GEOPHYSICAL-GEOLOGICAL REPORT
ON THE
E.H.P. MINERAL CLAIMS

(E.H.P. 1-8 INCL., RECORD NOS.1684-87 AND 1706-9)
WELLS-BARKERVILLE AREA, CARIBOO MINING DIVISION
LONG. 121°30'W; LAT. 53°07'30"W.
N.T.S. 93H4/E

for

ELMER SPATE, ET AL
1220 Motherwell Road, N.E.
Calgary, Alberta
T2E 6E8

by

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November, 1981

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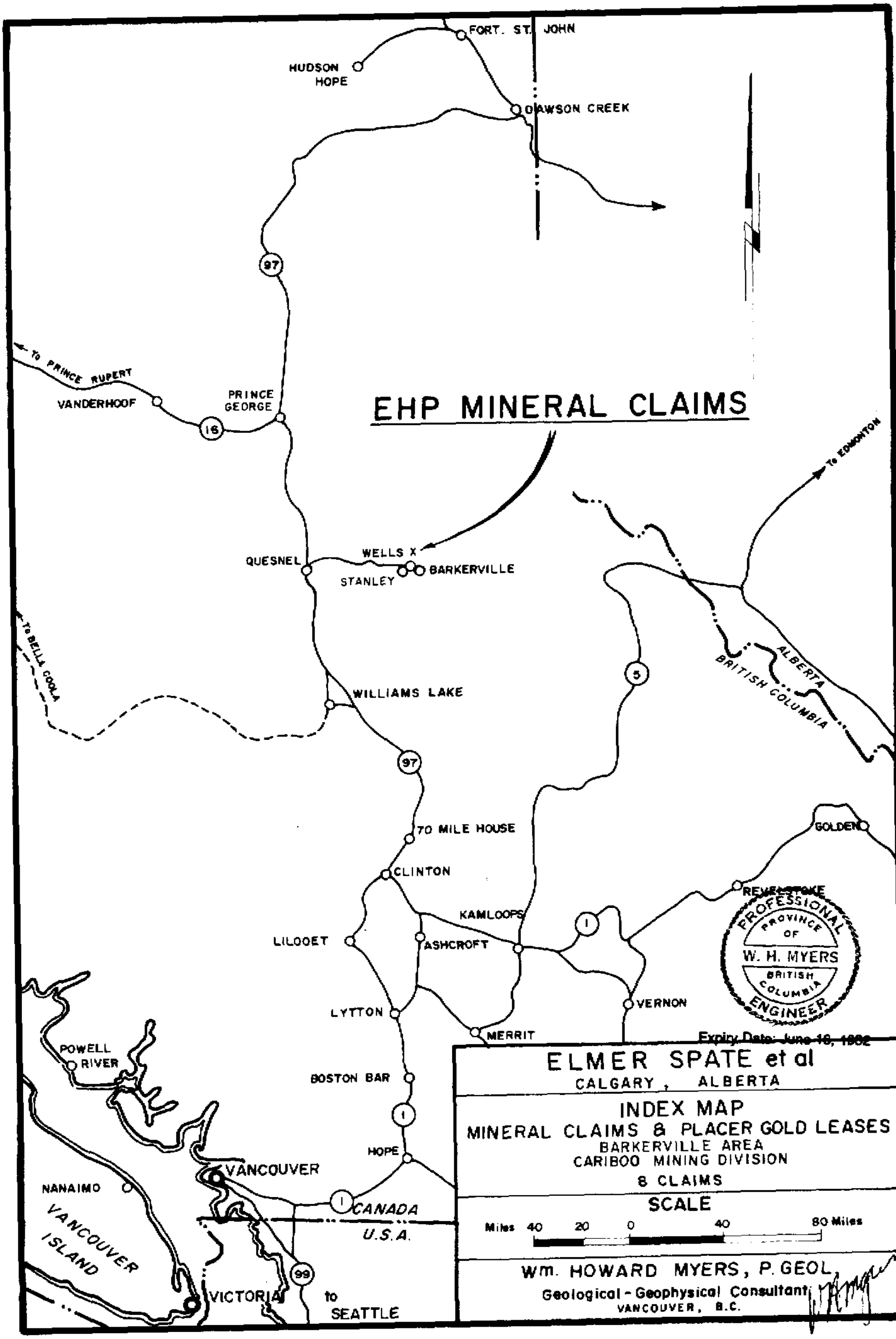

EHP MINERAL CLAIMS
FORT. ST. JOHN
HUDSON HOPE
DAWSON CREEK
97
To PRINCE RUPERT
VANDERHOOF
PRINCE GEORGE
16
To EDMONTON
WELLS X
QUESNEL
STANLEY
BARKERVILLE
To BELLA COOLA
5
ALBERTA
BRITISH COLUMBIA
WILLIAMS LAKE
97
70 MILE HOUSE
GOLDEN
CLINTON
REVELSTOKE
KAMLOOPS
1
LILOOET
ASHCROFT
VERNON
LYTTON
MERRIT
POWELL RIVER
BOSTON BAR
1
HOPE
VANCOUVER
NANAIMO
1
CANADA
U.S.A.
VANCOUVER ISLAND
99
VICTORIA
to SEATTLE
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
W. H. MYERS
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CALGARY, ALBERTA
INDEX MAP
MINERAL CLAIMS & PLACER GOLD LEASES
BARKERVILLE AREA
CARIBOO MINING DIVISION
8 CLAIMS
SCALE
Miles 40 20 0 40 80 Miles
Wm. HOWARD MYERS, P. GEOL.
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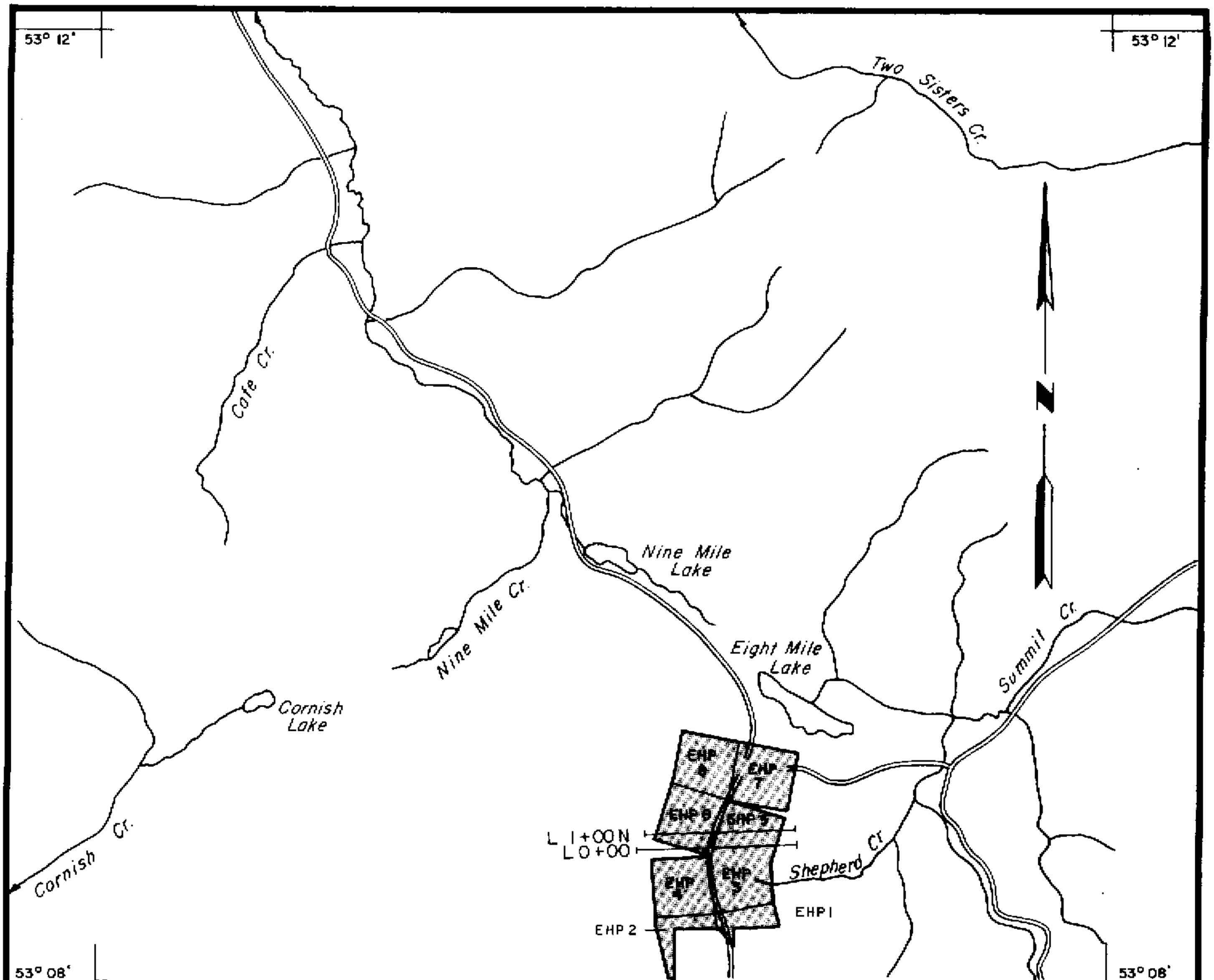
VANCOUVER, B.C.



ELMER SPATE et al

WELLS - BARKERVILLE GOLD PROSPECT

CARIBOO MINING DIVISION, BRITISH COLUMBIA

MAP No. M 93H/4E

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — W. H. MYERS

Expiry Date: June 16, 1982

CLAIM LOCATION MAP

EHP - 1 to 8 INCLUSIVE , RECORD Nos. 1684 - 1687 & 1706 - 1709

SCALE = 1 : 50,000

1000 0 1000 2000 3000 4000 METERS

FROM MAP 93H/4E APRIL 17, 1981

To accompany Report "Geological - Geophysical Survey of EHP Claims."

Wm Howard Myers, P. Eng (B.C.) P. Geol. (Alta),
CONSULTANT, VANCOUVER B.C. Nov. 1981

ABSTRACT

The eight mineral claims known as E.H.P. #1 to #8 inclusive with record nos. 1684 to 87 and 1706 to 09 inclusive, located some 2 miles northeast of Wells, B.C. are situated on the northern projection of the Lowhee and Rainbow Faults as mapped by Hanson in the Cariboo Gold Quartz Mine area. The claims also cover the fault contact between the Pleasant Valley and Barkerville Formations as mapped by Hanson in the Eight Mile Lake Area, northeast of Wells. The claims cover the area of intersection of the two fault systems. Two electromagnetic survey lines were run in the general area of the intersection of the two fault trends. The lines are each approximately 1100 metres long and cover the width of the claim block. The lines are 100 metres apart and parallel in an east-west direction.

Both lines indicate a fairly strong conductor near the west boundary of the claim block. This is in the vicinity of the projected Lowhee and/or Rainbow Faults and in an area covered with overburden. The anomaly or conductor on both lines near the west boundary is in all probability the result of the faulting. The anomaly or conductor on line 1+00N near station 3+50E is near the fault contact between the Pleasant Valley and Barkerville Formations as mapped by Hanson.

Further exploration is recommended along both fault trends in an effort to find possible mineralization.

GEOPHYSICAL-GEOLOGICAL REPORT ON E.H.P. MINERAL CLAIMS, WELLS AREA, CARIBOO MINING DIVISION

INTRODUCTION

The electromag survey of the eight E.H.P. mineral claims, geological reconnaissance mapping together with this report on the results of the fieldwork were commissioned by Mr. Elmer Spate, owner of the claims. The monies spent for the fieldwork and the report have been claimed as assessment work on the 8 claims. The breakdown of time and monies spent on the work is enclosed with the report.

The 8 claims are located in Downey Pass some two miles northeast of Wells, B.C. The location line for the two post staking is along the road up Downey Pass from Wells and is known as logging road No.2Z00. The road provides access to the Big Valley area for both logging and mining. The claims were staked by Mr. Spate in 1980 in the latter part of June. The claims are in good standing and have been grouped. The two electromag lines some 1100 metres long each and 100 metres apart were run near the center of the claim block on June 16th and 17th, 1981. Heavy rains and some local thunder and lightning were experienced the second day on line 1+00N and may have affected the results slightly.

The claims are located on N.T.S. 93H4/E and the coordinates of the center are Long. 121°30'W; Lat. 53°07'30N.

The claims are readily accessible by logging road #2200 which runs through the center of the claims. Logging road #2200 takes off the Wells-Barkerville highway #26 one mile east of the hamlet of Wells, B.C.

The terrain in the area of the claims is very moderate. Part of the area of the claims has been logged and is quite open. Bedrock has been exposed in parts of the area by old placer operations along Downey and Shepherd Creeks. Elevations in the area of the claims varies from 4100 to 4500 feet above sea level.

The climate in this portion of British Columbia is moderate to cold. The area experiences "Chinook" conditions during part of the winter months and the climate becomes very moderate for a few days. Snowfall in the area of the claims is moderate to heavy. The majority of snow falls in January and February with local heavy snow until April. Most of the snow is gone right after the first week in May except for higher elevations and shaded areas. The snow goes rapidly about the beginning of May due to the longer days and direct rays of the sun. Fieldwork can be carried out from the middle of May to the middle of October in normal years.

The published maps and reports used in the preparation of this report are listed under the Bibliography in the Appendix of the report. The electromag survey was carried out during June 16th & 17th, 1981. The lines are each approximately 1100 metres long and 100 metres apart near the center of the claim block. The lines were run in an east-west direction normal to the structural trends of the area. The lines cross the entire claim block. The geological work consisting of mapping and studying outcrops as well as scouting the location was carried out on May 29th, June 6th & 9th, 1981. I was also on the property on June 16th & 17th, while the electromag fieldwork was being done by Geotronics Surveys Ltd. of Vancouver, B.C. The equipment used for the survey was a Max-Min portable 2-man electromagnetometer manufactured by Apex Parametrics Ltd. of Toronto, Ontario

The coil spacing on this job was 100 metres and frequencies varied from a low of 222 hz to a high of 1777 hz. This instrument is designed for measuring the electromagnetic field which results from a conductive body; that is a structure which conducts electricity better than the barren types do. The instrument has an advantage over many other EM units in that it can operate with different modes and frequencies as well as having a variety of distances between transmitter and receiver.

In all electromagnetic prospecting, a transmitter induces an alternating magnetic field (primary) by having a strong alternating current move through a coil of wire. This primary field travels through any medium and if a conductive mass such as sulphide body is present, the primary field induces a secondary alternating current in the conductor and this current in turn induces a secondary magnetic field. The receiver picks up the primary field and if a conductor is present, the secondary field also. The fields are expressed as a vector which has two components, the in-phase (quadrature) component. The results are plotted as the percent of deviation of each component from what values would be if no secondary field (and consequently no conductor) was present. Since the fields lose strength proportionally with the distance they travel a distant conductor has less of an effect than a close conductor. Also the lower the frequency of the primary field the further the field can travel and so the greater the depth of penetration.

The Max-Min 11 electromagnetometer allows for better discrimination between low conductivity structures such as clay beds and barren shear zones and the more conductive bodies like massive sulphide mineralization. The instrument also gives several different types of data over a given area so that statistical analysis can result in less error in the interpretation.

COSTS OF GEOPHYSICAL SURVEY & REPORT

The following is a detail breakdown of the costs for the Electromag Survey and the Report.

Field EM Survey (2 men), (instrument rental) 2 days @ $450/day	$ 900.00
Compiling data, writing report, plotting profiles: (1 man) 3 days @ $250/day	750.00
Drafting & typing	150.00
	$ 1,800.00

HISTORY

This area of the Cariboo has produced millions of dollars in gold from both placer and lode deposits. The gold rush which started around 1861 has produced millions in placer gold from creeks around Barkerville. Lode gold was produced from underground workings in the Cariboo Gold Quartz Mine and Island Mountain Mine in Wells, some four miles west of the restored gold rush town of Barkerville.

Throughout the general Cariboo area, quartz veins and areas of mineralization on the ridges and tops of mountains where bedrock outcropped, were prospected during the gold rush. Many of the adits and shafts sunk during this time were not recorded, consequently no information is available on values obtained. The ridges and mountains were about the only place where bedrock outcropped. In many areas shafts were put down in search for lode gold in bedrock as well as for placer gold in the overlying gravel.

The Cariboo Gold Quartz Mine ceased operations in 1967 primarily because of long haulage of ore and obsolete and worn out equipment.

Reports from the underground exploration work did not indicate any decrease in gold values with depth.

Gold is now being produced from the Mosquito Creek Mine immediately northwest of the previous lode mining. The mine has been operating for two years now and returns are reported to be fair to good.

Exploration work in this portion of the Cariboo has been slow due primarily to the thick cover of glacial drift covering or masking outcrops.

GEOLOGY

General

A widespread mantle of glacial drift overgrown with trees and vegetation limit the outcrops of bedrock largely to the tops of ridges, divides and individual mountains and along steep slopes of the more prominent rivers and streams. Outcrops of bedrock are not extensive even along the ridges and mountain tops. Local bedrock outcrops occurs in the bottom of steep incised streams.

In many of the areas on ridges and divides or steep hillsides where bedrock does outcrop quite large quartz veins were observed in the preliminary work. Igneous rocks are infrequent but were observed in the form of dykes and sills.

Stratigraphy

The oldest rocks in the general area of the claims is the Cariboo Series of Precambrian Age. The Cariboo Series has been further divided into three different formations by G. Hanson, Geological Survey of Canada Bulletin #181, 1935. The three formations from the oldest to youngest are: Richfield Formation, Barkerville Formation and the Pleasant Valley Formation. The rocks of the Cariboo Series are not fossiliferous but from their structural position, degree of metamorphism and their similarity to Precambrian rocks further south, they are considered to be Precambrian Age. The Cariboo series in general is composed of quartzite, sericite schist, argillite, limestone and slate. In the Wells-Barkerville area the series has been broken down into three formations outlined above. In the same publication, Hanson further divides the Richfield Formation into the Baker, Rainbow, B.C., Lowhee and Basal members. The identification of these members and their structural position are open to some question. The Stanley Area, some seven miles southwest of the Wells-Barkerville, is underlain by a succession of metamorphosed sedimentary rocks belonging to the Richfield Formation of Precambrian Age. The rocks in this area cannot be correlated with members of the Richfield Formation in the Barkerville Gold Belt. The problem of correlating the various members in different parts of the area is due partially to facies changes in the original sedimentary rocks and also to a degree of metamorphism resulting from both local and regional metamorphism. Local metamorphism due possibly to faulting has produced local areas of graphitic material from argillites. The graphitic material produces high conductivity on the electromagnetic survey, however, these are areas of severe alteration and also can be related to sulphide mineralization. In this respect the use of the electromagnetic surveys can possibly produce favorable areas for further exploration.

The eight claims are located in the general Wells-Barkerville area. This area is identified by G. Hanson and others as the Barkerville Gold Belt. That part of the area extending from Island Mountain southeastward to Grouse Creek has been mapped geologically and described in detail by G. Hanson and others. The Barkerville Gold Belt has been the site of three lode gold mines and numerous placer deposits. Substantial gold has been produced from these mines in the past. The last of the larger lode gold mines were closed down in 1967. The present mine Mosquito Creek Mine, adjacent to the old mines has been on production for approximately two years.

From the Island Mountain southeastward to Grouse Creek, a distance of eight miles, the belt is fairly well defined and correlations within the belt are satisfactory.

In the Barkerville Gold Belt the Richfield Formation has been divided into five members known as the Baker Member, Rainbow Member, B.C. Member, Lowhee Member and Basal Member. As stated earlier there is some question on the structural position of the various members and its is very possible that there is repetition of some of the beds. The Basal Member and the B.C. Member are composed almost entirely of argillite, while the Rainbow Member and Lowhee Member are composed of quartzite and limestone with some interbedded argillite. The Rainbow Member contains the most quartz veins throughout the Barkerville Gold Belt.

Structure

The major structural feature of the Cariboo series in the Wells-Barkerville and Stanley areas is a broad, open anticlinorium whose axis trends approximately north 55^{o} west from Mounts Pinkerton and Amador to Mount Nelson. On the northeastern side of the axis, which would include the Barkerville Gold Belt as outlined by G. Hanson, the beds dip generally northeasterly and on the southwestern side generally southwesterly. Further to the east and to the west the Slide Mountain series and the Quesnel River group are involved in the regional anticlinal structure.

The Cariboo Series of schists are not only complexly folded and drag-folded but in addition are cut by large northerly and north-easterly trending normal faults.

The rocks in the Barkerville Gold Belt are located on the north-eastern limb of the large northwesterly trending anticlinorium. The rocks strike northwest and dip northeast. The folding within the belt appears simple but in some places minor folds are very sharp with associated faulting.

Several northerly striking faults that have offset the strata by 1200 feet or less have been mapped by G. Hanson in the Barkerville Gold Belt. The four main faults of this type were recognized: the Rainbow fault, Lowhee fault, the Grouse fault and the Island Mountain fault. The displacement on the faults varied from 400 to 1200 feet and the overall trend was almost true north with local variations in trend from northeast to northwest. These faults are very similar to those described by Stuart S. Holland in the Stanley area to the southwest. It is very possible that these northerly trending faults could act as feeders for gold mineralization in this portion of the Cariboo. Stuart Holland in Bulletin #26 suggests that these faults are considered to be favorable areas for detailed prospecting. The eight claims held by Mr. Elmer Spate are located on or near the northerly extension of the Lowhee and/or Rainbow faults.

Mineralization

Lode gold mineralization in the area of the Barkerville Gold Belt, is in the form of gold-bearing quartz veins and gold-bearing pyritic. Deposits with an encouraging gold content, have been found only in the Cariboo Series of Precambrian Age. In the Barkerville Gold Belt where the series has been divided into formations, the best of the known veins in the upper part of the Richfied formation.

The vein deposits can be divided into four classes, the division is based on the relationships between the fractures and the structure of the country rock. The veins are: (1) Transverse; (2) Diagonal; (3) Strike; and (4) Bed veins.

The transverse and diagonal veins contain pyrite and arsenopyrite with smaller amounts of gold in a gangue of quartz with some ankerite and sericite. In some veins pyrite approximates 50 percent of the vein by volume but the average is less. Gold appears to be most plentiful in the veins containing the most pyrite but the amount of the two minerals are not in direct proportion. Veins with very little pyrite are in general uncommercial. Arsenopyrite occurs with the pyrite in most of the veins, but is always a minor constituent. The transverse and diagonal veins contain an abundance of coarse pyrite crystals. The quartz in these veins is also coarsely crystalline but does not show crystal outlines. These veins in general have been so highly shattered that it is difficult to obtain large hard specimens. In mining these veins break up into small pieces.

The strike veins are not numerous and are very poorly exposed. The B.C. vein is of this type and has been exposed underground. The B.C. vein, so far as is known, has much lower values in gold than the normal pyritic transverse or diagonal veins. Veins of this type have not been developed sufficiently to prove that they are of low grade or to prove that they are uncommercial.

Only a few bed veins have been seen and these were quite thin and short. These veins in general consist of quartz with no pyrite or gold.

Unglow, Bulletin #149, divided the veins into A and B veins and stated that the B veins were higher grade than the A veins. The B veins would include the transverse and also diagonal veins as outlined above. The A veins would include the strike and bed veins. Many of the A veins lie outside of the gold belt and are not well mineralized.

The other main type of lode gold deposit is one formed by replacement of limestone. The ore is typically a solid mass of fine grained pyrite. This type of deposit was first recognized in the Cariboo in 1933. The largest of this type was found in the Island Mountain Mine. The new producing mine, Mosquito Creek Mine, is reportedly obtaining ore almost entirely from this type of deposit. The ore of this type is in general higher grade than the vein ore and commonly assays 2 ounces of gold per ton. The best ore consists of massive, fine grained pyrite with free gold. Where replacement is less intense, the ore consists of silicified limestone with streaks of pyrite.

The fractures in which the transverse and diagonal veins occur were formed after the rocks were folded and sheared. The shapes and pattern of the fractures suggest that some were formed by compression, some by tension and some by torsion. The intersection of major structural trends in the general Cariboo area has produced fractures, which form both diagonal and transverse veins. The identifying of major structural trends in the area is very important for future exploration work.

RESULTS OF ELECTROMAG SURVEY

The plots of the two lines run across the claim block are enclosed in the Appendix of the report. The two lines which were run with different frequencies are all plotted on the same scale and the coil spacing in all instances was the same 100 metres. A reading was taken every 25 metres and the results are plotted below their respective stations.

The results of the survey are considered good. The results on line 1+00N which was run in the heavy rain and thunder storm, may have some additional noise which has been interpreted as geological noise due to conductive overburden. The data is still considered useable.

The conductor mapped in the western portion of the area near station 4+50W on both lines corresponds in location to either the extension of the Lowhee or Rainbow Faults as mapped by G. Hanson in the Cariboo. Gold Quartz Mine area to the south and reported in Memoir 181 of the Geological Survey of Canada. Hanson maps the two faults some 500 metres apart with a northwest strike into the area of the claims. Both faults are shown on Map 2394 enclosed with his report. Both of these faults have the same northerly trend mentioned earlier and are parallel. In other parts of the Cariboo where electromag lines were run across known fault trends very similar anomalies were obtained. The known fault zones contain water and a high degree of alteration of the argillite or phillite to a high content of graphitic schist. Both the west fault and/or the graphitic schist produce highly conductive results. The conductor shown on the west end of each line is no doubt due to either the wet fault or conductive argillite with graphitic schist. This part of the area does warrant further testing.

The conductor in the eastern portion of the area on line 1+00N near station 3+50E, could very easily be due to the fault contact between the Pleasant Valley Formation and the Barkerville Formation as mapped by G. Hanson in this immediate area. This fault contact is shown on Geological Survey of Canada Map #336A (east-half) Willow River Sheet by G. Hanson, 1933. In this immediate area of the electromag line this contact is covered with glacial drift. Additional electromag work should be considered across this fault contact to see if it can be used to map the contact in more detail.

RECOMMENDATIONS

Additional exploration work should be carried out in the areas of the anomalies on the electromag survey in both the eastern and western portion of the surveyed area. If bedrock is not too deep in the areas of the anomalies, test pits could be put down with a large backhoe to obtain bedrock samples. If the overburden is deep then the drill will have to be used to obtain bedrock in the area of the anomalies.

Respectfully submitted,

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
W. H. MYERS

Expiry Date: June 16, 1982

Wm. HOWARD MYERS, P.Eng.(B.C.), P.Geol.(Alta.)
Geophysical-Geological Consultant

APPENDIX

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Map 335A, Willow River Sheet (west-half) 1933, G. Hanson
Map 336A, " " " (east-half) 1933, G. Hanson
Bulletin 280, R.W. Boyle, 1979. The Geochemistry of Gold and its Deposits.

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CERTIFICATE

I, William Howard Myers, do hereby certify that I am an independent geological-geophysical consultant with offices at Suite 500 - 475 Howe Street, Vancouver, British Columbia. I have been actively engaged in my profession as an independent consultant in both oil and mining since 1952. I am a professional geologist member P.Geol. #16704 of the Association of Professional Engineers, Geologists and Geophysicists of Alberta, and a non-resident member P.Eng., of the Professional Engineers of British Columbia.

I graduated from Fresno State College, Fresno, California in 1939 with high honors and a B.Sc. degree in Geology. I did graduate work at Stanford University, Stanford, California for M.Sc. degree in geology, 1939 to 1941. After graduation I spent 11 years in the field in geophysical exploration for oil and minerals.

For the past 17 years, since 1964, I have spent the majority of my time in the general Cariboo Area in exploration for gold. During the past three years I spent considerable time carrying out various geophysical surveys and research programs for gold in the Cariboo Gold Belt of British Columbia. The research programmes were based on conclusions and recommendations by R.W. Boyle in Bulletin 280 of the Geological Survey of Canada published in 1979. This publication does not follow older conventional exploration techniques.

Information for this report is from published and unpublished maps and reports of this general area together with my work in the Cariboo exploring for gold over the past 17 years. Published maps and reports used in the preparation of the report for Elmer Spate Etal, are tabulated in the Bibliography in the Appendix of the report.

The Electromagnetic Survey was carried out in the field on June 16th & 17th, 1981.

Geological field mapping and scouting the area of proposed geophysical survey was carried out on May 29th, June 6th & 9th, 1981.

Wm. Howard Myers

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November, 1981

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PROVINCE OF BRITISH COLUMBIA
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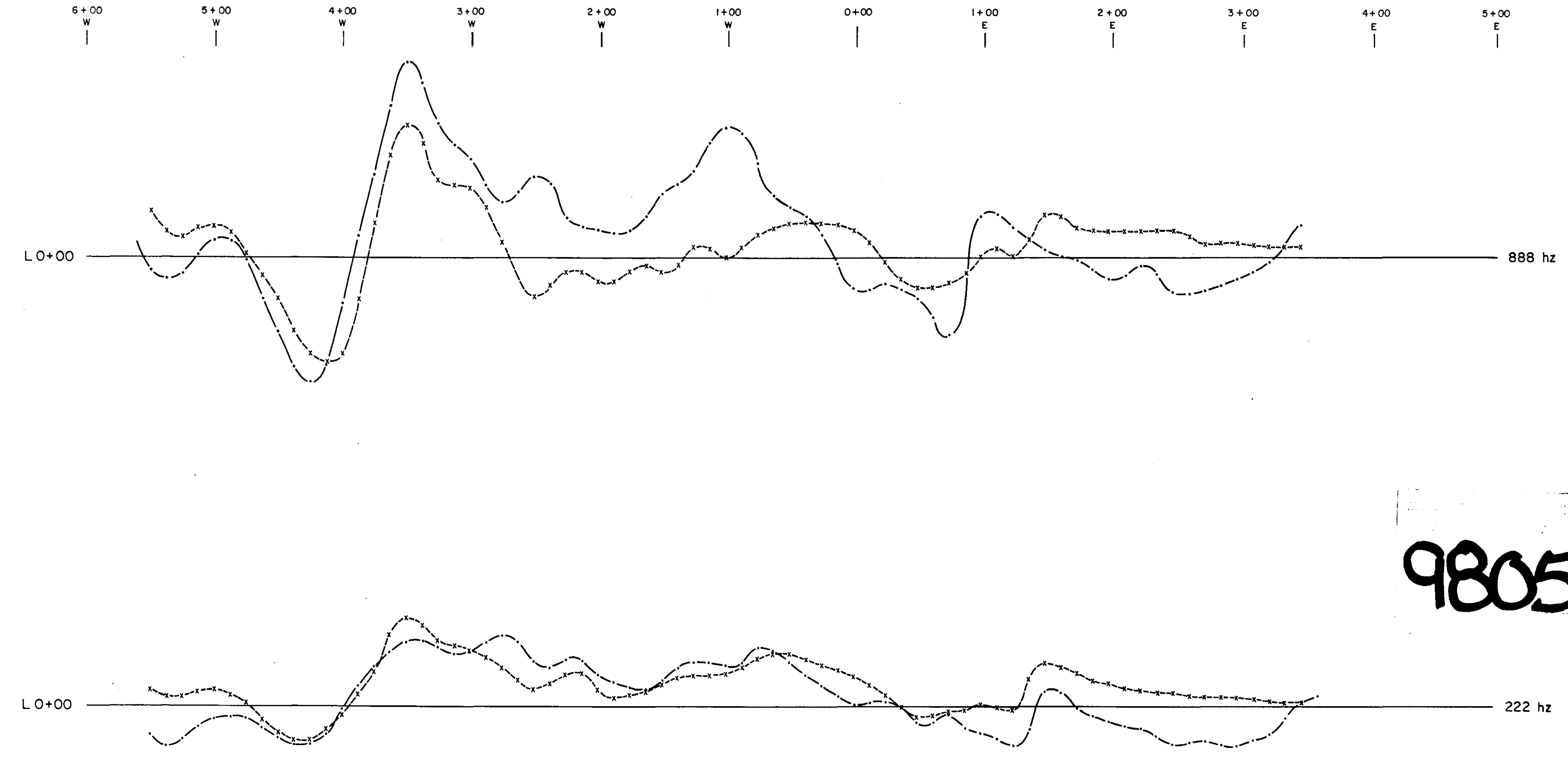

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INSTRUMENTATION : APEX MAX – MIN II E.M.

+10 %
+ 5 %
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– 5 %
–10 %
PERCENT DEVIATION FROM NORMAL FIELD

—·—·—· IN – PHASE RESPONSE

x--x--x--x OUT – OF – PHASE RESPONSE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA W. H. MYERS

Expiry Date: June 16, 1982

To accompany geophysical report by Wm Howard Myers P. Eng., dated Nov. 28/81

ELMER SPATE et al

RECONNAISSANCE ELECTROMAGNETIC PROFILE

EHP CLAIMS

WELLS AREA, CARIBOO MINING DIVISION, MAP 93 H 4E

SURVEY DATE: JUNE 1981

Wm Howard Myers, P. Eng, Consultant, Vancouver, B.C.

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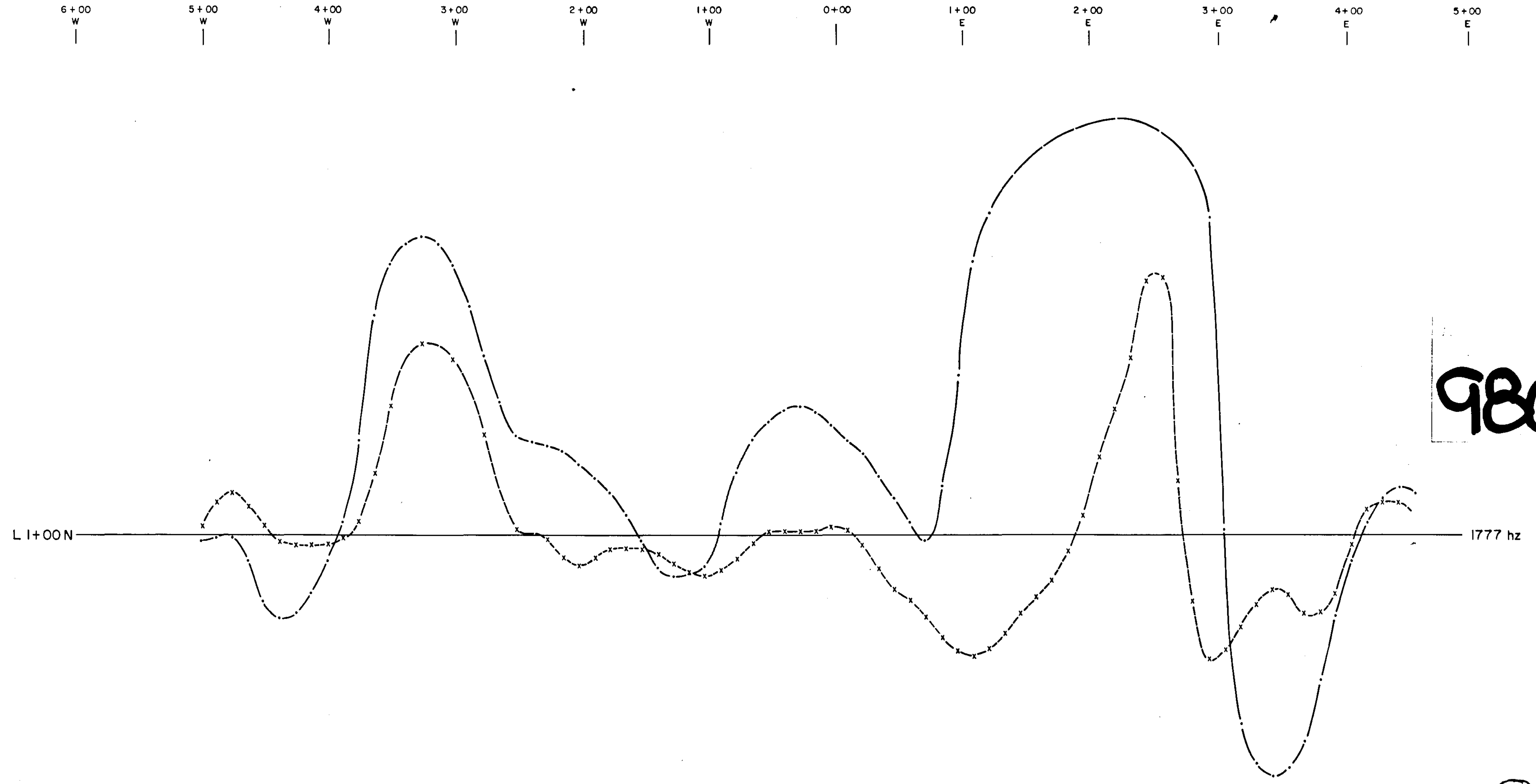

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INSTRUMENTATION: APEX MAX-MIN II E.M.

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+5 %
0
-5 %
-10 %

PERCENT DEVIATION FROM NORMAL FIELD

-·-·-·- IN-PHASE RESPONSE

x--x--x--x OUT-OF-PHASE RESPONSE

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, W. H. MYERS

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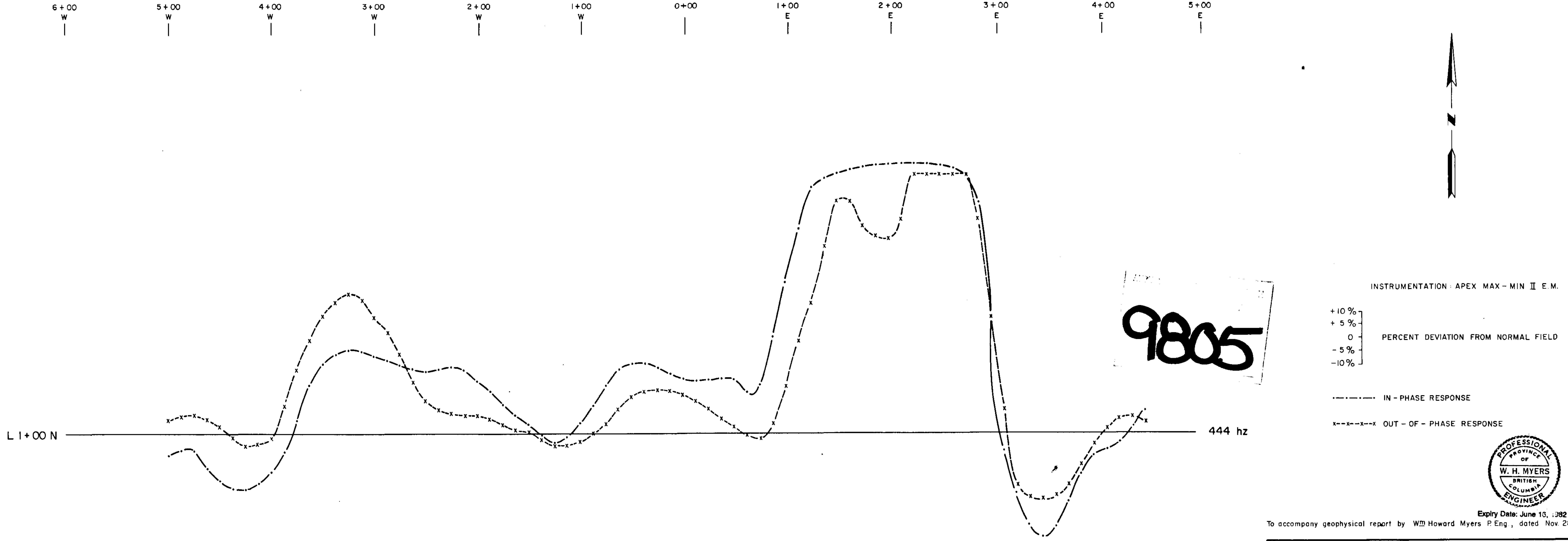

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RECONNAISSANCE ELECTROMAGNETIC PROFILE

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