

6065

GEOLOGICAL, GEOPHYSICAL, GEOCHEMICAL
AND DRILLING REPORT

ON THE

POPLAR GROUPS 1 TO 7
OMINECA MINING DIVISION

MAY TO AUGUST, 1976

LOCATED
FIFTY KILOMETERS SOUTHWEST
OF HOUSTON, B.C.
54° 127° NW

93L/2W

BY

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UTAH MINES LTD.

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

NO.

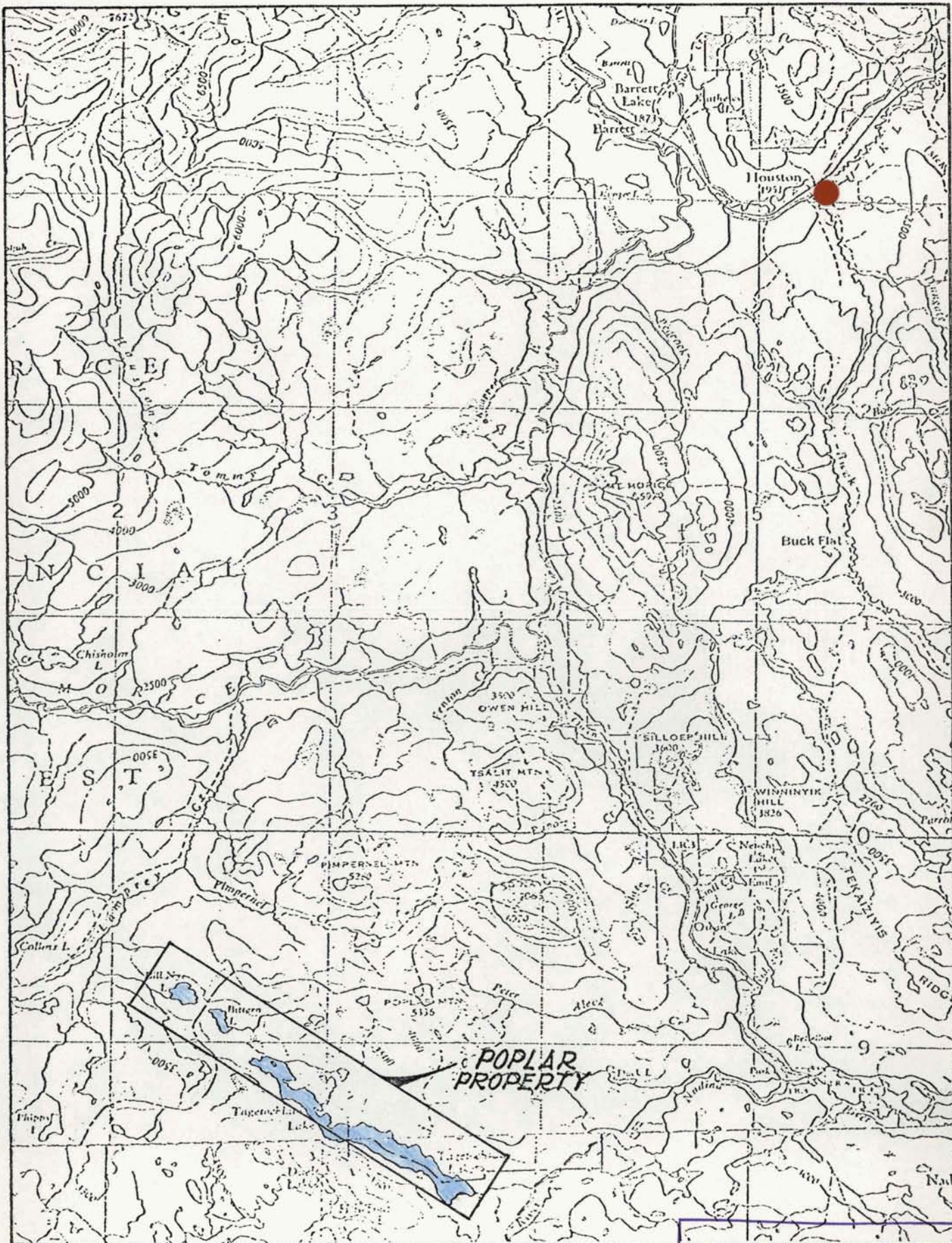
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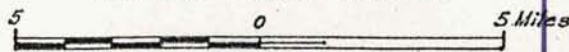
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INDEX MAP

POPLAR CLAIMS

OMINECA MINING DIVISION



1:250,000

MINERAL RESOURCES BRANCH

ASSESSMENT REPORT

NO. 6065

SUMMARY

Utah Mines Ltd. examined the Poplar claims from 11th May to 27th August, 1976, with a crew of twenty men. Geological, magnetic, topographic and geochemical soil surveys and 7500 feet (2286.0 meters) of diamond drilling were carried out over a portion of the Poplar claim block, located along the north-east side of Tagetochlain Lake, approximately 50 kilometers southwest of Houston, British Columbia.

The Poplar claims studied are underlain by volcanic and sedimentary rocks of the Hazelton Group which are intruded by several feldspar porphyry, or feldspar biotite porphyry stocks and dikes. A unique granodioritic biotite porphyry stock contains pyrite, chalcopyrite and molybdenite mainly as fracture fillings. A late NNW porphyry dike system intrudes all above rocks.

Dominant structural trends are northwest, parallel to the Poplar Lake lineament and north-northwest, parallel to the porphyry dike system. The mineralized biotite porphyry stock is contained within the latter structural belt.

Sulphides, mainly pyrite, are concentrated within and adjacent to the biotite porphyry stock and the NNW structural belt.

A 650 meter by 500 meter copper-molybdenum soil geochemical anomaly is approximately coincident with the mineralized biotite porphyry stock.

The most magnetically active area is in close proximity to the biotite porphyry stock and is probably related to higher magnetite content in hornfelsed volcanics. Other magnetic anomalies are related to regional linears and higher magnetic susceptibility of certain lithologies.

GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL
REPORT ON THE POPLAR GROUPS 1 TO 7

INTRODUCTION

From the 11th May to 27th August, 1976, geological, geophysical and geochemical work was done on the Poplar Groups 1 to 7. The claims specifically covered in this work include Poplar #57, #59, #66 to #71, #74, #76 to #88, #90, #92, #94 and #95; Don #6, #7, #14, #15, #45 and #54; Lake #1 to #36; Pine #1 to #22; and Tag #1 to #9, #11 to #15, #17, #19, #21, #23 to #28, #30 to #44, #197 to #207 and Tag No.1 Fraction.

The field work was undertaken by B. Bowen, D. Crowe, G. Mitchell, geologists, J. Vyselaar, geophysicist and D. Johnson, D. Alexander, K. Akhurst, G. Holland, L. Frantz, B. Lovell, S. Garner, S. Ramsey, T. Buchy, W. Lee, R. McIntyre, M. Murphy and S. Anderson, field assistants.

The above claims are part of a larger block of 394 claims staked by F. Onucki, C. Critchlow and M. Callaghan (optioners) and Utah Mines Ltd. (operator) between 1971 and 1976, along the northeast side of Tagetochlain Lake, approximately 50 kilometers southwest of Houston, British Columbia.

Two separate grid areas, referred to as East Grid and West Grid, are covered by this report (see Grid Surveys Index Map, Plate No.37). The East Grid area occupies the southeastern one-quarter of the claim group and its dimensions are approximately 3km north-south by 4km east-west. Relief is moderate, with elevations ranging from 840(±) meters at Tagetochlain Lake level to 1340(±) meters on Poplar Mountain ridge, which

projects into the survey area from the north. Apart from precipitous rock bluffs on Poplar Mountain ridge, topography is moderate to gentle, southerly sloping.

The West Grid, which occupies the central portion of the claim block, is irregular in shape and is sandwiched between two grid areas surveyed in 1975. Again relief is moderate, but topography is somewhat more irregular and hilly than that of the East Grid.

Forested areas in both grids consist mainly of lodgepole pine and spruce. There are also numerous large, open, grassy meadows, sparsely treed with poplar. Approximate annual precipitation is 75 to 100 centimeters.

Tagetochlain Lake (local name Poplar) lies approximately 50km southwest of Houston, British Columbia. Vehicle access from Houston is along the Morice River, Owen Lake and Tahtsa Reach Forest Service access roads, a distance of about 72km. A rough jeep road extends from the Tahtsa road along the north shore of Poplar Lake, through the Poplar Groups of mineral claims. The last 5.5km of this road were completely re-built by Utah Mines Ltd. during June and July, 1975, and now provide good access to the base camp.

The base camp for the above surveys was located on Poplar No.8 mineral claim and was serviced exclusively by road.

FIELD WORK

The 1976 field work by Utah Mines Ltd. on the Poplar claims consisted of geological, magnetic, topographic and geochemical soil surveys. For control, a series of north-south and east-west transit baselines were established. These are summarized below:

EAST GRID

<u>BASE LINE</u>	<u>FROM</u>	<u>TO</u>	<u>METERS</u>
13800E	6100N	5600N	500
5600N	13800E	15200E	1400
15200E	5600N	4400N	1200
4400N	15200E	18000E	2800
16000E	4400N	2700N	1700

WEST GRID

<u>BASE LINE</u>	<u>FROM</u>	<u>TO</u>	<u>METERS</u>
9800E	6100N	9800N	3700
8150N	7960E	11000E	3040
9800N	9600E	10400E	800

Additional control in the East Grid included a transit survey along approximately 6700 meters of access road and also a tie line along 3400N, from 15300E to 17200E. Tie lines in the West Grid included:

<u>TIE LINE</u>	<u>FROM</u>	<u>TO</u>	<u>METERS</u>
7200N	8400E	8800E	400
SE	8800E, 7200N	9800E, 6100N	1500

All picket lines were run north to south and were surveyed using a compass and chain with slope corrections made where necessary. Picket line spacing is 200 meters and station interval along the picket lines is 50 meters. In areas of interest, picket line spacing was reduced to 100 meters. Most lines were tied at each end with a compass and chain survey. Grid summaries are given below:

<u>GRID AREA</u>	<u>NUMBER OF PICKET LINES</u>	<u>LINE KILOMETERS</u>	<u>APPROX. AREA SURVEYED (IN SQUARE KILOMETERS)</u>
East Grid	28	74.5*	15.0
West Grid	24	40.1**	9

*Includes 2.90 kilometers of north-south baselines

**Includes 1.65 kilometers of north-south baselines

The surveyed grids, as described above, were employed as a base for all surveys. A geochemical soil survey was conducted over the entire grid areas, at the same time that picket lines (flagged only) were established.

Geological, magnetic and topographic surveys were conducted, for the most part, over the standard 200 meter line-spaced grid. However, in areas considered low priority, line spacing was increased to 400 meters. Conversely, in areas of interest, line spacing was reduced to 100 meters.

Magnetometer and altimeter readings were taken at 50 meter intervals along each picket line. Altimeter readings were tied into baseline transit hubs, the elevation of which were used as datum for the area surveyed.

A summary of total line kilometers with respect to the various surveys done in both the East and West Grids is given below:

<u>SURVEY</u>	<u>EAST GRID</u>	<u>WEST GRID</u>	<u>TOTAL</u>
Geochemical soil	74.5	40.1	114.6
Geology	56.9	24.6	81.5
Magnetics and Topography	60.4	31.0	91.4

FIELD PROCEDURE - SOIL GEOCHEMICAL SURVEY

For standard grid coverage, samples were collected every 100 meters on grid lines spaced 200 meters apart. For detailed areas samples were collected every 50 meters on grid lines spaced every 100 meters apart. Samples were taken from a reddish "B" horizon where developed or from "C" horizon materials immediately below topsoil. No samples were collected in areas of thick humus or predominantly surface outcropping. Average depth is 25 centimeters.

Samples were collected with a mattock and stored in Kraft paper bags. A total of 1331 samples were submitted to Chemex Labs Ltd., 212 Brooksbank Avenue, North Vancouver, B.C. The -80 mesh fraction was analyzed by routine atomic absorption methods for copper and molybdenum.

FIELD PROCEDURE - GEOPHYSICAL SURVEYS

The magnetics survey conducted over the picket lines was run using the McPhar GP-70 Proton Precession magnetometer. This

instrument measures the earth's total magnetic field to an accuracy of ± 1 gamma and expresses the value on a digital display panel. The unit consists of two components; a sensor head and an instrument console. The sensor head can be mounted on a collapsible staff or worn in a backpack harness by the operator. The total system weighs approximately eleven pounds with rechargeable lead cells as the power supply. Magnetic baselines were established by making short period loops down the surveyed baselines. These loops were then corrected for diurnal variation by interpolating in a linear fashion the observed drift in the magnetic field. Loops were then run over the picket lines between magnetic baseline stations and corrected for observed diurnal variation. From the total field value, which is in the region of 57,700 gammas in the Houston area, a constant value of 56,500 gammas was subtracted to bring the values down to a manageable level.

The topography survey was run by a separate operator concurrent with the magnetometer survey. The instrument used was a Thommens Model 3B5 Barometric altimeter. Readings were taken at 50 meter intervals and read to an accuracy of ± 5 feet which is about twice the unit's inherent capability. The readings were then converted to meters before plotting. Control for the survey was the known elevations of the baseline transit survey hubs. These elevations were established by a transit survey and were known to an accuracy of ± 0.1 meters.

The changes in barometric pressure while a loop was surveyed were corrected for in the same fashion as was done for the magnetics survey.

GENERAL GEOLOGY

The area is mainly underlain by mixed volcanic and sedimentary rocks of the Jurassic Hazelton sequence. To the north, small coal bearing sedimentary sequences of Cretaceous and Tertiary age lie within the valleys of the Morice and Telkwa Rivers. To the east are extensive areas of Tertiary Plateau basalts; small outliers of these persist in the Shelford Hills region to the southeast as well.

The east flank of the Coast Range batholith lies approximately 50 kilometers to the southwest of Tagetochlain Lake. Smaller bodies of intrusive rocks of more than one age are widespread as dikes, sills and stocks.

Several strong, topographic lineaments in the area have been interpreted as being the surface expression of major tectonic structures. The most common direction is north-northwest (Babine Lake, Bulkley River, Owen Lake, Tagetochlain Lake). A second strong lineament direction, trending northeast, is represented by Ootsa, Whitesail, Nanika and Morice Lakes. A third, apparently more minor fracture direction in the area, is north-south (Chapman Lake, Howson Creek, Twinkle Lake).

The region is well mineralized as a whole, with many small, polymetallic, vein systems and many porphyry copper/molybdenum prospects at all stages of development. The association of the latter mineral occurrence with small feldspar and quartz porphyry intrusions is common.

DETAILED GEOLOGY

EAST GRID

HAZELTON ROCKS

Volcanic and sedimentary rocks of the Hazelton Group underlying the East Grid map area can be subdivided into two units. A lower volcanic unit, exposed in the northwest half of the map area consists of fine to medium grained feldspar porphyry tuffs, agglomerates, massive andesites and fine to medium grained diabase to gabbroic rocks and chlorite-zeolite-carbonate amygdale volcanics. The volcanic unit also contains a few narrow argillite beds.

A major sedimentary unit, occurring in the flat to gently sloping southeastern half of the map area, overlies the volcanic rocks. A 400 meter section of dense to gritty argillite at the base of the unit is overlain by sorted and unsorted, coarse to medium grained sandstone and conglomerate.

Average attitude of Hazelton rocks, determined from bedding attitudes in the argillites, is 035 degrees strike, dipping 60 degrees southeast.

INTRUSIVE ROCKS

a) STOCKS: Centered at 14900E and 5800N is a 300 by 600 meter (estimated) intrusive body of granodiorite biotite porphyry. It contains coarse blocky feldspar (70 percent), large euhedral books of biotite (7-10 percent), and is fairly acid, especially near its margins, where aplitic varieties are common. It is

weakly mineralized with chalcopyrite, molybdenite and pyrite, largely fracture controlled.

A second intrusive occurrence, possibly of stock dimensions as indicated by magnetics, underlies the extreme northeast corner of the map area. The feldspar porphyry intrusive, containing 50 percent coarse (5mm) plagioclase and 5 percent accessory biotite, outcrops on line 17800E, from 5400N to 5700N.

b) DIKE ROCKS: Two regions of dike swarms contain nearly all the dikes in number and variety recorded in the map area. One region is a 200 meter wide dike swarm exposed in the China Creek canyon immediately north of the biotite porphyry stock. It is associated with considerable fracturing and faulting near the western border and hornfelsing of Hazelton volcanics throughout.

Quartz eye porphyry dikes have 5 percent quartz eyes in a somewhat argillized pink aphanitic matrix. Another common dike is porphyritic in quartz, biotite, hornblende, and plagioclase (40 percent total).

Other dikes in this locality had unique occurrences. One, with a more granitic texture, is situated north of the canyon exposure and contains coarse plagioclase phenocrysts (55 to 60 percent), as well as hornblende and biotite (5 percent combined). This, and the two dikes mentioned above, contain disseminated pyrite in places, and all have a NNW trend with a near vertical dip. Dike widths range from 3 to 10 meters.

Two other dikes recorded in the creek canyon are mafic rich (10 to 20 percent biotite and hornblende), dioritic to granodioritic in composition. The trend of one conformed to the other dikes; the other appears to be 045 degrees and vertical.

The second dike swarm is centered at 16200E and 3400N, in a zone about 450 meters wide. The dikes cut Hazelton sandstone and argillite. Three sheared quartz eye porphyry dikes are about 2 to 3 meters wide and subparallel, striking NNW and dipping vertically. In one locality, at 15920E, 3400N, 0.3 meter wide sills with fine bladed feldspar and scattered zoned phenocrysts of plagioclase, intrude beds of graded sandstone.

Two other intrusives occur as scattered outcrop and lack observable dike-like form. One is a coarse grained feldspar biotite porphyry and the other is a feldspar, hornblende, biotite porphyry.

A major biotite feldspar porphyry dike outcrops in the vicinity of 14400E and 4700N. It appears to be 40 to 80 meters wide and trends at about 135 degrees azimuth.

Scattered occurrences of andesitic to gabbroic northeast striking dikes crosscutting Hazelton volcanic rocks are thought to represent feeders for that period of volcanic activity.

STRUCTURE

Two main structural elements on a regional scale have been observed in air photo interpretation. In the southwest

portion of the map area, a strong northwesterly structural grain is expressed by alignment of ridge tops and topographic depressions and also accented by the major northwest trending feldspar biotite porphyry dike. This grain is associated with Poplar Lake lineament.

The two dike swarms previously mentioned appear to be an expression of a dominant NNW structural belt, 200 to 450 meters wide, which is bounded to the east by Poplar Mountain Fault, which passes (approximately) through coordinate points 15800E, 6000N; 16000E, 4600N; and 16600E, 3100N; and to the west by an air photo lineament, trending NNW, which subparallels China Creek just west of the northern dike swarm. This structural belt contains the mineralized biotite porphyry stock and appears to be the boundary between pyroclastics to the west and massive amygdaloidal volcanics to the east in the Hazelton volcanic unit.

A third NNW air photo lineament, through coordinate points 17200E, 5300N and 18000E, 4000N likely forms the fault boundary between Hazelton sediments and volcanics in the vicinity of 17800E and 4400N.

Analysis of local structural trends in outcrop shows dominant trends, with average azimuth, to be north-northwest (154 degrees) and north-south (000 degrees).

Average strike and dip of Hazelton rocks, determined from several bedding attitudes of thinly bedded argillites, is 035 degrees strike, dipping 60 degrees southeast. There is little folding or flexuring of beds visible. Bedding is

generally inconspicuous in exposures of lower and upper volcanic rocks, other than occasional attitudes determined from trachytic textures in flows and observed contacts between volcanic units.

ALTERATION

Several weak alteration effects associated with the biotite porphyry stock were noted. The stock itself is relatively fresh in appearance, with minor sucrose quartz filling on fractures and rare secondary biotite, also along fractures.

Weak hornfelsing in volcanic rocks occurs up to 300 meters from the biotite porphyry contact. Locally, especially adjacent to the contact, hornfelsing is very strong. Within the hornfelsed aureole, there is an increase in quartz veining towards the biotite porphyry contact and usually there is a sulphide (pyrite, rarely chalcopyrite) association with the quartz veins.

Outside of the hornfelsed aureole, chlorite-epidote or quartz-epidote +pyrite veining is common, especially in the NNW structural belt. In amygdoloidal volcanic rocks not confined to the NNW structural belt, irregular quartz veining was noted at scattered localities. In black argillite at 4650N, 16600E, epidote occurs as clots parallel to bedding.

At 16400E and 3650N, quartz veinlets and possibly secondary biotite were noted in a feldspar hornblende biotite porphyry dike.

Clay alteration is commonly associated with shears and faults and some quartz eye porphyry dikes showed a weak to moderately argillized groundmass.

MINERALIZATION

Sulphide concentrations occur within and adjacent to the biotite porphyry stock and the NNW structural belt. The biotite porphyry contains up to 1.5 percent disseminated sulphides (mostly pyrite, very minor chalcopyrite) and also pyrite, chalcopyrite and minor molybdenite associated with sucrosic quartz fracture fillings.

Within the hornfelsed aureole, disseminated pyrite is widespread and quartz veins usually contain pyrite and very minor chalcopyrite. Locally, very minor pyrite occurs in quartz-epidote veins away from the biotite porphyry stock but within the NNW structural belt. Minor pyrite and rare specs of chalcopyrite occur in various dike types comprising the dike swarm.

Copper mineralization was also noted in a small pit at 16000E and 5150N, about 100 meters east of the projected Poplar Mountain Fault. Minor amounts of chalcopyrite, sphalerite, malachite and azurite occur in a one meter wide banded carbonate vein. The vein follows a narrow northeast shear structure (attitude 050°/65°N) within barren gabbroic to diabasic wallrock.

WEST GRID

HAZELTON ROCKS

Volcanic rocks of the Hazelton Group underlying the map area consist of tuff, lapilli tuff, volcanic breccia and very minor volcanic sandstone in the southwest corner of the map area, and in the east portion of the map area, volcanic flow rocks, light beige-gray in colour, with limonized hornblende lathes, blocky feldspar phenocrysts and accessory biotite flakes. Although no in-place flow attitudes were observed, the rock correlated lithologically to flow rocks previously mapped in the vicinity of 9700E, 8050N, whose average attitude is 063 degrees strike, dipping 34 degrees southeast.

The area northeast of the feldspar biotite porphyry stock (described below), on lines 9800E to 10600E, north of base line 9800N is underlain by vitric tuff, which is very finely laminated, with ashy layers of round to blocky clayey pumaceous particles interlayered with siliceous layers. The average bedding attitude of 110 degrees strike, dipping 55 to 80 degrees northeast, is discordant with the regional Hazelton trend. It is possible these rocks may be Tertiary(?).

INTRUSIVE ROCKS

a) STOCKS: The largest intrusive body in the area is a feldspar biotite porphyry stock centered at 9200E and 9500N. The stock is roughly elliptical along a northwest axis, with dimensions 2.5 kilometers x 1.5 kilometers. The rock is a rather dark greenish grey, feldspar, or both feldspar and biotite porphyry, with 20 to 30 percent blocky feldspar phenocrysts, up to

15 percent biotite as fresh euhedral books and minor hornblende. Other minor occurrences of intrusive feldspar porphyry occur at 11400E, 8500N and 12520E, 8600N.

A medium grained, greyish green diorite phase was noted on line 12600E, from 8350N to 8500N. The relationship of this rock to the feldspar porphyry or biotite feldspar porphyry intrusive types is uncertain.

b) DIKE ROCKS: Felsic intrusive dikes occur near the margins of the feldspar biotite porphyry stock and are thought to be related differentiates. Minor occurrences of feldspar porphyry or feldspar biotite porphyry, as small isolated outcrops or angular rubble mounds, in pyroclastics underlying the south-east portion of the map area, may be dike-like in form.

Quartz eye porphyry and diabase rubble, at 9800E and 8950N, most likely represent dikes paralleling a strong NNW structural lineament which projects 200 meters to the east through the feldspar biotite porphyry stock.

At 8300E and 7750N, a fine grained diorite dike, less than 10 meters in width, with carbonate veinlets, trends at azimuth 015 degrees.

STRUCTURE

There are two dominant structural elements regionally, based on air photo interpretation. One is the northwest trending Poplar Lake Fault system and its associated east-southeast splays. The outcrop at 8200E, 7500N, on the north shore of

Poplar Lake, appears to be at the juncture of a northwest and an east-southeast splay. The outcrop exhibits strong brecciation and shearing, bleaching (clays) and silicification. The east-southeast splay projects through coordinate point 9200E and 7075N. Here outcrops are strongly argillized and contain strong carbonate veining with pyrite. A second east-southeast splay projects through coordinate points 8600E, 8300N and 9400E, 8000N and may form the boundary between the dominantly pyroclastic terrain to the southwest and the volcanic flow terrain to the northeast.

A major NNW structure, an extension of Canyon Creek Fault described in the "Geological and Geophysical Report on the Poplar Goups 1,2,3,5 and 6" (B.Bowen, 31st October, 1975), projects through coordinate points 9600E,9400N and 10600E, 8200N. A subsidiary parallel structure projects through coordinate points 9200E, 9400N and 9600E, 8500N.

No bedding attitudes were observed in Hazelton pyroclastics and flow rocks. Average attitude of Tertiary (?) vitric tuffs is 110 degrees strike, dipping 55 to 80 degrees northeast. Antiform flexuring of the latter was noted at 10600E, 9900N.

ALTERATION

Hydrothermal alteration is not widespread. Argillic alteration and locally, silicification, are associated with Poplar Lake Fault and related east-southeast splays. In the vicinity of Canyon Creek Fault projection, on lines 9200E and 9400E, around 9000N, the feldspar biotite porphyry exhibits spotty

argillic and phyllic alteration, sparse 1/4 inch quartz veins and strong hematite soaking on fractures. A zone of pervasive silicification, with chlorite and epidote and fine quartz veinlets, possibly associated with feldspar porphyry or feldspar biotite porphyry diking, is located at 8400E, 7600N and 8600E, 7700N.

MINERALIZATION

Sulphide mineralization is sparse throughout the entire map area. Pyrite occurs in a carbonate veinlet stockwork in an east-southeast splay fault exposure at 9200E and 7050N. Cubic pyrite, with magnetite, occurs in aplite rubble at 9600E and 9575N.

GEOCHEMICAL DISCUSSION

COPPER

Threshold and anomalous copper values were determined statistically for three control areas (areas where percent outcrop is sufficient to have reasonable assurance of underlying lithological type): Hazelton volcanics, Hazelton sediments and feldspar porphyry or feldspar biotite porphyry. Results are shown in Table No. 1. Threshold and anomalous values were about equal in Hazelton sediments and volcanics and much lower in intrusive terrain.

Copper values within biotite porphyry terrain were not treated separately because, with respect to the above three populations, values are mostly anomalous. Instead, given the distinct geochemical contrast between biotite porphyry and other rock types, a statistical treatment was done on all geochemical data (minus fill-in data). Threshold and anomalous values determined are 130 ppm and 180 ppm respectively. A qualitative adjustment, based on the observation that the 100ppm contour of the anomaly associated with the biotite porphyry stock is roughly coincident with the areal extent of the stock, gives threshold and anomalous values of 100ppm and 150ppm respectively. These latter figures are used as a basis of discussion of results in the following paragraphs.

EAST GRID

Centered at approximately 14950E and 5700N, a strong anomaly with numerous values greater than 1000ppm, has a 100ppm closure approximately 650 meters by 550 meters. The anomaly is

TABLE 1

STATISTICAL TREATMENT OF
COPPER SOIL ANALYSES

CONTROL AREA	NUMBER OF SAMPLES	MEAN (ppm)	STANDARD DEVIATION (ppm)	THRESHOLD MEAN+2S. D. (ppm)	ANOMALOUS MEAN+3S. D. (ppm)
Feldspar porphyry, Feldspar biotite porphyry	156	12	7	26	33
Hazelton Volcanics	363	31	35	101	136
Hazelton Sediments	255	33	32	97	129
All Samples (excluding fill-in)	1167	30	50	130	180

approximately coincident with, and has the same aerial extent as the biotite porphyry stock, which contains chalcopyrite as fracture fillings and disseminations.

Immediately north of the preceding anomaly is a 700 meter by 700 meter grouping of 100+ ppm values, in the range 100 to 300ppm and up to 600+ ppm. There is very little outcrop in the area. Possibly hornfelsed volcanics, with quartz-epidote-chlorite veins containing minor pyrite and the mineralized dike swarm containing traces of chalcopyrite may account for the widespread, but weak, geochemical response.

Aside from the above two anomalous areas, there exists only local grouping of anomalous values or isolated single value anomalies.

Occasional anomalous or possibly anomalous values in fresh Hazelton volcanics are probably related to minor amounts of copper in the NNW dike set, or could be related to a mineralized structure similar to that described at 16000E and 5150N.

Random values in the 100 to 250ppm range in the southern dike set area are probably related to minor copper mineralization in the weakly mineralized dikes.

WEST GRID

The West Grid contains only one anomalous locality, at 8800E, 8000N (241ppm Cu, 4ppm Mo) and 8800E, 7900N (313ppm Cu, 3ppm Mo). Although no outcrop exists in the immediate vicinity,

approximately 300 meters to the southwest, at 8600E and 7750N, pervasive silicification and fine quartz veinlets, with chlorite, epidote and possibly copper silicate grains were noted in volcanic rocks. Possibly these features extend to the geochemically anomalous locality.

MOLYBDENUM

Molybdenum data was not treated statistically as most values are less than 1ppm. Within the East and West Grid areas, only one well defined molybdenum response is noted: that coincident with the copper anomaly over the mineralized biotite porphyry stock. Values are generally within the 1 to 3ppm range, with numerous values greater than 5ppm and a peak value of 9ppm.

Within and adjacent to the feldspar porphyry and feldspar biotite porphyry stocks, molybdenum background is somewhat higher than that of Hazelton volcanics and sediments away from the stocks.

GEOPHYSICAL DISCUSSION

MAGNETIC SURVEY

As the magnetic survey done this year was completed around and between sections of last year's data, each sheet will be discussed separately.

Sheets B-5, C-5, E-5, F-8, G-7 and G-8 are all magnetically inactive and reflect the sediments or nonmagnetic volcanics which underlie them.

Sheet D-4 shows intense anomalies centered at L82+00E, 77+50N and L84+00E, 75+00N.

Sheet D-5 shows similar intense anomalies centered at L86+00E, 77+50N and L88+00E, 79+00N with less intense anomalies centered at L86+00E, 81+00N, 90+00E, 80+00N and 94+00E, 80+00N. Air photographs show lineaments close to the above anomalies and they are therefore interpreted as being caused by a fault.

The rest of the sheet shows low values and no anomalies. A big low west of Nose Lake is caused by volcanic rocks with low magnetic susceptibility.

Sheet D-6 shows anomalous values from Line 124+00E, 85+75N and Line 126+00E, 86+25N. These are believed to be caused by either a geological contact or a small intrusive stock.

Sheet E-7 is divided into two halves by a fault extending from approximately L148+00E, 50+00N to L114+00E, 70+00N. A

second fault, trending east-west, is interpreted just south of China Creek. It intersects the north-south fault close to where China Creek turns south. The area west of the north-south fault is generally magnetically inactive and reflects the underlying geology of tuffs and volcanic agglomerates.

The area east of the north-south fault is the most magnetically active encountered on the property and also shows the highest readings obtained with readings up to 4,200 gammas.

These high values are caused by the biotite porphyry stock and the metamorphosed rocks which surround it.

Sheet E-8 shows a small anomalous area extending between L178+00E, 51+00N to L182+00E from 51+00N to 53+00N. The rest of the sheet is flat.

Sheet F-7 shows a broad magnetically inactive area trending NNW through the middle of the map. This is related to the same fault that trends approximately north-south on sheet E-7.

The western part of sheet F-7 shows a strong east to southeast structural trend with anomalies related to magnetic concentrations in the volcanics.

The magnetic patterns east of the fault reflect underlying volcanics and sediments and show an east-west trend.

An intense anomaly on line 158+00E from 30+00N to 31+00N may be a small porphyry stock or a dyke swarm.

CONCLUSIONS

Pyrite is the most abundant sulphide and is most prevalent within and adjacent to the biotite porphyry stock and the NNW structural belt. A pyrite-chalcopyrite-molybdenite assembly occurs mainly as fracture fillings within the biotite porphyry stock.

A well defined copper-molybdenum soil geochemical anomaly is approximately coincident with the biotite porphyry stock.

The ground magnetics survey was useful in determining the extent of intrusive stocks in areas of overburden cover and also in determining the positions of regional fault projections by comparing fault blocks of contrasting magnetic susceptibility.



B.K. Bowen
Geologist



J. Vyselaar
Geophysicist

/edb

REFERENCES

- DUFFELL, S., Whitesail Lake Map Area, British Columbia; Geological Survey of Canada, Memoir 299, pages 35 to 48, 1959.
- CARTER, N.C.,
KIRKHAM, R.V., Geological compilation map of the Smithers, Hazelton and Terrace areas; Department of Mines and Petroleum Resources, British Columbia, Map 69-1, 1969.
- TIPPER, H.W., Report of Activities, Part A: April to October, 1970, Geological Survey of Canada Paper 71-1A, pages 34 to 36.
- TIPPER, H.W., Report of Activities, Part A: April to October, 1971, Geological Survey of Canada Paper 72-1A, pages 39 to 41.
- *BOWEN, B.K., Geological and Geophysical Report on the Poplar Groups 1,2,3,5 and 6; Omineca Mining Division, 1975.
- *BOWEN, B.K., Geological, Geophysical and Geochemical Report on the Tag Groups 1 to 4; Omineca Mining Division, 1975.

*Assessment reports submitted by Utah Mines Ltd.

DRILLING REPORT ON THE
POPLAR GROUPS 1 TO 7

INTRODUCTION

An eleven hole diamond drilling program was conducted on the Poplar Lake Prospect between 14th June and 11th July, 1976. The claims upon which diamond drilling was specifically done include Poplar #3, #5, #7, #9, #13, #15 and Poplar #1 Fraction.

Geology and supervision by Utah Mines Ltd. included the following personnel: B. Bowen and D. Crowe, geologists, D. Alexander, D. Johnson, K. Orleski, G. Holland, L. Frantz, field assistants.

Drilling was performed by D.W. Coates Enterprises Ltd. The drilling crew consisted of two two-man drilling crews, with one man acting as a runner-foreman. Camp costs were incurred by Utah Mines Ltd.

The Poplar groups affected by this report cover an area approximately 10.5 kilometers long by 3.5 kilometers wide. Drilling was confined to the Canyon and East Creek areas, on the north shore of Tagetochlain Lake. Within the immediate drill area, vegetation is characterized by large open poplar meadows, topography is gentle to flat and there is very little relief. Average elevation is 910(±) meters above sea level.

Base camp for the grid surveys, located on Poplar #8, also served as support camp for the diamond drilling.

DIAMOND DRILLING PROGRAM

One Longyear "38" drill was used and was equipped to drill NQ core size. Each crew worked a 10 hour shift, 7 days per week. A John Deere 450 tractor was used for drill moves.

Core was logged by a Utah geologist, then split in half, with half of the core sent for analyses via Pacific Western Airlines air freight to Chemex Labs Ltd., Vancouver. The remaining half of the split core was placed in storage in the storage and logging facility located on Poplar #7. Every box of core was labelled with the diamond drill hole number and the footage contained in the box.

Upon completion of the drilling program, each drill hole collar was surveyed by J. Kerr, Professional Engineer. His hole location data is incorporated in the Diamond Drill Hole Collar Location Plan (Plate No.38).

A summary of diamond drill holes drilled during the period 14th June to 11th July, 1976 is given below:

HOLE NO.	CO-ORD. N	(METERS) E	ELEV. (METERS)	ANGLE	AZIMUTH	TOTAL DEPTH (METERS)
PC-16	5671.99	12703.42	912.7	-90°		260.9
PC-17	5610.56	12505.42	886.1	-90°		230.7
PC-18	5796.62	12501.07	906.1	-90°		191.1
PC-19	6096.53	12202.67	919.3	-90°		188.1
PC-20	6293.48	12101.97	914.8	-90°		200.3

HOLE NO.	CO-ORD. N	(METERS) E	ELEV. (METERS)	ANGLE	AZIMUTH	TOTAL DEPTH (METERS)
PC-21	6199.95	11796.77	920.3	-80°	180°	227.7
PC-22	5997.90	11801.00	912.3	-90°		184.1
PC-23	5998.25	11587.10	909.6	-90°		206.4
PC-24	5993.09	11373.84	911.5	-60°	090°	214.6
PC-25	6206.46	11695.78	901.3	-60°	245°	196.9
PC-26	5494.11	12704.17	893.7	-90°		<u>185.3</u>
TOTAL METERAGE						2286.0

Data accompanying the drilling report consists of complete diamond drill logs for diamond drill holes PC-16 to PC-26 and a diamond drill hole collar location plan (Plate No. 38). Diamond drilling contractor's invoices and a copy of the drilling contract are given in Appendices D and E respectively. A detailed calculation of average cost per foot, used for cost distribution purposes, is given in Appendix C.

B. K. Bowen

B. Bowen
Geologist

APPENDIX A

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

The field work for the report was done by the following persons whose qualifications are outlined below:

1. B. Bowen, Geologist for Utah Mines Ltd., Vancouver, British Columbia.

Completed B.A.Sc. at the University of British Columbia in 1970; worked as a student during the summer field seasons with Cominco Ltd. in 1967 and 1968 and with Wayland S. Read, Consulting Geologist, Vancouver, British Columbia in 1969; employed as a field geologist, Gibraltar property, May, 1970 to October, 1970 by Placer Development Ltd.; employed as a field geologist, Alice Springs, N.T., Australia, from March, 1971 to December, 1971 by Central Pacific Minerals, N.L.; employed as mine geologist, Tungsten, Northwest Territories, Canada from May, 1972 to March, 1974 by Canada Tungsten Mining Corporation; employed by Utah Mines Ltd. from March, 1974 to date as a geologist under the supervision of A.J. Schmidt, P.Eng.

2. J. VYSELAAR, Geophysicist for Utah Mines Ltd., Vancouver, British Columbia.

Completed B.Sc. (geology and geophysics) at the University of British Columbia in 1971; employed by Chisolm Prospecting Ltd. and Texas Gulf Sulphur Ltd. during the 1969 and 1970 field seasons, respectively, as a geological assistant; employed by Geoterrex from May, 1971 to October, 1971 and January, 1972 to April 1972 as a field geophysicist under Peer Norgaard, P.Eng.; employed by Barringer Research Ltd. as a geophysicist from May, 1972 to October, 1974 under

the supervision of F.L. Jagodits, P.Eng., and R.J. Henderson; employed by Utah Mines Ltd. from January, 1975 to present as a geophysicist under the supervision of A.J. Schmidt, P.Eng.

3. DON CROWE, Temporary geologist, Utah Mines Ltd., Vancouver, British Columbia.

Completed B.Sc. at the University of British Columbia in 1976; employed by Cominco Ltd., Canex Placer Ltd. and Utah Mines Ltd. in the summers of 1973, 1974 and 1975 respectively as an assistant geologist; employed by Utah Mines Ltd. from May, 1976 to October, 1976 as a field geologist, under the supervision of A.J. Schmidt, P.Eng.

4. GERRY MITCHELL, Temporary geologist, Utah Mines Ltd., Vancouver, British Columbia.

Completed B.Sc. (Honors) at the University of British Columbia in 1975; employed as an assistant geologist by the Geological Survey of Canada in the summers of 1973 and 1974; employed by the Geological Survey of Canada as a field geologist from June, 1975 to August, 1975; employed by Utah Mines Ltd. from May, 1976 to June, 1976 as a field geologist, under the supervision of A.J. Schmidt.

APPENDIX B

STATEMENT OF COSTS

STATEMENT OF COSTS

SALARIES

B. Bowen	109 days @ \$58.50 per day	\$ 6,376.50	
D. Crowe	106 days @ \$39.50 per day	\$ 4,187.00	
J. Sheppe	123 days @ \$50.00 per day	\$ 6,150.00	
D. Johnson	55 days @ \$24.00 per day	\$ 1,320.00	
D. Alexander	73 days @ \$27.00 per day	\$ 1,971.00	
K. Akhurst	59 days @ \$34.50 per day	\$ 2,035.50	
F. Crha	8 days @ \$42.50 per day	\$ 340.00	
K. Orleski	13 days @ \$42.50 per day	\$ 552.50	
G. Holland	19 days @ \$32.00 per day	\$ 608.00	
L. Frantz	27 days @ \$29.00 per day	\$ 783.00	
B. Lovell	17 days @ \$26.00 per day	\$ 442.00	
G. Mitchell	22 days @ \$39.50 per day	\$ 869.00	
S. Garner	13 days @ \$35.50 per day	\$ 461.50	
S. Ramsey	13 days @ \$26.00 per day	\$ 338.00	
J. Vyselaar	7 days @ \$51.00 per day	\$ 357.00	
T. Buchy	53 days @ \$29.00 per day	\$ 1,537.00	
W. Lee	19 days @ \$38.50 per day	\$ 731.50	
R. McIntyre	10 days @ \$31.00 per day	\$ 310.00	
M. Murphy	37 days @ \$24.00 per day	\$ 888.00	
S. Anderson	13 days @ \$27.00 per day	\$ 351.00	
	TOTAL	\$30,608.50	\$ 30,608.50

VEHICLE RENTAL

One 1972 3/4 Ton Pick-up Chevrolet 4x4
13 days @ \$12.00 per day \$ 156.00

VEHICLE RENTAL Continued

One 1975 Suburban, GMC 4x4		
64/30 months @ \$238.50 per month		
	\$	508.80
One 1975 3/4 Ton Pick-up, GMC 4x4		
109/30 months @ \$217.50 per month		
	\$	790.25
One 1976 3/4 Ton Pick-up, GMC 2x4		
109/30 months @ \$335.00 per month		
	\$	<u>1,217.17</u>
TOTAL	\$	2,672.22
	\$	2,672.22

GAS (BULK AND CREDIT CARDS)

Total Cost	\$	<u>1,283.04</u>
TOTAL	\$	1,283.04

MAINTENANCE AND TIRES (FIELD)

Total Cost	\$	1,375.72
TOTAL	\$	1,375.72
	\$	1,375.72

LIGHT PLANT RENTAL

One VM Motori 5 KW Diesel		
109 days @ \$11.83 per day	\$	<u>1,289.47</u>
TOTAL	\$	1,289.47
	\$	1,289.47

RADIO EQUIPMENT

SSB-60	109 days @ \$2.42 per day	\$ 263.78	
Repairs -	Jack Ross Electric	<u>\$ 238.74</u>	
	TOTAL	\$ 502.52	\$ 502.52

MAGNETIC EQUIPMENT

Two McPhar GP-70 Proton Precession Magnetometers

	39 days @ \$18.47 per day	<u>\$ 720.33</u>	
	TOTAL	\$ 720.33	\$ 720.33

ALTIMETER

Two Thommens Altimeters

	39 days @ \$2.00 per day	<u>\$ 78.00</u>	
	TOTAL	\$ 78.00	\$ 78.00

TRANSIT RENTAL

Total Cost		<u>\$ 90.00</u>	
	TOTAL	\$ 90.00	\$ 90.00

PUMP RENTAL

One Bean 415	4 months @ \$300.00 per month	<u>\$ 1,200.00</u>	
	TOTAL	\$ 1,200.00	\$ 1,200.00

BOAT RENTAL

One 12' Canova Rubber Boat with 20 HP Johnson Outboard Motor

109 days @ \$5.50 per day \$ 599.50

One 14' Aluminum Boat with 20 HP Johnson Outboard Motor

109 days @ \$5.50 per day \$ 599.50

TOTAL \$ 1,199.00 \$ 1,199.00

CORE BOXES

Total Cost \$ 977.14

TOTAL \$ 977.14 \$ 977.14

GROCERIES

Total Cost \$ 6,972.45

TOTAL \$ 6,972.45 \$ 6,972.45

PROPANE

Total Cost \$ 993.36

TOTAL \$ 993.36 \$ 993.36

FUEL OIL (BULK)

Total Cost \$ 1,497.00

TOTAL \$ 1,497.00 \$ 1,497.00

MOBILIZATION

Total Cost \$ 3,261.25

TOTAL \$ 3,261.25 \$ 3,261.25

DEMOBILIZATION

Total Cost		<u>\$ 950.00</u>	
	TOTAL	\$ 950.00	\$ 950.00

BASELINE CONTROL

Total Cost		<u>\$ 7,943.10</u>	
	TOTAL	\$ 7,943.10	\$ 7,943.10

ROAD CLEARING

Total Cost		<u>\$ 1,809.84</u>	
	TOTAL	\$ 1,809.84	\$ 1,809.84

HELICOPTER

Total Cost		<u>\$ 2,507.15</u>	
	TOTAL	\$ 2,507.15	\$ 2,507.15

DIAMOND DRILLING

Total Cost		<u>\$95,678.87</u>	
	TOTAL	\$95,678.87	\$ 95,678.87

AIR FREIGHT OF SOIL SAMPLES (PWA)

Total Cost		<u>\$ 47.75</u>	
	TOTAL	\$ 47.75	\$ 47.75

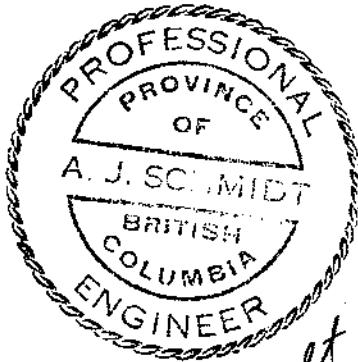
ASSAY COSTS OF SOIL SAMPLES (CHEMEX LABS LTD)

Total Cost	\$ 2,593.76	
TOTAL	\$ 2,593.76	\$ 2,593.76

REPORT AND MAP PREPARATION

Total Cost	\$ 4,500.00	
TOTAL	\$ 4,500.00	\$ 4,500.00

GRAND TOTAL		\$170,750.47
-------------	--	--------------



A. Schmidt
Nov. 23/76

A.J. Schmidt, P.Eng.
District Geologist

APPENDIX C

CALCULATION OF AVERAGE COST PER
FOOT FOR DIAMOND DRILLING

CALCULATION OF AVERAGE COST PER
FOOT FOR DIAMOND DRILLING

SALARIES - CORE LOGGING

B. Bowen	42 days @ \$58.50 per day	\$ 2,457.00	
D. Crowe	30 days @ \$39.50 per day	<u>\$ 1,185.00</u>	
	TOTAL	\$ 3,642.00	\$ 3,642.00

SALARIES - CORE SPLITTING

D. Alexander	50 days @ \$27.00 per day	<u>\$ 1,350.00</u>	
	TOTAL	\$ 1,350.00	\$ 1,350.00

SALARIES - CONSTRUCTION OF CORE STORAGE STRUCTURE

D. Johnson	4 days @ \$24.00 per day	\$ 96.00	
K. Orleski	5 days @ \$42.50 per day	\$ 212.50	
G. Holland	5 days @ \$32.00 per day	\$ 160.00	
L. Frantz	5 days @ \$29.00 per day	<u>\$ 145.00</u>	
	TOTAL	\$ 613.50	\$ 613.50

TRANSIT RENTAL

Total Cost		<u>\$ 90.00</u>	
	TOTAL	\$ 90.00	\$ 90.00

CORE BOXES

Total Cost		<u>\$ 977.14</u>	
	TOTAL	\$ 977.14	\$ 977.14

DIRECT DRILLING COST

Total Invoice		<u>\$ 95,678.87</u>	
	TOTAL	\$ 95,678.87	\$ 95,678.87

SUPPORT COST

Total Cost		<u>\$ 12,619.44</u>	
	TOTAL	\$ 12,619.44	\$ 12,619.44

	GRAND TOTAL		\$114,970.95
--	-------------	--	--------------

Average cost per foot for diamond drilling:

equals	<u>GRAND TOTAL</u>
	TOTAL FOOTAGE
equals	<u>\$114,970.95</u>
	7500 FEET
equals	\$15.33 per foot

APPENDIX D

CONTRACTORS' INVOICES

North Shore
Association for the Mentally Retarded

3069 Lonsdale Avenue, North Vancouver, B.C. V7N 3J6

984-9321



Utah Mines Ltd.,
#1600 - 1050 West Pender Street,
Vancouver, B.C.
V6E 3S7

047 95-2

INVOICE NO. 2989 - 68 DATE May 31, 1976 CUSTOMER P.O. NO.

Cartage charges re invoice 2916-68 \$26.95

Poplar

UTAH MINES LTD. - EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Minor	Act.	Exp.	Amount
00	ITAFARS	006	0	0	26.95
00			0	0	
JUN 30 1970			0	0	
00			0	0	
00			0	0	
Date Received			Invoice Amount		26.95
Ext. & Prices			Discount		
Approved by			Amount Payable		
			Check No.		

North Shore
Association for the Mentally Retarded

3069 Lonsdale Avenue, N.W. Vancouver, B.C. V7N 3J6

984-9321



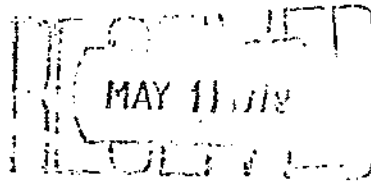
Utah Mines Limited,
#1600 - 1050 West Pender Street,
Vancouver, B.C.
V6E 3S7

047 25-2

INVOICE NO. 2916 - 68 DATE May 6, 1976 CUSTOMER P.O. NO.

10	PQ Core box lids	@ .80 ea.	\$ 8.00 *
		May 7, 1976	P.O. 4470
250	NQ Core Boxes	@ 2.75 ea.	687.50
250	NQ Lids	@ .80 ea.	<u>200.00</u>
			895.50
	7% B.C. Sales Tax		<u>62.69</u>
			\$958.19

Poplar



* This particular \$8.00 charge not Poplar

July

Document

009 56-3

May 1956

Utah Mines Ltd

AUG 11 1956

1050 W. Pender St. Vancouver B.C.

In Acc't With

605120

Terms

30 hrs	C 51 75			1552 50
Loaded charges				217 34
One day to chub road.				40 00
				1809 84
Snow blowing out Papineau Basin Road with A.B. 21.				

UTAH MINES LTD. - EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Minor	Act.	Exp.	Amount
00	105 / A 288	046			1809 84
00					
00					
00					
00					
00					
MAY 20 1956					
Date Received					1809 84
Ext. & Prices					
Approved by	[Signature]		Accountable		
			Checked by		

KERR, DAWSON & ASSOCIATES LTD.

9 - 219 Victoria Street
Kamloops, B.C.

INVOICE # 204

03959-4

INVOICE TO: Utah Mines Ltd.,
#1600 - 1050 W. Pender Street,
VANCOUVER, B. C.,
V6E 3S7.

PROJ. # 106

DATE: May 26/76

ATTENTION: Andy Schmidt, Exploration Department

FOR: Establishing Baseline by Transit Control and Transit Survey along existing road per our agreement May 3rd., 1976, and attached approvals from B. K. Bowen.

Road Survey:

4.18 miles at \$375.00/mile ----- \$1,567.50

Transit Baseline Survey*

9.66 miles at \$660.00/mile ----- 6,375.60

TOTAL HEREIN ----- \$7,943.10

CLASS / 10/10/76

* All lines established as cut baselines. ^{DISTRIBUTION} there was no surveying along existing lines.

UTAH MINES LTD. -- EXPLORATION DEPT.						
Location	Existing	Minor	Major	Act.	Exp.	Amount
00	17288		045	045	0	7943.10
00			0	0	0	
00			0	0	0	
00			0	0	0	
00			0	0	0	
Date Received				Invoice Amount		7943.10
Ext. & Prices				Discount		
Approved by				Amount Payable		
				Check No.		

P6/92

E. & O.E.

D.W. COATES ENTERPRISES LTD.

256A SIMPSON ROAD
RICHMOND, B.C.
V6X 2P9

INVOICE NO.: 997
JOB NO.: 273
DATE: July 7/76

RECEIVED
JUL - 8 1976

Utah Mines Ltd.
Suite 1600, 1050 West Pender St.
Vancouver, B. C.
V6E 3S7

RE: Poplar 93-L-2 Drilling

PERIOD: June 16 - 30, 1976

-017-31-7

017299

Drilling Detail
Moving, Setting Up & Tearing Down
Resetting on Hole# 21
Mud & Additives
Materials Left in Holes
Acid Testing

\$55,755.34
991.50
176.25
372.58
3,415.04
138.84

\$60,849.51

OK/ASS.
Poplar

UTAH MINES LTD. - EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Minor	A/P	Exp.	Amount
00	12288	0	0	0	60,849.51
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received					60,849.51
Ext. & Prices					
Approved by					
Check No.					

D.W. COATES ENTERPRISES LTD.

256A SIMPSON ROAD
RICHMOND, B.C.
V6X 2P9

INVOICE NO.: 1005

JOB NO.: 273

DATE: July 16/76

Utah Mines Ltd.
Suite 1600, 1050 West Pender St.
Vancouver, B. C. V6E 3S7

017-31-7
017299

RE: Poplar 93-1-2 Drilling
PERIOD: July 1 - 11, 1976

Drilling Detail	\$30,135.60
Moving, Setting Up & Tearing Down	968.00
Mud & Additives	36.30
Demobilization	995.50
Materials Left in Holes	1,676.50
Materials Left in Holes - Adjustment	(328.40)
Acid Testing	35.70
	\$33,519.30

OK/ASS.
Poplar

UTAH MINES LTD. -- EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Miner	Act.	Exp.	Amount
00		A2880	040	0	33,519.30
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received		Invoice Amount		33,519.30	
Ext. & Prices		Discount			
Approved by		Amount Payable			
		Check No.			

RECEIVED
JUL 20 1976

D.W. COATES ENTERPRISES LTD.

256A SIMPSON ROAD
RICHMOND, B.C.
V6X 2P9

INVOICE NO.: 989
JOB NO.: 273
DATE: June 21, 1976

Utah Mines Limited
Suite 1600, 1050 W. Pender St.
Vancouver, B. C. V6E 3S7

017299

~~017317~~

RE: Poplar 93-L-2 Drilling

PERIOD: June 14 - 15, 1976

Mobilization

OK/ASS
Poplar


\$1,310.00

\$1,310.00

DISTRIBUTION					
Location	Major	Minor	Act.	Exp.	Amount
00	A 228	040	0	0	1,310.00
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received			Invoice Amount		1,310.00
Ext. & Prices			Discount		
Paid by			Amount Payable		
			Check No.		

JUN 25 1976

002-04-6



ALPINE
HELICOPTERS LTD.

P.O. BOX 698, KELOANA, BRITISH COLUMBIA V1V 2P4

UTAH MINES LTD.,
1600 - 1050 WEST PENDER ST.,
VANCOUVER, B.C.

INVOICE NO: K 5455
DATE: SEPTEMBER 2, 1976
CONTRACT NO: K-600
WORK ORDER NO:

TO: CHARGE FOR HIRE OF BELL 206B HELICOPTER
IN THE BURNS LAKE AREA

AUGUST 17, 1976 FLIGHT REPORT NO. 479 1.6 Hrs.
1.6 Hrs. @ \$315.00 per hr. \$504.00
38.4 gals. fuel @ \$1.03 gal. 39.55
\$543.55

1.6 Hrs

TOTAL THIS INVOICE \$543.55

UTAH MINES LTD. -- EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Minor	Act.	Exp.	Amount
00		A 2880	0	150	543.55
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received				Amount	543.55
Ext. & Prices				Amount	
Approved by				Amount Payable	

[Signature]

RECEIVED
SEP 3 - 1976



OKANAGAN HELICOPTERS LTD.
 HEAD OFFICE:
 439 AGAN DRIVE, INTERNATIONAL AIRPORT SOUTH
 VANCOUVER, B.C. V7B 1A5
 TEL. (604) 278-5502 TELEX: 04-508883

ACCOUNT NUMBER **84996 172423**

FLIGHT DATE **16 08 76** YEAR **76** AUG 27 1976
 DAY MONTH YEAR INV. DATE

BASE NO. 170	BASE Smithers	AIRCRAFT TYPE 206B	TYPE OF CONTRACT - X	FLIGHT CLASS 0310AR	EARLY RATES (1 TO 21 DAYS)	10 DAYS OR MORE	FLIGHT LOCATION Blomfield	FLIGHT LOG
PURCHASE ORDER NO.				NO. OF PASSENGERS		FREIGHT LBS.		
PRINT NAME OF PERSON AUTHORIZED TO SIGN				ENG. NAME - 1 Base		ENG. NAME - 2		

OPERATION	TAKE-OFF	LAND	FLYING TIME
Crew Moves Popton Lake Area			
From 10 & From Smithers			1.7
Popton			

RECEIVED
AUG 30 1976

T.O.L. 10		D.M. 12 AUG. 14		EXTRA CHARGES OR ADJUSTMENTS	AMOUNT	ZONE A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AMOUNT
<p>OUR TERMS ARE DUE & PAYABLE WITHIN 30 DAYS FROM DATE OF INVOICE INTEREST OF 1 1/2% PER MONTH WILL BE CHARGED IF NOT PAID WITHIN 30 DAYS.</p>						NON REV. HRS.	REV. HRS.	TARIFF		
						CUST. SUP. (FUEL HRS.)	OUR FUEL 39 GALS. @	00.85		535.5
							OUR FUEL GALS. @			89.1
							OUR FUEL GALS. @			
							OUR OIL 1.7 HRS. @	20.80		1.3
SIGNED FOR CHARTERER BY B.H. Brown						SIGNED FOR CARRIER BY [Signature]				
						EXTRA CHARGES OR ADJUSTMENTS				
						TOTAL		\$	570.0	

OKANAGAN HELICOPTERS LTD.

HEAD OFFICE:
439 GARDNER, INTERNATIONAL AIRPORT SOUTH,
VANCOUVER, B.C. V7B 1A5
TEL: (604) 278-5502 TELEX: 04-508883

ACCOUNT NUMBER: 811 996 113960

FLIGHT DATE	06	06	76						
	DAY	MONTH	YEAR	INV. DATE	TYPE OF FLYING				

BASE NO.	170	BASE	Smithers	AIRCRAFT TYPE	2069	TYPE OF CONTRACT - X			
				DAILY MINIMUM 1 TO 29 DAYS	X	30 DAYS OR MORE			5
UTAH Lines LTD 1600 - 1050 W. Pender Vancouver B.C.				IND. CLASS	03F00R	AIRCRAFT REG. NO.	Blumenthal		309
				STATE OF AIRCRAFT - X					
				UNSERVICABLE		STORED			
				ENG. NAME - 1	Buse				
				ENG. NAME - 2					
PURCHASE ORDER NO.		NO. OF PASSENGERS		FREIGHT LBS.					

OPERATION			TAKE-OFF	LAND	FLYING TIME
Disp. of Pass in AM Plus PM in Sept 1975 Lake Area PAID JUL 25			Poplar	0315	358
RECEIVED BY: [Signature] PURCHASE ORDER NO. [Blank] PRICE & EXT. [Blank] APPROVED: [Signature] CHARGE 7020 Carbon Copy 11-20-10 30-10-18-80					
PRINT NAME OF PERSON AUTHORIZED TO SIGN [Signature]			DISCOUNT PAY NET AMT. 735.56		

TO L	TO S	EXTRA CHARGES OR ADJUSTMENTS	AMOUNT	ZONE	NON-REV. HRS.	REV. HRS.	TARIFF	AMOUNT
				A B C LTD	2	2.2	375.00	693.00
								40.80
								176
EXTRA CHARGES OR ADJUSTMENTS								
TOTAL \$ S								735.56

SIGNED FOR CHARTERER BY: *A. S. [Signature]*
 SIGNED FOR CARRIER BY: *[Signature]*

CHARTERER'S BILL ADDRESS

INVOICE



SKANAGAN HELICOPTERS LTD.
 HEAD OFFICE:
 439 AGAR DRIVE, INTERNATIONAL AIRPORT SOUTH
 VANCOUVER, B.C. V7B 1J5
 TEL: (604) 278-5502 TELLEX: 04-508883

ACCOUNT NUMBER: **84996 113965**

FLIGHT DATE: **05 06 76**
 DAY MONTH YEAR

BASE NO. **170** BASE **Smithers** AIRCRAFT TYPE **206B**

TYPE OF CONTRACT - X
 DAILY MINIMUM 1 TO 29 DAYS 30 DAYS OR MORE

FLIGHT LOCATION **Smithers** FLIGHT LOCATIONS **39**

IND. CLASS **0310A9** AIRCRAFT REG. NO. **Bloomfield** PILOT 1 **364**

STATE OF AIRCRAFT - X

UNSERVICEABLE STORED

PILOT 2 PILOT 2

ENG. NAME - 1 **BDSE**

ENG. NAME - 2

PURCHASE ORDER NO. NO. OF PASSENGERS FREIGHT LBS

CHARTERER'S BILLING ADDRESS

WEATH Mines LTD.
 1600-1050 W Pender
 Vancouver B.C.

PURCHASE ORDER NO. NO. OF PASSENGERS FREIGHT LBS

OPERATION
Smithers - Pender to 1070 Main Pines
RT. Smithers, Pender in P.I.

PAID JUL 23 1976

CHECK NO. **11**

PRINT NAME OF PERSON AUTHORIZED TO SIGN **A. Schilt**

TAKE OFF **0315** LAND **3318** FLYING TIME

UTAH INTERNATIONAL INC.
 MATERIALS OR SERVICES
 RECEIVED BY **[Signature]** DATE **3**

PURCHASE ORDER NO. **11**

PRICE & EXT. O.K.

APPROVED **[Signature]**

CHARGE **1000 Carbon**

DISCOUNT

PAY NET AMT. **701.58**

TO	ISSUE	EXTRA CHARGES OR ADJUSTMENTS	AMOUNT
			0
			0
			0
			0
			0

ZONE	A	B	C	D	AMOUNT
					2.3
NON REV. HRS.					661.5
REV. HRS.	2	2.1	3.5	0.2	38.40
TARIFF					
CUST. SUP. (FUEL HRS.)					
OUR FUEL	4.2 GALS.	0	0	0	
OUR FUEL	GALS.	0	0	0	
OUR FUEL	GALS.	0	0	0	
OUR OIL	2.1 HRS.	0	0	0	1.68
EXTRA CHARGES OR ADJUSTMENTS					
TOTAL					701.58

SIGNED FOR CHARTERER BY **A. Schilt**

SIGNED FOR CARRIER BY **[Signature]**

INVOICE



INVOICE

(016-62-4)

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7J 2C1 TELEPHONE (604) 985-0618

Utah Mines Ltd.,

1600 - 1050 W. Pender,

Vancouver, B. C.

DATE July 27/76

INVOICE NO. 17410

CERTIFICATE NO. 37770

ATTN: _____

Poplar

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
	Samples from Houston		
27	Analyzed for Cu & Mo @ \$1.85	\$49.95	
27	Prepared @ \$0.35	9.45	
		59.40	
	Less 10%	5.94	
			\$53.46

RECEIVED
JUL 28 1976

TERMS — NET 30 DAYS

1½% Per Month (18%) Per Annum Charged on Overdue Accounts.

75-040



INVOICE

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7J 2C1 TELEPHONE (604) 953-0618

Utah Mines Ltd.

DATE June 9/76

1600 - 1050 W. Pender

INVOICE NO. 16821

Vancouver, B.C.

CERTIFICATE NO. 37163 - 65

Podar
016 62-4

ATTN: _____

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
113	Analyzed for Cu & Mo @ \$1.85	\$209.05	
113	Prepared @ \$0.35	39.55	
3	Analyzed for Cu, Mo, Pb, Zn, Ag & Au @ \$6.80	20.40	
3	Prepared @ \$1.25 (rocks)	3.75	
UTAH MINES LTD. - EXPLOSION DEPT		272.75	
Less 10% DISTRIBUTION		27.27	
			\$245.48

Location	Major	Minor	Ass.	Exp.	Amount
00	A	288		0.250	245.48
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received			Invoice Amount		245.48
Ext. & Prices			Discount		
Approved by			Amount Payable		
			Check No.		

TERMS - NET 30 DAYS

1½% Per Month (18%) Per Annum Charged on Overdue Accounts.

75-040



INVOICE

C16629

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7J 2C1 TELEPHONE (604) 585-0514

Utah Mines Ltd.,
1600 - 1050 W. Pender,
Vancouver, B.C.

DATE June 4/76
INVOICE NO. 16781
CERTIFICATE NO. 37075 to 3708
ATTN:

Poplar

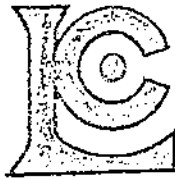
ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
	Samples from Houston, B. C.		
498	Analyzed for Cu & Mo @ \$1.85	\$921.30	
498	Prepared @ \$0.35	174.30	
		1095.60	
	Less 10%	109.56	
			\$986.04

JUN 7 1976

TERMS -- NET 30 DAYS

75-040

1 1/2% Per Month (18% Per Annum Charged on Overdue Accounts.



INVOICE

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7 2C1 TELEPHONE (604) 993-0611

Utah Mines Ltd.

1600 - 1050 W. Pender

Vancouver, B.C.

DATE June 16/76

INVOICE NO. 16915

CERTIFICATE NO. 37300 - 04 & 05 - 08, 10

ATTN: _____

215-604

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
405	Analyzed for Cu & Mo @ \$1.85	\$749.25	
405	Prepared @ \$0.35	141.75	
	Less 10%	891.00	
		89.10	
			\$801.90

UTAH MINES LTD. EXPLORATION DEPT.					
DISTRIBUTION					
Location	Major	Minor	Act	Exp.	Amount
00	A 288	040	✓	0	801.90
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	
Date Received					JUN 17 1976
Ext. & Prices					801.90
Approved by	<i>[Signature]</i>				
			Check No.		

- 59 -

TERMS - NET 30 DAYS

1 1/2% Per Month (18%) Per Annum Charged on Overdue Accounts.

75-040



INVOICE

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7J 2C1 TELEPHONE (604) 953-0618

Utah Mines Ltd.,

1600 - 1050 W. Pender,

Vancouver, B.C.

Poplar

DATE July 16/76

INVOICE NO. 17302

CERTIFICATE NO. 37634 to 37636

ATTN: _____

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
	Samples from Houston, B. C.		
99	Analyzed for Cu & Mo @ \$1.85	\$183.15	
99	Prepared @ \$0.35	34.65	
		217.80	
		21.78	

Less 10%

\$196.02

UTAH MINES LTD. -- EXPLORATION DEPT.

DISTRIBUTION

Location	Major	Minor	Act.	Exp.	Amount
00		A2880	0250	0	196.02
00		0	0	0	
00		0	0	0	
00		0	0	0	
00		0	0	0	

RECEIVED
JUL 19 1976

Date Received	Invoice Amount
Ed. & Prices	Discount
Approved by	Amount Payable
	Check No.

TERMS - NET 30 DAYS

1 1/4% Per Month (18% Per Annum Charged on Overdue Accounts.

75-040



INVOICE

0116624

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. V7J 2C1 TELEPHONE (604) 945-0518

Utah Mines Ltd.

DATE July 21/76

1600 - 1050 W. Pender

INVOICE NO. 17342

Vancouver, B.C.

Poplar

CERTIFICATE NO. 37706-10 & 10A

ATTN:

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
157	Analyzed for Cu & Mo @ \$1.85	\$290.45	
157	Prepared @ \$0.35	54.95	
		\$345.40	
	Less 10%	34.54	
			\$310.86

JUL 22 1976

TERMS - NET 30 DAYS

75-040

1 1/2 % Per Month (18%) Per Annum Charged on Overdue Accounts.

APPENDIX E

DIAMOND DRILLING CONTRACT

DRILLING AGREEMENT

THIS AGREEMENT, entered into this 26th day of
April, 19 76 by and between

UTAH MINES LTD., a
corporation, hereinafter referred to as "Owner", and
D. W. Coates Enterprises Ltd.
256A Simpson Road
Richmond, B. C.

hereinafter referred to as "Contractor",

WITNESSETH:

WHEREAS, Owner desires to have Contractor carry out
a drilling program on certain lands controlled by Owner and
located near Houston, B. C., specifically on the north shore of
Tagetochlain (Poplar) Lake, about 30 miles southwest of Houston,
B. C.

; and

WHEREAS, Contractor is desirous of performing such
drilling program for Owner and is fully equipped and capable to
perform such work;

NOW THEREFORE, in consideration of the covenants and
conditions hereinafter set forth, Owner and Contractor mutually
agree as follows:

1. WORK TO BE PERFORMED: Contractor agrees to perform
fully and completely all drilling and/or coring work requested
by Owner to be done by Contractor on the abovementioned lands,
such performance by Contractor to be in strict conformance with
the terms and provisions of this agreement and specifically in
conformance with those provisions set forth on Schedule I
attached hereto and by this reference incorporated herein.

All work to be performed by Contractor hereunder
shall be done at such times, such locations and in such manner
as requested by Owner, subject, however, to the specific provisions
set forth in Schedule I hereto.

It is understood that Owner may employ other contractors to perform work, including drilling, upon the subject property and Contractor shall conduct its operations so as to best cooperate with such other contractors, if so requested by Owner.

2. WORKMEN AND EQUIPMENT: Contractor agrees to furnish and maintain in first class operating condition the equipment, machinery, tools, and supplies specified in Schedule I hereto, or necessary to perform the work as set forth in said Schedule I hereto, and all labor, including superintendence, and all other things whatsoever required or convenient to properly perform the work specified in this agreement and within the time herein required. Owner may require Contractor to discharge from the performance of this contract any employee deemed to be in any way objectionable by Owner. No equipment furnished by Contractor hereunder for use in the performance of this agreement shall, without the prior consent of Owner, be removed from the site of the work until such time as the performance of this contract shall be completed by Contractor.

3. COMMENCEMENT AND PROGRESS OF WORK: Unless otherwise specified in Schedule I herein, Contractor shall, within thirty days after being notified by Owner to start work, commence work in the field at such locations as Owner may designate and shall thereafter continue diligently in the performance of the work at such rate of progress and at such locations as may be required by Owner and shall fully complete said work to the satisfaction of Owner.

4. NO REPRESENTATIONS TO CONTRACTOR: It is understood that Contractor has satisfied itself as to the nature and location of the work, the character of the soil, rock, or other materials to be encountered, the character, kind and quantity of equipment needed for the prosecution of the work, and the conditions under which the work is to be performed and Owner has made no

representations to Contractor concerning the conditions to be encountered in the performance of the work. No verbal agreement or statement shall affect or modify any of the terms or provisions of this contract and no change, amendment, or modification of the terms or conditions of this contract shall be valid unless reduced to writing and signed by Owner and Contractor.

5. LIENS AND CLAIMS: Contractor shall discharge at once all liens, claims, stop notices, or attachments which may be filed or levied in connection with the work done by Contractor under this agreement and shall pay all taxes levied upon Contractor, its employees, equipment, property, or operations and Contractor shall hold Owner, Owner's property, and the lands upon which the work called for in this contract is being performed harmless therefrom. Contractor shall pay promptly and in full the claims of all persons, firms, or corporations performing labor upon or furnishing equipment, materials, supplies, or power used in the performance of or contributing to the work described in this agreement.

Upon completion of work under this agreement, Contractor, if required by Owner, shall deliver to the Owner a complete release of all claims for taxes, liens, claims, stop notices, or attachments arising out of this agreement or receipts in full in lieu thereof and if required in either case, an affidavit that, to Contractor's knowledge, such releases or receipts include all labor and material for which a lien, claim, stop notice, or attachment could be filed.

6. LIABILITY FOR INJURIES AND PROPERTY DAMAGE: Contractor shall save harmless Owner, Owner's property, and the lands upon which the work called for in this agreement is being performed from all liability for injury to or death of persons and for damage to property in any way arising out of Contractor's performance under this agreement.

7. PATENT RIGHTS: Contractor shall save harmless Owner, Owner's property, and the lands upon which the work called for in this agreement is being performed from any claim, damage or expense arising out of any action or proceeding for the infringement or alleged infringement of any patent arising out of Contractor's performance under this agreement.

8. PAYMENT: In consideration of the covenants of the Contractor herein set forth and the full and prompt performance of this agreement by Contractor, Owner agrees to pay to Contractor and Contractor agrees to receive and accept as full compensation for Contractor's performance of this agreement, and also for any loss or damage to Contractor arising out of this agreement or from action of the elements or from unforeseen difficulties or obstructions which may be encountered in the performance of the contract, and for all risks of every description to Contractor in connection with the work, those sums set forth in Schedule II attached hereto and by this reference incorporated herein.

An estimate will be made by Owner once each calendar month during the term of this agreement of the amount of work completed by Contractor during the preceding calendar month and Owner will, on or before the last day of each calendar month, pay to Contractor the amounts due under the terms of Schedule II hereto for such work completed by Contractor during said preceding month. The estimates and calculations made by Owner as to the amount of work done by Contractor hereunder shall be final and binding upon Contractor and shall conclusively establish the amount of work done by Contractor hereunder.

9. BOND: Contractor shall furnish a surety bond in form satisfactory to Owner, with a surety approved by Owner, in the amount of waived (\$) guaranteeing the faithful performance of this agreement by Contractor and the payment by Contractor of the claims of all persons, firms or corporations performing labor upon or furnishing materials, equipment, supplies or power used in the performance

of this agreement.

No work shall be commenced under this contract until the required bond is produced and submitted to Owner. Should any surety upon the said bond become unacceptable to Owner for any reason at any time, Contractor will promptly furnish such additional surety, sureties, or security as Owner may request.

10. TERM OF CONTRACT: Unless the provisions of Schedule I shall specify a different length of time during which Contractor shall be bound to perform under the terms of this agreement, Contractor shall be obligated to perform for Owner under the provisions of this contract upon the lands hereinabove described, all drilling work requested by Owner to be performed by Contractor during a period of one (1) year from and after the date of this agreement, provided, however, that Owner may, at any time after the completion of the minimum amount of drilling work guaranteed to Contractor under the provisions set forth in Schedule I, terminate this agreement by giving notice of such termination to Contractor.

11. INSURANCE: Contractor shall obtain and carry during the period of this agreement at Contractor's sole cost the following insurance coverage:

<u>Insurance Coverage</u>	<u>Minimum Limits</u>	
Bodily Injury Liability including Contractual Liability and Completed Operations	Each person	\$100,000.00
	Each occurrence	\$300,000.00
Property Damage Liability including Contractual and Completed Operations	Each occurrence	\$100,000.00
	Aggregate	\$100,000.00
Automobile: (Including owned and non-owned automobiles)		
Bodily Injury	Each person	\$100,000.00
	Each occurrence	\$300,000.00
Property Damage	Each accident	\$100,000.00

Workmen's Compensation
and Employer's
Liability

Full Statutory Compliance
Each person \$100,000.00
Each accident \$300,000.00

No work under this contract shall be started until certificates of insurance conforming with the above minimum requirements are obtained and submitted to the Owner. Insurance companies must be satisfactory to Owner, and policies must provide that ten (10) days' written notice be given to Owner prior to cancellation or annulment.

12. COMPLIANCE WITH THE LAW: Contractor and its employees shall at all times observe and comply with all statutes, ordinances, and regulations of any nation, state, province, municipality or other governmental authority or agency having jurisdiction over the place where the work hereunder is being carried on.

13. PERMITS: Contractor shall obtain all permits and licences necessary for the performance of this contract and shall give all necessary notices and pay all fees required by governmental agencies or by other authorities in connection with the performance of this contract.

14. SUPERINTENDENT: The Contractor shall have a competent superintendent, satisfactory to Owner, on the work at all times with authority to act for Contractor. The superintendent shall not be changed except with the consent of Owner unless the superintendent ceases to be in the employ of the Contractor.

15. CONTRACTOR NOT AGENT OF OWNER: In the execution of the work to be performed hereunder, Contractor shall operate as an independent contractor and not as an agent or employee of Owner. Contractor shall hold Owner harmless from any liability which may arise by reason of any action or representation of Contractor, its agents, or employees.

16. NOTICE AND PLACE OF PAYMENT: All notices to be given to Owner by Contractor hereunder shall be delivered to

Owner's office at 1600 - 1050 West Pender Street

Vancouver, B. C. Any notice to be given by Owner to Contractor hereunder may be given by delivering such notice personally to Contractor's superintendent at the job site or, at Owner's option, such notice may be given by depositing said notice in any United States post office in an envelope, postage prepaid, and addressed to Contractor at 256A Simpson Road Richmond, B. C. Such notice to Contractor shall be deemed to have been given either upon its delivery to Contractor's superintendent or by deposit in said post office as the case may be.

All moneys payable to Contractor hereunder shall be payable at Owner's office in Vancouver, B. C. or at Owner's option may be mailed to Contractor in the manner hereinabove prescribed for the giving of notice to Contractor.

17. ASSIGNMENT: Contractor will not, without the previous written consent of Owner, assign this agreement nor subcontract any part or portion of the work to be performed hereunder to any other party.

18. PROTECTION OF INFORMATION: No information whatsoever regarding the conduct, records, or results of any work performed by Contractor under this agreement shall be given or discussed by Contractor or any of Contractor's agents or employees in any manner to or with any party other than the Owner without the prior written consent of Owner.

19. SUCCESSORS: This agreement and each and every provision hereof shall inure to the benefit of and be binding upon the parties hereto and their successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the date hereinabove set forth.

Utah Mines Limited
OWNER

BY [Signature]

D. W. Coates Enterprises Ltd.
CONTRACTOR

By [Signature]

SCHEDULE I
WORK PROVISIONS

1. The work is to consist of NQ core drilling on the Company's property near Houston, B.C. The Contractor will supply equipment and crews to operate one drilling rig, two 10 hour shifts per day on the drill rig, seven days a week.

Drilling will commence after camp is established, by Owner, on or about June 15, 1975.

2. Holes will be drilled with NQ wireline. In all instances, reasonable care shall be exercised to obtain the recovery of as high a percentage of core as the formation being drilled will reasonably permit. All such core shall be properly identified in correct order and placed in core boxes provided by Owner. Contractor shall furnish a log of each hole drilled, showing location and depth drilled and/or a daily record sheet with holes drilled and footage noted. Said record is to be signed by the driller and will be used in computing payment for work done.

3. The location, depth and angle of each hole to be drilled by Contractor shall be specified by the Owner. Maximum depth of any hole shall be around 1000 feet.

Notwithstanding any other provision of this agreement, Owner guarantees that a minimum of 5000 feet of drilling will be required of Contractor, under this agreement, but total footage may be extended beyond that amount by mutual consent.

4. The Owner shall check the angle and direction of each hole in order to assure that the hole is being started at the required angle and in the required direction. The Contractor assumes no responsibility for any deviation that may occur in a hole beyond the collar. The measurement of all holes shall be taken from the top of casing, or standpipe, as the case may be, which shall be kept as close to the original contour of the ground as circumstances will permit.

5. Should cavities or loose and caving materials, or other adverse conditions be encountered, so that in the opinion of the Owner and Contractor, further drilling in a hole is not practical, the hole may be abandoned, and the Contractor shall be paid at the rates specified in Schedule II attached hereto for the footage actually drilled, provided, however, that the Contractor shall not be paid when said adverse conditions are a direct result of negligence on the part of the Contractor. The Contractor, at the request of the Owner, will replace any driller not achieving satisfactory core recovery.

6. The Owner shall provide main camp facilities such as dining tent and dry tent. Contractor shall provide sleeping quarters for its crews, at his own expense.

7. The Contractor will provide the transportation necessary to move its equipment and crews on the property, with the exception of air transportation services which, if required, would be supplied by Owner.

8. The Owner shall provide, at its own expense, all rights of way that may be required to enable Contractor to move to and from, and to operate on, the drill sites specified by Owner. Contractor shall be permitted to fell and cut such timber as may be required in the course of the work hereunder upon the property controlled by Owner, provided, however, that Contractor shall comply with all the terms of Owner's permits allowing such timber cutting. Owner shall save the Contractor harmless from any assessments for stumpage.

9. This agreement and any disputes arising hereunder shall be interpreted and determined in accordance with the laws of the province of British Columbia.

10. During the course of the work, the Contractor agrees at all times, to keep operations free from accumulation of waste material, rubbish and garbage, and upon completion of the work, shall remove all tools, scaffoldings, surplus materials and rubbish, and leave premises in a clean condition. The Contractor shall observe and comply with all applicable Federal and Provincial laws, regulations and orders relating to prevention of forest fires and sanitation.

SCHEDULE II
PAYMENT SCHEDULE

The Owner shall pay the Contractor in Canadian Funds for work completed according to the following schedule:

1. Surface Drilling

The price per foot for core drilling in bedrock, from the surface, shall be:

	<u>Price/foot (NQ)</u>
0 - 500 feet	\$11.21 a foot
500 - 1000 feet	\$11.93 a foot

2. Overburden Drilling

From 0 to 25 feet at \$11.21 a foot; from 25 to 50 feet at \$11.80 a foot; from 50 to 100 feet at \$13.30 a foot; beyond 100 feet at Field Cost.

3. Field Cost Defined

Field Cost is defined for the purpose of this agreement as all direct labor, including supervision, at \$13.00 per man hour, drill and tower rental at \$9.50 per drill shift hour, pumps at \$0.85 per hour, mud mixer (when applicable) at \$0.60 per hour, tractor (when applicable) at \$15.00 per hour, 4x4 truck (when applicable) at \$7.50 per hour, pickup truck (when applicable) at \$6.50 per hour, plus the cost of all down-the-hole tools and supplies lost or consumed on the Field Cost portion of the work, at job site cost plus 15%. Reaming casing shall be done at \$0.80 per foot reamed to cover the cost of wear and tear on casing.

4. Casing, reaming, cementing and mud circulation operations, in overburden or in bedrock, if and when required shall be at Field Cost.

5. Pipe or Casing left in hole

Any casing, casing shoe bits or pipe left in holes at Owner's request shall be paid for by Owner, at cost plus 15%.

6. Standby, dip testing or delay time, or other time during which the Contractor's crews are performing services for the Owner, not otherwise covered herein, shall be at Field Cost.

7. Travel Time

Should travel time between camp and drill site exceed one half hour per man per shift, the cost of such travel time shall be for the Owner's account, at Field Cost Labor rates.

8. Water

Contractor will supply 2500 feet of water line with pumps capable of 300 foot lift at no cost to the Owner. Contractor will install and remove waterlines at no cost to the Owner.

9. The above schedules include the first 20-man hours spent moving between holes, setting up and tearing down. Should such moving time be greater, then that time over 20 man hours will be charged on a Field Cost basis.

Any move of equipment and crews requiring air transportation will be at Field Cost.

10. Tractor Rental

Contractor will provide a tractor to assist with moves at no cost to the Owner. Tractor rental, when applicable, shall be at \$15.00 per hour.

11. Mud and Additives

If ever required to help penetrate the overburden and/or aid in core recovery, would be supplied at cost on job site plus 15%. Time spent mixing mud and stabilizing the hole would be charged on a Field Cost basis.

12. Service Vehicles

Contractor will supply four wheel drive vehicles for service vehicles for its crews, at no cost to Owner.

13. Camp

Owner will provide board in its camp for Contractor's crew at no cost to Contractor. Contractor will provide sleep tents for its crew.

14. Mobilization and Demobiliation

For equipment and crews from Contractor's base of operations to truck discharge point, and from truck loading point return, a lump sum of \$1500.00. If the transport cannot be taken to camp, either for unloading or loading, then the move from truck discharge point to drill camp, and from drill camp to truck loading point shall be at Field Cost.

15. Core Boxes

Contractor will supply core boxes, if requested, at \$4.55 per box, lids at \$1.50 each.

16. Cost Escalation

The Owner will not countenance any cost escalations by the Contractor during the life of this contract.

17. Additional Drilling

The Contractor agrees that should the Owner request additional drilling, beyond the minimum 5000 feet, that such drilling, up to a total footage of 10,000 feet, will be done at the same rates as detailed above in Schedule II.