MAR 19680009: BOUNDARY LAKE

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GEOLOGICAL REPORT
ON
BOUNDARY LAKE SILVER PROSPECT
ALBERTA

PREPARED FOR
McGREGOR TELEPHONE AND POWER CONSTRUCTION CO.

BY:

Orhan Baykal, P. Eng. P. Geol.
INTRODUCTION:

This report outlines the geology of the Boundary Lake area, with particular emphasis to Township 86 Range 13 W6.

The purpose of this study was to investigate the occurrence of silver in the cores of the Pan-Am 10E A-3 Willow 11-35 well, located in Lsd. 11-35-86-13 W6 Meridian, and to relate this occurrence to the geology, structural pattern and tectonic framework of the area.

RECOMMENDATIONS:

The presence of silver at a depth of about 3900 ft. in the Pan-Am #11-35 well (86-13 W6), suggest a possible zone of mineralization along the Boundary Lake fault. The extent and the quality of mineralization should be ascertained by investigating either the trace of the fault or by studying the mineralization that may have taken place in wells cut by the fault in the Boundary Lake field.

The investigation of the fault trace could be done by geochemical and/or by drilling shallow test holes (200-300 ft. deep) in the vicinity of the fault zone. In addition to the above work a geomagnetic survey which will outline and define the fault trace can be recommended.
In order to ascertain the extent of mineralization that may be associated with this fault, it may also prove useful to study the wells that have been cut by this fault in the Boundary Lake field.

**GEOLOGY:**

The description of the full stratigraphic section of the area is beyond the scope of this study. However, the formation pertaining to the silver occurrence will be outlined.

The Gething formation where the silver occurs, is 110 to 116 feet thick and is composed of interbedded sandstone and shale. (Figure 2). The shale is dark grey and silty and the sandstone is brownish-grey, medium to fine-grained, silty and argillaceous. The sandstone is composed of sub-angular quartz grains inbedded in quartzitic matrix.

This section was cored between 3880 and 3920 for a total of 40 feet. The cores were examined, and out of a cut length of 40 feet only a maximum of 20 feet of core were present in four 2½ feet long core-boxes.

The following is a brief description of the cores:

**Box #1 - 3880-3890, 30% recovery:**

- 3880-85: Shale, black, silty, carbonaceous.
- 3885-90: Sandstone, (only one foot was present), greyish, fine to medium grained, argillaceous, slightly oil stained. Fractures
filled with dried hydrocarbons. Very fine mineralization consisting of pyrite and possibly silver.

**Box # 2- 3890-3900, 50% recovery:**

3890-92: Shale, dark grey, silty, carbonaceous.

3892-93: Sandstone, greyish to brownish-grey, medium grained, grading to silty shale. Poor to fair porosity. Very fine mineralization.

3893-95: Sandstone, dark grey, fine grained carbonaceous, argillaceous, with some dried hydrocarbon residue present in fractures. The sandstone grades into silty dark grey carbonaceous shale. Mineralization consists of very finely disseminated silver that occurs also in clusters.

3895-3900: Shale, dark grey to black, conchoidal fractures.

**Box # 3- 3900-3910, 50% recovery:**

3900-03: Shale, dark grey to black, conchoidal fracture.

3903-10: Sandstone, brownish-grey, medium-grained consisting of sub-angular quartz grains, slightly argillaceous and oil stained, grades into poorly consolidated, easily crumbled rock. Porosity, medium to fair. Trace of very fine mineralization disseminated through the rock.
Box # 4- 3910-3920, 40% recovery-Fernie:

3910-17: Shale, dark brown, finely laminated and very heavily slickensided.

3917-20: Siltstone, grey, medium grained, with thin dried hydrocarbon residue injected along bedding plane. Very finely disseminated mineralization.

According to the core, the top of the Fernie can be placed 3910 feet. According to "E" log the top is at 3905 feet. Consequently there is a five foot difference between log and core.

On the basis of slickensides, the fault occurs either in the uppermost part of the Fernie formation or in the lower part of the Gething formation. Considering the cores and "E" log correlation the fault is thought to cut this well at a depth of 3904 feet. (Figure 2).

STRUCTURAL GEOLOGY:

To depict and trace the faults that are present in this area, the Triassic Baldonnel formation (found about 200 feet below the Fernie formation) was used and structural contour lines were drawn on top of this horizon. (Figure 1).

In order to have a clear conception of the fault trace, the Boundary Lake field was studied and the fault line drawn
through it in accordance with well date. Furthermore, the
logs of all wells in Township 86-13 W6 have been studied,
compared and the formational tops recorded in Figure 3.

Two major normal faults appear to be present
in this area. The Northern fault, called the Worsley
fault, extends in an East-Northeasterly direction and
has a throw of about 50 feet, and dips 60-70° to the
North. (Figure 1). The second fault, the Boundary Lake
fault, cuts across the Boundary Lake field and extends
through Township 86 Range 13 W6, in a Northeasterly
direction, and dips 60-70° to the Northwest. The throw
of this normal fault varies along the strike. In the
Southwestern portion of the map-area (figure 1); the
throw is almost 100 feet. However, in the Southwestern
corner of Township 86 Range 13 W6, the throw is about 30 to
40 feet and in the vicinity of the Pan-Am 11-35 well (86-13
W6) the throw is approximately 50 feet. Along this fault, the
downthrown block is Northwest of the fault line.

This fault cuts both the Pan-Am 11-35 and 6-27
(86-13 W6) wells. In the Pan-Am 11-35 well, where the basal
portion of the Gething appears to be missing. The fault
cuts the well at a depth of about 3904 feet just above the
Fernie, and at the base of the Gething formation causing
this formation to have a shortened section (figure 3) by
about 30 feet. In the Pan-Am 6-27 well, the fault appears
to occur within the Notikewin Formation. The fault has shortened this section by about 23 feet. (Figure 3).

**ECONOMIC GEOLOGY:**

Mineralization consisting of very finely disseminated silver and pyrite can be seen in the cores of the Pan-Am #11-35 well. This mineralization is directly related to the fault which occurs in this well at a depth of about 3904 feet.

The faults present in this area appear to be deep seated, probably cutting the basement. The mineralized solutions have moved along these fracture planes causing deposition of minerals along the faults. Consequently, in the Pan-Am #11-35 well, the unfaulted section above the Gething has little possibility of being mineralized.

With a dip of about 60° to 70° to the northwest the surface trace of the fault can be expected to occur approximately 1500 to 2300 feet southeast of the well. If this venture is to be pursued further it may be advantageous to attempt to locate the fault trace and test for mineralization.

**SUMMARY AND CONCLUSION:**

Mineralization has been encountered in the core of the Pan-Am #11-35 well located in 11-35-86-13 W6. This mineralization consists mostly of silver with minor amount of pyrite.
The mineralization is related to faulting and it is thought that the Boundary Lake fault is responsible for the mineral occurrence in the Pan-Am # 11-35 well.

The extent of mineralization along the strike and the dip of the fault is not known. This will have to be determined either by drilling or by studying the wells located along the strike of the fault in the Boundary Lake field.

Respectfully Submitted

Orhan Baykal, P. Eng., P. Geol.
FIGURE 1

LEGEND
Fault Line
Arrow pointing to direction of dip.

STRUCTURE OF THE BALDONNEL
Contour Interval: 50 Feet
Scale: 1" to 2 miles

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<th>Fm. Gething</th>
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Form 110 Geological Data Sheet.
November 8, 1968

Mr. M. Curcio  
McGregor Telephone & Power Construction Co. Ltd.,  
P.O. Box 4505,  
Edmonton, Alberta.

Re: Laboratory Report Number: C68-4202  
C68-4202-1-A (Small rock)  
C68-4202-2-A (Large rock)

Dear Sir:

As per your request, we assayed the two samples described above for silver but as you will note from the following assays they are very low.

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<th>Silver Content in oz./ton</th>
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<tr>
<td>2A (large rock)</td>
<td>&lt; 0.03</td>
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</table>

Yours truly,

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

W.M. Morrison
QUARTZ MINERAL EXPLORATION PERMIT No. 35

McGREGOR TELEPHONE & POWER
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EDMONTON, ALBERTA

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