REPORT ON THE

W 1-24 YA39258 - 39281

TW 25-80 YA39601 - 39656

MINERAL CLAIMS

MAYO MINING DISTRICT

N.T.S. 105 M-6

Lat: $63^{\circ}29'$ Long: $135^{\circ}22'$W

September 1979 J. C. Stephen

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ATTESTATION

I, David A. Barr, do hereby certify that:

1. I am a geologist residing at 1334 Camridge Place, West Vancouver, British Columbia and I am employed by Du Pont of Canada Exploration Limited, 102-1550 Alberni Street, Vancouver, British Columbia.

2. I am a graduate of the University of Toronto with a B.A.Sc. degree in mining geology.

3. I am a registered Professional Engineer in the Provinces of British Columbia and Ontario.

4. I have practised my profession in geology continuously in Canada for the past 30 years.

5. Based on personal discussions with Mr.J.C. Stephen and his staff concerning the results of the geological, geophysical and geochemical programme during which reference was made to representative specimens of the various rock types and mineralization encountered, I am confident that the work as described in the report was carried out in a qualified manner.

D. A. Barr

1980 January 11

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This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $ 24,600

Resident ~~Geologist~~ or
Resident Mining Engineer

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

D. R. BAXTER
Supervising Mining Recorder

Commissioner of Yukon Territory

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GEOLOGICAL,GEOPHYSICAL, GEOCHEMICAL REPORT
ON THE
W 1-28 AND TW 29-80 MINERAL CLAIMS

INTRODUCTION

The W 1-24 mineral claims were staked in February 1979 to cover an acid intrusive plug intruding Yukon Group rocks approximately 30 kilometres southeast of Mayo, Yukon. The claim group covers an acid intrusive shown on GSC map 890A which was indicated to be anomalous for molybdenum and tungsten on publication of GSC Open File No. 51 (1971).

The area had been previously staked by Canada Tungsten at the time of publication of Open File 51, and had been investigated geochemically by others including CCH Resources in 1978.

The W 1-24 claims were optioned by Dupont of Canada Exploration Limited during March. The claim group was enlarged in April with the addition of the TW 25-80 mineral claims.

A program of geological mapping, soil and silt sampling,EM and magnetometer surveying and prospecting was conducted by J. C. Stephens Explorations Ltd. during 21 days during July - August, 1979.

CLAIMS REGISTER

GROUP	NAME	RECORD NUMBERS
W	W 1-24	YA 39258-281
TW	TW 25-80	YA 39601-656

LOCATION AND ACCESS

The claims covering Two Buttes area are located 30 kilometres southeast of Mayo, Yukon, Map Sheet 105 M-6.

Access to the property was entirely by helicopter during the exploration program.

TOPOGRAPHY

The claims are located on the Two Buttes Plateau. Slopes are generally moderate and topography rolling.

A small swampy lake lies at an elevation of 1396 metres in the central part of the claim group. The east and west buttes reach 1537 and 1557 metres respectively. Maximum slopes are at about the angle of repose for talus slopes and are generally steepest on north facing slopes. Much of the southern half of the property is covered by open meadows and swampy ground.

Drainage from the lake is to the northeast toward Stewart River. Other drainage flows southerly to No Gold Creek.

Outcrop is limited primarily to the main east trending spine of the east butte, the southeast spur of the west butte, the main northeast flowing creek and isolated north facing small cuesta-like ridges. Rock exposure is primarily as felsenmeer and scree.

BASE MAPS AND CONTROL GRID

An air photo mosaic and topographic map, at a scale of 1:10,000, were prepared to aid mapping of the property. A print of the air photo mosaic is included in this report on Map I. Geological mapping at 1:10,000 is plotted on a tracing of the topographic map and is provided as Map II.

A north-south cross line 2 km in length and an east-west base line 4.8 km in length were established, and tie lines were cut parallel to the base line at 10+00 metres north and south of the base line. 00N and east lies at the intersection of the base and cross line just north east of the central lake. These lines were well cut out and chained.

From 7+00W to 7+00E flagged compass lines were run from the base line to the tie lines at 100 metre intervals. Additional flagged lines were located at 9+00, 12+00, 15+00, 21+00 and 24+00 east and west of the cross line. Flagged stations were marked at 50 metre intervals on these lines. An extra line was run north from 10+50W to aid in mapping.

Errors in chaining on the east base line and on flagged lines were noted and locations of stations are indicated as closely as possible on the magnetometer survey maps. Errors were generally due to topography, thick buckbrush and erratic behaviour of one hip chain.

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6. INTRUSIVES
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   - 6b Quartz Feldspar Porphyry
   - 6c Biotite Granite
   - 6d Quartz Biotite Feldspar Porphyry, less coarse than 6a
   - 6e Biotite Hornblende Porphyry
   - 6f Quartz Biotite Feldspar Breccia

5. LIMESTONE
   - Includes Sandy, Garnetiferous, Siliceous

4. SKARN
   - 4a Calc Silicate Fine Grained
   - 4b Diopside-Garnet

3. TUFF
   - 3a Tuffaceous Greywacke
   - 3b Lapilli Tuff

2. METAGREYWACKE
   - 2a Biotite Metagreywacke
   - 2b Biotite Hornfels
   - 2c Micaceous Greywacke

1. QUARTZITE
   - 1a Silicified Quartzite

GEOLOGY

Preliminary mapping was conducted by J. C. Stephen on a scale of 1:10,000 using the air photo mosaic and contoured base maps provided by Dupont for the project, Map II. Traverses were primarily within the cut grid area although some work was done outside the grid area where the air photos indicated outcrop. Rock classification is based on field determinations. Mapping was done on the east grid area by A. Stanta and on the west grid area by S. McFarland at a scale of 1:2,000, Maps III and IV.

Rock Types

Quartzite Unit 1

Several varieties of quartzite were noted but were not necessarily separated on the map due to lack of continuity or because of small size or quantity. The following brief descriptions cover rock types classed as Quartzite on the 1:10,000 scale map.

Pure Quartzite

Thin beds, perhaps 2 to 30 cm in thickness, of pure white weathering high silica quartzite occur and were seen primarily as scattered white blocks of felsenmeer or scree. The scattered blocks look like pieces of vein quartz on the hillsides. On breaking to a fresh surface quartz grains are clearly visible. The rock appears to consist essentially of subrounded clear quartz grains well indurated.

Grey Quartzite

This rock is generally grey to slightly buff in color on the weathered surface. On a fresh break, it is grey, fine-grained, well indurated and fairly massive. Beds vary from about 5 cm to perhaps 30 cm but bedding is not well developed. The rock consists essentially of fine quartz grains but contains small amounts of mica and feldspar.

Buff Quartzite

Beds of buff, brown, to rusty weathering quartzite are essentially the same as to bedding, grain size and constituent minerals as the grey quartzite. The buff weathering characteristic appears to be due to a small iron content which imparts the buff color on weathering. The rock is usually grey in color if broken to a fresh surface.

Quartz Biotite Schist

Relatively thin beds interlayered with quartzites have developed to quartz biotite schist. These are generally thin beds which have not been separated on the 1:10,000 scale map. They were probably impure sandy to argillitic beds which have served as planes of shearing or deformation between more competent quartzite beds.

Silicified Quartzite Unit 1a

South of the main intrusive and near the base line at 15 and 16W, outcrops and felsenmeer of fine-grained, smooth, white to light buff weathering quartzites occur. At some locations joints and fractures are filled with thin white quartz veining. The rock is usually buff to rusty brown on a fresh fracture. It appears to consist primarily of quartz with fine sericite and close to the buried intrusives at 9W to 10W at about 1S small quartz eyes and faint to small feldspar phenocrysts appear to develop. The rock is considered an alteration product of slightly impure quartzites near the intrusive contact and principally above buried portions of intrusive.

Metagreywacke Unit 2

Occurrences of massive, usually poorly bedded fine-grained grey sediment were termed greywacke. Generally constituent minerals could not be readily identified in the field.

Biotite Metagreywacke Unit 2a

The colors of this unit range from dark grey to almost black. It has a banded appearance depending on the biotite content. Medium quartz and feldspar form the intermediate light colored bands with medium grained biotite forming dark colored bands which vary in widths. This unit may contain up to 50% biotite. The biotite is a product of regional metamorphism of the area.

Biotite Hornfels Unit 2b

This is a massive, very siliceous dark purple-black unit. It is composed mainly of medium quartz and biotite. It is very siliceous and has a conchoidal fracture. It is very suggestive of a contact metamorphic rock. This unit does not form a distinct band of rocks but does appear in several areas which are not in close proximity of any visible intrusive. It is suggested that intrusives may be present in these areas, below the surface.

Micaceous Greywacke Unit 2c

The massive greywacke appears to develop muscovite or sericite mica where alteration is accentuated by structural deformation. The grey color is retained but cleavage develops and the fine mica surfaces impart a sheen to the cleavage surface. With stronger deformation the rock approaches phyllitic structure.

Tuff Unit 3

A white to pale greenish fine-grained siliceous unit which occurs on the south slopes of the east butte was termed tuff and considered to be a rhyolite or rhyolite tuff. It is generally quite siliceous but develops into a light colored calc silicate skarn. It appears to be limited to a very thin band at the north contact of the calc silicate skarn.

Tuffaceous Greywacke Unit 3a

Relatively extensive occurrences of biotite metagreywacke and locally quartz biotite schist appear to grade from greywacke with fine volcanic ash eventually to lapilli tuff. The rock type has not been well separated from what was termed greywacke. It is usually fine-grained and biotitic with only weak to moderate development of cleavage. It is dark grey to purple in color because of biotite and in many occurrences shows small creamy to buff spots which were taken to be particles of volcanic ash.

Lapilli Tuff Unit 3b

The lapilli tuff occurs near the base line on the east grid. It is generally dark purple in color even when massive and apparently fresh. It is, however, generally somewhat sheared and quite biotitic. It is relatively fine for a lapilli tuff but is recognized by abundant small rounded or elongated white to buff spots or blebs of what were taken to be lapilli fragments. In the sheared tuff these fragments become elongated to the point that they almost disappear in cross section but show up well on weathered shear plane surfaces. In underformed rock they are more or less equidimensional. On some surfaces they are weathered out leaving small pits. Near ON, 7E a large block of talus shows repetitive gradational beds of lapilli tuff. The relatively larger orbicular fragments (up to 3 mm) are at what is taken as the base of each bed and volcanic ash becomes progressively finer upwards.

The lapilli tuffs become spotted biotite schist as deformation increases and develop fairly strong phyllitic structure near 7E ON to 1S where folding appears to have developed.

Skarn Unit 4

This unit is divided into two types primarily on field appearance but the apparent primary rock type is important.

Fine-Grained Calc Silicate Skarn Unit 4a

This is a whitish to pale green, occassionally pale pink highly siliceous rock which occurs primarily as felsenmeer or scree on the south slopes of the main east butte. No limestone has been found in association and the parent rock type is considered to have been a fine-grained rhyolite or rhyolitic tuff.

Diopside-Garnet Skarn Unit 4b

Associated with the limestone horizon extending easterly from 15W 7N are felsenmeer occurrences of dark green fine to medium fine-grained skarn. On this same horizon are occurrences of what appears to be thin banded silicified limestone or chert, garnetiferous limestone, fine-grained calc silicate skarn and coarse red and green garnetiferous skarns.

Small isolated patches of similar dark green skarn occur at 9W 5N, 12W 1+50S, 16W 0+50N and at 9W 0+50S.

This skarn appears to have developed along a limestone horizon in the general vicinity of the main intrusive. Fine scheelite and 'powellite' mineralization occurs in this rock type fairly commonly.

Due to the fragmentary nature of the skarn(no outcrop was located,) no real estimate of the thickness of the bed can be given. From the quantity of material available it is judged the maximum thickness might be in the order of 5 metres.

Limestone Unit 5

Grey to white limestone was found as scattered fragments near 9S 0E, and northwest of the west grid. It occurs within the skarn horizon as local scree near 15W, 7N; 12W, 7N; and 4E, 3N. Between 7E and 10E near the base line limestone occurs in outcrop as massive white to grey marble or recrystallized limestone and as thin bedded differential weathering limestone and chert or silicified limestone.

The unit is apparently persistant though not likely thicker than about 10 metres. It may not be continuous on any one horizon and it is not known whether the various occurrences are separate horizons or the same one repeated by folding.

The limestone may be associated with the rhyolitic tuff and is important because of its association with scheelite bearing skarn.

No positive correlation of skarn horizons has been possible thus far from the west to the east grid areas.

From 2E to about 6E occasional fragments of skarn and limestone appear in talus or felsenmeer at about 0+50N. A parallel bed of 'silicified limestone' occurs at 2N on lines 5E and 6E.

From 7E to 9E near the base line calc silicate skarn occurs above a thicker than usual limestone horizon.

On lines 3E to 7E from about 1S to 4S scattered calc silicate skarn occurs with siliceous tuffaceous beds. No limestone is present.

No dark green diopside skarn, or scheelite mineralization was found in the east grid.

Quartz Feldspar Biotite Porphyry Unit 6

The main intrusive body occurs on the west grid centred at about 10+50W, 1+50N. The main mass is a coarse grained porphyry with large (up to 3 cm) white to cream colored euhedral feldspar phenocrysts accompanied by dark rounded quartz eyes up to 5 mm in diameter. Small fresh biotite books occur as smaller phenocrysts.

Toward the margin, and possibly the top, of the main intrusive there is an incomplete zone of relatively equigranular quartz monzonite, light grey in color, which appears to have the same constituent minerals as the main porphyry. This quartz monzonite is a medium grained rock which may be a border phase of the main porphyry or may be a separate intrusive pulse of similar composition.

At the contacts of the main intrusive a narrow zone of fine-grained intrusive has developed which contains fairly abundant hornblende needles. This phase was noted along the northeast contact of the main intrusive between 9W abd 10+50W as well as at 6W 1+50N. Fragments of wall rock appear, in places, to have been engulfed by this phase and partially digested.

Although the above three phases are considered parts of the same intrusive event there is evidence, particularly along line 6W from 1N to 2+50N, that the fine-grained 'hornblende needle' phase has been brecciated and intruded by the normal feldspar, quartz biotite porphyry.

Quartz Biotite Feldspar Porphyry

The main intrusive body of the west grid is a light colored, highly porphyritic unit.

It is composed of very coarse grained euhedral feldspar (K spar?) (1 x 2-3 cm), coarse grained quartz "eyes' (up to 1 cm) in a matrix of medium grained feldspar, quartz and fine-grained to medium-grained biotite flakes. Amphibole (hornblende) is often present as well as chlorite, pseudomorphosed after biotite.

Little alteration is present in this unit, minor sericitization and chloritization are present in no distinct patterns.

It is thought this unit intrudes the surrounding metasediments with discordant contacts.

Quartz Feldspar Porphyry 6b

This unit is a phase of quartz biotite feldspar porphyry which is biotite poor. It is present in several locations within the main intrusive. It's characteristics are similar to 6a.

Biotite Granite 6c

This is another phase within the main intrusive body. It is equigranular to slightly feldspar porphyritic. It does not have quartz eyes which are distinctive to the main intrusion.

The main minerals are quartz, feldspar, biotite and minor hornblende.

Quartz Biotite Feldspar Porphyry 6d

This is a fine-grained equivalent of the main intrusive. The feldspar phenocrysts are smaller and less euhedral. Quartz eyes are present but still in small sizes. This unit is probably a border phase of the main intrusive as it is generally found near the contacts with the metasediments.

It is slightly sericitized in some localities.

Biotite-Hornblende Porphyry 6e

This is a light grey-greenish colored unit composed of needle-like amphibole crystals and biotite flakes in a fine-grained matrix of feldspar and quartz. Feldspar is slightly porphyritic.

This unit is formed along the contacts of the main intrusive and along with the secondary intrusive unit which is found between 5 and 6W 2+00N.

It is possible this unit has formed through the assimilation of metasediments.

Quartz Biotite Feldspar Breccia 6f

This unit is very limited in area and is found only within the secondary intrusive. It is composed of subrounded to subangular fragments of 6e biotite-hornblende porphyry in a matrix of 6a quartz biotite feldspar porphyry. Since 6e is thought to be younger than 6a it is maybe possible that the matrix of the breccia is a later pulse of magma which formed the main intrusive.

Feldspar Biotite Porphyry, Aplite, Pegmatite etc. Unit 7

At several places scattered over much of the property fragments of feldspar biotite porphyry are found which are probably fragments of narrow dykes. All occurrences seen were isolated fragments except for a 15 cm dyke cutting quartzite at about 10+50E, 1S. This dyke was, in turn, cut by two white quartz veins at about 60^{o} to the dyke contacts.

This dyke rock is a grey to very dark grey fine-grained, nearly aphanitic, ground mass with small grey to buff euhedral plagioclase phenocrysts and small books of biotite.

At 9W, 1+50S a dyke-like zone of fine-grained grey to buff loosely granular intrusive was encountered. This small zone contains crystals and spots of a grey to silvery metallic mineral tentatively identified as arsenopyritic. The intrusive is thought to be a dyke but has not been mapped in detail.

At 3+50N, 12W small dyke-like zones of aplitic granite cut the contact phases of the main feldspar quartz biotite porphyry.

On line 9W at about 3N small isolated occurrences of apparently barren coarse quartz feldspar pegmatite occur.

Quartz Feldspar Pegmatite 7a

These dykes are formed of very coarse grained quartz and feldspar in a coarse grained matrix of quartz and feldspar. Muscovite is present in very minor amounts.

They are found only in close proximity to the intrusives.

Quartz Porphyry Dyke 7b

This dyke unit is only found near the main intrusive. It's composition of mainly a fine-grained quartz feldspar matrix with minor quartz eyes,biotite flakes and minor muscovite. Arsenopyrite is present within the dyke.

STRUCTURE

Outcrop is limited on the property but determinations of dip and strike were possible at widely separated points. Formations appear to strike about 110° and dip 45° south. At about 13N, 3E on the main creek dips steepen to 68°S. At 18E 1N: and 19+50E 0+50S strikes are about 120° and dips about 45°S.

At about 12 E 1S a small shear drop at the east end of the outcrop shows a tightly folded synclinal structure which appears to plunge at about 20° to the west.

A single attitude at 15W 6N gives a strike of 060° and dip of 30°SE.

Measurement of individual attitudes of sedimentary beds indicates a thick sequence of quartzite, mica schists, tuffs and skarn dipping south. Minor limestone occurrences to the north west of the grid, with the skarn, and as boulders at about 00E 9+00S, together with the synclinal structure at 12E 1S, however, suggest possible tight folding (isoclinal?) and repetition of beds. The local development of micaceous beds and phyllitic structure in greywacke and lapilli tuff also suggest metamorphism due to local stress.

It is suggested folding may be important in tracing the tungsten mineralized skarn.

MINERALIZATION

Mineralization is extremely sparse on the Two Buttes property. The following notes describe the occurrences found during mapping by three individuals over some ten to fourteen days as well as prospecting by one individual during five days. Virtually no mineralization except a very little pyrrhotite was found on the east grid.

Pyrite

Only a few grains of pyrite were reported in a rock fragment in the south central part of the property. There may be traces in rusty quartz veined biotite schist at about 13N 5W in the main creek north of the grid.

Pyrrhotite

Small streaks and disseminations occur in some biotite rich metasediments. Checking with a hand magnet shows this mineral to be non-magnetic to only weakly magnetic. The more magnetic variety occurs with fine grains of chalcopyrite in biotite schist. The most abundant pyrrhotite was in a rusty quartz veined zone in the main creek north of the grid.

Chalcopyrite

A few fine grains were found with pyrrhotite in metasediments.

Arsenopyrite

Grains and small patches of a grey mineral, identified in the field as arsenopyrite, occur in a dyke-like variety of intrusive at about 9+10W, 1+50S. It also occurs in very small quantity in the silicified quartzite in the same general area.

Molybdenite

This was the most common sulphide after pyrrhotite in the vicinity of the main intrusives. It was found only rarely with quartz stringers within the intrusives. More commonly it occurs as 'grains' or small rosettes on dry fractures in quartzitic sediments and rarely in biotitic greywacke or tuffaceous greywacke. It also occurs as small rosettes along some narrow quartz veins.

Occurrences of molybdenite were recorded, no matter how small, during four days of prospecting and are plotted as a letter M on the west grid geology map. All occurrences were trace amounts. Some molybdenite is apparently coated with ferromolybdate as it fluoresces yellow.

Scheelite-Powellite

UV lamping of rock in the field during prospecting located occurrences of scheelite (bluish to bluish-white fluorescence) and 'powellite' (yellow fluorescing), mineralization associated with quartz stringers, relatively rarely, within the main intrusive and, more commonly, with fractures and quartz stringers in the surrounding sediments. In all cases quantities were trace amounts.

The skarn horizon at about 5N from 15W to 5W, exposed only as talus fragments, contains relatively fine scheelite-powellite. The light colored white to greenish 'calc-silicate' skarn appears to be barren while the dark green fine-grained massive 'diopside' skarn contains mineralization which might grade up to 0.7% WO_3 in selected hand specimens.

Skarn fragments at 9W 5N and 16W 0+50N also contain scheelite.

Occurrences are indicated on the west grid geology map by the letter 'W'.

Wolframite

Three occurrences of wolframite were found in quartz veins in the area surrounding the main intrusive.

Magnetite

No magnetite was recognized in the field.

Fluorite

No fluorite was recognized in the field.

ALTERATION

Indications of hydrothermal alteration, as distinguished from metamorphism, were found around the main intrusive bodies. Alteration did not appear to be intense or well defined and the general lack of real outcrop hindered recognition. The following types of alteration were noted:-

Silicification

In the vicinity of line 10+50W, north of the main intrusive the biotitic sediments appear to be weakly silicified to a weak biotite hornfels. This rock type is noted on the west grid geology map as unit 2c.

South of the main intrusive from 9W to 16W areas of quartzite appear to be altered by 'silicification' and weak sericitization. Close to the intrusive, particularly the various phases near 9W 1+50S, small quartz eyes and scattered small feldspar crystals have developed in the quartzite. A hand specimen of this altered rock resembles a fine-grained slightly porphyritic intrusive. The silicified quartzite is noted on the geology maps as unit 1a. It does not generally conform to the northwest striking south dipping configuration of most sediments.

Sericitization

Sericite was noted as an alteration mineral, in the field, within the 'silicified' quartzite, very locally in a phase of quartz feldspar biotite porphyry at about 12W 1N, and in metagreywacke at about 14W 2N. Large areas of metagreywacke have developed muscovite mica as a result of deformation and were noted as micaceous metagreywacke. Development of these micas is apparently as a result of deformation and was difficult to distinguish from sericitization.

Secondary Biotite

This type of alteration is suspected in some phases of the intrusive because of slight differences in color of the biotite flakes. What appears to be primary fresh biotite is common in the intrusives.

Chloritization

Chloritized biotite was noted rarely in metasediments and more commonly in intrusive rocks. It appears to be more common in the vicinity of the small intrusive at 6W 2N.

In general alteration is relatively weak and no distinct zoning was documented. Feldspars in the main intrusive appear to be quite fresh.

Skarnification

Thin limestone horizons extending across the property generally on a line from 15W 7N to 9E 0N appear to have been altered to skarn and/or silicified on a regional basis. Between 15W 7N and 5W 5N, however, skarn development is more complete and a dark green fine-grained diopside variety is mineralized with fine scheelite and 'powellite'. It is assumed this more intense skarn development and mineralization is associated with the granitic intrusives to the south.

GEOPHYSICAL SURVEYS

Magnetometer Survey

Purpose and Method

A magnetometer survey was conducted to define location of rock units and possible magnetic halos around the intrusive body.

A McPhar M-700 fluxgate magnetometer was used initially for readings along the base and tie lines. This instrument malfunctioned and a Scintrex MF-1 fluxgate magnetometer, with similar characteristics, was used for the remainder of the survey.

A base station was established at the camp site and multiple readings were taken to establish its value. Readings were then taken along base and tie lines. Two or more readings were taken at each location and tied into the camp site base station. Readings were then taken on the flagged lines and tied in at both ends to the base and tie line stations.

Erratic readings were obtained at times. These were sometimes most noticeable in the early morning and work was postponed for quieter periods. However, some lines were read on the last day during relatively erratic magnetic disturbances in order to complete the survey. Readings were repeated as many as eight times on some stations to get the most consistant values possible under the existing conditions. Displays of northern lights indicate the magnetic field was probably widely disturbed.

Compilation

Readings taken on flagged lines were corrected to match the tie line and base line values and these corrected readings are plotted on Maps V and VI. Values range from270 gammas to 2825 gammas. Most fall within the range of 400 to 500 gammas and indicate the rock units are generally almost devoid of magnetic minerals. All occurrences of pyrrhotite mineralization encountered were checked with a pocket magnet during mapping and found to be non-magnetic to only very weakly magnetic. Quantities of pyrrhotite are very small and magnetite was not visually identified on the property.

Magnetic values are contoured to outline areas of greater than 500 gammas. Several isolated values above 500 gammas are contoured but readings are too far apart to define these areas in any but the most general way.

Interpretation

Magnetic values above 500 gammas occur over a broad area generally around the north contact of the main intrusive body. Two high readings, 2825 and 1515 gammas occur within this zone and are the highest on the property.

The zone surrounds in a rough manner, the west and north contacts of the main intrusive as it is known from outcrop and felsenmeer. It covers a large area of greywacke type sediment to the west where no intrusive is known and includes an area along lines 6W and 7W which is located in a backbrush covered plateau. It is possible this area contains some sediments.

A check was carried out on the location of the 1515 gamma reading and a few skarn fragments were located. These fragments, at 4+50N and 5+00N 9W are dark green dropside skarn with scheelite mineralization. No estimate of the width or character of the zones is possible from the fragments found in felsenmeer. Since skarn fragments tested with a hand magnet were non-magnetic it may be only fortuitous that these high readings coincide with this rock type.

On line 15W the high reading of 2825 gammas as in an area of meta-greywacke some of which is micaceous. No skarn or mineralization to account for this high were noted during mapping. No specific ground check was carried out.

The magnetic high zone from line 15W to line 6W is probably due to a very weak halo surrounding the northwest and north portions of the main intrusive body. This halo may be due to development of minor pyrrhotite in impure sediments, metagreywacke and tuffaceous greywacke, as a result of the intrusion. To the south and east no such magnetic zone appears to have developed because the relatively more pure quartzites have not been condusive to development of pyrrhotite.

On the Base Line at 5+00 to 6+50E a small zone of slightly higher magnetic readings occurs. This lies over the approximate outcrop of sheared lapilli tuff close to a suspected synclinal axis. It may be that some pyrrhotite has developed in the altered tuffs at this location. The westerly trace of the lapilli tuff across lines 5E to 3E shows no significant magnetic response.

From 0+00E to 9+00E, north of 6N, weak irregular zones of magnetic high readings occur. These may represent development of pyrrhotite in impure sediments which do not outcrop. Frost heave fragments of quartzite were found in the area together with a very few fragments of fine-grained siliceous quartz feldspar porphyry. These last fragments are similar to the most highly altered quartzite over the intrusive at about 9+50W to 1+00S, where small quartz eyes and feldspar phenocrysts appear to develop in the 'Silicified quartzite' rock unit. This area may be underlain by an acid intrusive which has not been found in outcrop and may not necessarily reach surface.

Readings on line 6W from the base line south to the tie line are slightly lower than readings to the east and west. This difference is probably real as the readings were adjusted to stations on the base and tie lines. In a general way this low corresponds to north trending contour lines for the tungsten soil sample results and to north trending contours on the interpretation map of EM-16 results.

Conclusions

The magnetometer survey was less precise than is desirable and, over large areas, the spacing of survey stations is too wide to provide good definition.

A possible weak magnetic halo is indicated surrounding part of the known intrusive body on the west buttes.

Magnetic zones in the tree-covered area north of the main east butte suggest a possible intrusive at depth.

There is only the very weakest suggestion of a magnetic halo at the north end of the lake. The lack of a magnetic halo in the lake area may be due to:

1) the absence of an intrusive of significant size or;

2) the lack of reactive country rocks to develop pyrrhotite or magnetite to produce a halo.

If further work is done on the property a magnetometer survey may be useful if done with a proton magnetometer with stations at 25 metre intervals on lines 100 metres apart. Anomalies will be generally weak.

EM-16 SURVEY

Purpose and Method

The EM-16 survey was conducted between lines 7E and 7W in the area of most extensive overburden as a possible aid to interpretation of the geological structure.

A Geonics EM-16 unit, supplied by Dupont, was tuned to Seattle. Readings were taken at 50 metre stations on the tape and compass lines and are plotted on Maps VII and VIII.

Compilation

Readings recorded at each station are plotted with the "In Phase" to the left of the station and "Quadrature" to the right. These readings are profiled along each line with a solid line representing "In Phase" and dotted lines representing "Quadrature".

During compilation of data these results were also contoured as outlined by D.C. Fraser, C.I.M. Transactions, Volume LXXIV pp 11-13 1971.

Results and Interpretation

High readings, both positive and negative were obtained over portions of the property. Readings at 50 metre intervals are relatively widely spaced to indicate conductive bodies of limited size but in general there are only one or two "cross overs" shown by the data which are of the form normally associated with conductors. One of these is located on line 6W at 6S where the In Phase readings produce a cross over but there is no similar response from the Quadrature.

Other "crossovers" occur but none are considered indicative of conductive bodies.

Abrupt changes in profile of the In Phase component occur on lines 5W at 2N; on line 6W at 3S and 3N and on line 7W at 1+50S and 4N. These arelocated just to the north of the small intrusive mapped on 6W and are on the trend of the intrusive outcropping at 9W 1+50S. The abrupt EM profile changes may indicate these contacts.

On lines 5W and 7W there is a weak correlation of contoured EM-16 effects with location of skarn fragments. The correlation does not appear to indicate direct extension of the zone into the east grid.

In general the broad zones of EM highs and lows follow the trend of major rock units. No significant structural or economic inferences have been derived from them.

GEOCHEMISTRY

Procedure

Soil sampling was carried out on the cut control lines and the flagged grid. Between 7+00W and 7+00E samples were taken at 50 metre intervals on lines averaging 100 metres apart. Lines 900 to 2400 metres east and west were sampled at 150 metre intervals. All drainages of any consequence were silt sampled where encountered on the grid lines. In areas of felsenmeer some rock chip samples were taken when soil was not available.

In all, approximately 730 soil samples, 27 silt samples and 11 rock chip samples were collected. Data concerning location, type of sample, color of soil etc was noted for each sample. Samples from base and tie lines, as well as silt samples, were tested for pH using a Cole Parmer "Digi Sense" Digital pH Meter. Samples were dried on site and shipped for further processing.

pH Tests

Twenty three sediment samples were tested for pH. Results range from 5.4 to 7.4. No pattern is evident from the locations of these samples.

Eighty soil samples on base and tie lines were tested for pH. The minimum value obtained was 4.8 at ON18+00E and the maximum was 7.8. Only two values were above 7.5. These were 7.8 at 1+00S on the 0+00E Cross line and 7.7 at 1+50S on the 0+00 Cross line.

Analysis

Samples were submitted to Min-En Laboratories Ltd. North Vancouver where the determination of molybdenum content was done by nitric, perchloric digestion and A.A. analysis and tungsten content was done by fusion and colorimetric determination.

Presentation

Base maps at 1:2,000 scale of the east and west grids show the location of base and tie lines together with location of flagged sample stations. The molybdenum and tungsten sample results are plotted together on one set of base maps. Tungsten values are contoured at 10, 20, 40 and 100 ppm.

Results and Interpretation

Tungsten values in soil samples range to a high of 300 ppm. Where samples are located at 50 metre intervals on lines 100 metres apart the results can be contoured into several zones as shown on the base maps.

Zone 1: Tungsten values, including the high of 300 ppm, lie along a south east trend from about 9W 6N. This is considerably wider than expected but follows the trend of scheelite bearing scree found during mapping.

Molybdenum values are generally in the 2 to 8 ppm range except at the east end of the zone where two values of 46 and 47 ppm occur. These last two values may be due to wet ground in this area.

Zone 2: Values up to 175 ppm tungsten occur on line 6W south of the small intrusive at 2N. There is little or no outcrop where geochemical values are high and no significant mineralization is known. Molybdenum values range from 2 to 13 ppm with the highest values being on the periphery of the tungsten anomaly.

Zone 3: This is a north east trending zone which may include the high molybdenum, low tungsten values to the north east to join with the east end of Zone 1. Similar trends are suggested by the EM-16 and magnetometer results. No outcrop is known.

The shape of zones 2 and 3 may be substantially changed by more detailed sampling on line 9W. The high value at 9W 1+50S is probably related to the small intrusive body there and may trend to the south east.

Zone 4: Relatively anomalous tungsten values, with moderate molybdenum in the lower wet areas, trend easterly into the outcrop area of calc silicate skarn.

Molybdenum values on the property are usually in the 2 to 10 ppm range. Higher values, up to 265 ppm occur on the east, north and south west sides of the lake in relatively low ground. It is presumed these values are primarily due to hydromorphic concentration of molybdenum in these wet areas in the vicinity of sparse mineralization related to intrusives and skarns.

South of the lake in similar wet ground molybdenum values are in the 3-7 ppm range.

Isolated high values as at 4+50N on lines 12W and 15W are probably due to minor molybdenum mineralization. This area was not adequately mapped and should be investigated.

No geochemical anomalies of significance were located on the east grid. More detailed sampling at about 7W to 9W: 00 to 3S may reveal some low tungsten values related to calc silicate skarn in the area. No anomaly is indicated by the current data and no significant mineralization is known.

Soil sample values in the north portion of the east grid do not support the possibility of an important buried intrusive.

Values east of the lake are probably derived from the calc silicate skarn zone on the south side of the east butte. They may also represent the east extension of Zone 3 values.

Conclusions

No significant molybdenum anomalies are indicated. Isolated high values may warrant investigation. High values in swampy ground around the lake are probably due to concentration of molybdenum by ground water.

Tungsten anomalies are indicated by Zones 1 to 3. Zone 1 is almost certainly associated with tungsten bearing skarns. Zone 2 would bear further prospecting but very little outcrop is available. No outcrop is known in the Zone 3 area.

More detailed soil sampling, at least on lines 9, 10+50 and 12W, should be carried out to define Zone 3 more completely and investigate the margins of the intrusives.

The overall shape of the tungsten anomalies suggests a broad Z shape possibly related to folding of the sedimentary sequence.

CONCLUSIONS AND RECOMMENDATIONS

No significant molybdenite mineralization was encountered and alteration patterns appear weak. It is concluded the porphyry molybdenum potential of the intrusive stock is low.

A scheelite bearing skarn horizon has been located. The geochemical results suggest this horizon may fold in the area north west of the lake. More detailed soil sampling and a more precise magnetometer survey would aid in tracing this horizon.

Traces of tungsten and molybdenum mineralization were encountered south of the base line at about 9W to 11W. More complete mapping would be desirable here together with limited rock geochemistry.

The magnetometer high on line 15W together with the geochemical highs at 4+50N and 6+00N should be investigated.

If assays of tungsten bearing skarn fragment indicate significant grades diamond drilling may be justified along the skarn horizon.

Respectfully submitted
J.C. Stephen Explorations Ltd.

J.C. Stephen

JCS/ms

APPENDIX I

COST STATEMENT

J.C. STEPHEN EXPLORATIONS LTD. PROGRAM

Personnell

Field	Dates	Days	Amount	
H. Awmack	July 27-Aug 12,	17	$ 1,200.00	
A. Stanta	July 27-Aug 17,20,	23	1,672.50	
M. Seifert	July 27-Aug 12,	19	1.331.00	
S. McFarland	Aug. 3-Aug 17,20	15	1.080.00	
B. Rode	July 27-Aug 8	13	997.50	
				$ 6,281.00

Field, Supervision and Compilation

J.C. Stephen Field August 2-11	10 days @ 150.	$ 1,500.00	
Travel August 1,12	2 days @ 100.	200.00	
Office			
Compilation between August 20 and September 14	40 hours @ $12.50	500.00	
			$ 2,200.00

Groceries

Danny's Department Store, Mayo, Y.T. 939.20

Truck Mileage and Rental

$ 409.00 + $ 594.00 $ 1,003.00

$10,423.20

APPENDIX II

STATEMENT OF QUALIFICATIONS

J.C. STEPHEN

Ass. Member British Institute of Engineering Technology 1951

Member Canadian Institute of Mining and Metallurgy

EXPERIENCE

DATES	POSITION	COMPANY
1947 - 49	Engineering staff	Central Patricia Gold Mines Ltd.
1949 - 50	Geology student	Univ. of Alberta
1950 - 51	Geological staff	Eldorado Mining & Refining (1944) Ltd.
1951	Engineering staff	Madsen Red Lake
1952	Geological staff	Hasaga Gold Mines Ltd.
1953 - 55	Engineering and Geological staff	Pickle Crow Gold Mines Ltd.
1955 - 56	Exploration staff	Combined Developments Ltd.
1956 - 59	Associate and field man	Jay-Kay Syndicate R.G. Crosby and Assoc.
1960 - 62	Senior construction Inspector	Haddin, Davis & Brown Ltd.
1962 - 68	Exploration staff	Mastodon Highland Bell Mines Ltd.
1968 - 76	Exploration Sup't NBC, LUC, DC Synd's	Bacon & Crowhurst Ltd.
1977 -	Manager President	D.C. Syndicate J.C. Stephen Explorations Ltd.

STATEMENT OF QUALIFICATIONS

I, Angie Stanta am a candidate for Honours Bachelor of Science, University of Windsor, 1980.

Employment experience included the following:-

May - September 1979 - Geologist with J.C. Stephen Explorations Ltd. North Vancouver, B.C.

June - September 1978 - Assistant to Chief Geophysicist, Husky Oil Operations, Calgary, Alberta.

July 23, 1979

Angie Stanta

STATEMENT OF QUALIFICATIONS

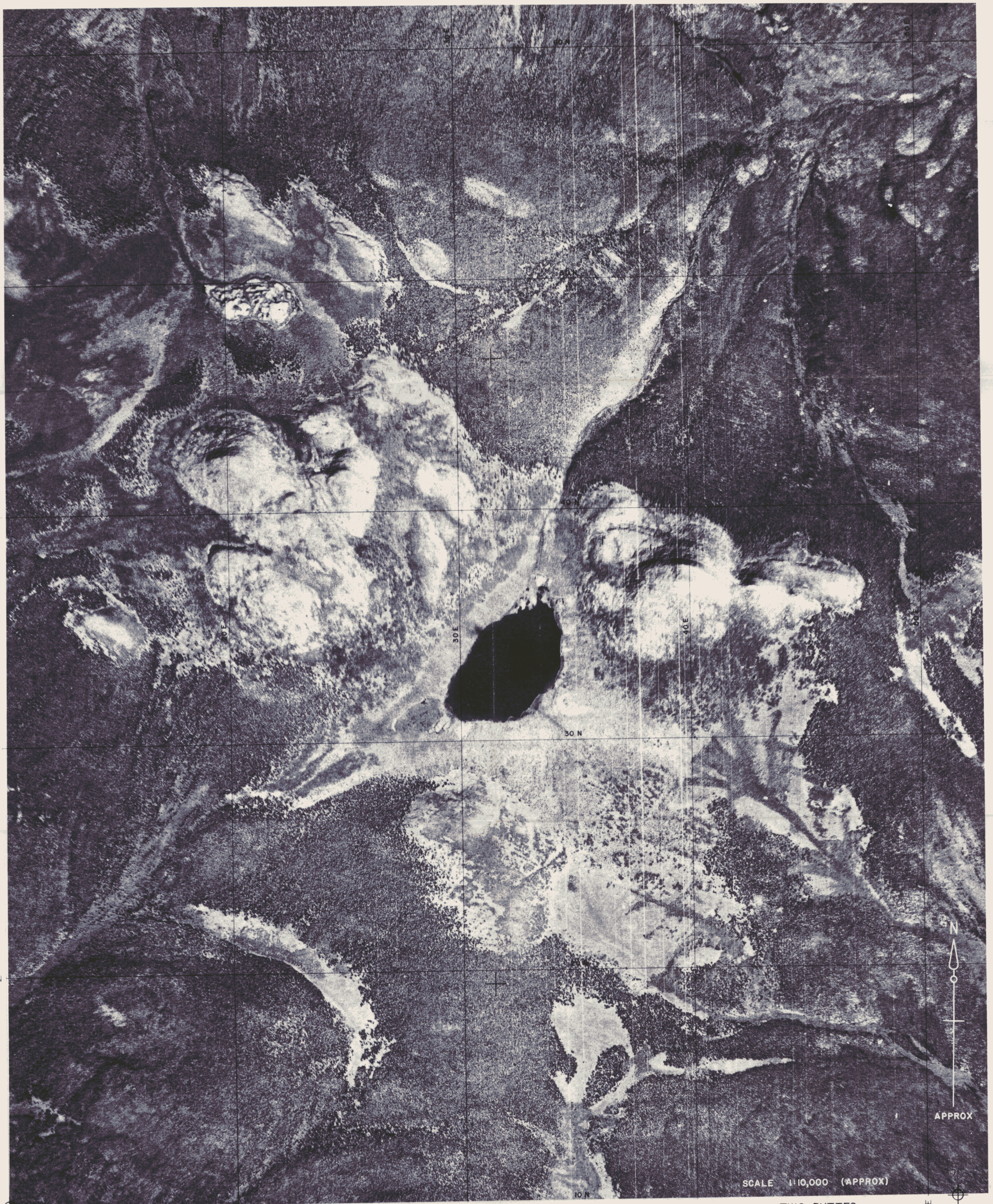
SUSAN McFARLAND

EDUCATION

1979	Bachelor of Science, Geology University of Toronto

EXPERIENCE

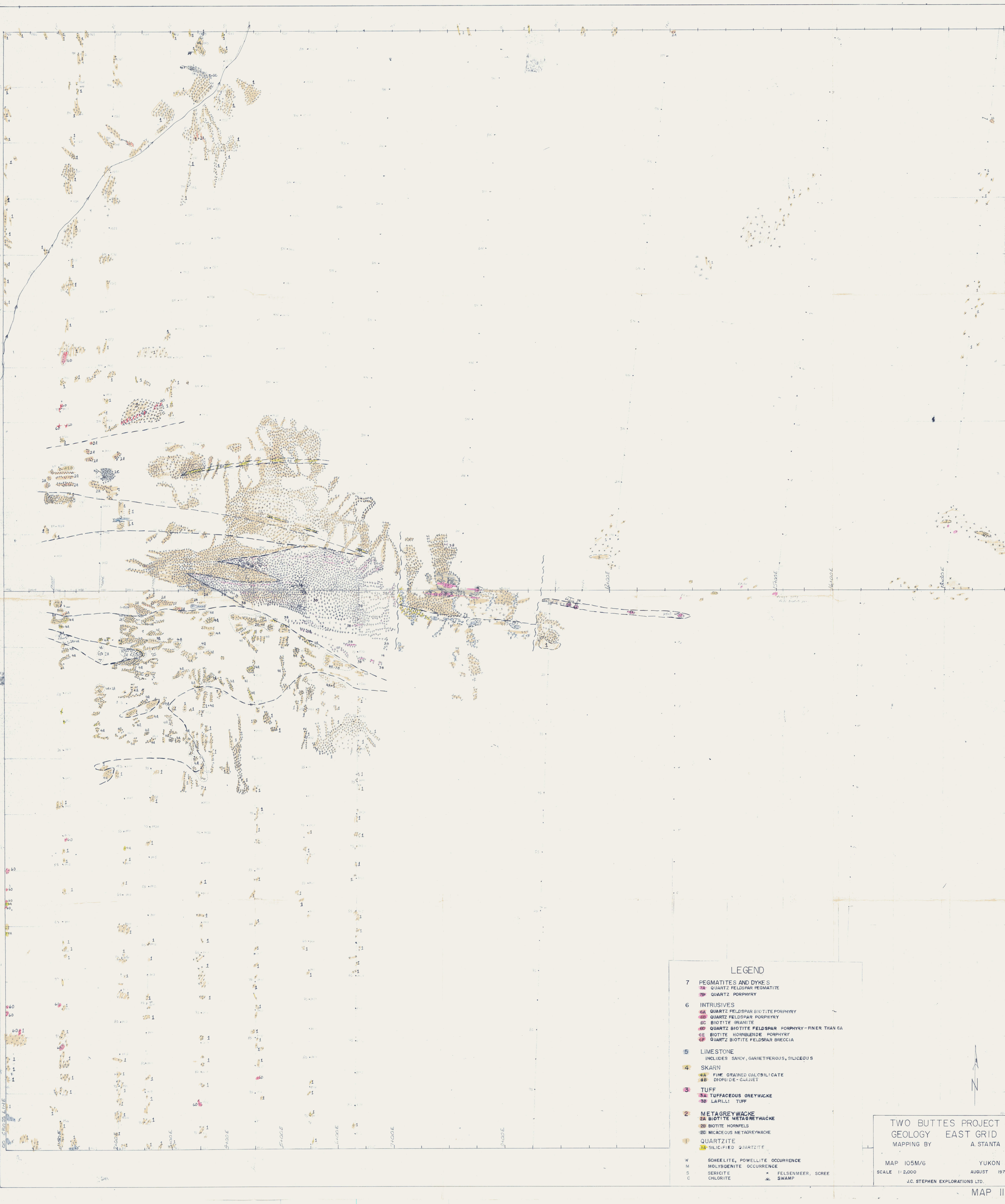
May 1976 - Sept. 1976 Sept 1976-May 1977 (Part Time)	Department of Geology University of Toronto Research Assistant
May 1977 - Sept. 1977	Ontario Division of Mines Mapping Assistant
Sept 1978- March 1979	Ontario Geological Survey Geological Drafting, Petrographic Analysis
May 1978 - Sept. 1978	Campbell Chibougamau Mines Mayo Area, Yukon
May 1979 - Aug. 1979	Claymore Resources Party Chief
Aug 1979 -	J.C. Stephen Explorations Ltd.

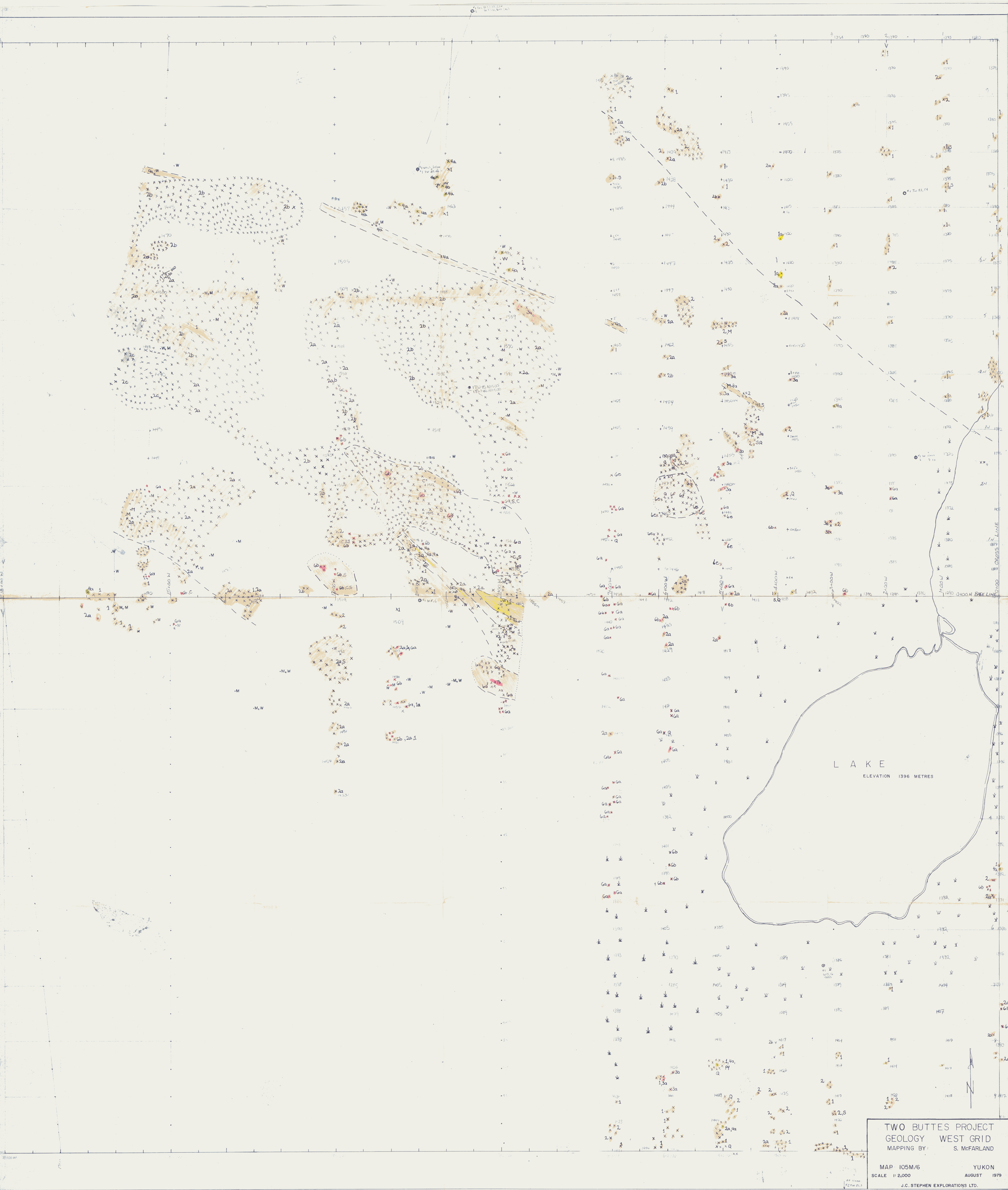


10N
20N
30N
40N
REGISTRATION
10E
20E
30E
40E
50E

TWO BUTTES

MAP I

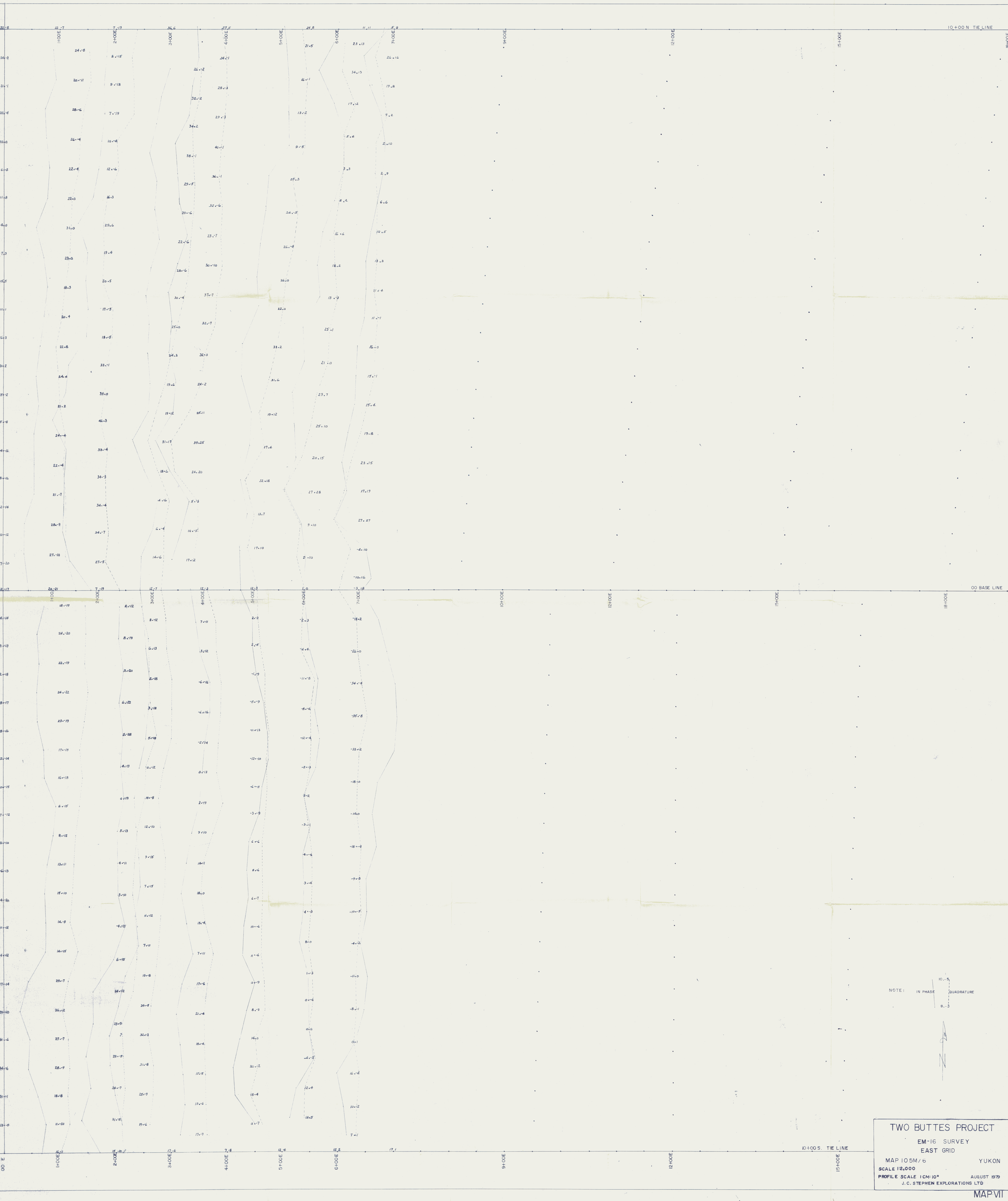

LEGEND
7 PEGMATITES AND DYKES
7A QUARTZ FELDSPAR PEGMATITE
7B QUARTZ PORPHYRY
6 INTRUSIVES
6A QUARTZ FELDSPAR BIOTITE PORPHYRY
6B QUARTZ FELDSPAR PORPHYRY
6C BIOTITE GRANITE
6D QUARTZ BIOTITE FELDSPAR PORPHYRY - FINER THAN 6A
6E BIOTITE HORNBLENDE PORPHYRY
6F QUARTZ BIOTITE FELDSPAR BRECCIA
5 LIMESTONE
INCLUDES SANDY, GARNETIFEROUS, SILICEOUS
4 SKARN
4A FINE GRAINED CALCSILICATE
4B DIOPSIDE - GARNET
3 TUFF
3A TUFFACEOUS GREYWACKE
3B LAPILLI TUFF
2 METAGREYWACKE
2A BIOTITE METAGREYWACKE
2B BIOTITE HORNFELS
2C MICACEOUS METAGREYWACKE
1 QUARTZITE
1A SILICIFIED QUARTZITE
W SCHEELITE, POWELLITE OCCURRENCE
M MOLYBDENITE OCCURRENCE
S SERICITE
C CHLORITE
FELSENMEER, SCREE
SWAMP
N
TWO BUTTES PROJECT
GEOLOGY EAST GRID
MAPPING BY A. STANTA
MAP 105M/6
YUKON
SCALE 1:2,000
AUGUST 1979
J.C. STEPHEN EXPLORATIONS LTD.
MAP III


LAKE
ELEVATION 1396 METRES
0+00N BASELINE
CROSS LINE
N
TWO BUTTES PROJECT
GEOLOGY WEST GRID
MAPPING BY: S. McFARLAND
MAP 105M/6
YUKON
SCALE 1:2,000
AUGUST 1979
J.C. STEPHEN EXPLORATIONS LTD.

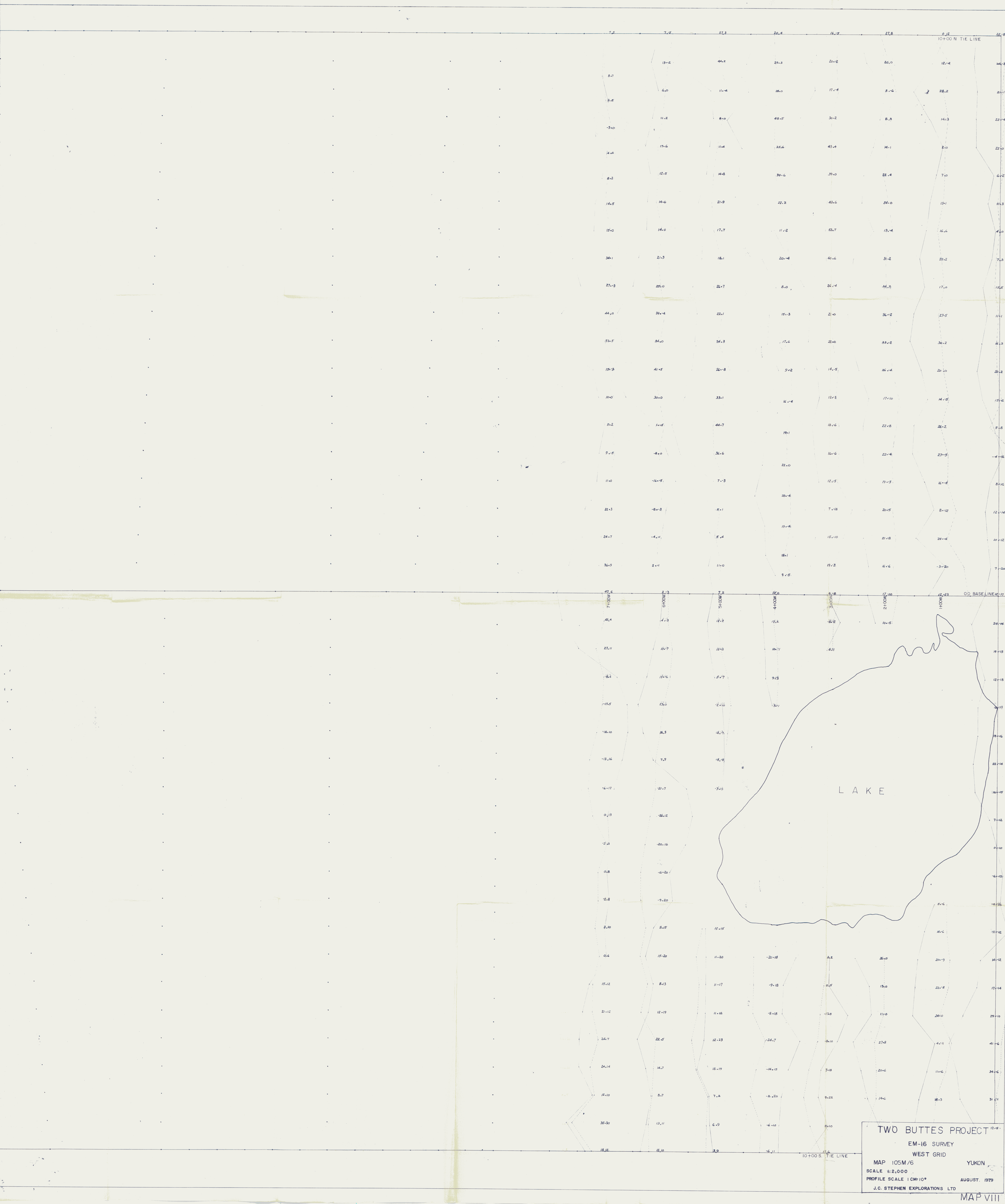
MAP IV


TWO BUTTES PROJECT
MAGNETOMETER SURVEY
EAST GRID
MAP 105M/6
YUKON
SCALE 1: 2,000
AUGUST 1979
J.C. STEPHEN EXPLORATIONS LTD
MAP V

10+00 N
BASE LINE
LAKE
10+00 S
TWO BUTTES PROJECT
MAGNETOMETER SURVEY
WEST GRID
MAP 105M/6
YUKON
SCALE 1:2,000
AUGUST 1979
J.C. STEPHEN EXPLORATIONS LTD.
MAP VI



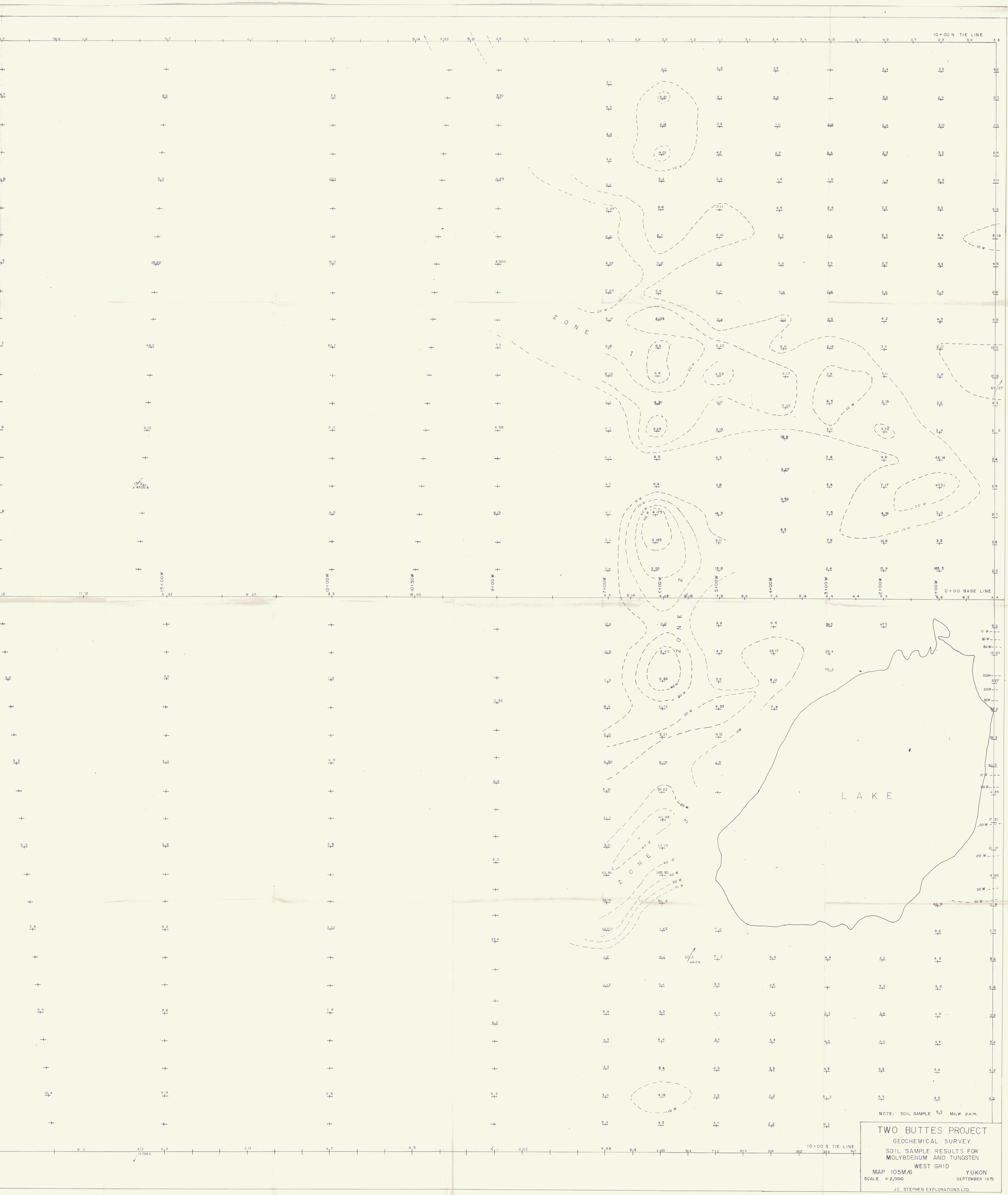
10+00N TIE LINE
00 BASE LINE
10+00S. TIE LINE
NOTE: IN PHASE QUADRATURE
N
TWO BUTTES PROJECT
EM-16 SURVEY
EAST GRID
MAP 105M/6 YUKON
SCALE 1:2,000
PROFILE SCALE 1CM: 10° AUGUST 1979
J.C. STEPHEN EXPLORATIONS LTD
MAP VII


10+00 N TIE LINE
00 BASELINE
7+00W
6+00W
5+00W
4+00W
3+00W
2+00W
1+00W
LAKE
10+00 S. TIE LINE
TWO BUTTES PROJECT
EM-16 SURVEY
WEST GRID
MAP 105M/6
YUKON
SCALE 1:2,000
PROFILE SCALE 1CM=10°
AUGUST, 1979
J.C. STEPHEN EXPLORATIONS LTD

MAP VIII

10+00 N TIE LINE
0+00 BASE LINE
10+00 S. TIE LINE
ZONE 4
NOTE: SOIL SAMPLE 6,5 Mo, W p.p.m.
TWO BUTTES PROJECT
GEOCHEMICAL SURVEY
SOIL SAMPLE RESULTS FOR
MOLYBDENUM AND TUNGSTEN
EAST GRID
MAP 105M/6
YUKON
SCALE 1: 2,000
SEPTEMBER 1979
J.C. STEPHEN EXPLORATIONS LTD.

MAP IX


10+00 N TIE LINE
0+00 BASE LINE
10+00 S. TIE LINE
15+00W
12+00W
10+50W
9+00W
7+00W
6+00W
5+00W
4+00W
3+00W
2+00W
1+00W
ZONE 1
ZONE 2
ZONE 3
LAKE
NOTE: SOIL SAMPLE Mo,W p.p.m.
TWO BUTTES PROJECT
GEOCHEMICAL SURVEY
SOIL SAMPLE RESULTS FOR
MOLYBDENUM AND TUNGSTEN
WEST GRID
MAP 105M/6
YUKON
SCALE 1:2,000
SEPTEMBER 1979
J.C. STEPHEN EXPLORATIONS LTD.

MAP X