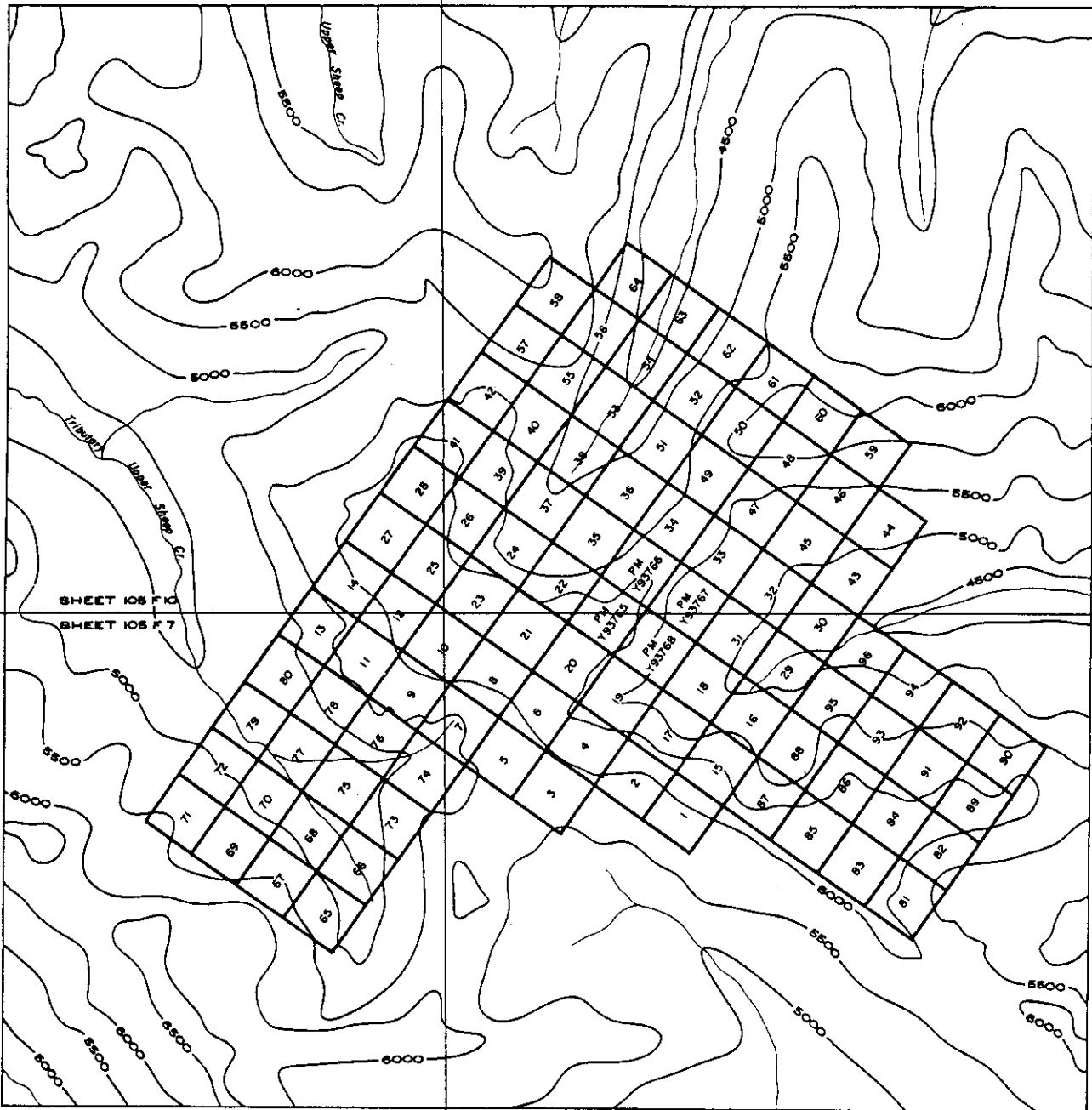
DDH U23

LOOKING N45°E

1" = 20' SEPT. 1959



132°50'



LOCATION SKETCH  
MP 1-96 MCs

# WATSON LAKE MINING DISTRICT

SHEETS : 105 F7  
105 F10



March 14 and 15, 1979

## Upper Sheep Creek

Canol Metal Mines Limited has a molybdenum property consisting of 30 claims at the head of Upper Sheep Creek, 36 miles south-southeast of Ross River. The adit is at lat.  $61^{\circ}29\frac{1}{2}'N$ , long.  $132^{\circ}48'W$ , at an elevation of about 6,400 feet on the south side of a ridge about 7,000 feet high. The property is accessible by a 14-mile truck road along Upper Sheep Creek from mile 100 on the Canol Road.

The showing was discovered by A. Racicot in 1955. In 1958, Racicot cut eleven trenches exposing disseminated molybdenite along the contact between granodiorite and limestone. Samples from four of these assayed from 4.2 to 9.3 per cent molybdenum. Canol Metals was incorporated in September 1958 to acquire and explore the property. In 1959 the company explored the property with a total of about 1,000 feet of adit, drifts, and crosscuts and 26 or more diamond-drill holes. The company made a detailed geological survey of the property in 1960.

At the end of August 1959 the underground workings consisted of the following: an adit extending  $N52^{\circ}W$  for 150 feet; a cross-cut at 110 feet from the portal, extending southwest for 20 feet to a drift paralleling the adit; this drift extended 80 feet northwesterly and 40 feet southeasterly along the granodiorite-limestone contact; a second drift at 105 feet from the portal extended north for 240 feet; a third drift at 160 feet extended  $N50^{\circ}E$  for 70 feet; and a fourth drift at 240 feet extended northwest for 140 feet. About 95 per cent of the tunnel is in granodiorite.

The regional geology of the area has been described by Wheeler, Green and Roddick (1960a). Canol Metal Mines Limited molybdenite showing is at the north contact between a large granodiorite stock and Middle and Upper Cambrian (?) limestone and phyllite. The contact is conformable with the bedding of the overlying limestone and phyllite. From 75 to 250 feet northeast of the adit the bedding is almost flat-lying; however, southwest of there it dips to the southwest. Thirty feet southwest of the adit the bedding strikes  $N50^{\circ}W$  and dips  $40^{\circ}SW$ .

A skarn zone is present in the limestone near the contact with granodiorite. This zone is about 20 feet thick where the bedding is almost flat-lying and about 3 feet thick where the bedding dips  $40^{\circ}SW$ . Molybdenite is disseminated in the skarn and granodiorite near the contact, but grades are better where the contact dips to the southwest. Assays from samples taken in a 40-foot trench across the contact above the adit were 0.68 per cent molybdenum sulphide along 22 feet in skarn, and 8.4 per cent molybdenum sulphide along 12 feet in granodiorite. A high-grade molybdenite body cut in the adit from 95 to 120 feet from the portal is in granodiorite from 10 to 20 feet from the contact, where

the contact is dipping 30 to 40°SW. The body is from 4 to 7 feet thick, more than 45 feet down dip, and about 24 feet along strike. The grade of this body has not been released, but it is probably greater than 4 per cent molybdenum sulphide.

The granodiorite in the underground workings is highly fractured and cut by many small faults. Several of these faults strike northeasterly and dip steeply southeastward. Two sets of faults strike northwesterly: one dips steeply northeastward, the other steeply southwestward. A few of the faults are easterly striking and dip steeply. One northerly striking normal fault dips 50°E and displaces the orebody a few feet.

### Fire Lake

In August 1960, Cassiar Asbestos Corporation Limited discovered a copper showing on North River in Finlayson map-area (105G), about 95 miles northwest of Watson Lake. The property comprises 272 claims which lie east of the largest lake on North River (locally called 'Fire Lake'). The main showing is reported to be at the head of a small southerly flowing tributary of Fire Lake about 1 1/2 miles northwest of the centre of the lake, at lat. 61°13'N, long. 130°30'W, at an elevation of about 5,000 feet.

The main showing is reported to be a 47-foot-wide, northwesterly trending zone of sulphides consisting mainly of pyrite, but containing some narrow chalcopyrite-rich bands. One chalcopyrite band is 5 feet wide and assays between 3 and 4 per cent copper. The mineralized zone has been traced for some distance to the northwest and south-east. Very little exploration has been done on the showing, but the company plans to explore it in 1961.

The geology of the area was described by Wheeler, Green, and Roddick (1960b). According to their map, the showing is in a metamorphic formation that contains quartz-biotite and quartz-chlorite schists, micaceous quartzite, hornfels, and minor phyllite and limestone, and dips at 30°E. A granodiorite stock lies about a mile to the east, a second about 1 1/2 miles to the north, and a third about 3 miles to the south.

Cassiar Asbestos Corporation Limited during the summer of 1960 prospected Pelly Mountains west of Frances Lake and Finlayson River to Tintina Valley (Hoole and Black River valleys).

DATE. OCTOBER 9, 1979

FILE NO. 615-7

# ASSAY CERTIFICATE

WHITEHORSE ASSAY OFFICE LTD.  
BOX 4518 WHITEHORSE Y. T.  
PHONE 667 2694 Y1A 2R8

SAMPLE RECEIVED FROM MR. P. WHITE

SAMPLE NO.	GOLD Oz. Per Ton	SILVER Oz. Per Ton	Total Mo % Mo	TUNGSTEN % WO <sub>3</sub>				
Y North Drift Sample A (Fine) & B (Coarse)			2.73	.12				
Y Centre Adit Stub Wall Shear			1.78	.08				
Ad Y Entrance 6' Channel Sample- Across Adit			5.33	.41				
Garnet Zone			.001	.13				
A Skarn			.004	.45				
Surface Moly Granite ( Fine)			1.40	4.00				
Surface Showing Moly Section			9.28	1.10				

ASSAYER. *L. Spalding* GEO. SPALDING





# PLACER DEVELOPMENT LIMITED

MEMO TO: D.A. Knight

December 3, 1979

FROM: B. Wilson

RE: Rio Alto Moly Property

Regarding your request for a summary of the testwork to date on the Rio Alto moly property, the following results have been obtained.

These results are of a preliminary nature, but I would not expect much further improvement as to grade and recovery except what might be gained by fine tuning and more stages of regrinding and cleaning.

One flotation test was done on the hand sample and seven flotation tests were done on the bulk sample. Regrinding was done in one stage for three of the bulk tests.

The following table indicates the variables.

Test No.	% MoS <sub>2</sub>				Regrind Ro Con	Rougher Grind To 80% Passing $\mu$	Concentrate	
	Head	Tail	Cleaner Tail	Con			% WT	% Dist.
H.S.*	12.5	0.10	1.19	94.7	Yes	40 $\mu$	13.1	98.8
1	5.07	0.38	3.49	90.7	Yes	112 $\mu$	4.98	89.0
2	4.79	0.41	5.04	88.2	Yes	76 $\mu$	4.75	97.5
3	5.03	0.41	4.76	89.7	Yes	145 $\mu$	4.91	87.6
4	5.06	0.42	2.47	84.0	No	145 $\mu$	5.45	90.6
5	5.09	0.44	2.3	86.2	No	112 $\mu$	5.31	90.0
6	5.0	0.41	2.1	86.0	No	76 $\mu$	5.26	90.5
7	5.01	0.56	2.3	87.2	No	52 $\mu$	5.14	89.4

\* H.S. = Hand Sample.

Work Index tests were done at four grinds ranging between 80% minus 80  $\mu$  to 80% minus 140  $\mu$ .

BW/gg

December 3, 1979

The following results were obtained:

<u>Grind Size</u> <u>80% Passing</u>	<u>Work Index</u>
140 $\mu$	16.5
110 $\mu$	17.1
94 $\mu$	18.1
80 $\mu$	18.8

The concentrate from the hand sample returned assays of 0.009% Cu and 0.006% Pb. Both of these impurities while low in this sample, would have to be monitored continuously to avoid the possibility of obtaining batches which may be high in one or the other of these unacceptable metals.

It should be noted that, while the recoveries look respectable, the tailings are higher than the feed to most operating molybdenite plants.

B. Wilson.  
Chief Research Metallurgist.

BW/gg

cc: W.A. Triggs  
D.A. Knight  
H.A. Steane

December 3, 1979



**can test ltd.**

To: **Placer Development Ltd.** 1650 PANDORA STREET, VANCOUVER, B.C. V5L 1L6 • TELEPHONE 254-7278  
 Telex 04-54210

**SEMI QUANTITATIVE SPECTROGRAPHIC ANALYSIS CERTIFICATE**

323 Alexander Street,

VANCOUVER, B.C. V6A 1C4

File No. **2742D**

Date **16 Oct. 1979**

ATTN: **MR. B. WILSON**

We hereby Certify that the following are the results of semi quantitative spectrographic analysis made on Ore samples submitted.

		1	2			1	2	Sample Identification
Aluminum	Al	1.		Cerium	Ce	N.D.		<p>Sample 1: <b>MOLYBDENAM CONCENTRATE</b></p> <p>Sample 2:</p> <p>Percentages of the various elements expressed in these analysis may be considered accurate to within plus or minus 35 to 50% of the amount present.</p> <p>Semi-quantitative spectrographic analytical results for gold and silver are normally not of sufficient degree of percision to enale calculation of the true value of ores. Therefore, should exact values be required, it is recommended that these elements be assayed by the conventional Fire Assay Method. Quantitative and Fire Assays may be carried out on the retained pulp samples.</p> <p>Silicon, aluminum, magnesium calcium and iron are normal components of complex silicates.</p> <p>MATRIX — Major constituent            MAJOR — Above normal spectrographic range            TRACE — Detected but minor amounts            N.D. — Not detected            * — Suggest assay (above 0.3%)</p> <p>All results expressed as <u>Percent</u></p> <p>Note: Pulps retained one week.</p> <p>ALL REPORTS ARE THE CONFIDENTIAL PROPERTY OF CLIENTS PUBLICATION OF STATEMENTS, CONCLUSION OF EXTRACTS FROM OR REGARDING OUR REPORTS IS NOT PERMITTED WITHOUT OUR WRITTEN APPROVAL. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED.</p> <p>CAN TEST LTD.</p> <p><i>[Signature]</i></p>
Antimony	Sb	N.D.		Cesium	Cs	N.D.		
Arsenic	As	N.D.		Dysprosium	Dy	N.D.		
Barium	Ba	N.D.		Erbium	Er	N.D.		
Beryllium	Be	N.D.		Europium	Eu	N.D.		
Bismuth	Bi	N.D.		Gadolinium	Gd	N.D.		
Boron	B	N.D.		Hafnium	Hf	N.D.		
Cadmium	Cd	N.D.		Holmium	Ho	N.D.		
Calcium	Ca	0.3		Indium	In	N.D.		
Chromium	Cr	N.D.		Lanthanum	La	N.D.		
Cobalt	Co	N.D.		Lithium	Li	N.D.		
Copper	Cu	0.03		Lutetium	Lu	N.D.		
Gallium	Ga	N.D.		Neodymium	Nd	N.D.		
Gold	Au	Trace		Praseodymium	Pr	N.D.		
Iron	Fe	0.5		Rubidium	Rb	N.D.		
Lead	Pb	N.D.		Samarium	Sm	N.D.		
Magnesium	Mg	0.01		Scandium	Sc	N.D.		
Manganese	Mn	N.D.		Selenium	Se	N.D.		
Molybdenum	Mo	MATRIX		Tellurium	Te	N.D.		
Niobium	Nb	N.D.		Terbium	Tb	N.D.		
Nickel	Ni	0.003		Thallium	Tl	N.D.		
Potassium	K	N.D.		Thulium	Tm	N.D.		
Silicon	Si	3.		Ytterbium	Yb	N.D.		
Silver	Ag	Trace		Yttrium	Y	N.D.		
Sodium	Na	N.D.		Zirconium	Zr	Trace		
Strontium	Sr	N.D.		Iridium	Ir	N.D.		
Tantalum	Ta	N.D.		Osmium	Os	N.D.		
Thorium	Th	N.D.		Palladium	Pd	N.D.		
Tin	Sn	0.1		Platinum	Pt	N.D.		
Titanium	Ti	0.05		Rhenium	Re	N.D.		
Tungsten	W	N.D.		Rhodium	Rh	N.D.		
Uranium	U	N.D.		Ruthenium	Ru	N.D.		
Vanadium	V	N.D.						
Zinc	Zn	*						



PLACER DEVELOPMENT LIMITED

December 5, 1979

Mr. P. White  
President  
Rio Alto Exploration  
Suite 710, 610 8th Avenue S.W.  
Calgary, Alberta  
T2P 1G5

Dear Paul:

I understand you want the attached report promptly, so I am sending it to Calgary as well as to Whitehorse.

You will note that the results indicate that the ore seems to mill fairly well giving reasonable good recovery and a clean molybdenite concentrate.

If you have any questions on the report, I am sure Doug Knight will be happy to try to answer them.

Art Ganshorn and I would be interested to learn how you are intending to progress with the property.

Best wishes for a good Christmas season.

Yours very truly,

PLACER DEVELOPMENT LIMITED

J. A. Butterfield  
Vice President, Marketing

JAB/mh

att.

cc: Mr. P. White  
President  
Rio Alto Exploration  
Whitehorse, Yukon

DATE. NOVEMBER 15, 1979

FILE NO. 615-7 ADDENDUM

# ASSAY CERTIFICATE

WHITEHORSE ASSAY OFFICE LTD.  
BOX 4518 WHITEHORSE Y. T.  
PHONE 667 2694 Y1A 2R8

SAMPLE RECEIVED FROM MR. PAUL WHITE

SAMPLE NO.	GOLD Oz. Per Ton	SILVER Oz. Per Ton	TIN %					
Y NORTH DRIFT SAMPLE A (FINE) & B (COARSE) Y CENTRE ADIT STUB WALL SHEAR ADIT Y ENTRANCE 6' CHANNEL SAMPLE GARNET ZONE A SKARN SURFACE MOLY GRANITE ( FINE ) SURFACE SHOWING MOLY SECTION			TR TR TR TR TR TR TR					

ASSAYER. *K. Hayward for* GEO. SPALDING

WHITEHORSE ASSAY OFFICE  
BOX ~~4518~~ 4518  
WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540

SAMPLE #	P.P.M. Cu	Am Fe	% Mo	P.P.M. W	P.P.M. U
BL-C-N	28	72	4	4	.4
LOON- 0E	40	72	11	24	.4
50E	24	72	6	12	<.2
100E	44	72	4	8	.4
150E	32	72	21	12	.4
200E	20	1-2	4	4	.6
250E	24	72	23	19	<.2
300E	16	72	24	4	.8
350E	8	1-2	2	4	<.2
400E	44	72	5	4	.8
450E	16	72	6	8	.8
500E	12	72	4	4	.8
550E	8	1-2	3	4	1.0
600E	28	72	13	16	2.2
650E	8	1-2	9	12	1.6
700E	12	1-2	4	4	.6
750E	4	9000	3	4	.4
800E	4	5300	3	4	.2
850E	8	1-2	2	4	.2
900E	8	1-2	3	7	.4
950E	4	8000	1	4	4.4
10+00E	36	72	6	8	1.2
LOON-10+50E	16	1-2	4	4	26.0
BL C+CON	440	72	94	12	20.0
LO+CON- 50E	28	72	5	12	.4
1+00E	20	5200	4	4	<.2
1+50E	8	1-2	1	4	<.2
2+00E	16	8900	3	4	.4
2+50E	28	72	4	6	.8
3+00E	24	72	4	6	.6
3+50E	32	72	4	6	.6
4+00E	12	1-2	3	6	.2
4+50E	20	72	2	4	.2
5+00E	20	72	3	4	.4
5+50E	40	1-2	8	6	.8
6+00E	16	1-2	8	4	.4
6+50E	64	72	7	4	4.6
7+00E	16	1-2	4	4	.6
7+50E	32	1-2	5	4	2.0
8+00E	8	7100	2	4	<.2
LO+CON-8+50E	12	72	6	6	2.0

Date: September 15, 1979

Assayer: K. Hayward

WHITEHORSE ASSAY OFFICE  
 BOX ~~333~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 2

SAMPLE #	PPM Cu	PPM Fe	% Mo	PPM W	PPM U			
10+00N-9+00E	12	1-2	6	22	5.8			
" 9+50E	8	8200	2	4	2.8			
B. 00E → " 1+00E	14	1-2	3	6	6.0			
" 10+50E	4	8500	3	4	.6			
" 11+00E	8	1-2	3	4	3.2			
" 11+50E	8	1-2	2	4	4.9			
" 12+00E	8	1-2	3	6	3.8			
" 12+50E	4	6900	1	4	.4			
" 13+00E	12	1-2	2	6	1.0			
" 13+50E	12	1-2	2	6	4.7			
" 14+00E	8	1-2	3	4	4.2			
" 14+50E	4	5300	1	4	.4			
" 15+00E	12	1-2	1	4	.4			
" 15+50E	TR	3100	TR	4	<.2			
10+00N-16+00E	4	1-2	2	8	5.8			
? 14+00N-16+50E	24	72	2	8	3.0			
" 17+00E	4	5000	TR	4	.4			
" 17+50E	4	1-2	3	4	.2			
? 14+00N-18+00E	4	6400	1	4	<.2			
11050N-0+50E	60	72	7	4	2.0			
X10+50N-1+00E	32	72	6	2	1.6			
1+50E	24	72	4	2	1.6			
2+00E	52	72	5	4	2.0			
2+50E	48	72	3	4	1.8			
3+00E	36	72	3	2	1.0			
3+50E	36	72	3	6	.8			
4+00E	24	72	5	4	.4			
4+50E	28	72	5	6	.4			
5+00E	36	72	4	4	.6			
5+50E	20	72	3	6	5.2			
6+00E	16	72	3	12	.8			
6+50E	28	72	5	12	4.5			
7+00E	16	1-2	6	10	7.2			
7+50E	16	72	5	6	30.0			
8+00E	12	1-2	6	10	.4			
8+50E	16	72	5	6	13.7			
9+00E	16	1-2	5	4	.8			
9+50E	28	72	3	6	.6			
110+50N-10+00E	16	1-2	3	4	7.2			

Date: November 15, 1979

Assayer: X. Hayward

WHITEHORSE ASSAY OFFICE  
BOX ~~55~~ 4518  
WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 3

KOB.  
1150E →

KOB.  
1100E →

SAMPLE #	PPM Cu	PPM Fe	%	PPM Mo	PPM W	PPM U			
L3100N-1150E	16	1-2		1	8	.4			
2100E	32	72		2	8	.6			
2150E	16	1-2		1	12	.4			
3100E	28	72		3	8	.8			
3150N	8	7600		1	8	1.6			
4100E	12	9300		1	8	1.4			
4150E	16	1-2		3	8	2.8			
5100E	16	72		2	6	.2			
5150E	8	6600		1	4	.8			
6100E	28	5800		3	4	<.2			
6150E	20	1-2		4	8	.8			
7100E	12	1-2		2	8	7.6			
7150E	12	1-2		3	6	2.8			
8100E	12	1-2		5	8	.4			
8150E	20	2900		4	6	.2			
9100E	12	1-2		4	12	.2			
9150E	20	1-2		5	4	1.0			
11000E	4	8000		1	4	.6			
10150E	8	1-2		1	4	.4			
11100E	4	5700		1	4	1.8			
11150E	8	8000		2	12	.4			
12100E	8	9900		2	4	.4			
L3100N-12150E	12	1-2		7	4	10.0			
6010N-0100E	28	72		3	2	.4			
50E	20	1-2		2	2	.4			
100E	8	7100		1	2	.2			
150E	20	1-2		4	2	.4			
200E	36	72		6	2	1.2			
250E	52	72		6	4	1.2			
300E	36	72		7	4	.8			
350E	24	72		2	4	1.0			
400E	28	72		3	2	1.0			
450E	12	1-2		2	2	<.2			
500E	32	1-2		2	2	<.2			
550E	54	72		7	4	1.0			
600E	44	72		4	10	.2			
650E	16	8400		4	2	.2			
700E	28	1-2		3	2	1.7			
750E	32	72		5	4	4.8			
6010N-800E	32	72		6	4	2.4			

Date: November 15, 1979

Assayer: X. Hayward

WHITEHORSE ASSAY OFFICE  
BOX ~~358~~ 4518  
WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 4

SAMPLE #	PPM Cu	PPM % Fe	PPM Mo	PPM W	PPM U			
6010N- 850E	24	72	12	2	13.2			
900E	16	72	7	12	6.0			
950E	20	72	5	8	6.8			
10100E	12	9800	4	2	.4			
10150E	8	5300	1	2	6.8			
11100E	12	7600	4	2	7.0			
11150E	4	4100	1	8	.2			
12100E	8	1-2	3	4	.4			
12150E	12	72	3	6	.6			
13100E	8	1-2	6	2	5.7			
13150E	8	9600	3	2	2.4			
14100E	16	1-2	3	4	1.8			
14150E	12	1-2	6	4	1.8			
15100E	8	8600	2	2	.2			
15150E	4	1-2	3	4	.6			
16100E	12	1-2	4	2	8.4			
16150E	24	72	7	2	2.8			
6010N-17100E	24	72	11	4	3.2			
150N- 0E	44	72	17	110	.8			
50E	32	72	9	78	1.2			
100E	24	72	5	25	.4			
150E	24	72	4	12	<.2			
200E	40	72	3	8	.2			
250E	40	72	4	17	.2			
300E	32	72	4	15	.2			
350E	24	72	4	14	.2			
400E	16	1-2	3	4	.4			
450E	32	1-2	4	12	7.5			
500E	12	5600	2	2	3.2			
550E	12	5800	4	4	2.0			
600E	52	1-2	18	10	3.4			
650E	12	1-2	5	4	.4			
700E	12	72	12	24	7.3			
750E	16	72	10	10	2.2			
800E	4	2600	1	2	<.2			
850E	12	1-2	4	4	1.2			
900E	20	72	3	8	.8			
950E	4	3600	TR	2	<.2			
10100E	4	4100	TR	2	<.2			
150N- 10150E	4	4700	TR	4	.4			

Date: November 15, 1979

Assayer: K. Hayland

WHITEHORSE ASSAY OFFICE  
 BOX ~~388~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 5

SAMPLE #	PPM Cu	PPM % Fe	PPM Mn	PPM W	PPM U
L750N-BL-O-N	16	1-2	3	4	1.2
50E	16	1-2	4	4	1.0
100E	24	72	4	6	.2
150E	16	1-2	4	6	.2
200E	20	72	3	4	.4
250E	32	72	4	8	.8
300E	36	72	4	4	.8
350E	8	8800	2	6	<.2
400E	12	1-2	1	6	<.2
450E	12	1-2	2	2	.2
500E	24	1-2	3	4	.4
550E	16	1-2	3	10	.2
600E	4	3100	1	2	<.2
650E	4	4000	1	2	.2
700E	28	72	6	4	.8
750E	4	4100	2	2	<.2
800E	4	2900	2	2	<.2
850E	8	1-2	3	6	.4
900E	12	1-2	4	4	3.5
950E	24	72	7	8	.6
1000E	20	72	7	4	.4
1050E	8	9300	4	2	.8
1100E	12	1-2	4	2	2.0
1150E	8	8000	3	2	4.3
1200E	16	1-2	7	10	9.8
1250E	4	8100	2	4	<.2
1300E	4	3600	1	2	<.2
1350E	4	2700	2	2	<.2
1400E	4	6900	2	6	.8
1450E	12	1-2	3	4	1.2
L750N-1500E	4	1-2	5	4	2.4
BL O+OON	24	72	4	4	.4
L900N-O+50E	20	1-2	4	2	.4
L900N-100E	28	72	3	4	.8
150E	8	6800	1	4	<.2
200E	20	1-2	3	4	.4
250E	16	1-2	2	6	.4
300E	24	1-2	3	2	.6
350E	28	72	4	8	.4
L900N-4+00E	36	72	4	8	.6

Date: November 15, 1979

Assayer: K. Hayward



WHITEHORSE ASSAY OFFICE  
 BOX ~~328~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 7

ALL RESULTS - P.P.M.

SAMPLE #	CU	MO	W	U.				
BL 00S	B	2	2	.8				
L10+50S 50E	4	1	2	<.2				
100E	4	TR	2	<.2				
1+50E	B	4	4	.8				
2+00E	TR	3	4	.8				
2+50E	TR	2	2	.8				
3+00E	TR	1	4	1.0				
3+50E	B	2	2	.6				
4+00E	4	1	2	<.2				
4+50E	4	3	2	.8				
5+00E	4	1	4	.8				
5+50E	B	2	4	1.0				
6+00E	4	2	4	2.0				
6+50E	4	2	4	1.2				
7+00E	TR	1	2	.8				
7+50E	4	1	2	.6				
8+00E	TR	1	2	.2				
8+50E	B	1	4	1.2				
9+00E	TR	TR	2	.2				
9+50E	B	1	4	.8				
10+00E	4	1	4	.4				
10+50E	B	2	6	.6				
11+00E	TR	TR	2	<.2				
11+50E	TR	3	4	7.0				
12+00E	TR	12	6	6.0				
12+50E	4	13	6	34.4				
13+00E	4	9	8	1.0				
13+50E	TR	7	4	13.8				
14+00E	TR	16	6	72.0				
14+50E	B	7	12	5.6				
15+00E	TR	4	12	21.0				
15+50E	4	3	6	.4				
16+00E	4	5	4	61.0				
16+50E	4	3	6	565.0				
17+00E	TR	1	4	.6				
17+50E	B	8	4	.8				
18+00E	B	8	4	20.0				
18+50E	4	6	4	5.6				
19+00E	4	6	6	1.2				
L10+50S-19+50E	4	6	6	.2				

CB  
+00E →

Date: November 15, 1979

Assayer: K. Heyland

WHITEHORSE ASSAY OFFICE  
 BOX ~~555~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 8

ALL RESULTS - P.P.M

SAMPLE #	CU	MO	W	U				
<sup>2B</sup> 100E → 110150S 2+00E	TR	5	4	5.0				
112+00S 50E	B	3	6	.4				
1+00E	4	2	8	.8				
1+50E	B	4	6	1.4				
2+00E	TR	2	6	4.0				
2+50E	B	2	4	2.4				
3+00E	4	2	4	1.0				
3+50E	4	1	4	1.2				
4+00E	4	1	4	.8				
4+50E	B	2	4	2.0				
5+00E	4	1	4	.4				
5+50E	4	1	4	3.0				
6+00E	TR	1	4	1.0				
6+50E	4	2	4	5.9				
7+00E	B	2	6	.4				
7+50E	TR	1	4	<.2				
8+00E	B	1	4	2.4				
8+50E	TR	1	2	<.2				
9+50E	4	2	6	4.2				
<sup>2B</sup> 100E → 10+00E	B	1	8	.6				
10+50E	B	1	6	.8				
11+00E	4	1	6	.4				
11+50E	4	1	6	<.2				
12+00E	4	1	4	<.2				
12+50E	4	2	2	.2				
13+00E	B	1	6	.8				
13+50E	4	1	4	<.2				
14+00E	4	7	4	16.0				
14+50E	TR	2	6	.2				
15+00E	B	27	4	120.0				
15+50E	4	6	4	.2				
16+00E	B	3	4	2.0				
16+50E	B	3	4	.2				
17+00E	4	2	4	.2				
17+50E	4	1	2	<.2				
18+00E	4	9	2	6.8				
18+50E	TR	1	2	<.2				
19+00E	TR	6	4	.4				
19+50E	B	7	4	70.0				
<sup>2B</sup> 100E → 112+00S-2+00E	4	12	4	23.2				

Date: November 15 1979

Assayer: K. Hayward

WHITEHORSE ASSAY OFFICE  
 BOX ~~4518~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 9

ALL RESULTS - P.A.M.

SAMPLE #	CU	MO	W	U				
L13+50S- 0E	4	3	2	2.6				
50E	12	2	2	1.8				
100E	16	2	4	1.2				
150E	12	2	2	2.2				
200E	12	2	4	2.2				
250E	8	2	4	1.8				
300E	4	2	4	2.0				
350E	4	2	2	2.4				
400E	8	2	4	2.0				
450E	8	2	4	1.6				
500E	8	2	4	.8				
550E	12	2	2	1.2				
600E	12	1	4	.4				
650E	16	2	6	.4				
700E	8	2	4	1.2				
750E	2	3	4	2.0				
800E	4	4	4	.8				
850E	8	3	6	1.2				
900E	4	2	2	3.0				
950E	4	2	6	2.0				
10+00E	8	3	8	.6				
10+50E	8	2	4	.4				
11+00E	4	2	4	.8				
11+50E	4	1	4	5.4				
12+00E	4	3	4	.4				
12+50E	4	3	4	2.0				
13+00E	8	3	4	.8				
13+50E	16	1	10	.4				
14+00E	8	2	6	.8				
14+50E	4	2	6	.2				
15+00E	8	2	6	.2				
15+50E	TR	4	4	10.3				
16+00E	TR	2	2	3.2				
16+50E	4	10	4	20.8				
17+00E	TR	7	6	2.6				
17+50E	4	6	4	24.0				
18+00E	TR	9	4	7.3				
18+50E	4	7	4	28.8				
19+00E	TR	9	4	4.6				
19+50E	4	7	2	6.4				
L13+50S- 20+00E	TR	4	4	.8				

Date: November 15, 1979

Assayer: K. Hayland

WHITEHORSE ASSAY OFFICE  
 BOX ~~558~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 10

ALL RESULTS - P.P.M.

SAMPLE #	CU	MO	W	U				
45100S- 0E	4	2	4	3.4				
50E	4	2	4	.8				
100E	8	2	2	1.8				
150E	4	1	2	<.2				
200E	TR	1	4	.8				
250E	4	2	4	.8				
300E	8	1	4	1.2				
350E	4	1	4	.4				
400E	4	3	4	2.6				
450E	8	2	4	.4				
500E	8	2	6	.8				
550E	12	3	4	1.2				
600E	8	3	6	1.2				
650E	12	2	8	.8				
700E	4	2	4	2.8				
750E	8	2	6	1.8				
800E	8	3	8	1.8				
850E	4	2	4	<.2				
900E	8	4	8	11.7				
950E	8	2	4	.2				
10+00E	4	2	8	.8				
10+50E	4	2	8	.4				
11+00E	8	1	6	.4				
11+50E	4	1	6	.4				
12+00E	4	1	4	<.2				
12+50E	8	1	6	1.6				
13+00E	4	1	2	<.2				
13+50E	4	6	4	2.6				
14+00E	4	2	2	<.2				
14+50E	8	3	6	<.2				
15+00E	8	3	6	.4				
15+50E	4	3	4	2.4				
16+00E	8	9	6	6.3				
16+50E	4	2	4	<.2				
17+00E	TR	4	4	<.2				
17+50E	8	13	4	27.6				
18+00E	TR	1	2	<.2				
18+50E	TR	1	4	<.2				
19+00E	TR	7	6	<.2				
19+50E	4	8	4	19.3				
L 15+00S-20+00E	TR	4	6	5.3				

Date: November 15, 1979

Assayer: K. Hayland

WHITEHORSE ASSAY OFFICE  
 BOX ~~388~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 11

ALL RESULTS - P.P.M.

28  
5 →

SAMPLE #	Cu	Mn	W	U			
BL 0+00S	44	12	19	.8			
L150S- 50E	28	18	26	.6			
150N- 100E	16	8	2	1.2			
L150S- 150E	24	11	12	.2			
200E	20	7	2	.2			
250E	32	5	2	<.2			
300E	60	7	2	.4			
350E	16	5	23	1.2			
400E	16	2	4	.4			
450E	12	2	18	.8			
500E	12	2	16	1.8			
550E	4	3	18	.2			
600E	16	2	4	.4			
650E	4	2	4	<.2			
700E	8	3	2	<.2			
750E	16	9	20	7.2			
800E	16	2	2	15.1			
850E	16	2	2	5.3			
900E	16	1	2	5.2			
950E	12	2	2	70.0			
1000E	8	1	2	1.4			
L150S- 1050E	8	4	2	6.6			
BL 00-5	24	22	8	1.6			
L300S- 50E	28	23	4	4.4			
100E	16	9	12	2.3			
150E	12	40	4	.2			
200E	20	9	12	5.8			
250E	20	9	12	7.6			
350E	8	1	2	.3			
400E	12	5	8	36.8			
450E	28	11	14	16.4			
500E	16	8	40	7.0			
550E	8	4	2	7.2			
600E	8	8	4	27.2			
650E	8	2	4	1.2			
700E	12	2	8	1.8			
750E	28	3	4	2.0			
800E	12	2	4	.8			
850E	4	TR	4	<.2			
L300S- 900E	4	TR	4	<.2			

Date: November 15, 1979

Assayer: K. Hayward

WHITEHORSE ASSAY OFFICE  
BOX ~~333~~ 4518  
WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 12

ALL RESULTS - P.P.M.

SAMPLE #	cu	mo	w	u				
L300S- 950E	4	TR	4	.2				
1000E	8	6	8	50.5				
L300S- 1050E	8	1	4	4.0				
BL- 005(*)	60	31	12	1.0				
L450S- 50E	28	4	8	<.2				
100E	24	4	4	<.2				
150E	20	4	12	3.2				
200E	28	4	12	1.4				
250E	24	6	8	.6				
L450S- 300E	28	3	12	2.0				
BL- 005(**)	12	2	8	1.4				
L450S- 3150E	12	9	12	4.4				
4100E	28	5	12	2.2				
5100E	24	2	8	8.8				
5150E	28	4	12	4.4				
6100E	12	16	12	17.2				
6150E	8	4	8	3.6				
7100E	16	2	12	1.0				
7150E	12	2	4	.4				
8100E	12	1	6	<.2				
8150E	8	2	4	1.6				
L450S- 9100E	8	10	8	14.8				
L600S- 4150E	32	20	12	1.6				
5150E	28	19	12	11.0				
6150E	8	4	12	10.5				
7150E	4	1	8	<.2				
8150E	12	6	16	14.8				
9150E	8	6	8	11.8				
350E	24	59	55	2.7				
400E	20	33	180	3.2				
500E	44	10	2	1.0				
600E	4	1	4	.3				
700E	4	1	4	<.2				
800E	4	2	8	18.8				
L600S- 900E	4	2	18	5.2				
L750S- B10+E	52	3	4	<.2				
L750S- 50E	60	3	4	.2				
1100E	ROCKS	NO SAMPLE	—	—				
1150E	ROCKS	NO SAMPLE	—	—				
L750S- 2100E	36	4	8	.6				

Date: November 15, 1979

Assayer: K. Hayland

WHITEHORSE ASSAY OFFICE  
 BOX ~~55~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

Lot. No.: A-2191-540 PAGE 13

ALL RESULTS - P.P.M.

SAMPLE #	QL	MO	W	U			
L750S- 2150E	8	4	4	1.2			
3100E	4	6	8	1.6			
3150E	8	1	4	2.0			
4100E	8	1	8	1.4			
4150E	8	1	8	1.4			
5100E	8	2	8	4.7			
5150E	4	1	8	1.0			
6100E	8	2	10	5.8			
6150E	8	2	8	9.9			
L750S- 7100E	8	1	8	16.7			
B20 + 00S	28	5	12	.2			
L900S- 50E	12	10	8	.8			
100E	4	6	8	.6			
150E	4	4	4	1.4			
L900S- 200E	TR	3	8	1.4			
L1650S B20+00E	8	3	4	1.2			
L1650S- 50E	8	1	4	.4			
100E	---	ROCKS, NO SAMPLE		---			
150E	---	ROCKS, NO SAMPLE		---			
200E	12	1	4	.2			
250E	16	2	8	4.2			
300E	4	3	8	.8			
350E	12	2	12	1.2			
400E	2	1	12	2.4			
450E	4	2	12	.6			
500E	8	3	8	.8			
550E	12	2	8	.6			
600E	8	1	8	.4			
650E	8	3	6	1.2			
700E	12	2	8	.4			
750E	12	2	8	.4			
800E	8	2	6	.4			
850E	12	4	50	2.4			
900E	16	4	4	.2			
950E	12	TR	8	4.2			
1000E	8	2	8	2.0			
1050E	8	1	14	.6			
1100E	4	3	8	4.2			
1150E	4	2	8	5.6			
L1650S- 1200E	8	4	4	10.0			

Date: November 15, 1979

Assayer: K. Hayward

WHITEHORSE ASSAY OFFICE  
 BOX ~~440~~ 4518  
 WHITEHORSE, YUKON

Samples from: MR. PAUL WHITE

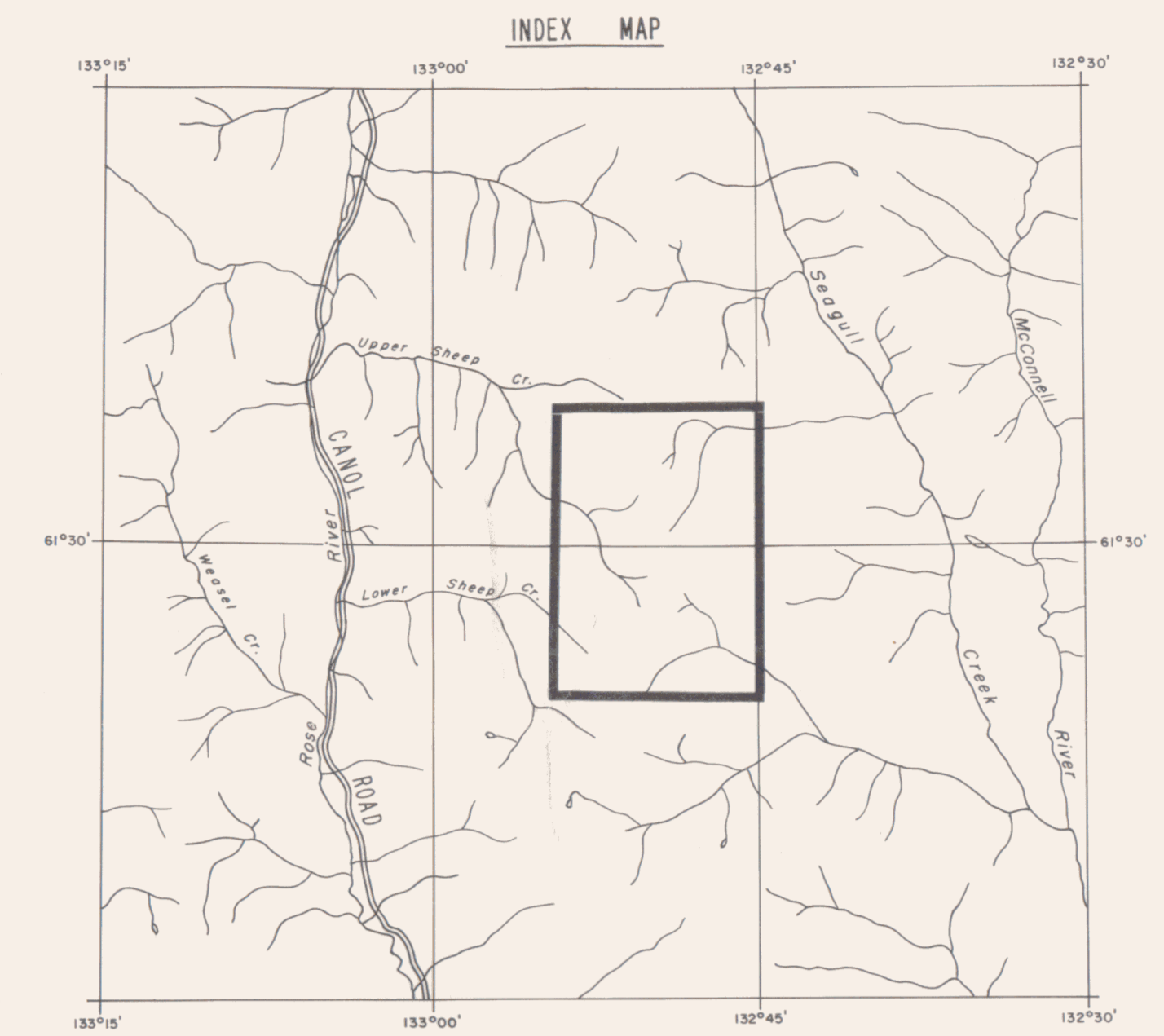
Lot. No.: A-2191-540 PAGE 14

ALL RESULTS - P.A.M.

SAMPLE #	cu	mo	w	u.				
L1650S-1250E	4	3	6	3.8				
1300E	4	3	6	1.8				
1350E	TR	1	2	4.2				
1400E	TR	2	6	1.4				
1450E	4	3	6	.4				
1500E	8	2	12	.8				
1550E	4	2	6	.6				
1600E	4	2	6	4.2				
1650E	4	2	6	.8				
1700E	B	3	8	.4				
1750E	TR	2	4	4.2				
1800E	4	1	4	.4				
1850E	4	2	4	1.6				
1900E	TR	1	8	1.2				
1950E	TR	1	4	11.5				
L1650S-2000E	4	4	10	18.7				
L1800S-850E	B	2	10	7.8				
900E	16	1	10	.4				
950E	12	1	10	.4				
1000E	8	1	10	1.0				
1050E	12	2	8	.6				
1100E	8	2	8	.2				
1150E	4	1	8	4.2				
1200E	12	TR	6	.8				
1250E	8	1	8	1.4				
1300E	4	1	8	.8				
1350E	TR	1	8	1.4				
1400E	2	TR	8	.6				
1450E	B	1	8	2.4				
1500E	4	2	8	.8				
1550E	B	1	8	3.6				
1600E	4	1	8	1.6				
1650E	8	3	6	23.8				
1700E	4	3	8	15.2				
1750E	4	1	8	2.8				
1800E	4	2	10	1.6				
1850E	4	3	4	2.0				
1900E	4	2	4	2.8				
1950E	B	3	2	8.3				
L1800S-2000E	B	1	2	3.6				

Date: November 15, 1979

Assayer: K. Hoyle



**LEGEND**

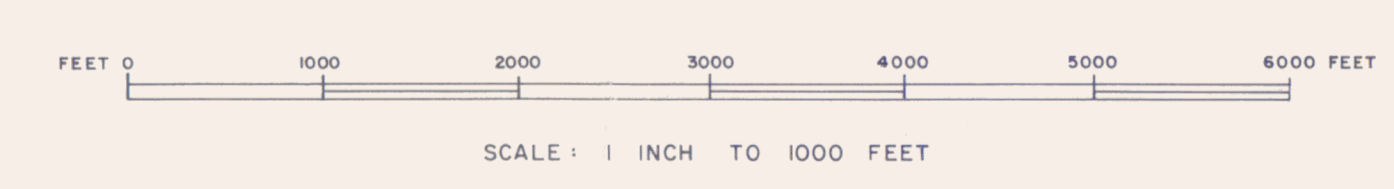
- △ 4841 Federal Government Topographic map control point
- STA 5 6056 Rio Alto field station
- X 3502 Kern PG 2 spot elevation point
- + 76 Photo center
- Mine adit (approximate)
- Mine access road
- Underground workings
- Trench
- ..... Geochemical grid

This map was compiled with a Kern PG 2 stereoplottor from government air photograph numbers A 12238; 76-79. Ground control consisted of Federal Government topographic maps scale 1:250,000, (Quiet Lake, NTS 105F) and 1:50,000 (Pass Peak, 105 F/10).

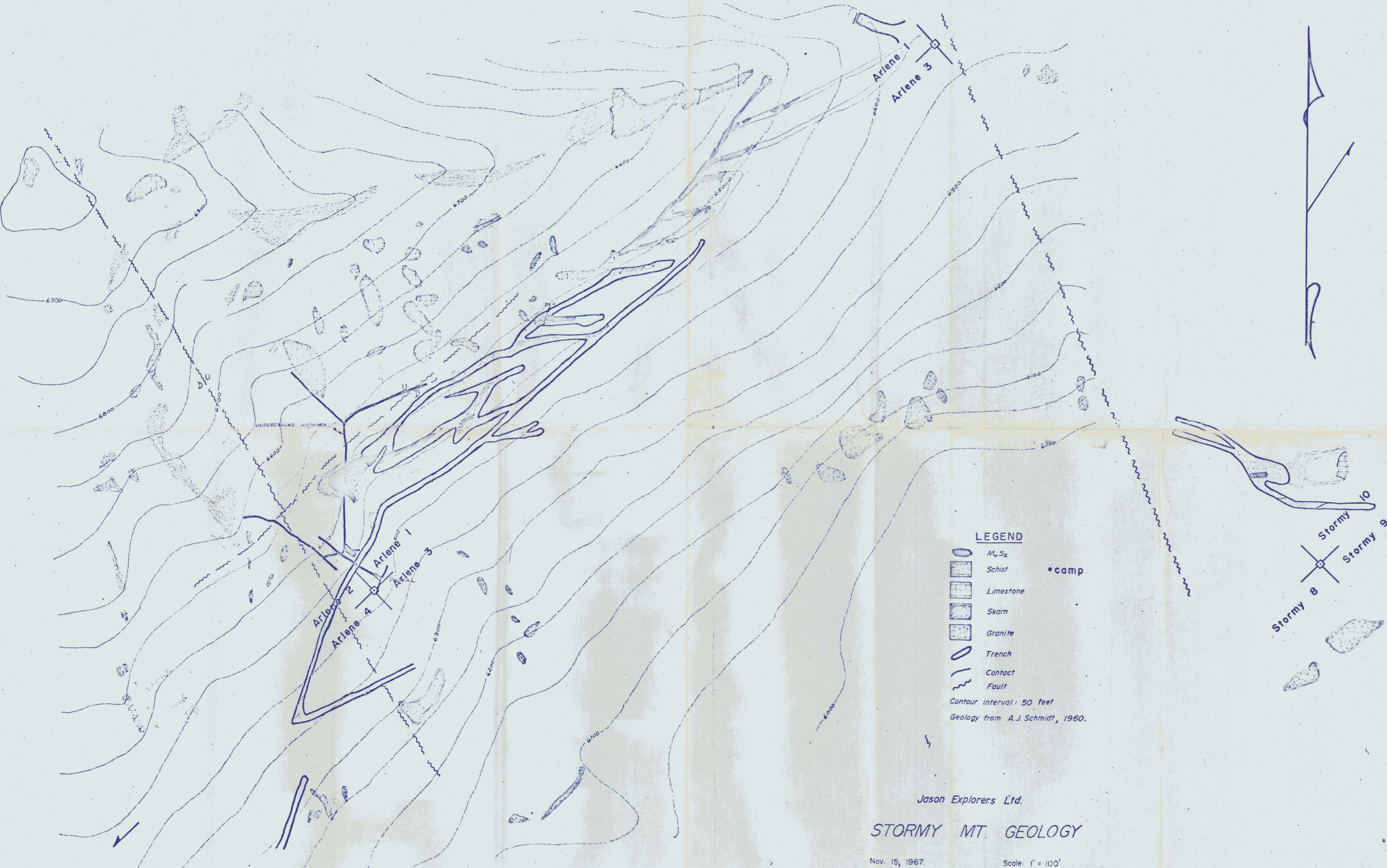
**TOPOGRAPHIC MAP  
OF THE  
STORMY MTN. AREA**

YUKON TERRITORY

CONTOUR INTERVAL: 100 FEET



Prepared for  
RIO ALTO EXPLORATION LTD.  
by  
V. ZAY SMITH ASSOCIATES LTD.  
CALGARY, ALBERTA  
1980



**LEGEND**

- M<sub>1</sub>S<sub>2</sub>*
- Schist
- Limestone
- Skarn
- Granite
- Trench
- Contact
- Fault

•camp

Contour interval: 50 feet  
 Geology from A.J. Schmidt, 1960.

Jason Explorers Ltd.





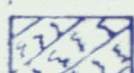

**STORMY MT. GEOLOGY**

Nov. 15, 1967.

Scale: 1" = 100'

CANOL METAL  
MINES, LTD.  
Stormy Mt., Yukon.  
CROSS-SECTION A-A  
looking N45°E  
1" = 20' June, 1960

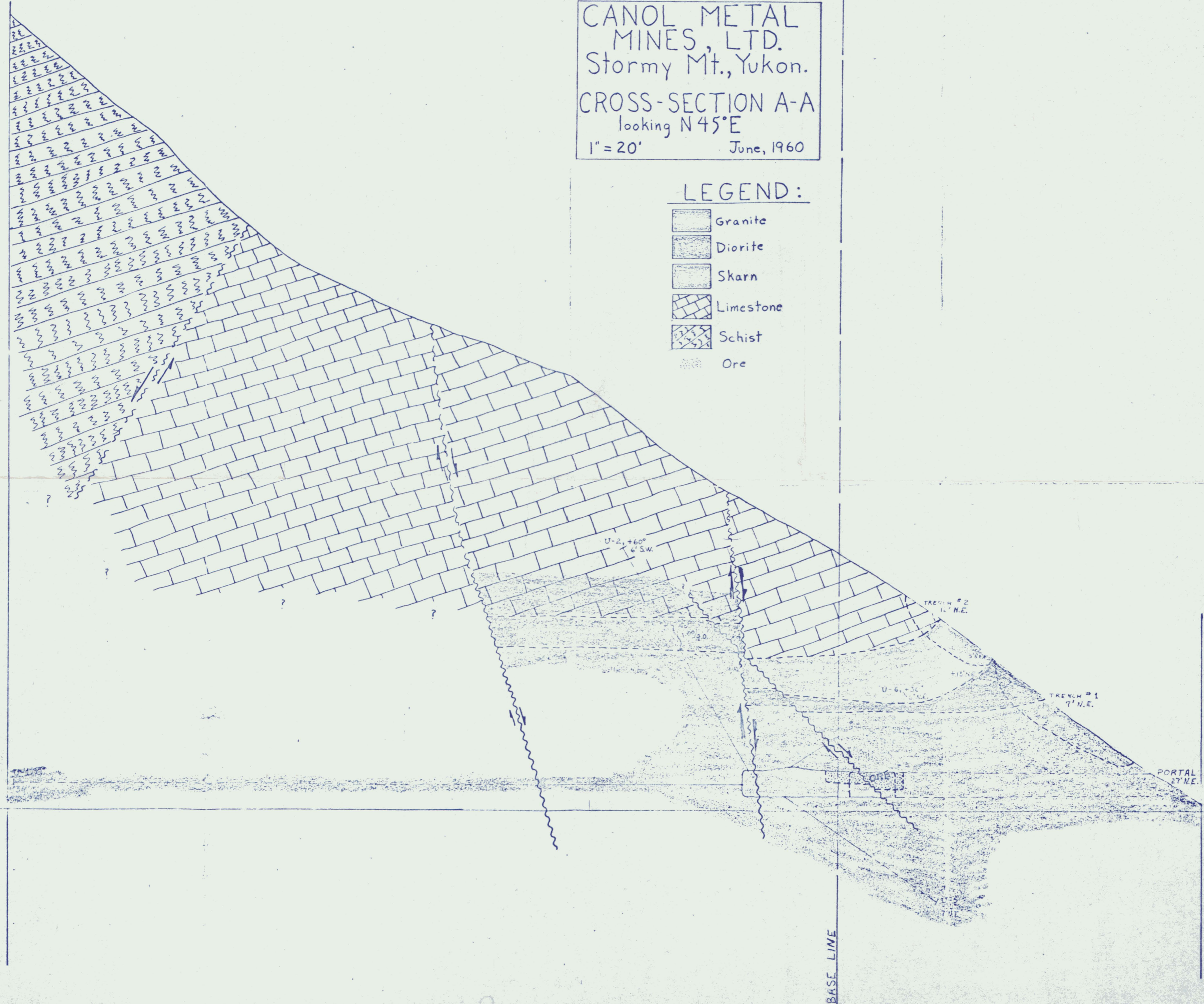
LEGEND:

-  Granite
-  Diorite
-  Skarn
-  Limestone
-  Schist
-  Ore

6600'






6500'

6400'



CANOL METAL MINES, LTD.  
 Stormy Mt., Yukon.  
 CROSS-SECTION B-B  
 looking N45°E  
 1" = 20' June, 1960

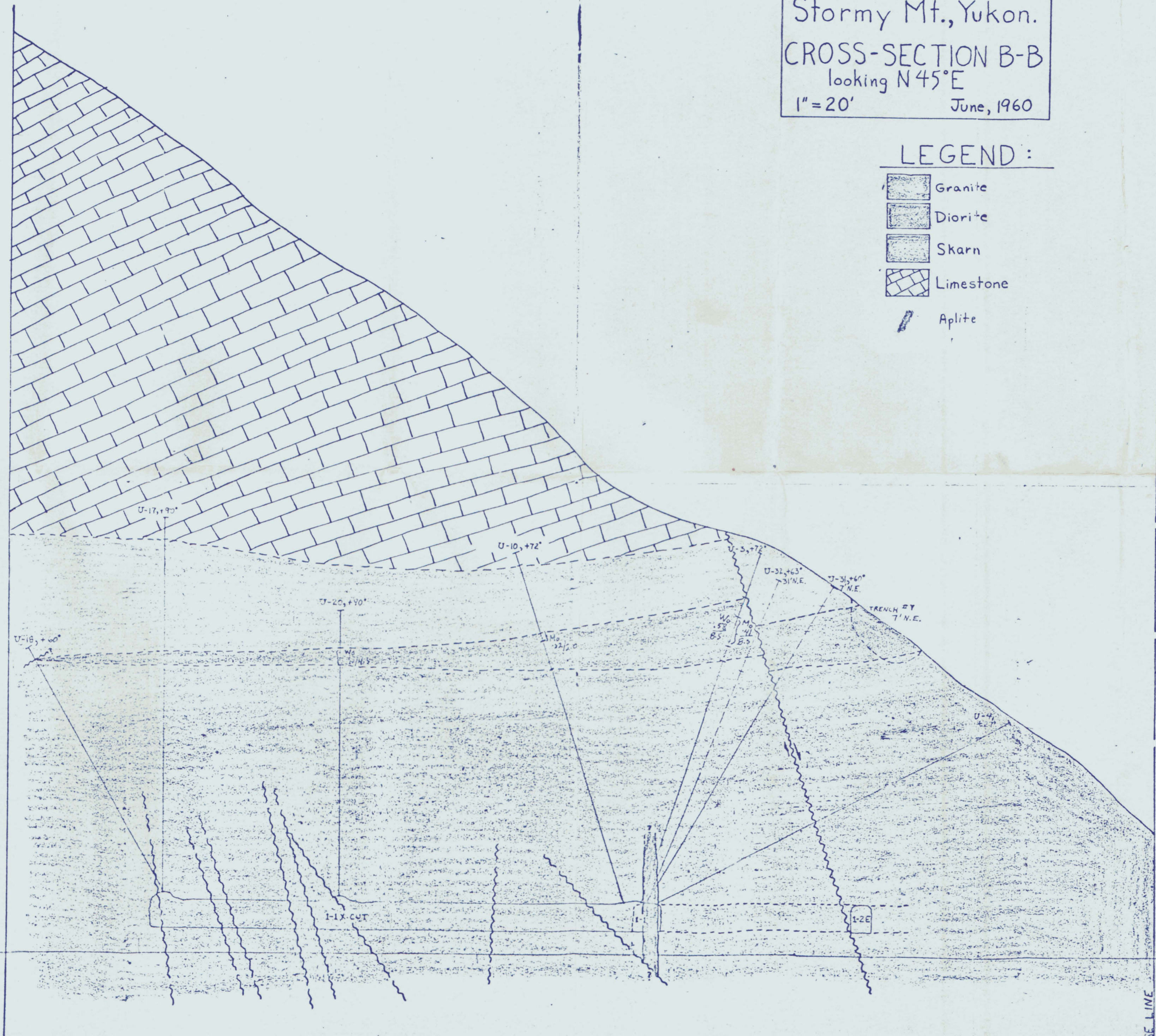
LEGEND:

-  Granite
-  Diorite
-  Skarn
-  Limestone
-  Aplite

6600'

6500'


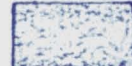



6400'

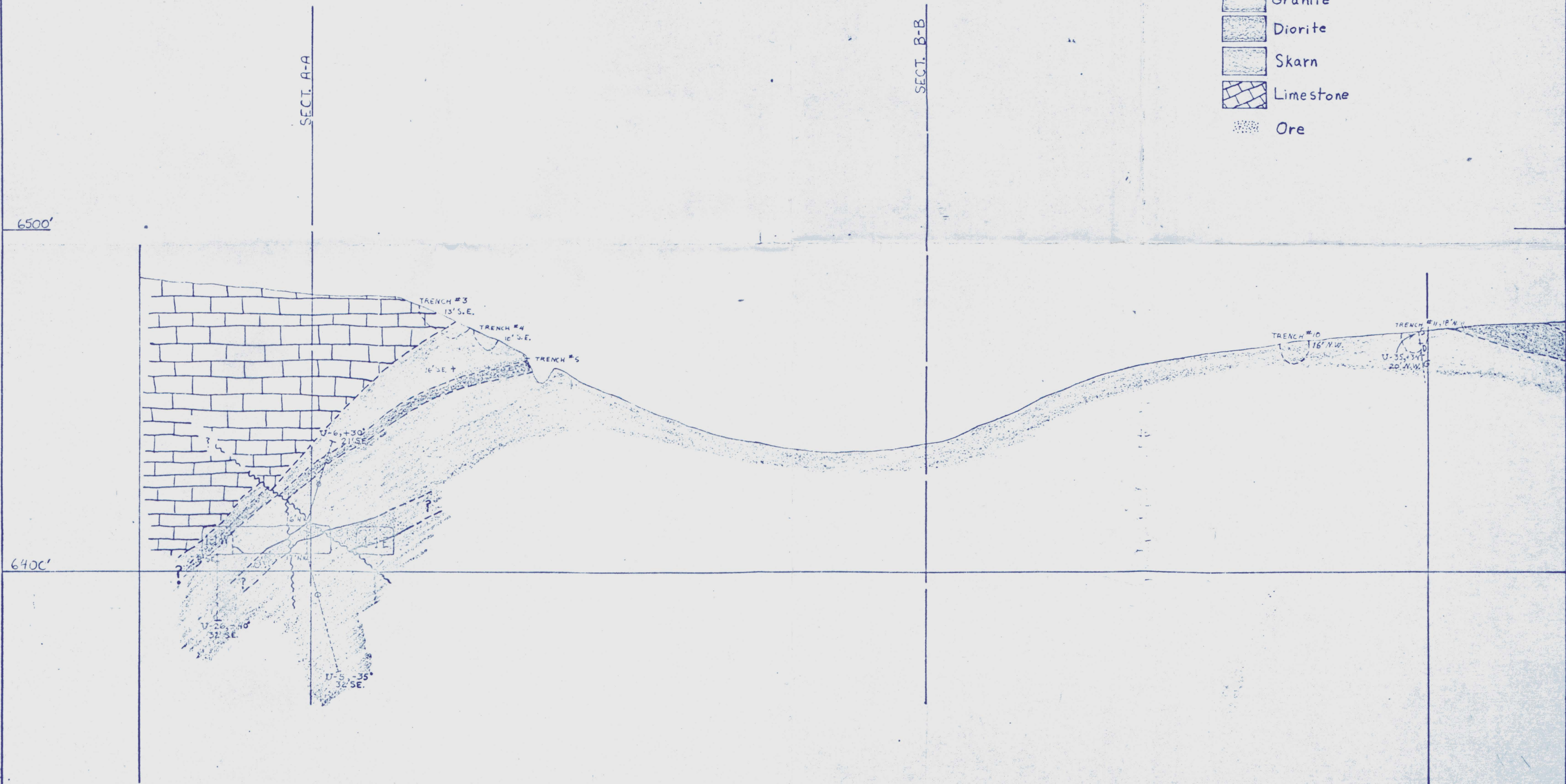


3-B

CANOL METAL  
MINES, LTD.  
Stormy Mt., Yukon.  
LONG-SECTION X-X  
looking N45°W  
1" = 20' June, 1960






LEGEND:

-  Granite
-  Diorite
-  Skarn
-  Limestone
-  Ore



CANOL METAL  
MINES, LTD.  
Stormy Mt., Yukon.  
LONG-SECTION Y-Y  
looking N45°W  
1" = 20' June, 1960

LEGEND:

-  Granite
-  Diorite
-  Skarn
-  Limestone
-  Aplite



Y-Y