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MEMORANDUM

TO: A. Lange

DATE: May 3, 1976

FROM: J. Roth

Best

SUBJECT: Resistivity Survey, Cove Fort

Although I was unable to complete full analysis of the resistivity survey executed by Parker Gay near Cove Fort, Utah, I would like to record the comments and tentative conclusions verbally conveyed to you in Denver.

The resistivity survey (dipole-dipole, a = 1,000', N = 3, 5, 7 and 9) appears to have been executed conscientiously. Data are generally reasonable, although inspection of actual field data cards is required to fully ascertain data quality.

The contoured overlays of the apparent resistivities completed for N = 3 & N = 7 allow ready appreciation of the lateral extent of the low resistivity zones. Similar contour plans should be prepared for N = 5 & N = 9.

Low resistivities (~10 Ω-m) are notably present in a broad zone trending NE-SW with outer near-surface boundaries approximately as interpreted by Gay. The resistivity low is abruptly terminated at the north end, most likely by an E-W fault. On Lines 12, 16 & 20 N, higher resistivities appear to overlie the central portion of the overall low. To the south, slightly higher resistivities are N = 3 (~15-20 Ω-m) overlie 10-12 Ω-m material; alluvium, increasing in thickness to the south, is interpreted as the source of this slightly more resistive upper layer.

Below the conductive zone, there is weak evidence for a more resistive horizon, probably best indicated on Line 4N.

On the basis of present evidence, the central low resistivity zone can be interpreted as a steep-sided basin. Faulting can obviously be invoked along its margins, although I doubt that the bounding faults themselves account for the resistivity pattern, as concluded by Parker Gay. This principal resistivity low is spatially associated with Tertiary volcanics designated Tmb. Conductive Quaternary alluvium can be largely eliminated as the souce of the resistivity low.

Some encouragement may be derived from the fact that the conductive zone broadens in the direction of a Quaternary cinder cone 5 kilometers to the SE.

Conversely, a hot irrigation well lying just outside the northern terminus of the conductive zone may be related to the E-W fault previously mentioned, rather than the resistivity low.

Thus a large volume of highly conductive rock has been partially outlined by the resistivity survey. Whether this resistivity anomaly is significant in terms of reflecting the presence of hot geothermal fluids awaits the determination of the local heat flow pattern.

Two other conductivity anomalies are present, although extent and significance are not decipherable.

On the NW end of Line 24N, a thick section of resistive Paleozic (?) sediments appear to overlie more conductive ($\sim 30\,\Omega$-m) material.

On the SE end of Line 8N, conductive ($\sim 10\,\Omega$-m) material is present, apparently extending further east under resistive Paleozoics.

Two principal deficiencies attend the resistivity survey as executed: absence of near-surface resistivity data; and failure to delimit the resistivity lows. These deficiencies can readily be rectified by further electrical surveys. For coherence and consistency with the data under discussion, it is recommended that the dipole-dipole resistivity technique again be employed. However, it is of paramount importance to determine first the pattern of heat flow in the area. These results will determine if additional resistivity coverage may then be usefully undertaken.

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/J. Roth.