84-#511 - 12504

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SUMMARY GEOPHYSICAL REPORT

ON A

SEISMIC REFRACTION STUDY

OVER

PLACER LEASE 9840

MOYIE RIVER, FORT STEELE M.D.

BRITISH COLUMBIA

49°22, 116°04

FOR

TIARA RESOURCES LIMITED
AND
FRONTEND RESOURCES LIMITED
VANCOUVER, BRITISH COLUMBIA

BY

DAVID G. MARK, GEOPHYSICIST

AUGUST 26, 1983

GEOTRONICS SURVEYS LTD.
Engineering & Mining Geophysicists
VANCOUVER, CANADA

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MAPS

SUMMARY

Three seismic refraction profiles, totalling 575 m in length were completed over Placer Lease 9840 located on the Moyie River 30 km southwest of Cranbrook, B.C.

The purpose of the study was to determine the overburden thickness as well as to locate any possible buried river channels within the bedrock where placer gold may be concentrated.

The overburden is possibly tills, sands and gravels with a velocity range of 190 to 1,500 m/s indicating a material varying from loose and dry to compact and probably moist.

The velocity range of the bedrock is 4,500 to 5,000 m/s which is typical of the quartzite as has been mapped on the placer lease.

The overburden thickness was found to vary from 1 to 13 m but for the most part averaging 2 to 3 m. Several shallow bedrock depressions were located which may be former river channels. One in particular occurs on the northwest end of each line and therefore has a greater possibility of being a buried river channel that may carry gold.

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INTRODUCTION

This report discusses the results of a seismic refraction survey program carried out over Placer Lease 9840 located on the Moyie River.

The purpose of the work was to determine the thickness of the overlying river gravels which contain placer gold as well as to locate any buried bedrock channels where placer gold is often concentrated.

The work was carried out from July 28th to August 2nd, 1983 by a Geotronics crew of three men headed by Andrew Rybaltowski. The crew consisted of one geophysicist, one geophysical technician and one helper. The crew was accompanied by Charles J. Brown, P.Eng., consulting geologist, who recommended the work to be done.

used for all traverses. The technique consisted of laying out 24 geophones in a straight line and recording arrival times from shots fired at either end of the spread. The arrival times from three additional shot points approximately every 1/4 the spread length within the spread were also recorded. This provided the overburden depths and velocity variations along the spread, and also gave additional information about the deeper layers. Finally for each spread, two additional off-end shots were fired at a distance of up to one-half a spread length from the nearest geophone so that all first arrivals were from the bedrock surface. This was felt necessary so that the refractions received from the other shot points could be correlated and assigned the correct layer number.

A total of five spreads were done along three seismic lines, SL-1, SL-2 and SL-3 using a geophone separation of 5 m. The direction of each of the lines is 325°E (N55°W). SL-1 was located by measuring 100 m upstream along the river from the initial post, SL-2, 250 m, and SL-3, 500 m. The horizontal length of SL-1 and SL-2 was 230 m and that of SL-3 was 115 m.

The shots were placed in holes 0.4 to 0.7 meters deep with the shot size ranging from 0.15 to 0.5 kg.

There was difficulty in running the lines across the Moyie River which produced significant seismic noise on the geophones planted withint he river itself. There was also some wind noise problems.

COMPUTING METHOD

All seismic data were analyzed using an intercept-delay

time technique. Implementation of this method requires reverse refraction profiles with bedrock refractions emanating from a common point for at least two detectors. This rock overlap is necessary in order to obtain a true refractor velocity and travel time in the overburden independent of bedrock dip and/or surface irregularities. The off-end shot times are used to extrapolate the rock refractions from either end back to their respective shot locations. With this information and related overburden velocities, it is possible to compute the depth to bedrock not only below each shot point, but also below each detector.

DISPLAY OF RESULTS

A plan, 1:5,000 , showing the location of the seismic lines is given on Sheet 2 at a scale of 1:5,000 (1 cm = 50 m). The seismic interpretation is shown in profile form on Sheet 3 for all 3 lines at a scale of 1:250 (1 cm = 2.5 m).

DISCUSSION OF RESULTS

2- and 3-layer cases were encountered on the 3 seismic lines with the 2-layer case being within the valley bottom and the 3-layer case being on the valley sides. The following is a suggested velocity classification of each of the 3 layers.

Layer	Velocity (m/s)	Classification
1	190 to 650	overburden-loose, fairly dry to partially saturated, surficial sands, silts, gravels and tills.
2	460 to 1,500	overburden-fairly compact, partially saturated to very compact fully saturated sands, silts, clays, gravels and tills.
3	4,500 to 5,000	bedrock-quartzite.

Horizontal changes in overburden velocity may be caused by a variable water content, type of material and/or compactness of the material.

Arbitrary boundaries within the overburden on both seismic lines should be treated as physical changes and not as geological boundaries.

On seismic line SL-1 the overburden thickness varies from over 1 m below geophone 16 on the Moyie River to 10 m below geophone 1 on the northwest end of the profile. The bedrock surface is somewhat undulating. A possible bedrock river channel occurs below geophones 6 to 8. Though these are much smaller, others may exist below geophones 14 and 15, and below geophone 30.

On seismic line SL-2 the overburden thickness varies from about 1 m below geophone 27 to 13 m below geophone 8 where a possible river channel occurs from geophones 8 to 12. Most of this line consists of a very shallow overburden varying in thickness from 1 to 2 m.

The overburden thickness on SL-3 varies from 1 m below geophone 13 within the Moyie River to 7 m below geophone 1 where a shallow buried river channel may exist. Another possible one is below geophone 15.

The bedrock depressions where possible channels may exist have been drawn on the survey plan on Sheet 2. The northwest depression on each survey line is shown connected and therefore has greater possibility of being a buried bedrock

channel that may carry placer gold.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

August 26, 1983

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices located at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify that:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.

2. I have been practising my profession for the past 15 years and have been active in the mining indistry for the past 18 years.

3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4. This report is compiled from data obtained from a seismic refraction survey carried out under the supervision of myself during the period July 28th to August 2nd, 1983.

5. I do not hold any interest in Tiara Resources Ltd. nor in Frontend Resources Ltd., nor in Placer Lease 9840, nor do I expect to receive any interest as a result of writing this report.

David G. Mark,
Geophysicist

August 26, 1983

AFFIDAVIT OF COSTS

This is to certify that a seismic survey was carried out on Placer Lease 9840 on the Moyie River within the Fort Steele M.D., B.C., from July 28th to August 2nd, 1983, to the value of the following:

Field:

Geophysicist and 2 geophysical technicians 57 hrs. @ $80/hr.	$ 4,560.00
Instrument rental, 1 week @ $1,500/week	1,500.00
2-wheel drive truck rental and gas	500.00
Airline tickets	600.00
Room and board, 6 days @ $150/day	900.00
Explosives and seismocaps	280.00
	$8,340.00

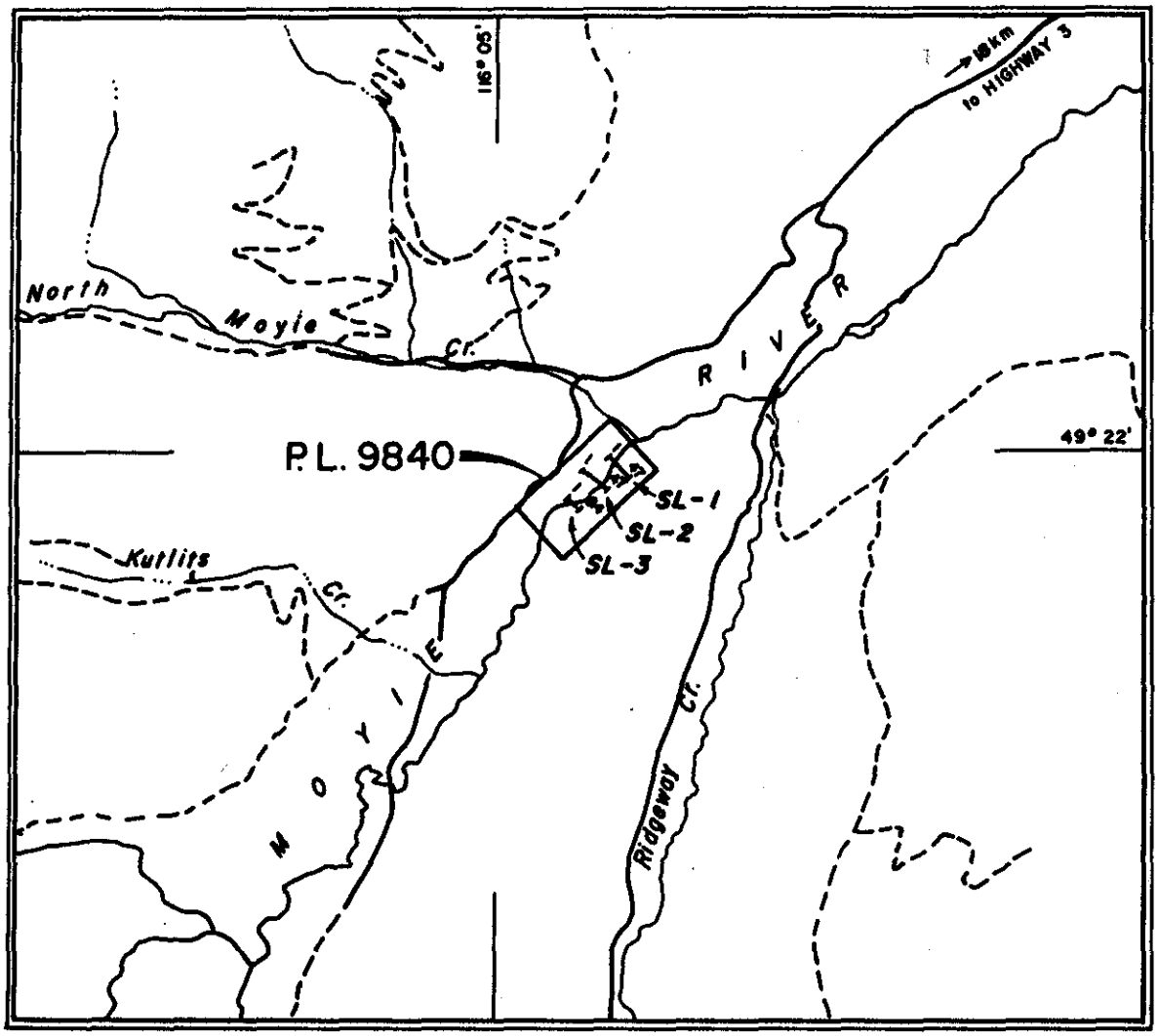
Office:

Senior geophysicist, 5 hours @ $40/hour	$ 200.00
Junior geophysicist, 54 hours @ $30/hour	1,620.00
Drafting and printing	300.00
Typing, photocopying, compilation	100.00
	$2,220.00

Grand Total	$10,560.00

GEOTRONICS SURVEYS LTD.

David G. Mark,
President



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TIARA RESOURCES LIMITED
FRONTEND RESOURCES LIMITED
PLACER LEASE 9840
MOYIE RIVER
FORT STEELE M.D., B.C.

SEISMIC REFRACTION STUDY
LOCATION MAP

DRN. BY:	DATE:	JOB No.	SCALE:	N.T.S.	SHEET No.
A.R.	AUG. 1983	83-35	1:50000	82F/8E	1

LOCATION AND ACCESS

Placer Lease 9840 lies astride the Moyie River, as is shown on Sheet 1, 250 m upstream from the junction of North Moyie Creek. The lease is approximately 30 km southwest of Cranbrook and 13 km west of Highway #3. An excellent all-weather road leads to within 1 km of the property. A tote trail exists between the road and the east end of the lease.

INSTRUMENTATION

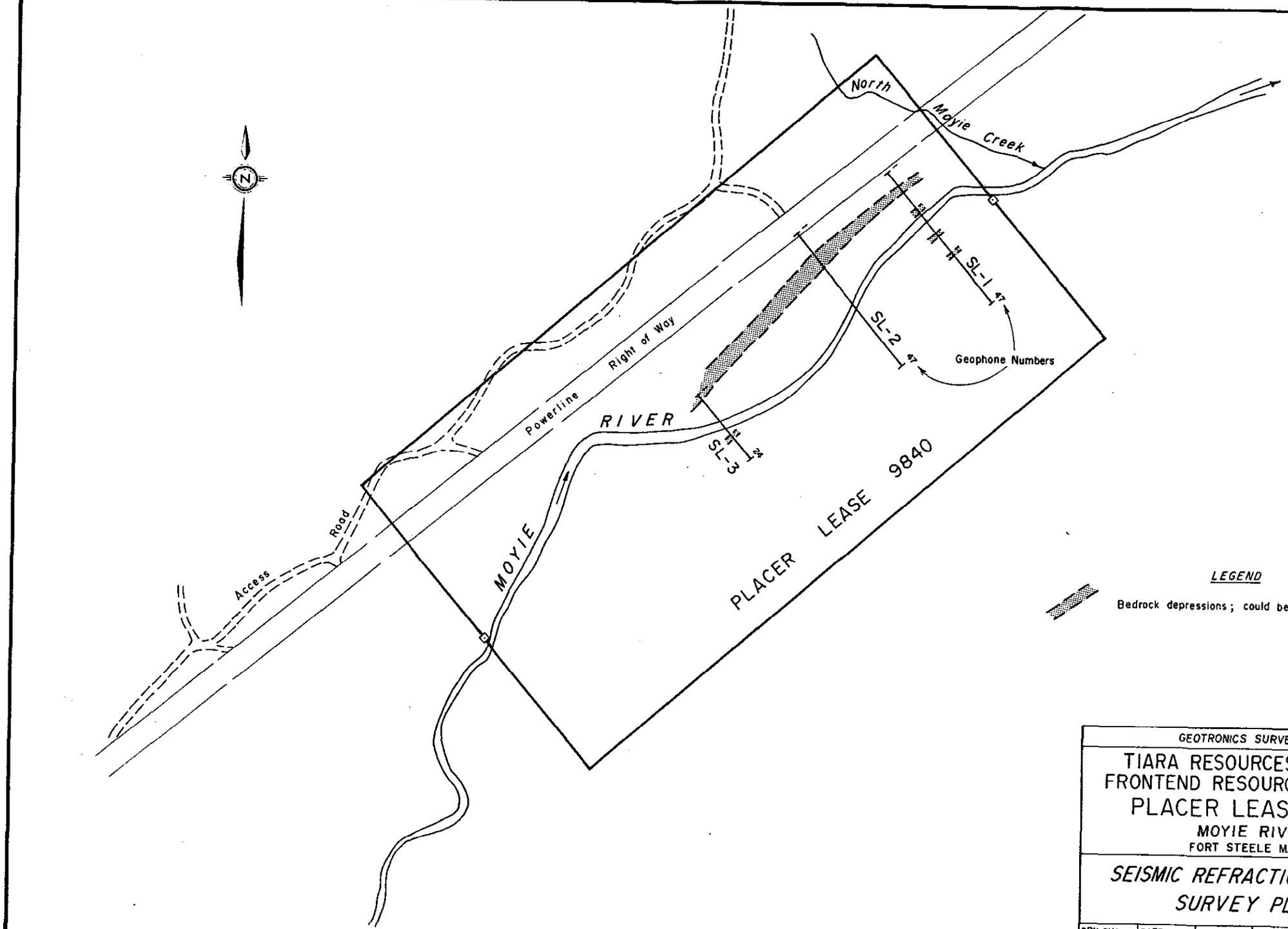
Two 12-channel seismographs, model 1210F, manufactured by Geometrics/Nimbus of Sunnyvale, California were used on the project. This instrument features signal enhancement by stacking repeated signals in a digital memory. A CRT (cathode ray tube) continuously displays the signal stored in the memory on all channels simultaneously, or on selected combinations of fewer channels. The stored signal can then be printed on a permanent paper recorded by a built-in electric writing oscillograph. The instrument also contains active signal filters on each amplifier.

Geophone cables of varying lengths were used as well as 8 cycle/sec. marsh geophones both items manufactured by Mark Products of Houston, Texas.

The blasting was done by radio signal with one encoder and two decoders, series 200, manufactured by Input/Output of Houston, Texas. These were interfaced with Motorola portable FM radios.

FIELD PROCEDURE

The 'two-way, in-line, shot' seismic refraction method was



LEGEND

Bedrock depressions; could be buried river channel.

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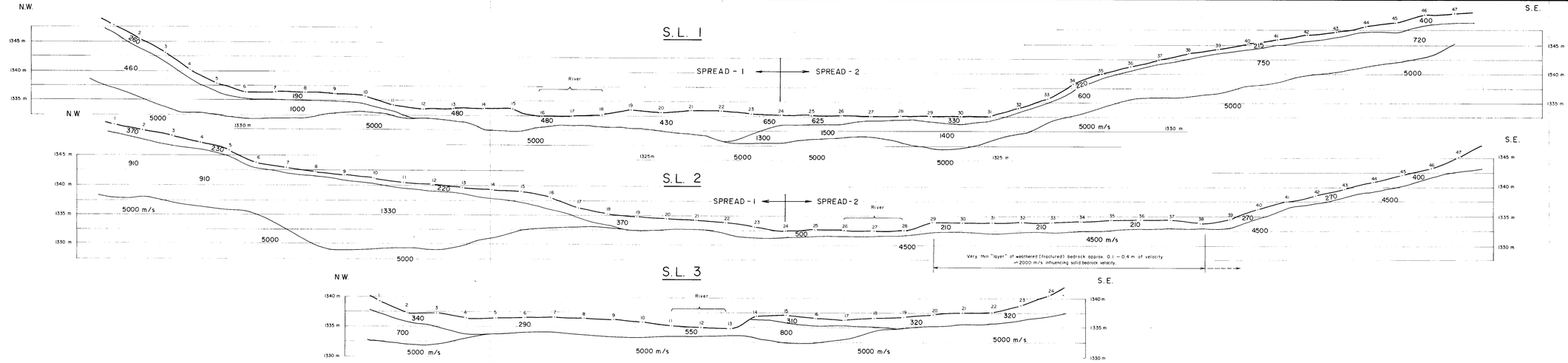
PLACER LEASE 9840
MOYIE RIVER
FORT STEELE M.D., B.C.

SEISMIC REFRACTION STUDY
SURVEY PLAN

DRN. BY:	DATE:	JOB No.	SCALE:	N.T.S.	SHEET No:
A.R.	AUG. 1983	83 - 35	1:5000	82F/8E	2



LEGEND

- 2 — Geophone location
- Calculated seismic interface
- 1330 — Average velocity in metres per second

VELOCITY (m/s)	CLASSIFICATION
190 - 400	Overburden - loose surficial, dry fluvial sands and gravels or glacial till
400 - 830	Overburden - more compact fluvial sands and gravels or glacial till.
850 - 1500	Overburden - fairly consolidated, near-to fully-saturated sands, gravels or glacial tills.
4500 - 5000	Bedrock - quartzite

DIRECTION OF LINES - 325° E (N.55° W)

SCALE IN METRES

5 0 5 10 15

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PLACER LEASE 9840
MOYIE RIVER
FORT STEELE M.D., B.C.

SEISMIC REFRACTION STUDY PROFILES

DRN. BY	DATE	JOB No.	SCALE	N.T.S.	SHEET No.
A. R.	AUG. 1983	83-35	1:250	82F/8E	