GEOLOGY AND GEOCHEMISTRY OF THE MOX CLAIM GROUP

Claim Sheet 105F/11

Lat.: 61°30'N
Long.: 133°16'W

Claims:
MOX 1-14, 16-17, 19, 21-60

Whitehorse Mining District

Yukon Territory

by:

Eric James Sacks, M.Sc.

Work Completed July 28 and August 1, 1979

090 641

This report has been examined by the Geological [illegible] Unit and is recommended to the [illegible] to be considered as [illegible] the amount of

$ 7125

[illegible] Engineer

Considered [illegible] work under Section [illegible] Quartz Mining Act.

Commissioner of Yukon Territory

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SUMMARY

The MOX Claims are located at 61°30'N, 133°16'W within N.T.S. map sheet 105F/11, Whitehorse Mining District, Ykon Territory. The MOX Claim Group, originally covering 60 full claims, now comprises 50 full claims plus parts of 7 others due to previous staking in the northeastern corner (FIRST Claims of Archer & Cathro Associates).

The claims are underlain primarily by well layered, biotite-quartz-feldspar schist and gneiss containing stocks, bosses, sills and dykes of medium-grained biotite quartz-monzonite. Tempelman-Kluit (1977) has interpreted this entire assemblage as being of Proterozoic age; however, due to an extensive area of Cretacous quartz-monzonite occurring to the southwest, it is possible that some or all of the quartz-monzonite could be intrusive and of Cretaceous age. The gneisses and schists are probably of sedimentary origin and enclose layers of Lower Cambrian recrystallized marble and limy mud, now skarn, which outcrop in many places over the claims. A dyke of Cretaceous quartz-feldspar porphyry occurs in the southeast corner of the claims.

In at least one location skarn contains visible galena, sphalerite, pyrrhotite, pyrite, chalcopyrite, fluorite and garnet. Both soil and stream geochemistry strongly reflect the presence of this known showing and on this basis suggest that the skarn may be much more extensive and underlie much of the west-central and northwestern areas of the claims. Potential skarn mineralization includes Cu, Pb, Zn and Ag. Silver response in soils, stream sediments and heavy minerals is extremely intense and geochemistry has proven extremely effective in delineating

this type of mineralization on the MOX Claims.

I INTRODUCTION

The MOX Claims were staked on June 20, 1979 to cover the headwaters of a 1978 Geological Survey of Canada - Uranium Reconnaissance Program stream sediment and water U-F-Pb anomaly. On July 28, 1979 CanadianOxy conducted reconnaissance geological mapping and geochemistry surveys over the claim group. This report presents the results of that survey.

II LOCATION AND ACCESS

The MOX Claim Group which comprises 57 individual claims, is located at 133°16'W, 61°30'N within N.T.S map sheet 105F/11, Whitehorse Mining District, Yukon Territory. The claim group covers an area of 4.8 mi^2 (12.4 km^2).

The claims are located at the head of Caribou Creek approximately 7 mi (11.2 km) west of the Canol Road (Yukon Highway No. 8). The Canol Road is a summer-only, narrow dirt road, built during the Second World War to service the oil pipeline carrying oil south from Norman Wells. The pipeline has since been removed however, its right of way is still visible paralleling the Canol Road.

III PHYSIOGRAPHY AND VEGETATION

Relief over the MOX Claims is 1900 ft (580 m) between elevations of 6300 ft and 4400 ft above sea level. The claims are cut by a central NS trending, well developed stream valley at 4500 ft (Caribou Creek) with well developed east and west facing cirques on either side. The faces of the cirques are

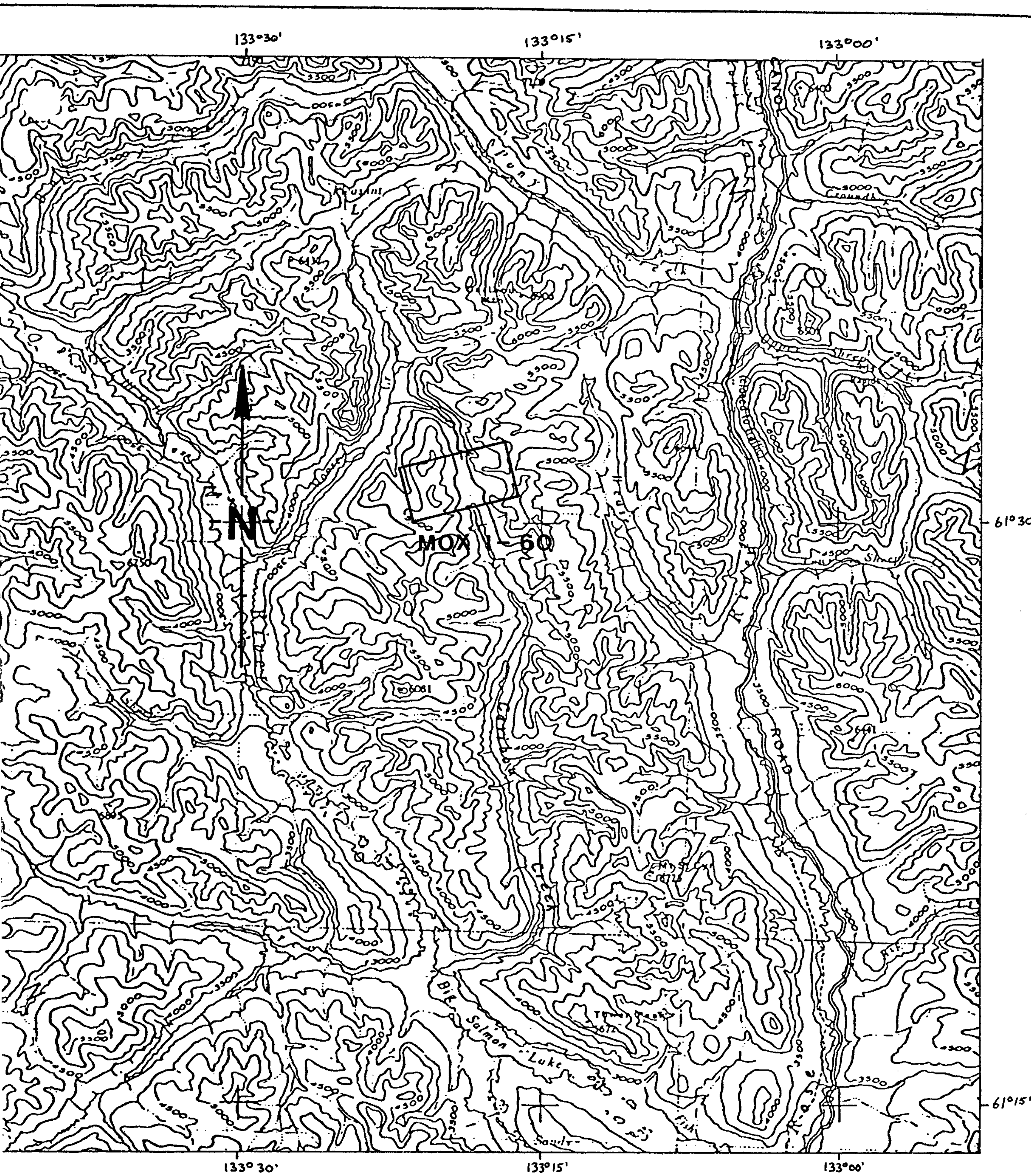

Figure 1

LOCATION AND ACCESS OF MOX MINERAL CLAIMS
Scale: 1:250,000

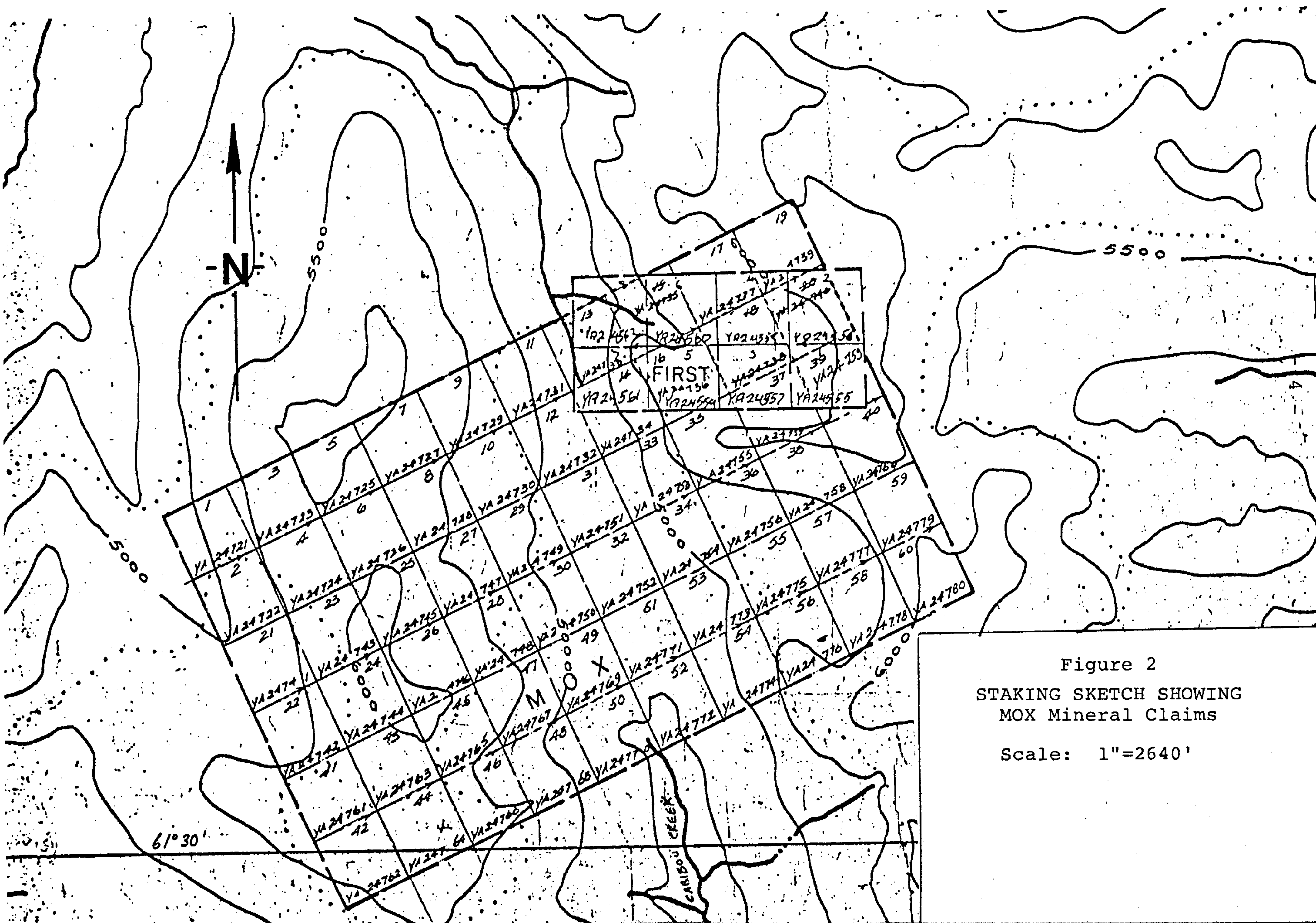

Figure 2

STAKING SKETCH SHOWING
MOX Mineral Claims

Scale: 1"=2640'

quite steep however the tops are gentle and rolling.

The entire claims are above treeline with grass covering upper slopes and grass and sparse buckbrush in the stream valley.

IV PREVIOUS WORK

1. No evidence of previous prospecting was found.

2. The Quiet Lake map sheet was geologically mapped by numerous Geological Survey of Canada geologists between 1956 and 1977 providing 1:250,000 coverage (Wheeler, et al., 1960; Tempelman-Kluit, 1977).

3. The Geological Survey of Canada conducted a stream sediment and water geochemistry survey over the entire Quiet Lake (105F) sheet during 1978. Results were released on June 15, 1979 as Open File Report 564. The MOX Claims were staked on June 20, 1978 to cover the headwaters of a U-F-Pb anomaly (100 ppb F, 59.7 ppm U, 129 ppm Pb). Parts of MOX claims 13 to 20, 37 and 39 had been staked as the FIRST claims on June 15, 1979 and have been disallowed (see Figure 2). The FIRST Claims are located in the NE corner of the MOX Claims and are owned by Archer & Cathro Associates.

V WORK COMPLETED - 1979

5.1 Staking

The MOX 1-60 Mineral Claims were staked on June 20, 1979 and recorded at Whitehorse on July 4, 1979 by M.B.W. Surveys of Whitehorse, Yukon Territory for CanadianOxy.

The NE corner of the MOX Claims were previously staked by Archer & Cathro Associates as the FIRST Claims. As a result MOX 15, 18 and 20 and parts of MOX 13, 17, 19, 14, 16, 37 and 39 have been disallowed (see Figure 2).

5.2 Geological Mapping

Sacks and Hooper conducted reconnaissance mapping and prospecting surveys over the MOX Claims on July 28, 1979. Sacks, Wallis and Hooper visited the MOX Claims on August 1, 1979 (see Appendix IV). A total of 2.9 man days of work were performed.

5.3 Geochemistry

A total of 3 heavy mineral, 31 stream sediment, 31 stream water, 23 soil and 23 rock samples were collected by CanadianOxy personnel and sent to Chemex Labs Ltd., N. Vancouver, British Columbia for analysis. A total of 3 man days of work were performed.

5.4 Summary of Work Completed

Type of Work	Man Days	No. Samples	No. Analyses											
			Cu	Mo	Pb	Zn	Ag	U	Th	Sn	W	F	As	Total
Geological mapping	2.9													
Geochemistry	3.0													
i) Rock		23	23	23	23	23	23	23	23	23	23	-	-	207
ii) Sediment		31	31	31	31	31	31	31	31	-	-	-	-	217
iii) Heavy Min.		3	3	3	3	3	3	3	3	3	3	-	-	27
iv) Water		31	-	-	-	-	-	31	-	-	31	31	-	93
v) Soil		23	23	23	23	23	23	23	23	-	-	-	-	161
Helicopter	3.8 hrs													
TOTAL	5.9	111												705

5.5 Names and Addresses of Personnel

Dr. R.H. Wallis — Chief Geologist
Canadian Occidental Petroleum Ltd.
Minerals Division
311 - 215 Carlingview Drive
Rexdale, Ontario M9W 5X8

E.J. Sacks, M.Sc. — Project Geologist
Same address as above

J. Hooper — Senior Assistant
Same address as above

E. Jermakowicz Same address as above	Junior Assistant
C. Pelletier Same address as above	Junior Assistant
B. Zayachivsky Same address as above	Junior Assistant
Dr. C.F. Gleeson C.F. Gleeson and Associates Ottawa, Ontario	Consulting Geochemist

VI GEOLOGY

6.1 General Geology

Mapping by Geological Survey of Canada geologists shows the MOX Claims to be underlain primarily by Proterozoic and/or Lower Cambrian injection migmatite consisting of muscovite-biotite gneiss, augen gneiss and sills, plugs, dykes and plugs of biotite granite, quartz-monzonite, pegmatite and aplite (Unit Pn+ of Tempelman-Kluit, 1977). The Pn+ unit contains layers of Lower Cambrian marble and limy mud (Unit lCc2 of Tempelman-Kluit, 1977). The eastern portion of the claims is cut by NW trending Cretaceous feldspar porphyry dykes (Unit KTFp of Tempelman-Kluit, 1977). A large body of Cretaceous quartz-monzonite lies to the southwest of the claims. The Pn+ unit is probably a meta-sedimentary unit gradional to the lCc2 carbonate unit. Mapping by CanadianOxy geologists confirms the above interpretation and has revealed sulphide-bearing skarn development within the limy units.

6.2 Table of Formations (PLAN 1)

Unit	Description
V	Volcanic dyke, white, aphanitic
QM	Biotite quartz-monzonite
GN	Biotite-quartz-feldspar gneiss, augen gneiss
S	Skarn, carbonate hornfels

6.3 Description of Rock Units (PLAN 1)

Descriptions of individual rock samples are listed in Appendix II.

Unit V - Quartz-feldspar porphyry

This rock type consists of aphanitic, grey to beige coloured, quartzo-feldspathic material (JH-MOX-8). Sub to euhedral feldspar phenocrysts and limonite boxworks, both up to 1/8 in. in size are disseminated throughout the groundmass. The unit has a scintillometer response of 250 cps.

Unit QM - Biotite quartz-monzonite

This unit comprises medium grained, generally unaltered biotite quartz monzonite containing K-feldspar (40%), plagioclase (30%), quartz (10-15%), biotite (5%) and occasional traces of muscovite.

The rock is generally fresh and massive but is brecciated and altered within fracture zones where it becomes limonitized, chloritized and hematized and weathers easily to form fine, crumbly talus. The fracture zones are marked by bright orange limonite gossan. The unit is characterized by a scintillometer response of from 220 to 275 cps (BGS-4) in fresh material and 300 to 450 cps within fracture zones.

Unit GN - Biotite quartz-feldspar schist and gneiss

This unit comprises fine-grained, well foliated biotite -quartz-feldspar schist, well layered gneiss and augen gneiss in which quartz-feldspar fragments are contained in a biotite-chlorite groundmass. Mafics are occasionally stained by limonite, resulting in a rustry, easily weathered, schistose rock.

Scintillometer response ranges from 165 to 275 cps.

Unit S - Skarn

This unit comprises many rock-types including fine-grained, limy, banded mudstones, massive marble and highly siliceous hornfels. Several samples contain pyrite and pyrrhotite, while one location (ES-MOX-8, 10, 11) shows massive sulphide mineralization including pyrite, pyrrhotite, galena, sphalerite, chalcopyrite as well as garnet and fluorite (ES-MOX-7d). Contacts with other units including the QM and GN units are gradational and highly complex and lenses and pods of quartz-monzonite are intimately associated with the skarn. Skarn was identified in several areas in the western part of the claims and also in the SE corner where it is covered by extensive gossan. Scintillometer response ranges from 100 to 250 cps (EGS-4)

6.4 Structure

Foliation within the GN unit is variable. In the northern parts of the claims foliation occurs at 045T to 080T /45° to 65°N. In the southeastern areas foliation was measured at 150T/50° to 80°SW. Undoubtedly, some folding has occurred but would require detailed mapping to delineate.

Two prominent fracture zones were noted within the QM unit in the east-woutheast corner of the claims. One zone trending at 150T occurs just south of the claims and can be traced over 4000 ft (1220 m) onto the claims. The zone is up to 10 ft (3 m) wide and contains brecciated, crumbly weathering, limonitized quartz-monzonite. One other zone, trending 050T occurs in the eastern part of the claim group and contains crumbly weathering, limonitized, chloritized and hematized quartz monzonite and breccia.

The quartz-feldspar porphyry is inferred (from Tempelman-Kluit, 1977) to be part of a NW trending dyke. Contacts among the other units are complex and gradational. At ES-MOX-7 the contact between quartz-monzonite, schist and skarn was noted

6.5 Metamorphism

The gneiss and schist have been regionally metamorphosed, possibly to amphibolite facies. The quartz-monzonite is apparently unmetamorphosed and it is not clear whether it forms part of Tempelman-Kluit's Precambrian migmatite complex or is part of the Cretaceous intrusive event illustrated by the large area of intrusive quartz-monzonite outcropping to the southwest. The quartz-feldspar porphyry is unmetamorphosed.

The skarn bodies have undergone thermal metamorphism. It is unknown whether skarn development is related to the regional metamorphism, intrusion of Cretaceous quartz-monzonite or a combination of the two.

Some cataclastic metamorphism occurred after cooling of the quartz-monzonite and is illustrated by the well developed fracture zones.

6.6 Alteration

Significant alteration is confined to limonitization, chloritization and hematization within fracture zones in the QM unit. Outside of these zones alteration is confined to weathering of mafic and sulphide minerals to produce limonite stain and gossan (ES-MOX-8, 10, 11).

6.7 Economic Geology

Massive sulphide mineralization in carbonate skarn (ES-MOX-7, 8, 10, 11) includes sphalerite, galena, pyrite, pyrrhotite, chalcopyrite plus fluorite and garnet. Visible mineralization is excellent but of limited extent; possibly an areal extent of 100 x 50 ft (30 m x 15 m) within scree, however, individual occurrences within skarn are widespread (ES-MOX-7, in the western and south-eastern portions of the MOX Claims ES-MOX-8, 10, 11). There appears to be less potential for uranium mineralization, though U is associated with the skarns.

VII GEOCHEMISTRY

Rock, stream sediment, stream water, heavy mineral and soil samples were collected over the MOX Claims. Analytical results are listed in Appendix I. Sampling and laboratory procedures are listed in Appendix III.

Mean, possibly anomalous and probably anomalous levels for each element in stream sediment, waters, and heavy mineral samples were determined at the 50th, 84th, and 97th percentile levels of cumulative frequency distributions constructed from the Project WATSU regional follow-up survey data. In the case of soil samples the combined data from all Project WATSU claim group surveys were used. In the case of rock samples probably anomalous levels were determined using data published by Levinson, 1974, (Table 2-1).

7.1 Rock Geochemisty (PLAN 2, 3)

All rock samples were analysed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

1. 1.1% Pb, 1.1% Zn, 1.9 oz/ton Ag, 1100 ppm Cu and 5 ppm W occur in a sample of skarnified carbonate (ES-MOX-10) from the NW corner of the claims. Visible pyrite, galena and fluorite occur in the sample.
2. 1250 ppm Cu, 184 ppm Pb, 280 ppm Zn, 19 ppm Ag and 4 ppm W occur in a sample of siliceous skarn adjacent to ES-MOX-8 above (ES-MOX-11). Visible pyrite, chalcopyrite and malachite staining occcur in the sample.
3. 198 ppm Cu and 0.8 ppm Ag occur in a sample of massive sulphide skarn adjacent to ES-MOX-10 above (ES-MOX-8). Visible

TABLE 1

Mean, Possibly Anomalous and Probably Anomalous Levels - Soils, Sediments, Waters, Heavies.

Note: levels chosen from cumulative frequency curves at 50th, 84th and 97th percentiles, respectively.

A. Heavy Minerals

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppb Au	ppm Sn	ppm W	ppm U	ppm Th
Mean	24	17	75	.05	1.5	<10	2.3	15	3.8	44
Poss. Anom.	63	89	200	.38	3.5	19	38	60	26	330
Prob. Anom.	165	280	440	.95	8.5	3150	300	160	120	1200

B. Stream Sediments

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppm Sn	ppm W	ppm U	ppm Th
Mean	11	5	58	<.1	<1	<1	<1	2.5	13
Poss. Anom.	28	21	115	<.1	3	2	5	17	29
Prob. Anom.	54	59	320	1	11	5	16	38	50

C. Soils

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppm Sn	ppm W	ppm U	ppm Th
Mean	8	8	48	<.1	<1	<1	<1	2	14
Poss. Anom.	22	32	115	.1	2.5	1	7.5	7	36
Prob. Anom.	120	150	270	.8	5	2	40	30	75

D. Stream Waters

	ppb U	ppb F	m.mhos/cm S.C.
Mean	.25	19	18
Poss. Anom.	.85	100	46
Prob. Anom.	2.5	210	100

pyrite, chalcopyrite and pyrrhotite occur in the sample.

4. 270 ppm Zn occurs in limonitized biotite quartz-monzonite from a fracture zone in the SW corner of the claims (ES-MOX-3).

5. 132 ppm Pb, 198 ppm Zn and 2.8 ppm Ag occur in a sample of leucocratic, biotite quartz-monzonite from the NE corner of the claims (JH-MOX-3).

6. Zn highs of from 104 to 134 ppm occur in schist and monzonite samples scattered over the eastern part of the claims (JH-MOX-4, 6, 9).

7.2 <u>Heavy Mineral Geochemistry (PLAN 4, 5, 6)</u>

A total of 3 heavy mineral samples were collected from streams draining the northern and eastern parts of the claims. All samples were analysed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

1. 118 ppm Cu, 10 ppm Mo, 980 ppm Pb, 800 ppm Zn, 2 ppm Ag and 90 ppm W occur in a sample from the stream draining the north-central part of the claims. Anomalous contents of Cu, Pb, Zn, Ag, and W occur in skarn material at the head of the stream (ES-MOX-8, 10, 11).

2. 74 ppm Cu, 10 ppm Mo, 285 ppm Pb, 400 ppm Zn, 80 ppm W and 3 ppm Ag occur in the lower reaches of the stream occupying the central valley and draining from a small pond in a cirque in the SE corner of the claim group. Anomalous Zn contents occur in rocks underlying the cirque and a skarn occurrence, which is marked by gossan, at the head of the cirque.

3. 90 ppm Cu, 6 ppm Mo, 196 ppm Pb, 1.8 ppm Ag, 100 ppm W and 180 ppm Sn occur in a sample in the NW corner of the claims. Soils adjacent to the stream contain highly anomalous Ag, Pb and Zn contents.

7.3 Stream Sediment Geochemistry (PLAN 4, 7, 8)

Stream sediment samples were collected at 500 ft (150 m) intervals from all streams draining the MOX claims (except Caribou Creek). Samples were analysed for Cu, Mo, Pb, Zn, Ag, U, and Th.

1. Samples from the stream draining the mineralized skarn (ES-MOX-8, 10, 11) in the north-central part of the claims contain 24 to 80 ppm Cu, 92 to 166 ppm Pb, 280 to 1000 ppm Zn, and 0.6 to to 3.4 ppm Ag. The stream also contains highly anomalous Ag, Pb, Zn and Cu plus Mo and W in heavy minerals (Sample No. 79-Wt-1508).
2. Spotty highs of 28 to 32 ppm Cu, 42 to 92 ppm Pb, 142 to 280 ppm Zn, 20 to 162 ppm U and 0.4 to 1.2 ppm Ag occur in the stream draining the SE corner of the claims through the central N-S stream valley. A skarn occurrence occurs at the head of the stream. The anomalies occur over a length of 2 mi (3.2 km) downstream.
3. 54 ppm Cu, 152 ppm Pb, 230 ppm Zn, and 2.8 ppm Ag occur in spot anomaly in a small stream draining the extreme west-central portion of the claims in the vicinity of the minerlized skarn.
4. 32 to 70 ppm Pb, 0.4 to 1.2 ppm Ag occur in a stream draining the extreme NW corner of the claims. The highest values occur in the lowest portion of the stream approximately 1 mi (1.6 km) downstream from the junction with the stream mentioned in (3) above.

7.4 Stream Water Geochemistry (PLAN 4, 9)

Stream water samples were collected at each sediment site. All samples were analysed for pH and specific conductivity (S.C.) in the field and for U, F and As in the laboratory.

1. pH over the entire claim group is high (7.7 to 8.6) as would be expected in a gneissic-carbonate terrain. The high pH does

not appear to inhibit the solution and movement of base metals for large distances downstream from their source (up to 2 mi).

2. S.C. over the entire claim group is low (26 to 81 m. mohs/cm).

3. 0.8 to 1.2 ppb U occurs in the stream draining the extreme NW corner of the claims. The anomalous U content is accompanied by possibly anomalous S.C.

7.5 Soil Geochemistry (PLAN 4, 10, 11)

Soil samples were collected from talus fines in the western portion of the claim group and were analysed for Cu, Mo, Pb, Zn, Ag, U and Th.

1. 8 to 68 ppm Cu, 36 to 730 ppm Pb, 64 to 630 ppm Zn and 0.2 to 0.8 ppm Ag occur in talus material below the mineralized skarn. (ES-MOX-8, 10, 11) in the west-central portion of the claim group. The highest Pb, Zn and Ag contents occur around the headwater of the anomalous stream at the north end of the soil anomaly immediately below the visible sulphide mineralization (see PLAN 12). The anomaly is approximately 1 mi (1.6 km) in length.

2. 24 to 74 ppm Cu, 36 to 158 ppm Pb, 200 to 290 ppm Zn and 0.2 to 4.0 ppm Ag occur in talus material paralleling the entire length of the anomalous stream draining the NW corner of the claims. The most intense portion of the anomaly occurs immediately adjacent to the headwater of the stream and is approximately ½ mi (0.8 km) in length.

VIII CONCLUSIONS

1. The MOX Claims are primarily underlain by biotite-quartz-feldspar schist and gneiss of probable Proterozoic age. This probably represents a regionally metamorphosed sedimentary assemblage. This unit encloses carbonate skarn zones which may represent metamorphosed carbonate layers within the

porphyry dyke cuts the SE corner of the claims.

Stocks of quartz-monzonite are cut by NE and NW trending fracture zones up to 1000 ft long and 10 feet wide containing limonitized, chloritized and hematized material.

2. Visible chalcopyrite, pyrite, sphalerite, galena, pyrrhotite and fluorite occur in a zone up to 100 ft by 5 ft (30 m by 15 m) within a larger skarn zone in the west-central part of the claim group. Sills, dykes and lenses of quartz-monzonite are intercalated with the skarn material.

3. An intense Cu-Pb-Zn-Ag (Mo, W) stream sediment and heavy mineral anomaly occurs in a stream draining the mineralization. Anomalous Pb, Zn and Ag contents occur in soils immediately downslope and the extent of the soil anomaly suggests that the skarn zone may be larger than is visible on surface.

4. Extremely high Ag and lesser Cu, Zn and Pb contents occur in soils in the NW corner of the claims. Stream sediments and heavy minerals draining these soils are also anomalous in Cu, Pb, Zn and Ag. Ag values of greater than 1 ppm and up to 4.0 ppm occur over a length of ½ mile around the headwater of the stream. This may represent a separate skarn zone or part of a larger zone which includes the visible mineralization mentioned in (2) above.

5. Spotty, but persistent U, Cu, Pb, Zn and Ag anomalies occur in stream sediments up to 2 mi (3.2 km) downstream from a skarn occurrence in the SE corner of the claims. The area is cut by quartz-feldspar porphyry dykes.

6. Pb-Zn-Ag (W, Mo) bearing skarn mineralization has been seen at one location in the western half of the claims. Geochemistry suggests the presence of further, similar mineralization underlying a large portion of the western half of the claims and also the SE corner of the claims.

IX RECOMMENDATIONS

1. Systematic geological mapping and prospecting on a scale of 1"=400 ft should be carried out over the MOX Claims. A N-S baseline could be established in the central valley with picket lines extending over the cirques. Particular attention should be placed upon recognition and delineation of skarn mineralization in the western and southeastern areas.

2. Systematic soil sampling on maximum 200 ft x 800 ft centers should accompany the mapping survey.

3. 1"=400 ft airphoto blow-ups should be used for all future work.

4. The area covered by the FIRST Claims in the northeastern area appears to be of least interest from the CanadianOxy point of view. Representation should be made to the owners of the claims, however, with the aim of possible option or takeover if their work is promising.

Respectfully submitted,

Eric James Sacks, M.Sc.

Toronto, Ontario
December 1979

Appendix I

Analytical Data

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: [redacted] 984-0221
AREA CODE: 604
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49352
INVOICE NO. 31746
RECEIVED August 3, 1979
ANALYSED August 10, 1979

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division
311 - 215 Carlingview Dr.,
Rexdale, Ont.
ATTN: M9W 5X8

WATSU - MOX - WATERS
c.c. Penticton

SAMPLE NO. :	PPB U	PPB F	PPB As
79 WT 1282	0.6	25	<2
1290	1.4	30	<2
1293	1.6	50	<2
1294	0.8	60	<2
1295	1.0	50	<2
1296	1.0	40	<2
1297	1.2	40	<2
1298	0.8	40	2
1299	2.6	30	<2
1330	1.4	20	<2
1331	0.6	20	<2
1332	0.4	30	<2
1333	0.6	25	<2
1334	0.4	25	<2
1335	0.8	30	<2
1336	0.8	40	<2
1337	0.4	20	<2
1338	0.8	30	<2
1339	0.6	40	<2
1340	0.6	40	<2
1341	0.8	45	<2
1342	1.0	40	<2
1501	0.4	50	<2
1504	0.8	25	<2
1505	0.8	20	<2
1506	0.8	30	<2
1507	1.4	50	<2
1508	1.4	40	<2
1087	1.2	25	<2
1093	0.6	25	<2
79 WT 1100	0.6	20	<2

CERTIFIED BY: ....

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: [redacted] 984-0221
AREA CODE: 604
TELEX: 043-52597

CHEMEX LABS LTD.

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49342

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

INVOICE NO. 31920
33375 - Th only

RECEIVED Aug. 3/79

ANALYSED Aug. 16/79

ATTN: WATSU-Mox-Stream Silts CC. E. Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM Th
79 WT 1087	10	1	24	68	0.1	17.0	24
1093	22	1	48	152	0.4	44	20
1100	60	1	162	420	1.6	44	16
1282	12	1	22	70	0.2	3.0	30
1290	54	1	152	230	2.8	2.0	27
1293	14	1	32	106	0.6	18.0	20
1294	18	1	34	126	0.4	31	21
1295	16	1	32	110	0.6	19.5	31
1296	16	1	46	106	0.8	9.0	35
1297	16	1	44	102	0.4	9.0	41
1298	14	1	32	94	0.1	12.5	70
1299	26	1	70	144	1.2	16.0	36
1330	42	3	300	196	1.2	10.5	14
1331	28	1	138	188	0.8	23.5	27
1332	24	1	94	186	0.6	31.5	25
1333	30	2	82	190	1.0	107	17
1334	20	1	58	142	0.8	28.5	20
1335	30	2	64	188	1.0	162	16
1336	14	2	42	124	0.1	16.5	18
1337	24	2	48	158	0.8	68	10
1338	20	1	62	184	0.6	53.5	25
1339	20	1	58	182	0.4	65	23
1340	18	1	56	186	0.8	45.5	19
1341	24	1	92	280	0.6	20.0	31
1342	22	1	88	265	0.8	20.0	38
1501	80	1	166	1000	3.4	9.5	17
1504	52	2	132	400	2.4	10.0	17
1505	46	2	138	410	2.6	10.0	15
1506	28	2	108	445	1.2	6.5	17
1507	42	1	168	540	1.8	15.5	24
79 WT 1508	34	1	146	470	1.2	15.5	32

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hart Bichler

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: [redacted] 984-0221
AREA CODE: 604
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO: **Canadian Occidental Petroleum Ltd.,**
Minerals Division,
Ste. 311 215 Carlingview Dr.,
Rexdale, Ont.

ATTN: WATSU-MOX-Heavy Minerals E. Sacks

CERTIFICATE NO. 49349
INVOICE NO. 32463, Th - 32606
RECEIVED Aug. 3/79
ANALYSED Sept. 7/79

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM Sn	PPM W	PPM U	PPM Th (N.A.)
79 WT 1508	118	10	980	800	2.0	21	90	17.0	150
1340	74	10	285	400	3.0	24	80	23.5	210
79 WT 1296	96	6	196	156	1.8	180	100	15.5	110

	Total	-10 fraction	-10 magnetic	-10 Non mag.
79 WT 1508	457	427	1.73	18.52
1340	300	293	0.81	6.22
79 WT 1296	669	504	0.59	13.97

CERTIFIED BY: Hart Bichler

CHEMEX LABS LTD.

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NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: [redacted] 984-0221
AREA CODE: 604
TELEX: 043-52597

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49334

INVOICE NO. 31900

Th-32440

RECEIVED Aug. 3/79

ANALYSED Aug. 15/79

TO: Canadian Occidental Petroleum Ltd.
Minerals Division
Ste. 311 - 215 Carlingview Dr.
Rexdale, Ont. M9W 5X8

ATTN: PROJECT: Watsu-Mox-Soils CC: E. Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM Th
79WT1088	12	1	62	64	0.1	5.0	33
1089	12	1	22	56	0.1	4.0	14
1090	6	2	6	26	0.1	3.5	10
1091	6	1	16	20	0.1	2.5	11
1092	8	1	20	46	0.1	1.0	16
1094	8	1	54	64	0.2	5.0	32
1095	24	1	36	118	0.8	5.0	15
1096	22	2	58	110	0.6	27	19
1097	22	1	98	330	0.6	11.0	37
1098	12	2	20	78	0.2	2.0	17
1099	30	1	148	270	0.4	2.0	18
1281	8	1	6	42	0.2	2.0	12
1283	20	1	16	96	0.4	1.5	28
1284	22	1	12	98	0.4	3.5	27
1285	24	1	10	90	0.2	2.0	18
1286	30	1	36	114	1.0	3.0	24
1287	56	1	158	290	2.6	3.0	24
1288	62	1	120	200	3.2	2.5	22
1289	74	1	130	200	4.0	2.0	21
1291	12	1	24	68	0.4	3.5	35
1292	6	1	16	54	2.4	3.0	25
1502	68	2	730	630	0.8	3.0	20
79WT1503	32	1	68	200	0.4	4.5	26

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hart Bichle

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49362
INVOICE NO. 31943
Th-32440
RECEIVED Aug. 3/79
ANALYSED Aug. 16/79

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

ATTN: Watsu-Rock CC. E. Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM Th	PPM Sn	PPM W
ES-Bigox-2c	2	2	8	16	0.1	7.5	9	1	12
3	2	2	18	2	0.1	4.5	43	1	4
4	2	1	12	2	0.1	4.0	41	1	15
4a	4	6	6	10	0.2	5.5	17	1	1
5	2	3	2	8	0.2	3.0	6	1	1
ES-Bigox-6	4	1	6	24	0.2	7.5	43	2	1
JH-Wox-1	12	47	16	6	0.4	23.5	29	1	12
2	6	1	6	18	0.2	3.5	32	2	6
JH-Wox-3	2	1	4	10	0.1	22.0	44	1	10
ES-Wox-1	10	2	4	8	0.2	1.5	15	1	1
2a	12	1	2	26	0.4	1.5	15	1	1
2b	32	7	2	8	0.4	1.5	17	2	1
3	4	15	8	14	0.1	9.5	21	1	10
4	90	3	2	10	0.2	5.0	10	1	1
5	2	1	6	12	0.1	12.5	43	1	3
ES-Wox-6	40	1	1	72	0.1	< 0.5	1	1	1
ES-Sal-1	2	1	4	42	0.1	4.5	10	1	1
2	2	1	4	48	0.1	3.5	14	2	1
3	26	2	4	76	0.2	1.0	5	2	1
4	4	1	6	44	0.1	2.5	13	1	1
5a	8	1	10	24	0.1	15.5	4	1	20
5b	2	1	10	40	0.1	3.0	6	1	10
ES-Sal-6	8	1	6	56	0.1	3.5	20	1	2
JH-Pisa-1	8	1	4	44	0.1	1.5	16	1	2
2	4	1	4	104	0.1	1.0	7	1	1
3	8	1	2	58	0.1	2.5	15	1	1
4a	16	1	2	54	0.2	3.5	13	1	2
4b	2	1	4	4	0.1	2.0	3	1	8
5	6	1	22	16	0.1	23.0	2	1	1
6	6	1	74	290	0.1	7.5	34	1	5
JH-Pisa-7	2	1	6	50	0.1	6.5	22	1	3
ES-Mox-1	4	1	10	52	0.4	4.0	25	1	2
2	6	1	38	14	0.1	1.0	4	1	2
3	16	1	18	270	0.2	2.0	20	1	1
4	12	2	4	98	0.4	0.5	15	1	3
5	4	1	12	22	0.2	2.0	23	1	2
6	12	1	14	48	0.1	1.0	16	1	3
7a	4	1	12	42	0.1	0.5	21	1	1
7b	24	1	8	82	0.1	2.0	26	1	1
ES-Mox-7c	38	2	6	90	0.4	0.5	14	1	3

CERTIFIED BY: Hart Bichler

CHEMEX LABS LTD.

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AREA CODE: 604
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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49363
INVOICE NO. 31943
RECEIVED Aug. 3/79
ANALYSED Aug. 16/79

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

ATTN: WATSU-Rocks CC. E. Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM Th	PPM Sn	PPM W
ES-Mox-7D	24	2	14	54	0.2	1.0	16	1	1
8	198	2	6	22	0.8	1.5	19	1	1
9	48	1	4	72	0.6	1.0	23	1	3
10	1100	4	>4000	>4000	>20	0.5	1	1	5
ES-Mox-11	1250	3	184	280	19	1.5	6	1	4
JH-Mox-1	20	1	32	28	0.2	<0.5	8	1	1
2	32	1	10	66	0.4	<0.5	6	1	1
3	48	1	132	198	2.8	1.0	51	1	1
4	16	1	4	116	0.2	0.5	18	1	1
5	76	2	6	12	0.2	<0.5	5	1	1
6	6	1	16	104	0.1	0.5	28	2	1
7	4	1	1	62	0.1	0.5	3	1	1
8	6	1	6	58	0.1	0.5	19	2	1
JH-Mox-9	14	2	4	134	0.2	0.5	7	1	1
ES-Pisa-1	20	1	2	8	0.2	4.0	18	1	1
2a	28	1	6	22	0.1	1.0	10	1	1
2b	6	1	6	2	0.2	0.5	2	1	1
3	38	1	6	4	0.1	5.0	5	1	2
4	6	1	8	2	0.1	7.0	2	2	1
5	4	2	4	34	0.2	1.0	34	2	1
6	4	1	8	84	0.1	0.5	6	1	1
ES-Pisa-7	2	1	6	52	0.1	20.5	38	2	1

CERTIFIED BY: Hart Bichle

CHEMEX LABS LTD.

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TELEPHONE: [redacted] 984-0221
AREA CODE: 604
TELEX: 043-52597

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CERTIFICATE OF ASSAY

CERTIFICATE NO. 66171

INVOICE NO. 33296

RECEIVED September 5, 1979

ANALYSED October 18, 1979

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division
311 - 215 Carlingview Dr.,
Rexdale, Ont.
M9W 5X8 ATTN: E. Sacks

ATTN:

SAMPLE NO. :	% Pb	% Zn	% Sn	% WO_3	oz/ton Ag
H M 71			NSS		
E S TOOZ 7B				1.53	
E S RAN 3					1.56
E S MOX 10	1.12	1.11			1.88

MEMBER CANADIAN TESTING ASSOCIATION

REGISTERED ASSAYER, PROVINCE OF BRITISH COLUMBIA

APPENDIX II - ROCK DESCRIPTIONS, TRACE ELEMENT CONTENTS

Sample No. (Scint BGS-4) cps	Name	Description	Analyses (ppm) Cu	Mo	Pb	Zn	Ag	U	Th	Sn	W
ES-MOX-1 (275)	Bi quartz-monzonite	K-feldspar (40%), plag.(30%), qtz(10%), biotite(5%), muscovite (trace) - med. gr., massive	4	1	10	52	0.4	4	25	1	3
ES-MOX-2 (330)	Hematite bearing vuggy quartz	Massive quartz with vugs coated by euhedral quartz crystals; disseminated massive, black, hematite with limonite holes	6	1	38	14	0.1	1	4	1	2
ES-MOX-3 (475)	Altered bi quartz-monzonite	As ES-MOX-1; clay and lt alternation of feldspars, vugs develop along fractures; gossan zone	16	1	18	270	0.2	2	20	1	1
ES-MOX-4 (250)	Fine-grained banded marble -skarn	V. f. gr. marble bands alt. with bi-cht bands; marble bears Po; very hard, very dense, slight crenulation of banding	12	2	4	98	0.4	0.5	15	1	3
ES-MOX-5 (350)	Altered bi qtz-monzonite	As ES-MOX-3 in fracture zone	4	1	12	22	0.2	2	23	1	2
ES-MOX-6 (300)	Altered bi qtz-monzonite	As ES-MOX-3; brecciation	12	1	14	48	0.1	1	16	1	3
ES-MOX-7a (275)	Bi qtz-monzonite	Med.gr. massive, white	4	1	12	42	0.1	0.5	21	1	1
ES-MOX-7b	Bi qtz-fsp schist	V. fine-grained; lt alt^{n} of bi; slight augen development in fspar, qtz	24	1	8	82	0.1	2	26	1	1
ES-MOX-7c	Leucocratic aplite (migmatite?)	F. grained qtz (50%) fsp(50%) no mafics except sma pod of biotite-c.b. felsic segregation	38	2	6	90	0.4	0.5	14	1	3

APPENDIX II - ROCK DESCRIPTIONS, TRACE ELEMENT CONTENTS

Sample No. int BGS-4) cps	Name	Description	Analyses (ppm) Cu	Mo	Pb	Zn	Ag	U	Th	Sn	W
ES-MOX-7d	Fluorite pyrite bearing marble (skarn)	Fine to med. gr. marble with 5% disseminated green fluorite and 5% altered pyrite	24	2	14	54	0.2	1	16	1	1
ES-MOX-8 (250-300)	Massive sulphide	Massive Po, CPy in alt. green, aphanitic siliceous material, gossan coating	198	2	6	22	0.8	1.5	19	1	1
ES-MOX-9	Rusty weathering qtz-fsp schist	Med. gr. limonitic, qtz-fsp schist-sheared bi-qtz monz? - trace pyrite (hematite?)	48	1	4	72	0.6	1	23	1	3
ES-MOX-10 (250-300)	Skarn	Fine-grained galena, pyrite, fluorite in skarnified carbonate	1100	4	>4000 (1.1%)	>4000 (1.1%)	(1.9) oz	.5	1	1	5
ES-MOX-11 (250-300)	Skarn	Fine-grained siliceous skarn, malachite stain, trace pyrite, trace CPy	1250	3	184	280	19	1.5	6	1	4
JH-MOX-1 (220)	Bi qtz-monz + peg.	Med. gr. bi qtz-monzonite with coarse gr. qtz-peg. phase showing graphic texture	20	1	32	28	0.2	<.5	8	1	1
JH-MOX-2 (150)	Bi qtz - fsp. schist (meta-semi pelite)	F. gr. bi-qtz-fsp. schist cut by qtz-fsp peg. vein parallel to foliation	32	1	10	66	0.4	<.5	6	1	1
JH-MOX-3 (260)	Quartz-monzonite	Med. gr., massive, leucocratic, 1% Bi	48	1	132	198	2.8	1	5	1	1
JH-MOX-4 (165)	Bi-chl -fsp augen gneiss	Fsp (plag) augen in foliated bi-chl(Hb?) gdmass	16	1	4	116	0.2	<.5	5	1	1

APPENDIX II - ROCK DESCRIPTIONS, TRACE ELEMENT CONTENTS

Sample No. (Scint BGS-4) cps	Name	Description	Analyses (ppm) Cu	Mo	Pb	Zn	Ag	U	Th	Sn	W
JH-MOX-5 (160)	Quartz limonite rock	Fine-grained quartz grains in limonite-goethite matrix, cubic holes c.b. weathered pyrite; very dense	76	2	6	12	0.2	<.5	.5	1	1
JH-MOX-6 (230)	Chlorite biotite, quartz-feldspar breccia (schist)	Fsp and qtz-frags in schist -ose bi-chl gdmass	6	1	16	<u>104</u>	0.1	0.5	28	2	1
JH-MOX-7 (100)	Skarn	Banded marble; dk. grey bi bearing bands alt. with greenish -white mafic deficient band; trace Py, Po	4	1	1	62	0.1	0.5	3	1	1
JH-MOX-8 (250)	Fine gr. quartz-feldspar porphyry	Beige, aphanitic, massive, disseminated limonite boxworks; dense	6	1	6	58	0.1	0.5	19	2	1
JH-MOX-9 (250)	Fine-grained bi-diorite	Bi up to 25% with qtz+plag; f.gr. to m.gr.; biotite forms rosetts	14	2	4	<u>134</u>	0.2	0.5	7	1	1

Appendix III - Sampling and Laboratory Procedures

I. SAMPLING PROCEDURES

A) Heavy Minerals

1. A sample site is selcted which exhibits maximum sorting of stream bed material. Active (below water) or previously active (dry now but previously below water) sites may be chosen. Leading edges or sides of gravel bars with large boulders are most attractive. In practice, the ideal case is rare and one chooses the best possible site.

2. Gravel and cobble material is shoveled into a large (18" to 24") gold pan into which 1/4" holes have been drilled. The material is vigourously shaken in still water so that - 1/4 in. material passes the screen into a second, matching pan. Enough -1/4 in. material is collected to fill an 18" x 24" poly bag (usually one large pan or two smaller ones). The -1/4" material is returned to camp.

3. The - 1/4 in. material is panned to achieve a concentrate of heavy minerals and aggregates containing heavy minerals. Approximately 80% of the original material (20 - 25 lbs) is discarded while a 1 - 2 lb. concentrate is obtained. The concentrate is sealed in a plastic or cloth bag (cloth is preferred as it allows

the sample to dry, thus reducing shipping weight)and then sent to the laboratory for geochemical analysis.

B) <u>Stream Sediment</u>

1. A presently or previously active stream site is selected which exhibits minimum sorting ie. quiet water, and accumulation of fine sandy and silty material. If the stream is too active, material can be obtained from bank-moss which acts as a trap, or by digging out the lee of large boulders.

2. Three to four handfuls of material is collected and after squeezing to remove excess water is placed in high wet-strength, heavy duty, prenumbered kraft envelopes. The samples are dried in the field and then sent to the laboratory for geochemical analysis.

C) <u>Stream Water</u>

1. A 4 oz. poly bottle is rinsed with the sample site water at least three times then filled fully and tightly capped. The sample is tested in the field for pH and specific conductivity, then sent to the laboratory for geochemical analysis.

2. Care should be taken to avoid contamination by always collecting waters up-stream from a heavy mineral or sediment sample site.

D) Soil

1. 'B' horizon or talus fine material is sampled.

2. Three to four handfuls of material are collected into heavy duty, high wet-strength kraft envelopes which are dried in the field and then sent to the laboratory for analysis.

E) Sample Site Information Card

1. At each soil or stream sample site, an 80 column field data card is completed. The sampler records such information as sample number, location and type, depth of stream, sample composition, vegetation, drainage, etc. Separate cards are used for stream and soil samples in order to record pertinent information.

II. Laboratory Procedures

A. Sample Preparation

i) Heavy Minerals

1. Samples dried and weighed.

2. Screen - 10 mesh material from sample and weigh; weigh and retain +10 mesh material left on screen.

3. Use -10 mesh fraction for heavy liquid separation.

4. Transfer -10 mesh (fine) fraction into a 1000 ml. separatory funnel containing 200 mls. of tetrabromoethane (S.G. 2.96).

5. Shake sample gently in heavy liquid. Particles of fines adhering to sides of the separatory funnel can be washed into the heavy liquid by slowly rotating the funnel at an oblique angle. The "heavies" (S.G. $>$2.96) will slowly settle to the bottom of the heavy liquid.

6. Drain the "heavies" into a small filter funnel. Drain excess heavy liquid and light materials into a separate filter funnel. Collect all heavy liquid into a waste receiving bottle.

7. Save light minerals (S.G. $<$2.96). Wash "heavies" fraction with methanol to remove residual tetrabromoethane. Use the same procedure on light minerals fraction. Dry both fractions and weigh. Retain the "lights" in a suitable sealed container. Save 0.5 gm of "heavies" in a plastic vial for visual examination.

8. Pulverize the remaining "heavies" in an agate mortar and pestle and homogenize before weighing for analyses.

9. Analyse the "heavies" powder for appropriate elements. The number of elements analysed for is determined by the amount of "heavy" material obtained in separation.

ii) Stream Sediments

1. Samples are sorted and dried at 50^{o}c for 12 to 16 hours.

2. Dried material is then screened to obtain the -80 mesh (177 micron) fraction. The rest of the material is discarded.

3. -80 mesh fraction material is weighed and analysed for appropriate elements.

iii) Soils

Same procedure as for stream sediments.

iv) Rocks

1. Entire sample is crushed.

2. If necessary (>250 gms.). The sample is split on a Jones splitter, the reject is retained for a short period.

3. The split fraction is pulverized in a ring grinder such that 90% passes a 200 mesh (74 micron) sieve.

4. The -200 mesh material is weighed and analysed for the appropriate elements.

v) Waters

See individual element descriptions for U and F.

B. Elemental Analyses

i) ppm Copper, Lead, Zinc, Silver, Molybdenum (Atomic Absorption)

1. A 1.0 gm portion of -80 mesh soil or stream sediment or -200 mesh rock flour or pulverized "heavies" is digested in concentrated, hot, perchloric - nitric acid ($HClO_4$-HNO_3) for 2 hours.

2. Digested sample is cooled and made up to 25 mls. with distilled water.

3. Solution is mixed and solids allowed to settle.

4. Cu, Pb, Zn Ag and Mo are determined by atomic absorption, using background correction for Pb and Ag analyses.

Element	Bkgd. Corr.	Flame Type	Wave Length hm	Detection Limit	Chemex Standard	± 1 Std. Deviation
Cu	No	A	324.7	1 ppm	71 ppm	± 3
Pb	Yes	A	217.0	1 ppm	59 ppm	± 1
Zn	No	A	213.8	1 ppm	52 ppm	± 3
Ag	Yes	A	328.1	0.2 ppm	8.5 ppm	± 0.5
Mo	No	N	313.3	1 ppm	25 ppm	± 1

A = Air acetylene flame.

N = Nitrous oxide - acetylene flame.

ii) ppm Tin (Sn) (Atomic Absorption)

1. A 1.0 gm sample of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is scintered with ammonium iodide.

2. The resulting tin-iodide is leached with a dilute HCl - ascorbic acid solution.

3. The TOPO complex is then extracted into MIBIC (Methyl isobutyl ketone) and anaylsed via atomic absorption.

4. Detection limit: 1 ppm Sn

iii) ppm Tungsten (W) (Colourimetric)

1. 0.5 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is fused with potassium bisulfate and leached with HCl.

2. The reduced form of W is complexed with toluene 3, 4 dithiol and extracted into an organic phase.

3. The resulting colour is visually compared to similarly prepared standards. (Colourimetric method)

4. Detection limit: 2 ppm W

iv) ppb Gold (Au) (Atomic Absorption)

1. A 5 gm sample of -200 mesh rock flour or pulverized "heavies" is ashed at 800^{o}c for 1 hour.

2. Ashed material is digested with aqua regia twice to dryness.

3. Digested material is taken up in 25% HCl.

4. Au is extracted as the bromide into MIBK and analysed via atomic absorption.

5. Detection limit: 10 ppb Au

v) ppm Thorium (Th) (Neutron Activation)

1. 1 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is weighed into a polyethelene vial and heat sealed.

2. Samples, along with standards, are then irradiated

for sufficient periods to receive a neutron dose of 1-3 X 10^{10} to $10^{15}/cm^2$.

3. Following irradiation, samples are cooled for at least one week and thorium determined by the measurement of its characteristic gamma ray, using a semiconductor (Ge (Li)) detector.

4. Detection limit: 1 ppm Th

vi) Uranium (U) (Fluorimetry)

A) Uranium in soils, stream sediments, "heavies", rocks.

1. 1 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is digested with hot, $HClO_4$-HNO_3 to strong fumes of $HClO_4$ for approximately 2 hours.

2. The digest is diluted to volume and mixed.

3. An aliquot is extracted into MIBK with the acid of an aluminum nitrate-tetrapropyl ammonium hydroxide salting solution. (TPAN)

4. Uranium in the MIBK is determined by evaporating a portion of the MIBK in a platinum dish and fusing with a mixture of $Na2CO_3$-K_2CO_3-NaF.

5. The fluorescence of the fused flux is measured to determine the uranium content.

6. Detection limit: 0.5 ppm U

B) Uranium in Water

1. A portion of the sample is filtered to remove sediment (if necessary), is acidified and then evaporated to dryness.

2. Residue is leached with a small volume of HCO_3.

3. Uranium in the leachate is extracted into MIBK, with the aid of TPAN salting solution.

4. Uranium is determined as for solid materials, above by fluorimetry.

5. Detection limit: 0.2 ppb U

vii) Fluorine (F) (Specific Ion Electrode)

A) F in soils, stream sediments, rocks, "heavies".

1. 0.25 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is fused with a 2:1 $NaCO_3$-KNO_3 mixture.

2. The melt is leached with water and citric acid, adjusted to pH 5.5 and the activity measured with a fluoride specific ion electrode.

3. Detection limit: 10 ppm F

B) F in Waters (Potentiometric)

1. An aliquot of the sample is filtered and treated with an equal volume of Total Ionic Strength Adjustment Buffer (TISAB) consisting of glacial acetic acid, sodium chloride and cyclohexanediamine tetraacetic acid.

2. The resulting solution is stirred for 3 minutes to allow the fluoride electrode to stabilize.

3. The F concentration is read from a specific ion meter which is calibrated frequently with freshly prepared standard fluoride solutions.

4. Detection limit: 0.02 ppb F

viii) <u>ppb Arsenic (As) (Atomic Absorption)</u>

a) <u>As in waters</u>

1. An aliquot of water is acidified with HCl and then reduced with potassium iodine to reduce As (V) to As (III).

2. A portion of this solution is further reduced with sodium borohydride to arsine, AsH_3.

3. The volatile arsine is swept into a heated cell in an atomic absorption spectrophotometer and decomposed to free arsenic to determine the arsenic concentration.

4. Detection limit: <u>2 ppb As</u>

ix) <u>pH</u>

1. pH in waters was determined in the field, using a portable pH meter.

2. The meter was standardized by means of buffer solutions, every 10th sample to minimize meter drift.

x) <u>Specific Conductivity (S.C.)</u>

1. S.C. in waters was determined in the field, using a portable S.C. meter.

2. The electrode was washed in a standard water, after each determination, to minimize and standardize contamination.

Appendix IV - Comments of R.H. Wallis' Visit to MOX Claims

MOX Claims: (1-60) NTS 105F11 August 1st, 1979

Commodity (Ag-W-U-F-Pb) RHW, EJS, JH

A well developed central NNW valley, has a series of well developed cirques on both sides. Valley lies at 4500 feet with buckbrush and very rare scrub trees, almost all the property is open slopes, talus and rocky bluffs above the tree line. Generally easy topography, can lay a central baseline along the valley and run crosslines from it. 1500 feet or so relief.

1:50,000 topographic maps are available for this area.

According to Tempelman-Kluit (1977) the claims are predominantly underlain by:

Pn+ = Proterozoic and/or Lower Cambrian Injection Migmatite. Muscovite-biotite gneiss, augen gneiss with sills, dykes and plugs of fine-grained biotite-granite, biotite quartz-monzonite, aplite and pegmatite. Gradational to Pn and Pns = muscovite-biotite granodiorite-gneiss and augen gneiss. Contacts with Kqm arbitrary. At MOX Pn+ is just a highly diverse group of metasediments, and DT-K shows layers of lCc2 = ?Lower Cambrian, white weathering, resistant marble, recrystallized lime mud and bioclastic limestone.

This group of rocks is cut by KTFp, mid-Cretaceous feldspar porphyry dykes, light grey-green aphanitic groundmass with small, subhedral, white feldspar phenocrysts.

A large body of Kqm lies just southwest of the claims, Kqm, moderately resistant, light grey weathering, biotite quartz-monzonite, moderate to coarse-grained. Equigranular, generally lacks fabric, boundaries with Pn+ arbitrary, lacks small xenoliths but locally has large screens of metamorphic rocks.

Colour layering of the metasediments is very obvious, white marbles, limonitic pyritic metapelites, etc., the dominant element is well layered, well foliated metasediments with all ages and all stages of segregation and intrusive "granitic" veins.

Much porphyritic, megacrystic, quartz-monzonite about.

Visited area of marbles and metapelites with much sulphide making prominent gossan, intruded by massive bluff of quartz-monzonite and riddled with late pegmatites of muscovite-2 feldspars-quartz. Much late chlorite and epidote around.

Lots of sulphides present, pyrite-pyrrhotite-sphalerite-galena, malachite, garnet-diopside-epidote skarns.

Excellent mineralization but very small scale as yet found.

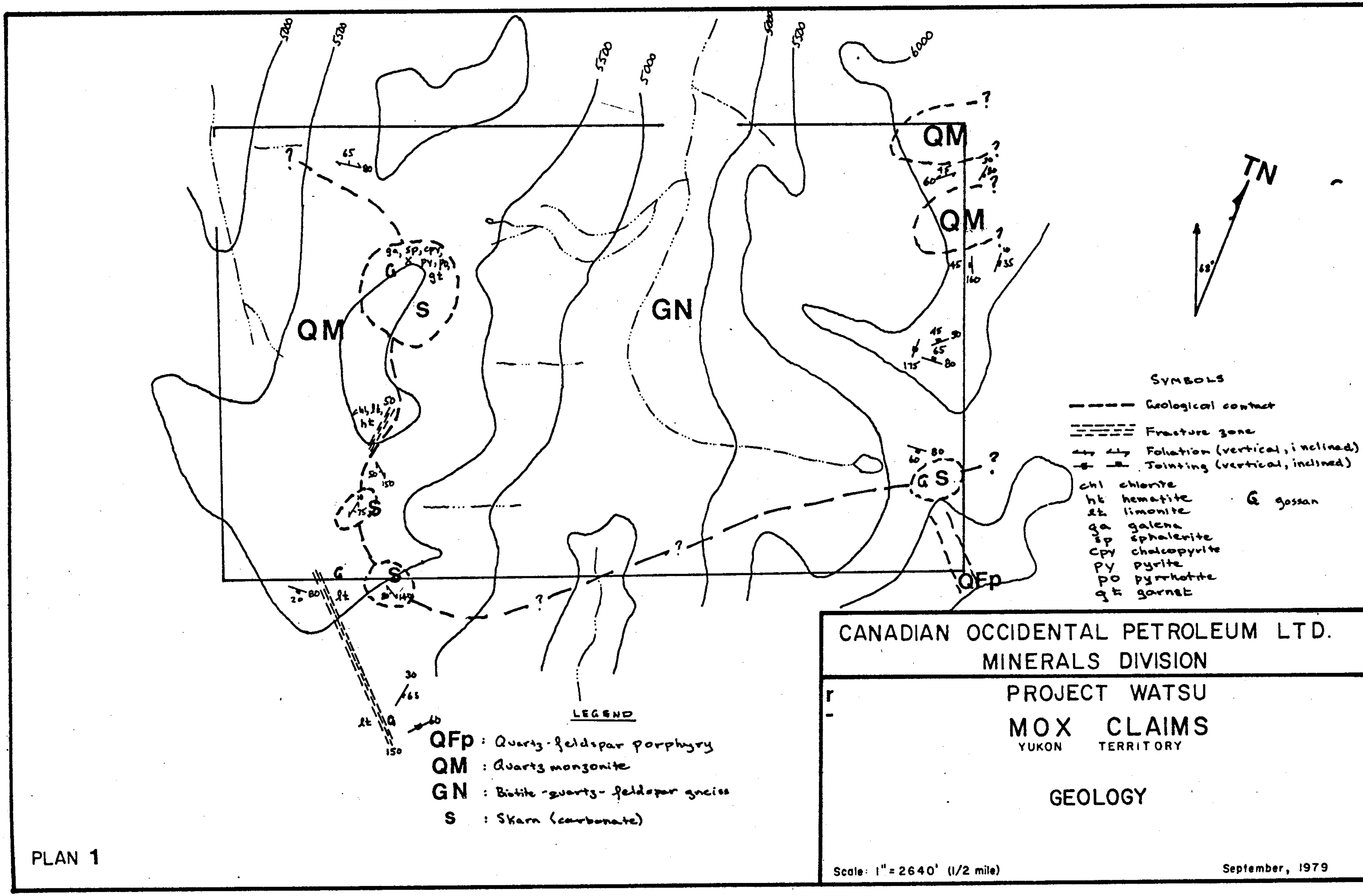
Appendix V - References

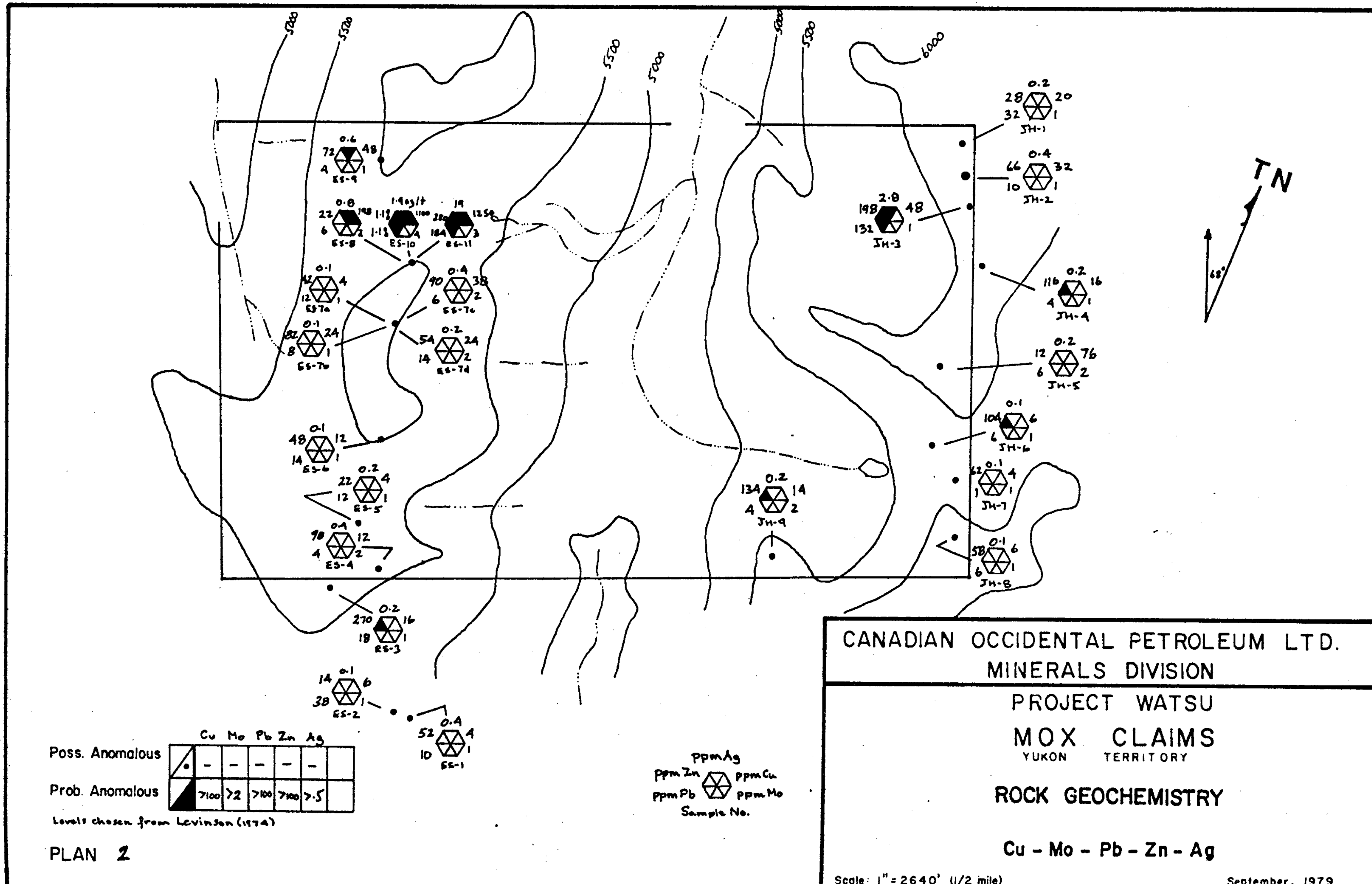
1. Geological Survey of Canada (1979): Stream Sediment Reconnaissance Sampling Survey, Southern Yukon; Geological Survey of Canada Open File Report 564, Sheet 105F

2. Levinson, A. (1974): Introduction to Exploration Geochemistry; Applied Publishing, Calgary

3. Tempelman-Kluit (1977): Geology of Quiet Lake (105F) and Finlayson Lake (105G) Maps-Areas; Geological Survey of Canada Open File Report 486 (3 sheets)

4. Wheeler, J.O., Green, L.H., and Roddick, J.A. (1960): Geology of Quiet Lake, Yukon Territory; Geological Survey of Canada Map 7-1960, Preliminary Series Sheet 105F


CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION
PROJECT WATSU
MOX CLAIMS
YUKON TERRITORY
GEOLOGY
Scale: 1" = 2640' (1/2 mile)
September, 1979
PLAN 1
TN
QM
GN
S
QFp
LEGEND
QFp : Quartz-feldspar porphyry
QM : Quartz monzonite
GN : Biotite-quartz-feldspar gneiss
S : Skarn (carbonate)
SYMBOLS
Geological contact
Fracture zone
Foliation (vertical, inclined)
Jointing (vertical, inclined)
chl chlorite
ht hematite
lt limonite
ga galena
sp sphalerite
cpy chalcopyrite
py pyrite
po pyrrhotite
gt garnet
G gossan
5000
5500
6000



CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

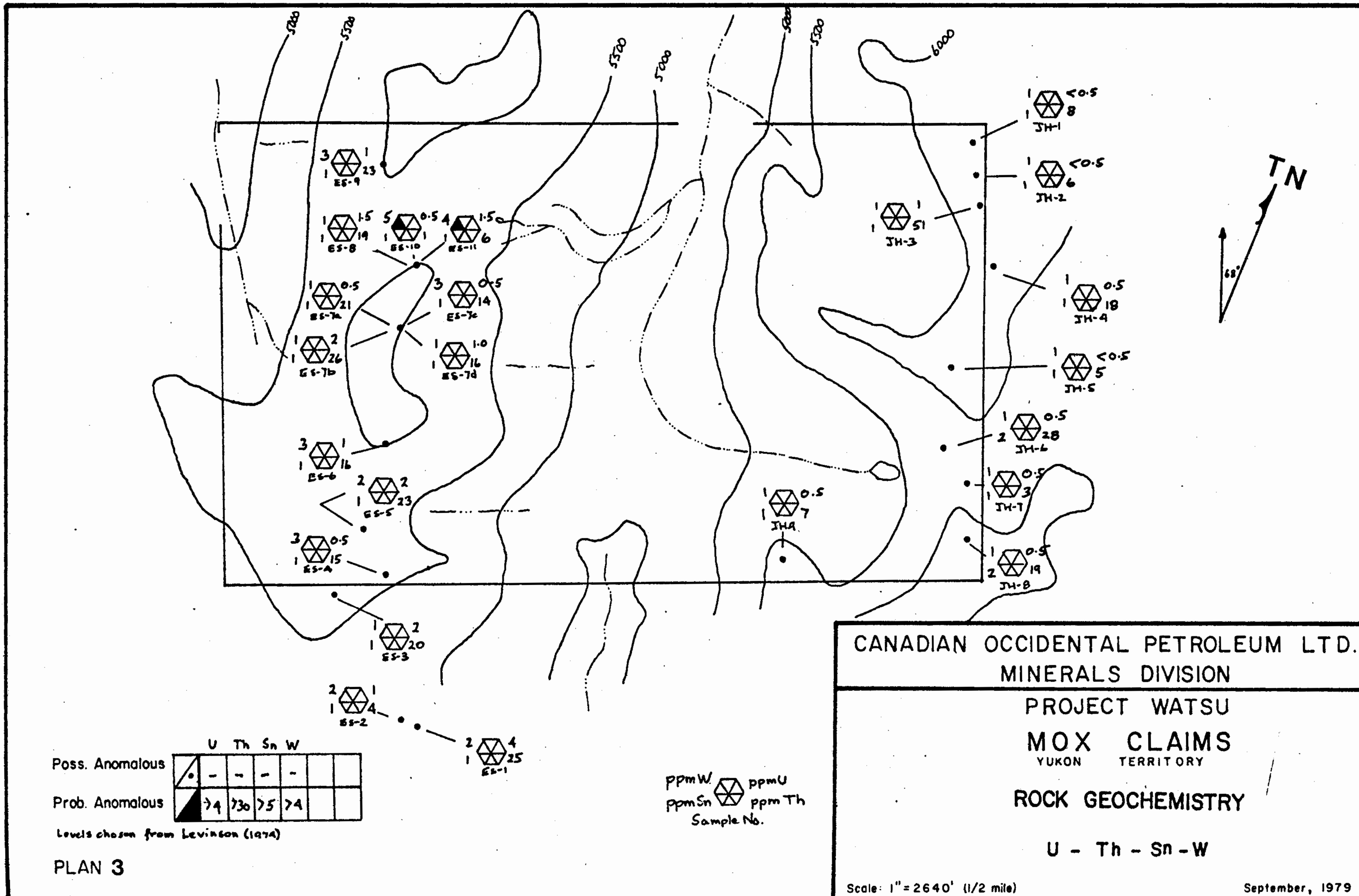
MOX CLAIMS
YUKON TERRITORY

ROCK GEOCHEMISTRY

Cu – Mo – Pb – Zn – Ag

Scale: 1" = 2640' (1/2 mile)

September, 1979



PLAN 3

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

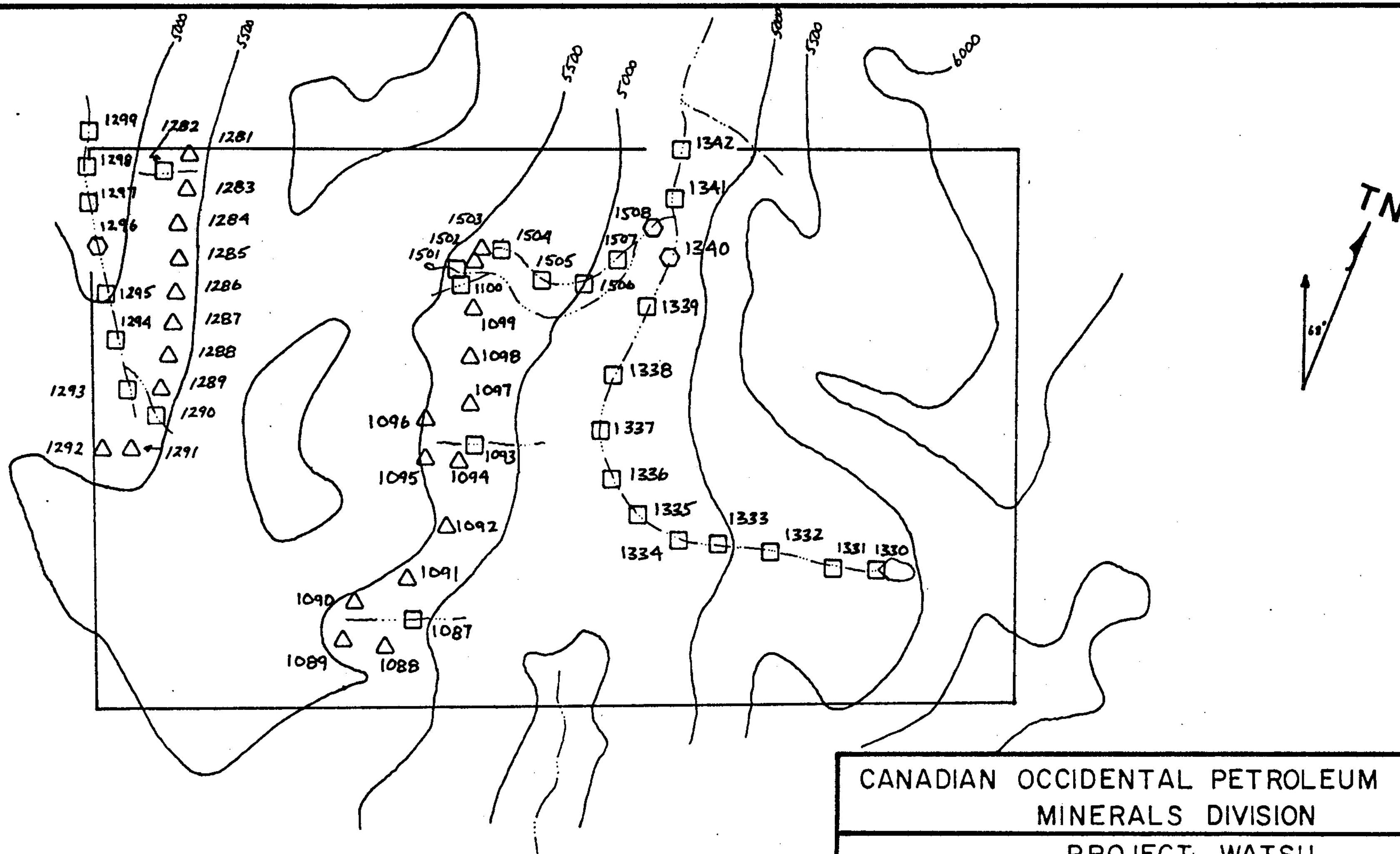
MOX CLAIMS
YUKON TERRITORY

ROCK GEOCHEMISTRY

U - Th - Sn - W

Scale: 1" = 2640' (1/2 mile)

September, 1979



LEGEND

△ Soil

□ Sediment & water

⬡ Heavy mineral & sediment & water

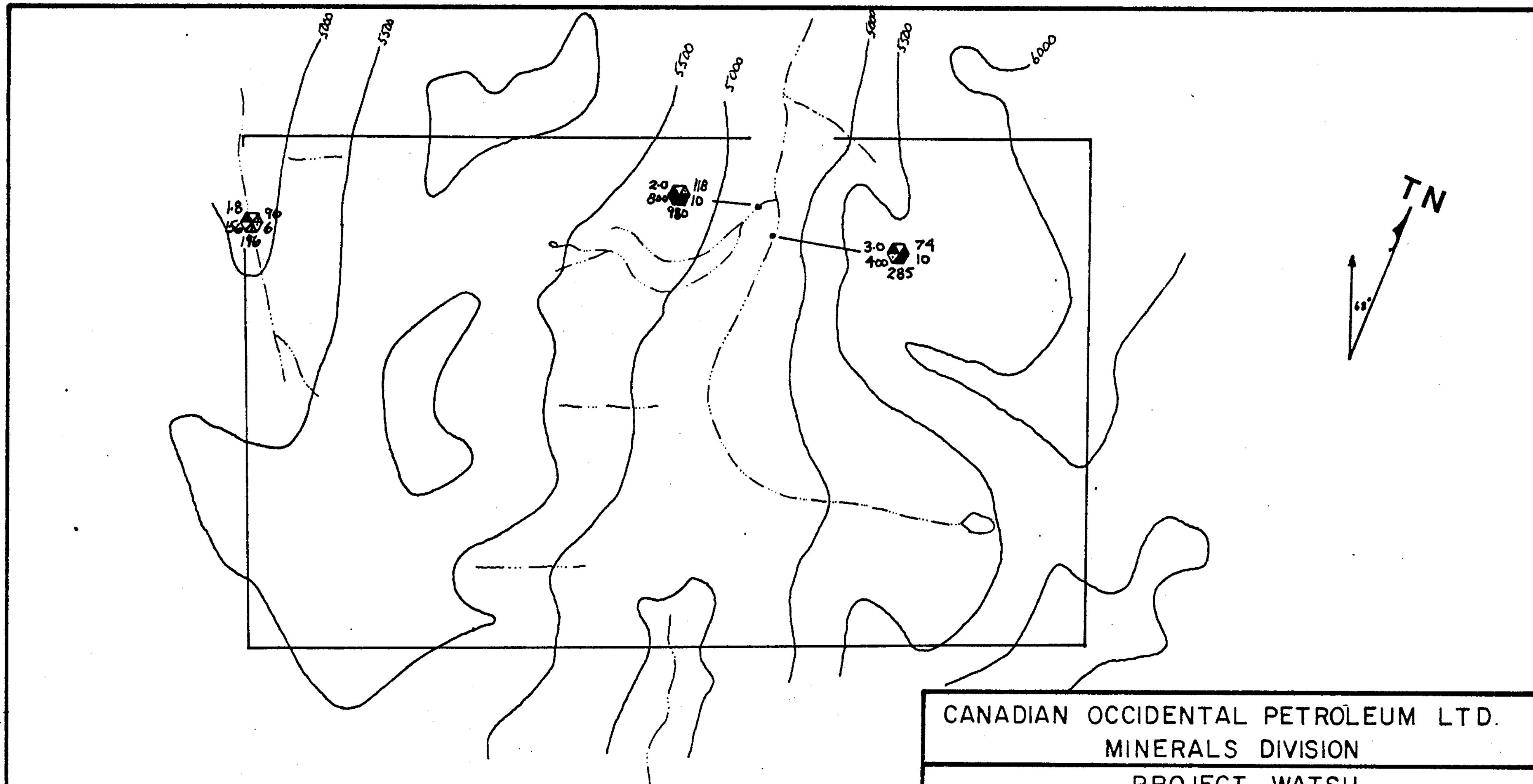
CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

MOX CLAIMS
YUKON TERRITORY

SAMPLE LOCATIONS

Scale: 1" = 2640' (1/2 mile) | 4 | September, 1979



	Cu	Mo	Pb	Zn	Ag	
Poss. Anomalous	63	3.5	89	200	.4	
Prob. Anomalous	165	8.5	280	440	.95	

LEGEND

ppm Ag ppm Cu
ppm Zn ppm Mo
ppm Pb

PLAN **5**

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

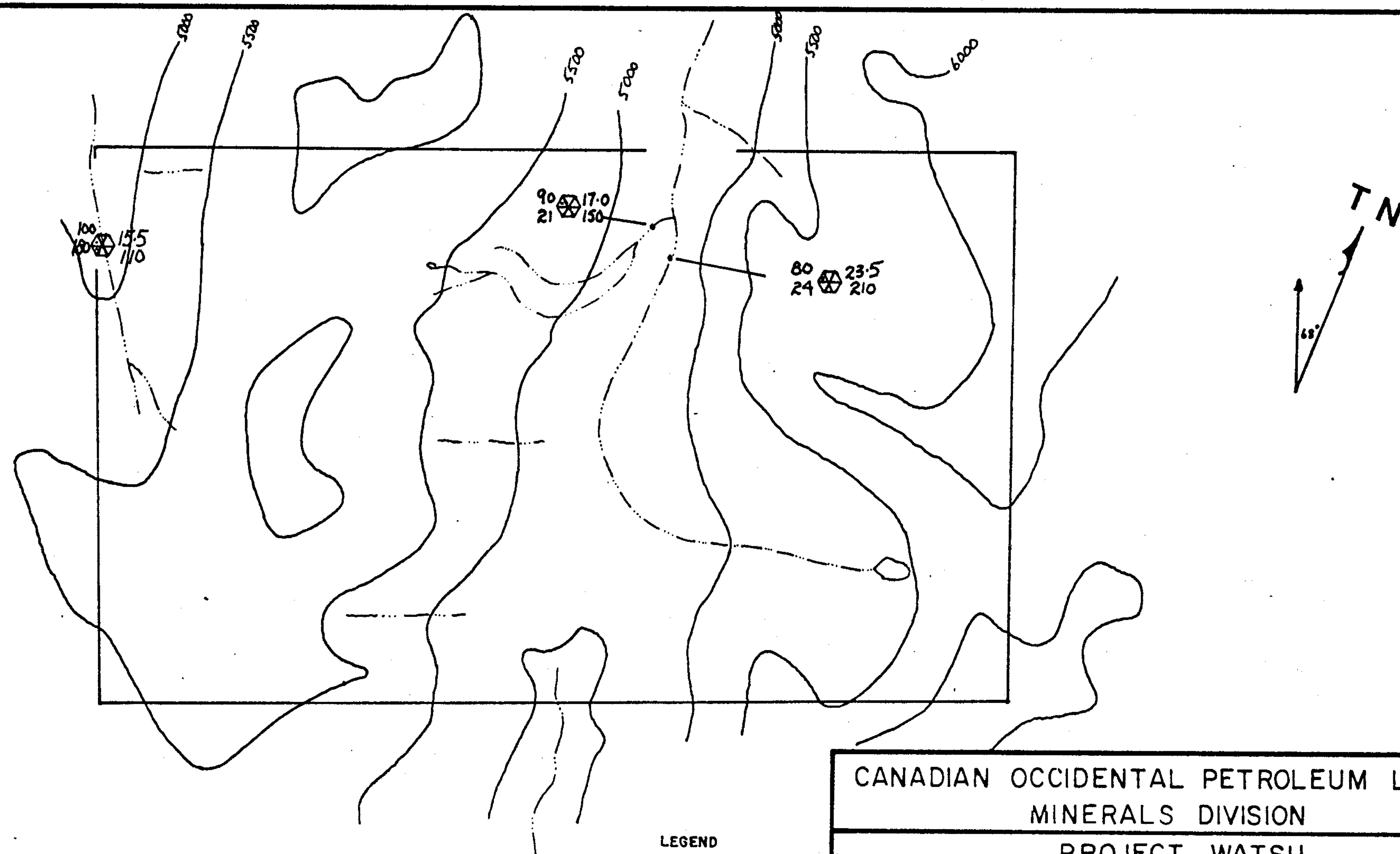
PROJECT WATSU

MOX CLAIMS
YUKON TERRITORY

STREAM HEAVY MINERALS GEOCHEMISTRY

Cu - Mo - Pb - Zn - Ag

Scale: 1" = 2640' (1/2 mile) September, 1979



LEGEND

		U	Th	Sn	W		
Poss. Anomalous	•	26	330	38	60		
Prob. Anomalous	◣	120	1200	300	160		

ppm W ⊛ ppm U
ppm Sn ppm Th

PLAN **6**

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

MOX CLAIMS

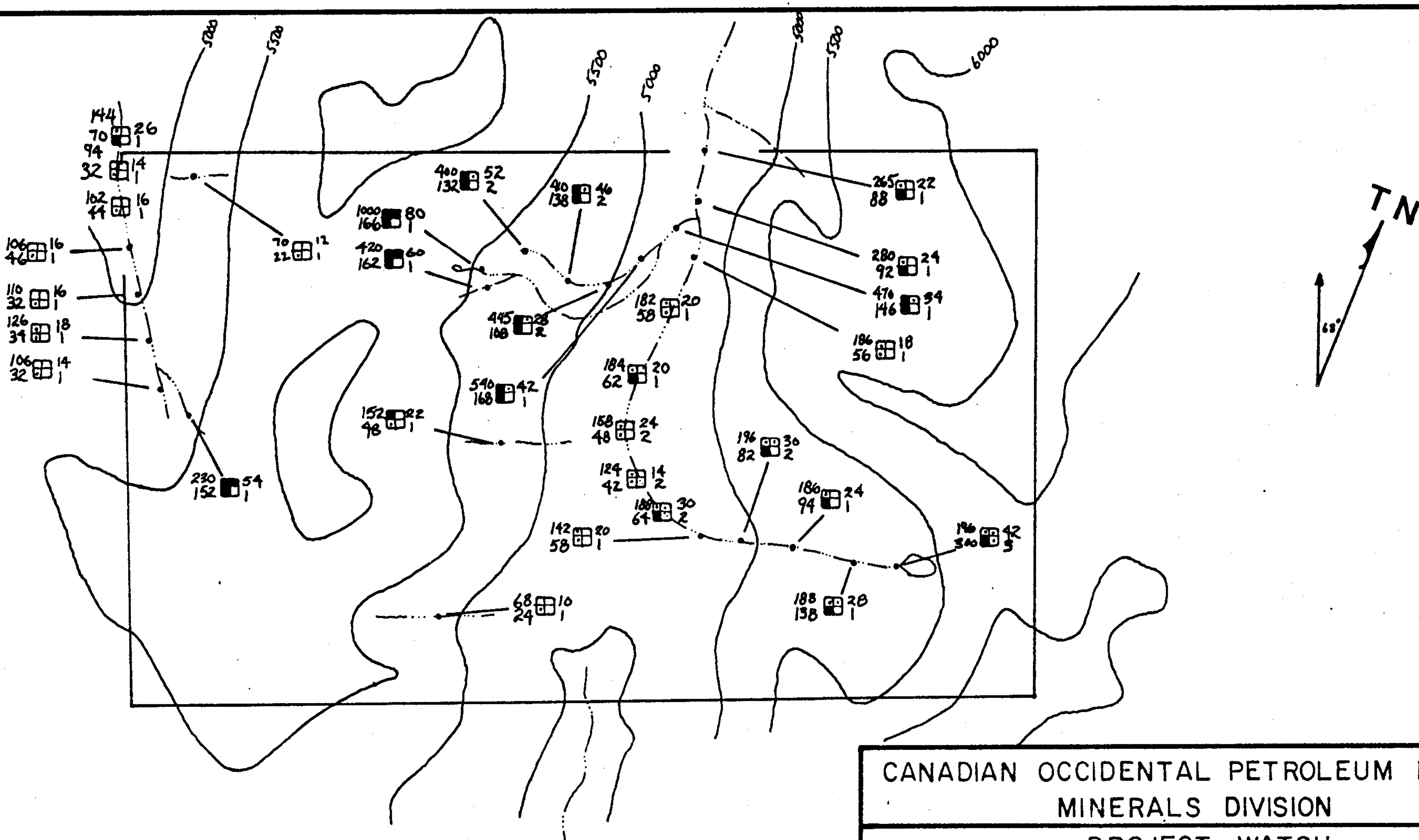
YUKON TERRITORY

STREAM HEAVY MINERALS GEOCHEMISTRY

U - Th - Sn - W

Scale: 1" = 2640' (1/2 mile)

September, 1979



	Cu	Mo	Pb	Zn		
Poss. Anomalous	28	3	21	115		
Prob. Anomalous	54	11	59	320		

LEGEND

ppm Zn / ppm Pb ⊞ ppm Cu / ppm Mo

PLAN 7

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

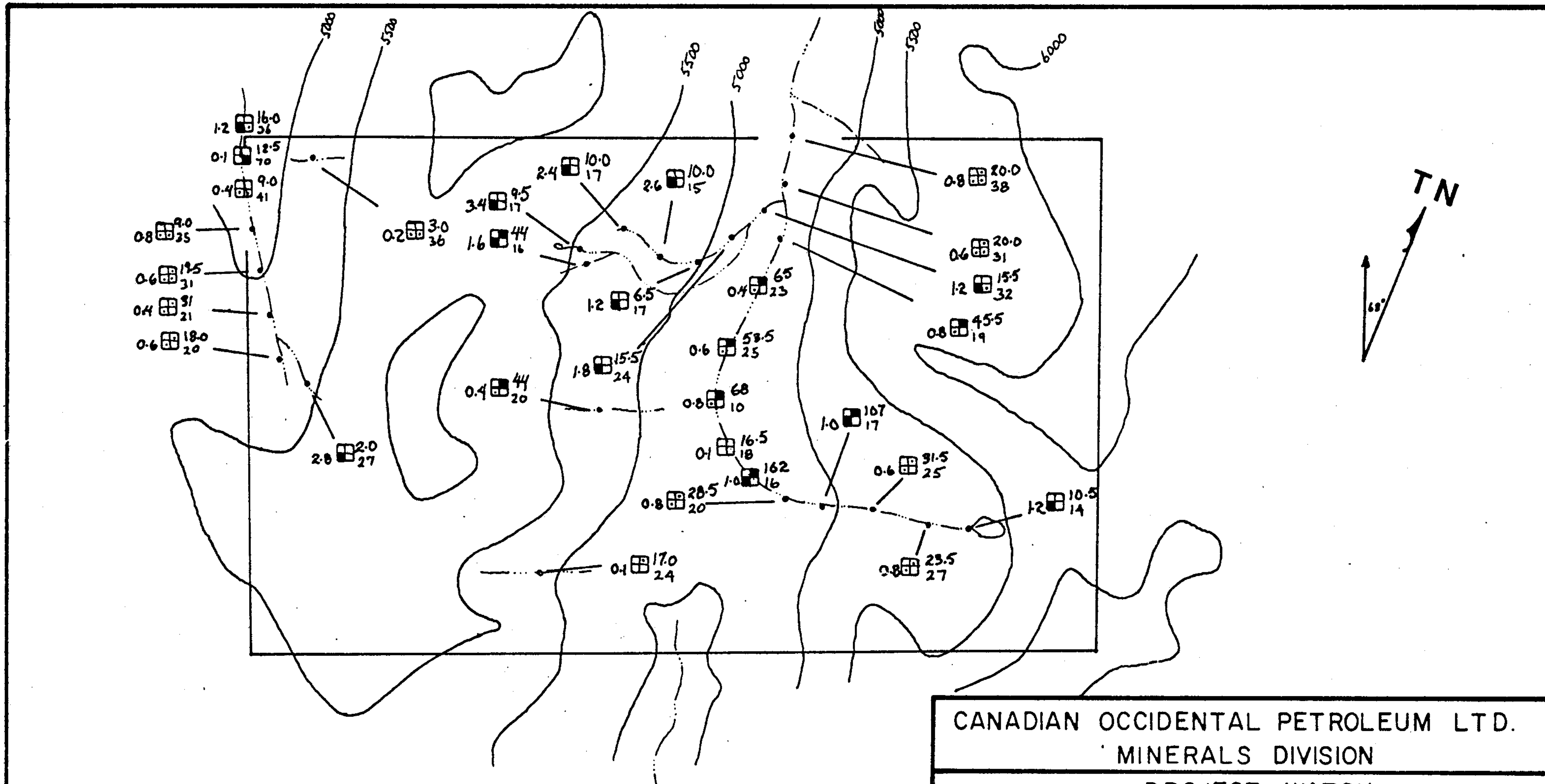
MOX CLAIMS
YUKON TERRITORY

STREAM SEDIMENT GEOCHEMISTRY

Cu - Mo - Pb - Zn

Scale: 1" = 2640' (1/2 mile)

September, 1979



	U	Th	Ag			
Poss. Anomalous	17	29	<1			
Prob. Anomalous	38	50	1			

LEGEND

ppm Ag ⊞ ppm U / ppm Th

PLAN 8

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

MOX CLAIMS

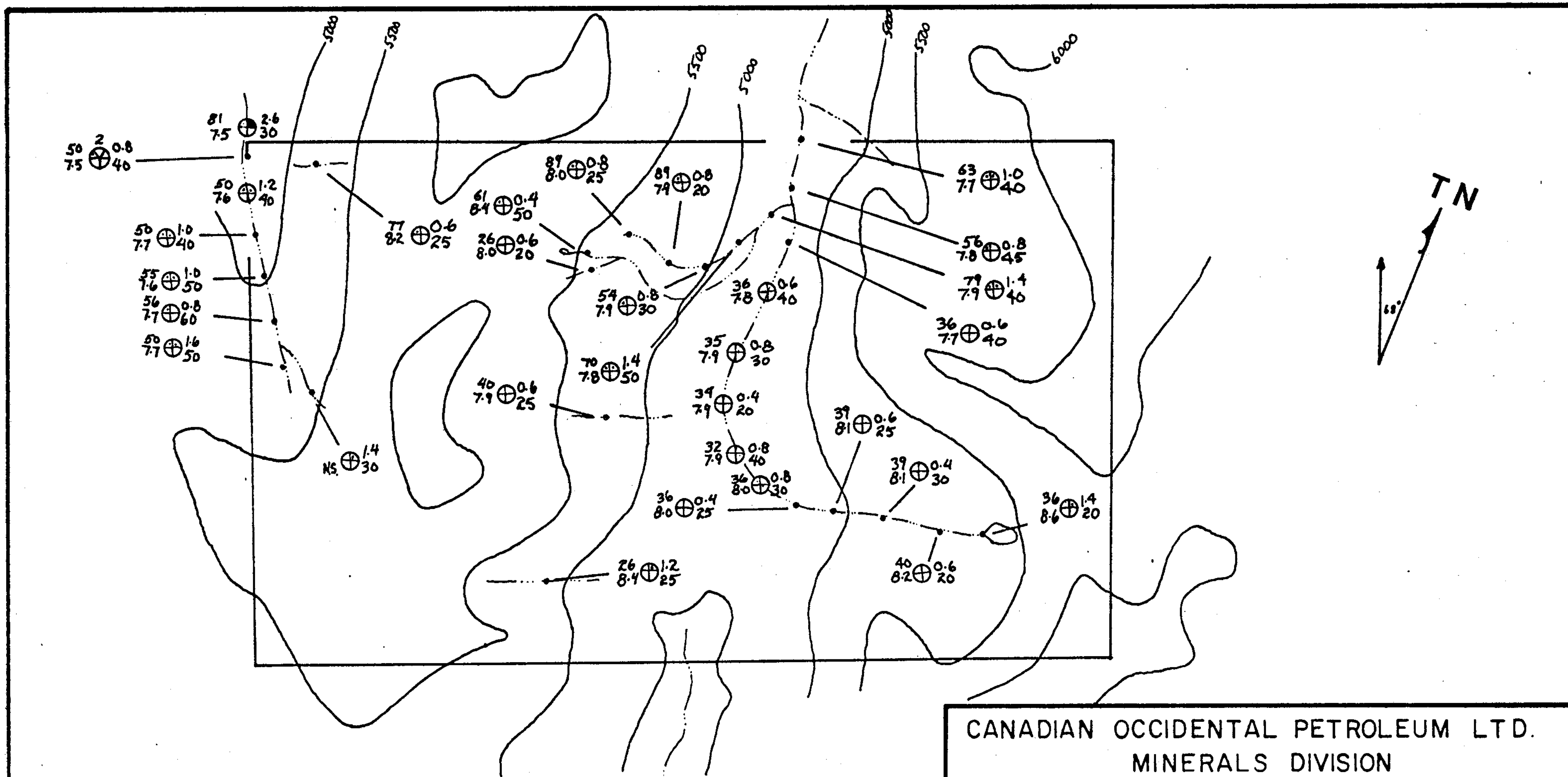
YUKON TERRITORY

STREAM SEDIMENT GEOCHEMISTRY

U - Th - Ag

Scale: 1" = 2640' (1/2 mile)

September, 1979



	U	F	As	S.C.		
Poss. Anomalous	.85	100	-	46		
Prob. Anomalous	2.5	210	-	100		

LEGEND

S.C. ⊕ ppb U ; As < 2ppb
pH ⊕ ppb F

ppb As
S.C. ⊕ ppb U
pH ⊕ ppb F

PLAN 9

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

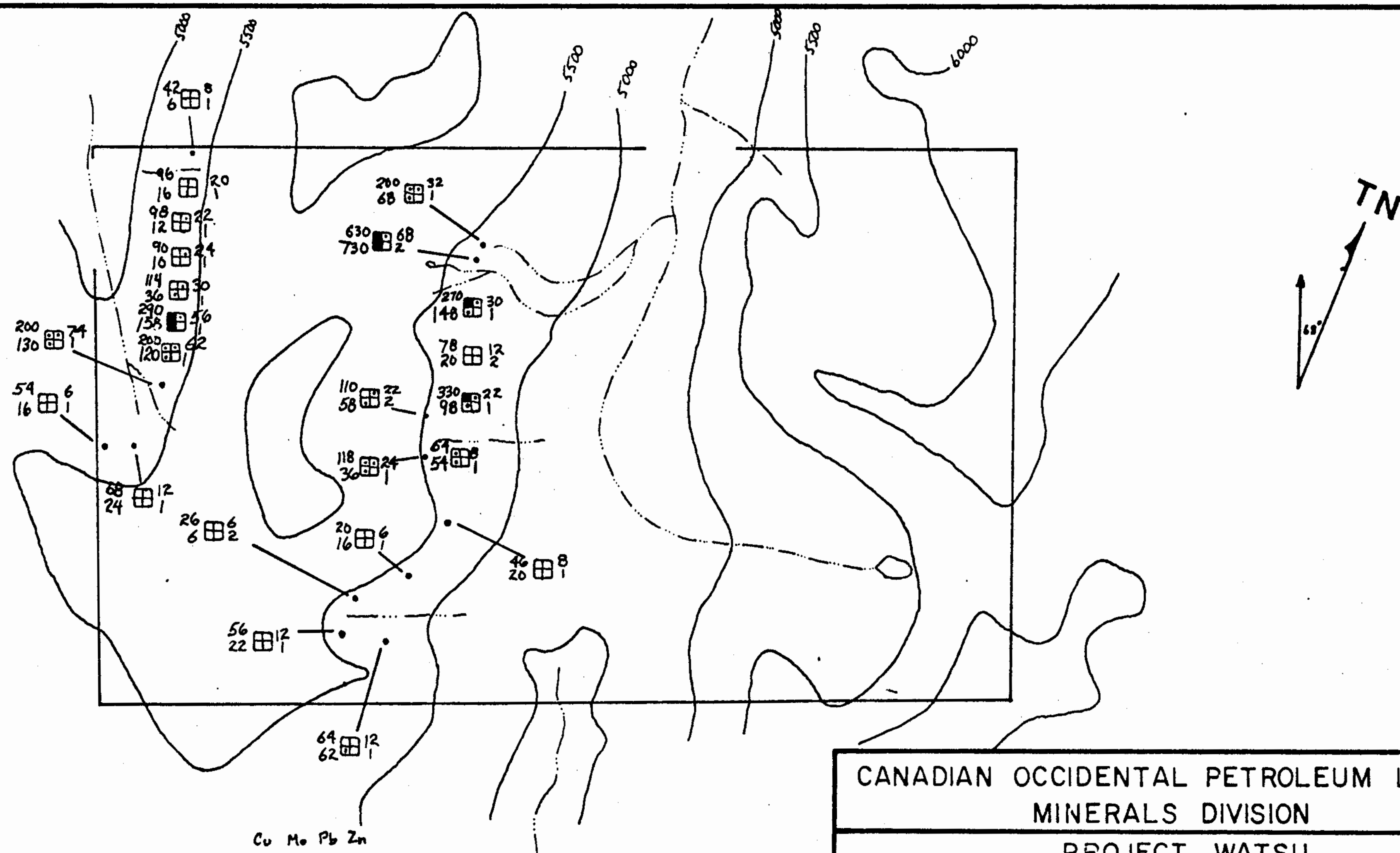
MOX CLAIMS
YUKON TERRITORY

STREAM WATER GEOCHEMISTRY

U - F - pH - SC - As

Scale: 1" = 2640' (1/2 mile)

September, 1979



		Cu	Mo	Pb	Zn		
Poss. Anomalous		22	2.5	32	115		
Prob. Anomalous		120	5	150	270		

PLAN 10

LEGEND

ppm Zn ⊞ ppm Cu
ppm Pb ⊞ ppm Mo

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

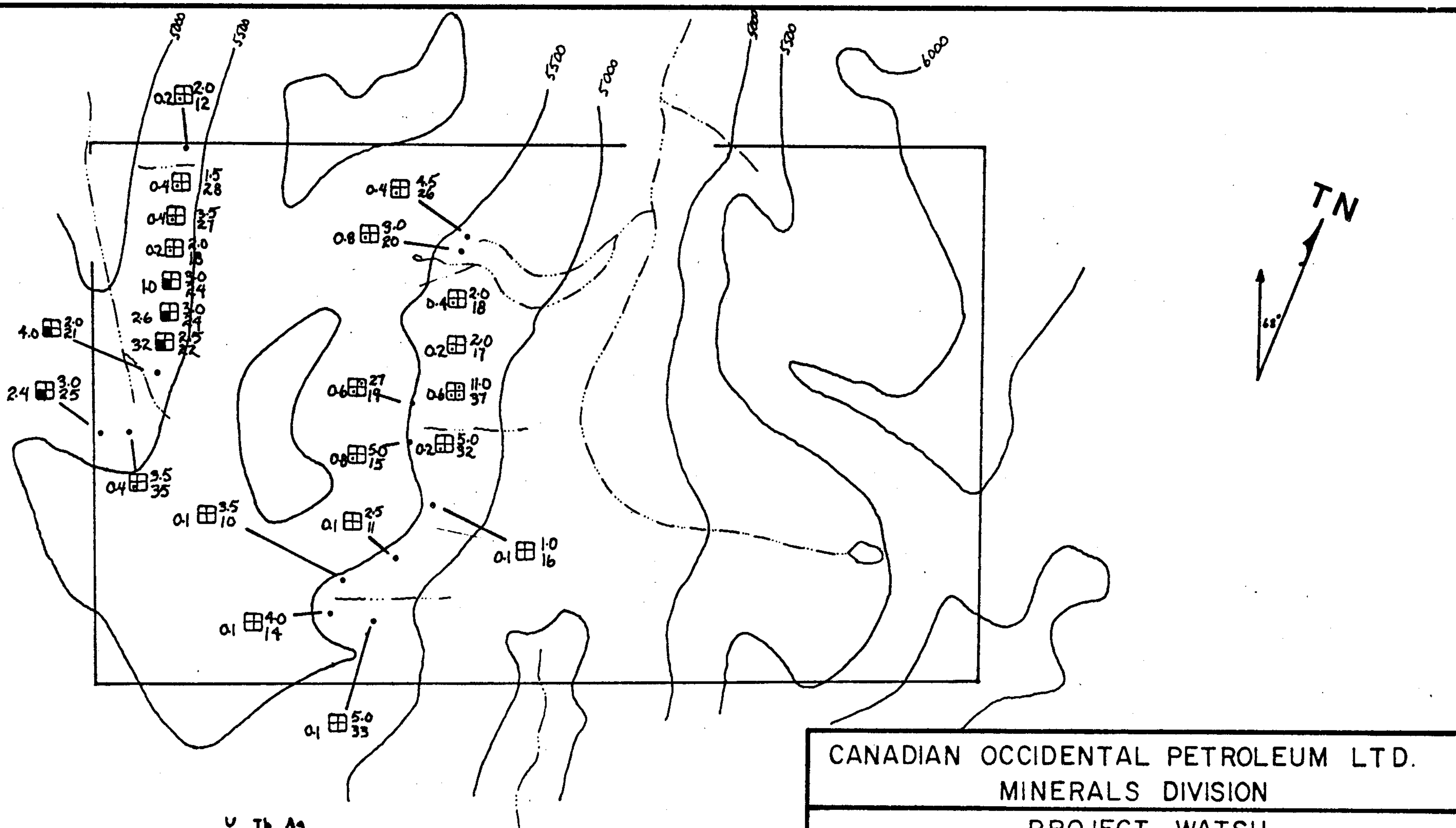
PROJECT WATSU

MOX CLAIMS
YUKON TERRITORY

SOIL GEOCHEMISTRY
Cu - Mo - Pb - Zn

Scale: 1" = 2640' (1/2 mile)

September, 1979



U Th Ag

		U	Th	Ag			
Poss. Anomalous	◩	7	36	·1			
Prob. Anomalous	◢	30	75	·8			

LEGEND

ppm Ag ⊞ ppm U / ppm Th

PLAN 11

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

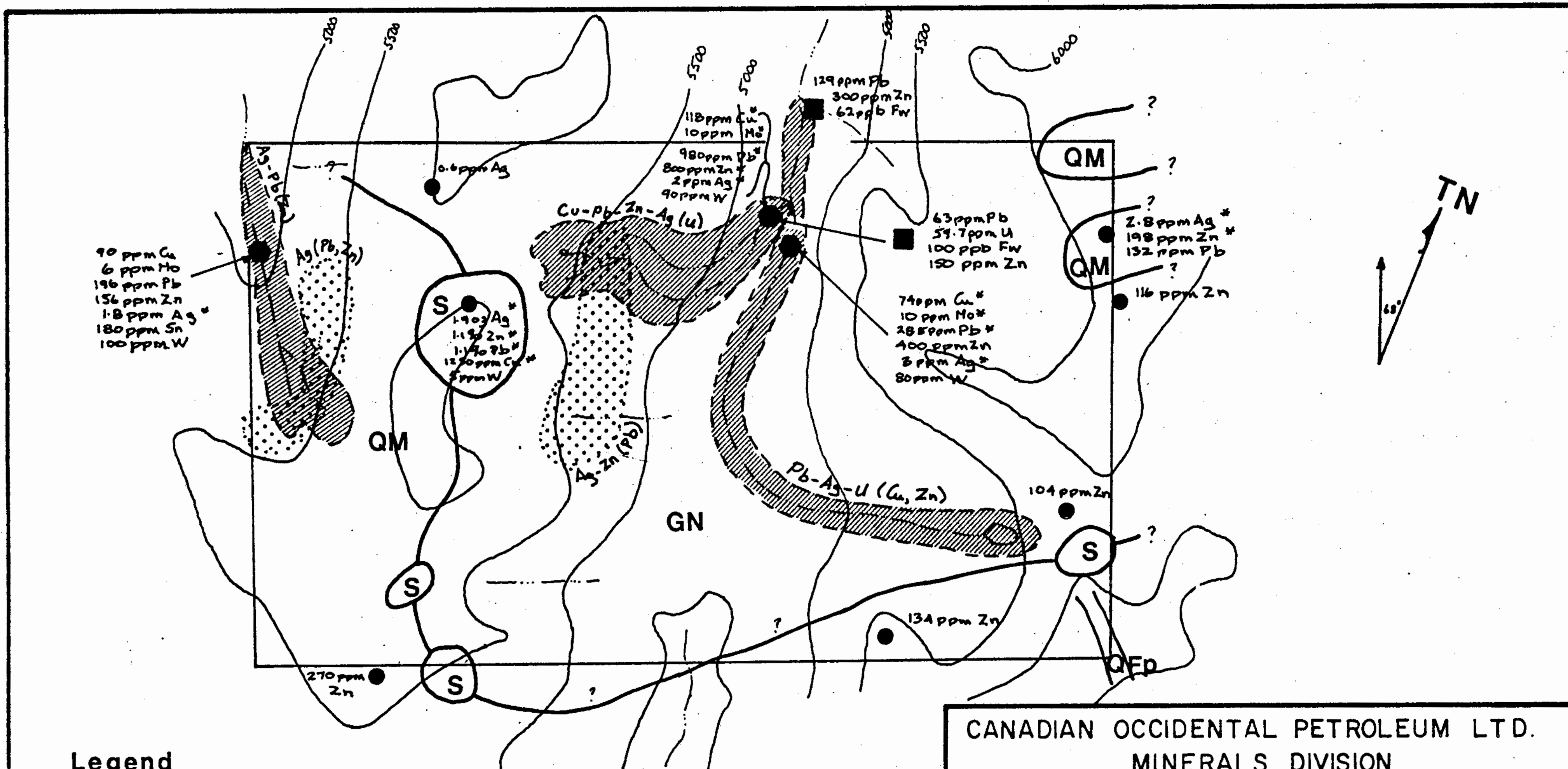
PROJECT WATSU

MOX CLAIMS
YUKON TERRITORY

SOIL GEOCHEMISTRY
U-Th-Ag

Scale: 1" = 2640' (1/2 mile)

September, 1979



Legend

QFp : Quartz-feldspar porphyry
QM : Biotite-quartz monzonite
GN : Biotite-quartz-feldspar gneiss
S : Skarn
— : Geological Contact (assumed)

Stream sediment anomaly: Cu > 28 ppm; Pb > 21 ppm; Zn > 115 ppm; Ag > 0.1 ppm; U > 17 ppm

Soil Anomaly: Pb > 32 ppm; Zn > 115 ppm; Ag > 0.1 ppm

● Rock Geochemistry

● Heavy Mineral Geochemistry

■ 1978 G.S.C.-U.R.P.

CANADIAN OCCIDENTAL PETROLEUM LTD.
MINERALS DIVISION

PROJECT WATSU

MOX CLAIMS
YUKON TERRITORY

COMPILATION OF GEOLOGY & GEOCHEMISTRY

Scale: 1" = 2640' (1/2 mile) PLAN 12 September, 1979

Author's Qualifications

Eric J. Sacks

Education - Graduated Queen's University, Kingston, Ontario
M.Sc. in Geology, 1978
- Graduated University of Toronto, Toronto, Ontario
B.Sc. in Geology, 1977

Work Experience - Employed as field exploration geolgist with Canadian Occidental Petroleum Ltd., Minerals Division, Toronto, Ontario since 1978. Carried out and supervised mineral exploration programs in B.C. and Yukon.

Statement of Expenditures

Claims MOX 1-14, 16, 17, 19, 20-60

Record Numbers YA 24721 - YA 24734, YA 24736 - YA 24737, YA 24739, YA 24741 - YA 24780

			Pro-rated[1] Costs
Salaries and Benefits			$1,738.61
Travel and Accommodation			1,059.75
Drafting and Reproduction			372.32
Consultant			522.43
Camp costs and Supplies			1,193.42
Rental of Equipment			198.90
Other Work			508.54
	Sub-total		$5,593.97
Helicopter 3.8 hr. at $340/hr.	$1,292.00	2	
Geochemical 705 analyses	1,205.04	3	$2,497.04
	Total		$8,091.01

Notes

[1] Pro-rated on basis of 5.9 man-days worked on claims conducting geological/geochemical/geophysical surveys out of a total of 115.6 man-days spent on these surveys during Project Watsu (see attached breakdown on following sheet).

[2] Helicopter flying completed by Associated Helicopters Ltd.

[3] Geochemical analyses completed by Chemex Labs, Vancouver,.B.C. (see attached Cost Breakdown).

BC CLAIM GROUPS	TOTAL NO. OF MAN DAYS	PRO-RATED COSTS SALARIES & BENEFITS	TRAVEL & ACCOMMODATION	DRAFTING & REPRODUCTION	CONSULTANTS	CAMP COSTS & SUPPLIES	EQUIPMENT RENTAL	OTHER WORK	SUB-TOTAL "A"	REAL COSTS HELICOPTER at $310/hr	hrs.	GEOCHEMISTRY cost	# ana	SUB-TOTAL "B"	TOTAL "A" + "B"
ALLEN	4.3	1267.12	772.36	271.35	380.75	869.78	144.96	370.63	4076.95	620.00	2.0	617.80	385	1237.80	5314.75
ASP	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	682.00	2.2	627.28	396	1309.28	6049.95
COT	3.0	884.04	538.86	189.32	265.64	606.83	101.13	258.58	2844.40	620.00	2.0	378.24	201	998.24	3842.64
KAZ	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	527.00	1.7	854.64	454	1381.64	6122.31
MAR	1.0	294.68	179.62	63.11	88.55	202.28	33.71	86.20	948.15	310.00	1.0	62.40	18	372.40	1320.55
NEED	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	837.00	2.7	966.36	560	1803.36	6544.03
PLATE	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	961.00	3.1	793.24	464	1754.24	6874.15
RAN	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1209.00	3.9	775.28	524	1984.28	7104.19
SHAR 1&2	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1023.00	3.3	639.36	402	1662.36	6782.27
SHAR 3&4, 9	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1488.00	4.8	480.04	619	2268.04	7387.95
SHAR 5&6	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	899.00	2.9	750.36	469	1649.36	6769.27
SHAR 7&8	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	837.00	2.7	749.28	460	1586.28	6706.19
SUB-TOTAL (1)	55.7	16413.66	10004.78	3514.99	4932.03	11266.77	1877.72	4801.02	52810.97	10013.00	32.3	7994.28	4952	18007.28	70818.25
YUKON CLAIM GROUPS										at $340/hr					
BIG OX	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.69	5309.54	1020.00	3.0	879.76	541	1899.76	7209.30
BORDER	1.1	324.15	197.58	69.42	97.40	222.50	37.08	94.81	1042.94	204.00	0.6	165.16	101	369.16	1412.10
CLO	3.9	1149.25	400.52	246.11	345.33	788.87	131.47	336.16	3697.71	1224.00	3.6	316.96	185	1540.96	5238.67
CO	2.2	648.30	395.16	138.83	194.80	445.01	74.16	189.63	2085.89	918.00	2.7	535.24	372	1453.24	3539.13
GOAT	5.5	1620.74	987.91	347.08	487.01	1112.51	185.41	474.07	5214.73	782.00	2.3	1266.48	807	2048.48	7263.21
ICE	4.2	1237.66	754.40	265.04	371.90	848.56	141.59	362.32	3982.47	782.00	2.3	798.64	351	1280.64	5263.11
LICK	5.2	1532.34	934.02	328.15	460.44	1051.83	175.30	448.21	4930.29	748.00	2.2	920.36	546	1668.36	6598.65
MOX	5.9	1738.61	1059.75	372.32	522.43	1193.42	198.90	508.54	5593.97	1292.00	3.8	1205.04	705	2497.04	8091.01
OXY	4.6	1355.53	826.25	290.29	407.31	930.47	155.07	396.49	4361.41	884.00	2.6	732.44	449	1616.44	5977.85
PISA	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.68	5309.54	714.00	2.1	757.96	512	1471.96	6781.50
SAL	5.6	1650.21	1005.87	353.39	495.86	1132.74	188,78	482.78	5309.54	1190.00	3.5	497.12	411	1687.12	6996.66
TIER	4.9	1443.93	880.15	309.21	433.91	991.10	165.18	422.71	4645.46	1156.00	3.4	750.76	438	1906.76	6552.60
WOX	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.69	5309.54	952.00	2.8	841.08	579	1793.08	7102.62
SUB-TOTAL (2)	59.9	17651.35	10759.22	3780.01	5303.97	12116.23	2019.28	5162.98	56793.41	11866.00	34.9	9367.00	5997	21233.00	78026.41
TOTALS (1+2)	115.6	34065.00	20764.00	7295.00	10236.00	23383.00	3897.00	9964.00	109604.00	21879.00	67.2	17361.28	10949	39240.28	148844.66

THE MOX CLAIM GROUP

GEOCHEMICAL COST BREAKDOWN

INVOICE #[1]	# OF SAMPLES	DESCRIPTION	COST[2]
31746	31	U, F, As	$286.75
31920	31	Cu, Mo, Pb, Zn, Ag, U	218.55
33375	31	Th	155.00
32463	3	Cu, Mo, Pb, Zn, Ag, Sn, W, U	76.80
32606	3	Th	15.00
31900	23	Cu, Mo, Pb, Zn, Ag, U	162.15
32440	46	Th	230.00
31943	23	Cu, Mo, Pb, Zn, Ag, U, Sn, W	330.05
33296	1	%Pb, %Zn, oz./ton Ag	32.00
		SUB-TOTAL	$1506.30 less 20%
		TOTAL	$1205.04

1 - all invoices from Chemex Labs unless otherwise noted
2 - cost includes preparation of samples