A REPORT 92-I
on
INDUCED POLARIZATION SURVEYS
Cache Creek & Spences Bridge Areas, B.C.
by
Peter E. Walcott, P.Eng.
May 1971

A REPORT

ON

INDUCED POLARIZATION SURVEYS

Cache Creek & Spences Bridge Areas,
British Columbia

FOR

GARNET EXPLORATION CORPORATION LIMITED

Vancouver, British Columbia

BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, British Columbia

MAY 1971

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ACCOMPANYING MAPS

INTRODUCTION

Between April 21st and May 5th, 1971, Peter E. Walcott & Associates Ltd. carried out two resistivity expander depth determinations in the Cache Creek area, B.C. and a limited induced polarization reconnaissance survey (I.P.) in the Spences Bridge area, B.C. for Garnet Exploration Corporation Limited.

The latter survey was carried out over pre-established lines which were picketed at 100 foot intervals.

Measurements (first to fourth separation) of apparent chargeability (the I.P. response parameter) were made every 200 feet along the lines using the "pole-dipole" method of surveying using a 200 foot dipole.

The data are presented in profile form on Maps W-128-1 to 3 that accompany this report.

PURPOSE

The purpose of the survey was to

a. determine the overburden depth in the Cache Creek area, and

b. to try and locate the possible presence of mineralization that might be associated with an east-west structure down Pimainus Creek in the Spences Bridge area.

SURVEY SPECIFICATIONS

The induced polarization (I.P.) survey was carried out using a pulse-type system manufactured by Huntec Limited of Toronto, Ontario. Measurements with this system are made in the time domain.

The system consists basically of three units, a receiver, a transmitter and a motor-generator. The transmitter, which provides a maximum of 7.5 kw d.c. to the ground, obtains its power from the 7.5 kw 400 cycle, three phase generator driven by a gasoline engine; the cycling rate of the transmitter is 1.5 seconds "current-on" and 0.5 seconds "current-off" with the pulses reversing continuously in polarity. The data recorded in the field consists of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V) appearing between the two potential electrodes, P_1 and P_2, during the"current-on" part of the cycle, and a secondary or overvoltage (V_s) appearing between P_1 and P_2 during the "current-off" part of the cycle.

The apparent chargeability (M_a) is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400, which is the sampling time in milliseconds of the receiver unit. The apparent resistivity (P_a) in ohm-meters is proportional to the ratio of the primary voltage and the measured current, the proportionality factor depending on the geometry of the array used. The chargeability and resistivity obtained are called apparent as they are values which that portion of the earth sampled would have if it were homogeneous. As the earth sampled is usually inhomogeneous the calculated apparent chargeability and resistivity are functions of the actual chargeability and resistivity of the rocks.

The survey was carried out using the "pole-dipole" method of surveying with a dipole "a" of 200 feet. In this method the current electrode C_1 (the pole) and the two potential electrodes P_1 and P_2 (the dipole) are moved in unison along the survey lines. The spacing between these electrodes is kept constant for each traverse, with that between C_1 and P_1, "n a" feet (n = 1, 2, 3, 4), roughly equal to the depth to be explored, and that between P_1 and P_2 at "a" feet. The second current electrode "C_2" is kept fixed at "infinity".

DISCUSSION OF RESULTS

Cache Creek Area.

Two "three-array" resistivity depth expanders were carried out in this area at locations 3000 feet apart on the baseline, the results of which are shown on Map W-128-1.

The resistivity curve for the determination at 100 E suggests a three layered earth, with (a) the first layer, a thin layer of high resistivity, corresponding to the dry topsoil, (b) the second layer, a layer of low resistivity, to the glacial fill, and (c) the third layer to the bedrock. The interface between the second and third layers, i.e. the depth to bedrock, represented by the point of maximum curvature is some 600 feet below surface.

The resistivity curve for the determination at 70 E also suggests a three layered earth, with (a) the first layer, a thin layer of very low resistivity, corresponding to a thin layer of watersaturated topsoil (this determination was located in a pond of surface water), the second layer (b), a layer of low resistivity, to the glacial fill, and (c) the third layer to the bedrock. The interface between the second and third layers, i.e. the depth to bedrock, is some 450 feet below the surface.

Spences Bridge Area.

a. West side. - The results of the induced polarization survey (Lines 1 to 4) show the part surveyed to exhibit a low flat chargeability background above which several sharp anomalies are discernible.

These anomalies have indicated shallow narrow causative sources as indicated by their double peaks on the larger separations on Lines 1, 2 and 3, and are believed by the writer to be caused by buried and/or grounded irrigation pipes (the farm is covered by a complex system of pipes and grounded wheel irrigators).

b. East side. - The results of the induced polarization survey (Lines 5 to 7) show the part surveyed to exhibit a low flat chargeability background above which a possible small response anomaly from 24 to 42 W is discernible on Line 5.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Between April 21st and May 5th, 1971, Peter E. Walcott & Associates Ltd. carried out some induced polarization surveying in the Cache Creek and Spences Bridge areas of British Columbia for Garnet Exploration Corporation Limited.

Two resistivity expanders in the Cache Creek area suggested depths to bedrock of 450 and 600 feet respectively.

No anomalies except those corresponding to buried irrigation pipes were obtained on the west side of the Thompson River in the Spences Bridge area.

A possible broad low amplitude anomaly was located on the east side of the Thompson River on Line 5. However no corresponding response was obtained on a parallel line down Pimainus Creek some 1000 feet to the north, and no response was obtained over a zone of alteration located in the creek bottom.

Should encouraging results be obtained from the soil samples over the possible anomalous area on Line 5 then further work should be carried out to delineate an anomalous zone.

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED

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Geophysicist

Vancouver,
British Columbia

May 1971

GARNET EXPLORATION CORP. LTD.

CACHE CREEK PROJECT ; CACHE CREEK AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY

RESISTIVITY EXPANDERS

SCALE - 1 INCH = 200 FEET

200 100 0 200 400 600

FEET FEET

MAP No. W-128-1
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT P. Eng.
DATED-MAY 1971

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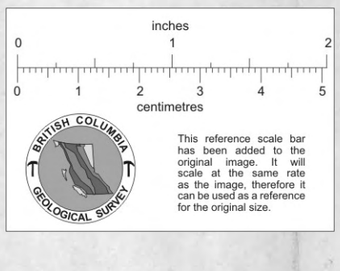
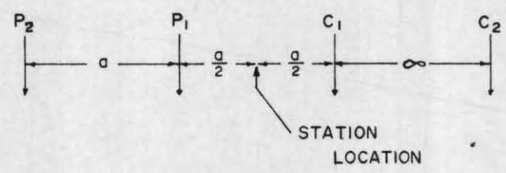
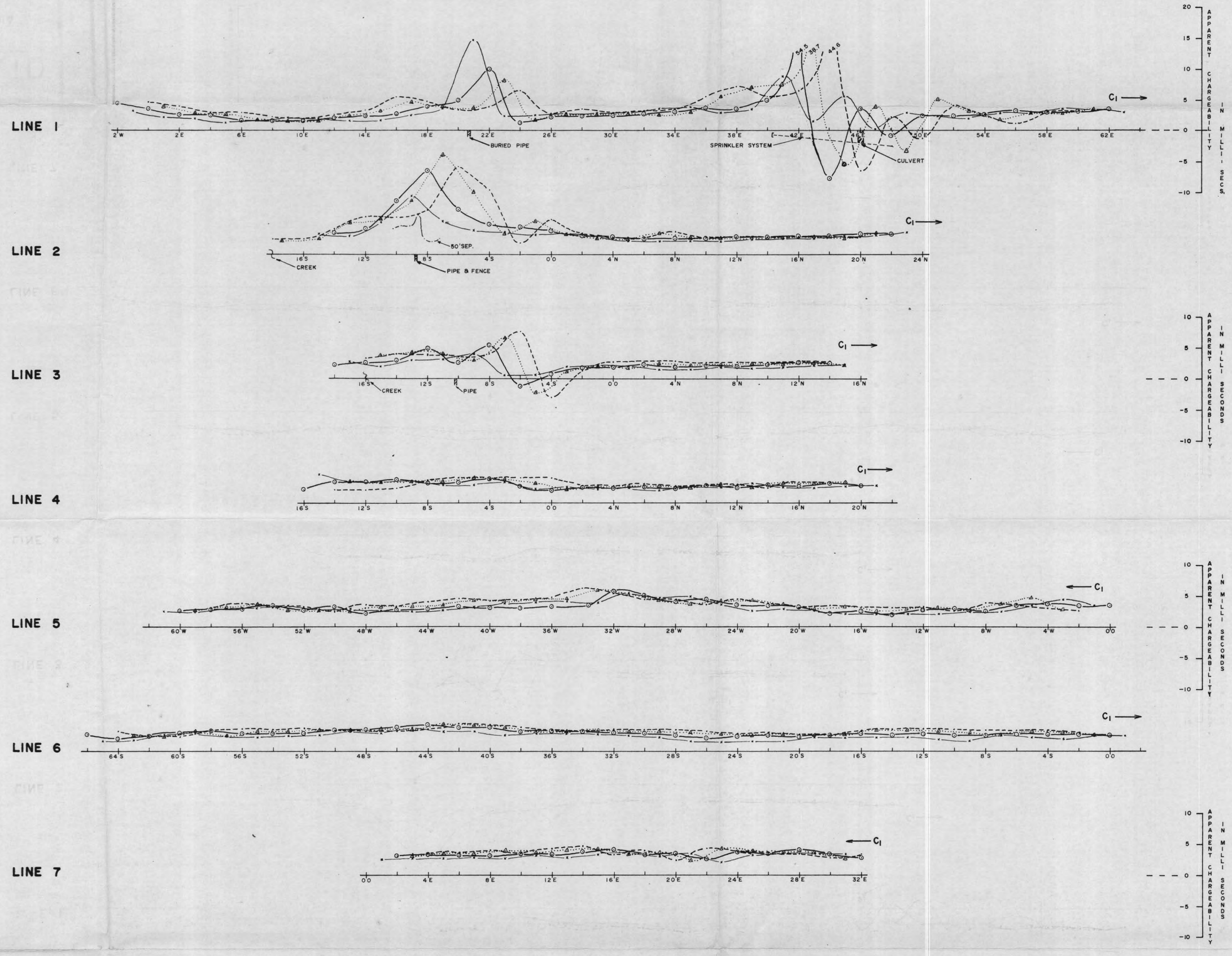
APRIL , 1971

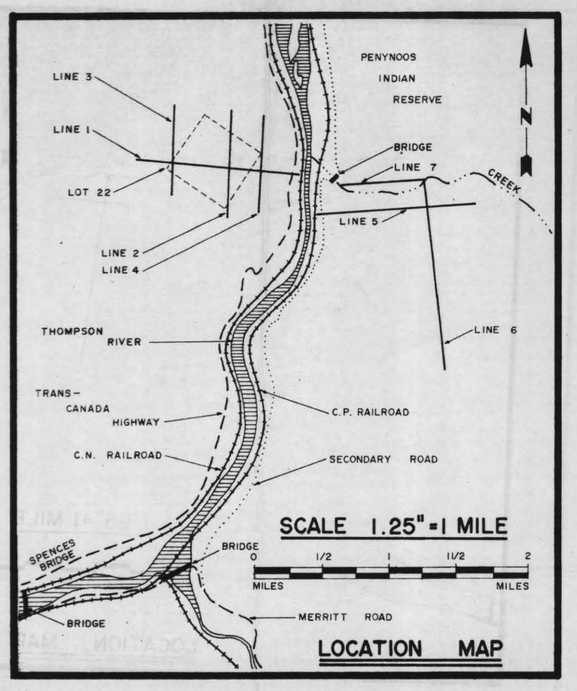
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PETER E. WALCOTT



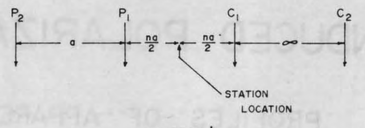
3 ARRAY EXPANDERS







POLE - DIPOLE ARRAY



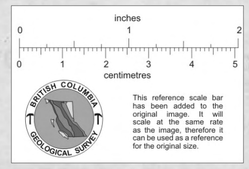
a = 200'

na = 200'

na = 400'

na = 600'

na = 800'



GARNET EXPLORATION CORP. LTD.

PIMAINUS PROJECT; SPENCES BRIDGE AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT CHARGEABILITY

(IN MILLI SECONDS)

SCALE - 1 INCH = 400 FEET

400 200 0 400 800 1200
FEET FEET

MAP No. W-128-2
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT B. Eng.
DATED - MAY 1971

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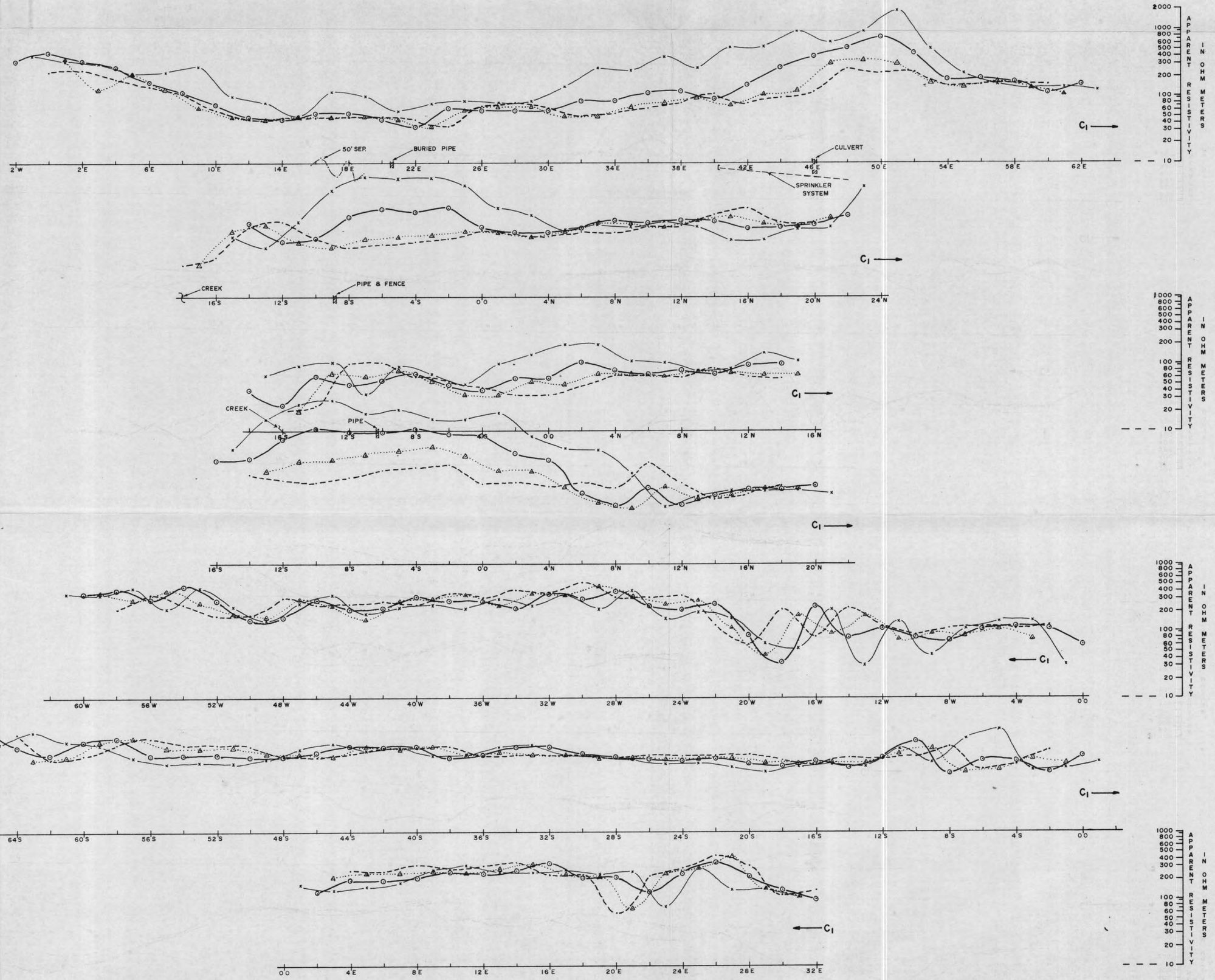
PROVINCE OF BRITISH COLUMBIA PETER E. WALCOTT ENGINEER



LOCATION MAP

POLE – DIPOLE ARRAY

a = 200'

na = 200'

na = 400'

na = 600'

na = 800'

GARNET EXPLORATION CORP. LTD.

PIMAINUS PROJECT; SPENCES BRIDGE AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY

PROFILES OF APPARENT RESISTIVITY

(IN OHM-METERS)

SCALE - 1 INCH = 400 FEET

400 200 0 400 800 1200
FEET FEET

MAP NO. W-128-3
TO ACCOMPANY A REPORT BY
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DATED - MAY 1971

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