DRILLING REPORT

ON THE

RED DOG 9, 12 AND RED DOG Fr MINERAL CLAIMS

Nanaimo Mining Division

92 L/12

50°42'N 127°58'W

Owned by Heinz Veerman
and William G. Botel

Work by Utah Mines Ltd.
J.B. Richards
H.R. Muntanion

November, 1983

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INTRODUCTION

Location and Access

The Red Dog property is centered on a 520m hill, 6.5 km NNE of Holberg. It lies within Western Forest Products Ltd. Tree Farm Licence No. 6. Access is via W.F.P. logging roads, specifically NE62, 15 km to Holberg and 46 km to the Island Highway at Port Hardy. See Index Map, Fig. 1.

Topography is fairly rugged with slopes in the 20^{o} to 40^{o} range.

The soil is weak and prone to slumping. The use of any heavy equipment, even tracked equipment neccessitates ballasted roads.

Property Definition

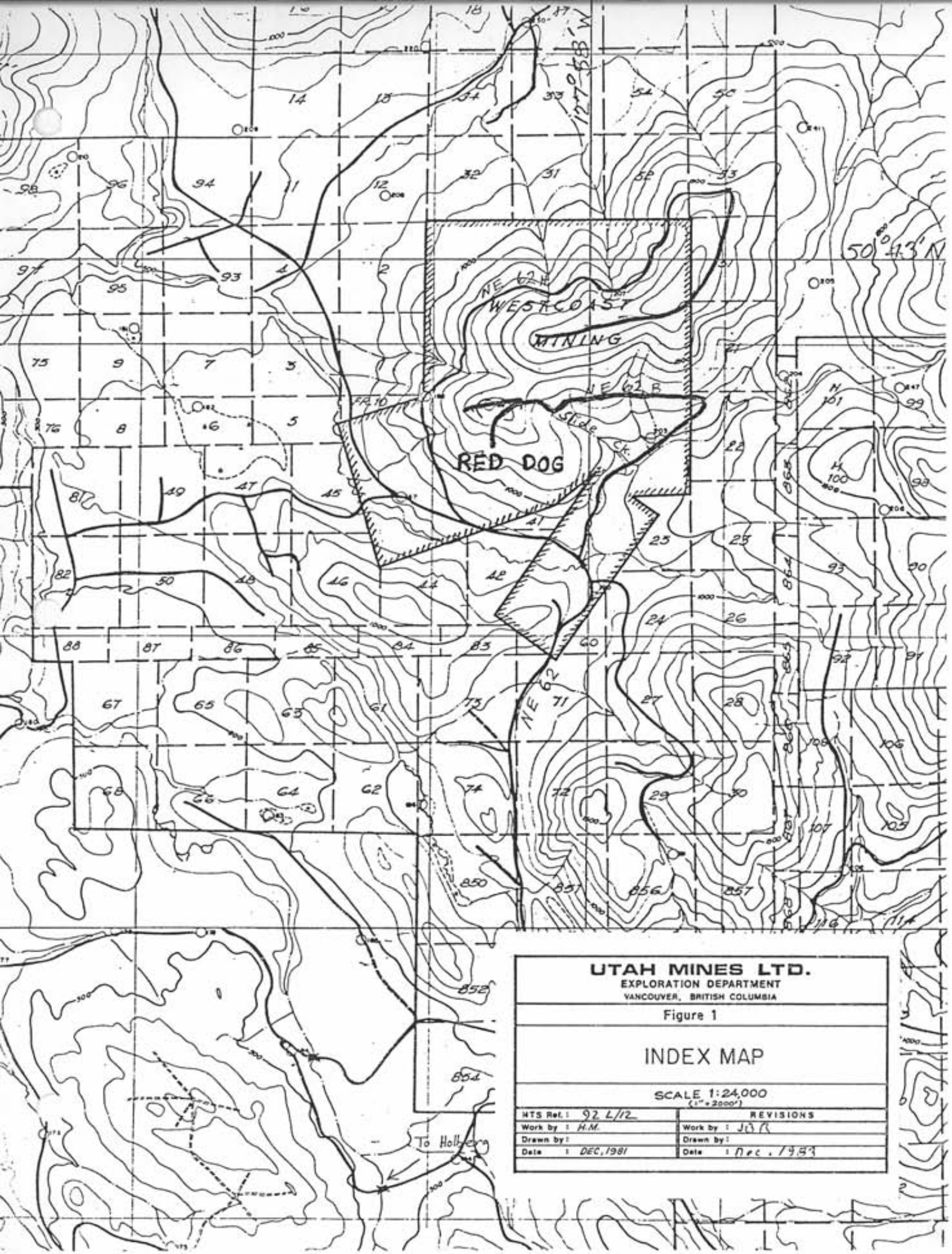
The property consists of 28 2-post and fractional claims:

Red Dog 1 - 26
Red Dog 29
Red Dog Fr

staked in 1967 and 1968 and owned by Heinz Verrman and William G. Botel, under option to Utah Mines Ltd.

The claims have been explored by the owners under the name Westcoast Mining and Exploration and by Cities Services and Utah Mines under option agreements. Previous work has consisted of geological mapping, EM-16, magnetometer and I.P. surveys and 42 D.D. holes totalling 5316 meters. Two small zones of near surface mineralization have been located but no economic reserve has been delimited. The property could be of economic interest if metal prices were closer to historic values and considerably larger volumes of mineralized rock located.

The 1983 work program consisted of 780 meters of NQ diamond drilling in 5 holes.



UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER, BRITISH COLUMBIA

Figure 1

INDEX MAP

SCALE 1:24,000
(1" = 2000')

NTS Ref. : 92 L/12	REVISIONS
Work by : H.M.	Work by : J.D.R.
Drawn by :	Drawn by :
Date : DEC, 1981	Date : Dec. 14, 83

DRILLING PROGRAM

The drill program was executed by Tonto Drilling on a contract basis using a Longyear Super 38 diamond drill equiped for helicopter moves. NQ tools were used throughout.

Drill sites were prepared by Van Alphen Exploration Services on a contract basis.

The drill was moved using a Bell Long Ranger helicopter on charter from Vancouver Island Helicopters in Port Hardy.

Core was delivered to the core logging facilities in Holberg. It was logged in detail by J.B. Richards and H.R. Muntanion using the "Geolog" method of International Geosystems which permits digitization of geologic data and logs to be printed on computer terminals.

The core was split lengthways and sampled in 10 foot intervals. All samples were assayed at Utah Mines Ltd. laboratory at Island Copper in Port Hardy, for copper, molybdenum, gold and silver. In addition each sample was tested for magnetite content using a Scintrex Model SM-5 magnetic susceptibility meter. Results are tabulated with assays on the assay logs.

Core is stored at the logging facility in Holberg.

See Plate 1 for drill hole locations.

The objective of holes EC-145 to EC-148 was to test an I.P. anomaly on the south slope of Red Dog Hill that may have represented a higher sulphide zone fringing the alteration centre.

All four holes encountered a zone of moderate to strong argillic alteration with kaolinite and pyrophyllite alteration of Bonanza Volcanics and the Red Dog Porphyry. In many cases alteration intensity was such as to make positive rock type identification very difficult. Moderate sulphide mineralization was encountered in all holes, consisting of disseminated pyrite with occasional primary bornite. No mineralization of possible economic importance was found.

The intensity of clay alteration and pyrite seen are quite adequate to explain the I.P. anomaly.

Hole EC-149 was drilled to determine the southern limit of the alteration zone encountered in the 4 previous holes. It encountered andesite flows and flow top breccias of the Bonanza Volcanics. Alteration was weak propylittic with pyrite the only sulphide mineral. This hole effectively puts a southern limit on the area of interest.

Complete logs of the five drill holes are attached as Appendix C, the signatures below cover all logs.

J.B. Richards, B.A.Sc., P. Eng.
Senior Geologist

H.R. Muntanion, B.Sc.
Project Geologist

APPENDIX A

STATEMENT OF QUALIFICATIONS

J.B. Richards, Senior Geologist for Utah Mines Ltd., Vancouver, B.C.

B.A.Sc., University of British Columbia, 1970

Registered as P. Eng., B.C., 1973, Geological. Continuously employed as an exploration geologist from 1970 to 1973 for various employers in B.C., Yukon, Washington and Costa Rica

1973 to 1978 - Geologist for Equity Mining, developing Sam Goosly Deposit.

1980 to 1983 - Senior geologist, Utah Mines in Vancouver on various development projects.

H.R. Muntanion, Project Geologist for Utah Mines Ltd., Vancouver, B.C.

Completed B.Sc. in 1970 at the University of Manitoba; employed by: Canadian Nickel Co. in the summers of 1969 and 1971 as a student and field geologist, respectively; Amax, Vancouver, B.C. during the summer of 1970 as a geological assistant in the Yukon; The Manitoba Mines Branch during the 1972 field season as a field geologist; Hudson Bay Oil and Gas Ltd., Toronto, Ontario during May to December, 1973 as a temporary geologist; Mindeco Ltd., Lusaka, Zambia from May 1974 to May 1977 as a geologist; Canadian International Development Agency, Ottawa, Ontario from August, 1977 to December, 1979 as geologist in Malaysia; Utah Mines Ltd. from April, 1980 to present under the supervision of D.N. leNobel, P. Eng.

APPENDIX B

STATEMENT OF COSTS

Drill Site Construction:		
Van Alphen Exploration Services		$ 6,998.30
Tonto Drilling - 780m NQ @ $82.45/m		65,308.28
Haida Trucking		624.00
Webb's Crane and Truck Service Ltd.		650.00
Assaying	227 samples for Cu, Mo, Au @ $19.38/sample	4,399.26
	56 samples for Ag @ $6.37/sample	356.72
Inter National Geosystems - data entry		2,010.94
Logging, Supervision and Sampling:		
J.B. Richards, Senior Geologist, 13 days & report 2 days @ $222.37		3,335.55
H.R. Muntanion, Project Geologist 23 days @ $189.69		4,362.87
L. Gibbon, Sampler 19.5 days @ 82.50		1,608.75
Room and Board - 36 man days @ $30./man day		1,080.00
Vehicle Expenses - 36 days @ $45./day		1,620.00
A. Reeves, Surveyor, 12.5 hrs. @ $18.68/hr.		233.54
D. Innes, Rodman, 12.5 hrs. @ $17.65/hr.		220.63
Helicopter Charter:		
Vancouver Island Helicopters		6,567.15
	TOTAL	$99,375.99

APPENDIX C

DIAMOND DRILL LOGS

G E O L O G E D I T L I S T I N G

SYSTEMS ENGINEERING BY
INTERNATIONAL GEOSYSTEMS CORP.

UTAH MINES LTD, VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY,BC NTS 92L/12

FORMAT VERSION : 6802

DRILLHOLE/TRAVERSE :	DDHAA000	COLLAR ELEVATION:	0.00	AZIMUTH(DEG) :	0.00
TOTAL DEPTH/LENGTH :	0.00	NORTHING(- IF S):	0.00	VERTICAL ANGLE :	-90.00
CORE/HOLE DIAMETER :	NQ	EASTING (- IF W):	0.00	CO-ORD SYSTEM :	GRD

GEOLOGGED BY :	HRM + NC				
DATE (YY/MM/DD):	830920				
PROJECT NUMBER :	2140				

```
   F   - I N T E R V A L -      T- %      TYPI- DAL  TEX- GRAIN FRAC- PGI   STRUCTUR-1 ALTERATION MINS  ORE-TYPE MINS SUMMARY
   M M ROCK FYING MIN TURES CHARACS TURE                          H  H  H  H  H  H  H  H  H ANY  ALTER-
K  A  (UNITS = FT,2 DEC.PLACE)  D I      TM TM MAT TX TX F C % M D M  /RT T ID STK DIP  A  A  A  A  A  A  A  A  A MIN  ATION
E  A   (FT=FOOTRIC)             U X TYPE  1  2 ONI  1  2 F F C P  S S      1    AZM  RT QZ BI CY CR MG PP PY CP CC YY  F I F I
Y  G  F R O M - T O -  I N T   -- - ---- -- -- --- -- -- - - - - ---- --- - -- --- --- -- -- -- -- -- -- -- -- -- --  - - - -
- --- ----.-- ----.-- ---.--
K  F                            G  C Z     TM GP2 TX TX S R S D D S      T ID STK DIP KF MS CL EP HE ZE PR MU BO HA  M I M I
E  L                              S  S S LC- 3      3  4 O N H /  S S      2    AZM  RT       H  H  H  H  H  H  H  H  H  SUMMARY
Y  G                            FRACTURE COL           R D P C          STRUCTUR-2       A  A  A  A  A  A  A  A  ORE
```

```
R SUM
R SUM                    RED DOG PROPERTY IS NEAR HOLBERG, VANCOUVER IS., B.C.
R SUM                     (NTS 92L/12)
R SUM                    DRILLING COMPANY:  TONTO DRILLING
R SUM                    GEOLOGGED BY:  HRM  =  HARRY R. MUNTANION
R SUM                                   JBR  =  J. BYRON RICHARDS
R SUM                    COORDINATE SYSTEM IS GRID ORIENTED TRUE NORTH.
R SUM                    GEOLOGICAL ROCK CODES AND LEGEND (/ 24-27)
R SUM                     OVER      OVERBURDEN
R SUM                     CASN      CASING IN BED ROCK, NO CORE
R SUM                     STKP      CASING ABOVE GROUND
R SUM                     MISN      MISSING CORE (CORE NOT AVAILABLE FOR LOGGING)
R SUM                     FAUL      FAULT (GOUGE ZONE > 1 FT)
R SUM                     SAND      SAND (ASSOCIATED WITH FAULT)
R SUM                     BS/D      ANDESITE TO BASALT DIKE - POST MINERAL
R SUM                     LT/D      LATITE DIKE - POST MINERAL
R SUM                     PPLT      LATITE AND TRACHYTE DIKE - POST MINERAL
R SUM                     FP/D      FELDSPATHIC DIKE - POST MINERAL
```

R SUM	PPQF	QUARTZ-FELDSPAR PORPHYRY DIKE - POST MINERAL
R SUM	PPQM	QUARTZ MONZONITE PORPHYRY DIKE - INTER MINERAL
R SUM	PPMZ	MONZONITE PORPHYRY DIKE - INTER MINERAL
R SUM	PPGD	GRANODIORITE PORPHYRY DIKE - INTER MINERAL
R SUM	PPDR	QUARTZ, DIORITE TO DIORITE PORPHYRY DIKE
R SUM		- INTER MINERAL
R SUM	RDBX	RED DOG INTRUSIVE BRECCIA - INTER MINERAL
R SUM	RDPP	RED DOG PORPHYRY - INTER MINERAL
R SUM	RDFP	RED DOG ALTERED FELDSPAR-QUARTZ PORPHYRY
R SUM		- INTER MINERAL
R SUM	RDQM	RED DOG QUARTZ MONZONITE - INTER MINERAL
R SUM	RDMZ	RED DOG MONZNITE - INTER MINERAL
R SUM	RDGD	RED DOG GRANODIORITE - INTER MINERAL
R SUM	RDDR	RED DOG DIORITE TO QUARTZ DIORITE - INTER MINERAL
R SUM	RDIN	RED DOG INTRUSIVE, UNDIVIDED - INTER MINERAL
R SUM	PPAN	BONANZA ANDESITE PORPHYRY DIKE - PRE MINERAL
R SUM	BVLT	BONANZA LATITE - PRE MINERAL
R SUM	BVAT	BONANZA ANDESITE TUFF - PRE MINERAL
R SUM	BVAF	BONANZA ANDESITE FLOW AND PORPHYRY - PRE MINERAL
R SUM	BVAB	BONANZA ANDESITE BRECCIA - PRE MINERAL
R SUM	BVAN	BONANZA ANDESITE UNDIFF. - PRE MINERAL
R SUM	PBVS	PARSON'S BAY VOLCANIC SEDIMENTS - PRE MINERAL
R SUM	KEY FLAGS (/,L 1-4) AND GENERAL FLAGS (/,L 2-4)	
R SUM	KTOX	TOP OF OXIDIZED ZONE (ABUNDANT LIMONITE)
R SUM	KBOX	BASE OF OXIDIZED ZONE (ABUNDANT LIMONITE)
R SUM	STK	CASING ABOVE GROUND
R SUM	OVB	OVERBURDEN
R SUM	RHED	REMARK, HEADER; PRINTED AT TOP OF GEOLIST
R SUM	RSUM	REMARK, SUMMARY; PRINTED AT BOTTOM OF GEOLIST

R SUM RALT REMARK, ALTERATION
R SUM RBSR REMARK, BEDROCK SURFACE
R SUM RCOL REMARK, COLOUR
R SUM RCON REMARK, CONTACT
R SUM RFRC REMARK, FRACTURE ZONE
R SUM RLTH REMARK, LITHOLOGY
R SUM RMIN REMARK, MINERAL (NON-SULPHIDE)
R SUM RMNZ REMARK, MINERALIZATION
R SUM RSAM REMARK, SAMPLE TAKEN
R SUM RSTN REMARK, SAMPLE STAINED
R SUM RSTR REMARK, STRUCTURE
R SUM RTHN REMARK, THIN SECTION
R SUM RTXT REMARK, TEXTURE
R SUM RVEN REMARK, VEIN
R SUM RXRD REMARK, X-RAY DIFFRACTION
R SUM RASY REMARK, ASSAY FILE REMARKS
R SUM TYPIFYING MINERALS TM1 (/28-29) TM2(/30-31) TM2(L32-33)
R SUM TM3 (L28-29) TM1(/32-33)
R SUM QZ QUARTZ QF QUARTZ FRAGMENT
R SUM FX FELDSPAR PHENOCRYSTS RF ROCK FRAGMENT
R SUM BI BIOTITE
R SUM HB HORNBLENDE
R SUM PX PYROXENE
R SUM QX QUARTZ PHENOCRYSTS
R SUM MG MAGNETITE
R SUM TEXTURES TX1(/35-36) TX2(/37-38)
R SUM PP PORPHYRITIC
R SUM EQ EQUIGRANULAR
R SUM FR FRAGMENTAL

R SUM CT CLASTIC
R SUM VG VUGGY
R SUM BR BRECCIATED
R SUM KR CRACKLED
R SUM SH SHEARED
R SUM GG GOUGED
R SUM MY MYLONITIC
R SUM CM CHILLED MARGIN
R SUM FRACTURE: INTENSITY - F-SCALE
R SUM QUARTZ (/43) CARBONATE (L24)
R SUM ORY (L43) ZEOLITE (L26)
R SUM MAGNETITE (/45)
R SUM SULPHIDE (L45)
R SUM F-SCALE
R SUM X EXTREME
R SUM 9 VERY STRONG-EXTREME
R SUM 8 VERY STRONG
R SUM 7 STRONG
R SUM 6 MODERATE-STRONG
R SUM 5 MODERATE
R SUM 4 WEAK-MODERATE
R SUM 3 WEAK
R SUM 2 VERY WEAK-WEAK
R SUM 1 VERY WEAK
R SUM 0 ABSENT
R SUM FRACTURE DIP, STEEPNESS (/,L44,45, L25,27)
R SUM MEASURED PARALLEL TO CORE AXIS
R SUM 1 SHALLOW (0 -<30)
R SUM 2 MODERATE (30-60)

R SUM 3 STEEP (>60-90)

R SUM STRUCTURE

R SUM STRUCTURE ID'S

R SUM VQ VEIN, QUARTZ F/ FAULT

R SUM VP VEIN, PYRITE C/ CONTACT

R SUM VY VEIN, PYROPHYLLITE SH SHEAR

R SUM VC VEIN, CLAY

R SUM DIP MEASURED PARALLEL TO CORE AXIS AND RECORDED /L55-56

R SUM THICKNESS OF VEIN (/L48)

R SUM T1 (/48) THICKNESS OF QUARTZ VEINS

R SUM T2 (L48) THICKNESS OF SULPHIDE VEINS

R SUM T-SCALE

R SUM 0 < 1 MM

R SUM 1 1-3 MM

R SUM 2 3-10 MM

R SUM 3 1-3 CM

R SUM 4 3-10 CM

R SUM 5 10-30 CM

R SUM 6 30-100 CM

R SUM 7 > 1 M

R SUM COLOUR OF ROCK (L28-29)

R SUM	LIGHTNESS (L-SCALE)	COLOUR RANGE (C-SCALE)
R SUM	9 PALEST	W WHITE
R SUM	8 PALE	A GRAY
R SUM	7 LIGHT	U BROWN
R SUM	6 MEDIUM LIGHT	T TAN
R SUM	5 MEDIUM	G GREEN
R SUM	4 MEDIUM DARK	R RED

R SUM 3 DARK O ORANGE

R SUM 2 VERY DARK N BLACK

R SUM 1 DARKEST B BLUE

R SUM P PURPLE

R SUM % MIX IS PERCENT OF INTERVAL WHICH IS OF R D-TYPE

R SUM USE G-SCALE

R SUM TWO LETTER CODE FOR ALTERATION AND ORE MINERALS

R SUM	QZ QUARTZ (/57-58)	PY PYRITE	(/69-70)
R SUM	KF K-FELDSPAR (L57-58)	PR PYRRHOTITE	(L69-70)
R SUM	BI BIOTITE (/59-60)	CP CHALCOPYRITE	(/71-72)
R SUM	MS MUSCOVITE-SERICITE (L59-60)	MO MOLYBDENITE	(L71-72)
R SUM	CY CLAY (/61-62)	CC CHALCOCITE	(/73-74)
R SUM	CL CHLORITE (L61-62)	BO BORNITE	(L73-74)
R SUM	CB CARBONATE (/63-64)	YY ODDBALL ORE MINERAL	(/75-76)
R SUM	EP EPIDOTE (L63-64)		
R SUM	MG MAGNETITE (/65-66)		
R SUM	HE HEMATITE (L65-67)		
R SUM	PP PYROPHYLLITE (/67-68)		
R SUM	ZE ZEOLITE (L67-68)		

R SUM HOW OF ALTERATION MINERAL OCCURENCE (FIRST COL. UNDER MINERAL)

R SUM X MASSIVE

R SUM 9 PERVASIVE

R SUM 8 DISS., PATCHES > VEINS, SELVAGES, ENVELOPES

R SUM 7 DISS., PATCHES = VEINS, SELVAGES, ENVELOPES

R SUM 6 DISS., PATCHES < VEINS, SELVAGES, ENVELOPES

R SUM 5 VEINS AND/OR ABUNDANT ENVELOPES

R SUM 4 VEINS AND/OR OCCASIONAL ENVELOPES

R SUM 3 VEINS = SPOTS AND PATCHES

R SUM 2 MICROVEINS AND VEINS

GEOLOG

UTAH MINES LTD, VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY,BC NTS 92L/12
DRILLHOLE/TRAVERSE --- DDHAA000 --- (CONTINUED)

R SUM 1 MINOR MICROVEINS AND SCATTERED CRYSTALS
R SUM 0 BARREN
R SUM D DISSEMINATIONS
R SUM V VEIN
R SUM E ENVELOPE
R SUM P PERVASIVE
R SUM Q PATCHES
R SUM C COATING
R SUM S SELVAGE
R SUM AMOUNT OF ALTERATION MINERAL
R SUM G-SCALE (GRADE IN PERCENT) I-SCALE (INTENSITY)
R SUM - (ORE MINERALS ONLY) - (SILICATE MINERALS ONLY)
R SUM ? POSSIBLY PRESENT
R SUM / PROBABLY PRESENT X EXTREME
R SUM 0 0.00% 9 VERY STRONG-EXTREME
R SUM . 0.01% 8 STRONG-VERY STRONG
R SUM - 0.03% 7 STRONG
R SUM (0.1% 6 MODERATE-STRONG
R SUM * 0.3% 5 MODERATE
R SUM) 1.0% 4 WEAK-MODERATE
R SUM + 2.5% 3 WEAK
R SUM = 5.0% 2 VERY WEAK-WEAK
R SUM 1 10% 1 VERY WEAK
R SUM 2 20% 0 NONE
R SUM 3 30%
R SUM 4 40%
R SUM 5 50%
R SUM 6 60%
R SUM 7 70%

R SUM 8 80%

R SUM 9 90%

R SUM X 100%

R SUM F-SCALE FOR SILICATE ALTERATION FACIES - (/77,79)

R SUM 0 FRESH

R SUM 1 PROPYLITIC

R SUM 3 ARGILLIC

R SUM 4 CHLORITE SERICITE

R SUM 5 PHYLLIC

R SUM 7 ADVANCED ARGILLIC

R SUM 8 POTASSIC

R SUM 9 SILICIC (>90% QUARTZ)

R SUM M-SCALE FOR METALLIC MINERAL FACIES

R SUM 0 NEGLIGIBLE (<0.5% SULPHIDE),

R SUM 1 PY

R SUM 2 PY>CP

R SUM 3 PY>CP, MO(MO>=0.005%)

R SUM 4 PY>CP, BO OR PY=BO

R SUM 5 PY>CP, BO, MO

R SUM 6 CP>PY

R SUM 7 CP>PY, MO

R SUM 8 CP>PY>BO

R SUM 9 CP>PY>BO, MO

R SUM ASSAY HEADERS FOR RED RED PROJECT,

R SUM PC.0SAMPLE RQDMS K.1 % CU % CU % MO OZ AU OZ AG

R SUM SERIAL PC.0 FIELD FIELD ISCU ISCU ISCU ISCU

R SUM NUMBER CORE CORE CORE CORE CORE CORE

R SUM HAND EST AAS AAS FA1.5 AAS

R SUM CORE RECOVERY MEASURED AS A PERCENT OF SAMPLE LENGTH

UTAH MINES LTD, VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY,BC NTS 92L/12
DRILLHOLE/TRAVERSE --- DDHAA000 --- (CONTINUED)

R SUM ROD MEASURED AS A PERCENT OF SAMPLE LENGTH
R SUM MS K.1 = MAGNETIC SUSCEPTIBILITY IN KAPPA UNITS
R SUM ISCU = ISLAND COPPER LAB, PORT HARDY
R SUM HAND = HAND HELD
R SUM EST = ESTIMATE
R SUM AAS = ATOMIC ABSORPTION
R SUM FA1.5 = FIRE ASSAY, 1.5 OZ PER 1 ASSAY TON
R SUM RECOMMENDED GRAFLOG LEGENDS
R SUM BASIC GEOLOGY AND METAL ZONE CHARACTERISTICS.
R SUM FLAG PGI RI %PY %CP %BO %MO SULPHIDE ZONE SULPHIDE INTENSITY
R SUM +HISTOGRAMMED EST-CU, %CU, %MO, PPM AU
R SUM BASIC STRUCTURE.
R SUM PGI (QZ-DIP) (DRY-DIP) (MG-DIP) (SX-DIP)
R SUM + HISTOGRAMMED RECOVERY, ROD
R SUM BASIC ALTERATION.
R SUM PGI %QZ IMS %CY %PP %CL %EP %MG ALTERATION FACIES
R SUM + HISTOGRAMMED MAGNETIC SUSCEPTIBILITY
R SUM GRAFLOG ROCK TYPE SYMBOLS
R SUM OVER O BLACK
R SUM CASN O BLACK
R SUM MISN BLANK BLACK
R SUM FAUL WV BLUE
R SUM BS/D BD
R SUM L
R SUM LT/D TO
R SUM L
R SUM PPLT PD
R SUM FP/D FD
R SUM Q

R SUM	PPQF	FD	
R SUM	PPQM	PQ	
R SUM		A	
R SUM	PPMZ	PZ	
R SUM		G	
R SUM	PPGD	PD	
R SUM		D	
R SUM	PPDR	PR	
R SUM	RDBX	RB	
R SUM	RDFP	RP	
R SUM	RDQM	RQ	
R SUM	RDMZ	RM	
R SUM		G	
R SUM	RDGD	RD	
R SUM	RDDR	RD	
R SUM	RDIN	R	
R SUM		A	
R SUM	PPAN	BD	PURPLE
R SUM	BVLT	BS	PURPLE
R SUM	BVAT	BT	PURPLE
R SUM	BVAF	BA	PURPLE
R SUM	BVAB	BB	PURPLE
R SUM	BVAN	B	PURPLE
R SUM	PBVS	P	PURPLE

G E O L O G E D I T L I S T I N G

SYSTEMS ENGINEERING BY
INTERNATIONAL GEOSYSTEMS CORP.

UTAH MINES LTD., VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY BC NTS 92L/12

FORMAT VERSION : 6802

DRILLHOLE/TRAVERSE :DDHEC145
TOTAL DEPTH/LENGTH : 507.00
CORE/HOLE DIAMETER : BQ

COLLAR ELEVATION: 1172.76
NORTHING(- IF S): 257722.01
EASTING (- IF W): 207116.17

AZIMUTH(DEG) : 0.00
VERTICAL ANGLE : -90.00
CO-ORD SYSTEM :

GEOLOGGED BY : HRM + NC
DATE (YY/MM/DD): 830919
PROJECT NUMBER : 2140

K	F L A G	- INTERVAL - (UNITS = FT,2 DEC.PLACE) (FT=FOOTRIC) FROM	TO	INT	T- M O D	% M I X	ROCK TYPE	TYPIFYING MIN TM 1	TYPIFYING MIN TM 2	QAL MAT QM1	TEXTURES TX 1	TEXTURES TX 2	GRAIN CHARACS F	C	%	FRACTURE M	D	PGI S	STRUCTUR-1 /RI	T	ID	STK	DIP	ALTERATION MINS HH AA QZ	HH AA BI	HH AA CY	HH AA CB	HH AA MG	ORE-TYPE MINS HH AA PP	HH AA PY	HH AA CP	HH AA CC	HH AA YY	ANY MIN	SUMMARY ALTERATION F	I	F	I
K	TOX	62.00	62.00																																			
R	TOX	62.00	62.00	TOP OF OXIDE ZONE MOSTLY LI COATS FRACTURES.																																				
R	TXT	62.00	68.00	NO RELICT TXT PY LARGELY LEACHED.																																				
R	MIN	68.00	71.00	HE PROB AFTER MG,ALSO DISSM IN QZ VEINS.																																				
R	MNZ	88.30	103.00	BO OCCURS AS SPARSE DISSM,SOME PY COATING+AS DISSM ON FRACTS																																				
R	SAM	91.00	91.20																																				
/	STK	0.00	1.50	1.50			STKP											P																					
/	OVB	1.50	62.00	60.50			OVER											P																					
/		62.00	68.00	6.00			BVAN			VG			72					P	1					76					94	9)					7	9	
L								9A					62											87											1	)	
/		68.00	71.00	3.00			BVAN			00			72					P	1					76					94	9)					7	8	
L								4A					62											97			91		00						0	0	
/		71.00	82.00	11.00			BVAN			VG			72					P	1	F/		45	97					96	9)	9(	C(			7	9	
L								9A					62											97							D.			1	)	
/		82.00	88.30	6.30			BVAN			00			32					P	1					96					96	8+	D-	C-			7	9	
L								9A					32											97	G2						D.			1	+	
/		88.30	103.00	14.70			BVAN			00			43					P	1	F/		00	86					93	8+	D-	C-			5	9	
L								9A					92											98	G5						8-			1	+	
/		88.60	91.50	2.90		5	FAUL											R																					
/		91.50	103.00	11.50		X	FAUL											R																					
/		103.00	116.00	13.00			BVAN			VG			72					P	1					68					94	00					7	9	
L								9A					82											95											0	0	

```
K  F  F R O M - T O -  I N T          % ROCK TM TM OM1 TX TX F C % M OSMS  RI 1 ID AZM DIP QZ BI CY CH MG PP PY CP CC YY  F I F I
E -L- ----.-- ----.-- ---.--         -- - ---- -- -- --- -- -- - - - - ---- --- - -- --- --- -- -- -- -- -- -- -- -- -- --  - - - -
Y  G                                    GS CSZS LC TM OM2 TX TX S R S U DSSS     2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA  M I M I

R ALT  103.00  116.00      BOTH MS+(CY?)+PP APPEAR

/      109.00  115.00   6.00          X FAUL                           R                        G5
L

/      116.00  136.00  20.00            BVAN         VG          71    P  1 F/      15 68    85       9? 00           5 9
L                                           9A                   91                     97                            0 0

/      116.00  120.00   4.00           9 FAUL                          R
L
R      116.00  136.00      SOME VUGGY SECTS LI COATED.

/      129.00  136.00   7.00          X FAUL                           R
L

/      136.00  146.00  10.00            BVAN         VG          83    P               89                 00          9 9
L                                           5U                   4                      92       4+                   0 0
R FRC  136.00  153.00      QZ VNS CUT BY H/L LI COATED FRACTS.

/      146.00  153.00   7.00            FAUL                     5     P               88    G5                       5 8
L                                                                X                      94                            0 0
K BOX  152.00  152.00

/      153.00  175.00  22.00            ROFP        FX2 PP     K 2  52     P               87    43           1(            5 8
L                                   .       7A                  7  51                     97                     1.     0 0

/      153.00  166.00  13.00          X ROFP        FX2 PP     K 2  52     R               87    43           1(            5 8
L                                   .       7A                  7  71                     97                     1.     0 0
R TXT  153.00  175.00      SOMEWHAT POROUS SOME SOFT MIN LEACHED OUT.FAIRLY VAGUE RELICT
R      153.00  175.00      TXT.
R LTH  153.00  175.00      TXT SAME APPEARANCE AS RDFP GEN MUCH MORE ALT.
R FRC  165.00  166.00      FAULT W GOUGING WK LIM STAIN.
R SAM  173.50  173.70

/      175.00  191.00  16.00            RDFP        FX2 PP     K 2  82     P   VQ      40 68    43       98 1.           7 9
L                                   .       6A                  7  51                     97       D-            1.     0 0
R VEN  175.00  191.00      40 DEG VNS VERY DOMINANT ALSO MINOR SETS IN A FEW OTHER
R      175.00  191.00      DIRECTS CONTAIN TR OF DISSM V FINE PY.INTENSE VN
R      175.00  191.00      DESTROYS TXT.VNS BROKEN.
R MIN  175.00  191.00      MS HAS PALE PINK HUE DUE TO V FINE DISSM HE (POSS PP??.DETERMIN-
R      175.00  191.00      ED TO BE SAME AS AT 290')
R TXT  175.00  191.00      M.G.POR TXT FADES OUT.STILL POR BUT FINER(AND.POR?)

/      179.50  180.00   0.50          X FAUL                           R
L

/      191.00  202.50  11.50            BVAB                     82    P               68    G3       98 00           7 9
L                                                                X                                                    0 0
R LTH  191.00  202.50      PSEUDOBX..RK IS QV+RP.LOCAL FINE RELIC POR (AND POR? RDFP?)

/      198.00  202.50   4.50          X FAUL                           R
L
```

K E Y	F -L- G	F R O M	- T O -	I N T		% ROCK TM TM QM1 TX TX F C % M QSMS RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY F I F I GS CSZS LC TM QM2 TX TX S R S O DSSS 2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA M I M I
R	FRC	198.00	202.50		STR GOUGING.	
/		202.50	212.30	9.80	BVAB 72 P VQ 50 67 G2 98 1* 7 9	
L					6A 3 D(0 0	
R	ALT	202.50	212.30		QZ NEARLY ALL AS VNS PROB MINOR AMT IN PERVAS SER PATCHES.	
R	SAM	205.00	205.20			
/		209.00	211.00	3.00	X BVAB 82 R 68 G3 98 17 7 9	
L					x D* 0 0	
/		212.30	225.00	12.70	RDFP FX2 PP K 2 4 P 86 98 00 7 9	
L					7A 3 0 0	
R	FRC	212.30	225.00		SEVERAL NARROW GOUGES THRU SECT MOST ABOUT 60 DEG.	
R	TXT	217.00	217.00		M.G. POR TXT VISIBLE.SOME BX ZONES DUE TO SHATT+QZ VNING.	
R	MIN	225.00	227.00		SOME WK LI STAIN.STR GOUGING.	
/		225.00	237.00	12.00	RDFP FX2 PP K 2 3 P 1 86 98 9? 00 3 9	
L					9A 8 0 0	
/		225.00	227.00	2.00	X FAUL R	
L						
R	ALT	225.00	237.00		POSS MIX OF CY+MS.CY DOMINANT? POSS SOME PP	
R	ALT	225.00	417.00		THE DISTINCTION OF ARGIL +PHYLLIC IS DUBIOUS. BUT SEEMS SOME CY	
/		231.50	235.00	3.50	X FAUL R	
L						
R		231.50	235.00		V.STR GOUGING.	
R	SAM	235.00	235.20		FOR X-RAY TO DETERMINE SOFT WHT ALT MIN (CY,MS,PP)	
/		237.00	246.00	9.00	RDFP FX2 PP K 2 5 P 1 87 97 95 00 3 9	
L					7A 8 0 0	
R	VEN	237.00	246.00		CRISS CROSS VNS,AT LEAST 2 GENERATIONS,RANDOM FRACT DIRECTIONS	
/		246.00	277.00	31.00	FAUL PP 2 P 87 98 1) 3 8	
L					5A FX/ X 1)	
R	TXT	246.00	277.00		RELICT POR TXT V VAGUE FX COMPLETELY ALT.	
/		277.00	287.00	10.00	RDBX FX/ PP 2 P 3 VY 17 87 96 54 1) 7 9	
L					5A 6 1)	
R	VEN	277.00	287.00		PP?VN OBVIOUS (2") TXT IS V VAGUE.	
/		287.00	291.00	4.00	RDBX FX/ FR 6 2 7 00 P 3 VY 17 95 9? 97 1* 7 9	
L					AT 3 1 *	
R	SAM	290.00	290.10		SAMPLE FOR X-RAY TO DETERMINE.	
/		290.00	290.50	0.50	X PPAN R	
L					3A	
/		291.00	306.00	15.00	RDBX FX/ FR 12 P 1 VY 17 97 97 54 1* 3 8	
L					7A 4 98 D. 1 *	
R	TXT	291.00	306.00		NARROW ZONES OF QZ FRAGS (UP TO 1CM) POR TEXT STILL DOMINANT.	

K E Y	F -L- G	FROM -	TO -	INT	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M O	DSMS DSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F M	I M	F M	I I
/		298.50	300.50	2.00	X	RDBX			FX/	PP						2	R	3	VY		17	87		96		54	5=				7	9		
L							5A									6 6															1	=		
R	CON	298.50	300.50		CONTACT GRADATIONAL.																															
/		306.00	320.00	14.00		RDBX				PP		5	5	6	00		P					97		97		5?	1*				3	8		
L							7A			FR		5	3	7	C	4							9?						1(		0	0		
R	TXT	306.00	320.00		POLYLITH,QZ FR DOMINANT W FINE DISSM PY,TAN COL FR COMPLETE ALT																															
R		306.00	320.00		TO CY,PP?MS?W V FINE DISSM HE,TEXT VARIES W ALT INTENSITY,SOME																															
R		306.00	320.00		SECTS W VAGUE +FINER FR,FR LATER THAN SILIC,POR TXT MOSTLY VAGUE																															
R	SAM	308.00	308.30																															
/		310.00	312.00	2.00	X	RDBX				PP		5	5	6	00		R					97		89		5?	1*				3	8		
L							7A			FR		5	3	7	C	8							9?						1(		0	0		
R	FRC	310.00	312.00		MUCH NARROW GOUGING.																															
/		312.00	313.00	1.00	X	FAUL											R																			
L																																		
R	CON	312.00	313.00		CONTACT V GRADATIONAL.																															
/		320.00	356.00	36.00		RDIN				EQ	PP				00		P					97		98			1)				3	8		
L							7A			FR			1		4								9?								1	)		
R	LTH	320.00	356.00		HAS V VAGUE POR TXT BUT NOT CERTAIN IF RDFP,RELICT PHENOS?ARE																															
R		320.00	356.00		FINER MAY BE STR ALT+BLEACHED BVAN UNIT?? POSS AND POR																															
R	TXT	320.00	356.00		FR STILL FAIRLY OBVIOUS OVER SOME SECTS,BUT CONSIDERABLY FINER																															
R		320.00	356.00		DK GRY FP FR,IMPRESSION OF ORIG EQUIGRAN INTRUS W XENOLITHS																															
/		322.30	327.00	4.70	X	RDIN				EQ	PP				00		R					97		89			1)				3	8		
L							7A			FR			1		8								9?								1	)		
/		327.00	328.00	1.00	X	FAUL											R							89			1+								
L																																		
/		338.00	343.50	5.50	X	FAUL				EQ	PP				00		R					97		89			1)				3	8		
L							7A			FR			1		8								9?								1	)		
R		338.00	343.50		NARROW(UP TO 6")GOUGE ZONES.																															
/		354.00	355.20	1.20	X	FAUL											R							8X			00								
L																																		
/		356.00	367.00	11.00		RDIN				EQ	PP				00		P					97		97			1-				3	8		
L							6A			FR			1		3								9?						1(		0	0		
R	TXT	356.00	367.00		NARROW ZONES OF VAGUE FR TXT RESULTS OF VNING?HEALER FRC?																															
R	LTH	356.00	367.00		GRADES TO FX POR.																															
R	SAM	357.00	357.50																															
/		367.00	386.50	19.50		RDFP				PP					1		P	1				97		98		03	1*				3	8		
L							6A			FR			1		3								9?						1.		0	0		
R	TXT	374.00	376.50		FR ZONE(ABOUT 20 %)MOST SUBANG QZ FR,SOME PP?CY?																															
/		381.30	383.00	1.70	X	FAUL											R							89			1)								
L																																		

K E Y	F -L- G	FROM	TO	INT		% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	F S	C R	% S	M O	QSMS DSSS	RI 2	1 ID	AZM	DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F I M	F I M
/		383.80	384.50	0.70		X	RDFP	6A			PP FR	1				1 9	R	1			97	9?	98		03	1*		1.		3 8 0 0	
/		386.50	403.50	17.00			RDFP	8A			PP					00 3	P				96	9?	98			1)		1*		3 8 4)	
R	TXT	386.50	403.50		PP TXT ONLY PRESERVED OVER SHORT SECTS,FP BUT NOT CONFIDENT IT																													
R		386.50	403.50		IS SAME UNIT AS RDFP																													
R	SAM	388.50	388.70																													
R	MNZ	388.50	388.70		PY INCREASE NOTED W INCREASE IN SILICA FLOODING(SHORT SECTS																													
R		388.50	388.70		HERE)																													
/		391.50	393.00	1.50		X	FAUL										R																
L																																	
/		399.80	400.70	0.90		X	FAUL										R																
L																																	
/		403.50	411.50	8.00			RDIN				EQ	5	5			7	P																
R	TXT	403.50	411.50		TXT GRADES TO EQUIGRAN.																													
/		411.50	417.00	5.50			RDIN	7A			EQ	5	5			8	P										1+				3 8 4 +	
R	CON	411.50	417.00		CONTACT ZONE IS GRADATIONAL.																													
R	MNZ	417.00	429.50		THROUGHOUT BN ZONE BN IS DISSM BUT CONC CHANGES OVER SHORT SECTS																													
/		417.00	429.60	12.60			RDBX									00 4 2	P				97	95	97			8=		1*		3 8 4 =	
R	SAM	423.80	424.00																													
R	TXT	423.80	424.00		POLYLITH.																													
/		426.00	429.60	3.60		X	RDBX									00 8 2	R				97	95	97			8=		1*		3 8 4 =	
/		429.60	440.00	10.40			RDBX	7A	RF Q		FR	5	4 3	7	10 0 3 1		P				98	97 53	97			9+		1(		5 8 4 +	
R	TXT	429.60	440.00		POLYLITH,ALT PPFX (MS)PREDOMINATE,SOME PALE GREY QZ FR,BUFF CO2																													
R		429.60	440.00		MS?PP?ALT FR,A BX FR NOTED.																													
/		440.00	443.50	3.50			RDFP	3A			PP FR	K	4	L	0 7 2		P				98	96				9)		1(		5 7 4)	
R	TXT	440.00	443.50		A FEW F,G,RK FR																													
/		443.50	459.00	15.50			RDIN	7A								431	P				98	96				9)		1(		5 8 4)	
R	TXT	443.50	459.00		NO RELICT TXT,SMALL (1-2MM)WHT MS OR CY FLECKS AFTER FX. LOCALLY																													
R		443.50	459.00		VAGUE APPARENT FX' PHENOS,A FEW RK + QZ FR (XENOLITHS?)																													
R	LTH	443.50	459.00		NOT CERTAIN IF V STR ALT RDIN OR ANDS POR (BVAF)																													
R	FRC	443.50	459.00		A FEW SHORT SECTS (<LT1 FT) OF STR FRACTS 6 IN GOUGE AT 457'																													
/		459.00	467.00	8.00			RDIN	8A								331	P				99	95				9+		1(		5 9 4 *	

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K  F  F R O M - T O -  I N T           % ROCK TM TM QM1 TX TX F C % M QSMS  RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY   F I F I
E -L- ----,-- ----,-- ---,--          -- - ---- -- -- --- -- -- - - - - ----  --- - -- --- --- -- -- -- -- -- -- -- -- -- --   - - - -
Y  G                                    GS CSZS LC TM UM2 TX TX S R S O DSSS      2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA   M I M I

/       463,50  465,00   1,50            X                                R                 64
L                                                                    9
R CON   463,50  465,00         CONTACT IS GRADATIONAL.
R SAM   465,00  465,20
R TXT   465,00  465,20         A FEW VAGUE FR OF VARIABLF SIZE,SAME SMALL WHT FLECKS AS ABOVE
R TXT   465,00  465,20         VAGUE SCATT FR OF VARIABLE SIZE,SMALL WHT FLECKS AFTER FX
R       465,00  465,20         (PHEN?)

/       467,00  507,00  40,00              RDBX          FR PP         32    P  1               98    52          8=            5 9
L                                              6A                2      0 3 3     1                96                   1, 1(       4 =
R TXT   467,00  507,00         FR ARE APPARENT V RAGGED,MAY ONLY BE ALT PRODUCT RK HAS MOTTLED
R       467,00  507,00         APPEARANCE,FR ARE MOSTLY AGGREGATES OF MS(CY?)PY
R LTH   467,00  507,00         RK COMPLETELY ALT TO SIL MS PY,SOME QZ+LESSER PP VNING,ABOVE
R       467,00  507,00         THIS UNIT VAGUE PP TXT RECOGNIZED+THE BX MAY HAVE ORIGINALLY
R       467,00  507,00         BEEN INTRUSIVE? WHERE ALT MORE PERVAS LOOKS LIKE BVAB
R SAM   475,00  475,20

/       489,00  493,00   4,00            X RDBX          FR PP         32    R  1 SH        45 98    52          8=            5 9
L                                              6A                2      0 3 3     1                96                   1, 1(       4 =

/       498,00  507,00   9,00            X                                R                 97              95 1)                 7 9
L                                                                                              95                   1(
R FRC   498,00  507,00         SEVERAL SH W SMEARED SULPH
R STN   498,00  507,00         STN TESTS DONE THROUGHOUT HOLE. RESULTS ALL NEGATIVE.

R SUM                             0     62     OVER

R SUM                            62    153     BVAN

R SUM                                          ADV ARG  ALT IS V STRONG W ZONES OF PHYLLIC

R SUM                                          ALT WKLY DISSM PY  QZ VNING INCREASES,BELOW 103'

R SUM                           153    191     RDFP

R SUM                                          V STR PHYLLIC ALT, BELOW 175' ALT IS V STR ADV

R SUM                                          ARGILLIC FINER POR TXT(AND POR?)

R SUM                           191    212     BVAB

R SUM                                          V STR ADV ARGILLIC,PSEUDOBX TXT DUE TO STR QZ VN

R SUM                           212    277     RDFP

R SUM                                          V STR ADV ARGILLIC,BELOW 225'V STR ARGILLIC ALT W

R SUM                                          WKLY DISSM PY,SOME SHATTER (QZ VN)BX ZONES

R SUM                           277    320     RDBX
```

R SUM			V STR ARGILLIC ALT,W NARROW ZONE OF ADV ARGILLIC ALT
R SUM			W NEGLIGIBLE PY+BO
R SUM	320	367	RDIN
R SUM			V STR ARGILLIC ALT W WKLY DISSM PY (BVAN?)
R SUM	367	403.5	RDFP
R SUM			V STR ARGILLIC ALT W NEGLIGIBLE DISSM PY+BO,BELOW
R SUM			385'BO INCREASES AS DISSM +ON FRCTS
R SUM	403.5	417	RDIN
R SUM			V STR ARGILLIC ALT W MOSTLY DISSM PY+BO
R SUM	417	440	RDBX
R SUM			V STR ARGILLIC ALT,BELOW 430'ALT IS V STR PHYLLIC
R SUM			MOSTLY DISSM PY,BO
R SUM	440	443.5	RDFP
R SUM			STR PHYLLIC ALT W WKLY DISSM PY,BO
R SUM	443.5	467	RDIN
R SUM			V STR PHYLLIC ALT W WKLY DISSM PY, BO
R SUM	467	507	RDBX
R SUM			V STR PHYLLIC ALT PY+MINOR BO MORE STRLY DISSM +ON
R SUM			FRCTS (BVA8?)
R SUM			HOLE CONSIST OF ALT AND? + BELOW 212' OF ALT RED DOG POR W
R SUM			APPARENT EQUIGRAN +BX PHASES,DISTINCT CONTACTS ARE NOT FOUND
R SUM			RELATIVELY NARROW ZONES W DISTINCT RELIC POR TXT.
R SUM			STRONG FAULTING OCCURS BETWEEN '88'+ 153,225'+227'.,
R SUM			QZ VNING IS WILL DEVELOPED FROM 103' TO 212'.
R SUM			THE UPPER 291' IS PREDOMINANTLY ALT TO ADV ARGILLIC MARKED BY
R SUM			EXISTENCE OF PP.THIS IS FOLLOWED BELOW BY ARGILLIC OR POSS
R SUM			PHYLLIC ALT,+BY PHYLLIC BELOW ABOUT 430'
R SUM			THE OXIDE ZONE OCCURS FROM 62-153'W SULPH LEACHED FROM THE UPPER
R SUM			FEW FT, PY IS MOSTLY WKLY DISSM,PY=BO MINZ OCCURS FROM ABOUT 385

R SUM -507'

R SUM NOTABLE MNZ OCCRS FROM:

R SUM 62-100' 0.12% CU .006% MO,.016 OZ/T AU PY>CP=CC>BO

R SUM 400-500' 0.14%CU .005% MO,.003 OZ/T AU PY>BO

R SUM TWO ZONES OF INTERESTING MO RESULTS OCCUR W NEGLIGIBLE CU + AU:

R SUM 120-170' .013% MO

R SUM 260-320' .013% MO

R SUM 62-507' AVERAGE CORE RECOVERY FOR HOLE IS 74.5%

R SUM 62-507' AVERAGE RQD FOR HOLE IS 8.8%

R ASY 498.00 507.00 ASSAY HEADERS FOR RED DOG PROJECT

R ASY 498.00 507.00 SUSCEP = MAGNETIC SUSCEPTIBILITY IN KAPPA UNITS

R ASY 498.00 507.00 RQD = ROCK QUALITY

R ASY 498.00 507.00 ISCU = ISLAND COPPER LAB,PORT HARDY

R ASY 498.00 507.00 HAND = HAND HELD

R ASY 498.00 507.00 EST = ESTIMATE

R ASY 498.00 507.00 AAS = ATOMIC ABSORPTION

R ASY 498.00 507.00 FA1.5 = FIRE ASSAY 1.51OZ PER 1 ASSAY TON

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISCU CORE 1AAS	% MO ISCU CORE ASS	OZ AU ISCU CORE FA1.5	OZ AG ISCU CORE AAS	% FE ISCU CORE AAS
A 001	62.00	70.00	63.00	19441	33	0.0	-.05	.04	.006	.026		7.7
A 001	70.00	80.00	59.00	19442	13	0.0	-.05	.19	.006	.005	.005	6.3
A 001	80.00	90.00	44.00	19443	0	0.0	-.05	.10	.006	.015		6.2
A 001	90.00	100.00	71.00	19444	0	0.0	-.05	.15	.006	.019		6.4
A 001	100.00	110.00	46.00	19445	0	0.0	-.05	.06	.005	.007		4.7
A 001	110.00	120.00	34.00	19446	0	0.0	-.05	.02	.005	.004	.003	3.5
A 001	120.00	130.00	63.00	19447	3	0.0	-.05	.02	.012	.006		4.3
A 001	130.00	140.00	53.00	19448	21	0.0	-.05	.03	.007	.004		6.8
A 001	140.00	150.00	58.00	19449	20	0.0	-.05	.02	.015	.003	.002	5.3
A 001	150.00	160.00	49.00	19450	0	0.0	-.05	.02	.009	.003		3.2
A 001	160.00	170.00	23.00	19451	8	0.0	.05	.04	.021	.004		4.2
A 001	170.00	180.00	65.00	19452	5	0.0	-.05	.02	.004	.009		2.1
A 001	180.00	190.00	43.00	19453	0	0.0	-.05	.03	.005	.008		2.6
A 001	190.00	200.00	70.00	19454	0	0.0	-.05	.03	.005	.006	.007	2.3
A 001	200.00	210.00	87.00	19455	14	0.0	-.05	.08	.004	.006		2.8
A 001	210.00	220.00	90.00	19456	18	0.0	-.05	.04	.004	.005		2.4
A 001	220.00	230.00	91.00	19457	26	0.0	-.05	.02	.004	.004		2.8
A 001	230.00	240.00	96.00	19458	9	0.0	-.05	.02	.005	.006	.003	2.4
A 001	240.00	250.00	96.00	19459	0	0.0	-.05	.02	.004	.003		2.1
A 001	250.00	260.00	48.00		0	0.0	-.05	.03	.006	.004		3.0
A 001	260.00	270.00	46.00	19460	0	0.0	-.05	.03	.009	.005		3.5
A 001	270.00	280.00	34.00	19461	0	0.0	-.05	.03	.012	.006		3.7
A 001	280.00	290.00	80.00	19462	20	0.0	-.05	.01	.011	.003	.002	1.8
A 001	290.00	300.00	81.00	19463	19	0.0	-.05	.15	.015	.002		2.4
A 001	300.00	310.00	88.00	19464	12	0.0	-.05	.05	.012	.001		2.2
A 001	310.00	320.00	96.00	19465	13	0.0	.10	.15	.016	.001		2.3
A 001	320.00	330.00	73.00	19466	3	0.0	.05	.09	.005	.002	.005	3.3
A 001	330.00	340.00	54.00	19467	0	0.0	-.05	.06	.005	.002		2.7
A 001	340.00	350.00	59.00	19468	0	0.0	.05	.02	.007	.001		1.7
A 001	350.00	360.00	95.00	19469	0	0.0	-.05	.04	.005	-.001		1.6
A 001	360.00	370.00	79.00	19470	8	0.0	-.05	.09	.005	-.001	.002	1.5
A 001	370.00	380.00	76.00	19471	13	0.0	.05	.07	.006	-.001		1.6
A 001	380.00	390.00	84.00	19472	12	0.0	-.05	.02	.005	.001		2.0
A 001	390.00	400.00	85.00	19473	18	0.0	.05	.09	.001	-.001		2.9

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISCU CORE 1AAS	% MO ISCU CORE ASS	OZ AU ISCU CORE FA1.5	OZ AG ISCU CORE AAS	% FE ISCU CORE AAS
A 001	400.00	410.00	90.00	19474	4	0.0	.10	.15	.005	.002	-.001	3.7
A 001	410.00	420.00	88.00	19475	0	0.0	.10	.19	.005	.002		4.5
A 001	420.00	430.00	94.00	19476	5	0.0	.05	.09	.007	.001		4.9
A 001	430.00	440.00	93.00	19477	8	0.0	.10	.25	.007	.002		5.8
A 001	440.00	450.00	85.00	19478	8	0.0	.05	.06	.004	.002	.003	2.6
A 001	450.00	460.00	85.00	19479	6	0.0	.05	.01	.001	-.001		4.0
A 001	460.00	470.00	88.00	19480	11	0.0	.20	.16	.002	.003		3.8
A 001	470.00	480.00	87.00	19481	23	0.0	.15	.21	.005	.006		5.4
A 001	480.00	490.00	88.00	19482	31	0.0	.10	.10	.001	.005		5.1
A 001	490.00	500.00	98.00	19483	11	0.0	.10	.20	.007	.004		4.9
A 001	500.00	507.00	85.00	19484	6	0.0	.05	.01	.021	.002		2.8

G E O L O G E D I T L I S T I N G

SYSTEMS ENGINEERING BY
INTERNATIONAL GEOSYSTEMS CORP.

UTAH MINES LTD VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY BC NTS 92L/12

FORMAT VERSION : 6802

DRILLHOLE/TRAVERSE :DDHEC146 | COLLAR ELEVATION: 1067.10 | AZIMUTH(DEG) : 180.00 | GEOLOGGED BY : HRM +
TOTAL DEPTH/LENGTH : 637.00 | NORTHING(- IF S): 258172.58 | VERTICAL ANGLE : -60.00 | DATE (YY/MM/DD): 830926
CORE/HOLE DIAMETER : NQ | EASTING (- IF W): 207593.19 | CO-ORD SYSTEM : | PROJECT NUMBER : 2140

K E Y	F L A G	- INTERVAL - (UNITS = FT,2 DEC.PLACE) (FT=FOOTRIC) FROM	TO	INT	T- % M M ROCK O I O X TYPE	TYPI- FYING TM 1	QAL MIN TM 2	TEX- TURES MAT	GRAIN CHARACS TX 1	TX 2	FRAC- TURE F F C P	PGI /RI	STRUCTUR-1 T ID STK DIP 1 AZM RT	STRUCTUR-2 T ID STK DIP 2 AZM RT	ALTERATION MINS H A QZ	H A BI	H A CY	H A CB	H A MG	H A PP	H A PY	H A CP	H A CC	H A YY	ORE-TYPE MINS H A ANY MIN	SUMMARY ALTER- ATION F I	F I
/ L	STK	0.00	1.50	1.50	STKP							P																
/ L		1.50	12.00	10.50	OVER							P																
K	TOX	12.00	12.00																									
R	TOX	12.00	12.00		TOP OF OXIDE ZONE MOSTLY LI W MINOR HE.																							
/ L		12.00	34.50	22.50	BVAT 3G		FR	3 5 2 7 3 6 7				P				86 92		87 92 96 83		9*						8 8 0 0		
R	TXT	12.00	34.50		BLK MOTTLED DUE TO FR WHICH CONTAIN,AGGREGATES OF F,MG,FR NATURE																							
R		12.00	34.50		IS VAGUE,KF IN STRKS+PATCH TO 12-28'																							
R	VNS	12.00	34.50		MG VNS GEN H/L TO 2MM THICK.																							
/ L		18.00	19.50	1.50	X BVAT 3G		FR	3 5 2 7 3 6 9				R				86 92		87 92 96 83		9*						8 8 0 0		
/ L		22.00	25.00	3.00	X BVAT 3G		FR	3 5 2 7 3 6 9				R				86 92		87 92 96 83		9*						8 8 0 0		
R	SAM	25.00	25.20																									
/ L		33.00	34.50	1.50	X BVAT 3G		FR	3 5 2 7 3 6 9				R				86 92		87 92 96 83		9*						8 8 0 0		
/ L		34.50	45.00	10.50	BVAF 7G		PP	3 K 3 K 3 3 5 7				P				93 94		95		9)				1-		3 7 1)		
R	LTH	34.50	45.00		MAY BE TUFF OR EVEN A RD PR. SIM TXT AS AT 550',(RDPP)																							
R	TXT	34.50	45.00		PHENOS? RK FR? ARE PALE GRN W DISSM PY TR BO MIX SIM ALT SER CY?																							
R	MNZ	34.50	45.00		MUCH OF ORIG PY LEACHED.																							
/ L		38.00	40.00	2.00	X BVAF 7G		PP	3 K 3 K 3 3 5 8				R	F/		10	93 94		95		8+				1(		3 7 1)		
/ L		45.00	58.50	13.50	RDDR 5G		EQ	J J 4			3	P	C/	U45		93 94	92	93		9)				1*		4 7 4)		

K E Y	F -L- G	FROM ----.--	TO ----.--	INT ---.--	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M O	QSMS QSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F M	I I	F M	I I
R	TXT	45.00	58.50			V VAGUELY GRANULAR PROB EQ+F.G.																												
R	CON	45.00	58.50			CONTACT VISIBLE+FAIRLY IRRES.																												
/		46.50	47.50	1.00		X	FAUL			EQ		J	J			3	R		C/		U45	93		9?		83		9)				4	7
L								5U							X								94	92					1*		4	)
/		49.30	50.60	1.30		X	FAUL			EQ		J	J			3	R		C/		U45	93		9?		83		9)				4	7
L								5G							X								94	92					1*		4	)
/		54.20	54.50	0.30		X	FAUL			EQ		J	J			3	R		F/		D80	93		9?		83		9)				4	7
L								YU							4								94	92					1*		4	)
R		54.20	54.50			EXTR GOUGE (MUD)																												
/		58.50	79.00	20.50			BVAF		FX2	PP		3	K	2	K	21	P	1				93		5?		91		8)	P(	C-		4	6
L								4G							3								93	95					7*		4	)
R	TXT	58.50	79.00			VARIES WITHIN SECTION.																												
R	LTH	58.50	79.00			PROB PART OF VOLC PILE (HYPABYS DIKE??) SAME UNIT AS 35-45 FT)																												
R	SAM	59.00	59.20			T.S. TO DETERMINE ALT FACIES FOR 45-85'																												
R	ALT	59.00	59.20			PROPYL OR TRANSITIONAL																												
/		72.00	73.00	1.00		X	FAUL										R							9X				D+		D*			
L																																		
/		79.00	82.00	3.00			FAUL										P							98				D)					
L															9									92									
K	BOX	82.00	82.00																															
R	BOX	82.00	82.00			BOTTOM OF OXIDE ZONE.																												
/		82.00	88.00	6.00			BVAF									31	P					83						D)	D*	C(		4	7
L								5G							3								94	95					D(		4	+
/		88.00	95.50	7.50			RDIN									31	P	1				98						7)	7(	D-		5	8
L								GA							6	2		0					92						D(		4	)
R	LTH	88.00	95.50			ZONE OF ASSIM.+INTERFINGERING.																												
R	MNZ	88.00	95.50			THE INTRUS?(BLEACHED UNIT) MUCH STRONGER IN SULPHS.																												
R	TXT	88.00	95.50			V VAGUE POR + GRAN TXT WHT CY,MS ALT FX.																												
/		90.00	91.50	1.50		X	FAUL										R					95		96				D+					
L								8A																9?									
/		92.50	93.00	0.50		X	FAUL										R							99				D+					
L								7A																										
/		95.50	113.00	17.50			RDIN			FX	PP					21	P	1				98						8+	8-	C-		5	9
L								8A								7 1		0					92						D(		4	+
/		95.50	105.00	9.50		X	RDIN									31	R	1				98						8=	7(	D-		5	8
L								GA								6 2		0					92						D(		4	)
R	TXT	95.50	113.00			POORLY RELICT POR COMPLETELY ALT.																												
R	FRC	95.50	113.00			OPEN FRC W QZ + PY XLS																												
R	LTH	95.50	113.00			POSS ASSIMILATED VOLC.																												

K E Y	F -L- G	F R O M -	T O -	I N T		%	ROCK	TM	TM	QM1	TX	TX	F	C	%	M	OSMS	RI	1	TD	AZM	DIP	QZ	BI	CY	CB	MG	PP	PY	CP	CC	YY	F	I	F	I
		----.--	----.--	---.--		--	-	----	--	--	---	--	--	-	-	-	-	----	---	-	--	---	---	--	--	--	--	--	--	--	--	--	--	-	-	-	-
						GS	CSZS	LC	TM	QM2	TX	TX	S	R	S	O	DSSS		2	ID	AZM	DIP	KF	MS	CL	EP	HE	ZE	PR	MO	BO	HA	M	I	M	I
/		99.80	100.80	1.00			X	RDIN									31	R	1				95		98				7)	7(	D-		5	8		
L									GA								9 2		0					92							D(		4	)		
/		108.00	111.00	3.00			X	RDIN									31	R	1				98						7)	7(	D-		5	8		
L									GA								9 2		0					92							D(		4	)		
R		108.00	111.00		4' CY GOUGE AT 110.5'																															
/		113.00	127.50	14.50				BVAN				FR					5	P	1				97		G2				8+				5	8		
L									6A															93							1(		1	+		
R	LTH	113.00	127.50		POSS STILL IN ZONE OF ASSIMILATION.																															
R	TXT	113.00	127.50		SOME SUBTLE RELIC FRAGMENTAL TXT(VOLC?)																															
/		121.50	126.00	4.50			X	BVAN				FR					5	R	1				97		G4				8+				5	8		
L									6A								8							93							1(		1	+		
/		127.50	149.00	21.50				RDIN			FX	PP		4	K	3	K 42	P	1				88		*				8+				5	8		
L									7A								3 1							94							7*		4	+		
R	TXT	127.50	149.00		POR TXT ONLY FADES IN + OUT. PHENOS SUBHED TO EUHED,DUE TO BLEAC																															
R	LTH	127.50	149.00		HING GHOSTS VISIBLE SAME UNIT AS EC-145-465'																															
R	VNS	127.50	149.00		OV ABOUT 1 PER 2"CONTAIN PY+BO DISSM.SOME HAVE WHT BLCN(SIL)SELV																															
R	ALT	127.50	149.00		MTRX ESSENTIALLY SIL EX PHENOS STR MS? CY? ALT.																															
/		129.50	130.20	0.70			X	RDIN			FX	PP		4	K	3	K 42	R	1	SH		80	88		G4				8+				5	8		
L									7A								9 1							94							7*		4	+		
R	SAM	134.00	134.30																																	
/		137.00	149.00	12.00			X	RDIN			FX	PP		4	K	3	K 42	R	1				88		G4				8+				5	8		
L									7A								8 1							94							7-		4	+		
R		137.00	149.00		SOME V NARROW GOUGING.																															
/		149.00	172.00	23.00				RDFP			FX			4	K	4	L 3	P	1				98		*				9=				5	8		
L									7A								9							94									1	=		
R	LTH	149.00	172.00		GRADES INTO MORE OBVIOUS COARSER,+MORE HOMOGENEOUS TXT.																															
R	LTH	149.00	172.00		IDENTICAL TXT AS RDFP IN EC-139,140. MORE ALT																															
R	ALT	149.00	172.00		V STR SILIC IN MTRX + VIRTUALLY COMPLETE ALT OF PHENOS TO CY,MS?																															
/		152.80	153.70	0.90			X	FAUL			FX			4	K	4	L 3	R	1				98		G7				9=				5	8		
L									7A								X							94									1	=		
R	SAM	156.00	156.20																																	
/		157.00	158.20	1.20			X	RDFP			FX			4	K	4	L 3	R	1				98		G7				9=				5	8		
L									7A								91							94									1	=		
/		161.00	171.00	10.00			X	RDFP			FX			4	K	4	L 3	R	1				98		G5				D)				5	8		
L									7A								8							94									1	=		
/		172.00	178.00	6.00				RDFP			FX			4	K	4	L 42	P	1				86		9?		Q-		8+				5	8		
L									6A								3 1							96							6-		1	+		
R	LTH	172.00	178.00		APPEARS TO BE ZONE OF ASSIM																															
/		178.00	202.00	24.00				RDBX				PP	VG				72	P	2				69		9?				9)				5	8		
L									4A								8 2							94									1	)		

K E Y	F -L- G	FROM -	TO -	INT		% ROCK TM TM QM1 TX TX F C % M QSMS RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY F I F I GS CSZS LC TM QM2 TX TX S R S D DSSS 2 ID AZM DIP KF MS CL EP ME ZE PR MO BD HA M I M I
R	VMS	178.00	202.00			CRISS-CROSS QV W WKLY DISSM PY W ADJ PERVAS SILIC LOCAL STCKWK
R	LTH	178.00	202.00			SAME UNIT AS EC-145 440-445'
R	TXT	178.00	202.00			CAUSED BY QV, VUGULAR PVE LEACH OF SOFT ALT MIN +OPEN FRCTS.
R	ALT	178.00	202.00			MTRX ALL QZ ,FX ALT TO MS?,CY
/		193.00	202.00	9.00	X RDBX	PP VG 32 R 2 89 9? 9) 5 8
L					4A	8 2 94 1)
R		202.00	206.00		4" SH AT 203'	
/		202.00	218.00	16.00	BVAB	RF3 FR 6 7 2 P 1 95 95 9+ 7 8
L					4A	QF1 2 3 7 0 8 1 9? 9- 1 +
/		202.00	206.00	4.00	X BVAB	RF3 FR 6 7 2 R 1 SH 97 93 9= 7 8
L					4A	QF1 2 3 7 0 2 1 9? 9- 1 +
R	LTH	202.00	218.00		TXT MOSTLY VAGUE FR ALT POR,BUFF PP ALT RK + QZ.	
R	SAM	214.00	214.20			
/		218.00	219.10	1.10	RDIN	FR J K K P C/ U45 93 *4 3 6
L					6A	0 0
/		219.10	223.00	3.90	BVAF	FX3 PP 1 J P 94 96 9+ 3 7
L						3 9? 9- 1 +
/		223.00	223.50	0.50	RDIN	FX3 PP K L P C/ D35 93 *4 3 6
L						0 0
/		223.50	246.50	23.00	BVAB	FR P 94 9 98 00 7 X
L					TA	5 0 0
R	ALT	223.50	246.50		MOTTLED W BVFF PYROP RK COMPLETELY ALT.	
R	TXT	223.50	246.50		ONLY VAGUE RELIC ALT FR,MAY BE APPARENT FR DUE TO PATCH ALT.	
/		224.00	224.60	0.60	X FAUL	FR R 94 G4 98 00 7 X
L					TA	X 0 0
/		228.00	231.00	3.00	X BVAN	MX R 97 9? 93 0) 7 9
L					8T	1)
/		246.50	250.00	3.50	BVAB	FR P 97 9 95 00 7 9
L					TA	5 0 0
R	TXT	246.50	250.00		SOME LOCAL SUBTLE RELIC POR TXT (AND POR?,RDIN?)	
/		250.00	263.50	13.50	RDIN	5 5 P C/ U00 96 9? 94 0* 7 8
L					TA	4 0. 0 0
R	LTH	250.00	263.50		RK CONSISTS OF QZ + CY+MS? ALT FX ,SOME ASSIMILATE PP ALT BVAN	
R	CON	250.00	263.50		THIS IS ZONE OF RDIN INTERFINGERING W BVAN SEVERAL CON-SHALLOW	
R	MNZ	250.00	263.50		BVAN DEVOID OF SULP# RDIN CONTAIN ABOUT 2-3% PY W TR BO.	
/		258.00	263.50	5.50	X RDIN	5 5 R C/ U00 95 9? 96 00 7 9
L					TA	7 00 0 0
/		263.50	283.80	20.30	RDIN	1 J P 96 G3 9? 9) 5 8
L					6A	8 96 0- 1)

K E Y	F -L- G	F R O M -	T O -	I N T		% ROCK TM TM QM1 TX TX F C % M QSMS RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY F I F I GS CSZS LC TM QM2 TX TX S R S O OSSS 2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA M I M I
R	LTH	263.50	283.80		SAME UNIT AS FROM 127-149'+ EC145-465' POSS ANO POR (BVAF)??	
R	TXT	263.50	283.80		RELIC TXT SEEMS TO VARY FROM F,G EQ TO FG POR	
/		268.80	269.50	0.70	X FAUL I J R 96 95 9? 9) 5 8	
L					6A X 96 D- 1)	
R	SAM	274.00	274.20			
R	FRC	274.00	274.20		SEVERAL NARROW GOUGES (272',276')	
R	SAM	277.00	277.20		ANALIZE FOR TI	
/		283.80	294.70	10.90	BVAN P 93 99 D) 7 X	
L					5T 7 1)	
/		283.80	284.50	0.70	X FAUL R F/ U60 93	
L						
R	TXT	283.80	294.70		MOTTLED W BUFF MASS PP PATCHES +GRYISH CY,PP,QZ	
R	LTH	283.80	294.70		SAME AS 223-246	
/		285.50	288.00	2.50	X BVAN R 93 99 D) 7 X	
L					5T 9 1)	
/		294.70	305.30	10.60	RDIN I J P 96 9? D) 5 8	
L					6A 9 96 D- 1)	
R	LTH	294.70	305.30		IDENTICAL TO UNIT AT 263-283'	
/		302.00	305.30	3.30	X FAUL I J R 96 9? D) 5 8	
L					6A X 96 D- 1)	
/		305.30	310.80	5.50	BVAN P 93 98 D) 7 X	
L					5T 4 1)	
/		305.30	308.50	3.20	X FAUL R 93 98 D) 7 X	
L					5T X 1)	
/		310.80	322.00	11.20	RDIN I J P 96 9? 94 D* 7 8	
L					6A 9 9? C- 0 0	
R	FRC	310.80	322.00		MUCH NARROW GOUGING.	
R	MIN	310.80	322.00		ABUT 0.1% V TINY GRAINS OF RED BRN MIN (RUTILE?)	
/		321.50	322.00	0.50	X FAUL R 94 97 D*	
L						
/		322.00	363.50	41.50	RDIN FX PP I J 5 P 2 87 95 93 1) 7 8	
L					6A 9 9? C(1)	
R	TXT	322.00	363.50		V VAGUE QZ EYES? PROB <10% POR TXT NOT PERSISTENT	
R	LTH	322.00	363.50		SAME AS ABOVE BUT COARSER +SOMEWHAT POR,DIFF PHASE? VAGUE TXT	
R		322.00	363.50		CHANGE BELOW F/, CONTAINS XENOLITHS OF STR PP BVAN.	
/		323.00	324.50	1.50	X FAUL I J 00 R 96 9? 94 D* 7 8	
L					6A 9 9? C- 0 0	
/		326.00	327.00	1.00	X FAUL I J 00 R 96 G8 94 D* 7 8	
L					6A 9 9? C- 0 0	

K E Y	F -L- G	F R O M	- T O -	I N T	% ROCK TM TM QM1 TX TX F C % M QSMS RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY F I F I GS CSZS LC TM QM2 TX TX S R S O DSSS 2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA M I M I
R	SAM	328.00	328.20		
/		335.00	363.50	28.50	X FAUL GG I J 00 R 96 GA 94 D* 7 8
L					6A 9 9? C. 0 0
R	FRC	335.00	363.50		MOST OF SECTION V STR GOUGE.
/		363.50	400.00	36.50	RDIN FX PP K 3 L P 98 95 D(5 8
L					7A 3 94 0 0
R	TXT	363.50	400.00		POR TXT CONSISTENT.PHENOS ARE SUBHED- ANHED
R	LTH	363.50	400.00		MAY BE RDFP.
R	ALT	363.50	400.00		MTRX ESSENTIALLY QZ,PHENOS ALT TO CY,MS?
/		366.50	368.50	2.00	X FAUL FX PP K 3 L R 98 95 D(5 8
L					7A X 94 0 0
/		370.00	390.00	20.00	X FAUL FX PP K 3 L R 98 95 D(5 8
L					7A X 94 0 0
/		393.60	400.00	6.40	X FAUL FX PP K 3 L R 98 95 D(5 8
L					7A X 94 0 0
R	SAM	393.60	400.00		
/		400.00	412.00	12.00	RDIN FX PP J 3 K P 98 9? D(5 8
L					7A 4 96 0 0
/		400.00	407.00	7.00	X FAUL FX PP K 3 L R 98 95 D(5 8
L					7A X 94 0 0
R	TXT	400.00	412.00		POR TXT MORE VAGUE + FINER (ALT AND POR?) PROB FINER IN TR,PHASE
/		412.00	430.00	18.00	RDIN EQ MY 5 5 P 97 9? D* 5 8
L					6 5A 6 96 D- 0 0
R	TXT	412.00	430.00		ONLY VAGUE + PROB EQ . MS (CY?)ALT FX.PROB POR ZONES.
R	LTH	412.00	430.00		HOMOGENEOUS COMP
R	VNS	412.00	430.00		GY VNS MOSTLY 2-4MM WIDE (ABOUT 1 PER IN.)
/		421.00	425.00	4.00	X RDIN EQ MY 5 5 R 97 9? D* 5 8
L					6 5A 9 96 D- 0 0
/		430.00	450.00	20.00	RDIN EQ 5 5 P 97 9? B* D* 5 8
L					4 6A 2 1 1 96 9- 8)
R	TXT	430.00	450.00		VAGUE RELICT M,G, GRANULAR TXT A FEW FEINT RNDED QZ GRNS,
R	VNS	430.00	450.00		PALE APPLE GRN PATCHES ADJ TO ZONES W STR GY VNING
R	LTH	430.00	450.00		PROB FELSIC INTRUS (GRDR OR QZMZ)
R	SAM	435.00	435.20		FOR TI ANAL
/		439.00	439.50	0.50	X FAUL EQ 5 5 R SH D50 97 G8 B* D* 5 8
L					4 6A X 1 1 96 9- 8)
R	SAM	440.00	440.20		
/		447.50	448.50	1.00	X FAUL EQ 5 5 R SH U60 97 G9 B* D* 5 8
L					4 6A X 1 1 96 9- 8)

K E Y	F -L- G	FROM	TO	INT		% ROCK / GS	TM TM QM1 TX TX F C % M QSMS RI 1 ID AZM DIP QZ RI CY CR MG PP PY CP CC YY / CSZS LC TM QM2 TX TX S R S O DSSS 2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA	F I F I / M I M I
/		450.00	471.50	21.50	RDIN		EQ 5 5 P 97 9? D(D. 5 8
L					2	6A	7 1 1 96 9- 0 0
R	TXT	450.00	471.50		ALT FX GRAINS W INTERSTIT SUGARY QZ PROB ZNDARY,SOME APPLE GRN		
R		450.00	471.50		STREAKS,POSS SAUSS		
R	SAM	458.00	458.20				
/		462.50	463.20	0.70	X FAUL		R D30 G9
L							
/		465.50	469.00	3.50	X FAUL		EQ 5 5 R 97 9? 8* D* 5 8
L					4	6A	9 1 1 96 9- 8)
/		471.50	485.00	13.50	RDFP	FX4 PP	K 4 L P 98 9? 8* D(5 8
L						6A	3 2 1 96 2 *
R	CON	471.50	485.00		MAY BE ON SHR(35') PROB POR PHASE OF SIMILAR MAGMA AS RDIN		
R	LTH	471.50	485.00		SIM TXT AS RDFP IN EC139,140 BUT MORE BLEACHED+ HERE CONTAINS CP		
R	ALT	471.50	485.00		MS(SAUSS?+CY?)ALT OF FX HAS V PALE GRN COL, PERVAS INTERSTIT QZ		
R		471.50	485.00		HAS LT BUFF SUE POSS DUE TOO V FINE MS?		
/		474.50	475.50	1.00	X FAUL	FX4 PP	K 4 L R 98 9? 8* D(5 8
L						6A	X 2 1 96 2 *
/		485.00	492.00	7.00	RDFP	FX4 PP	K 4 L P SH 30 94 97 D(D(5 8
L						6A	9 2 1 9? 0 0
/		492.00	507.00	15.00	RDFP	FX3 PP	K 4 L 22 P 98 9? D) D(5 8
L					32	4A	5 96 1)
R	FRC	492.00	507.00		A FEW NARROW SHRS AT ABOUT 60' TO CORE AXIS (495',502')		
R	SAM	497.00	497.20		FOR TI ANAL		
/		507.00	527.50	20.50	RDIN		EQ 5 5 P 97 9? 8) 5 9
L					31	6A	3 2 97 D. 1)
R	TXT	507.00	527.50		INDISTINCT DUE TO ALT BUT APPEARS FAINLY GRANULAR.		
R	CON	507.00	527.50		SEEMS TO BE 2" SH BETWEEN RDIN + RDFP.		
R	SAM	518.00	518.10				
/		527.50	532.50	5.00	RDIN		EQ 5 5 6 P 2 98 9? 8= 5 9
L					31	4A	3 2 0 97 D. 1 +
/		531.30	532.50	1.20	X FAUL		R F/ U60 98
L							
/		532.50	558.00	25.50	RDPP		PP 4 L 3 L 3 P 2 C/ U45 98 8+ 8* 4 8
L					1	GA QZ+	323 0 95 *4 D. 2 +
R	LTH	532.50	558.00		THIS UNIT V SIM TO 35-45'+59-79'BUT APPEARS TO HAVE COARSER MTRX		
R		532.50	558.00		POSS AND? DIKE OR FLOW. POSS LAP TUFF.		
R	TXT	532.50	558.00		DK GRN PATCHES POSS RELICT PHENOS (MAFIC?)OR AND RK FR?.WK		
R		532.50	558.00		DISTRIB OF QZ EYES (RNDED 2-3MM)		
R	ALT	532.50	558.00		RELIC PHEN COMPLETE ALT TO MS>CHL W SULPH MTRX V HARD W QZ (SOME		
R		532.50	558.00		(PRIMARY?)+V FINE MS +WK DISSM SULPH.		

KEY	F -L- G	FROM ----.--	TO ----.--	INT ---.--	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	F S	C R	% S	M U	QSMS DSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F M	I M	F M	I M
/		533.50	534.00	0.50		X RDPP				PP	4	L	3	L	3	R	2	SH		D30	98					8+	8*			4	8		
L					1		GA		Q +						X23		0					95	*4					D.			2	+		
R	SAM	538.00	538.00		ANALIZE FOR TI.																												
R	SAM	542.00	542.30																														
/		555.70	557.50	1.80		X RDPP				PP	4	L	3	L	3	R	2	SH		U00	98					8=	8*			4	8		
L					1		GA		Q +						823		0					95	*4					D.			2	+		
/		558.00	575.00	17.00		RDPP				PP	4	L	3	L	0	P	2	C/		U40	98					9+	9*			5	8		
L					2	3	6A		Q +						500		0					95	*4					D.			2	+		
R	ALT	558.00	575.00		ABRUPT COL +ALT CHANGE,ASSOC W SHEARING.																														
/		559.70	562.50	2.80		X RDPP				PP	4	L	3	L	3	R	2	SH		U50	98		9			8+	8*			4	8		
L					1		GA		Q +						823		0					95	*4					D.			2	+		
/		565.60	567.30	1.70		X RDPP				PP	4	L	3	L	3	R	2	C/		U45	98		9			8+	8*			4	8		
L					1		7A		Q +						923		0					95	*4					D.			2	+		
/		570.00	571.20	1.20		X FAUL				PP	4	L	3	L	3	R	2	C/		U45	98		9			8+	8*			4	8		
L					1		7A		Q +						X23		0					95	*4					D.			2	+		
/		571.20	575.00	3.80		X RDPP				PP	4	L	3	L	3	R	2	C/		U45	98					9+	D-			5	8		
L					1		GA		Q +						323		0					95	*4					D.	C*		4	+		
R	SAM	574.00	574.20																														
/		575.00	580.00	5.00		FAUL										P						98				9+							
L																												C*					
/		580.00	592.00	12.00		RDPP										P					9X					9)				9	X		
L							6A								9 2		0					92						C-		1	)		
R	LTH	580.00	592.00		ASSUMED TO BE CONT OF ABOVE UNIT,TOTAL ALT BY SIL FLOOD,NO TXT																												
/		592.00	615.00	23.00		FAUL										P					99	G				9)				9	X		
L							6A															92						C-		1	)		
/		615.00	637.00	22.00		BS/D			FX3	PP	H	K	3	K		P								D)						0	0		
L					2		GN		PX=						2							42								0	0		
/		615.00	618.00	3.00		X BS/D			FX3	PP	H	K	3	K		R								D)						0	0		
L					2		GN		PX=						9							42								0	0		
R	VNS	615.00	637.00		CRB VLTS H/L TO 2MM WIDE.																												
R	FRC	615.00	637.00		CHL DEVEL ON FRC.																												
/		621.00	622.00	1.00		X BS/D			FX3	PP	H	K	3	K		R								D)						0	0		
L					2		GN		PX=						9							42								0	0		
/		627.50	631.00	3.50		X FAUL										R						GB											
L							8A																										
/		632.50	636.00	3.50		X BS/D			FX3	PP	H	K	3	K		R								D)						0	0		
L					2		GN		PX=						9							42								0	0		

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K  F  F R O M - T O -  I N T          % ROCK TM TM QM1 TX TX F C % M QSMS  RI 1 ID AZM DIP QZ BI CY CB MG PP PY CP CC YY  F I F I
E -L- ----.-- ----.-- ---.--          -- - ---- -- -- --- -- -- - - - - ---- --- - -- --- --- -- -- -- -- -- -- -- -- -- - - - -
Y  G                                   GS CSZS LC TM QM2 TX TX S R S O OSSS .    2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA  M I M I
R STN  632.50  636.00      CORAL TINITRATE TESTS DONE,RESULTS NEGATIVE EXCEPT UPPER 27 FT
R SUM                       0-12     OVER
R SUM                       12-34.5 BVATVSTR POT ALT TO 27',PERVAS +VN MG WK QZ VNING
R SUM                       34.5-45 BVAF (RDPP?)STR ARG ALT, WK QZ VN  WK DISSM PY TR CP,
R SUM                       45-58   PPDR STR TRANSITIONAL ALT(BETWEEN PROPYL + PHYLL,)WK MAG
R SUM                               VLTS WK DISSM SULPN PY>BO
R SUM                       58-88   BVAF FAIRLY STR TRANS ALT,STR FRC WK QZ VNING, FAIRLY WK
R SUM                               SULPH DISSM > VN PY>=CPY=BO LOCAL CCT
R SUM                       88-113  RDIN CONT ZONE STR PHYLL ALT STR FRC WK QZ VNING,3%
R SUM                               DISSM > VN SULPH PY>BO>=CPY>CCT
R SUM                       113 -   BVAN ZONE OF ASSIM V STR PHYLLIC ALT MOD QZ VN 2-3%
R SUM                       127.5   SULPH DISSM > VN PY>>BO
R SUM                       127.5-  RDIN V STR PHYLL ALT,STR FRC FAIRLY WK QZ VN 2-3% SULPH
R SUM                       149     DISSM > VN,PY > BO
R SUM                       149-178 RDFP AS ABOVE, 3-5% PY DISSM > VN TR BO
R SUM                       178-202 RDBX V STR PHYLL ALT V STR FRC,STR CRISS-CROSS QZ VN, WK
R SUM                               DISSM PY
R SUM                       202-250 BVAB VSTR-EXTR ARG ALT,WK-MOD FRC, 0-3% DISSM PY, TR BO
R SUM                       250-284 RDIN TO 264',V STR ADV ARG ALT,MOD FRC NO SULPH
R SUM                               BELOW IS V STR PHYLL ALT,V STR FRC,WK DISSM PY TR BO
R SUM                       284-295 BVAN EXTR ADV ARG ALT,STR FRC,WK DISSM PY
R SUM                       295-305 RDIN V STR PHYLL ALT,STR FRC,WK DISSM PY TR BO,
R SUM                       305-311 BVAN EXTR ADV ARG ALT,FAIRLY WK FRC, WK DISSM PY
R SUM                       311-364 RDIN V STR ADV ARG ALT,MOST WITHIN FAULT,WK DISSM PY+BO
R SUM                               COATINGS
R SUM                       364-407 RDIN V STR PHYLLIC ALT IN FAULT,   WK DISSM,PY
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R SUM BELOW 430'WK FRC WK GYPS VN, PY=CPY>BO
R SUM 407-472 BELOW 450'V WK DISSM PY TR CPY
R SUM 472-507 RDFP V STR PHYLL ALT, VARIABLE FRC,
R SUM BELOW 492' WK QZ VN+GYPS VN WK DISSM PY>CPY
R SUM 507-533 RDIN V STR PHYLL ALT WK FRC WK SULPH+GYPS VN 1-3%PY TR
R SUM MO
R SUM 533-558 RDPP 5%QZ EYES,V STR TRANS ALT 3% SULPH DISSM > VN,
R SUM PY>CPY TR MO
R SUM 558-580 RDPP V, STR PHYLL ALT,STR FRC, 3% SULPH, PY>CPY
R SUM BELO 575'BO>CPY
R SUM 580-615 RDPP EXTR SILIC, MOST IN FAULT 1% DISSM PY,BO PART
R SUM REPLACES PY
R SUM 615-637 BS/D FRESH V WK FRC+ V WK CRB VN
R SUM TO DEPTH OF 126'ALT AND? W SOME INTR OF ALT RED DOG INTR
R SUM TO 310' IS CONTACT ZONE W SOME INTR BX, BELOW IS RDIN POSS BOTH
R SUM EQ +POR, BELOW 530' CON W POR DIKE AND POR?TUFF?(BUT QZ EYES)
R SUM BELOW 615'IS FRESH BS/D
R SUM POT ALT TO 27',27-85' ALT IS TRANS BETWEEN PROPYL+PHYLL
R SUM 85-205'PHYL ALT, 205-360'MOSTLY ADV ARG ALT, 360-580'MOSTLY
R SUM PHYLLIC ALT, EXTR SILIC OCCURS FROM 580-615'
R SUM A FAULT ZONE PERSISTS FROM ABOUT 300-407'+575-637'
R SUM MAG VNING OCCURS TO ABOUT 60', FAIRLY WK QZ VNING PERSISTS TO
R SUM ABOUT 200'+ FROM 530-550, GYPS VNING FROM 410-570',WK CRB VNING
R SUM BELOW 560',WK SULPH VNING FROM 470-560'
R SUM THE OXIDE ZONE OCC FROM 12-82'
R SUM NOTABLE MINZ OCCURS FROM:
R SUM 40-140' 0.21% CU .005% MO .015 OZ/T AU
R SUM 530-613.5' 0.13% CU .014% MO .003 OZ/T AU
R SUM AVERAGE CORE RECOVERY FOR HOLE IS 79.8%

R SUM AVERAGE ROD FOR HOLE IS 14.6%

GEOLOG

UTAH MINES LTD, VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY,BC NTS 92L/12
DRILLHOLE/TRAVERSE --- DDHFC146 --- (CONTINUED)

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISCU CORE AAS	% MO ISCU CORE AAS	PPM AU ISCU CORE FA1.S	PPM AG ISCU CORE AAS	% FE
A 001	12.00	20.00	63.00	19485	0	5.0	.05	.08	.004	.005	.013	8.8
A 001	20.00	30.00	74.00	19486	3	5.0	.05	.13	.004	.004		9.8
A 001	30.00	40.00	80.00	19487	0	2.0	.05	.12	.005	.005		8.3
A 001	40.00	50.00	83.00	19488	20	0.0	.05	.11	.004	.013		9.7
A 001	50.00	60.00	88.00	19489	18	0.8	.10	.16	.005	.031	.021	8.0
A 001	60.00	70.00	93.00	19490	27	0.1	.10	.37	.005	.013		6.5
A 001	70.00	80.00	70.00	19491	7	0.0	.15	.12	.004	.018		8.6
A 001	80.00	90.00	95.00	19492	18	0.0	.20	.37	.004	.021		6.6
A 001	90.00	100.00	90.00	19493	3	0.0	.15	.34	.005	.018	.004	5.0
A 001	100.00	110.00	72.00	19494	0	0.0	.10	.07	.005	.005		3.5
A 001	110.00	120.00	84.00	19495	5	0.0	.10	.14	.004	.011		4.6
A 001	120.00	130.00	85.00	19496	8	0.0	.10	.24	.004	.010		4.5
A 001	130.00	140.00	83.00	19497	6	0.0	.10	.18	.005	.009	.006	4.2
A 001	140.00	150.00	83.00	19498	0	0.0	.05	.08	.005	.003		3.7
A 001	150.00	160.00	84.00	19599	0	0.0	-.05	.03	.005	-.001		3.8
A 001	160.00	170.00	55.00	19500	0	0.0	-.05	.06	.005	.001		2.6
A 001	170.00	180.00	50.00	1301	0	0.0	.05	.05	.006	.002		3.3
A 001	180.00	190.00	40.00	1302	0	0.0	-.05	.05	.013	.001	.005	2.7
A 001	190.00	200.00	84.00	1303	0	0.0	.05	.05	.012	.003		2.9
A 001	200.00	210.00	77.00	1304	16	0.0	.05	.07	.007	.003		5.0
A 001	210.00	220.00	80.00	1305	0	0.0	.05	.08	.005	.001		4.5
A 001	220.00	230.00	81.00	1306	8	0.0	-.05	.04	.009	.003	.004	2.9
A 001	230.00	240.00	85.00	1307	18	0.0	-.05	.04	.004	.001		2.5
A 001	240.00	250.00	79.00	1308	8	0.0	-.05	.05	.003	-.001		2.3
A 001	250.00	260.00	83.00	1309	8	0.0	-.05	.05	.004	.001		3.0
A 001	260.00	270.00	79.00	1310	0	0.0	-.05	.06	.04	.001	.003	3.2
A 001	270.00	280.00	87.00	1311	0	0.0	.05	.07	.005	.002		3.6
A 001	280.00	290.00	81.00	1312	8	0.0	-.05	.08	.006	.002		3.7
A 001	290.00	300.00	73.00	1313	0	0.0	-.05	.07	.007	.002		3.7
A 001	300.00	310.00	59.00	1314	0	0.0	-.05	.07	.007	.001	.006	2.6
A 001	310.00	320.00	37.00	1315	0	0.0	.05	.04	.008	.001		2.6
A 001	320.00	330.00	78.00	1316	0	0.0	.05	.10	.007	.001		2.5
A 001	330.00	340.00	60.00	1317	0	0.0	.05	.11	.008	.002		2.6
A 001	340.00	350.00	66.00	1318	0	0.0	-.05	.08	.005	.002	.004	2.5
A 001	350.00	360.00	80.00	1319	0	0.0	-.05	.09	.005	.001		2.6
A 001	360.00	370.00	83.00	1320	0	0.0	-.05	.04	.008	-.001		2.4
A 001	370.00	380.00	55.00	1321	0	0.0	-.05	.04	.008	-.001		2.4
A 001	380.00	390.00	83.00	1322	0	0.0	-.05	.05	.008	.001	.003	2.4
A 001	390.00	400.00	76.00	1323	3	0.0	-.05	.05	.007	.002		2.7
A 001	400.00	410.00	96.00	1324	0	0.0	-.05	.04	.006	-.001		2.5
A 001	410.00	420.00	100.00	1325	55	0.0	.05	.05	.006	.002		2.5
A 001	420.00	430.00	100.00	1326	43	0.0	.05	.05	.006	.001	.004	2.5
A 001	430.00	440.00	84.00	1327	54	0.0	.15	.12	.007	.003		2.7
A 001	440.00	450.00	97.00	1328	40	0.0	.10	.08	.005	-.001		2.7
A 001	450.00	460.00	98.00	1329	36	0.0	-.05	.08	.005	.003		3.2
A 001	460.00	470.00	93.00	1330	21	0.0	-.05	.06	.005	.002	.005	3.0
A 001	470.00	480.00	91.00	1331	52	0.0	-.05	.08	.007	.002		2.9
A 001	480.00	490.00	98.00	1332	39	0.0	.05	.16	.008	.003		2.8
A 001	490.00	500.00	98.00	1333	34	0.0	.05	.12	.007	.004		2.5
A 001	500.00	510.00	96.00	1334	58	0.0	.05	.15	.009	.002	.006	2.4

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISEU CORE AAS	% MO ISCU CORE AAS	PPM AU ISCU CORE FA1.5	PPM AG ISCU CORE AAS	% FE
A 001	510.00	520.00	95.00	1335	48	0.0	-.05	.08	.010	.002		2.9
A 001	520.00	530.00	98.00	1336	48	0.0	.05	.08	.009	.002		3.0
A 001	530.00	540.00	96.00	1337	34	0.0	.25	.19	.011	.005		4.6
A 001	540.00	550.00	95.00	1339	56	0.0	.15	.16	.012	.006	.006	5.3
A 001	550.00	560.00	92.00	1339	36	0.0	.15	.22	.013	.006		5.7
A 001	560.00	570.00	100.00	1340	31	0.0	.05	.14	.021	.004		4.6
A 001	570.00	580.00	93.00	1341	17	0.0	.10	.16	.023	.002		3.3
A 001	580.00	590.00	87.00	1342	0	0.0	.05	.12	.018	-.001	.007	3.6
A 001	590.00	600.00	52.00	1343	0	0.0	-.05	.05	.012	.001		3.1
A 001	600.00	613.50	25.00	1344	0	0.0	-.05	.05	.016	-.001		2.9
A 001	613.50	620.00	74.00	1345	29	0.5	-.05	.04	.006	.001		6.0
A 001	620.00	630.00	79.00	1346	0	1.5	-.05	.02	.005	.001	.002	5.8
A 001	630.00	637.00	66.00	1347	6	1.5	-.05	.02	.004	.001		6.5

G E O L O G E D I T L I S T I N G

SYSTEMS ENGINEERING BY
INTERNATIONAL GEOSYSTEMS CORP.

UTAH MINES LTD VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY BC. NTS92L/12

FORMAT VERSION : 6R02

DRILLHOLE/TRAVERSE :DDHEC147
TOTAL DEPTH/LENGTH : 329.00
CORE/HOLE DIAMETER : NQ

COLLAR ELEVATION: 966.55
NORTHING(- IF S): 257627.95
EASTING (- IF W): 205681.63

AZIMUTH(DEG) : 0.00
VERTICAL ANGLE : -90.00
CO-ORD SYSTEM : GRD

GEOLOGGED BY : JBR +
DATE (YY/MM/DD): 831006
PROJECT NUMBER : 2140

KEY	FLAG	- INTERVAL - (UNITS = FT,2 DEC.PLACE) (FT=FOOTRIC) FROM	TO -	INT	T- % MM OI OX	ROCK TYPE	TYPI- FYING TM 1	TM 2	QAL MIN QM1	TEX- TURES TX 1	TX 2	GRAIN CHARACS F C % M P	FRAC- TURE D M S S	PGI /RI	STRUCTUR=1 T	ID	STK AZM	DIP RT	ALTERATION MINS HH AA QZ	HH AA BI	HH AA CY	HH AA CH	HH AA MG	HH AA PP	HH AA PY	HH AA CP	HH AA CC	HH AA YY	ORE-TYPE MINS ANY MIN	SUMMARY ALTER- ATION F I	F I
K	F				G	C Z		TM	QM2	TX	TX	S R S O	D S		T	ID	STK	DIP	KF	MS	CL	FP	HE	ZE	PR	MO	BO	HA	M I	M I
E	L				S	S S	LC= 3		3		4	O N H /	S S		2		AZM	RT			H	H	H	H	H	H	H	H	SUMMARY	
Y	G				FRACTURE		COL					R D P C				STRUCTUR=2					A	A	A	A	A	A	A	A	ORE	
/		0.00	1.00	1.00		STKP								P																
L																														
/		1.00	24.00	23.00		OVER								P																
L																														
K	BSR	24.00	24.00																											
K	TOX	24.00	24.00																											
/		24.00	30.00	6.00		RDBX				PP	BR	1 4 4 6		P					91	93					D+				3 3	
L							GA						82																1 +	
R	COL	24.00	30.00		ALL OXIDE ZONE MOD.TO STR LIM COLOR ON FRACTURES.																									
/		30.00	40.00	10.00		RDBX				PP	BR	1 4 4 6		P					83	95					D)				3 6	
L							6A						82																1)	
/		33.00	37.00	4.00		X MISN								R																
L																														
/		40.00	50.00	10.00		RDBX				PP	BR	1 4 4 6		P					83	96					D(				3 6	
L							6A						62																1 *	
R	MIN	50.00	57.00		MOD.TO STR BLUE COLR IN SOME PATCHES OF CLAY.																									
/		50.00	60.00	10.00		RDBX				PP	BR	1 4 4 6		P					83	99					D(				3 9	
L							6A						62																1 (	
R	SAM	52.70	53.00																											
/		57.00	60.00	3.00		X MISN								R																
L																														
/		60.00	70.00	10.00		RDBX				PP	BR	1 4 4 6		P					92	99					D.				3 9	
L							7A						82																1 .	
/		60.00	67.00	7.00		X MISN								R																
L																														

K E Y	F -L- G	F R O M ----.--	T O ----.--	I N T ---.--	% ROCK GS	TM TM CSZS	QM1 QM2	TX TX LC	F S TM	C R TX	% S TX	M O S	QSMS USSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F I M	F I M	F I M	F I M
R	MNZ	60.00	70.00		ABUNDANT VOIDS PROBABLY AFTER DISS,PY																										
/ L		70.00	80.00	10.00		RDBX	6A		PP	BR	1	4	4	6 92	P				91	97				D.				3 1 .	7		
/ L		77.00	80.00	3.00	X	MISN									R																
/ L		80.00	90.00	10.00		RDBX	6A		PP	BR	1	4	4	6 92	P				91	97				D.				3 1 .	7		
/ L		80.00	87.00	7.00	X	MISN									R																
/ L		90.00	98.00	8.00		RDBX	6A		PP	BR	1	4	4	6 92	P				91	97				D.				3 1 .	7		
K	BOX	98.00	98.00																												
/ L		98.00	100.00	2.00		RDPP	PA		PP		1	4	4	4 X2	P				93	95				D=				3 1 =	5		
/ L		100.00	110.00	10.00		RDPP	PA		PP		1	4	4	4 X2	P				93	95				D=				3 1 =	5		
/ L		104.00	110.00	6.00	X	MISN									R																
/ L		110.00	120.00	10.00		RDPP	PA		PP		1	4	4	4 X2	P				93	95				D=				3 1 =	5		
/ L		110.00	120.00	10.00	X	MISN									R																
/ L		120.00	130.00	10.00		RDPP	PA		PP		1	4	4	4 X2	P				93 93	95				D=			D(	3 1 =	5	5 4 .	1
/ L		120.00	122.00	2.00	X	MISN									R																
/ L		122.00	130.00	8.00	X	FAUL									R																
/ L		130.00	140.00	10.00		RDPP	PA		PP		1	4	4	4 X2	P				95 94	95				D=				5 1 =	5		
/ L		130.00	140.00	10.00	X	FAUL									R																
/ L		140.00	150.00	10.00		RDPP	PA		PP		1	4	4	4 X2	P				93 94	95				D=			D.	5 1 =	5	5 4 .	
/ L		140.00	150.00	10.00	X	FAUL									R																

K E Y	F L G	F R O M	- T O -	I N T	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M D	QSMS DSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F I M	F I M
/ L		150.00	162.00	12.00		RDPP	PA			PP		1	4	4	4	X2	P					93	92	95			D=			D.		3 5 5 2 1 = 4 .
/ L		150.00	162.00	12.00	X	FAUL											R															
/ L		162.00	170.00	8.00		RDPP	PA			PP		1	4	4	4	62	P					94	94	95			D=			D.		5 4 1 = 4 .
/ L		170.00	180.00	10.00		RDPP	PA			PP		1	4	4	4	62	P					94	94	95			D=			D.		5 4 1 =
R	SAM	171.70	172.00																													
/ L		176.00	177.00	1.00	X	FAUL											R															
/ L		177.00	180.00	3.00	X	MISN											R															
/ L		180.00	190.00	10.00		RDPP	PA			PP		1	4	4	4	X2	P					95	94	95			D=					5 4 1 =
/ L		180.00	185.00	5.00	X	MISN											R															
/ L		185.00	190.00	5.00	X	FAUL											R															
/ L		190.00	200.00	10.00		RDPP	PA			PP		1	4	4	4	X2	P					95	94	95			D=					5 4 1 =
/ L		190.00	196.00	6.00	X	FAUL											R															
/ L		196.00	200.00	4.00	X	SAND	QZ										R										2					
/ L		200.00	210.00	10.00		RDPP	PA			PP		1	4	4	4	X2	P					95	94	97			D=					5 7 1 =
/ L		200.00	201.00	1.00	X	SAND	QZ										R										2					
/ L		201.00	210.00	9.00	X	FAUL											R															
/ L		210.00	220.00	10.00		RDPP	PA			PP		1	4	4	4	X2	P					95	94	95			D=					5 4 1 =
/ L		210.00	220.00	10.00	X	FAUL											R															

KEY	F -L- G	FROM ----.--	TO ----.--	INT ---.--	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M U	QSMS DSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	OZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F I M	F I M
/		220.00	230.00	10.00		RDPP				PP		1	4	4	4		P					95		95			D=				5	4
L							PA									92							94						D?		1	=
/		220.00	230.00	10.00	X	FAUL											R															
L																																
/		230.00	240.00	10.00		RDPP				PP		1	4	4	4		P					95		95			D=				5	4
L							PA									92							94								1	=
/		230.00	240.00	10.00	X	FAUL											R															
L																																
/		240.00	250.00	10.00		RDPP				PP		1	4	4	4	92	P					86		95			D=				5	4
L							PA									X2							94								1	=
/		240.00	250.00	10.00	X	FAUL											R															
L																																
R	SAM	243.00	243.20																													
/		250.00	260.00	10.00		RDPP				PP		1	4	4	4		P					95		95			D=				5	4
L							PA									X2							94								1	=
/		250.00	260.00	10.00	X	FAUL											R															
L																																
/		260.00	270.00	10.00		RDPP				PP		1	4	4	4		P					95		95			D=				5	4
L							PA									X2							94								1	=
/		260.00	270.00	10.00	X	FAUL											R															
L																																
/		270.00	280.00	10.00		RDPP				PP		1	4	4	4		P					97		95			D=				5	8
L							PA									82							94								1	=
/		270.00	276.00	6.00	X	FAUL											R															
L																																
R	SAM	276.00	276.30																													
/		280.00	290.00	10.00		RDPP						1	4	4	4		P					96		95			D=				5	5
L							PA									92							94								1	=
/		290.00	300.00	10.00		RDPP						1	4	4	4		P					96		95			D=				5	4
L							PA									92							94								1	=
/		300.00	310.00	10.00		RDPP						1	4	4	4		P					96		95			D=				5	4
L							PA									92							94								1	=
/		307.00	309.00	2.00	X	MISN											R															
L																																
/		310.00	320.00	10.00		RDPP						1	4	4	4		P					97		95			D=				5	7
L							PA									92							94								1	=

KEY	F G	FROM	TO	INT		%	ROCK	TM	TM	QM1	TX	TX	F	C	%	M	QSMS	RI	1	ID	AZM	DIP	QZ	BI	CY	CB	MG	PP	PY	CP	CC	YY	F	I	F	I
							GS	CSZS	LC	TM	QM2	TX	TX	S	R	S	U	QSSS		2	ID	AZM	DIP	KF	MS	CL	EP	HE	ZE	PR	MO	BO	HA	M	I	M	I
R	SAM	315.00	315.30																																	
/ L		320.00	329.00	9.00				RDPP PA					1	4	4	4	92		P				97 94		95			D=							5 1	4 =		
/ L		326.00	329.00	3.00		X		FAUL											R																	

R	SUM	0 TO 24	OVERBURDEN
R	SUM	24 TO 98	BRECCIATED RED DOG PORPH. LIMONITE STAINED
R	SUM		MOD.TO STRONG PERVASIVE CLAY ALTERATION, LOW SULPH.
R	SUM		FRACTURING EXTREME
R	SUM	98 TO 329	RED DOG PORPHYRY, 40% MED.GR.FELDS.PHENOS IN
R	SUM		APHANITIC MATRIX. TEXTURE VARIABLY OBSCURED BY ALT.
R	SUM		FRACTURING GENERALLY STRONG TO EXTREME.
R	SUM	98 TO 130	CALY ALT. MOD +- 5% PY.
R	SUM	130 TO 329	CLAY-SERICITE ALT.MOD. +- 5% PY
R	SUM		TRACE BORNITE 140 - 180

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISCU CORE AAS	% MO ISCU CORE AAS	AU ISCU CORE FA 1.5	AG ISCU CORE FA AAS	% FE ISCU CORE ASS
A 001	24.00	33.00	19.00	1771	0	0.0	-.05	.03	.003	.002		6.5
A 001	33.00	37.00	0.00		0	0.0	-.05					
A 001	37.00	50.00	18.00	1772	0	0.0	-.05	.02	.005	.002		4.4
A 001	50.00	57.00	52.00	1773	5	0.0	-.05	.02	.004	.002		4.4
A 001	57.00	67.00	0.00		0	0.0	-.05					
A 001	67.00	77.00	50.00	1774	3	0.0	-.05	.03	.004	-.001	.002	5.6
A 001	77.00	87.00	0.00		0	0.0	-.05					
A 001	87.00	97.00	47.00	1775	0	0.0	-.05	.01	.003	.002		4.2
A 001	97.00	104.00	31.00	1776	0	0.0	-.05	.02	.002	.002		5.0
A 001	104.00	122.00	0.00		0	0.0	-.05					
A 001	122.00	130.00	90.00	1777	0	0.0	-.05	.07	.003	-.001		4.1
A 001	130.00	140.00	83.00	1778	0	0.0	-.05	.06	.002	-.001	.003	3.7
A 001	140.00	150.00	52.00	1779	0	0.0	-.05	.02	.001	-.001		5.9
A 001	150.00	160.00	59.00	1780	0	0.0	-.05	.05	.002	.001		3.9
A 001	160.00	170.00	62.00	1781	0	0.0	-.05	.04	.002	.001		3.8
A 001	170.00	177.00	45.00	1782	0	0.0	-.05	.03	.002	-.001	.001	2.7
A 001	177.00	185.00	0.00		0	0.0	-.05					
A 001	185.00	196.00	45.00	1783	0	0.0	-.05	.03	.002	-.001		4.7
A 001	196.00	201.00	0.00		0	0.0	-.05					
A 001	201.00	210.00	36.00	1784	0	0.0	-.05	.03	.002	-.001		3.9
A 001	210.00	220.00	66.00	1785	0	0.0	-.05	.03	.001	.001		6.0
A 001	220.00	230.00	75.00	1786	8	0.0	-.05	.02	.001	.001	.004	4.2
A 001	230.00	240.00	90.00	1787	0	0.0	-.05	.03	.002	-.001		4.9
A 001	240.00	250.00	49.00	1788	0	0.0	-.05	.03	.001	-.001		4.3
A 001	250.00	260.00	49.00	1789	0	0.0	-.05	.03	.003	.001		4.7
A 001	260.00	270.00	31.00	1790	0	0.0	-.05	.03	.002	.001	.005	4.7
A 001	270.00	280.00	75.00	1791	0	0.0	-.05	.03	.002	-.001		3.6
A 001	280.00	290.00	73.00	1792	0	0.0	-.05	.04	.002	.002		4.7
A 001	290.00	300.00	47.00	1793	0	0.0	-.05	.03	.003	.001		5.5
A 001	300.00	310.00	30.00	1794	0	0.0	-.05	.03	.001	.001	.006	4.4
A 001	310.00	320.00	27.00	1795	0	0.0	-.05	.03	.002	.001		4.9
A 001	320.00	329.00	40.00	1796	0	0.0	-.05	.03	.002	.001		4.8

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 I G C                                                                                                    PAGE : 1  DATE :1983/11/21

                                                          G E O L O G   E D I T   L I S T I N G                SYSTEMS ENGINEERING BY
                                                                                                            INTERNATIONAL GEOSYSTEMS CORP.

                                                                 UTAH MINES LTD VANCOUVER BC.
                                                           RED DOG CU-AU PORPHYRY BC.NTS 92L/12

                                                                    FORMAT VERSION : 6B02

DRILLHOLE/TRAVERSE :DDHEC148        COLLAR ELEVATION:      1032.60          AZIMUTH( DEG ) :     0.00        GEOLOGGED BY : HRM + JRR
TOTAL DEPTH/LENGTH :  676.00        NORTHING(- IF S):    257589.12          VERTICAL ANGLE :   -90.00        DATE (YY/MM/DD): 831003
CORE/HOLE DIAMETER :      NQ        EASTING (- IF W):    206469.52          CO-ORD SYSTEM  :    GRD          PROJECT NUMBER :   2140

   F    - I N T E R V A L -         T- %        TYPI- QAL  TEX-  GRAIN FRAC- PGI    STRUCTUR-1 ALTERATION MINS  ORE-TYPE MINS SUMMARY
K  L (UNITS = FT.2 DEC.PLACE)        M M ROCK FYING MIN TURES CHARACS TURE                      H  H  H  H  H  H  H  H  H ANY  ALTER-
E  A  (FT=FOOTRIC)                   O I        TM TM MAT TX TX F C % M Q M  /RI T ID STK DIP  A  A  A  A  A  A  A  A  A MIN  ATION
Y  G  F R O M - T O -  I N T         D X TYPE  1  2 QM1  1  2 F F C P  S S    1    AZM  RT QZ BI CY CH MG PP PY CP CC YY   F I F I
- --- ----.-- ----.-- ---.--        -- - ---- -- -- --- -- -- - - - - ---- --- - -- --- --- -- -- -- -- -- -- -- -- -- --   - - - -
K  F                                  G  C Z       TM QM2 TX TX S R S O D S        T ID STK DIP KF MS CL EP HE ZE PR MO BU HA   M I M I
E  L                                   S  S S LC- 3        3  4 O N H /  S S       2    AZM  RT        H  H  H  H  H  H  H  H   SUMMARY
Y  G                                 FRACTURE COL               R D P C             STRUCTUR-2          A  A  A  A  A  A  A  A  ORE


/ STK    0.00    1.50   1.50                STKP                            P
L

/ OVB    1.50   34.00  32.50                OVER                            P
L
K TOX   34.00   34.00
R TOX   34.00   34.00       LI STAIN MOSTLY ON FRC.

/       34.00   63.00  29.00                BVAN                            P               93     98           00           3 X
L                                                 7A                  8                                                      0 0
R ALT   34.00   63.00       STR WEATH RK ONLY CY IS OBVIOUS.THERE IS SIL  + POSS MS.

/       40.00   45.00   5.00              X FAUL                            R
L
R ALT   40.00   45.00       WEATH DUE TO WATER CIRCULATING DOWN FAULTS.ADDS TO ALT EFFECTS.

/       52.00   55.00   3.00              X FAUL                            R
L
R SAM   59.00   59.10       FOR X-RAY

/       61.50   63.00   1.50              X FAUL                            R
L
K BOX   63.00   63.00

/       63.00   76.00  13.00                BVAN                   5        P  1            86     97        9? 8+           3 9
L                                                 6A               8 3         1                9?                           1 +
R LTH   63.00   76.00       INTRS?? TXT COMPLETELY DESTROYED.

/       67.00   76.00   9.00              X FAUL                            R
L
R FRC   67.00   76.00       GOUGE.MUDDY

/       76.00   98.00  22.00                RDPP       FX3         K 3 K    P               96     96           9+           3 6
L                                                 6A   UZ=                X                                                  1 +
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KEY	F -L- G	FROM -	TO -	INT		%	ROCK	TM	TM	QM1	TX	TX	F	C	%	M	QSMS	RI	1	ID	AZM	DIP	QZ	BI	CY	CH	MG	PP	PY	CP	CC	YY	F	I	F	I
		----.--	----.--	---.--		--	-	----	--	--	---	--	--	-	-	-	-	----	---	-	--	---	---	---	--	--	--	--	--	--	--	--	--	-	-	-	-
							GS	CSZS	LC	TM	QM2	TX	TX	S	R	S	D	DSSS		2	ID	AZM	DIP	KF	MS	CL	EP	HE	ZE	PR	MO	BO	HA	M	I	M	I
/		76.00	96.00	20.00			X	FAUL			FX3			K	3	K		R						96		96			9+					3	6		
L									6A		Q =						X																		1	+		
R	TXT	76.00	98.00		FX SUBHED-EUHED,ALT TO CY(+MS?)MTRX IS QZ+CY,A FEW QZ EYES																																	
/		98.00	103.00	5.00				RDPP			FX3			J	3	J		P						96		96			9)					3	6		
L									6A		Q =						X																		1	)		
R	LTH	98.00	103.00		APPEARS SAME COMP AS ABOVE BUT SUDDEN CHANGE TO FINER TXT,NO QZ																																	
R		98.00	103.00		PHENOS SEEN.																																	
/		99.00	103.00	4.00			X	FAUL			FX3			K	3	K		R						96		96			9+					3	6		
L									6A		Q =						X																		1	+		
/		103.00	163.00	60.00				BVAN									3	P						96		97			9?	D+				3	9		
L									5A								X								9?							9.		1	+		
/		103.00	163.00	60.00			X	FAUL									3	R						96		97			9?	D+				3	9		
L									5A								X								9?							9.		1	+		
R	TXT	103.00	163.00		NO RELIC TXT, COMPLETELY SHEARED + GOUGED.																																	
R	ALT	103.00	163.00		SOME PP? IT IS NOTICHABLE AT 115'																																	
/		163.00	196.00	33.00				BVAT				FR		3	4	6	5	P						98		94			3?	D=		9-		3	7		
L									5A								X															9.		1	=	4	.
/		163.00	196.00	33.00			X	FAUL										R																				
L																																					
/		177.00	178.00	1.00			X	BVAT				FR		3	4	6	5	R						98		94			3?	D=		9-		3	7		
L									5A								X														2-	9.		1	=	4	.
/		196.00	204.00	8.00				BVAT				FR		2	6	6	7	P						96		92			3?	D=				3	7	7	1
L									5A								X															9.		1	=	4	.
/		196.00	204.00	8.00			X	FAUL										R																				
L																																					
/		204.00	221.00	17.00				BVAT				FR		3	4	6	5	P						96		96			32	01				3	7	7	2
L									5A								X															9.		1	1	4	.
/		204.00	221.00	17.00			X	FAUL										R																				
L																																					
/		221.00	226.00	5.00				RDPP				PP		3	5	4	5	P						96		94				D=				3	7		
L									5A								X																		1	1		
/		226.00	254.00	28.00				BVAT				FR		1	5	1	5	P						96		94				D=				3	7		
L									5A								X																		1	1		
R	TXT	226.00	254.00		241 TO 254 MORE SOLID SECTIONS HAVE CATACLASTIC TXT.																																	
/		254.00	283.00	29.00				BVAT				FR		1	5	1	5	P						93		94			06	D=				7	4		
L									5A								X																		1	1		

GEOLOG

KEY	F -L- G	FROM ----.--	TO ----.--	IN ---.--	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	F S	C R	% S	M O	QSMS QSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F M	I I	F M	I I
/		283.00	291.00	8.00		BVAT				FR	3	5	4	5		P					91		92				0)				3	2		
L							GA								X2								92								1	)		
/		291.00	300.00	9.00		BVAT				FR	3	5	4	5		P					93		93				0=				3	3		
L							5A								X2								91					9.			1	=	4	1
/		300.00	321.00	21.00		BVAT				FR	3	5	4	5		P					96		92				0+				3	4		
L							5A								X2													9.			1	+	4	1
/		321.00	326.00	5.00		BVAT				FR	3	5	4	5		P					96		92				0=				3	4		
L							TA								X2													00			1	+	4	1
/		326.00	327.00	1.00		BVAT				FR	3	5	4	5		P					96		92				0=				3	4		
L							5A								X2													2- 00			1	+	4	1
/		327.00	339.00	12.00		BVAT				FR	3	5	4	5		P					96		92				0=				3	4		
L							5A								X2													00			1	+	4	1
/		339.00	351.00	12.00		BVAT				FR	3	5	4	5		P					94		92				0=				3	4		
L							5A								X22													00			1	+	4	1
/		351.00	359.00	8.00		BVAT				FR	3	5	4	5		P					96		92			03	0=				3	4	7	2
L							5A								X2													00			1	+	4	1
/		359.00	371.00	12.00		BVAT				FR	3	5	4	5		P					94		92				0+				3	4		
L							GS								X2								S?					00			1	+	4	1
R	ALT	359.00	371.00	PATCHES OF GREEN MINERAL MAY BE CL BUT PROBABLY NOT.																															
/		371.00	384.00	13.00		BVAT				FR	3	5	4	5		P					93		94				0=		00		3	4		
L							TO								X2														9.		1	+	4	1
/		384.00	391.00	7.00		BVAN	FX		PP	FR	2	6	2	6		P					91		94				9=				3	4		
L							3A								82																1	=		
R	LTH	384.00	391.00	LITHIC FRAGS TO 2 CM.																															
/		391.00	425.00	34.00		BVAT				FR	3	6	6	8		P					92		93			01	9+				3	4	7	1
L							6A								921																1	+		
/		425.00	432.00	7.00		BVAT				FR	3	6	6	8		P					92		93			03	9=				7	3	3	1
L							6A								822																1	=		
/		432.00	433.00	1.00		BVAN	FX		PP		2	3	4	3		P							93				V)				3	3		
L							3A								7 3																1	)		
/		433.00	456.00	23.00		BVAT				FR	CT	2	6	6	8	P					94		93			0?	9=				3	3		
L							5A								X2																1	=		
/		456.00	458.00	2.00		BVAN				PP		2	3	2	3	P							93				9)							
L							3A								52																			
/		458.00	466.00	8.00		BVAT				FR		2	6	6	8	P					91		96				9)				3	6		
L							5A								53																1	)		

K E Y	F -L- G	F R O M -	T O -	I N T	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M O	QSMS QSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F M	I I	F M	I I
/ L		466.00	506.00	40.00		BVAT	5A			FR		2	6	6	8	X1	P					92		96				9)				3 1	6)		
/ L		506.00	518.00	12.00		BVAT	4A			FR		2	6	6	8	X1	P					91	93	96				91				3 1	6 1	5	I
R	ALT	506.00	518.00		ABUNDANT BLACK SOFT MINERAL IN PATCHES WITH PY,NOT SX.																															
/ L		518.00	522.00	4.00		BVAT	6A			FR		2	6	6	8	X1	P					91		96				9)				3 1	6)		
/ L		522.00	527.00	5.00		BVAT	5A			FR		2	6	6	8	52	P					93		94				8+				3 1	4 +		
/ L		527.00	567.00	40.00		BVAT	5A			FR		2	6	6	8	92	P					92		96				9=				3 1	6 =		
/ L		567.00	602.00	35.00		BVAT	5A			FR		2	6	6	8	92	P					91		96			Q3	9=				7 1	3 =		
/ L		602.00	605.00	3.00		BVAT	5A			FR		2	6	6	8	82	P					91		96				9=				3 1	6 =		
/ L		605.00	627.00	22.00		BVAT	UA			FR		2	6	6	8	93	P					91		96				9=				3 1	6 =		
/ L		627.00	650.00	23.00		BVAT	UA			FR		2	6	6	8	X2	P					91		98				9=				3 1	8 =		
/ L		650.00	676.00	26.00		BVAT	UA			FR		2	6	6	8	92	P					91		96				9=				3 1	6 =		

R SUM ENTIRE HOLE MAY BE TAKEN AS A FAULT ZONE.

R SUM 0 TO 34 OVERBURDEN

R SUM 34 TO 76 BONANZA VOLCANICS V.HEAILY CALY ALT, MINOR PY

R SUM 76 TO 103 RED DOG PORPH. 30% MED GR.PHENOS IN APHANITIC MATRIX.

R SUM MOD.CALY ALT.

R SUM 103 TO 221 BONANZA VOL. MOD. TO STR CLAY +=5%PY TRACE BORN.

R SUM 221 TO 226 RED DOG PORPH. STRONG CLAY ALT.

R SUM 226 TO 676 BONANZA VOLC. MOD CLAY. 3-5% PY OCC TRACE BORNITE.

R SUM OCCASIONAL PYROPHILLITIC.

G E O L O G

UTAH MINES LTD, VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY,BC NTS 92L/12
DRILLHOLE/TRAVERSE --- DDHEC148 --- (CONTINUED)

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	ROD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE FST	% CU ISCU CORE AAS	% MO ISCU CORE AAS	PPM AU ISCU CORE FA1.S	PPM AG ISCU CORE AAS	% FE ISCU CORE ASS
A 001	34.00	50.00	60.00	1348	3	0.0	-.05	.03	.002	.002	.005	6.3
A 001	50.00	60.00	55.00	1349	10	0.0	-.05	.02	.003	.003		6.7
A 001	60.00	70.00	54.00	1350	0	0.0	-.05	.03	.003	.002		5.1
A 001	70.00	80.00	38.00	1352	0	0.0	-.05	.06	.002	.003		5.1
A 001	80.00	90.00	43.00	1351	0	0.0	-.05	.11	.003	.003	.011	4.7
A 001	90.00	100.00	50.00	1353	0	0.0	-.05	.08	.002	.003		4.2
A 001	100.00	110.00	34.00	1354	0	0.0	-.05	.03	.003	.001		4.1
A 001	110.00	120.00	46.00	1355	0	0.0	-.05	.04	.003	.002	.006	5.5
A 001	120.00	130.00	40.00	1356	0	0.0	-.05	.04	.002	.002		5.9
A 001	130.00	140.00	33.00	1357	0	0.0	-.05	.05	.002	.001		4.9
A 001	140.00	150.00	33.00	1358	0	0.0	-.05	.10	.003	-.001		4.5
A 001	150.00	160.00	38.00	1359	0	0.0	-.05	.15	.003	.001	.003	4.8
A 001	160.00	170.00	39.00	1360	0	0.0	-.05	.08	.004	.001		4.7
A 001	170.00	180.00	55.00	1721	0	0.0	-.05	.06	.003	.003		4.5
A 001	180.00	190.00	74.00	1722	0	0.0	-.05	.06	.002	.003		6.2
A 001	190.00	200.00	45.00	1737	0	0.0	-.05	.09	.001	.003	.003	4.7
A 001	200.00	210.00	40.00	1723	0	0.0	-.05	.08	.002	.001		5.7
A 001	210.00	220.00	31.00	1724	0	0.0	-.05	.08	.003	.002	.007	4.6
A 001	220.00	230.00	44.00	1725	0	0.0	-.05	.08	.003	.002		4.9
A 001	230.00	240.00	31.00	1726	0	0.0	-.05	.06	.004	.002		4.7
A 001	240.00	250.00	72.00	1727	0	0.0	-.05	.04	.004	.001		5.4
A 001	250.00	260.00	70.00	1728	0	0.0	-.05	.05	.009	-.001		3.0
A 001	260.00	270.00	85.00	1729	0	0.0	-.05	.04	.003	-.001	.006	3.1
A 001	270.00	280.00	42.00	1730	0	0.0	-.05	.03	.003	.001		4.8
A 001	280.00	290.00	63.00	1731	0	0.0	-.05	.10	.003	.001		6.6
A 001	290.00	300.00	96.00	1732	0	0.0	-.05	.09	.001	.001		7.8
A 001	300.00	310.00	43.00	1733	0	0.0	-.05	.07	.003	.002		6.2
A 001	310.00	320.00	46.00	1734	0	0.0	-.05	.07	.003	.001	.006	5.2
A 001	320.00	330.00	62.00	1735	0	0.0	-.05	.05	.020	.001		4.3
A 001	330.00	340.00	51.00	1736	0	0.0	-.05	.34	.003	.001		7.9
A 001	340.00	350.00	61.00	1738	0	0.0	-.05	.02	.001	.002		6.6
A 001	350.00	360.00	95.00	1739	0	0.0	-.05	.18	.003	-.001	.006	5.0
A 001	360.00	370.00	71.00	1740	0	0.0	-.05	.06	.002	.001		6.2
A 001	370.00	380.00	61.00	1741	0	0.0	-.05	.04	.002	.001		5.6
A 001	380.00	390.00	63.00	1742	5	0.0	-.05	.07	.003	.002		5.9
A 001	390.00	400.00	50.00	1743	0	0.0	-.05	.07	.001	.002	.005	5.6
A 001	400.00	410.00	37.00	1744	0	0.0	-.05	.05	.003	.002		3.8
A 001	410.00	420.00	48.00	1745	0	0.0	-.05	.04	.001	.002		3.9
A 001	420.00	430.00	40.00	1746	0	0.0	-.05	.03	.002	.002		5.3
A 001	430.00	440.00	43.00	1747	0	0.0	-.05	.09	.003	.002	.006	6.6
A 001	440.00	450.00	48.00	1748	0	0.0	-.05	.04	.004	.002		5.0
A 001	450.00	460.00	63.00	1749	0	0.0	-.05	.01	.001	.001		5.0
A 001	460.00	470.00	74.00	1750	0	0.0	-.05	.01	.001	.001		3.8
A 001	470.00	480.00	73.00	1751	0	0.0	-.05	.07	.001	.001	.007	5.5
A 001	480.00	490.00	51.00	1752	0	0.0	-.05	.01	.001	.002		4.6
A 001	490.00	500.00	66.00	1753	0	0.0	-.05	.06	.002	.001		5.0
A 001	500.00	510.00	39.00	1754	0	0.0	-.05	.03	.001	.002		4.2
A 001	510.00	520.00	66.00	1755	0	0.0	-.05	.03	.001	.002	.009	4.1
A 001	520.00	530.00	49.00	1756	3	0.0	-.05	.05	.002	.002		5.0
A 001	530.00	540.00	69.00	1757	0	0.0	-.05	.03	.002	-.001		4.7

A UMM A LAB A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU ISCU CORE AAS	% MO ISCU CORE AAS	PPM AU ISCU CORE FA1.5	PPM AG ISCU CORE AAS	% FE ISCU CORE ASS
A 001	540.00	550.00	57.00	1758	0	0.0	-.05	.03	.002	-.001		5.7
A 001	550.00	560.00	50.00	1759	0	0.0	-.05	.03	.001	.001	.009	4.7
A 001	560.00	570.00	35.00	1760	0	0.0	-.05	.05	.002	.001		5.1
A 001	570.00	580.00	70.00	1761	0	0.0	-.05	.04	.002	-.001		5.4
A 001	580.00	590.00	49.00	1762	0	0.0	-.05	.03	.001	.001		4.9
A 001	590.00	600.00	38.00	1763	0	0.0	-.05	.06	.003	-.001	.008	5.0
A 001	600.00	610.00	66.00	1764	0	0.0	-.05	.05	.001	.001		4.2
A 001	610.00	620.00	58.00	1765	0	0.0	-.05	.03	.002	-.001		3.5
A 001	620.00	630.00	26.00	1766	0	0.0	-.05	.03	.001	-.001		5.4
A 001	630.00	640.00	38.00	1767	0	0.0	-.05	.03	.001	.002	.010	4.5
A 001	640.00	650.00	89.00	1768	0	0.0	-.05	.05	.002	-.001		4.9
A 001	650.00	660.00	64.00	1769	0	0.0	-.05	.04	.002	-.001		4.5
A 001	660.00	676.00	41.00	1770	0	0.0	-.05	.04	.002	-.001		6.3

G E O L O G   E D I T   L I S T I N G

SYSTEMS ENGINEERING BY
INTERNATIONAL GEOSYSTEMS CORP.

UTAH MINES LTD., VANCOUVER, B.C.
RED DOG CU-AU PORPHYRY BC.NTS 92L/12

FORMAT VERSION : 6802

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DRILLHOLE/TRAVERSE :DDHEC149        COLLAR ELEVATION:       791.83     AZIMUTH( DEG ) :     0.00      GEOLOGGED BY : JBR +
TOTAL DEPTH/LENGTH :  407.00        NORTHING(- IF S):    256341.85     VERTICAL ANGLE :   -90.00      DATE (YY/MM/DD): 831008
CORE/HOLE DIAMETER :      NQ        EASTING (- IF W):    207491.52     CO-ORD SYSTEM  :    GRD        PROJECT NUMBER :   2140

  F   - I N T E R V A L -           T- %       TYPI- QAL  TEX-  GRAIN FRAC- PGI   STRUCTUR-1 ALTERATION MINS  ORE-TYPE MINS SUMMARY
K L (UNITS = FT,2 DEC.PLACE)        M M ROCK FYING MIN TURES CHARACS TURE               H  H  H  H  H  H  H  H  H ANY  ALTER-
E A   (FT=FOOTRIC)                  D I       TM TM MAT TX TX F C X M Q M  /RI T ID STK DIP  A  A  A  A  A  A  A  A  A MIN  ATION
Y G  F R O M - T O -  I N T         O X TYPE  1  2 QM1  1  2 F F C P  S S      1     AZM  RT QZ BI CY CB MG PP PY CP CC YY  F I F I
- --- ----,-- ----,-- ---,--        -- - ---- -- -- --- -- -- - - - - ---- --- - -- --- --- -- -- -- -- -- -- -- -- -- --  - - - -
K F                                  G  C Z      TM QM2 TX TX S R S O D S       T ID STK DIP KF MS CL EP HE ZE PR MO BO HA  M I M I
E L                                   S  S S LC- 3       3  4 O N H /  S S      2     AZM  RT       H  H  H  H  H  H  H  H  SUMMARY
Y G                                 FRACTURE COL             R O P C            STRUCTUR-2           A  A  A  A  A  A  A  A  ORE

/        0.00    1.00   1.00             STKP                              P
L

/        1.00  110.00 109.00             OVER                              P
L

/      110.00  120.00  10.00             BVAF          PP    1 5 5 7 22    P   VQ       55        92          D+           1 5 3 2
L                                          32 GA                     32                           92 85    V3              1 +

/      112.00  113.00   1.00           X BS/D          PP CM 1 3 2 3       R   C/       90                      5)           0 0
L                                          1A
R STR  112.00  113.00         OCCASIONAL QTZ FILLED SHEARS WITH SLICK.
R SAM  117.00  117.30

/      120.00  130.00  10.00             BVAF          PP    1 5 5 7 22    P   VQ       55 92     92 84       D+           1 5 3 3
L                                          32 GA                     32                           91 85    V3              1 +

/      130.00  132.00   2.00             BVAF          PP    1 5 5 7 22    P   VQ       55 93     92          D+           1 4 3 3
L                                          32 GA                     32                           90 83    V3              1 +

/      132.00  142.00  10.00             BVAF          PP SH 1 5 5 7 12    P                      92          D+           1 6 3 1
L                                          11 3G                                                  92

/      132.00  134.00   2.00           X FAUL                              R   F/       50        98
L

/      142.00  150.00   8.00             BVAF          PP    1 5 5 7       P                      92          D+           1 4
L                                          61 GA                                                     84    V6              1 4
R SAM  143.00  143.30

/      150.00  158.00   8.00             BVAF          PP    1 5 5 7       P                      92          D+           1 3
L                                          61 GA                                                     84    V6              1 +

/      158.00  160.00   2.00             BVAF          PP    1 5 5 7       P                      92          D+           1 3
L                                          22 GA                                                     84    V6              1 +
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K E Y	F -L- G	F R O M -	T O -	I N T	%	ROCK TM TM QM1 TX TX F C X M QSMS RI 1 ID AZM DIP Q7 BI CY CR MG PP PY CP CC YY F I F I GS CSZS LC TM QM2 TX TX S R S O DSSS 2 ID AZM DIP KF MS CL EP HE ZE PR MO BO HA M I M I
/		160.00	170.00	10.00		BVAF PP 1 5 5 7 P 92 D+ 1 3
L						22 GA 84 V6 1 +
R	SAM	165.00	165.30			
/		170.00	180.00	10.00		BVAF PP 1 5 5 7 P 92 D+ 1 3
L						22 GA 84 V6 1 +
/		180.00	189.00	9.00		BVAF PP 1 3 5 5 P D+ 1 3
L						42 4A 83 1 +
R	SAM	181.00	181.30			
R	TXT	180.00	189.00		BOTH PY + FX FINER GRAINED.	
/		189.00	190.00	1.00		BVAF PP 1 5 5 7 P 92 D) 1 3
L						32 GA 83 1)
/		190.00	200.00	10.00		BVAF PP BR 1 5 5 7 P 92 D+ 1 3
L						62 GA 83 1 +
/		193.00	193.50	0.50	X	FAUL R 55
L						82
/		200.00	206.00	6.00		BVAF PP 1 5 5 7 P 92 D+ 1 3
L						32 GA 83 1 +
R	SAM	201.00	201.30			
R	VEN	200.00	206.00		ZEOLITE VEINS ON FRACTURES AND IRREGULAR FLOW BORDERS.	
/		206.00	210.00	4.00		BVAF 1 3 2 5 P 94 D= 3 4
L					72	P$ F/ 55
K	STR	207.00	207.00		FAULT	
/		210.00	215.00	5.00		BVAF 1 3 2 5 P 96 D= 3 4
L					72	P$ F/ 55
/		215.00	220.00	5.00		BVAB LT PP BR 1 5 5 8 P P3 D= 1 4
L						22 PG 84 1 =
R	LTH	215.00	220.00		FLOW TOP BX.	
/		220.00	231.00	11.00		BVAB LT PP BR 1 5 5 8 P P3 D1 1 4
L						22 PG 22 84 1 1
R	SAM	227.00	227.30			
/		231.00	244.00	13.00		BVAF PP 1 3 6 5 P 92 D1 1 2
L					22	42 22 82 1 1
/		231.00	244.00	13.00	1	FAUL R F/ 55
L					82	82
/		244.00	250.00	6.00		BVAF PP 1 3 P D1 1 5
L					22	32 2355 9? 85 1 1
/		250.00	260.00	10.00		BVAF PP 1 3 P D1 1 5
L					12	22 0055 9? 85 1 1

KEY	F -L- G	FROM ----.--	TO ----.--	INT ---.--	% --	ROCK GS	TM CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M O	QSMS DSSS	RI ---	1 - 2	ID -- ID	AZM --- AZM	DIP --- DIP	QZ -- KF	BI -- MS	CY -- CL	CB -- EP	MG -- HE	PP -- ZE	PY -- PR	CP -- MO	CC -- BO	YY -- HA	F I M	F I M	F I M	F I M
/		260.00	270.00	10.00			BVAF				PP		1	3				P										D1				1	4		
L					22		22										0055							9?	84							1	1		
/		270.00	280.00	10.00			BVAF				PP		1	3				P										D=				1	4		
L					22		22										0055							91	83							1	=		
R	SAM	275.00	275.30																																	
/		280.00	290.00	10.00			BVAF				PP		1	3				P										D)				1	2		
L					32		02										0055							9?	82							1	)		
/		290.00	300.00	10.00			BVAF				PP		1	3				P										D)				1	2		
L					22		02										0055							9?	82							1	)		
/		300.00	310.00	10.00			BVAF				PP		1	3				P										D+				1	2		
L					22		02										1355							9?	82							1	+		
/		310.00	318.00	8.00			BVAF				PP		1	3				P										D+				1	3		
L					22		02										1355							9?	83							1	+		
/		318.00	320.00	2.00			BVAB				PP	BR	1	3	5	8		P							93											
L					22		42	PG									22								83											
R	LTH	318.00	320.00	FLOWTOP BX																																
/		320.00	336.00	16.00			BVAB				PP	BR	1	3	5	8		P							93											
L					22		52	PG									22								83											
R	SAM	320.00	320.30																																	
/		328.00	329.00	1.00		X	FAUL											R		F/		50		98				D)				1	3		
L					82		8																										1	)		
R	STR	328.00	329.00	THIS FAULT PROBABLY PREMINERAL.																																
/		336.00	340.00	4.00			BVAF				PP		1	3	5	3		P										D)				1	2		
L					22												32								82							1	)		
/		340.00	350.00	10.00			BVAF				PP		1	3	5	3		P							92				D+				1	2	3	2
L					32			PG									32								81							1	)		
R	SAM	340.00	340.30																																	
/		350.00	360.00	10.00			BVAF				PP		1	3	5	3		P							96				D)				3	6		
L					82			4A									32								80							1	)		
R	SAM	351.00	351.30																																	
/		360.00	362.00	2.00			BVAF				PP		1	3	5	3		P							97				D)				3	6		
L					72			6A									32								80							1	)		
/		362.00	367.50	5.50			BS/D						1	3	2	3		P				35											0			
L					32																												0			
/		367.50	370.00	2.50			BVAF						1	3	4	4		P										D)				1	2		
L					42			5A																	82							1	)		

K E Y	F -L- G	FROM-.--	TO-.--	INT---.--	% GS	ROCK CSZS	TM LC	TM TM	QM1 QM2	TX TX	TX TX	F S	C R	% S	M U	QSMS QSSS	RI	1 2	ID ID	AZM AZM	DIP DIP	QZ KF	BI MS	CY CL	CB EP	MG HE	PP ZE	PY PR	CP MO	CC BO	YY HA	F I M	F I I
/		370.00	380.00	10.00		BVAF						1	3	4	4	12	P											D)				1 3
L					42	22	5A																	83								1)
/		380.00	390.00	10.00		BVAF						1	3	4	4	12	P											D)				1 3
L					52	22	5A																	83								1)
R	SAM	382.00	382.30																													
R	TXT	380.00	390.00	TXT MICROLITIC BELOW ABOUT 385',FX LATHS < 0.5MM																												
/		390.00	400.00	10.00		BVAF						1	3	4	4	00	P											D+				1 3
L					42	42	PG																	83								1 +
/		400.00	407.00	7.00		BVAF						1	3	4	4		P											D+				1 3
L					42		5A																	01	83							1 +
R	SAM	403.00	403.20																													

R SUM 0 TO 110 OVER BURDEN.

R SUM 110 407 BONANZA VOLCANICS,ANDESITE FLOWS AND FLOW TOP BRECCIA

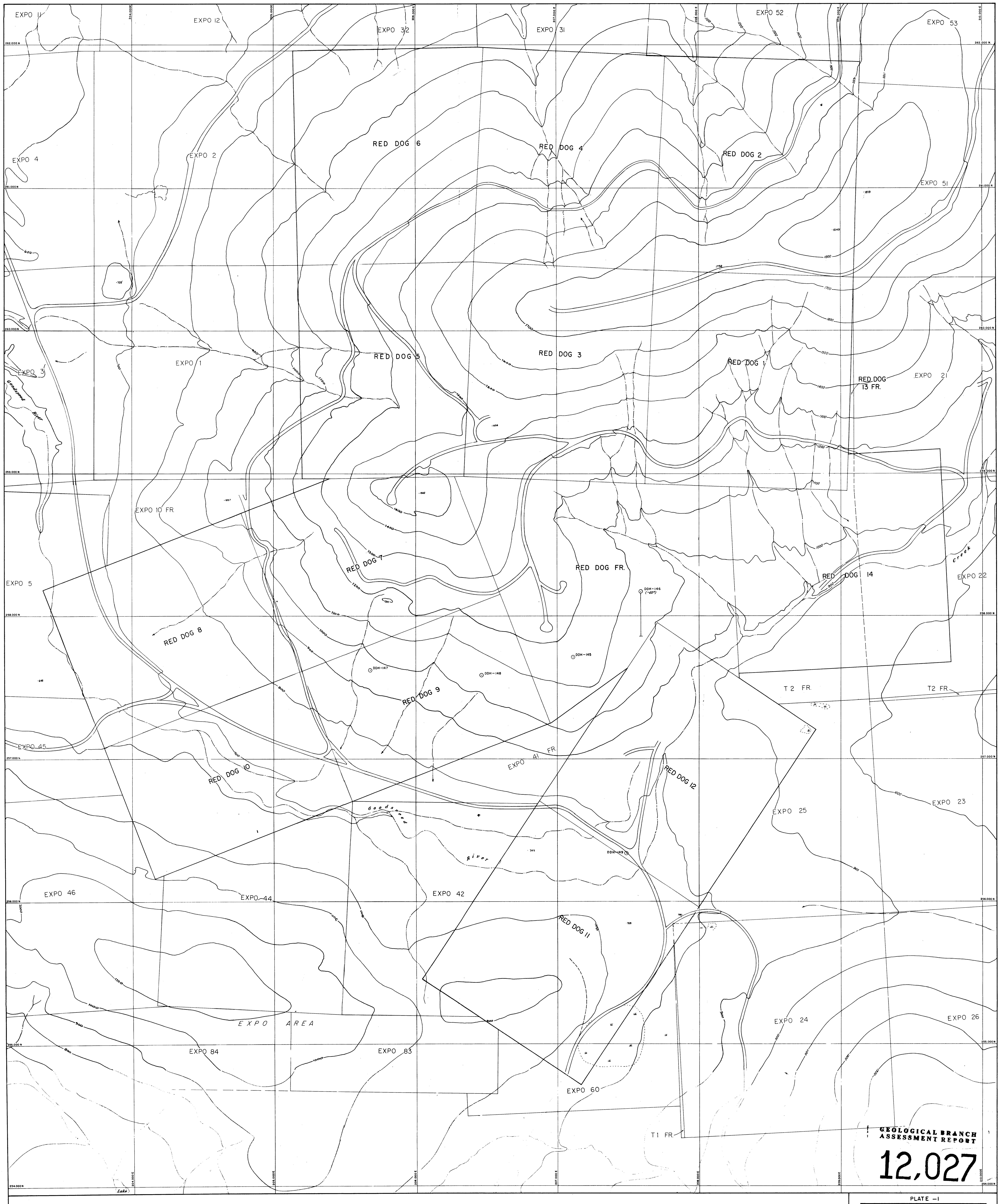
R SUM MINOR POST MINERAL BASALT DYKES AT 112 AND 362.

R SUM GENERALLY WEAK PROPYLITIC ALT AND WEAK PY MIN FACES.

R SUM THIS HOLE PUTS A SOUTHERN LIMIT ON THE AREA OF

R SUM INTEREST. NO COPPER SEEN. NO MAGNETITE.

A UMM A LAH A TYP A MTH	FROM	TO	RECOV	SAMPLE	RQD PC.0	MS K.1 FIELD CORE HAND	% CU FIELD CORE EST	% CU TSCU CORE 1AAS	% MO TSCU CORE ASS	OZ AU ISCU CORE FA1.5	OZ AG ISCU CORE AAS	% FE ISCU CORE AAS
A 001	110.00	120.00	92.00	1797	6	0.0		.02	.002	-.001	.005	6.4
A 001	120.00	130.00	100.00	1798	32			.02	.002	.001		5.4
A 001	130.00	140.00	94.00	1799	18			.02	.001	.001		6.1
A 001	140.00	150.00	99.00	1800	60			.02	.002	-.001		6.0
A 001	150.00	160.00	100.00	6721	46			.02	.002	.001	.002	6.0
A 001	160.00	170.00	89.00	6722	54			.02	.001	.001		5.9
A 001	170.00	180.00	83.00	6723	48			.02	.001	-.001		6.3
A 001	180.00	190.00	66.00	6724	31			.02	.001	.001		6.1
A 001	190.00	200.00	100.00	6725	60			.02	.002	.001	.005	5.8
A 001	200.00	210.00	100.00	6726	79			.02	.003	.001		4.3
A 001	210.00	220.00	100.00	6727	78			.02	.001	-.001		5.6
A 001	220.00	230.00	100.00	6728	80			.02	.001	-.001		6.4
A 001	230.00	240.00	100.00	6729	58			.02	.002	.001	.002	6.0
A 001	240.00	250.00	100.00	6730	58			.02	.001	.001		5.4
A 001	250.00	260.00	100.00	6731	65			.02	.002	-.001		6.2
A 001	260.00	270.00	100.00	6732	88			.04	.002	-.001		4.1
A 001	270.00	280.00	100.00	6733	80			.02	.002	-.001	.003	6.2
A 001	280.00	290.00	100.00	6734	83			.01	.001	.001		6.3
A 001	290.00	300.00	100.00	6735	91			.08	.003	.001		3.0
A 001	300.00	310.00	100.00	6736	88			.02	.001	.001		5.8
A 001	310.00	320.00	100.00	6737	76			.02	.003	.001	.001	6.2
A 001	320.00	330.00	100.00	6738	51			.02	.001	.001		5.7
A 001	330.00	340.00	100.00	6739	47			.02	.002	-.001		5.5
A 001	340.00	350.00	100.00	6740	80			.01	.001	-.001		4.8
A 001	350.00	360.00	100.00	35309	75			.01	.001	-.001	.010	3.3
A 001	360.00	370.00	100.00	35310	50			.02	.002	.001		5.5
A 001	370.00	380.00	100.00	35311	90			.02	.001	.001		5.6
A 001	380.00	390.00	100.00	35312	83			.02	.001	-.001		5.4
A 001	390.00	400.00	100.00	35313	87			.02	.002	.002	.006	5.5
A 001	400.00	407.00	100.00	35314	92			.02	.001	.001		5.5



Contours in feet.

NOTE: Date of Photography 13/8/79
Latest topo information has been added above the grid line 254 800 N

PLATE - I

UTAH MINES LTD.
EXPLORATION DEPARTMENT
VANCOUVER, BRITISH COLUMBIA

RED DOG PROPERTY — Expo Area

1983 DIAMOND DRILL HOLES

Scale 1:2400
FT 0 200 400 FT

		REVISIONS		
NTS Ref. :	92-L-12	Work by :		
Work by :	H. MUNTANION	Drawn by :	P.L., R.N.G.	R.N.G.
Drawn by :	R.N. Gopal	Date :	Jan '83	Dec. '83
Date :	MAY, 1981			