

KUTCHO CREEK

826038

INFORMATION SUMMARY

Esso Minerals Canada

June 1988

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KUTCHO CREEK AND ADJACENT PROPERTY

PROPERTY STATUS

The main Kutcho property contains three defined mineralized zones, one of which, the Kutcho Zone, has been extensively explored, bulk sampled, and metallurgically tested with a preliminary feasibility study completed in April 1985.

The southern adjacent property, held by Esso, was flown by a Questor Input survey. Subsequent ground evaluation confirmed and indicated additional targets which warrant drilling. Both the main Kutcho property and the southern property are being offered for joint venture.

The property claims are held by Sumac Mines Ltd. and Esso Minerals Canada with an existing agreement between the two covering part of the area (see Figure 3 - claim disposition). The claims have been maintained in good status but no extensive exploration has occurred over the past few years.

A Stage II environmental report was submitted in March 1986 followed by continued liaison with government officials. An acid mine drainage (AMD) assessment program is planned for 1988 and is designed to address governmental concerns regarding potential AMD generation and should lead to a Stage II approval.

LOCATION

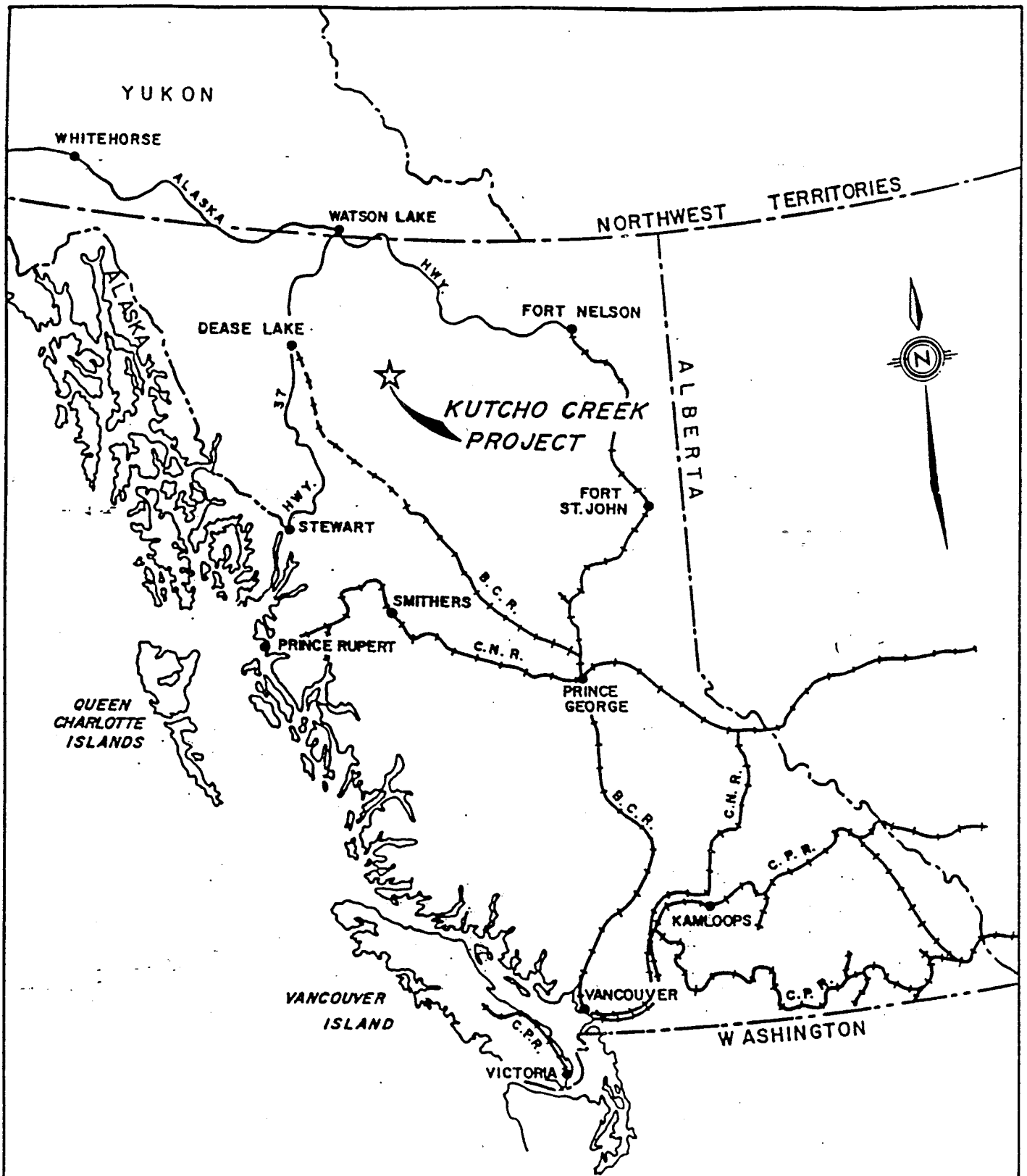
The property is located in northwestern B.C. approximately 100 km east of Dease Lake and approximately 390 km north of Smithers (see Figure 1). Geodesic coordinates are $58^{\circ}12'N$ and $128^{\circ}23'W$.

An airstrip was constructed in 1977 and is serviceable for up to a DC-3 or similar type aircraft. A 10 km road connects the airstrip and property which is to the east (see Figure 2).

The location is otherwise remote with only an exploration camp on site.

LAND

The area being offered for joint venture incorporates all claims held by Sumac Mines and by Esso Minerals (see Figure 3 for details).

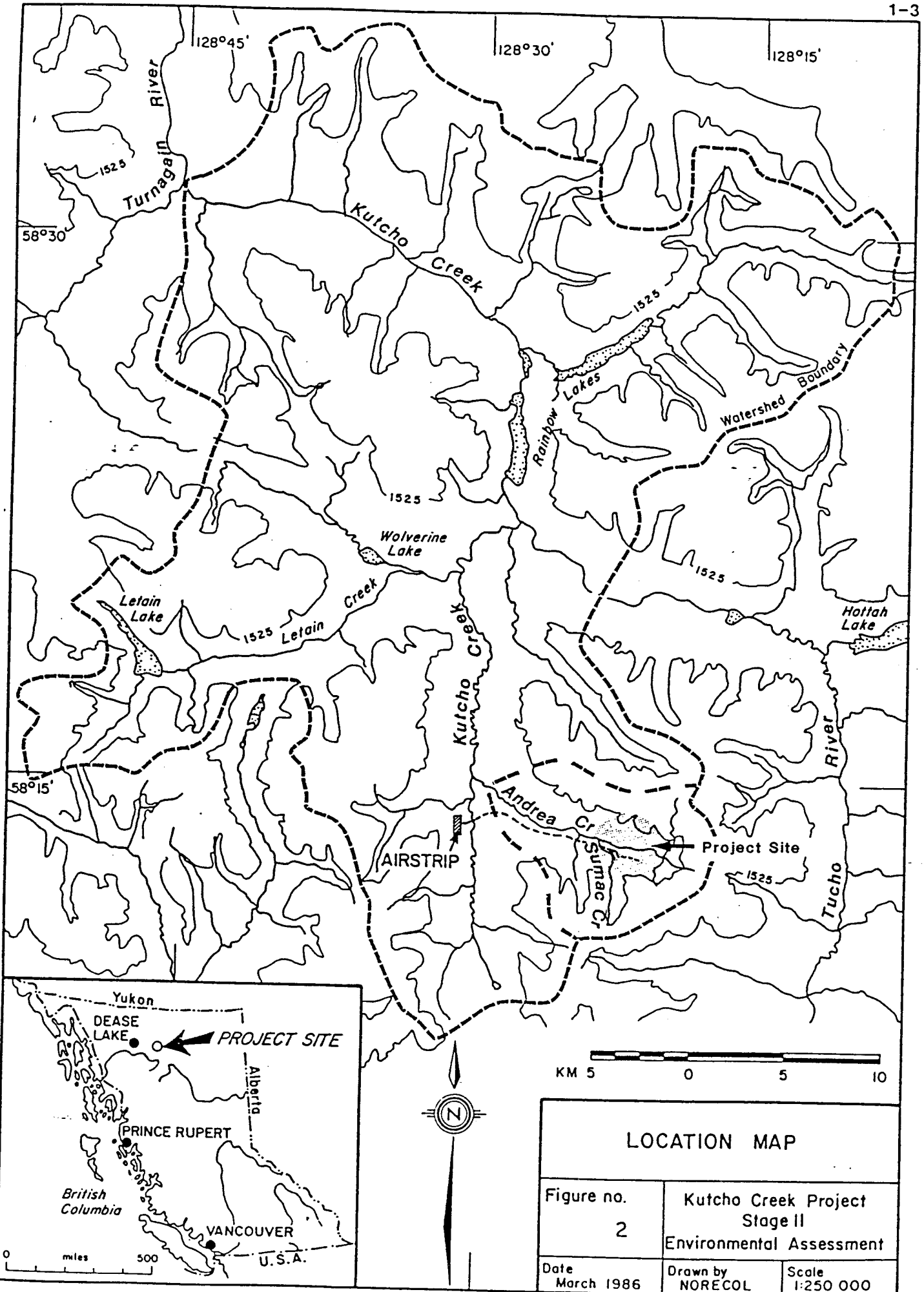


LOCATION OF KUTCHO CREEK DEPOSITS

Lat. 58° 12' N - Long. 128° 23' W



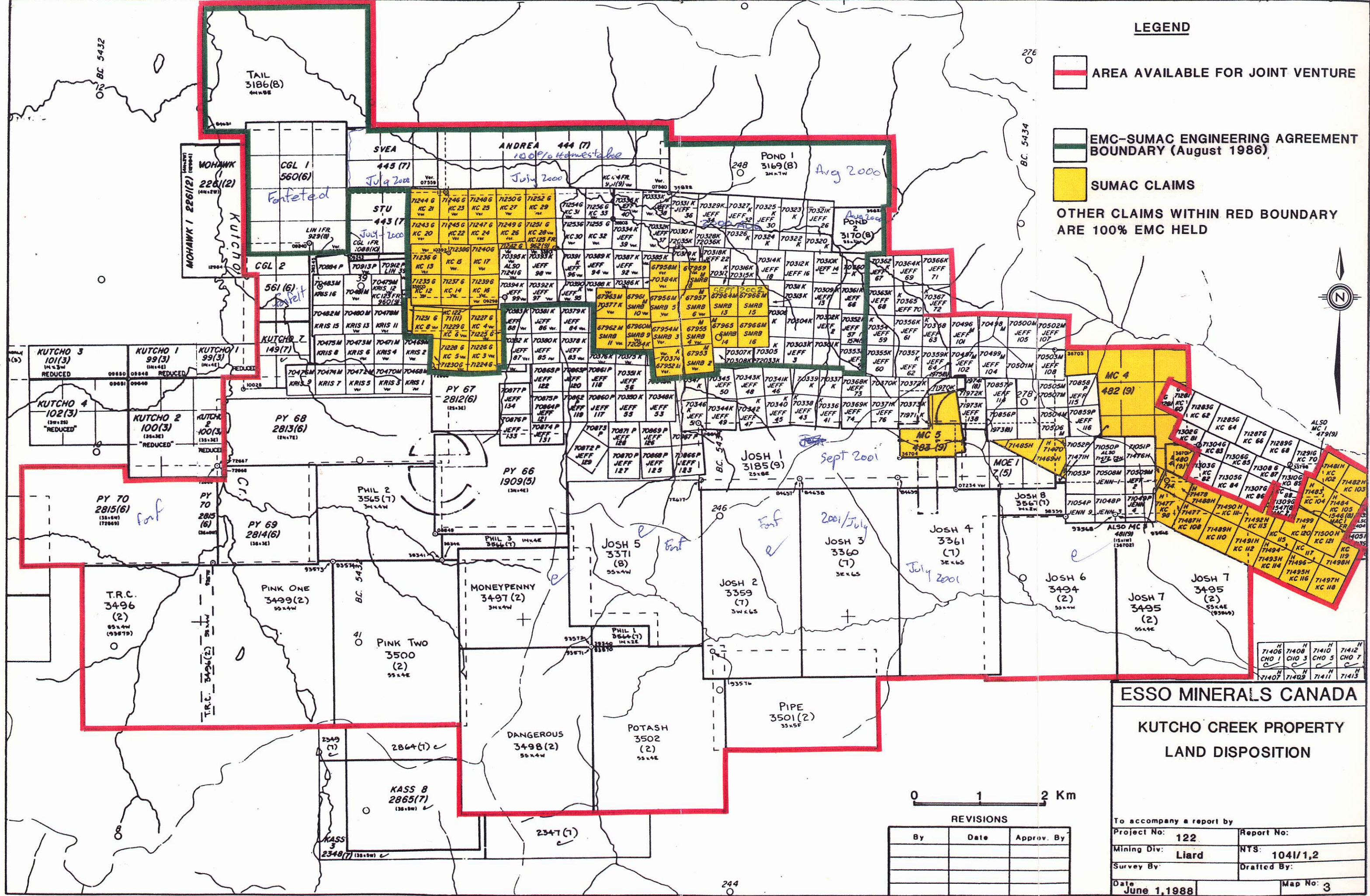
Figure 1



LOCATION MAP		
Figure no.	Kutcho Creek Project	
2	Stage II	
	Environmental Assessment	
Date	Drawn by	Scale
March 1986	NORECOL	1:250 000

LEGEND

- AREA AVAILABLE FOR JOINT VENTURE
- EMC-SUMAC ENGINEERING AGREEMENT BOUNDARY (August 1986)
- SUMAC CLAIMS
- OTHER CLAIMS WITHIN RED BOUNDARY ARE 100% EMC HELD



ESSO MINERALS CANADA
KUTCHO CREEK PROPERTY
LAND DISPOSITION

REVISIONS

By	Date	Appov. By

To accompany a report by

Project No: 122	Report No:
Mining Div: Liard	NTS: 1041/1,2
Survey By:	Drafted By:
Date: June 1, 1988	Map No: 3

HISTORY

A project history is shown on Table 1 which describes the geological status.

A bulk sample was obtained and pilot scale metallurgy was undertaken by Sumac in 1982. Detailed base line environmental work also started that year.

In 1984, Sumac Mines and Esso Minerals mutually agreed to carry out engineering programs and a Stage II government submission. As part of this agreement, a preliminary feasibility study was completed in April 1985 by Wright Engineers Limited.

The Stage II report was completed and submitted in March 1986. Approval has not yet been granted but, towards this end, an AMD program is to commence in 1988 which should lead to an approval.

TABLE 1
SIMPLIFIED CHRONOLOGICAL WORK HISTORY FOR KUTCHO CREEK PROPERTY

<u>YEAR</u>	<u>GEOLOGY</u>	<u>GEOPHYSICS</u>	<u>GEOCHEMISTRY</u>	<u>DRILLING</u>
1967			Initial survey & anomaly	
1970	Float discovery & staking (lapsed)			
1972	Staking by Sumitomo			
1973	Staking (Esso) Prospecting	AEM, Ground EM & Mag	Detailed stream/silt survey	
1974		Ground follow-up on AEM; HEM and MAG surveys Gravity survey		1696 m in 16 holes
1975	Regional & property scale mapping			1534 m
1976	Claims surveyed	EM & MAG surveys Turam	Soil & silt sampling	1691 m in 24 holes (DDM 31-54) (3120 m in Kutcho Zone)
1977	Property scale mapping		Silt sampling Litho geochem	4335 m in 16 holes Testing lower sulphide zone and west zone
1978	Claim staking, surveying DDH surveying, mapping	Charge potential survey		8933 m in 16 holes & 6 wedge branches (DDH 70-87)
1979		Charge potential Jenn Area, Esso West		6582 m (most in 4 holes + 25 branches in west zone)
1980	Structural mapping on western property			4245 m in 3 holes + 8 branches in west zones
1981		Horizontal loop EM		842 m in wedge branches
1982				346 m in DDH 98 (102) 4 metallurgical holes in Kutcho zone
1983	Color air photography surveying of claims and drill collars	Charge potential, magnetometer & GENIE surveys	Soil grids, vapour phase orientation survey, heavy mineral orientation study, and Hg analyses on fracture coatings.	4335 m in 19 holes (101-121)
1984	Detailed mapping, geological studies			
1985	Detailed mapping, core relogging and study of the geology and alteration around the Kutcho deposits.	Large loops and moving source GENIE approx. 60 line km. Questor MKVI INPUT survey 560 line km.	Lithogeochemical study	
1986	Mapping southern claims area, core logging	Moving source GENIE 6 line km	Soils, rocks, drillcore southern claims	

GEOLOGY

The Kutcho property lies within the King Salmon Allochthon, a narrow sequence of Triassic island arc volcanics and Jurassic sediments that are sandwiched between two northerly dipping thrust faults. The volcanic sequence is thickest in the deposit area, in part because of primary deposition but also because of stratigraphic repetition by folds and thrust faults. Major folds are delineated by the Sinwa Limestone and by the contact between Kutcho Formation volcanics and the overlying Inklin Formation argillites (Figure 4).

Volcanogenic mineralization of the Kutcho deposit occurs at the contact between footwall lapilli tuffs and hanging wall quartz and quartz-feldspar crystal tuffs. The main sulphide-bearing interval is marked by extensive hydrothermal alteration and thinly bedded ash tuffs. This sulphide-bearing interval is geochemically, and usually visually, recognizable over a strike length of 8 km. Coarse-grained pyroclastic rocks of the Kutcho Formation occur in the vicinity of the known sulphide lenses; these pyroclastics become noticeably finer grained both southward and westward. The major center of volcanism is interpreted to be northeast of the Kutcho sulphide lens although subordinate centers may exist elsewhere on the property.

GEOLOGY (cont'd)

Similar stratigraphy to that hosting the Kutcho deposit occurs in the southern part of the property in the Imperial Ridge and Josh Creek areas (Fig. 4). This stratigraphy, which includes felsic ash tuffs and exhalites, is interpreted as a structural repetition of the Kutcho Formation. The exploration potential of this stratigraphy has been enhanced by the definition of fourteen targets using a combination of geological, geochemical and geophysical techniques.

The geology is also described in further detail in a paper entitled "Geology of the Kutcho Creek Volcanogenic Massive Sulphide Deposits, Northern B.C." The authors of the paper are D. Bridge and J. Marr, Esso Minerals and M. Obara and R. Suzuki, Sumac Mines.

RESERVES

The three known sulphide occurrences (see Figures 4 and 5) which have been drilled have reserves outlined as follows:

	Tonnes <u>(000)</u>	Cu <u>%</u>	Zn <u>%</u>	Au <u>gm/t</u>	Ag <u>gm/t</u>
Kutcho Zone	14,000	1.75	2.97	0.39	28.11
Sumac West Zone	5,300	1.09	1.62	0.10	14.40
Esso West Zone	1,500	3.35	5.59	0.56	63.10

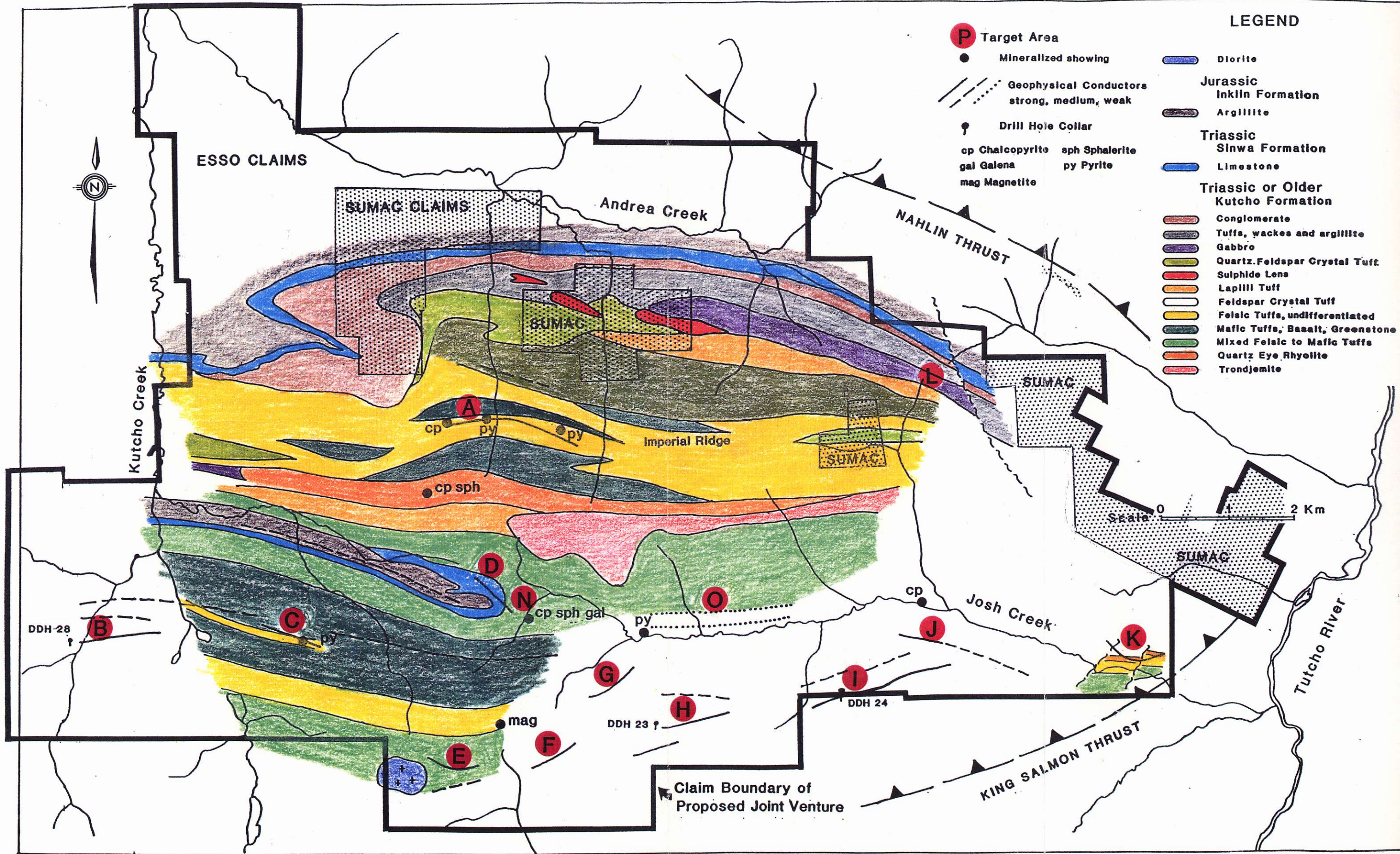


Figure 4. Generalized Geology and Geophysics, Kutcho Property

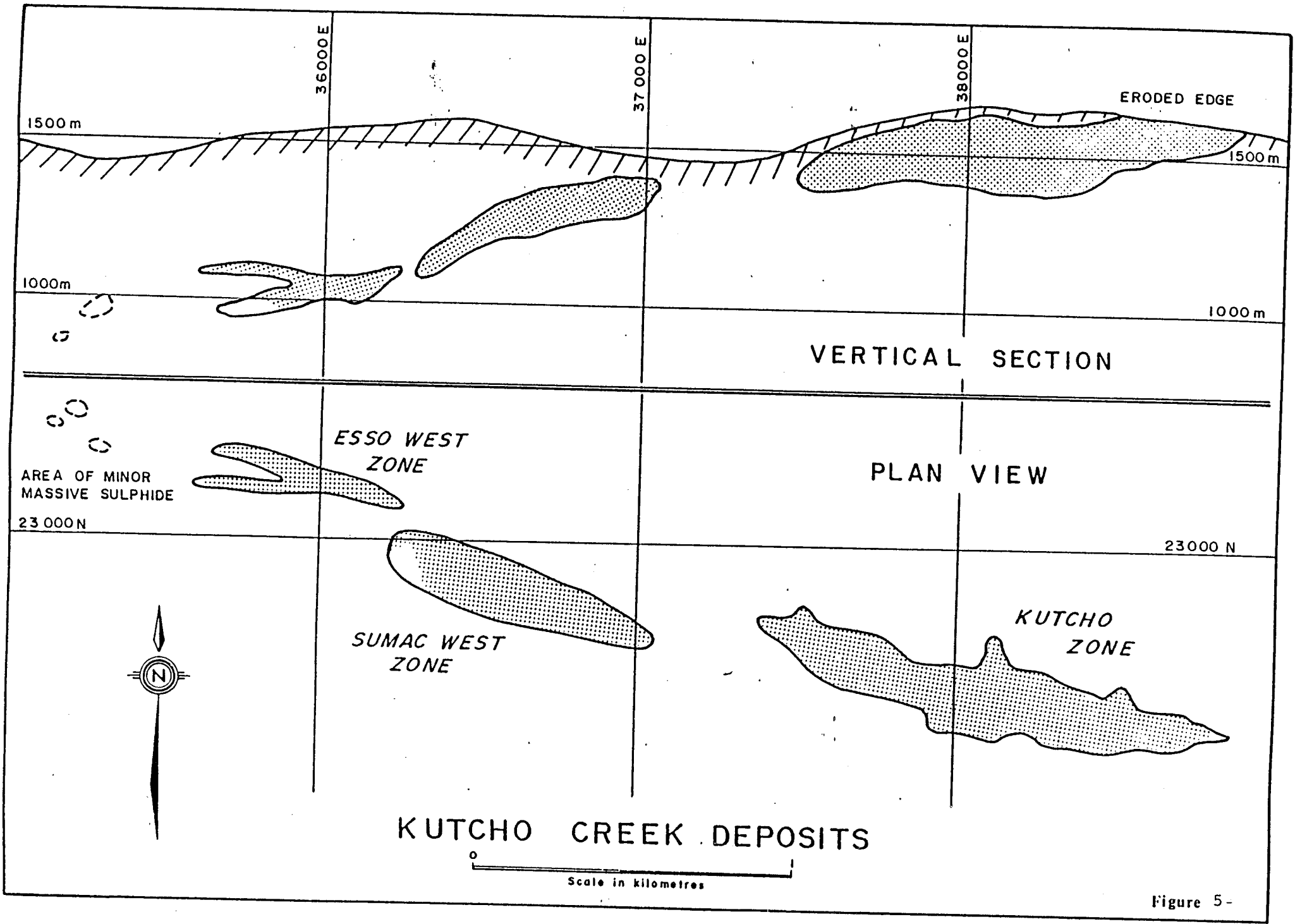


Figure 5-

RESERVES (cont'd)

The Kutcho Zone has been delineated by drilling on about 60 meter section lines. The reserves were independently calculated by Sumac and EMC with the results within 5% of each other.

The Esso West Zone, because of its depth of plus 600 meters, has less drilling. Thus, additional exploration would be required to confirm the zone.

The Sumac West Zone, because of low indicated grades, was also not extensively explored.

DRILL TARGETS

The 14 targets located on Figure 4 are described in summary fashion in Table 2. All the targets occur over a strike length of 16 km in Kutcho Formation lithologies. The priority rank of the targets is rated as high, medium and low on Table 2 to help guide drill testing or ground evaluation. The rank is based on encouraging exploration features such as anomalous geophysical or geochemical response, or favourable geology.

Priority	Target Description								Work Done						Recommendations					
	Identity	# of conductors	Length (m)	Depth (m)	Conductance (s)	Magnetics	Surface Geochem	Geology	Year	Ground Definition Technique 2	Geology	Geochemistry 3	Drilling	Results	Drill Test	Geophysical Method	Line km Req'd	Geology	Geochemistry	Comments
H	A	2	500	45	15	15	Cu, Zn silts	Interfolded felsic & mafic tuffs, Cu & Zn occurrences Carbonate exhalite.	n/a						Y	LLG	2.5	Y		Interpreted as a fold repeat of the main Kutcho horizon.
L	B	3	1200+	10	21	-			'75	HLEM	N	Y	110m	Narrow zones of pyrrhotite argillite. Mafic to felsic epiclastic host rocks.		MSG		Y	Y	Use MSG to locate conductors and prospect, particularly to the west.
H	C	1	3000+	35	19-64	-		Narrow band of sericite schist within mafic rocks.	'86	MSG	Y	Y		Massive pyrite & silica exhalite along conductive trend.	Y	GRV CHG				Extend grid to east and west. Chargeability survey to follow drilling.
L	D	1	400	25	15	-		Probably graphitic sediments in limestone.								MSG				Locate conductor and prospect.
M	E	3	1000	30	31	-		Oxide facies within mixed tuffs.								MSG				
L	F	1	400	10	9											MSG				Locate conductor and prospect.
M	G		350	30	11	30		Interbedded felsic ash tuffs.						Located within a resistivity low - typical of pyritic sericite schist.	Y	LLG GRV	2.5		Y	Delineate conductor, try gravity and soils, then drill test.
M	H	3	700	0	39	60		H & I are likely part of the same trend. Argillaceous, tuffaceous cherts correspond to conductors. Host rocks are crystal - lithic tuffs.	'75 '86	HLEM		LG	91m	Alteration and lithochemistry indicate hydrothermal exhalative horizon; much better developed in target I.	Y	MSG GRV	6.0	Y		Locate conductors with MSG. Use gravity and soil surveys to guide drilling.
H	I	3	2500	5	51	-			'75 '86	HLEM		LG	120m							
M	J	1	200	55	21	-		Mafic to felsic ash tuffs, sericite schist.							Y	LLG	2.0	Y	Y	Favourable geology, but thick overburden.
H	K	1	500	5	15	-		Crystal and lapilli tuffs, sericite schist.	'86	MSG	Y	Y		Similar stratigraphy to the main Kutcho horizon.	Y					Drill test: line 6w 2+25s.
L	L	1	200	0	8	-		Metagabbro.								MSG		Y		Locate with MSG and prospect.
M	N						Cu, Zn Pb	Carbonate exhalite. Pyritic, altered crystal tuffs.	'85	MSG LLG	Y	Y		No conductive response. Anomalous lithochemistry.	Y					Good geological target, test at depths greater than 150m.
M	O	2	2000	70	-	-		Pyritic sericite schist and ash tuffs.	'85	LLG	Y	Y		Thin lenses of massive pyrite in highly altered schists. Spotty lithochem anomalies.	Y					Probably 3 -4 holes required to test both conductors over the entire strike length.

1. H = High, M = Medium, L = Low

2. HLEM = Horizontal Loop EM, MSG = Moving source GENIE
LLG = Large Loop GENIE, GRV = Gravity, CHG = Chargeability

3. LG = Lithochemistry

TABLE 2. SUMMARY OF EXPLORATION TARGET AREAS, KUTCHO CREEK

EXPLORATION PROPOSAL

The proposal is based on Sumac and EMC both giving up 15% of their interest to a third party in return for the third party funding exploration and development work up to a maximum of \$15 million over the next three years. The final interests in the joint venture would then be Sumac 35%, EMC 35% and the third party 30%.

The proposal is based on Esso being the project operator during the third party earn-in period.

Once the third party has earned-in, a joint venture will be put in place between Esso, Sumac and the third party, at which time the mine operator will be selected by the three joint venture parties.