REFRACTION SEISMIC SURVEY

CHAGVAN PLATINUM PROSPECT

by: James R. Wylie

INTRODUCTION

Attached is a Basement Subsea Structure map and a Profile Cross section consisting of 6 profiles compiled from a seismic survey ran is September-October 1968 on the Chagvan Platinum Prospect. Purpose of the survey was to define and trace the Salmon River Bench Channel thought to have been encountered during the 1967 season drill program.

Chagvan Bay is located approximately 500 air miles southwest of Anchorage along the Kuskokwim Bay coast, approximately 20 miles south of the townsite of Platinum.

Four men, using a Geospace portable seismograph, completed the 6 profiles having a total length of 27390', including 26 shotpoints, 56 shots, 21 spreads, and having 664 geophone pickup locations. The survey was operated by Alaskan Geophysical for Wylie Associates.

SEISMOGRAPH

The Geospace GT-2B Portable Refraction System was used for the survey. Weighing 32 pounds, the 12 channel unit is highly portable and a Polaroid camera is used to record the timing data on Polaroid Type 47 film (3 3/4" x 2 7/8") 3000 ASA speed. Timing lines of 1 millisecond can be spaced using a .2 .3 or .4 second instrument speed. The unit is powered by a 12 volt, 6 amp/hour rechargeable battery pack.

A self contained, 90 volt capacitor type blaster is included in the instrument. Many of the shots were made using 5 pounds of dynamite. The last few shots used 6 pounds which were detonated by an electric blasting cap.

Geospace's X-2 land geophones, each having a dual coil and a spike base were used. Three double ending cables, 1320' long and having 13 outlets (12 used each time) at 110' spacing were used. Complete double coverage was obtainable using these cables.

PERSONNEL

Four men were required for the survey. The supervisor doubled as surveyor and powder handler. The observer (Alaskan Geophysical consultant) doubled as the jug handler, recorder, shooter and wasthe technical head of the crew. Two helpers dug the shot and geophone

holes, assisted the surveyor and were cable handlers. The two helpers were local Eskimos hired at Platinum.

MANNER OF DOING WORK

Each profile was surveyed using a transit and tape. Shot holes and geophone locations were flagged after determining location and elevation. Three foot holes were hand dug for shot holes which were filled with the powder charge and then carefully tamped. A 1' hole was dug for each geophone. The 1320' spread cable was laid out and the 12 geophones planted in the holes below the tundra and marsh. All pickups, the cap, and the instrument were tested and then the detonation and recording made. Following the shot, the end geophone was reversed and the spread was then shot from the other end.

INTERPRETATION

Following completion of the field work, the data was inspected and reviewed by Alaskan Geophysical interpreters. Final interpretation and compilation was completed by the writer. First arrivals were in most cases, quite clear and sharp. One difficulty encountered was the faint timing lines. These probably could be brightened in future surveys.

Observed bedrock velocities were much higher than anticipated being in the 20,000'/second to 30,000'/second range. cause of these velocities is not known, however it is understood that high velocities have been observed previously in similiar circumstances.
The seismic data correlates rather well with the available well data. Drill holes #8, #13, and #15 correspond accurately with the seismic. Drill hole #14 appears accurate on profile #1 but too deep on profile #5. The contour map suggests a tight knoll in this area which may account for an interpretation difficulty. Drill Hole #12 is 20' shallower than the seismic. It may be that the seismic tends to accentuate the dips or channel areas which may not be as deep as they appear.

CONCLUSION

The seismic survey appears to have traced the Salmon River Bench Channel from the Goodnews Bay Mining Company claims to the 1967 drill hole profile. The apparent channel broadens as expected before making an abropt right angle westerly turn where it narrows considerably before crossing the drill profile. An additional shallower channel lies west of the main channel. The strong bedrock high on Salmon Hill was confirmed and of special interest is the prominent high area in the east lagoon area. It is thought that this survey achieved the objective by locating and tracing the ancient Salmon River Bench Channel, and that it can be used as a guide for future core hole testing.

JRW/nc

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Southwest
Pressure 9
Southeast
East
Pressure 12
West
South
Pressure 15
Pressure 18