GEOPHYSICAL REPORT

ON A

SEISMIC REFRACTION SURVEY

ON THE

WOLF PLACER GOLD PROPERTY

GOODASANY CREEK, MANSON CREEK AREA

OMINECA MINING DIVISION, BRITISH COLUMBIA

PROPERTY LOCATION	:	Centre is located 11 km N70°W of village of Manson Creek, British Columbia 55°42'N Latitude, 124° 39.5'W Longitude N.T.S. - 93N/10E
WRITTEN FOR	:	**WILLEM KLEINHOUT** P.O. Box 407, Station A Vancouver, British Columbia V6C 2N2
WRITTEN BY	:	David G. Mark, P.Geo., **GEOTRONICS SURVEYS LTD.** #405 - 535 Howe Street Vancouver, British Columbia V6C 2Z4
DATED	:	July, 1997

25,050

GEOTRONICS

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SUMMARY

Seismic refraction surveying was carried out over the Wolf Claims, the center of which is located 11 km N70°W of the village of Manson Creek and 9.5 km S10°E of Germansen Landing. It is found on Goodasany Creek within the Omineca Mining Division, British Columbia. The work was carried out in December, 1996. The object of the work was to locate buried creek or river channels, especially pre-glacial, that may carry placer gold.

The leases are underlain by Cache Creek sediments, probably argillites and slates, and possibly volcanics. The overburden is glacial till and boulder clay and localized fluvial sands and gravels. Within the placer channels of the area, the sands and gravels are overlain by the glacial material.

The surveying was carried out using a 24-channel seismic refraction system with 190-meter spreads using 5/10-meter geophone spacings and with 345-meter spreads using 15-meter geophone spacings, and employing explosives as the energy course. Because the second 190-meter spread was completely overlapped by a 345-meter spread, the total line length was only 880 meters instead of 1,070 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. Three are interpreted from slow zones within the bedrock and one is interpreted from a bedrock depression. Considering the numerous placer deposits occurring within buried channels in the area, these channels are prime exploration targets.

1. The most probable channel is revealed as a slow zone within the bedrock and is about 80 meters wide from rim to rim. The depth to the bottom is unknown.
2. The second most probable channel is also revealed as a slow zone within the bedrock and is about 30 meters wide from rim to rim. The depth to the bottom is unknown.
3. The third possible channel is revealed as a bedrock depression. The minimum depth to the bottom is 78 meters. A seismic hidden layer probably occurs at this site, if it is a channel, and thus the depth is probably greater than 78 meters.
4. The fourth possible channel is revealed as a slow zone that would be less than 15 meters wide rim to rim. This slow zone is more likely caused by a fault.

RECOMMENDATIONS

Only one line was done on these claims and thus it is highly recommended to carry out the seismic refraction surveying both to the south and to the north in order to more accurately delineate the possible channel(s). This would also help determine which of the possible channels are actually channels. Preferably the line spacing should be 100 meters but no more than 200 meters.

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INTRODUCTION AND GENERAL REMARKS

This report discusses the results of seismic refraction surveying carried out along one line within the Wolf placer gold property, which occurs on Goodasany Creek, located 11 km N70°W (290°E) of the village of Manson Creek.

The seismic work was carried out for the purpose of locating buried Tertiary creek or river channels that were hoped to carry placer gold. The Manson Creek area is well known for numerous placer gold deposits occurring within buried channels. The Wolf claims were located to encompass the possible channels that were delineated from air photos and Landsat imagery by Willem E. Kleinhout, geophysicist.

The seismic work was of a reconnaissance nature and, thus, the survey and interpretation methods were designed not so much to obtain bedrock depths, but channel locations.

The work was carried out from from December 9 to 13, 1996 by a crew of five men headed by the writer.

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

PROPERTY AND OWNERSHIP

The property consists of nine contiguous placer leases grouped as the Wolf placer gold property as shown on Map #2, and as described below:

Name	Placer Lease No.	Tag No.	Expiry Date
Wolf 1	343839	P90957	February 17, 2000
Wolf 2	343840	P90958	February 17, 2000
Wolf 3	343841	P90959	February 17, 2000
Wolf 4	343842	P90960	February 17, 2000
Wolf 5	343843	P90961	February 19, 2000
Wolf 6	343844	P90962	February 19, 2000
Wolf 7	343845	P90963	February 19, 2000
Wolf 8	343846	P90964	February 19, 2000
Wolf 9	343847	P90965	February 19, 2000

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

The property is owned by Willem E. Kleinhout of Vancouver, British Columbia.

LOCATION AND ACCESS

The property is located 11 km N70°W (290°E) of the village of Manson Creek and 9.5 km S20°E (160°E) of Germansen Landing on Goodasany Creek within the Omineca Mining Division, British Columbia.

The geographical coordinates are 55° 42' north latitude and 124° 39.5' west longitude.

Manson Creek can be reached by car along gravel roads from Mackenzie, over a distance of 160 km (100 miles), or from Fort St. James over a distance of 185 km (115 miles). The center part of the property is reached by traveling westerly from Manson Creek along the road to Germansen Landing for about 14 km. The northern part of the property is reached by traveling 8 km (5 miles) on the Forestry Access Road southerly from Germansen Landing. About one km further is the turnoff to Manson Creek which runs southerly along the east side of the property.

PHYSIOGRAPHY

The property is located within the southern part of the physiographic unit known as the Swannell Ranges, which is a division of the Omineca Mountains. The terrain is generally moderate with slopes varying from gentle to steep. Mountains in the area reach elevations in excess of 1,600 m (5,250 feet) a.s.l., but valley floors are often about 1,000 m (3,280 feet).

The property is located within a crook of the Germansen River, that is, the river is located to the south, east, and north of the property. The northern part of the property is drained by the

northerly-flowing Goodasany Creek which is a tributary of the Germansen River. The southern part is drained by a small creek which is also a tributary of the Germansen River. The terrain is quite gentle, with the elevation varying from about 950 to 1,100 metres above sea level.

HISTORY

Placer gold was first discovered on Silver Creek in 1868 and through the years since, the creeks and rivers in the general area have been worked off and on. Apparently, the government did not keep records until 1874. Since then, 15,103 ounces of gold were mined from the area immediately east of the property (lower Slate Creek, Manson Creek, and Lost Creek). This is most likely significantly lower than the 'real' figure, since it was quite common not to report all the gold, due to government taxation.

West of the property, mostly along the northwesterly-trending part of Germansen River and its tributaries, 24,138 ounces of gold were recorded as produced, mostly by two main operators: Germansen Mines Limited and Germansen Ventures Ltd.

Slate Creek, the upper reaches of which is located about 4 km to the southeast, was worked by various companies, including Cominco, who worked it from 1929 to 1943. Six channels can be seen within their workings.

Since the nine placer leases have been staked, no previous work has been carried out on them.

GEOLOGY

The GSC geology map of the area shows the property to be underlain by mostly sediments, and possibly some volcanics of the Cache Creek group of Pennsylvanian and Permian age. The Cache Creek group occurs as a west- to northwest-trending band dipping nearly vertical that averages 13 km wide. The Cache Creek group in the area of the property consists mostly of argillites and slates, with minor beds of greenstone and schist. Also, several small bodies of serpentine have been seen to cut across the Cache Creek rocks.

The Manson fault zone crosses Slate Creek in a northwesterly direction and along this zone the slates and argillites have been hydrothermally altered to a buff-coloured aggregate of ankeritic carbonate, quartz and mariposite.

The overburden consists almost entirely of glacial till produced by easterly-flowing glaciers, as well as boulder clay. Fluvial gravels occur within the placer channels close to bedrock and underlie the till and boulder clay.

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 190-meter spreads, and two 165-meter cables for the 345-meter 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 line was started with the two 190-meter spreads. It appeared that the overburden thickness was too deep for the spread length and thus the spread length was switched to the 345-meter one. The first 345-meter spread completely overlapped the second 190-meter spread resulting in a total line length of 880 meters.

The geophone spacing used for the two 190-meter spreads was 5 metres at the two ends and the middle of the spread, and 10 metres for the rest of the spread. The geophone spacing used for the 345-meter spreads was 15 meters.

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 4.0 kg., and were placed in holes 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 profile was plotted at a scale of 1:1,000 on Map #3. The location of the seismic line is shown on the claim map, Map #2, 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	Overburden: loose surficial glacial till, possibly sand, gravel.
2	2100 - 2400	Overburden: boulder clay, glacial till, water-saturated, very compact.
3	3750 - 4000	Bedrock: probably volcanics.
3	6,000	Bedrock: possibly limestone.

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.

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 very

compact, possibly water-saturated glacial till/boulder clay and occurs in most of the suggested buried creek channels.

The seismic-calculated depths to bedrock vary from 18 meters along the line length from geophone 16 to 21, to 78 meters below geophone 25. However, the average depth from geophones 1 to 21 is about 20 meters after which is a probable channel of unknown depth. And then from geophone 28 to the west end of the line, the average depth deepens to about 50 meters.

The seismic interpretation along SL-F has indicated four possible channels described as follows:

1. The most probable channel is centered at geophone 25. It is a slow zone within the bedrock in which the velocity is 2400 m/s. This is a typical velocity for channel in-fill material and is likely a boulder till as indicated in the table above. The horizontal width is about 80 meters. It should be considered that the velocity could also be that of a low velocity rock-type or a fault zone rather than channel in-fill.

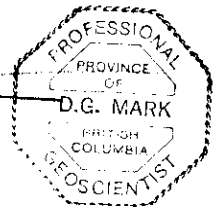
2. The second most probable channel is centered at about geophone 57. It has a slow zone velocity of 2300 m/s which, if it is a channel, the in-fill material is probably a boulder till and the horizontal channel width is about 30 meters. Like the above, the slow zone velocity could be due to a low velocity rock or a fault zone, but the most probable cause is channel in-fill.

3. Centered at geophone 36 is a bedrock depression that could be due to a buried channel. The seismic-calculated depth to the bottom of the depression is 78 meters and that from the east rim to the bottom is 20 meters. However, if the depression is a channel, the depth to the bottom is likely deeper because of the probable occurrence of a velocity inversion layer. It is well known in this area that in the buried creek channels, high velocity boulder clays are underlain by lower velocity gravels. This will result in seismically-calculated depths within channels to be deeper than they actually are.

4. Between geophones 47 and 48 is a velocity slow zone within the bedrock in which the velocity is not known. As mentioned above, slow zones can be faults and/or steep-sided buried channels. In this case, the causative source is considered to be more likely a fault. If it is a channel, the rim to rim width would be less than 15 meters.

Possible channel 1., 2., and 4. in the above description were delineated as slow zones within the bedrock. As such, the depths to the bottoms cannot be determined by the seismic method since the channels are steep-sided, that is, the channel sides have slopes greater than 45°. The result is that the first arrivals from the blast are from the channel rims rather than from the bottom of the channels.

Respectfully submitted,
Geotronics Surveys Ltd.



David G. Mark, P.Geo.,
Geophysicist

July, 1997

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REFERENCES

Armstrong, J.E., Fort St. James Map Area - Cassiar and Coast Districts, British Columbia. Geological Survey of Canada, Memoir 252, 1965.

Mark, David G., Geophysical Report on a Seismic Refraction Survey on The Slate Creek Pass Placer Leases, Manson Creek Area, Omineca Mining Division, British Columbia, December 11, 1993.

Mark, David G., Geophysical Report on a Seismic Refraction Survey on The Slate Creek Placer Claim Group, Manson Creek Area, Omineca Mining Division, British Columbia, December 21, 1993.

Mark, David G., Geophysical Report on a Seismic Refraction Survey on The Jackfish Creek Placer Leases, Manson Creek Area, Omineca Mining Division, British Columbia, December 22, 1993.

Mark, David G., Geophysical Report on a Seismic Refraction Survey on The Wolverine Placer Gold Property, Manson Creek Area, Omineca Mining Division, British Columbia, February 1997.

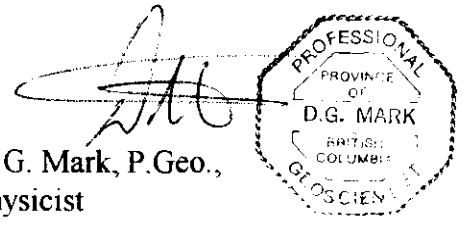
GEOPHYSICIST'S CERTIFICATE

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 during the period of December 9 to 13, 1996.
5. I do not hold any interest in the placer property discussed within this report, nor in any other properties Willem Kleinhout 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

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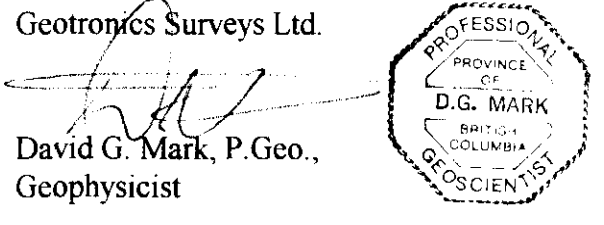
AFFIDAVIT OF EXPENSES

A seismic refraction survey along with line cutting was carried out over a portion of the Wolf Placer Gold Property which occurs on Goodasany Creek, located 11 km N70°W (290°E) of the village of Manson Creek, from December 9 to 13, 1996, to the value of the following:

Mob-demob (Share)		
Wages	$2,300.00	
Truck rental and gas	800.00	
Room and board	600.00	$3,700.00
Field:		
5-man crew, 3 days @ $1,350/day	4,050.00	
General Supervisor, 3 days @ $400/day	1,200.00	
Truck rental and gas, 2 trucks @ 120/day/truck for 3 days	720.00	
Ski-doo rental, 2 ski-doos @ 100/day/skidoo for 3 days	600.00	
Explosives, 2 cases @ $160/case	320.00	
Seismocaps, 35 @ $5.00/cap	175.00	
Room and Board, 3 days @ $225/day	675.00	7,740.00
Data Reduction & Report:		
Senior geophysicist, 19 hr. @ $50/hr.	950.00	
Drafting	250.00	
Geophysical technician, 30 hours @ $35/hour	1,500.00	
Printing, photocopying, compilation	150.00	2,850.00
GRAND TOTAL		**$14,290.00**

Respectfully submitted,
Geotronics Surveys Ltd.



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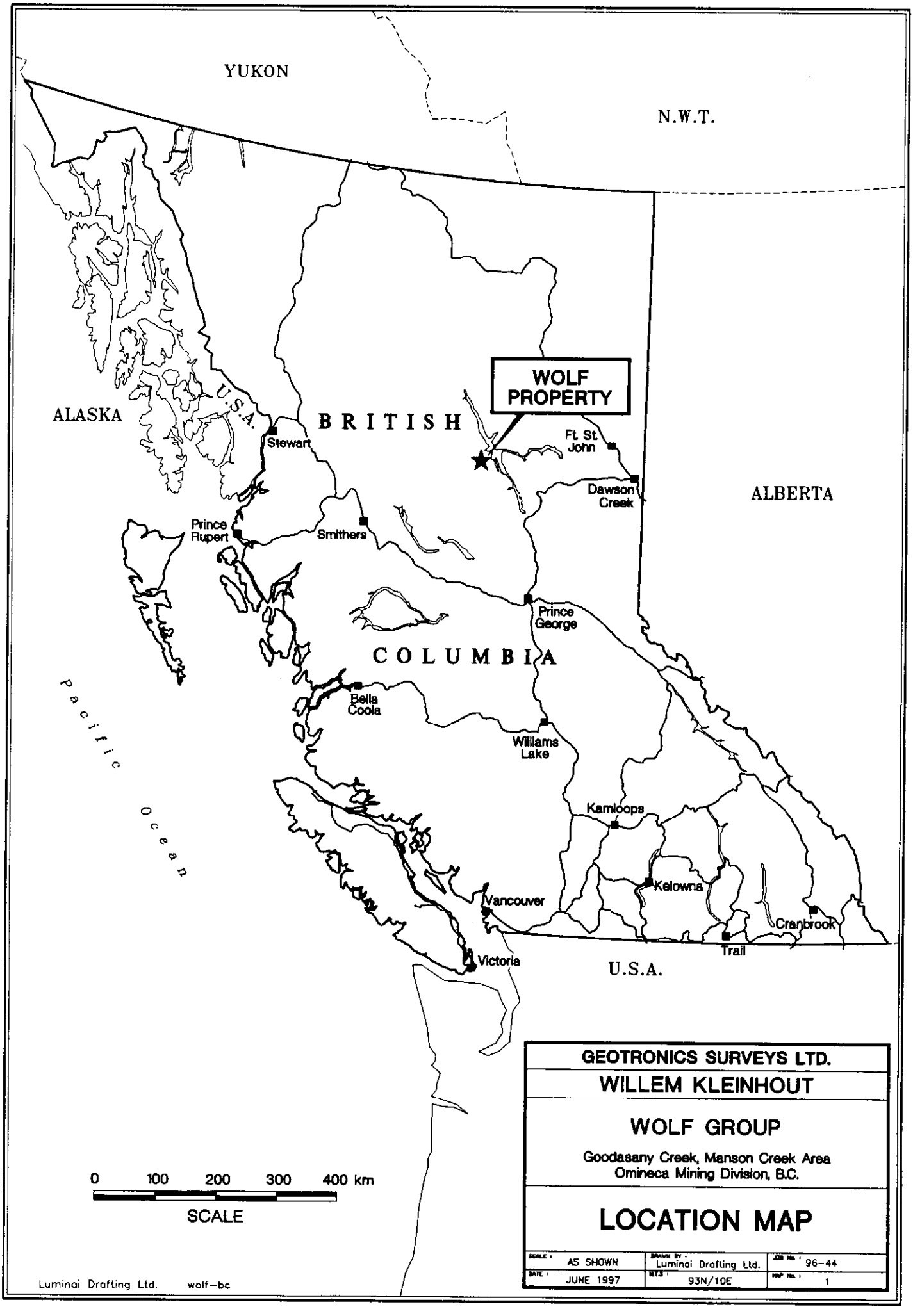
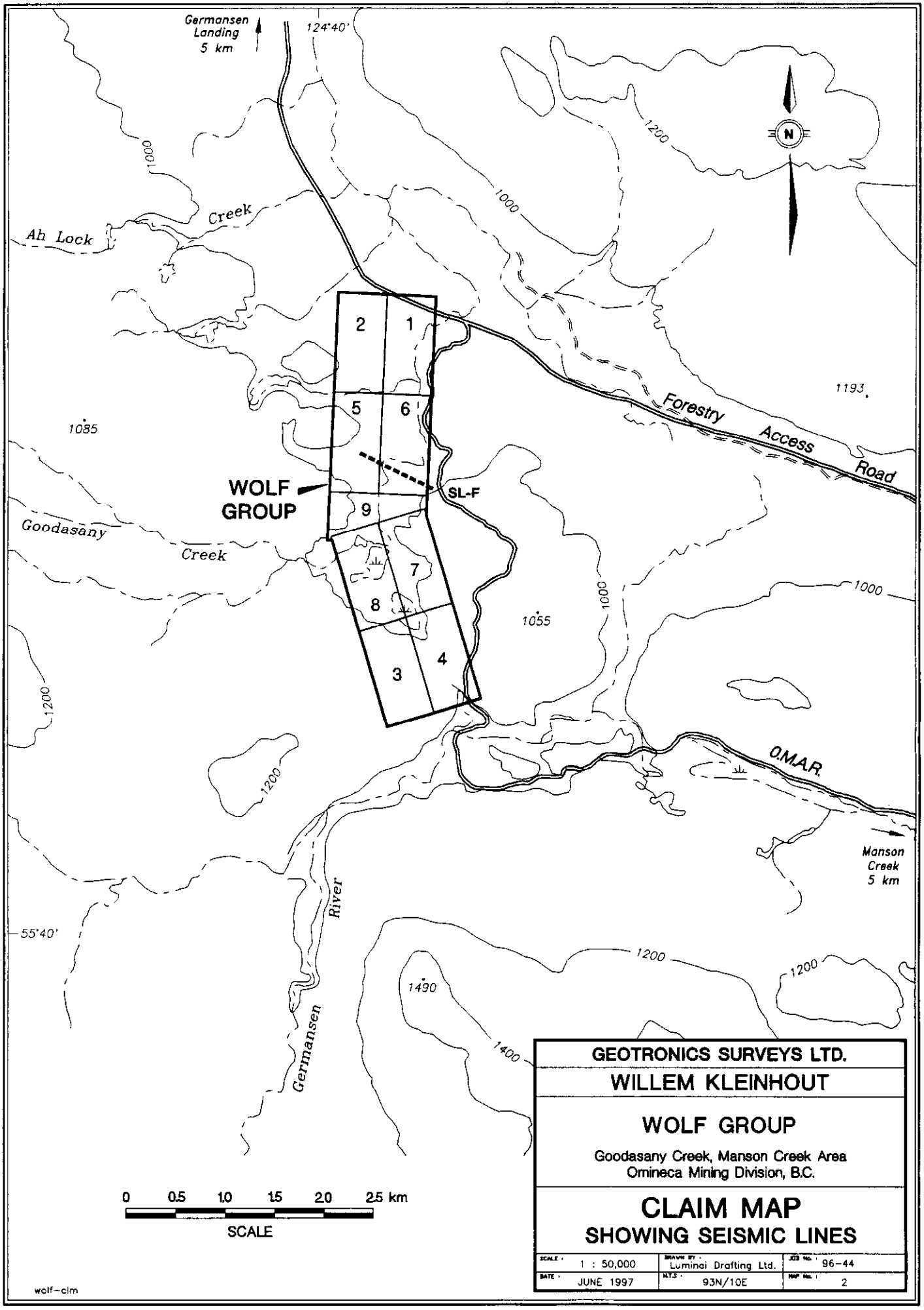


GEOTRONICS SURVEYS LTD.		
WILLEM KLEINHOUT		
WOLF GROUP Goodasany Creek, Manson Creek Area Omineca Mining Division, B.C.		
LOCATION MAP		
SCALE: AS SHOWN	DRAWN BY: Luminai Drafting Ltd.	JOB No.: 96-44
DATE: JUNE 1997	N.T.S.: 93N/10E	MAP No.: 1

Luminai Drafting Ltd. wolf-bc

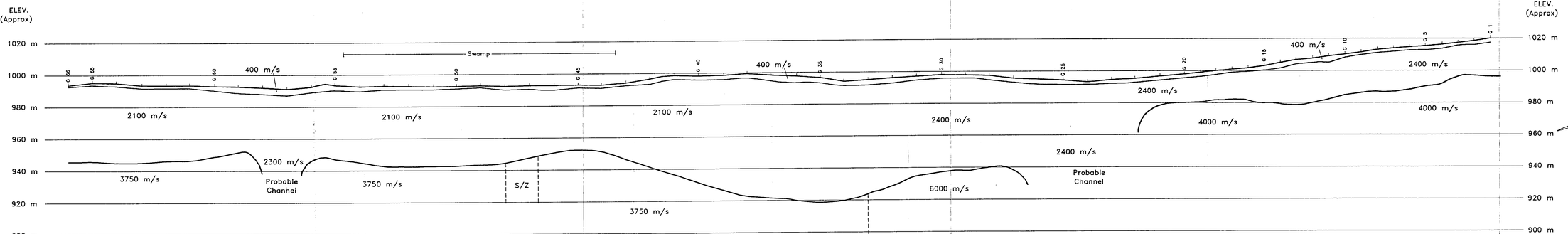

Germansen Landing 5 km
124°40'
1000
1200
Ah Lock Creek
1085
1193
Forestry Access Road
WOLF GROUP
SL-F
2
1
5
6
9
7
8
3
4
Goodasany Creek
1055
O.M.A.R.
Manson Creek 5 km
55°40'
River
1490
1400
Germansen
0 0.5 1.0 1.5 2.0 2.5 km
SCALE
N
GEOTRONICS SURVEYS LTD.
WILLEM KLEINHOUT
WOLF GROUP
Goodasany Creek, Manson Creek Area
Omineca Mining Division, B.C.
CLAIM MAP
SHOWING SEISMIC LINES
SCALE: 1 : 50,000
DRAWN BY: Luminai Drafting Ltd.
JOB No: 96-44
DATE: JUNE 1997
N.T.S.: 93N/10E
MAP No: 2
wolf-clm

SL-F

LINE DIRECTION
← 295° E

W

E



LEGEND

- G 15 — GROUND SURFACE SHOWING GEOPHONE NUMBERS
- 4000 m/s — AVERAGE SEISMIC VELOCITY (metres per second)
- INTERMEDIATE SEISMIC HORIZON (within overburden)
- SEISMIC-INTERPRETED BEDROCK (SUBSURFACE)
- S/Z — SLOW ZONE WITHIN BEDROCK INDICATIVE OF FAULT OR STEEP-SIDED BURIED CHANNEL

SUGGESTED VELOCITY CLASSIFICATION

400 metres/sec – OVERBURDEN: SURFICIAL LOOSE, DRY TILL, SANDS AND GRAVELS

2100–2400 metres/sec – OVERBURDEN: VERY COMPACT, WATER-SATURATED BOULDER CLAYS AND TILLS; POSSIBLY SANDS AND GRAVELS

3750–4000 metres/sec – BEDROCK: PROBABLY VOLCANICS

6000 metres/sec – BEDROCK: POSSIBLY LIMESTONE

PROFESSIONAL ENGINEER
D.G. MARK
GEOPHYSICIST

GEOTRONICS SURVEYS LTD.
WILLEM KLEINHOUT

WOLF GROUP
Goodasany Creek, Manson Creek Area
Omineca Mining Division, B.C.

SEISMIC REFRACTION STUDY
PROFILE SL-F

SCALE : 1 : 1,000	Drawn By : Luminai Drafting Ltd.	JOB No. : 96-44
DATE : JUNE 1997	N.T.S. : 93N/10E	MAP No. : 3