GEOPHYSICAL REPORT

ON A

SEISMIC REFRACTION SURVEY

AT

FRENCH CREEK PROPERTY

REVELSTOKE M.D.

BRITISH COLUMBIA

FRENCH CREEK PROPERTY

: 80 km NNE of Revelstoke

: 52° 118° NW

: N.T.S. 82M/9

WRITTEN FOR

: QUEENSTAKE RESOURCES LTD.

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BY

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DATED

: October 6, 1981

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Engineering & Mining Geophysicists

VANCOUVER, CANADA
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SUMMARY

Two seismic profiles were completed across the flat-bottomed French Creek Valley. Each profile comprised one spread, of up to 24 geophones.

Both spreads recorded a bedrock refractor, dipping steeply down from the valley walls, to depths of about 100 m in the middle of the valley. The overlying overburden material is probably river sands and gravels.
INTRODUCTION

This report presents the results of a seismic refraction survey carried out in the valley of French Creek, a tributary of the Goldstream River, which in turn feeds into the Columbia River, north of Revelstoke, B.C. (see Figure 1).

An 8 km long section of French Creek has been staked as the Kirk Placer Claims. The valley in this region is flat-bottomed and 400 to 600 m wide, with the creek meandering through swampy ground.

The aim of the geophysical work was to determine the bedrock profile across the valley, to assist in planning test borings and possible placer mining.

The survey was carried out on September 29th and 30th, 1981, by a crew comprising a geophysicist (the writer) and two geo-
physical technicians. Using 24-channel seismic equipment, two lines were completed across selected parts of the valley. Access was gained on a day-to-day basis by a 12 km helicopter trip, from the Noranda Mines road which branches off the Revelstoke-Mica Creek road about 85 km north of Revelstoke.

INSTRUMENTATION
Two 12-channel, Model 1210F seismographs, manufactured by Geometrics/Nimbus of Sunnyvale, California, were used on the project. The seismographs were interfaced to 30 m takeout interval geophone cables, to record the signal from 8 Hz marsh geophones made by Mark Products of Houston, Texas. The blasting was carried out with a radio shot firing system, comprising Motorola FM radios, and series 200 encoder and decoders, manufactured by Input/Output of Houston, Texas.

FIELD PROCEDURE
Although the lines were chosen to avoid the wetter parts of the valley, much of the ground traversed was waterlogged, especially along the northern line AA', where the swamp was thigh deep in places. Prior to laying out the seismic cable, the dense scrub and small trees were cleared (with chainsaws) from the drier parts of the lines. The line clearance generally took about half of each of the two survey days.

The geophone interval of 30 m was chosen such that a 24-channel spread would reach across the entire width of the valley. The last one or two geophones at each end of each spread were located up the steepening gradient of the valley wall. Shots were fired at the end of each spread and at three intermediate positions along the spread. Charge sizes ranged from 1 to
5 kg of 75% gelignite, fired with instantaneous electric detonators.

The spread locations shown on Figure 2 are approximations only, derived from sketching in the line with reference to natural features. The relative level of each geophone along line BB' was measured in the field by inclinometer, and absolute levels obtained by noting the intersection of the line with topographic contours on the 1:50,000 N.T.S. map. Lack of time prevented levelling of the geophones along line AA', so the ground profile shown on the seismic section is only an estimate.

COMPUTING METHOD

The seismic results were analyzed using an intercept-delay time technique, to compute bedrock depths beneath each geophone along the spread. Implementation of this method requires that at least two geophones (preferably a lot more) receive bedrock refractions from shots at opposite ends of the spread. When this overlap of refracted arrivals is obtained, the true rock velocity can be computed, and for each geophone a delay time is derived, representing the time taken for a shock wave to travel to the geophone from the refracting horizon.

The delay time computation procedure can be repeated for adjacent pairs of shots within each spread to compute the travel time to any intermediate seismic horizon (in the overburden). Thus the total delay-time from geophone to rockhead is split into two parts, representing travel in the two overburden materials.
With the knowledge of the propagation velocity in the materials the delay times can be converted to depths. These "depths" actually represent distances from geophone to bedrock, normal to the bedrock surface. They must therefore be plotted by swinging arcs beneath each geophone position. A smooth curve is then drawn through the envelope formed by the series of arcs.

RESULTS

The location of the seismic lines has been shown on Figure 2 and the seismic interpretation on Figure 3.

Quality of the seismic records was generally good, with the best results coming when the shot was placed beneath the water table, rather than in the drier ground up the side of the valley.

Both lines recorded a fast refractor, dipping steeply down from the valley walls to depths of about 100 m in the center of the valley. The velocity indicated for most of the overburden is about 1.6 km/sec. This implies saturated, unconsolidated material such as sands and gravels, but not glacial deposits such as stiff till, which typically has a velocity of 2.0 to 2.2 km/sec. A thin layer of slower, partly-saturated overburden is apparently present when the ground rises out of the valley floor. A slow top layer was also recorded over part of the marshy ground along line AA'. This is probably
caused by the presence of organic material and gas which reduces the seismic velocity below that of the water (1.5 km/sec).

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

J.M. Anderson,
Geophysicist

October 6, 1981
RESUMÉ

NAME: James M. Anderson
DATE OF BIRTH: March 4, 1947
NATIONALITY: Australian

EDUCATION
B.Ec. (Economics and Accounting) University of Tasmania
B.Sc. (Physics, Geology and Geophysics) University of Tasmania

EMPLOYMENT RECORD:
Director, Electronic and Geophysical Services Ltd., U.K. 1974-81.

TECHNIQUES USED:
Marine seismic reflection profiling, land, marine and airborne magnetics, electrical resistivity, gravity, induced polarization, electromagnetics, airborne spectrometry, side-scan sonar, current metering, float tracking, dye tracing, bathymetry, soil geochemistry.

PROJECTS:
Land site investigations for dams, roads, bridges, tunnels and buildings.
Marine site investigations for pipelines, dredging, reclamation, ports, harbours, bridges and tunnels.
Exploration for base metals and uranium.
Hydrogeological studies for water supplies.

COUNTRIES WORKED IN:
Australia, Great Britain, Eire, Belgium, Italy, Libya, Nigeria, Somalia, Saudi Arabia, Oman, Hong Kong and Canada.
FIG. 1
GEOTRONICS SURVEYS LTD.
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FRENCH CREEK SEISMIC SURVEY
LOCATION MAP

PROPERTY LOCATION
PLAN OF SEISMIC PROFILES

GEOTRONICS SURVEYS LTD.
QUEENSTAKE RESOURCES LTD.
FRENCH CREEK SEISMIC SURVEY
REVELSTOE, B.C., B.C.

LEGEND

A - A
Seismic Profile

Topographic Contours (feet)

To accompany report by J. M. Anderson, geophysicist.
October 26, 1981

TO: French Creek Placers Ltd.  

RE: Progress Billing for costs incurred on French Creek Joint Venture

1) Property examination:
   a) J. Lusney  $ 536.74
   b) G. Gutrath  484.11  $ 1,020.85

2) Seismic Survey:
   a) Geotronics
      Interim  $4,625.00
      Final    3,713.49  $ 8,338.49
   b) Okanagan Helicopters
      Sept. 10/81  $ 843.30
      Oct. 2/81  749.60
      Oct. 16/81  3,930.90  $ 5,523.80
   c) G. Gutrath
      Fees & Travel  $ 368.00

3) Management Fee pursuant to Article 2.1(b)(vii) of the Joint Venture Agreement - 10% of direct costs incurred:

   $ 1,525.11

INVOICE TOTAL  $16,776.25

Queenstake Resources Ltd. share of invoice total =  $8,388.12

French Creek Placers Ltd. share of invoice total =  $8,388.13

Balance due upon receipt of invoice