STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

Alaska Geologic Materials Center *Data Report No. 377*

No. 377: 1980 U.S. Borax assay report for the Orange Hill Property, Nabesna Quadrangle, Alaska: Technical Service Report No. TS 8009-14

Received *March, 2010*

All data reports may be downloaded free of charge from the DGGS website.

1977 DRILLING PROCEDURE

Contractor(s):	A joint venture - Diamond Drill Contracting Company and Minerals Exploration Services of Spokane, Washington
Type of rig:	Diamond Drill helicopter model mounted on a J.I. case rubber-tired logging skidder
Bit size:	NQWL
Holes:	US-1A, -90°, 35 feet US-1B, -81°, S85E, 443 feet US-2, -90°, 556 feet US-3, -90°, 556 feet
Dates of drilling:	June 19th to August 6th
Names of drillers:	Larry Johnson (driller) Rob McWilliams (helper)
U.S. Borax supervision:	Thomas A. Henricksen Michael B. Schaubs
Overburden:	US-1A - 20' US-1B - 10' US-2 - 43' US-3 - 60'
Additives and mud:	Soluble oil and mud (Quick Gel) rarely used
Recovery:	Generally greater than 95%

Technical Service Report No.

TS 8009-14

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COPPER, MOLYBDENUM, LEAD, ZINC, GOLD, SILVER AND TUNGSTEN IN 1980 ORANGE HILL CORE AND ROCK SAMPLES

December 8, 1981

The contents of this report are "Company Confidential" and should not be disclosed to or discussed with persons outside of U.S.BORAX without approval of U.S.Borax Research Corporation.

Technical Service Requested by: T. A. Henricksen

Author: D. L. Hunter

D. L. Hunter

Approved by: Kenneth K. Kendall, Jr.

Kenneth K. Kendall, Jr.

Technical Service Report No. TS 8009-14

COPPER, MOLYBDENUM, LEAD, ZINC, GOLD, SILVER AND TUNGSTEN IN 1980 ORANGE HILL CORE AND ROCK SAMPLES

I. SUMMARY

In support of the ongoing examination of the Orange Hill, Alaska, locale by the Exploration Department, 30 core and 13 rock samples were analyzed for seven geochemical elements, including gold and tungsten. Results of these determinations are presented in Tables I and II.

II. INTRODUCTION

During the 1980 field season, the Exploration Department submitted to Anaheim over 40 rock and core samples from Orange Hill, Alaska. The determination of copper, molybdenum, lead, zinc, silver, gold and tungsten was requested.

III. DISCUSSION

The results of the determinations made were transmitted to the Exploration Department upon completion and are presented here in Tables I and II.

The geochemical determinations were made by the usual method of acid digestion with aqua-regia of the ground samples, followed by atomic absorption analysis of the resulting solutions.

Gold was determined by fire assay and tungsten colorimetrically using dithiol reagent, after fusion of the sample with bisulfate and digestion of the fused material in HCl.

Appendix D of Report No. TS 8001-7 contains a description of grinding and sample preparation procedures. Examples of records kept pertaining to the logging-in and analysis of samples are given in Appendices C and E of the same report.

IV. EXPERIMENTAL

A complete description of the geochemical procedure is presented in Appendix A of Report No. TS 8005-15. The fire assay and tungsten procedures are described in Appendices C and D of the same report.

FILE

USBRC Geochemical Analysis --- ORCG8001 --- 02-SEP-80

Field Number	Cu PPM	Mo PPM	Pb PPM	Zn PPM	As PPM	Au PPM	W PPM
OH80/1-5-10-C	4090.	166.	18.	156.	2.0	0.088	2.
OH80/1-10-15-C	3550.	114.	9.	114.	1.7	0.055	2.
OH80/1-15-20-C	1923.	119.	9.	197.	1.0	0.022	0.
OH80/1-20-25-C	411.	40.	12.	126.	0.6	0.022	0.
OH80/1-25-30-C	49.	5.	21.	65.	0.7	< 0.005	0.
OH80/1-30-35-C	41.	5.	23.	58.	0.6	0.044	0.
OH80/1-35-40-C	3420.	193.	10.	130.	2.3	< 0.005	10.
OH80/1-40-45-C	3550.	333.	13.	67.	2.2	< 0.005	5.
OH80/1-45-50-C	4260.	337.	113.	140.	3.2	0.044	7.
OH80/1-50-55-C	3720.	285.	15.	170.	2.8	0.011	12.
OH80/1-55-60-C	4100.	181.	32.	114.	3.2	< 0.005	12.
OH80/1-60-65-C	4500.	148.	18.	54.	3.0	0.066	7.
OH80/1-65-70-C	3140.	149.	10.	84.	2.1	0.044	2.
OH80/1-70-75-C	2700.	186.	11.	93.	2.1	0.077	2.
OH80/1-75-80-C	4130.	260.	12.	87.	2.4	< 0.005	7.
OH80/1-80-85-C	3720.	454.	24.	84.	2.0	0.066	7.
OH80/1-85-90-C	3560.	404.	12.	99.	2.1	< 0.005	7.
OH80/1-90-95-C	2557.	169.	12.	163.	1.8	0.011	2.
OH80/1-95-100-	58100.	309.	11.	86.	2.9	0.088	7.
OH80/1-100-105	3430.	129.	14.	67.	2.4	0.110	2.
OH80/1-105-110	3570.	307.	10.	92.	1.9	0.055	7.
OH80/1-110-115	360.	122.	33.	112.	2.7	0.022	5.
OH80/1-115-120	3590.	362.	11.	85.	2.1	0.154	10.
OH80/2-20-33-C	1075.	60.	12.	72.	1.3	0.022	0.
OH80/2-33-40-C	1616.	92.	10.	72.	1.4	0.022	0.
OH80/2-40-45-C	1121.	66.	10.	60.	1.1	0.143	0.
OH80/2-45-50-C	2082.	93.	10.	74.	1.5	0.077	0.
OH80/2-50-55-C	1892.	106.	11.	69.	1.2	0.088	0.
OH80/2-55-60-C	1629.	85.	11.	68.	1.3	0.066	0.
OH80/2-60-67-C	1817.	106.	11.	63.	1.3	0.055	2.

TABLE I

USBRC Geochemical Analysis --- ORXG8001 --- 26-AUG-80

Field Number	Cu ppm	Mo ppm	Pb ppm	Zn ppm	As ppm	Au ppm	W ppm
A/80/ORH-1-R	1730.	77.	783.	1520.	6.7	0.286	7.
A/80/ORH-2-R	857.	56.	7.	110.	1.3	0.099	2.
A/80/ORH-3-R	1170.	7.	12.	211.	2.1	0.099	0.
A/80/ORH-4-R	31.	< 5.	12.	14.	0.5	0.110	0.
A/80/ORH-5-R	41.	< 5.	7.	16.	0.6	< 0.005	0.
A/80/ORH-6-R	488.	< 5.	11.	10.	1.4	2.970	0.
A/80/ORH-7-R	267.	2350.	31.	100.	2.8	0.187	50.
A/80/ORH-8-R	1534.	524.	17.	148.	3.7	0.066	43.
A/80/ORH-9-R	4330.	156.	24.	1360.	7.3	0.308	24.
A/80/ORH-10-R	3840.	435.	27.	1530.	10.8	0.154	29.
A/80/ORH-11-R	414.	< 5.	12.	< 5.	2.4	2.420	72.
A/80/ORH-12-R	71.	7.	16.	28.	0.9	0.055	0.
A/80/ORH-13-R	118.	< 5.	< 5.	< 5.	0.3	< 0.005	0.

TABLE II

USBRC Geochemical Analysis --- ORCG8001 --- 02-SEP-80

Field Number	Cu PPM	Mo PPM	Pb PPM	Zn PPM	As PPM	Au PPM	W PPM
OH80/1-5-10-C	4090.	166.	18.	156.	2.0	0.088	2.
OH80/1-10-15-C	3550.	114.	9.	114.	1.7	0.055	2.
OH80/1-15-20-C	1923.	119.	9.	197.	1.0	0.022	0.
OH80/1-20-25-C	411.	40.	12.	126.	0.6	0.022	0.
OH80/1-25-30-C	49.	5.	21.	65.	0.7	< 0.005	0.
OH80/1-30-35-C	41.	5.	23.	58.	0.6	0.044	0.
OH80/1-35-40-C	3420.	193.	10.	130.	2.3	< 0.005	10.
OH80/1-40-45-C	3550.	333.	13.	67.	2.2	< 0.005	5.
OH80/1-45-50-C	4260.	337.	113.	140.	3.2	0.044	7.
OH80/1-50-55-C	3720.	285.	15.	170.	2.8	0.011	12.
OH80/1-55-60-C	4100.	181.	32.	114.	3.2	< 0.005	12.
OH80/1-60-65-C	4500.	148.	18.	54.	3.0	0.066	7.
OH80/1-65-70-C	3140.	149.	10.	84.	2.1	0.044	2.
OH80/1-70-75-C	2700.	186.	11.	93.	2.1	0.077	2.
OH80/1-75-80-C	4130.	260.	12.	87.	2.4	< 0.005	7.
OH80/1-80-85-C	3720.	454.	24.	84.	2.0	0.066	7.
OH80/1-85-90-C	3560.	404.	12.	99.	2.1	< 0.005	7.
OH80/1-90-95-C	2557.	169.	12.	163.	1.8	0.011	2.
OH80/1-95-100-	58100.	309.	11.	86.	2.9	0.088	7.
OH80/1-100-105	3430.	129.	14.	67.	2.4	0.110	2.
OH80/1-105-110	3570.	307.	10.	92.	1.9	0.055	7.
OH80/1-110-115	360.	122.	33.	112.	2.7	0.022	5.
OH80/1-115-120	3590.	362.	11.	85.	2.1	0.154	10.
OH80/2-20-33-C	1075.	60.	12.	72.	1.3	0.022	0.
OH80/2-33-40-C	1616.	92.	10.	72.	1.4	0.022	0.
OH80/2-40-45-C	1121.	66.	10.	60.	1.1	0.143	0.
OH80/2-45-50-C	2082.	93.	10.	74.	1.5	0.077	0.
OH80/2-50-55-C	1892.	106.	11.	69.	1.2	0.088	0.
OH80/2-55-60-C	1629.	85.	11.	68.	1.3	0.066	0.
OH80/2-60-67-C	1817.	106.	11.	63.	1.3	0.055	2.

FILE

USBRC Geochemical Analysis --- ORXG8001 --- 26-AUG-80

Field Number	Cu PPM	Mo PPM	Pb PPM	Zn PPM	As PPM	Au PPM	W PPM
A/80/ORH-1-R	1730.	77.	783.	1520.	6.7	0.286	7.
A/80/ORH-2-R	857.	56.	7.	110.	1.3	0.099	2.
A/80/ORH-3-R	1170.	7.	12.	211.	2.1	0.099	0.
A/80/ORH-4-R	31.	< 5.	12.	14.	0.5	0.110	0.
A/80/ORH-5-R	41.	< 5.	7.	16.	0.6	< 0.005	0.
A/80/ORH-6-R	488.	< 5.	11.	10.	1.4	2.970	0.
A/80/ORH-7-R	267.	2350.	31.	100.	2.8	0.187	50.
A/80/ORH-8-R	1534.	524.	17.	148.	3.7	0.066	43.
A/80/ORH-9-R	4330.	156.	24.	1360.	7.3	0.308	24.
A/80/ORH-10-R	3840.	435.	27.	1530.	10.8	0.154	29.
A/80/ORH-11-R	414.	< 5.	12.	< 5.	2.4	2.420	72.
A/80/ORH-12-R	71.	7.	16.	28.	0.9	0.055	0.
A/80/ORH-13-R	118.	< 5.	< 5.	< 5.	0.3	< 0.005	0.

HOLE SUMMARIES

DEPTH	DESCRIPTION	ASSAYS
	US-1A	
0-20'	overburden	-
20-35'	hornfelsed (biotitized) f.g. metasediments	ave. 0.1 Cu less than 0.017 MoS_2
	US-1B	
0-280'	mixture of dark-green metavolc. and metased.; minor diorite and porphyritic trondhjemite dikes; py:cpy is 5-10:1, total sulfide ave. less than 5%	ave. 0.13 Cu, less than 0.017 MoS_2
280-443' EQH	mostly f.g. diorite; xenoliths of metavolc. and metased.; py:cpy is 5-10:1; total sulfide ave. 2%	ave. 0.19 Cu, less than 0.017 MoS_2
	US-2	
0-43'	overburden	-
0-220'	mostly diorite "sill"; py:cpy is 2-3:1; total sulfides ave. 1%	ave. 0.109 Cu, less than 0.017 MoS_2
220-550' EQH	mostly f.g. metavolc.; several post-mineral andesite dikes; py:cpy is 2-3:1; total sulfide ave. less than 1%; slight increase at bottom of hole of sulfides and Cu content	ave. 0.177 Cu, less than 0.017 MoS_2
	US-3	
0-51.9'	overburden	-
51.9-130'	predominantly hornfelsed (biotitized) f.g. metavolcanics; numerous diorite dikes; ave. py:cpy is 4:1; 1% total sulfides	ave. 0.25 Cu, 0.036 MoS_2
130-550'	predominantly biotitized qtz. diorite with numerous pendants of dark hornfelsed f.g. metavolcanics and metasediments; locally abundant barren qtz. vn. stockwork; ave. py:cpy is 1:1; total sulfides 1%; last 60 feet of hole average 0.41 Cu, but less than 0.017 MoS_2; local intense (10%) magnetite in veins and replacements	ave. 0.215 Cu, less than 0.025 MoS_2

CORE LOG

US-R1

0 - 245', overburden, coarse gravel and sand with scattered boulders.

245' - 255', (chips) porphyritic dacite. A fine grained light gray rock characterized by 10-15% opaque white subhedral to more commonly euhedral plagioclase phenocrysts set in a very fine grained quartzo-feldspathic matrix. The phenocrysts appear weakly altered, possibly to a clay or sericite. The groundmass feldspar appears relatively fresh. An elongate grass green mineral is present in the groundmass which appears to be secondary chlorite, probably replacing hornblende or a pyroxene. An extremely fine opaque dust (magnetite?) is associated with chlorite. Trace to minor euhedral magnetite and pyrite is scattered throughout the rock. The magnetite/pyrite ratio is approximately 10:1. Minor epidote-quartz chips are present between 245'-255' and apparently represent secondary veinlets. The rock appears very similiar in composition and texture to the Tertiary dacite-andesite sills exposed on the Orange Hill property.

US-R2

0 - 180', overburden, coarse gravel and sand with abundant boulders.

180' - 195', (core) quartz diorite with propylitic alteration developed between 180'-185' and adjacent to thin quartz-pyrite veinlets which cut the rock between 185'-195'. The rock appears hypidiomorphic-granular, coarse grained and exhibits a "salt and pepper" texture. 180'-185' has experienced hydrotheral propylitic alteration which is distinctive with its mottled pink to greenish-gray color. Fresh rock is composed of 10-15% anhedral quartz, 35-40% euhedral plagioclase withsubhedral biotite, hornblende and minor chlorite and pyrite. Chlorite partially replaces hornblende. Biotite books exhibit a deep reddish brown color and appear to be unaltered. Pyrite occurs as thin discontinous stringers, often with quartz and as descreet grains. Very fine pyrite grains are occassionally observed aligned on feldspar twins. Propylitic alteration is indicated by the complete replacement of biotite and hornblende by chlorite accompanied with secondary epidote and pyrite. Plagioclase is altered to either a clay or sericite and displays a salmon pink color. 185'-187' is gradational between fresh and altered rock. The plagioclase is weakly altered and chlorite replaces hornblende and biotite, minor epidote is present.. The fresh rock is cut by thin discontinous quartz-pyrite veinlets with variable propylitic alteration halos. The degree of alteration appears related to vein size. Trace amounts of chalcopyrite occur with secondary chlorite which replaces hornblende.

US-R3

0 - 150', overburden, coarse gravel and sand with abundant boulders

150' - 155', (chips) quartz diorite. The rock is hypidiomorphic-granular, medium grained and exhibits a light gray-green color. It is composed predominantly of plagioclase-quartz-biotite-hornblende with secondary chlorite which replaces both mafic minerals. Minor pyrite is present as descreet euhedral grains, small grain clusters. and as thin discontinous stringers. Trace to minor chalcopyrite is present as very fine stringers associated with chlorite that has replaced hornblende. Plagioclase appears relatively fresh except for a few grains which exhibit a slight pinkish color. Occassional chips contain abundant epidote with associated chlorite and pyrite. The rock appears similiar in texture and mineralogy to the quartz diorite identified in US-R2 and appears to have suffered similiar but somewhat more weakly developed propylitic alteration.

155' - 160' (chips) poor chip recovery, highly contaminated with sand, chips also quite small due to worn bit.

GEOLOGIC SUMMARY

The drill hole data suggests the area tested west of Orange Hill is underlain by quartz diorite with weak to well developed propylitic alteration. The alteration appears fracture

controlled and is recognized by; 1) complete replacement of hornblende and biotite by chlorite, 2) secondary epidote and possibly minor carbonate, 3) increased pyrite content, 4) partial alteration of plagioclase to sericite or a clay mineral. Tertiary dikes or sills similiar to those exposed on Orange Hill cut the quartz diorite.

The rock type and alteration appear to indicate the area west of Orange Hill and beneath the Nabesna River channel represents the deeply eroded outer edge of the porphyry system. The available data indicates the area hosts little potential for either hypogene or supergene copper porphyry mineralization. The data is insufficient to evaluate the area southwest of Orange Hill.

The drill hole locations are plotted on; Geologic Map of Orange Hill and Vicinity, 1977, by T. A. Hendrickson and M. P. Schaubs and is on file at U.S. Borax's Spokane, Washington exploration office.

PROJECT

DEPTH			% CORE RECOV.		ASSAY			ORE MINERALS								GANGUE			
from	to	int'vl			%Cu	ppm Mo	ppm W	% PYRITE	% CHALCOPYRITE	% MOLYBDENITE	% BORNITE					EPIDOTE	CHLORITE	SERICITE	
0	5	5	0																
5	10	5	10		.4090	166	2	0.5	0.25	—	—						Tr.	?	?
10	15	5	60		.3550	114	2	<0.1	0-3		Tr. + Azurite						Tr.	?	Vein
15	20	5	80		.1923	119	0	tr.	tr.									tr.	
20	25	5	80		.0411	40	0	tr.										Tr.	
25	30	5	80		.0049	5	0												
30	35	5	80		.0041	5	0												
25	40	5	95		.3420	193	10	0.25-0.5	0-0.5	Minor								✓	✓
40	45		95		.3550	333	5	0.5	0-.25	Minor								✓	✓
45	50		90		.4260	337	7	0.5	0-.5	0.1								✓	✓
50	55		100		.3720	255	12	1-2	0.25	0									✓ ✓
55	60		100		.4100	181	12	0.5	0-.2	0								✓	
60	65		<5		.4560	184	7	5%		.1-.2									
65	70		95		.3190	149	2	1-2	0-.1	Minor								✓	
70	75		90-95		.2700	186	2	.25-.5	0.1-0.5	.05-.1								✓	
75	80		>95		.4130	260	7	0.5-1	.25-.5							✓		✓	
80	85		>95		.3720	454	7	0.5-1	.1-.5	<.05						✓		✓	
85	90		90-95		.3560	404	7	1-2	.1-.2	tr.						✓		✓	
90	95		>95		.2557	169	2	1-2	.1-.2	tr.						Tr.		✓	✓
95	100		90-95		5.81	309	7	1-1.5	.1-.2	tr.						Tr.		✓	
100	105		>95		.3430	127	2	1-2	.1-.15	Tr.						Tr.		✓	
105	110		>95		.3570	307	7	1-1.5	.1	Tr.								✓	
110	115		95-100		.0360	122	5	.5-1	.1	tr.						Tr		✓	
115	120		100		.3590	362	10	.5-2	.1	tr.								✓	

EOLOGIC LOG

ANGE Hill

PROJECT ORANGE

Collar elev.

Coord N

Inclination

Logged by

Date start

MINERALS: Kaolin	Sec. QTZ	Calcite	Gypsum	Magnetite	STRUCTURE: Ore veins	Mineralized veins	Σ	ROCK TYPE	
									OVERBURDEN
			✓	✓		10°-CPY			ALT. GRAN TO QTZ-SER-CHL-CPY QUARTZ OR TONALITE
			✓	✓	70° x 3ft.				
			✓		75°	0, 45°			2 2.5 ft. ANDES + PORPH. DIKES. ALT TUFF TO
		✓				25°			FROM OLIVINE TO 12 DEGREES (CHL-SER) 2.5 ft.
									THICK FROM 0-5°, ALT + ALTERED TO CHL-SER-CPY
									THIN CALC-SILICATE.
					10, 15°	25°			2 3.5 ft. TONALITE (HBL + PLAG + QTZ) DIKES.
									ANDESITE. ALTERATION THICK 2ft + PYRITE &
			✓		70°	35°			5 ft. QTZ-PY BRECCIA. 2ft QTZ-PY. ALT
					30°				
					5°	60°			
						15°-MO			CRUMBLY pieces from 57.7-58', NO R
					40°				ALTERED TONALITE W/ SER. PYRITE ALONG VEINLETS
					50°				
					30°	30°-40° + PY			LATE STAGE QTZ + PY. VUGGY QTZ VEINS QTZ +
	✓	✓	✓		20°-50°				TONALITE W/ NUMEROUS QTZ. VEINS 1/2 in.
	✓	✓	✓		40°	40°-45° 2-20 PY			QTZ IN QTZ VEINS & DISS. GRAINS. PYRITE in
	✓	✓	✓		25°	45°-MO			PINK-EPIDOTE ALTERATION 80-85' ABUNDANT
	✓	✓	✓		0°	70°-CPY 2-40°	10-15%		SILICIFIED CLAYEY QUARTZ 90-95 (?
	✓	✓	✓		20°	50° GYP + CPY			
	✓	✓	✓		30°	30° GYP + CPY			3/8" WIDE GYP + CPY VEIN @ 102
	✓	✓	✓		30°, 60°	5° GYP + CPY			
	✓	✓	✓		30° 60°	30°	30°		SHEAR @ 111 5°
	✓	✓	✓		60°	50° + 70°	30° GYP + CPY		

PROJECT ORANGE HILL, ALASKA — HOLE NO. DDH 80-1

Collar elev. _____ — Final depth 120+ ft.

Coord N. _____ — Coord E _____

Inclination VERTICAL — Page 1 of 1

Logged by M. Lechner

Date start July 17, 1980 — Date finish _____

ROCK TYPE	REMARKS
	OVERBURDEN
	Mod. gray to lt. gray SER. GRANITE OR TONALITE
	@ 62± ft. [illegible]
	From 67± ft. to [illegible]
	more fractured, [illegible]
	thin calcite veinlets.
	@ 32± ft. TONALITE (qtz. + [illegible]) Abundant qtz. [illegible]
	Abundant Alteration Shows qtz. + epidote alteration. Trace → clay, [illegible]
	50 ft. 90° Rock [illegible] qtz. [illegible] Alteration
	CRUMBLY pieces From 55.5'-56', NO RECOVERY From 56'-56.4'
	Altered Tonalite w/ sp. to major qtz. veins. Poor Recovery
	Like Stage 61± ft. very broken qtz. + alt. veinlets. Spec. Trace of lead & trace qtz. veinlets
	Tonalite w/ numerous qtz. veins. Some epidote @ 76-77'. Mostly [illegible]
	Clay in qtz. veins & disc. grains. Pyrite in qtz. veins & fracturing qtz. veins
	More epidote than 80-85'. Area of Alteration (?)
	50 ft. Gray clayey gouge @ 90.5' (10-15°)
	3/4" wide Gyp + Clay vein @ 102 + 102.5'
	Shear [illegible]
	[illegible]

GEOLOGIC LOG

PROJECT ____________

…Y			ORE							MINERALS	GANGUE																	MINERALS	ST…
			% PYRITE	% CHALCOPYRITE	% MOLYBDENUM	% BORNITE					EPIDOTE	CHLORITE	SERICITE	Hyd. BIOTITE	SEC. QTZ.	CALCITE	GYPSUM	MAGNETITE	K-SPAR										QTZ. VEINS
			.05-.1	.05								tr.				✓	✓	✓											[illegible]
			.1-.5	.05-.1	tr.	tr.						tr.				✓	✓	✓	✓										50, 30 [illegible]
			.5-1	.1-.2	tr.							✓		✓		✓	✓	✓	✓										[illegible]
			.1-[illegible]	.05-.2	tr.							tr.		✓		✓	✓	✓											[illegible] 40
			.1-.25	.05-.1								✓				✓	✓	✓	✓										10, 30 [illegible]
			.2[illegible]-.5	.1-.2	tr.							✓				✓	✓	✓											0, 20, [illegible] 45
			.25-.5	.1-.2	0-.05							✓				✓	✓	✓											10, 20, 35 30, 30

PROJECT ORANGE HILL, ALASKA HOLE NO. 80-2

Collar elev. _____ Final depth 67 Feet

Coord N. _____ Coord E. _____

Inclination VERTICAL Page 1 of 1

Logged by M. LECHNER

Date start _____ Date finish _____

RUCTURE		ROCK TYPE	REMARKS
Mineralized veins	5		
		OOO	OVERBURDEN
		OOO	
		+ + + + + +	Poor recovery, broken fragments of tonalite w/ minor malachite splotches
		+ + + + + +	
[illegible]	[illegible]	+ + + + + +	Tonalite, due to poor recovery unable to accurately describe rock is plagioclase feld. w/ minor qtz.
		+ + + + + +	veins and veinlets + unable to positively identify gypsum along fractures and as veinlets of qtz.
[illegible]		+ + + + + +	as above except grain size and w/in qtz. veins. A few brittle grains are altered to chlorite
		+ + + + + +	minor malachite. Loss of core from 10' to qtz. vein @ 33.5' Specific gravity @ 26.91
[illegible]		+ + + + + +	[illegible] core altered to a little more than half. Trace of Hyd. Biotite @ 44.5' ½" wide
		+ + + + + +	qtz. veins. No ½ [illegible] Specific gravity @ Margins of vein, Minor propylitic alteration around veins.
[illegible]	20°	+ + + + + +	Check [illegible] from 47'-47.5' on fifth sheet @ 45.5 (20°). Fresher rock
		+ + + + + +	from 49.5-50. Crackled [illegible] from 46'-46.5'.
30°		+ + + + + +	S.G.G. Less qtz. veining than 47'-50'. More chloritized Biotite near qtz. vein
		+ + + + + +	margins.
	35°	+ + + + + +	S.G.G. @ 58.5' about 3" [illegible] angle. Also at bottom of third sheet.
		+ + + + + +	
[illegible]	30°	+ + + + + +	More qtz. veining than [illegible] @ 50.5' Recovery 2' from 56.5-57.5' Biotite less
		+ + + + + +	[illegible] altered to chlorite. A 5" [illegible] (10°) of propylitic alteration for 2mm
			outward from vein.

DEPTH			% CORE RECOV.		ASSAY					
from	to	int'vl			% Cu		ppm Mo			
0	20	20	0							
20	26	6	8.3							
					.1075		60			
26	33	7	36							
33	40	7	70		.1616		92			
40	45	5	95		.1121		106			
45	50	5	100		.2083		93			
50	55	5	10		.1892		106			
55	60	5	100		.1629		85			
60	67	7	94		.1817		106			

GEOLOGIC LOG

PROJECT _____

ORE MINERALS								GANGUE MINERALS																				STRUCTURE		
% PYRITE	% CHALCOPYRITE	% MOLYBDENITE	% BORNITE					EPIDOTE	CHLORITE	SERICITE	Hyd. BIOTITE	SEC. BIOTITE	CALCITE	GYPSUM	MAGNETITE	K-SPAR												RT. VEINS	MINERALIZED VEINS	S
.05-.1	.05								tr.				✓	✓	✓															
.1-.5	.05-.1	tr.	tr.						tr.				✓	✓	✓	✓														
.5-1	.1-.2	tr.							✓		✓		✓	✓	✓	✓														
.1-.5	.05-.2	tr.							tr.		✓		✓	✓	✓															
.1-.25	.05-.1								✓				✓	✓	✓															
.25-.5	.1-.2	tr.							✓				✓	✓	✓															
.25-.5	.1-.2	.05							✓				✓	✓	✓															