DIAMOND DRILL REPORT
FOR WORK DONE IN 1981
ON JEFF GROUP

LIARD MINING DIVISION
104I/1W
58°12'N 128°21W

for

ESSO MINERALS CANADA
600-1281 West Georgia Street
Vancouver, B.C. V6E 3J7

by

Walter Melnyk

October, 1981

ASSESSMENT REPORT
9657
NO.

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INTRODUCTION

The Kutcho Creek property is located 58°12'N, 128°21'W, and 200 kilometers due south of Watson Lake, Yukon Territory. The property is located in mountainous terrain in the Cassiar Mountains.

The property is situation 9 km east of the Kutcho airstrip and is accessible from there only by helicopter.

The property is owned and operated by Esso Minerals Canada, a division of Esso Resources Canada Limited.

This report describes 841.53 meters of BQ diamond drilling done in 1981 on JEFF 98 mineral claim. Three wedge branches were drilled from a pilot hole accounting for the total meters drilled.

The core for all holes drilled by Esso Minerals on the Kutcho property is stored at the exploration camp. Massive sulfide intersections are stored in the B.C. Yukon Air Service's hanger at Watson Lake, or Esso Minerals' office in Vancouver, B.C.

ESSO MINERALS CANADA

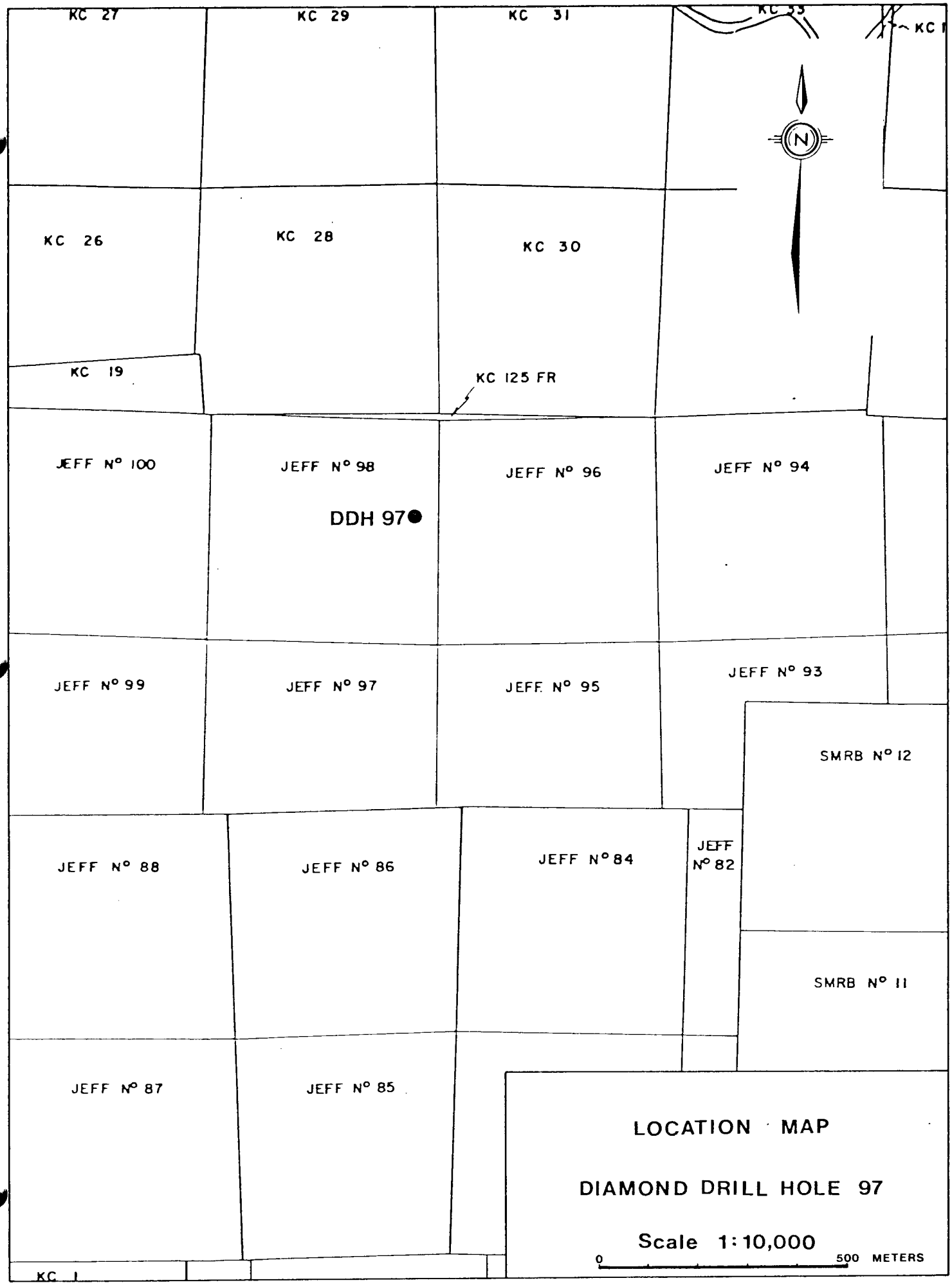
KUTCHO CREEK PROPERTY

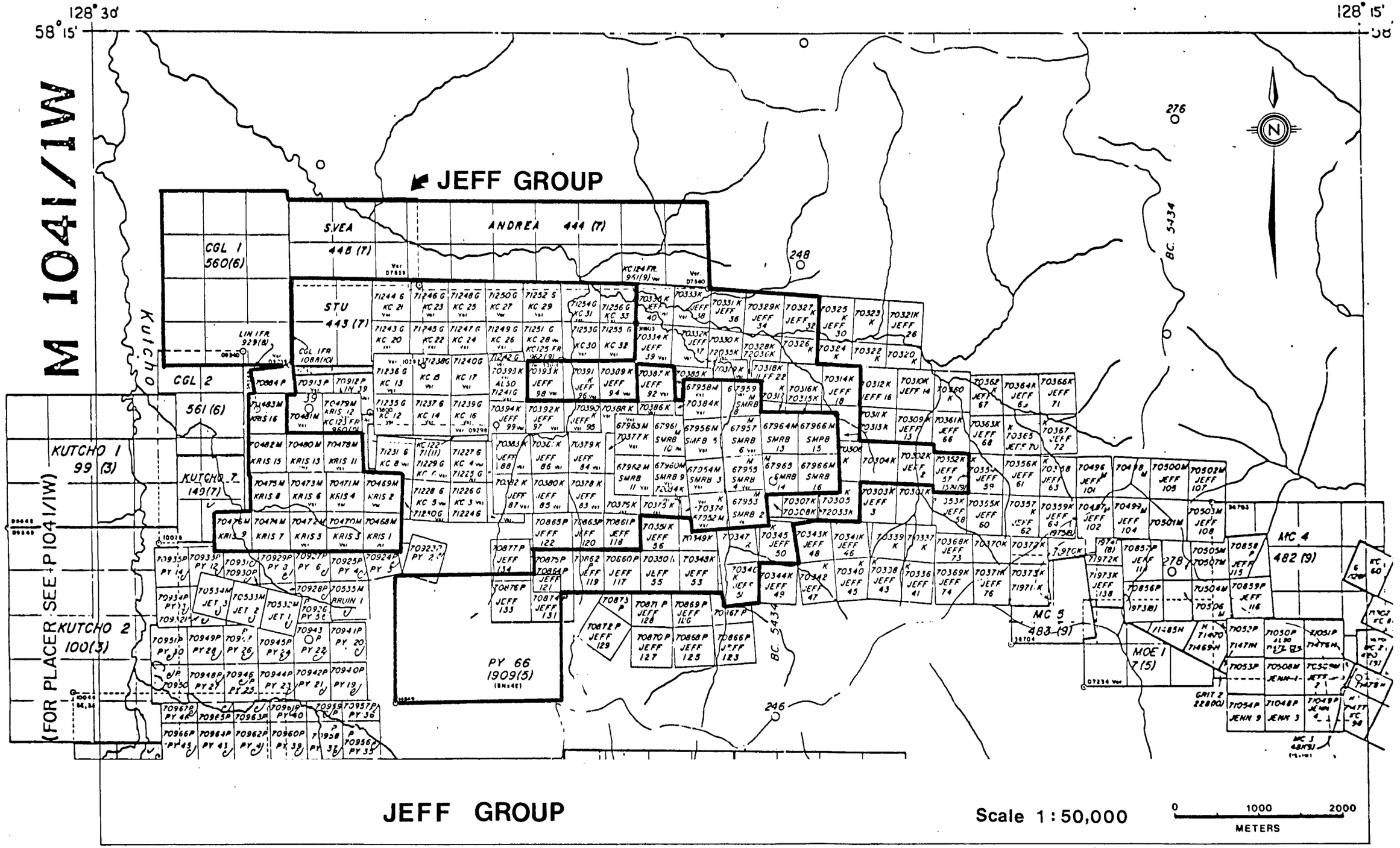
Scale 1 : 250,000

1 Inch to 4 Miles Approximately

Miles 5 0 5 10 15 20 Miles

Kilometres 5 0 5 10 15 20 25 30 Kilometres


KC 27
KC 29
KC 31
KC 33
KC 1
N
KC 26
KC 28
KC 30
KC 19
KC 125 FR
JEFF N° 100
JEFF N° 98
DDH 97
JEFF N° 96
JEFF N° 94
JEFF N° 99
JEFF N° 97
JEFF N° 95
JEFF N° 93
SMRB N° 12
JEFF N° 88
JEFF N° 86
JEFF N° 84
JEFF N° 82
SMRB N° 11
JEFF N° 87
JEFF N° 85
KC 1
LOCATION MAP
DIAMOND DRILL HOLE 97
Scale 1:10,000
0
500 METERS


128° 30'
128° 15'
58° 15'
M 1041/1W
JEFF GROUP
S.VEA 448 (7)
ANDREA 444 (7)
CGL 1 560(6)
STU 443 (7)
CGL 2 561 (6)
KUTCHO 1 99 (3)
KUTCHO 2 100(3)
(FOR PLACER SEE P 1041/1W)
Kutcho
PY 66 1909(5)
MC 5 483 (9)
MC 4 482 (9)
MOE 1 7 (5)
BC. 5434
276
248
278
246
JEFF GROUP
Scale 1 : 50,000
0 1000 2000
METERS

DIAMOND DRILLING

The three wedge branches described in this report intersect in whole or in part the stratigraphy as described in the geology sections. The massive sulfide stratigraphic horizon was intersected by all three wedge branches although sulfide content was marginal.

The detailed drill logs with all assays are in the Appendix.

The diamond drilling took place during the interval July 6 to August 1, 1981, during which time 841.53 meters of BQ core were recovered from three wedges including 97B3 - 246.57 m, 97B4 - 291.69 m, 97B5 - 303.27 m. The previously drilled #97 drill hole was used as a pilot from which B3, B4, and B5 wedges were drilled.

GEOLOGY

The Kutcho Creek massive sulfide deposit occurs in a sequence of volcanic rocks ranging in composition from basalt to soda rhyolite. These rocks are believed to be of Triassic age or older. The rocks have been foliated, folded and metamorphosed to lower green schist facies.

The following is a description of the lithologic units encountered in the three wedge branches drilled in 1981.

Basic Unit:

Basaltic to andesitic flows and tuffs were intersected initially by all three wedge branches. The basic unit rocks include massive basalt, basic schists, amphibolitic flows, amphibolitic flows with plagioclase phenocrysts, plagioclase porphyries and plagioclase porphyries with minor quartz phenocrysts. Variations from massive, amphibolitic units to plagioclase porphyries are the most common rocks in the basic unit.

The basic rocks are commonly weakly foliated and contain chlorite, epidote-clinoziosite and biotite.

Tuff-Argillite Unit:

This unit consists mainly of tuffs and slightly argillaceous tuffs metamorphosed to quartz-chlorite-sericite-biotite schists. Fine laminations, graded bedding and quartz phenocrysts are unaffected by the development of foliation.

A black, calcareous, graphitic argillite commonly occurs a few meters above the base of the unit. Minor disseminated pyrrhotite and pyrite are present throughout the tuff-argillite unit.

Quartz Feldspar Crystal Tuff (QFCT)

The QFCT unit is graded and tuffaceous at the top but could represent a flow assemblage.

Two main phases occur in the QFCT. The most abundant phase is a very homogeneous quartz-feldspar-sericite-chlorite schist with abundant quartz phenocrysts, commonly up to 1 cm, and fewer plagioclase phenocrysts. The rock has a distinctive porphyritic or crystal tuff texture and is variably sericitic or chloritic. Immediately above the ore zone it is intensely sericitized.

A coarse breccia phase occurs in the middle to upper part of the unit. It contains small to 1 m fragments texturally identical to the matrix and minor fine-grained chloritic fragments. The breccia phase is commonly heavily altered to epidote-clinozoisite.

Lapilli Crystal Tuff (LCT)

This unit consists of quartz, sericite and carbonate schists. It has a relict fragmental texture and minor, large quartz phenocrysts. Colors vary from white to a distinct grey. A transitional contact is assumed between this unit and the underlying lapilli tuff.

Massive Sulfide Horizon

Mineralization consisting of chalcopyrite, sphalerite and pyrite occur near the top of the lapilli tuff unit. Sulfides occur generally as thin elongate whisps conformable with the schistosity and to a lesser extent as both larger and smaller isolated blebs.

Disseminated and thinly banded pyrite with minor base metal content occurs in the sericite schists below the main mineralized zone.

Lapilli Tuff (LT)

This is the footwall unit which consists of lustrous, white to medium green, quartz, sericite, carbonate schists. These schists are further distinguished by closely packed, 5 to 15 mm thick elongate fragments of mosaic quartz with minor plagioclase and rare, fine quartz phenocrysts. Fragment abundance is highly variable and the fragmental texture is commonly difficult to detect because of the penetrative foliations.

COST STATEMENT - KUTCHO (1981)

Assay Costs:	11 samples @ $40.75 (samples run for Cu,Pb,Zn, Au, Ag)	$ 448.25
Survey Instrument:	rental one month @ 1400/mo. (Sperry Sun)	1,400.00
Core Boxes:	115 required @ $5/each	575.00
Geologist:	$120/day for 27 days	3,240.00
Assistant:	$79/day for 27 days	2,133.00
Room & Board	7 men @ $28/day for 27 days	5,292.00
Other Camp Costs:	Cook's salary	2,300.00
Helicopter:	$365/hr X 48 hrs.(contract 206B)	17,520.00
	fuel 48 hrs.x23 gal/hrx$4/gal	4,416.00
	A-star : 1.7 hrs. plus fuel	1,017.79
Diesel fuel:	200 gallons @ $1.68	1,512.00
Kutwell:	4 drums @ $207/drum	828.00
Labour Costs:	155 hrs. @ $24/hr	3,720.00
Drilling Costs:	3 wedge holes refer to attached sheet	52,820.00
Mobilization/demob:	$3500 per	7,000.00
TOTAL APPLICABLE COSTS		$ 104,222.04

Drilling Costs: (Detailed)

97B3 :	1209 - 2015 BQ	806' drilled	
	1209 - 1500 = 291	x 18.25 =	$ 5,310.75
	1500 - 2000 = 500	x 18.75 =	9,375.00
	2000 - 2015 = 15	x 19.25 =	288.75
	plus 1 wedge	=	550.00
		sub Total	15,524.50
97B4 :	1098 - 2055 BQ	957' drilled	
	1098 - 1500 = 402	x 18.25 =	7,336.50
	1500 - 2000 = 500	x 18.75 =	9,375.00
	2000 - 2055 = 55	x 19.25 =	1,058.75
	plus 1 wedge	=	550.00
		sub Total	18,320.25
97B5 :	1022 - 2017 BQ	995' drilled	
	1022 - 1500 = 478	x 18.25 =	8,723.50
	1500 - 2000 = 500	x 18.75 =	9,375.00
	2000 - 2017 = 17	x 19.25 =	327.25
	plus 1 wedge	=	550.00
		sub Total	18,975.75
		TOTAL COST	$ 52,820.50

STATEMENT OF QUALIFICATIONS

I, Walter D. Melnyk of North Vancouver, British Columbia hereby certify the following qualifications:

I obtained a B.Sc. (Eng.) in 1972 in Geological Engineering from the University of Saskatchewan, Saskatoon.

I am a registered member of the Association of Professional Engineers in the provinces of British Columbia and Ontario.

I have been practising my profession as a geologist in Canada for the past ten years.

Walter D. Melnyk
Esso Resources Canada Limited

SCHEDULE "A"

BID SHEET AND JOB SPECIFICATIONS

1. DESCRIPTION OF WORK:

The work is to consist of a series of drill holes, drilled at locations specified by the Company. A total minimum footage of 3,000 feet shall be drilled, but total footage may be extended by mutual consent. Maximum depth of any hole shall not exceed 2,500 feet and minimum depth shall be 800 feet. The Contractor will not be called upon to drill any hole at a flatter angle than 45' degrees. Measurement of all holes shall be taken from the top of the casing pipe. If holes of a greater depth than 2,500 feet are desired, such drilling shall be performed only upon such conditions and at such rates as may be agreed upon before commencement of such drilling.

2. SCHEDULE OF RATES:

The company agrees to pay the Contractor for footage drilled and other services performed as follows:

(a) Coring in Bedrock

Depth Intervals	B Q Size	Size
0 - 500 ft.	$ 17.25 /Ft.	$ _____ /Ft.
500 - 1000 ft.	$ 17.75 /Ft	$ _____ /Ft.
1000-1500 ft.	$ 18.25 /Ft	$ _____ /Ft.
1500-2000 ft.	$ 18.75 /Ft	$ _____ /Ft.
2000-2500 ft.	$ 19.25 /Ft	$ _____ /Ft.

(b) Casing of Overburden

Depth Interval	
0 - 50 ft.	$ 17.25 /Ft.
50-100 ft.	$ _____ /Ft.

(c) The following services will be provided on an operating Field Cost basis:

1. Casing of overburden over 50 feet.
2. Reaming and setting casing for borehole reduction, borehole stabilization, and control of return water.

3. Drilling caved or broken ground.
4. All cementing operations, excluding setting time but including drilling of set cement.
5. Supplying water to the drill when water supply over 2000 feet lateral and/or 300 feet vertical lift from borehole collar under non-freezing conditions and all costs under freezing conditions.
6. Recovering pipe and/or casing at the Company's request.
7. Hole orientation tests.
8. Setting of wedges, at the Company's request, for the purpose of directional drilling.

Where operating Field Costs are defined as:

Operating Field Costs

Labour (including Supervision) $24.00 per man hour.

Tractor n/a per hour.

Water Truck (excluding driver) n/a per hour.

Equipment

Drills	Type	Operating Hourly Rate
1	Longyear S38	$12.00

Pumps	Type	Operating Hourly Rate
n/a		

Other	Type	Operating Hourly Rate

While operating on a Field Cost basis, supplies consumed or damaged beyond use, including diamond articles, mud ingredients, cement, rods, core barrels, etc. shall be for the Company's account at site replacement value plus 10 %. However, if due to Contractor negligence, or through poor drilling practices, equipment is damaged or lost and hole is not completed, then these costs shall be for the Contractor's account.

(d) The Following services would be provided on a non-operating Field Cost Basis:

1. Setting time for cement.
2. Delays caused by the Company.

Where non-operating Field Costs are defined as:

Non-Operating Field Costs

Labour (Including supervision) $24.00 per man hour;
Drill, pumps and service vehicle n/a per drill hour.
Tractor - operating n/a per hour.
Tractor - non-operating n/a per hour.

(e) Travelling Time

The Company agrees to pay for travelling time from Campsite to drill site and return per shift on the following basis:

Labour $22.00 per hour after ½ hour per man.
Vehicle n/a per day

(f) Mobilization and Between Hole Moves

Mobilization and demobilization of crew and equipment to and from Kutcho Creek strip and will charge company $3500. for same. Moves between holes will be at non operating Field Cost.

(g) Room and board for Contractor's personnel will be provided by Company.

Contractor will provide meals and accomodations for up to n/a of the Company's representatives at a price of n/a per day.

Room and board will be provided by the Company to Contractor at NO COST per man day.

(h) Core boxes, including lids, will be provided by The Company.
Contractor's rates for core boxes on site shall be $_____?

(i) Core splitter to be supplied by n/a.
Contractor to supply core splittter at n/a per _____.

(j) Standby Rental

It is agreed that, at the completion of the present active drilling program, the Company may retain the Contractor's drilling equipment at the drill area for a rental rate of _____ per _____ per drilling unit. The standby rental charge will cease to apply upon commencement of continuous drilling program, or on the giving of written notice to the Contractor by the Company that the drilling equipment is no longer required.

(k) Fuel, gas, oil and propane for drills, pumps, heaters and camp will be supplied by The Company at no cost to The Contractor.

(l) The Contractor will mobilize and demobilize his drill and supplies to and from Kutcho Creek Strip and will charge $3500. for same.

(m) Delays caused by lack of transportation will be charged to the Company at Non-Operating Field Cost.

(n) Special Agreements.

1. The Company will pay for all wedging assemblies and special core barrels and shells required for wedging and/or controlled drilling.
2. The Contractor agrees to supply complete wedging assemblies and to wedge holes at Field Cost under the supervision of the Company's project engineer. It is further agreed that if trouble arises which is traceable to a wedge, the cost of clearing the hole to allow drilling to proceed will be charged to the Company.
3. The cost of pulling rods under controlled drilling over and above that normally required will be charged to the Company at Field Cost.

E1

ESSO RESOURCES CANADA LIMITED

ESSO MINERALS CANADA

DRILL LOG

PROJECT: Kutcho Creek (2122)	GROUND ELEV.: ~ 1446m
HOLE NO.: DDH 97 B3	BEARING:
LOCATION: 35156E 23469N — WEDGED OFF OF 97 AT 1206' (367.6m)	DIP:
	TOTAL LENGTH: 2015' (614.17m)
LOGGED BY: W. Melnyk	HORIZONTAL PROJECT: 122.17m (Wedge)
DATE: July 19, 1981	VERTICAL PROJECT: 200.4m (Wedge)
CONTRACTOR: ARCTIC DIAMOND DRILLING	**ALTERATION SCALE**
CORE SIZE: BQ	0 1 2 3 — absent; slight; moderate; intense
DATE STARTED: July 14, 1981	**TOTAL SULPHIDE SCALE**
DATE COMPLETED: July 19, 1981	0 1 2 3 4 — traces only; < 1%; 1% – 3%; 3% – 10%; > 10%

DIP TESTS

1263	79.5°	154°
1349	78.0°	154°
1509	66.5°	165°
1609	57.5°	163°
1709	50.5°	170°
1789	45.0°	168°
1929	36.5°	172°
2005	31.0°	175°

COMMENTS

LEGEND

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
				367.6 - 375.8 1206 - 1232.8' : FELDSPAR PORPHYRY (Porphyritic Andesite) Dark green, coarse grained, containing partially resorbed white phenos of feldspar to 8mm. Matrix consists of fine grained amphibole and chlorite. Unit is distinctly massive with only minor carbonate veining							
1220				Also called Meta gabbro							
			b/30°	375.8 - 377.5 1232.8 - 1238.5 : INTERMEDIATE TUFF Fine grained grey siliceous rock characterized by 10% white 1mm feldspar crystals. Weak remnant bedding. No veining							
1240				377.5 - 380.0 1238.5 - 1247.0 : INTERMEDIATE FLOW							
		g.v./25		light greenish beige color, coarse grained with qtz. crystals to 5mm Massive, development of clay minerals along foliation planes Mafic content low.							
				380.0 - 399.0 1247.0 - 1309.0 : MAFIC to INTERM TUFF light green in color fine - coarse grained containing darker bands of tuffaceous material. Banding is locally well developed. locally have coarse tuffaceous fragments to 2mm. Veining is minimal. clots of coarse material are present with angular fragments to 1cm							
1260				387.1 - 399.0 1270.0 - 1309.0 : Rhythmic banding is much more prevalent in this section and rock is a consistent light green color							
1280			b/30°	392.9 - 394.7 1289.0 - 1295.0 : Rock is badly							

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS			
1% disseminated pyrite									

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
				broken up, fracture direction is parallel with core axis.							
1300				396.8-399.0 1302.0-1309.0: Rock is badly fractured parallel with core axis, clay material present. Graphitic material present in section							
				399.0-400.7 1309.0-1314.7: Quartz-carbonate vein containing pieces of argillite. Unit is badly shattered with Py near argillic pieces.							
				400.7-459.5 1314.7-1507.6: TUFF-ARGILLITE							
1320				400.7-404.2 1314.7-1326.0: Section is shattered. Carbonate material extends to 1319.0' large amount							
			b/35	of angular argillite frags. cemented by carbonate.							
				404.2-412.7 1314.7-1354.0: Predominantly tuffaceous material with 15% black banded Arg. Tuffaceous material is generally fine grained to aphanitic locally containing fragments to 2mm. Rock is a							
			b/25	light green color. Unit is well bedded with alternating grey-black bands of argillitic material. Veining is rare. fracturing is minimal and conformable with bedding.							
1340			b/30								
			b/33								
	c/25			411.0-412.1 1348.4-1352.0: lapilli tuff with fragments to 3mm. Unit is variable green							
	c/30		b/25	2cm frags are light color of same comp. More altd contain qtz 'eyes' 5-7mm rounded.							
			b/30	412.7-441.8 1354.0-1449.4: this section darker then previous about 30-40% argillite, well bedded in part pyritic. Odd carbonate veinlet parallel with bedding							
1360			b/10	Rhythmic banding .3-5cm. Tuffs are light green fine grained occasionally contain fragments to 4mm.							
			b/32								
			b/30								
1380			b/30								

PAGE 4 OF 19	PROJECT: 2122	HOLE NO. 97-83

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS			
2-4% pyrite disseminated									
1-2% Disseminated pyrite									

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
			b/30								
			b/33	426.3 1398.7' : two carb veinlets x-cutting bedding at 20° W.C.A							
1400			b/25								
			b/32								
1420			b/35								
			b/50								
1440			b/50	439.7-441.8 1442.6-1449.4' : Coarse grained lapilli tuff. frags chloritized, near bottom larger frags. chaotic jumble.							
			b/40	441.8-451.3 1449.4-1480.7 : Argillite thinly bedded, black with thin carbonate whisps. carbonate veinlets x-cutting bedding.							
1460			b/50								
			b/17								

PAGE 6 OF 19	PROJECT: 2122	HOLE NO. 87-33

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
3-5% pyrite										

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.
		53°/wb v	b/10								
			b/50	451.3 - 459.5 1480.7 - 1507.6 Predominantly Int - matic tuff - argillite content drops off. Well bedded tuffaceous material, buff color to 1487 then changes to pale green color to 1507.6'. odd white fragments to 2mm. pick up to 5mm toward bottom of section							
1480			b/50								
1500			b/55								
		C/80°		459.5 - 532.0 1507.6 - 1942.4: QFCT Mottled QFCT quartz fragments to .5 to 1 cm constitute 20% of rock, bluish, rounded. Groundmass matted chloritic feldspathic material.							
				459.5 - 463.1 1507.6 - 1519.2: chloritic, hematitic QFCT, crudely banded, dark green color with reddish hematitic tinge, massive							
1520		9.1 m/30°		463.1 - 469.0 1519.2 - 1538.7: Well bleached section = white.							
				467.4 - 468.5 1533.4 - 1537.0: Drilling down cavity infilled with coarse carbonate crystals.							
				469.0 - 476.1 1538.7 - 1562.0: Chloritic hematitic QFCT, hematite drops off to 1562 and epidote content increases, overlap of two alt'n features.							
1540											
1560											

PAGE 8 OF 19	PROJECT: 2122	HOLE NO. 87-23

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS			
		FROM	TO	WIDTH					

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.
				476.1 - 495.8 1562.0 - 1626.5' : Unit is a mixture of dark green chloritic material with light yellowish-green epidote alt'n. Very minor hematite. Epidote occurs as blotchs to 5cm wide locally.							
1580											
1600											
1620											
	9.V/50			494.4 1622.0 : Quartz-carb vein 1.5cm wide at 50° W.C.A.							
				495.8 - 511.8 1626.5 - 1679.0 : Reddish staining due to hematite content. epidote content increases with depth.							
	9.V/35			Overall texture of rock is same. Quartz eye content and size vary locally.							
				497.1 - 499.3 1631.0 - 1638.1 : Bleached section.							
1640											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
1660											
		g.v./20°		508.4 1668.0 : Quartz vein chloritic margins 1cm							
		g.v./30°		510.7 1675.5 : Quartz vein 7mm							
1680				511.8 - 560.8 1679.0 - 1839.9' Homogeneous section - chloritized, 10-15% qtz eyes bluish 2-8mm set in finer matrix of darker green chlorite and fine grained feldspar. feldspar grains are in order of 1-2mm, white altd. Minor veining							
		g.v./25		516.9 1696.0 : Qtz-carb vein 4cm							
1700				511.8 - 522.4 1679.0 - 1714.0 Section contains 'bleached' fragments to 5cm in diameter. Inclusions constitute 10-15%.							
1720											
		g.v./35		530.0 1738.9' : Qtz-Fdl vein 5cm							
1740											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

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DUKSBAK WATERPROOF

PROJECT: 2122

HOLE NO. 97-83

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
		9.V./10		530.7 1741.0 : Qtz vein 7mm chloritic borders							
1760				536.7 - 555.1 1760.7 - 1821.2 Encounter bleached fragments again, clusters & feldspar grains, generally 2-4 cm in size with jagged outline							
1780											
1800											
1820				555.1 - 563.0 1821.2 - 1847.1 : Hematitic section, rock is distinctly reddish-brown - chlorite drops off. Matrix is peppered with specks of chlorite.							

PAGE 14 OF 19	PROJECT: 2122	HOLE NO. 37-83

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

 PROJECT: 2122 HOLE NO. 97-23

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
1840											
				563.0 - 568.2 1847.1 - 1864.1 ; Bleached section, weakly sericitic. Rock consists of qtz, feldspar + sericite., some carbonate.							
1860				568.2 - 575.9 1864.1 - 1889.5 ; Rock is variably brown in color due to hematite content. Odd short intervals rich in epidote. Very crudely banded at 50° w.c.a.							
1880				575.9 - 584.4 1889.5 - 1917.2 ; Sericitic section. Rock is white to pale green and contains more silica than previous sections. feldspars are not distinguishable - rock is well dusted with pyrite							
1900											
1920				584.4 - 590.8 1917.2 - 1938.2 ; Unit is weakly to moderately hematitic							

PAGE 16 OF 19	PROJECT: 2122	HOLE NO. 97-B3

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
Disseminated py 1%										

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DUKSBAK WATERPROOF

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
				with final 5' and initial 1.1' showing typical reddish hematitic color. Most Section is dirty green color. Sericitic alt'n is weak, Better than 97 B2. Final 5' are well sericitized. Several patches of recrystallized pyrite.							
				590.8 - 592.0 1938.2 - 1942.4 : Intense sericitic alteration - Rock is white, schistose, predominantly							
1940			C 80°	qtz, sericite, clay minerals.							
				592.0 - 593.6 1942.4 - 1947.5 : LAPILLI CRYSTAL TUFF : Greyish-white in color, irregularly banded containing odd scattered qtz crystals 1-2mm in diameter. Section is							
				sericitic and contains elongate lapilli to 3cm long.							
				593.6 - 594.0 1947.5 - 1949.0 : Gouge, clay material.							
				594.0 - 614.2 1949.0 - 2015.0 : LAPILLI TUFF Very fine grained greyish-white unit							
1960				containing white fragments 1-2mm in size as well as elongate rhyolitic elongate lapilli 2-3 cm long up to 1 cm wide. Unit is variably mineralized with cpy, py and sphalerite generally as conformable whisps.							
				602.6 - 605.6 1977 - 1987 : Mislatch or ground core, only 2 feet recovered							
1980				605.6 - 610.1 1987 - 2001.6 : Rock is schistose, sheared resulting in clayey material and difficult recovery. Only remnants of rhyolitic fragments (lapilli) remain.							
2000				610.1 - 614.2 2001.6 - 2015 : Core recovers some of it's competancy and schistosity, sulfides drop off somewhat.							

 PROJECT: 2122 HOLE NO. 37-83

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS Cu %	Pb %	Zn %	Ag	Au
Disseminated py 3-5%										
1949.0 - 1952.9' : Predominantly banded py, trace cpy, 5-7% py.		1949.0	1953.0	4.0'	2501	0.114	0.01	1.10	0.09	0.002
1952.9 - 1964.4' : Reasonable sulfides. Pyrite, cpy, sph increase significantly. Pyrite 15-20%, cpy ~ 1%, sph 4%		1953.0	1959.0	6.0'	2502	0.270	0.03	4.26	0.31	0.009
Sulfides are banded and conformable with tuffaceous nature of rock.		1959.0	1964.5	5.5'	2503	0.655	0.04	5.62	0.87	0.010
1964.4 - 1968.2' : Sulfides drop off, trace cpy, sphal (?), pyrite to 10%		1964.5	1968.5	4.0'	2504	0.093	0.01	1.37	0.11	0.001
1968.2 - 1976.1' : Sulfides increase again cpy 1.5%, sphal 4-6%, pyrite 20-25% Sulfides are bedded, traces of dark sphalerite		1968.5	1976.5	8.0'	2505	0.965	0.07	1.36	0.48	0.004
1976.1 - 2015 : Sulfides drop off ~ 10% py, trace cpy, Zn(?)										
		1987.0	1992.0	5.0'	2506	0.040	0.02	0.47	0.07	0.001
		1992.0	1997.0	5.0	2507	0.052	0.03	0.44	0.06	0.002
		1997.0	2002.0	5.0'	2508	0.104	0.03	0.86	0.10	0.001

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PAGE 19 OF 19 | PROJECT: | HOLE NO.

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.
2020				614.2 2015 END OF HOLE							

E1

ESSO RESOURCES CANADA LIMITED

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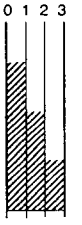
DRILL LOG

PROJECT: Kutcho (2122)	GROUND ELEV.: ~1446 m
HOLE NO.: DDH 97 BH	BEARING:
LOCATION: 25156E WEDGED OFF OF 97 at 1093' (334.67m); 23469N	DIP:
	TOTAL LENGTH: 2055' (626.36m)
LOGGED BY: [illegible]	HORIZONTAL PROJECT: 102.0 m (wedge)
DATE: July 30, 1981	VERTICAL PROJECT: 218.3 m (wedge)
CONTRACTOR: ARCTIC DIAMOND DRILLING	
CORE SIZE: BQ	
DATE STARTED: July 20, 1981	
DATE COMPLETED: July 25, 1981	

ALTERATION SCALE



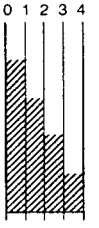
absent

slight

moderate

intense

TOTAL SULPHIDE SCALE



traces only

< 1%

1% – 3%

3% – 10%

> 10%

DIP TESTS

1149'	73°	161°
1239'	75°	157°
1379'	66°	168°
1509'	57°	169°
1619'	49°	170°
1699'	43.5°	170°
1889'	42.5°	174°
1978'	27°	179°
2047'	25°	183°

COMMENTS

LEGEND

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 1 OF 22	PROJECT: 2122	HOLE NO. 97 ?.4

DEPTH (ft)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
1100			b/30	1102-1160 [illegible] 335.9-353.6 Medium gr[illegible], [illegible] intermediate. Grain size varies from [illegible] [illegible]. Small amount of carbonate. Bed[illegible] [illegible] becomes [illegible] with depth and							
1110				silica seems to increase. Quartz veins of aprox. .5mm in thin. Some bleached bands. Mafic [illegible], [illegible] with depth. The [illegible] structure [illegible] seen: - [illegible]							
1120			b/40	- load casting - cross beading - soft sediment deformation							
1130		50	b/65	1138 (346.9) Quartz - carbonate vein							
1140				1146 (349.3) Vugs containing quartz crystals 1150 (350.5) Quartz - [illegible] chlorite vein							
1150											
1160		65		1160-1209 Mafic flow 353.6 - 368.5 Dark green. Fine grain with phenocrysts of 1165 (355.1) feldspar scattered [illegible]. Phenocrysts concentrated in [illegible] up to 70% of the total [illegible]. Mean size about .25 to .5cm with							
1170				some large [illegible] up to .75cm. Some phenocrysts have [illegible] [illegible] alteration [illegible]. Hornblende laths can be found through out the [illegible] about 1 or 2 mm in size. 1165: Vein 25-30cm thick containing							
1180				1182 (360.3) quartz, [illegible] and a light [illegible] [illegible] porphyritic. 1182: Contact between phases. Contact quite irregular with [illegible]. Some [illegible] [illegible]/phenocrysts of							
1190				[illegible] and/or [illegible]							

PAGE 2 OF 22	PROJECT: 2122	HOLE NO. 87 24

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 3 OF 22	PROJECT: 2122	HOLE NO. 97 E4

DEPTH (ft)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.	
1190												
1200												
				1209–1237 [illegible] flow (368.5 - 377.3) Grey background with white [illegible] zoned phenocrysts. Zoning can be quite well developed.								
1210												
1220												
1230												
				237–1240 Tuff: bedded, medium grey slightly greenish. (377.3 - 378.0) Some sorting, some carbonate.								
1240				1240–1248 Flow (?) Mafic medium grey with a few (378.0 - 380.4) white phenocrysts. Lower part shows many green augite/hornblende laths oriented. Some quartz "eyes".								
1250				1248–1255 Tuff: bedded medium to dark greyish-green (380.4 - 382.5) Some grading, some carbonate.								
				1255–1265 Flow (?) Contains augite, hornblende and (382.5 - 386.5) feldspar phenocrysts. Some interbedded tuffs.								
1260												
1270				1268–1446 TUFF - ARGILLITE UNIT								
				386.5 – 440.7 Medium green to medium/dark grey. 1268-1327: Tuff with dark bands of argillaceous material								
1280												

PAGE 4 OF 22	PROJECT: 2122	HOLE NO. 2714

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 5 OF 22 | PROJECT: 2122 | HOLE NO. 97B4

DEPTH (ft)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
1290											
1300											
1310											
1320				404.5 - 405.7 1327 - 1331: Coarse material, little or no bedding.							
1330				405.7 - 413.6 1331 - 1357: Interbedded argillite in tuff with occasional thin beds of coarse material							
1340											
1350				412.1 - 413.6 1352 - 1357: lack of bedding in tuff. Material is fairly coarse grain with white and green fragments in a greyish green matrix.							
1360				~1360 414.5 Change in composition from 75% tuff to 75% argillite. Argillite contains more quartz veins than the tuff.							
1370											

PAGE 6 OF 22	PROJECT: 2122	HOLE NO. 87-64

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PROJECT: 2122

HOLE NO. 97 64-

DEPTH (ft)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION		ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ	
1370													
1380													
1390		0		1393 (424.6)	Vug, 8cm contains quartz and pyrite crystals								
1400													
1410				1410-1412 429.8 - 430.4	Carbonate vein of unknown thickness, contact along axis of core. Pyrite.								
1420													
1430													
1440				440.7 - 578.8	1446 - 1899 QFCT								
				quartz + carbonate vein	1446-1452: QFCT with a combination of hematitic								
1450				chlorite band	epidotic, and chloritic alteration. Quartz eyes ≤.25cm. Bedding or layering present.								
				442.6 - 445.3	1452-1461: Strong hematitic alteration resulting in a rusty red colour. Quartz eyes larger ~.5cm with bluish tinge possibly due to zoisite								
1460					inclusions in the quartz.								

PAGE 3 OF 22	PROJECT: 2122	HOLE NO. 87 84

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANAD
DUKSBAK WATERPROOF

PAGE 9 OF 22	PROJECT: 2122	HOLE NO. 97 84

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION		ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1460				445.3-453.5	1461-1488: Very light coloured, or ... bleached. Quite a large number of quartz eyes. Slight green ch... tinge left from chlorite alteration. Sharp, well defined contacts at either end.							
1470												
1480				453.5-462.1	1488-1516: Mixture of light and dark sections in green. Blue tinged quartz eyes. Hematite is laced throughout the rock giving a rusty red coloration. Usually also chlorite, but occasionally epidote becomes the predominate alteration. 1488, 1499: predominate hematite bands.							
1490												
1500					epidote band							
					epidote band							
1510					hematite band at contact							
				462.1-463.9	1516-1522: Bleached white, little chlorite or epidote and essentially no hematite, except in a 20cm band at 1521. Sharp contacts.							
1520				463.9-474.3	1522-1556: Grey coloured, Little hematite alteration. Epidote in green patches throughout is the predominate alteration.							
				463.9	1522: band containing hematite 20cm							
1530				464.8	1525: band of hematite in epidote 10cm							
				467.3	1533: band of bleached rock 10cm							
				1537-1538 468.5-468.8	bleached and filled with disseminated epidote.							
1540												
1550												

PAGE 10 OF 22	PROJECT: 2122	HOLE NO. 87 84-

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PROJECT: 2122

HOLE NO. 97 C4

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
1550											
				473.7 1554: band of epidote 5cm							
				474.3 - 474.9 1556-1558: Hematite present. Grey background							
1560				474.9 - 482.5 1558- [illegible]: Grey rock with white hematite or chlorite but some patches of epidote. Epidote throughout as small dots.							
1570											
1580											
				482.5 - 489.8 1583-1607: Hematite and Epidote in grey rock. Varying in preominance but both always visible.							
				482.8 1584: carbonate vein							
1590											
1600											
				489.8 - 495.0 1607-1624: rock becomes darker green with chlorite and hematite being the predominate alterations. Some epidote present in places.							
1610				491.3 1612: Quartz-carbonate vein							
1620											
				495.0 - 497.4 1624-1632: light grey rock with slightly greenish tinge in places. Contains a number of carbonate veins, to 2cm. Largest is vuggy and contains carbonate crystals at 1629.							
1630											
				497.4 - 503.5 1632-1652: Very light cream coloured matrix. Mostly chlorite with some hematite as alteration.							
				498.6 1636: vuggy carbonate vein 2cm thick							
1640											

PAGE 12 OF 22	PROJECT: 2122	HOLE NO. 3764

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 13 OF 22 | PROJECT: 2122 | HOLE NO. 97 84

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1640											
		O		501.1 epidote patch							
1650				503.5 - 510.2 1652-1674: Chlorite content increases and carries darker colour							
1660											
1670				1670-1672 Bleached, slight green from epidote. Many quartz eyes.							
				(509.0 - 509.6) Hematite, epidote band 40cm.							
				(510.2 - 513.9) 1674-1686 Hematite, chlorite and epidote always present in varying proportions.							
				511.8 1679: bleached dark cream [illegible] 15cm.							
1680				quartz vein 2cm.							
				512.7 1682: quartz blob of unknown size.							
				513.9 - 575.2 1686-1887: A very homogeneous section showing little variation in texture, colour or composition. Chlorite vs. Epidote content is							
1690				used to distinguish sections.							
				513.9 - 515.1 1686-1690: chlorite >> epidote. Fairly intense quartz veining. Attitude and width of veins unknown due to overlap.							
1700				515.1 - 544.7 1690-1787: Medium greenish green from chlorite							
				alteration with specks of epidote through out. chlorite > epidote							
1710											
1720											
1730											

PAGE 14 OF 22 | PROJECT: 2122 | HOLE NO. 97 84

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS			

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 15 OF 12 | PROJECT: 2122 | HOLE NO. 97-64

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
1730											
1740											
1750											
1760											
1770											
1780											
1790				544.7 - 554.7 1787 - 1820: Slightly lighter in colour. Mafic quartz eyes. Epidote & chlorite							
1800											
1810											
1820											

PAGE 11o OF 22 | PROJECT: 2122 | HOLE NO. 77 04

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				

R. D. PENHALL LTD., MADE IN VANCOUVER, CANA
DUKSBAK WATERPROOF

PAGE 17 OF 22 | PROJECT: 2122 | HOLE NO. 97P.4

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION		ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ.
1820				554.7 - 563.9	1820-1850: lighter green [illegible] due to increased proportion of epidote. [illegible] // chloride.							
				563.3	Carbonate vein							
				563.9 - 572,0	1850-1877: gen[illegible] lighter in colour. Medium [illegible] light grey. [illegible]							
				568.1	Chloritized band 6cm							
				569.4	Chloritized band 15cm							
				571.5	Carbonate veins							
				572.1 - 573.9	1877-1883: increase in fragments all of which are chloritized.							
					finely bedded tuff band of about 15cm							
				573.9 - 578.8	1883-1899: Much darker, dark green with high mafic content. Becomes lighter in last couple of feet. ≥10% in quartz eyes ([illegible] to 15%)							
				1899-1901 (578.8 - 579.4)	LCT: medium grey with apple green lines from sericitization. Some quartz. Very soft.							
				1901-2055 (579.4 - 626.4)	LT							
					1901-1907 light green, highly sericitized							
					1907-1908 clay seam, light grey, contains fragments							
					1908-1914 light green to light grey, much sericitization.							

PAGE 18 OF 22	PROJECT: 2122	HOLE NO. 87 84

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
201-207 ~5% pyrrhotite										
1058-1911 ~5% pyrite										

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PAGE 19 OF 22 | PROJECT: 2122 | HOLE NO. 97 C4

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
1910				583.4 - 586.1 1914-1923: mostly bleached to dark cream, light grey in small patches.							
				584.3 band of pyrite 15cm							
1920				584.9 band of pyrite 10cm							
				586.1 - 597.7 1923-1961: Medium grey. No large blebs of quartz							
1930											
1940											
1950											
1960				597.7 - 608.1 1961-1995: Medium grey. Contains fair amount of quartz and siliceous material							
1970											
1980											
				606.2 - 606.9 1989-1991: highly sericitized.							
1990				608.1 - 620.0 1995-2034: Medium grey. Quartz blobs with squashed layered look							
2000											

PAGE 20 OF 22	PROJECT: 2122	HOLE NO. 97 84

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS Cu %	Pb %	Zn %	Ag	Au
1914-1917 5% pyrite										
1917 - 15cm 50% pyrite										
1919 - 10cm 80% pyrite										
1923 - 1945 Lower sulphides 1-2%										
1945-1961 8% pyrite varying locally from 5% - 15%. Traces of sphalerite and chalco. < 1%		1945.5								
				10.5	2509	0.470	0.01	0.97	0.12	0.002
		1956.0								
				5.5	2510	0.224	0.01	0.04	0.07	0.001
1961-1992 1-2% pyrite.		1961.5								
1992-1995 7% pyrite very little chalco or sphalerite.		1992.5								
				16.0	2511	0.312	0.02	0.87	0.11	0.001

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DUKSBAK WATERPROOF

PAGE 21 OF 22	PROJECT: 2122	HOLE NO. 97 e 4

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
2000											
2010											
2020											
2030				620.0 - 621.5 2034 - 2039: Light green with many elongate green fragments							
				621.5 - 626.4 2039 - 2055: Light greenish grey. Many fragments							
2040											
2050				626.4 2055: End of hole							
2060											

PAGE 22 OF 22	PROJECT: 2122	HOLE NO. 97 B4

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
2002 3cm of 70% chalco										
2017 2cm of 50% chalco 20% pyrite										
2008 2cm of 70% pyrite Drop in sulphide content ahead here (2008)										
2015 2cm of 40% chalco										
2020 4cm of 25% chalco 25% pyrite										
2034-2039 2-3% pyrite										
Background of 4% pyrite										
2048 30% chalco 2cm 60% pyrite										

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE	OF	PROJECT:	HOLE NO.

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION					FRACTURE INTENSITY	% VEIN QTZ.	
					A	B	C	D	E			

E1

ESSO RESOURCES CANADA LIMITED

ESSO MINERALS CANADA

DRILL LOG

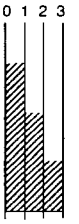
PROJECT: Kutcho (2122)	GROUND ELEV.: ~ 1446m
HOLE NO.: 97 - B5	BEARING:
LOCATION: 35156E, 23469N — WEDGED OFF OF 97 AT 1022' (311.51m)	DIP:
	TOTAL LENGTH: 2017' (614.78m)
LOGGED BY: W Melnyk, J. Harrop	HORIZONTAL PROJECT: 161.4m (Wedge)
DATE: July 23, 1981	VERTICAL PROJECT: 242.1m (Wedge)
CONTRACTOR: ARCTIC DIAMOND DRILLING	
CORE SIZE: BQ	
DATE STARTED: July 29, 1981	
DATE COMPLETED: July 29, 1981	

DIP TESTS

1199'	70.5°	163°
1369'	63.0°	175°
1459'	59.0°	171°
1557'	56.0°	173°
1649'	51.0°	167°
1769'	44.0°	170°
1869'	38.5°	173°
2009'	27.0°	176°

COMMENTS

ALTERATION SCALE



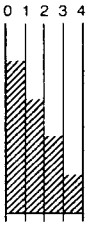
absent

slight

moderate

intense

TOTAL SULPHIDE SCALE



traces only

< 1%

1% – 3%

3% – 10%

> 10%

LEGEND

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PAGE 1 OF 23 | PROJECT: 2122 | HOLE NO. 97-E5

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.
				311.5 - 343.7 1022.0 - 1134.3' : MAFIC - INTERMEDIATE TUFF Predominantly very fine to fine grained tuff, uniformly medium green throughout. Bedding is very well exhibited - generally thinly							
		b/45°		laminated. Several sections are graded - coarser grained, but overall color and texture is remarkably uniform. Most common lapilli size is 1mm dia, white. Unit is chloritic.							
1040			q.v./15°	q.v. 1cm at 15° W.C.A							
		b/15°									
		b/45°	q.v./50°/20	quartz vein 5mm 50° W.C.A quartz vein 3cm 20° W.C.A. cross-cutting bedding							
1060		b/55°									
		b/56°		329.4 - 329.8 1080.8 - 1082.0': Coarse lapilli							
1080		b/45°		this section to 1cm dia white crudely bedded.							
		b/45°		1093.4 - 1094.4 : Coarse lapilli again largest to 5mm dia crudely banded at 45° W.C.A							
1100		b/50°		1098.2 - 1098.8 : Coarse white altd lapilli to 1cm elongate parallel with bedding.							

PAGE 2 OF 23	PROJECT: 2122	HOLE NO. 37 E5

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
		b/45°	9.V/30°	Quartz vein 7mm							
1120		b/60°		342.7 - 344.3 1124.3 - 1129.7' Coarse grained chloritized section with elongate fragments to 1cm long parallel with bedding. Also odd rounded qtz fragment to 6mm Dia							
			C/30°	344.3 - 345.7 1129.7' - 1134.3': fine to very fine grained green chloritic, bedded material. bottom contact chloritized. 1134.3 - 1258.8': MAFIC FLOWS (FELDSPAR PORPHYRY)							
1140				Distinct unit, mafic, chloritic, med - coarse grained rock, dark green or shades there off. Unit is of two varieties - containing chloritic clots replacing fragments at times to 1.5 cm in length, more often 4mm							
		b/40°	9.V./45° 4.V./80°	to 1cm. Unit may otherwise contain feldspar crystals to 6mm in size, white, rounded. Not many chloritic patches present in areas of crystalline feldspar. Overall texture of rock remains the same. Several spots of							
1160			9.V./45°	tuffaceous material are present. 351.3 - 352.7 1152.7' - 1157.0': Intermediate Tuff both contacts are irregular, top - 55° w.c.A. bottom - 60° w.c.A.							
			9.V./40°								
1180			C/35°	359.7 - 361.2 1180.2' - 1185.0': Intermediate -							
		b/35°	C/35°	Mafic Tuff. Dark grey to light brown, banded white fragments < 1mm. Both contacts 35° w.c.A. 360.2 1181.6' 9.V 1.5cm 80° w.c.A. 361.2 - 383.7 1185.0' - 1258.8': Mafic Flows Variable section color is light greenish-grey							
				to dark grey. Med. - coarse grained, with chloritic clots.							
1200											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS			
		FROM	TO	WIDTH					

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.
1220											
			g.v./40° g.v./55°	Final 15 feet of this unit, rock is light greenish-grey containing abundant 5mm - 10mm feldspar crystals with odd quartz eye up to 8mm. Mineral components are prominently lineated this section.							
1240				375.5 - 376.2 1232.0 - 1234.2: Int. Tuff, bedded at 10-15° w.c.A. contacts are similarly very shallow.							
1260				1258.8 - 1407.1: TUFF - ARGILLITE UNIT							
		b/50°		1258.8 - 1318.0': Fine to coarse grained, well bedded tuffs. light green with thin bands of grey very fine grained argillite material.							
		b/50°		Section contains no qtz-carb veining. Short portions are rhythmically banded. Some fragments reach up to 5cm. are either chloritized or appear as white							
1280		b/55°		carbonaceous patches or are siliceous and rounded. Unit is probably mafic, however does contain some silica rich sections.							

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS			
		FROM	TO	WIDTH					

R. D. PENHALL LTD., MADE IN VANCOUVER, CANA
DUKSBAK WATERPROOF

 PROJECT: 2122 HOLE NO. 97-85

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1300		b/50°									
		b/35°									
		b/55									
		b/15		401.7 - 423.1 1318.0 - 1388.0' : Mixed argillic - tuffaceous section. Tuff is still a green-grey color, but do have an increase in the amt. of argillite - 30-40%. Tuffs are again texturally variable.							
1320		b/50°									
		b/55°		405.0 - 405.4 1328.7 - 1330.1 : Argillite							
		b/50°		406.0 - 407.5 1332.0 - 1337.0' : Mainly argillite, with interbedded tuffaceous material.							
				407.9 - 409.5 1338.2 - 1343.6 : Coarse, light green lapilli tuff white carbonaceous angular fragments 5-8mm poorly sorted.							
1340				409.7 - 410.9 1344.0 - 1348.1 : thinly bedded argillite.							
		b/50°									
		b/40									
1360				416.0 - 420.2 1364.7 - 1378.5 : Well banded black argillic material. Bedding is at 45-50° W.C.A. Small elongate blebs of pyrite pyrrhotite in rock 2-3%							
		b/38°									
		b/40°		420.2 - 423.1 1378.5 - 1388.0' : light grey, beige felsic lapilli tuff odd elongate							
1380											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS			

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
				fragments. Characterized by elongate blebs of pyrite 5-8%. 1384.7 - 1385.3 : qtz vein both contacts 40° w.c a							
		b/60°		423.1 - 426.1 1388.0' - 1398.0' : predominantly graphitic argillic material. well bedded.							
1400				426.1 - 428.9 1398.0' - 1407.1' : Tuff. Beige							
		b/60°	C/65°	v. fine grained, thinly laminated with occasional 1-2 mm lapilli. 1407 - 1882 QFCT (428.9 - 573.6) 1407 - 1420 : absence of hematite and epidote.							
				Medium green with five stringers of yellowish grey material across the core, 10-15% ovoid quartz eyes.							
1420				432.8 - 446.8 1420 - 1486 : hematite and chlorite present. No epidote. Quartz eyes around 5%. Hematite pervasive in some short 20-30cm sections. Colour mostly red mixed in with dark green and grey. Lighter with depth							
				1430 - 1440 : many coloured bands resulting from bleaching and hematite, chlorite alteration.							
				433.4 1422 : Two bands, 2cm, of yellowish grey and							
				433.7 medium grey material.							
1440				1423 : number of bleached cream coloured veins							
				1446 (440.7) Quartz vein bordered by chlorite and pyrite unknown attitude. 15cm							
				1449 (441.7) 15cm band of chloritized tuff + pyrite.							
				1452 (442.6) 15cm band of the above.							
1460				446.8 - 458.7 1486 - 1505 : light to very light grey. 5% Quartz white feldspar fragments. Occasional band and/or fragments of fine grained darker coloured material.							

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

 PROJECT: 2122 HOLE NO. 97-05

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1470				448.7- 449.3 1472-1474: clay band containing coarse fragments							
1480											
1490											
1500				458.4 1504: hematite band 5cm 458.7- 462.7 1505-1518 Hematite chlorite and epidote present. Red and green on a grey background. 10% quartz eyes.							
1510				1512 (461.2) Epidotized fragment.							
1520				462.7 - 464.2 1518-1523: very light grey. 10-15% quartz eyes.							
				462.2 - 470.0 1523-1542: Chlorite main alteration with visible specks of epidote. Little hematite Light - medium greyish green. 10% or less quartz eyes. 1529 (466.0) Epidotized fragment.							
1530											
1540				470.0- 474.0 1542-1555: decrease in chlorite with increase in hematite and epidote giving way in the last bit to hematite. 1547 (471.5) Bleached band. 20cm							
1550				474.0 - 476.1 1555-1562 Very light grey with numerous white feldspar fragments. Quartz eyes <10% but with a fair bit of quartz veining throughout.							
1560				1560: clay band							

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1570				476.1 - 480.7 1562 - 1577 Strong rusty red colour. Several bleached bands. Hematite only alteration. 15+% Quartz eyes 1568 (477.9) bleached band 25cm 1570 (478.5) " " 2cm							
1580				1571 - 1573 " " 5 2-5cm 1574 (479.8) " " 40cm 480.7 - 493.2 1577 - 1618 Dark green on a light grey or yellowish grey background. No hematite or epidote visible.							
1590											
1600				488.9 1604: trace of hematite. 1618 - 1633: light grey with white feldspar fragments 10-15% Quartz eyes							
1610											
1620				1619 (493.5) hematite band 25cm 1620 (493.8) " " 10cm							
1630				1631 (497.1) " " 40cm 1633 (497.7) " " 20cm 1633 - 1641: Mixture of hematite, chlorite and epidote. Yellowish green streaks and specks in a red background.							
1640				1641 - 1651: Epidote and chlorite present with chlorite often predominate.							
1650											

 PROJECT: 2122 HOLE NO. 97-85

MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

N2/E2

R. D. PENHALL LTD., MADE IN VANCOUVER, CANAD
DUKSBAK WATERPROOF

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1650				503.2 - 511.1 1651-1677 Mixture of hematite, chlorite, and epidote. Green and red on grey background.							
1660											
1670				1672 (509.6) Quartz vein ?cm							
				511.1 - 525.8 1677-1725: Medium green with apple green patches on a light grey background. Little or no hematite. Mostly chlorite and epidote.							
1680											
1690											
1700											
1710											
1720				525.8 - 528.8 1725 - 1735: Hematite and chlorite present. Red on medium greenish grey background.							
1730				528.8 - 559.3 1735-1835: Dark green with light apple green specks throughout. No hematite. Chloritic present. Epidote strong throughout. (over)							
1740											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
DUKSBAK WATERPROOF

PROJECT: 2122

HOLE NO. 97-85

DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.	
1740				Quartz eyes usually around 10%. Abundant smaller chloritized feldspar phenocrysts. Some vfrm fragments chloritized and/or epidotized.								
1750												
1760												
1770												
1780												
1790												
1800												
1810												
1820												
1830												

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
		FROM	TO	WIDTH						

N2/E2

R. D. PENHALL LTD., MADE IN VANCOUVER, CANAD
DUKSBAK WATERPROOF

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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	B	C	D	E	FRACTURE INTENSITY	% VEIN QTZ
1830				559.3 - 564.2 1835 - 1851: Essentially same texture as above but without epidote and with some medium grey patches.							
1840											
1850				1850 (563.9) quartz - carbonate vein							
				564.2 - 567.2 1851 - 1861: More uneven grain size than above. Blotchy fragments!?!. Some bands of heavy chloritization. Small fragments							
1860				1861 carbonate vein.							
				567.2 - 570.6 1861 - 1872: light greenish grey groundmass with quartz eyes and dark green chloritized fragments. Feldspar phenocrysts.							
1870				570.6 - 573.6 1872 - 1882 Medium grey groundmass with dark green chlorite altered streaks. Feldspars altered to chlorite. Quartz eyes are "squashed". Contains many pyrite cubes of 1cm³ end of QFCT.							
1880				573.6 - 573.9 1882 - 1883: Shear Zone. Light green and bleached white. 2cm medium grey clay band.							
				573.9 - 614.8 1883 - 2017 LAPILLI TUFF Medium and light grey. Siliceous parts. Squashed fragments, mostly very fine grain. Weakly sericitized.							
1890											
1900											
1910											
1920											

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
1872-1883 ~7% pyrite in 1cm cubes.										
1883-1893 <1% pyrite in thin disseminated bands										
1893-1895 ~1% pyrite 1895-1902 <<1% pyrite										
1902 10cm 40% pyrite 1902-1950 background about 1% pyrite										

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ.	
1920												
1930												
1940												
1950												
1960												
1970												
1980												
1990												
2000												
2010												

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MINERALIZATION DESCRIPTION	TOTAL SULPHIDE	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH	SAMPLE NUMBER	ASSAYS				
1921-1922 40% pyrite										
1933 50cm 4% pyrite with trace amounts of chalcopyrite and sphalerite.										
1980-1985 < 1% pyrite										
1986 1% sphalerite										
1953 [illegible] 4% pyrite trace chalco										
1955-2008 ~1% pyrite with traces of chalc and sphalerite at a few places.										
1999 4cm 25% pyrite ~1% chalco.										
1993 4cm 10% pyrite ~1% chalco										
1999 2cm 10% pyrite trace chalco										
2007 20cm 4% pyrite										

R. D. PENHALL LTD., MADE IN VANCOUVER, CANADA
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DEPTH (m)	% CORE REC	LITHOLOGY	STRUCTURE	GEOLOGICAL DESCRIPTION	ALTERATION A	ALTERATION B	ALTERATION C	ALTERATION D	ALTERATION E	FRACTURE INTENSITY	% VEIN QTZ
2010				614.8 2017 END OF HOLE							
2020											