

INTER-OFFICE MEMORANDUM

SUBJECT: Resistivity Results in the Vicinity of Cove Fort

DATE April 19, 1976

TO: R. A. Barker

cc: W. M. Dolan
H. J. Olson
J. Roth

FROM: A. L. Lange

Low apparent resistivities on the order of 20 ohmmeters and less are generally associated with geothermal brines, and in the absence of low resistivity lithologic environments, such as water-saturated evaporites, may delineate geothermal fluids at depth. Resistivity methods are best suited for mapping water-dominated systems. In contrast, dry steam appears to exhibit higher apparent resistivities, but may be surrounded or covered by a condensation halo of more conducting brines.

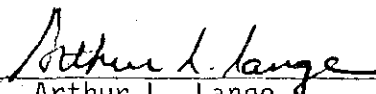
Three zones of low apparent resistivities were defined in the Cove Fort area as a result of a dipole-dipole electrical survey carried out by Applied Geophysics for Thermex Corporation in July, 1973. The extent of the survey is shown by the dashed outline on the accompanying map. Four search depths were addressed; namely, 2000, 3000, 4000, and 5000 feet (610, 914, 1220, 1524 meters, respectively), corresponding to dipole-dipole separations of twice these distances. Psuedosections were constructed from data along seven profiles oriented WNW and one tie line running at right angles.

The zones as they would appear at a search depth of 2000 feet or 610 meters are plotted on the map. Within the two western zones, apparent resistivities range between 5 and 15 ohmmeters; outside, values are seen in the 20-200 ohm-meter range or higher. The zones dip toward each other at angles of about 45°, so they appear to converge at about the 1500-meter level, forming a broad trough-like low. Resistivities decrease toward the south in an area of greater alluvial thickness. The low zone to the east is reported to be of lesser interest.

Lack of geological maps to a suitable scale prevent me from relating these zones to mapped faults at this time. I can say, in general, that the Cove Fort-Dog Valley zone is one of considerable faulting and thrusting, as born out by the high incidence of microearthquakes reported in a separate memo.

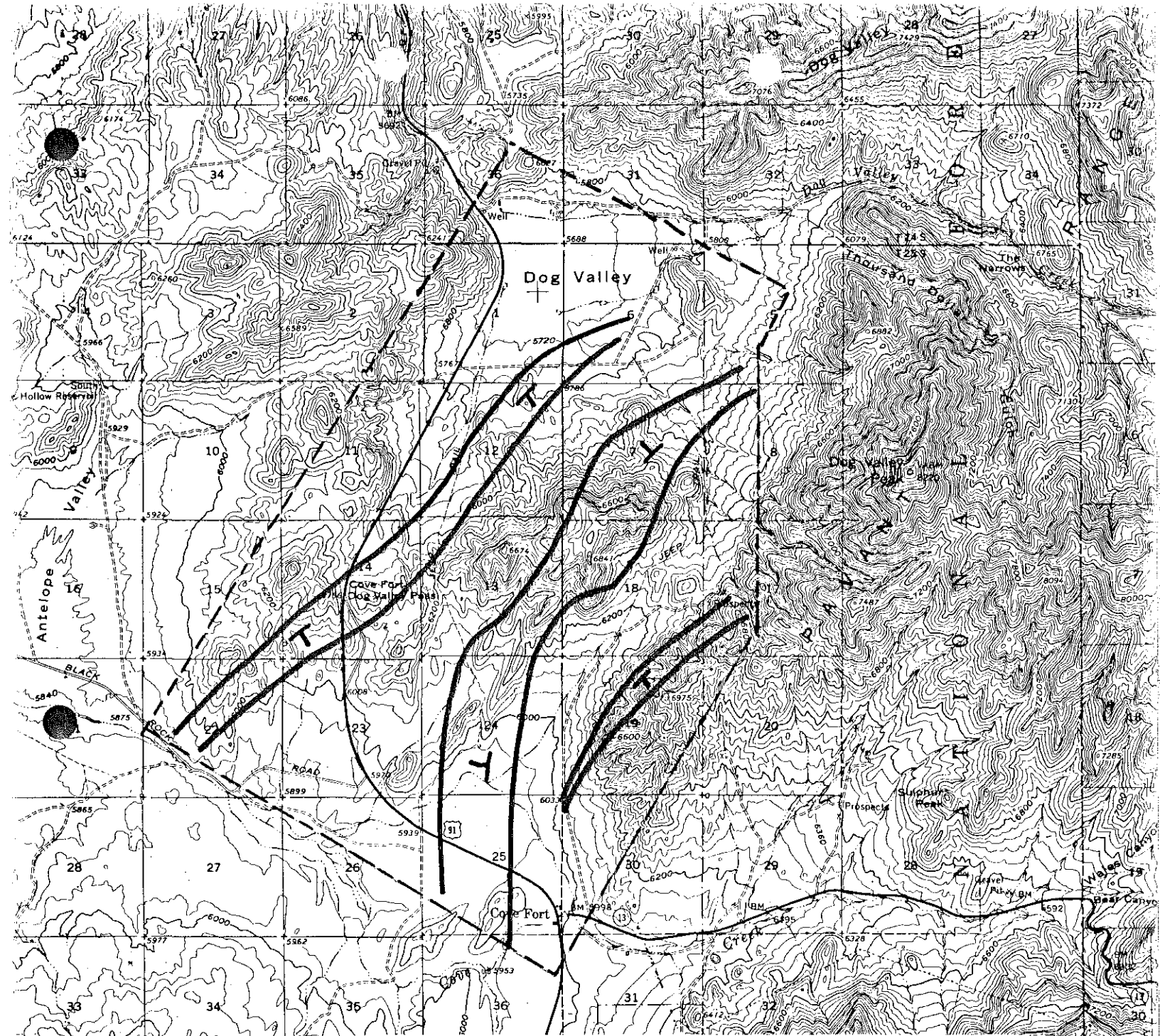
I caution, that without careful modelling of the pseudosection data, conclusions on the depth, attitude, and extent of a low resistivity zone must be regarded as tenuous; nevertheless, the evidence thus far warrants further investigation. A ratio-tellurics survey calibrated by magnetotelluric soundings at a suite of frequencies would be most desirable.

The presence of an extended low resistivity trend associated with active seismicity, sulfur deposits, emanations and recent volcanism confirms that the Cove Fort area is a very attractive geothermal target, and one of the most promising to be offered to us. I recommend our participation if the terms are suitable.



Arthur L. Lange

ALL:d
Attach.



RESISTIVITY RESULTS--COVE FORT, UTAH

Low resistivity trends mapped at 2000 ft (600m) search depth. Dips are about 45° . Zones with converging dip appear to intersect at depths of about 1200-1500m, forming a broad resistivity low. (colored).

1 5 0 1 2 3 4 5 KILOMETERS