CONFIDENTIAL

REPORT ON THE
RECONNAISSANCE ELECTROMAGNETIC
SURVEY IN THE NANSEN CREEK
AREA, YUKON TERRITORY
FOR

SILVER STANDARD MINES LIMITED

McPHAR GEOPHYSICS LIMITED

GENERAL NOTES ON THE McPHAR ELECTROMAGNETIC METHOD

Electromagnetic measurements are made in terms of "dip angles" and are recorded in degrees. The dip angles measure the amount of distortion of the primary (applied) electromagnetic field caused by secondary fields associated with currents induced in sub-surface electrical conductors. These angles are plotted in degrees on the accompanying maps either beneath or to the right of the station from which each observation was taken. Where a minus sign precedes a number, the angle of dip is to the west or south; the absence of a sign preceding a number indicates an easterly or northerly dip angle.

Transmitting coil locations are termed "setups"; each one being marked on the maps with a triangle and bearing a code number. Several lines are traversed with the receiving coil when the transmitting coil is at any one location; the readings on these lines are related to the corresponding setup by the code at the end of each series of readings.

"Conductor-axes" are marked on the maps according to the legend. They are, in general, vertical projections to the surface of the upper extremities of electrically-conductive bodies.

Electromagnetic anomalies can result from sulphide mineralization, graphitic schists, carbonaceous sediments and, on occasion, fault zones. Apropos of this it is to be noted that disseminated sulphide mineralization consisting entirely of discrete particles is not a conductor at the normal frequencies used for practical geophysical exploration. Consequently,

exploration of a property subsequent to an electromagnetic survey should be based not only on the indicated electromagnetic anomalies, but should take into account all the geologic and physiographic data that can be obtained.

McPHAR GEOPHYSICS LIMITED

REPORT ON THE RECONNAISSANCE ELECTROMAGNETIC SURVEY IN THE NANSEN CREEK AREA, YUKON TERRITORY FOR SILVER STANDARD MINES LIMITED

1. INTRODUCTION

At the request of Mr. William Dunn, Superintendent of Exploration, a reconnaissance electromagnetic survey was carried out on a group of claims in the Nansen Creek Area, Yukon Territory on behalf of Silver Standard Mines Limited.

The claim group is a few miles northwest of the Brown - McDade mine which is presently inactive. On the Brown - McDade property, economic gold mineralization has been found to be associated with a strong shear zone. The purpose of the electromagnetic survey was to attempt to trace this shear zone across the Silver Standard claims. The available geologic information suggests that the shear continues across the Silver Standard property and it was thought that if it could be located by geophysical methods, trenching and bulldozing operations would be much easier to carry out.

The field measurements were made during a two week period beginning June 26th, 1959.

2. PRESENTATION OF RESULTS

The results of the electromagnetic survey are shown on the following enclosed maps.

E. M. Survey on Brown - McDade Claims and Southern Portion of the Silver Standard Claims	Dwg. E 4556
E. M. Survey on the Northern Portion of the Silver Standard Claims	Dwg. E 4557
Detailed E. M. Survey on the Silver Standard Claims	Dwg. E 3252
Location Map showing the location of the claims and the approximate position of the lines surveyed with E. M.	Dwg. Misc. 4558

The results shown on the maps are all that were recorded as being useful. Other reconnaissance lines were covered that gave no reversal in dip angle and therefore indicated no anomaly. Since the field operation of the reconnaissance survey consists of finding the point of zero dip angle and then working both ways to get the complete curve, no data was recorded on those lines where no 'crossover' was indicated.

3. DISCUSSION OF RESULTS

The vertical loop system will not indicate false anomalies due to elevation differences between receiver and transmitter, if correct orientation is maintained. Consequently, it was chosen for the work at Nansen Creek. The thin overburden in the area suggested that the light-weight Reconnaissance Electromagnetic Unit would give adequate depth of exploration. The choice of the REM unit meant a great reduction in transportation problems and it was used for the survey.

Experience has shown that it is generally possible to locate and/or extend water filled shear zones with electromagnetic methods. This is particularly true if high frequencies are used for the measurements. The

anomalies from faults and shear zone usually indicate poor conductivity, i. e. - the results at 1000 cps are much poorer than at 5000 cps.

The first set-up was made on the shear zone in the vicinity of the old Brown - McDade workings and it was traced for a mile to the northwest. However, the EM zone ends abruptly before it enters the Silver Standard Claims. The results from transmitter #20A did not indicate a conductor to the north. A second conductor northeast of the main zone was located near its north end. This second zone appears to be deeper than the Brown - McDade zone and to be a better conductor.

Broadside Traverse #1 was made to the west of the Brown - McDade zone near the southern edge of the Silver Standard claim group. (See Dwg. E 4556) An anomaly was found at Line 1+50W, but additional detail did not locate an extension of this conductor.

Since the Brown - McDade Zone could not be traced onto the Silver Standard Mines Property, an attempt was made to locate the shear at its suggested location on the northern part of the claim group. Broadside Traverses #2 and #3 were made near an area of numerous pits and cuts which exposed rocks suggesting the presence of the shear.

An electromagnetic anomaly was located at Line 21+50W on Traverse #2, but additional detail was not successful in locating an extension of the zone for an appreciable distance. The source of this anomaly seems to have a limited strike length.

Several anomalies along Broadside Traverse #3 were checked

by setting up on them and running a box to determine the strike direction. None of these checks revealed a conducting zone similar to the Brown - McDade shear.

The final work on the Silver Standard claims was done in an area of old pits between the two traverses at the north end of the property. This data reveals a few weak anomalies, but the zone is not striking in the direction expected for the shear and is of limited strike length.

4. CONCLUSIONS

The shear zone that controls the mineralization on the Brown - McDade property could not be traced onto the Silver Standard claims. It appears to end at about the position of transmitter #21.

Reconnaissance lines across the Silver Standard Property were not successful in locating the continuation of the shear. Several conductors were located, but their sources could not be traced for more than a few hundred feet.

The conclusion that must be drawn is that either this shear does not extend as far as the Silver Standard claims or that it is of a different character by the time it gets that far north. The conductivity of a shear depends upon the porosity of the zone and the salinity of the fluids filling the pores. It is possible that the shear zone is tighter (because of different rock types, strike, etc.) and is not an electromagnetic conductor on the Silver Standard Mines Property.

McPHAR GEOPHYSICS LIMITED,

Philip G. Hallof

Dated: August 7, 1959

Philip G. Hallof

ASSESSMENT DETAILS

PROPERTY: Nansen Creek

SPONSOR: Silver Standard Mines Limited

LOCATION: Nansen Creek Area, Yukon Territory

TYPE OF SURVEY: Electromagnetic

OPERATING MAN DAYS:	8	**DATE STARTED:** ~~July 5~~, 1959	
EQUIVALENT 8 HOUR MAN DAYS:	12	**DATE FINISHED:** July 6, 1959	
CONSULTING MAN DAYS:	1/2	**NUMBER OF STATIONS:** 247	
DRAUGHTING MAN DAYS:	3	**MILES OF LINE SURVEYED:** 4.43	
TOTAL MAN DAYS:	23 1/2		

CONSULTANTS:

P. G. Hallof, 5 Minorca Place, Don Mills, Ontario.

FIELD TECHNICIANS:

J. Hussey, 139 Bond Avenue, Don Mills, Ontario.
W. Dunn, 602 West Hastings Street, Vancouver, B. C.

DRAUGHTSMEN:

D. Stone, 708 Kennedy Road, Apt. 407, Scarboro, Ontario.
M. Guest, 25 Lacelles, Apt. 405, Toronto, Ontario.

McPHAR GEOPHYSICS LIMITED,

Philip G. Hallof

P. G. Hallof

Dated: August 7, 1959

ASSESSMENT DETAILS

PROPERTY: Brown-McDade Group

SPONSOR: Silver Standard Mines Limited

LOCATION: Nansen Creek, Yukon Territory

TYPE OF SURVEY: Electromagnetic

OPERATING MAN DAYS:	4	**DATE STARTED:**	July 1, 1959
EQUIVALENT 8 HOUR MAN DAYS:	6	**DATE FINISHED:**	July 2, 1959
CONSULTING MAN DAYS:	1/2	**NUMBER OF STATIONS:**	199
DRAUGHTING MAN DAYS:	2	**MILES OF LINE SURVEYED:**	3.27
TOTAL MAN DAYS:	12 1/2		

CONSULTANTS:

P. G. Hallof, 5 Minorca Place, Don Mills, Ontario.

FIELD TECHNICIANS:

J. Hussey, 139 Bond Avenue, Don Mills, Ontario.
W. Dunn, Room 808, 602 West Hastings Street, Vancouver, B. C.

DRAUGHTSMEN:

D. Stone, 708 Kennedy Road, Apt. 407, Scarboro, Ontario.
M. Guest, 25 Lacelles Blvd., Apt. 405, Toronto, Ontario.

McPHAR GEOPHYSICS LIMITED,

Philip G. Hallof

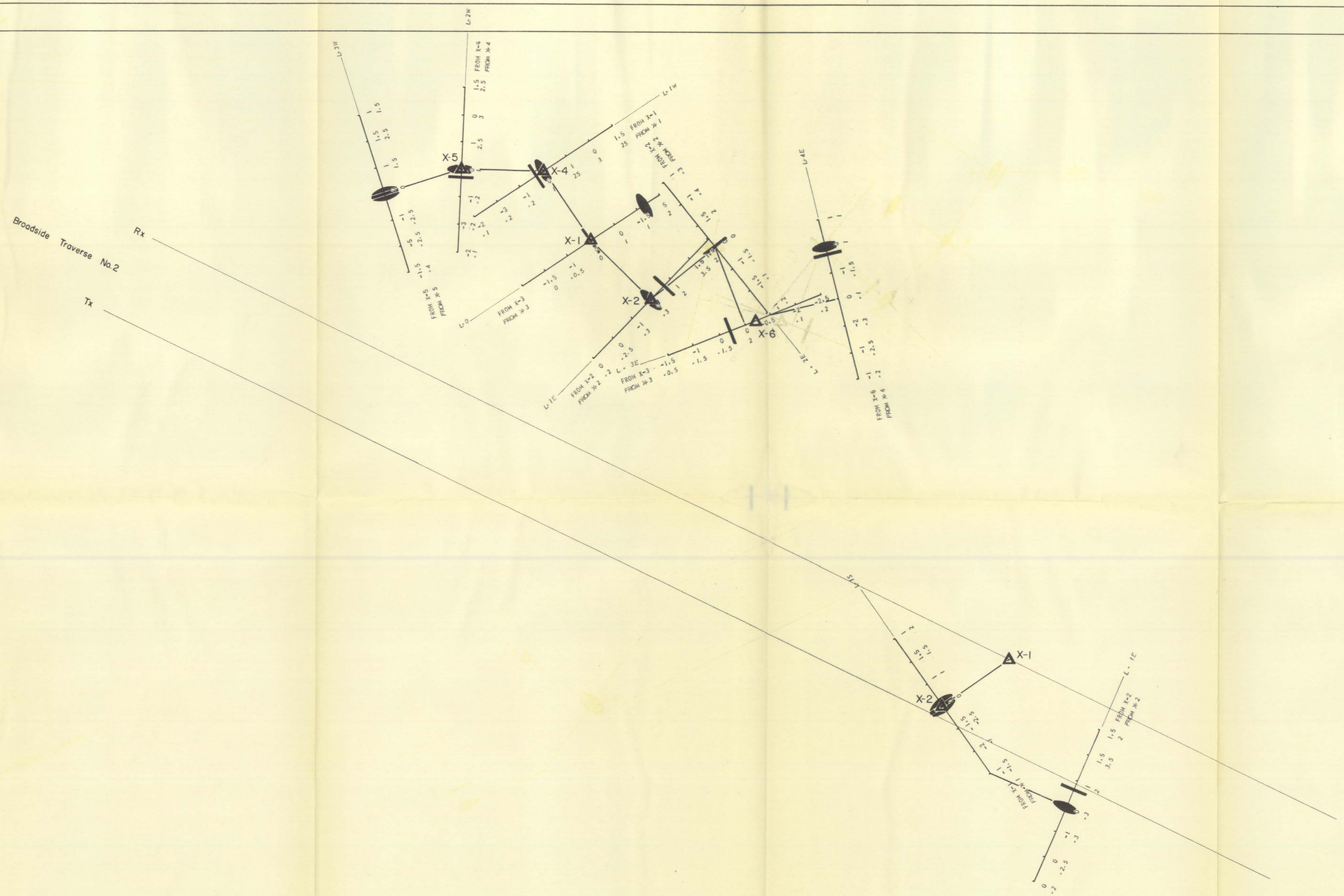
P. G. Hallof

Dated: August 7, 1959

DWG. E 3252

McPHAR GEOPHYSICS LIMITED

ELECTROMAGNETIC SURVEY



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LEGEND

△ TRANSMITTER LOCATION

RECEIVER TRAVERSE AND READINGS. 1000 C.P.S.

RECEIVER TRAVERSE AND READINGS 5000 C.P.S.

NOTE: CORRESPONDING TRANSMITTER IS INDICATED AT THE END OF EACH SERIES OF READINGS

SILVER STANDARD MINES LIMITED

NANSEN CREEK AREA YUKON TERRITORY

SCALE

200 150 100 50 0 200 400 600 800 1000 FEET

One Inch = Two Hundred Feet

SYMBOLS

1000 C.P.S. 5000 C.P.S.

- CONDUCTOR AXIS ESTABLISHED
- POSITION OF CONDUCTOR AXIS UNCERTAIN.
- EXISTENCE OF CONDUCTOR AXIS UNCERTAIN
- SUGGESTED TEST DRILL HOLE

DRAWN: D.R.S

DATE: AUGUST 1959

APPROVED:

DATE:

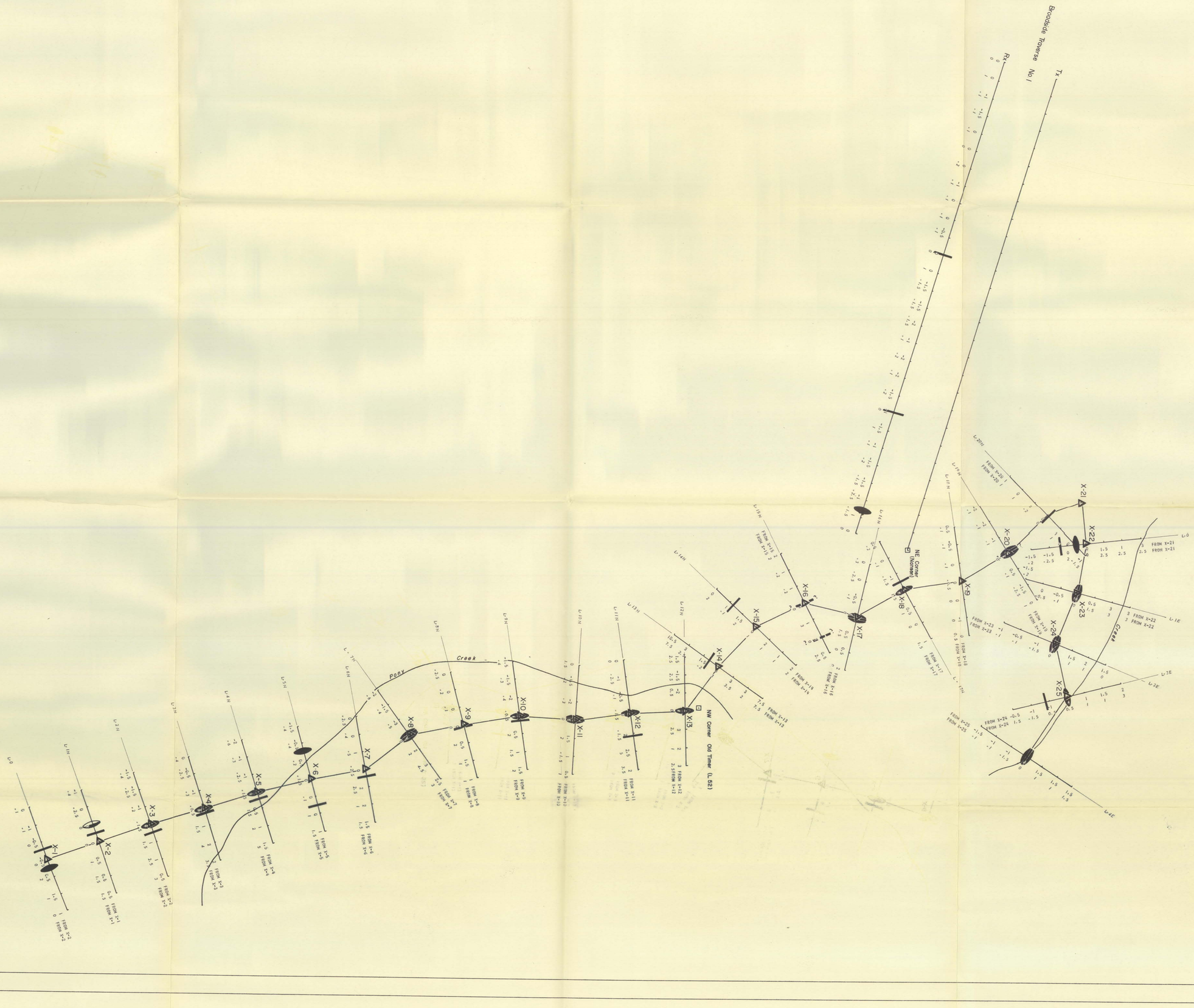
Aug 7, 1959

DWG. E 3252

DWG. E 4556

McPHAR GEOPHYSICS LIMITED

ELECTROMAGNETIC SURVEY



LEGEND

TRANSMITTER LOCATION

RECEIVER TRAVERSE AND READINGS. 1000 C.P.S.

RECEIVER TRAVERSE AND READINGS 5000 C.P.S.

NOTE: CORRESPONDING TRANSMITTER IS INDICATED AT THE END OF EACH SERIES OF READINGS

SILVER STANDARD MINES LIMITED

BROWN McDADE GRID

NANSEN CREEK AREA YUKON TERRITORY

SCALE

200 150 100 50 0 200 400 600 800 1000 FEET

One Inch = Two Hundred Feet

SYMBOLS

1000 C.P.S.	5000 C.P.S.	
		CONDUCTOR AXIS ESTABLISHED
	?	POSITION OF CONDUCTOR AXIS UNCERTAIN.
?	?	EXISTENCE OF CONDUCTOR AXIS UNCERTAIN
		SUGGESTED TEST DRILL HOLE

DRAWN D.R.S.

DATE AUGUST 1959

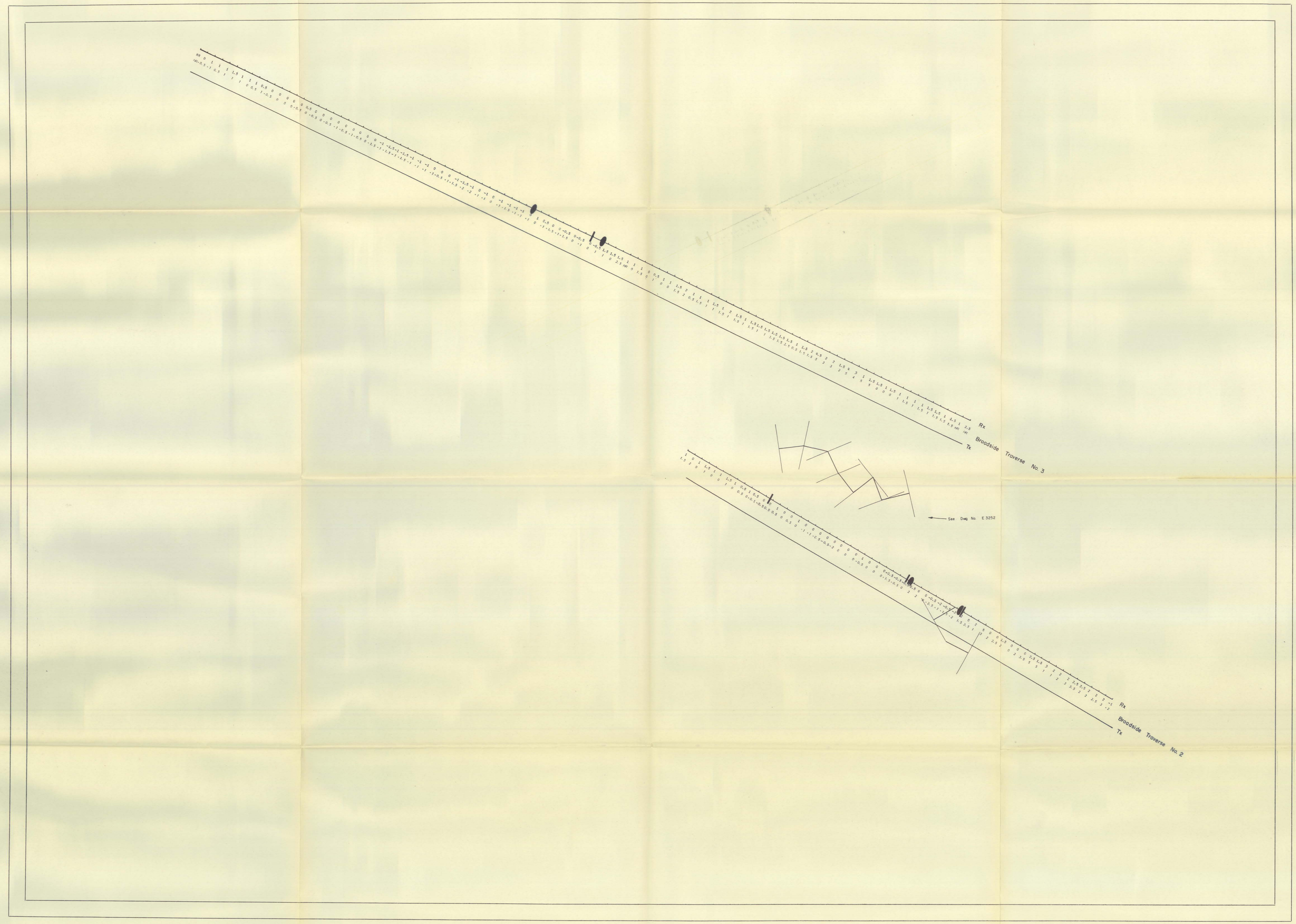
APPROVED

DATE Aug 7, 1959

DWG. E4556

McPHAR GEOPHYSICS LIMITED

ELECTROMAGNETIC SURVEY



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LEGEND

TRANSMITTER LOCATION
0 -0.5 RECEIVER TRAVERSE AND READINGS. 1000 C.P.S.
0 -0.5 *RECEIVER TRAVERSE AND READINGS 5000 C.P.S.*
NOTE: CORRESPONDING TRANSMITTER IS INDICATED AT THE END OF EACH SERIES OF READINGS

SILVER STANDARD MINES LIMITED

NANSEN CREEK AREA — YUKON TERRITORY

SCALE

400 200 0 400 800 1200 1600 2000 FEET

One Inch = Four Hundred Feet

SYMBOLS

1000 C.P.S.	5000 C.P.S.	
		CONDUCTOR AXIS ESTABLISHED
	? ?	POSITION OF CONDUCTOR AXIS UNCERTAIN.
?	? ?	EXISTENCE OF CONDUCTOR AXIS UNCERTAIN
		SUGGESTED TEST DRILL HOLE

DRAWN: D.R.S.
DATE: AUGUST 1959
APPROVED: [signature]

DATE: Aug 7, 1959

DWG. MISC 4558

McPHAR GEOPHYSICS LIMITED

LOCATION MAP

SILVER STANDARD MINES LIMITED

NANSEN CREEK AREA YUKON TERRITORY

SCALE

1000 250 0 500 1000 1500 2000 2500 FEET

One Inch = Five Hundred Feet

——— ——— ——— Suggested Brown McDade Zone

DRAWN: D.R.S.
DATE: AUGUST 1959
APPROVED: DRM
DATE: Aug 7, 1959

DWG. MISC. 4558