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GEOPHYSICAL REPORT

ON A

SEISMIC REFRACTION SURVEY

ON THE

UPPER CRACKER CREEK PLACER GOLD PROPERTY

CRACKER CREEK, ATLIN AREA

ATLIN MINING DIVISION, BRITISH COLUMBIA

-
- PROPERTY LOCATION : Centre is located 30 km N52°E of village of Atlin, British Columbia
59°44'N Latitude, 133° 16'W Longitude
N.T.S. - 104N/11E
- WRITTEN FOR : **SISTERS RESOURCES LTD.**
1096 West 3rd Avenue
North Vancouver, British Columbia
- WRITTEN BY : David G. Mark, P.Geo.,
GEOTRONICS SURVEYS LTD.
#405 - 535 Howe Street
Vancouver, British Columbia V6C 2Z4
- DATED : July, 1997

**GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT**

25,331



GEOTRONICS

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CLAIM MAP	1:50,000	1
<u>SEISMIC REFRACTION SURVEY PROFILES:</u>		
Profile SL-Z1	1:500	2
Profile SL-Z2	1:500	2
Profile SL-ZW	1:500	3

SUMMARY

Seismic refraction surveying was carried out over the upper part of the Cracker Creek Placer Gold Property, the center of which is located 30 km N52°E of the village of Atlin. Cracker Creek is a tributary of Surprise Lake within the Atlin Mining Division, British Columbia. The work was carried out on August 19, 1996. The object of the work was to locate buried creek channels, especially pre-glacial, that may carry placer gold.

The overburden is glacial till and localized fluvial sands and gravels. Within the placer channels of the area, the sands and gravels may be overlain by the glacial material. The bedrock is probably an alaskite intrusive, which underlies most of the property, as well as sediments and volcanics of the Cache Creek Group.

The surveying was carried out using a 24-channel seismic refraction system with 190-meter to 276-meter spreads, with 5/10-meter and with 12-meter geophone spacings and employing explosives as the energy source. A total of three lines were done with one spread per line resulting in a total length of 718 meters. The data were analyzed using an intercept time delay method.

CONCLUSIONS

The seismic refraction survey revealed four possible to probable Tertiary buried creek channels as follows:

1. The main bedrock depression along Cracker Creek, which is very probably the former course of the creek.
2. The main bedrock depression along the tributary to Cracker Creek, which is very probably the former course of this creek as well.
3. A raised bedrock depression subparallel to the main one along Cracker Creek
4. A velocity slow zone within the bedrock occurring on one of the Cracker Creek seismic lines, which could be caused by a buried canyon-like channel and/or a fault zone.

The average depths to bedrock were found to be in the order of 10 meters.

RECOMMENDATIONS

Information relayed verbally to the writer was that some testing was apparently done by excavation to bedrock along Cracker Creek with little gold being found. It is unknown whether anything was done along the tributary to Cracker Creek. If it has not, then testing by bulldozer or backhoe excavating would be recommended to be done on the tributary. This refers only to the upper part of Cracker Creek where the seismic work discussed within this report was done and not to the lower part where other seismic work was carried out by the writer.

GEOPHYSICAL REPORT
ON A
SEISMIC REFRACTION SURVEY
ON THE
UPPER CRACKER CREEK PLACER GOLD PROPERTY
CRACKER CREEK, ATLIN AREA
ATLIN MINING DIVISION, BRITISH COLUMBIA

INTRODUCTION AND GENERAL REMARKS

This report discusses the results of seismic refraction surveying carried out along three lines within the Upper Cracker Creek Placer Gold Property, which occurs on the upper reaches of Cracker Creek, located 30 km N52°E (52°E) of the village of Atlin.

The seismic work was carried out for the purpose of locating buried Tertiary creek channels that were hoped to carry placer gold. The Atlin area is well known for numerous placer gold deposits occurring within buried channels. The Upper Cracker Creek claims were located to encompass the possible channel(s) that were delineated from air photos by Will E. Godbey, geologist.

The work was carried out on August 19, 1996 by a crew of five men headed by the writer. Because of the remoteness of the property, the work was done in one long 16-hour day in order to save traveling to the property a second day. This essentially means that two days of work were done in one day.

The work was done at the request of Will E. Godbey, who also located the crew onto the property as well as managed the project.

PROPERTY AND OWNERSHIP

The Cracker placer gold property consists of 9 placer claims and 6 placer leases for a contiguous total of 15 units. This is as shown on Map #2, and as described below:

Name	Placer Claim No.	Tag No.	Expiry Date
Cracker 961	349077	P81334	July 29, 1998
Cracker 963	349078	P91715	July 17, 1998
Cracker 964	349079	P91716	July 17, 1998
Cracker 965	349080	P91717	July 17, 1998
Cracker 971	357104	P94445	unknown
Cracker 972	357105	P94446	unknown
Cracker 973	357106	P94447	unknown
Cracker 974	357107	P94448	unknown
Cracker 975	357108	P94449	unknown
Name	Placer Lease No.	Tag No.	Expiry Date
N/A	262317	P52183	unknown
N/A	262318	P52185	unknown
N/A	262319	P52186	unknown
N/A	262320	P52187	unknown
N/A	262334	P52188	unknown
N/A	262335	P52189	unknown

The expiry dates shown assume that the work discussed within this report will be accepted for assessment credits.

The property is owned by Will E. Godbey of Atlin, British Columbia.

LOCATION AND ACCESS

The part of the property that the work was carried out on occurs within the upper part of Cracker Creek which is located 30 km N52°E of the village of Atlin. Cracker Creek is a tributary of Surprise Lake. The total property of 15 units occurs along Cracker Creek, along two of its tributaries, as well as along a southwest-flowing tributary of Ruby Creek within the Atlin Mining Division, British Columbia.

The geographical coordinates of the center of the upper Cracker Creek part of the property are 59° 44' north latitude and 133° 16' west longitude.

The property can be reached by traveling 19 km from Atlin along the Pine Creek road to Surprise Lake. At the southwest end of Surprise Lake, one turns northerly to travel along the

northern shore of Surprise Lake for 8 km to Ruby Creek and then along Ruby Creek for about 3.5 km. One then crosses Ruby Creek onto the southwestern boundary of the property and travels northeasterly along the southwesterly-flowing tributary to Ruby Creek for about 4 km to a 'Y' junction. The east fork takes one to Surprise Lake, a distance of about 6.5 km, and the west fork takes one to the upper part of Cracker Creek, a distance of about 2.5 km and the area where the seismic work was carried out.

PHYSIOGRAPHY

The property is located within the physiographic unit known as the Teslin Plateau, which is a division of the Yukon Plateau. The terrain can vary from gentle within the creek valleys, to rugged. Mountains in the area reach elevations in excess of 2,000 m (6,560 feet) a.s.l., but valley floors are often about 1,000 m (3,280 feet).

The property is located along Cracker Creek and its tributaries as well as a tributary of Ruby Creek. The terrain along the creeks is gentle to moderate, with the elevation varying from about 917 meters at Surprise Lake to in excess of 1,500 metres at the upper reaches of the creeks.

HISTORY

Placer gold was first discovered on Pine Creek about 10 road km east of Atlin in 1898 by Fritz Miller and Kenneth McLaren. Through the years since, the creeks and rivers in the general area have been worked off and on. In fact the Atlin area is one of the prime placer areas in British Columbia.

Work was done in the early part of the century within the property on the lower part of Cracker Creek in an attempt to find placer gold by drifting along the Cracker Creek channel. Apparently flooding was a problem and the exploration was halted.

Seismic refraction work was carried out by the writer on the lower part of Cracker Creek within this same area in 1994 and 1996. This work is reported on in separate reports.

As far as the writer knows there has been no previous work done on upper part of Cracker Creek.

GEOLOGY

The GSC geology map of the area shows the property to be underlain entirely by an alaskite intrusive. It is described as occurring in outcrop as light brown, crumbly, inequigranular, and highly variable in texture. On the western part of the property close to Ruby Creek occurs sediments and volcanics of the Cache Creek Group which is of Pennsylvanian and Permian age.

The overburden consists almost entirely of glacial till produced by northerly and/or easterly-flowing glaciers, as well as fluvial gravels. Fluvial gravels occur within the placer channels and often underlie the till.

INSTRUMENTATION

Two 12-channel seismographs, Model 1210F, manufactured by Geometrics/Nimbus of Sunnyvale, California, were used on the project. The two were interfaced together to make up a 24-channel system. The 1210F 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. The stored signal can then be printed on a permanent paper record by a built-in electric-writing oscillograph. The instrument also contains active signal filters on each amplifier.

Two 90-meter cables for the smaller spread, and two 165-meter cables for the two larger spreads were used, as well as 8 cycle/sec marsh geophones, manufactured by Mark Products of Houston, Texas.

The blasting was done with one encoder and one decoder, 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 method was used for all seismic lines. The technique consists of laying out 24 geophones in a straight line and recording arrival times from shots fired at either end of the spread. Arrival times from three additional shot points each located every 1/4 of the spread length within the middle of the spread were also recorded. This provided the layer 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, each at a distance of up to one-half the spread length from the nearest geophone so that all first arrivals were from the basement bedrock (or basal layer). This was felt necessary so that the refractions received from the other shot points could be correlated and assigned the correct layer number.

The seismic lines were carried out as follows and as shown on the claim map, map #1:

Line	Direction	Geophone Spacing	Line Length	No. Spreads
SL-Z1	220°E	12 meters	276 meters	1
SL-Z2	220°E	12 meters	252 meters	1
SL-ZW	340°E	5 and 10 meters	<u>190 meters</u>	<u>1</u>
TOTAL	n/a	n/a	718 meters	3

Lines SL-Z1 and SL-Z2 were carried out on upper Cracker Creek parallel to each other and 100 meters apart. Line SL-ZW was carried out across a tributary to upper Cracker Creek

For SL-ZW, the 5/10 meter geophone spacing means it was 5 metres at the two ends and the middle of the spread, and 10 metres for the rest of the spread. The purpose of the 5-meter geophone spacing was to obtain a more accurate velocity of the surficial overburden layer.

The terrain along each of the lines was surveyed in by hand-held clinometer. The geophone stations were marked by blaze orange flagging.

The shots ranged in size from 0.1 to 1.0 kg., and were placed in holes up to 0.4 m deep.

COMPUTING METHOD

All seismic data were analyzed using an intercept-delay time technique. Implementation of this method requires reverse refraction 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 below each detector.

The seismic-interpreted profiles were plotted at a scale of 1:500 on Map #2 for SL-Z1 and SL-Z2 and on Map #3 for SL-ZW. The location of the seismic line is shown on the claim map, Map #1, at a scale of 1:50,000.

DISCUSSION OF RESULTS

A suggested classification of the velocities is as follows:

Layer #	Velocity	Suggested Material
1	400 - 630	Overburden: loose surficial glacial till, possibly sand, gravel.
2	1150 - 1400	Overburden:, sands and gravels, glacial till, partially compact partially water-saturated,.
2	2000	Overburden: sands and gravels, glacial till, water-saturated, very compact.
3	3600 - 4300	Bedrock: fractured and/or altered alaskite, or possibly volcanics and/or metamorphics.
3	4800 - 5300	Bedrock: alaskite.

Horizontal changes in overburden velocity may be caused by a variable water content, type of material and/or compactness of the material. Therefore, arbitrary boundaries within the overburden should be treated as physical changes and not necessarily as geological boundaries.

Bedrock velocities can be much lower than is indicated within the table if the rock is highly fractured or highly altered.

The accuracy of the velocity measurement is dependent on (1) the bedrock topography, especially around areas of sharp changes such as buried creek channels, and (2) the number

of points defining the velocity. Therefore some of the bedrock velocities may be higher or lower than is shown.

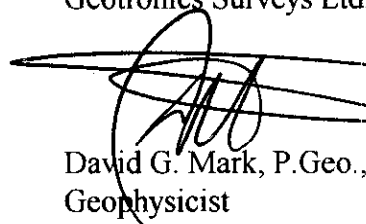
As indicated in the table, the number of seismic velocity layers occurring on the project site is three, with the third layer being bedrock. The first layer is loose, surficial overburden. The middle layer is a more compact to very compact, possibly water-saturated glacial till and/or gravels and occurs in most of the suggested buried creek channels.

For line SL-Z1, the seismic-calculated depths to bedrock vary from 4 meters below geophone 1, to 14 meters below geophones 21 and 22. And on line SL-Z2, the seismic-calculated depths to bedrock vary from 6.5 meters below geophone 18, to 22 meters below geophone 6. For the third line, these depths vary from 6 meters below geophones 18 to 20, inclusive, to 17 meters below geophone 8.

The seismic interpretation along the three lines has indicated four probable/possible channels described as follows:

1. The most probable buried channel on lines Z1 and Z2 is the lowest bedrock point across the valley and is centered below geophone 9 on line Z1 and below the midpoint of geophones 15 and 16 on line Z2. The depth on both lines is about 12 meters.
2. A possible channel could also occur at a higher bedrock elevation to the southwest of Cracker Creek. On Z1, this channel would occur between geophones 12 to 16 where the depth varies from 8 to 11 meters, and on Z2, between geophones 7 to 10 where the depth varies from 16 to 18 meters.
3. On line Z1 between geophones 20 and 21 occurs a velocity slow zone within the bedrock. These can be caused by buried canyon-like channels and/or faults. It has a slow zone velocity of 2200 m/s which, if it is a channel, the in-fill material is probably a boulder till and the horizontal channel width is about 10 meters.
4. On line SL-ZW, which was done across the tributary to Cracker Creek, the most probable buried bedrock channel occurs at the bedrock depression below geophone 8, where, as mentioned above, the seismic-calculated depth is 17 meters.

Respectfully submitted,
Geotronics Surveys Ltd.


David G. Mark, P. Geo.,
Geophysicist



July, 1997

REFERENCES

- Aitken, J.D., Atlin Map Area, British Columbia. Geological Survey of Canada, Memoir 307, 1959.
- Mark, David G., Summary Geophysical Report on a Seismic Refraction Study Over Two Placer Gold Properties, Cracker Creek and Spruce, Atlin Area, Atlin Mining Division, British Columbia, for Wilski Mining Co. Ltd., January 1995.
- Mark, David G., Summary Geophysical Report on a Seismic Refraction Study Over A Placer Gold Property, Cracker Creek, Atlin Area, Atlin Mining Division, British Columbia, for Montana Gold Corp., July 1997.

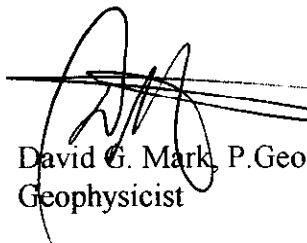
GEOPHYSICIST'S CERTIFICATE

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 at #405 - 535 Howe Street, Vancouver, British Columbia.

I further certify that:

1. I am registered as a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.
2. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
3. I have been practicing my profession for the past 29 years, and have been active in the mining industry for the past 32 years.
4. This report is compiled and interpreted from data obtained from a seismic refraction survey carried out under my field supervision on August 19, 1996.
5. I do not hold any interest in the placer property discussed within this report, nor in any other properties Will E. Godbey or Sisters Resources Ltd. may have an interest in, nor do I expect to receive any interest as a result of writing this report.


David G. Mark, P. Geo.,
Geophysicist



July, 1997

AFFIDAVIT OF EXPENSES

A seismic refraction survey along with line cutting was carried out over a portion of the Cracker Placer Gold Property which occurs on Cracker Creek, located 30 km N52°E (52°E) of the village of Atlin, August 19, 1996 (Because of the remoteness of the claims, the day was actually a 16 hour day meaning that two days work was done in one day.), to the value of the following:

Mob-demob (Share)

Wages	\$425.00	\$425.00
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Field:

5-man crew, 2 days @ \$1,350/day	\$2,700.00	
Truck rental and gas, 2 trucks @ 120/day/truck for 2 days	480.00	
Explosives,	160.00	
Seismocaps, 24 @ \$5.00/cap	120.00	
Room and Board, 2 days @ \$300/day	<u>600.00</u>	
	\$4,060.00	\$4,060.00

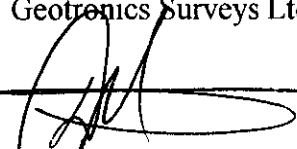
Data Reduction & Report:

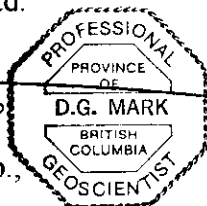
Senior geophysicist, 16 hr. @ \$50/hr.	\$800.00	
Geophysical technician, 20 hours @ \$35/hour	700.00	
Printing, photocopying, compilation	<u>250.00</u>	
	\$1,750.00	\$1,750.00

GRAND TOTAL

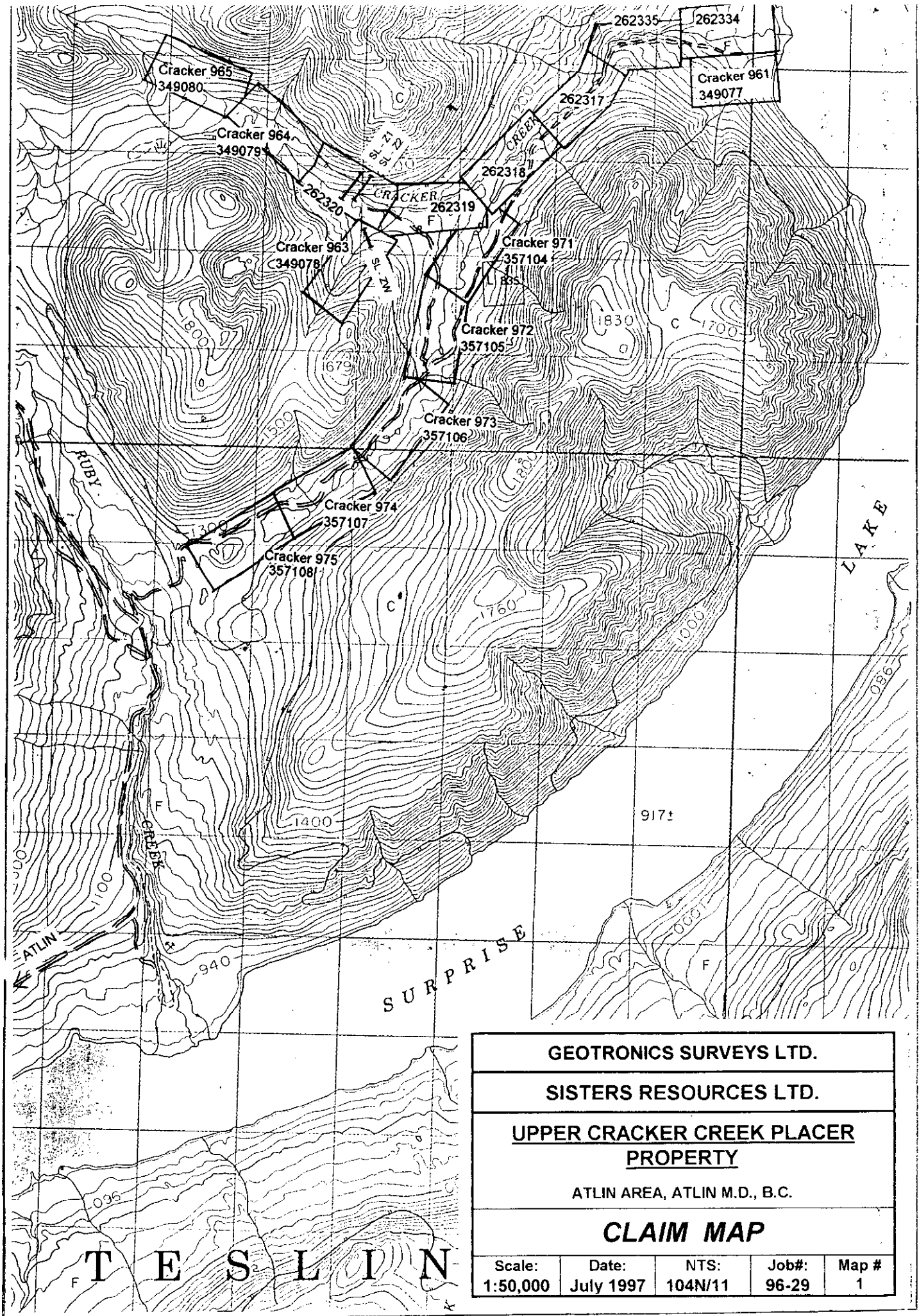
\$6,235.00

Respectfully submitted,
Geotronics Surveys Ltd.


David G. Mark, P. Geo.,
Geophysicist



July, 1997



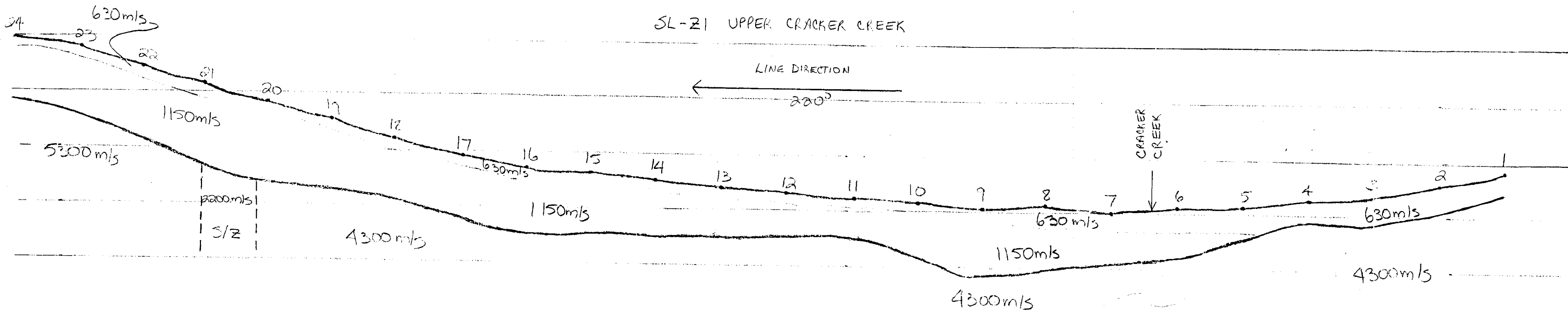
GEOTRONICS SURVEYS LTD.				
SISTERS RESOURCES LTD.				
UPPER CRACKER CREEK PLACER PROPERTY				
ATLIN AREA, ATLIN M.D., B.C.				
CLAIM MAP				
Scale:	Date:	NTS:	Job#:	Map #
1:50,000	July 1997	104N/11	96-29	1

25,331

SL-Z1 UPPER CRACKER CREEK

LINE DIRECTION

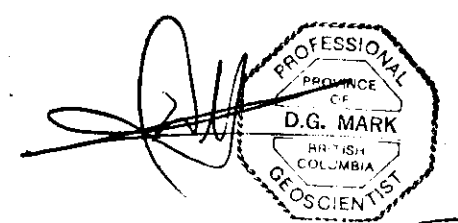
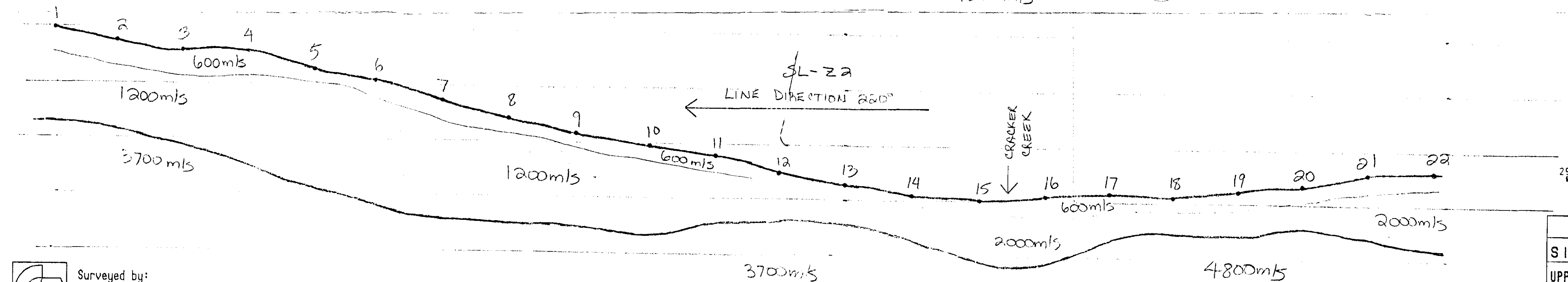
220°



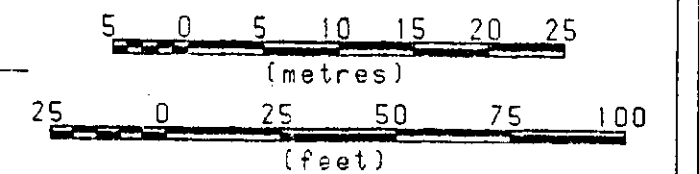
SL-Z2

LINE DIRECTION 220°

CRACKER CREEK



Scale 1:500



Surveyed by:
GEOTRONICS SURVEYS LTD.
VANCOUVER B.C.
August 28, 1996

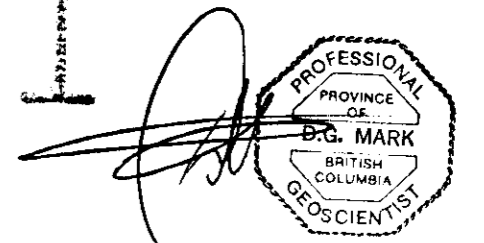
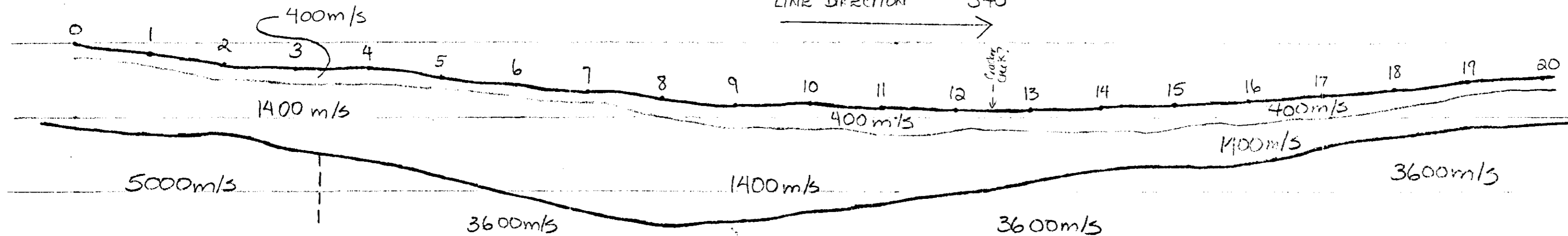
GEOTRONICS SURVEYS LTD.				
SISTERS RESOURCES LTD.				
UPPER CRACKER CREEK PLACER PROPERTY ATLIN AREA, ATLIN M.D., B.C.				
SEISMIC REFRACTION SURVEY PROFILES SL - Z1 and SL - Z2				
Drawn by: RTM	Job No. 96-29	NTS 104N/11E	Date Aug 96	Map No. 2

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,331

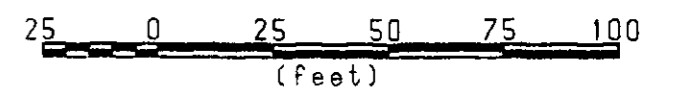
SL-Zw Upper Cracker Creek

LINE DIRECTION 340°

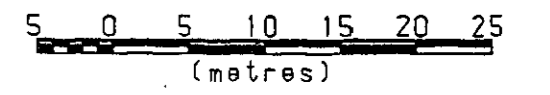


(Ma)

Scale 1:500



Scale 1:500



Surveyed by GEOTRONICS SURVEYS LTD
AUGUST 28, 1996

GEOTRONICS SURVEYS LTD.					
SISTERS RESOURCES LTD.					
UPPER CRACKER CREEK PLACER PROPERTY Atlin Area, Atlin M.D., B.C.					
SEISMIC REFRACTION SURVEY PROFILE SL-ZW					
Drawn by: G.N.B.	Job No. 96-29	NTS 104N/11E	Scale 1:500	Date Aug 96	Map No. 3