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DIPOLE-DIPOLE RESISTIVITY SURVEY OF A PORTION OF THE COSO HOT SPRINGS KGRA, INYO COUNTY, CALIFORNIA

by

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A detailed electrical resistivity survey of 54 line-km was completed at the Coso Hot Springs KGRA on the China Lake Naval Weapons Center in eastern California in September 1977. This survey has defined a bedrock resistivity low at least 4 sq mi (10 sq km) in extent associated with the geothermal system at Coso. The boundaries of this low are generally well defined to the north and west but not as well to the south where an approximate southern limit has been determined. The bedrock resistivity low merges with an observed resistivity low over valley gravel fill east of Coso Hot Springs.

A complex horizontal and vertical resistivity structure of the surveyed area has been defined which precludes the use of layered-earth or two-demensional interpretive models for much of the surveyed area. In general the survey data indicate that a 10 to 20 ohm-meter zone extends from near surface to a depth greater than 750 meters within the interpreted boundaries of the geothermal system. Bedrock resistivity outside of the system is greater than 100 ohm-meters. The area of resistivity low corresponds reasonably well with the area of observed surface hydrothermal alteration and high heat flow. A combination of observed increases in: 1) fracture density (higher permeability), 2) alteration (higher clay content), and 3) temperatures (with higher dissolved solid content of ground water) explain the bedrock resistivity low.

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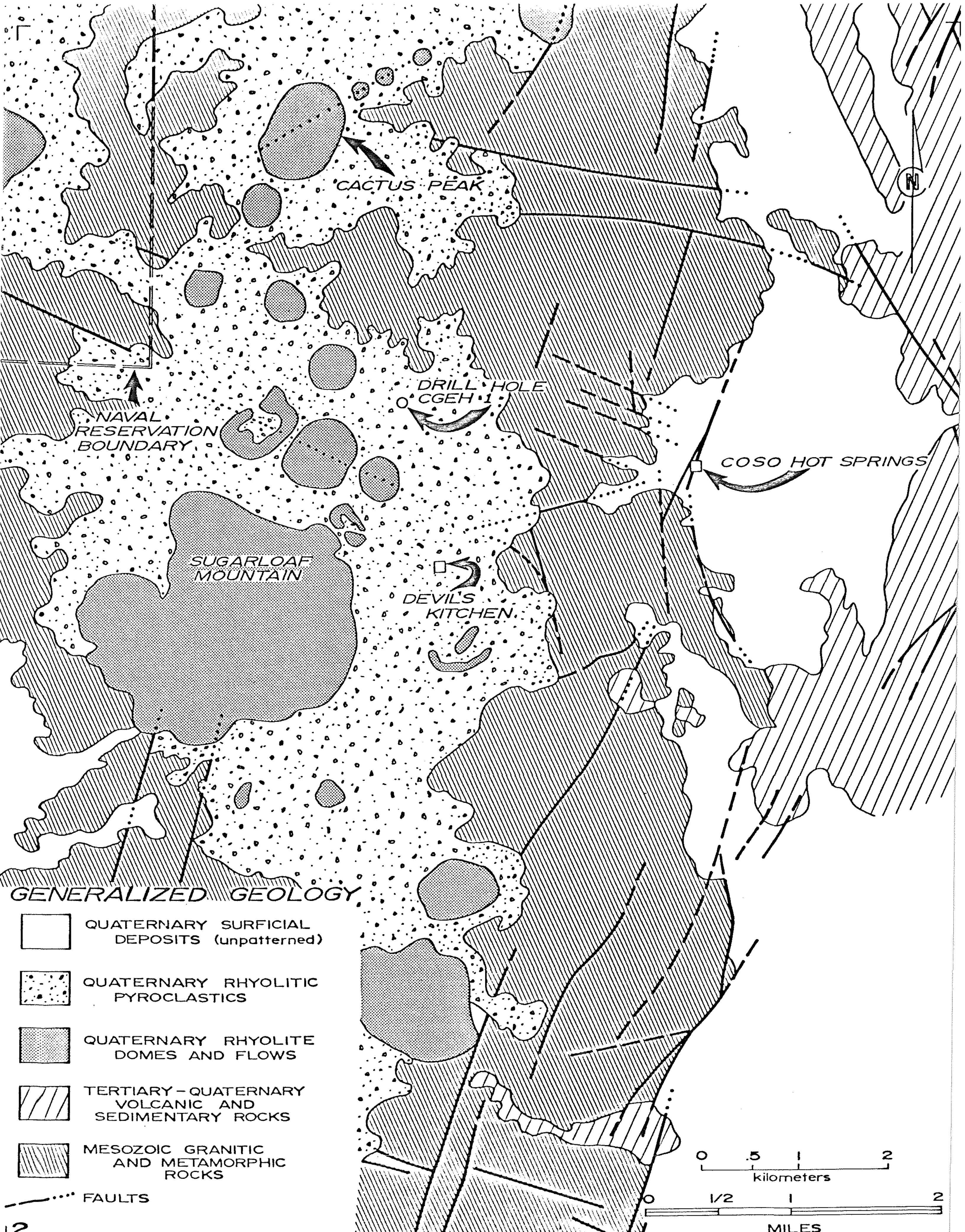
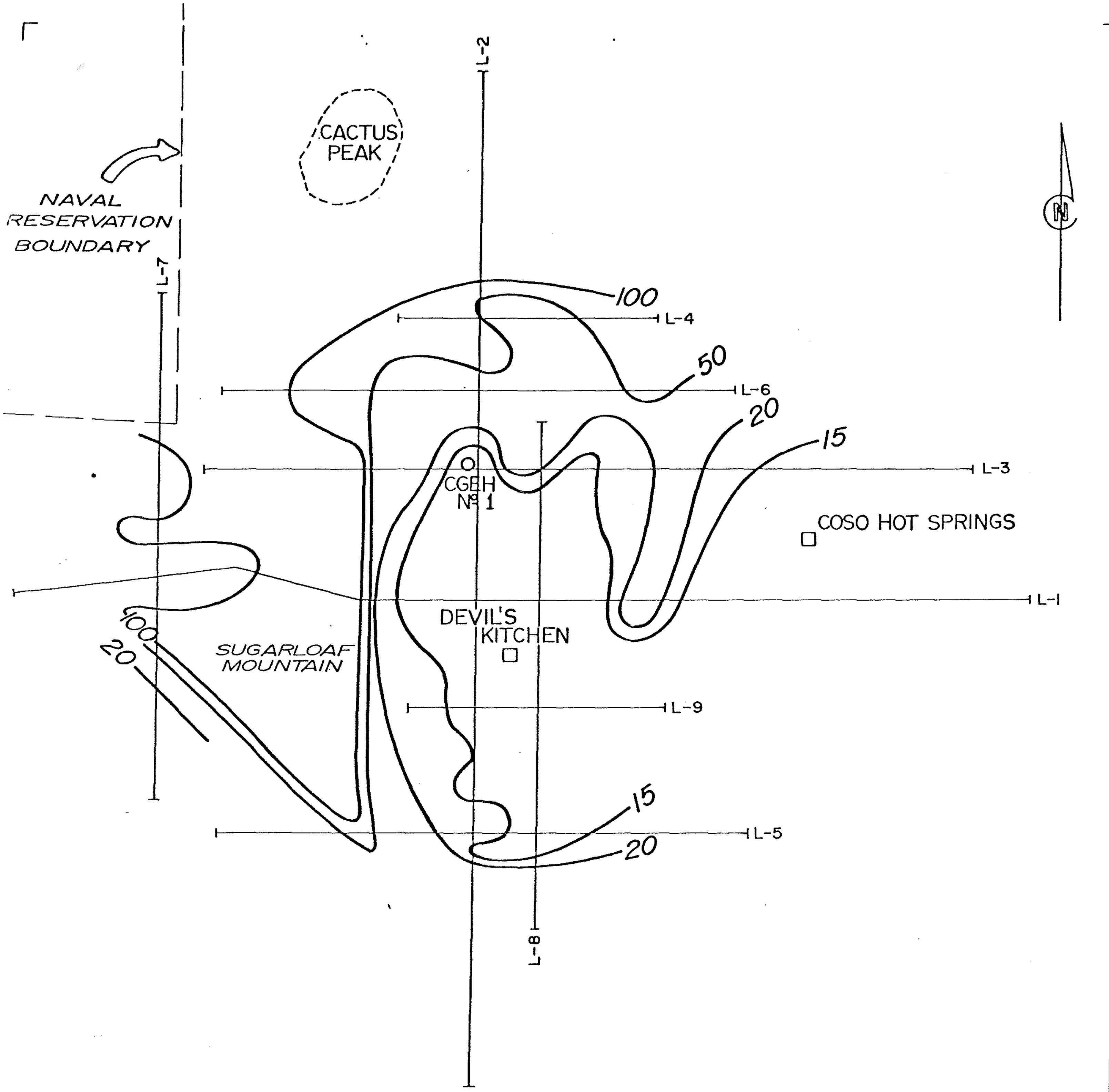
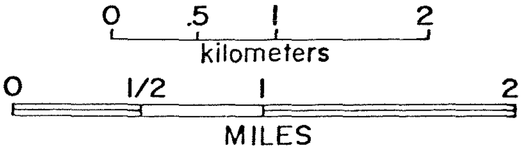
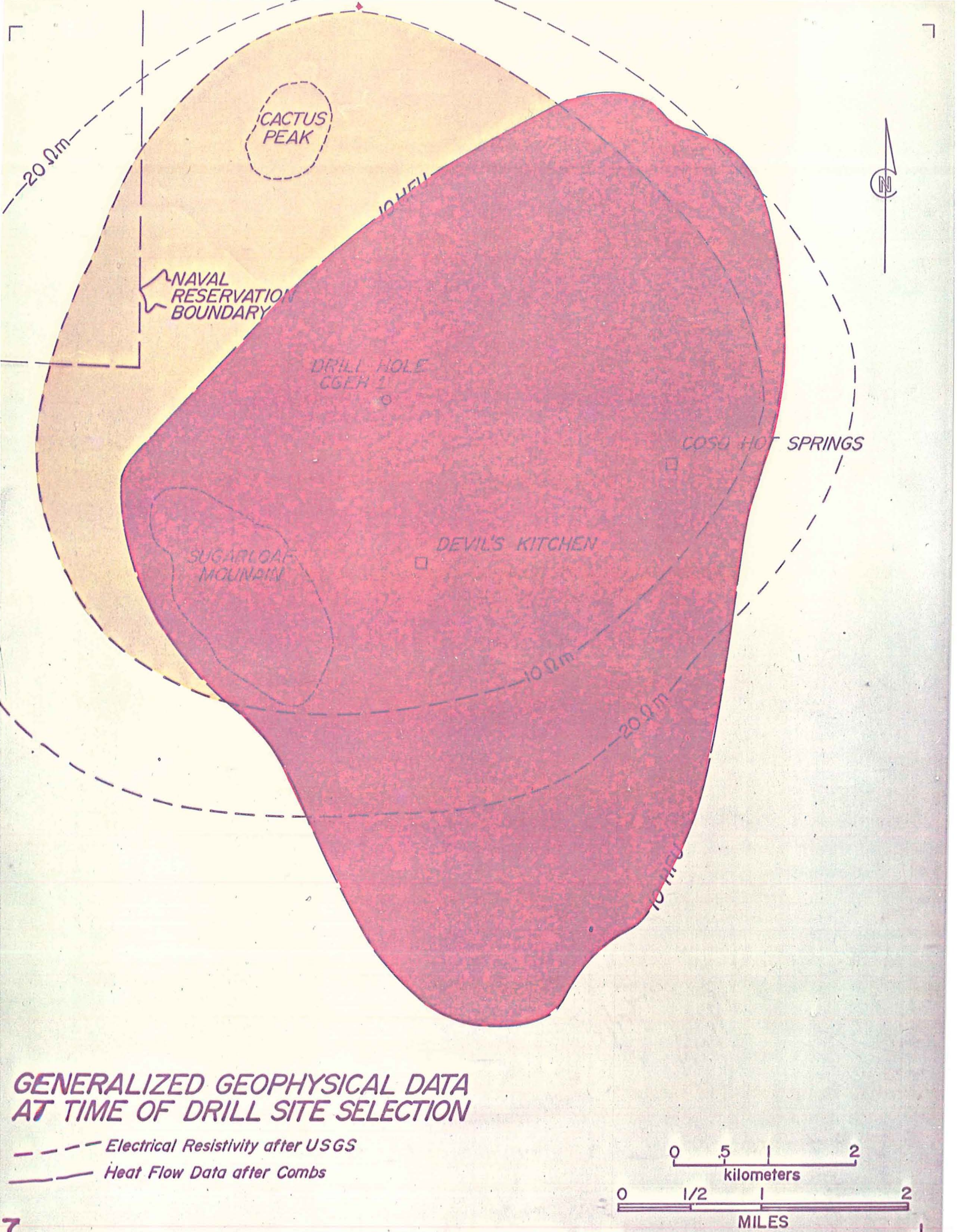

CACTUS PEAK
NAVAL RESERVATION BOUNDARY
DRILL HOLE CGEH 1
COSO HOT SPRINGS
SUGARLOAF MOUNTAIN
DEVIL'S KITCHEN
N
GENERALIZED GEOLOGY
QUATERNARY SURFICIAL DEPOSITS (unpatterned)
QUATERNARY RHYOLITIC PYROCLASTICS
QUATERNARY RHYOLITE DOMES AND FLOWS
TERTIARY - QUATERNARY VOLCANIC AND SEDIMENTARY ROCKS
MESOZOIC GRANITIC AND METAMORPHIC ROCKS
FAULTS
0 .5 1 2
kilometers
0 1/2 1 2
MILES



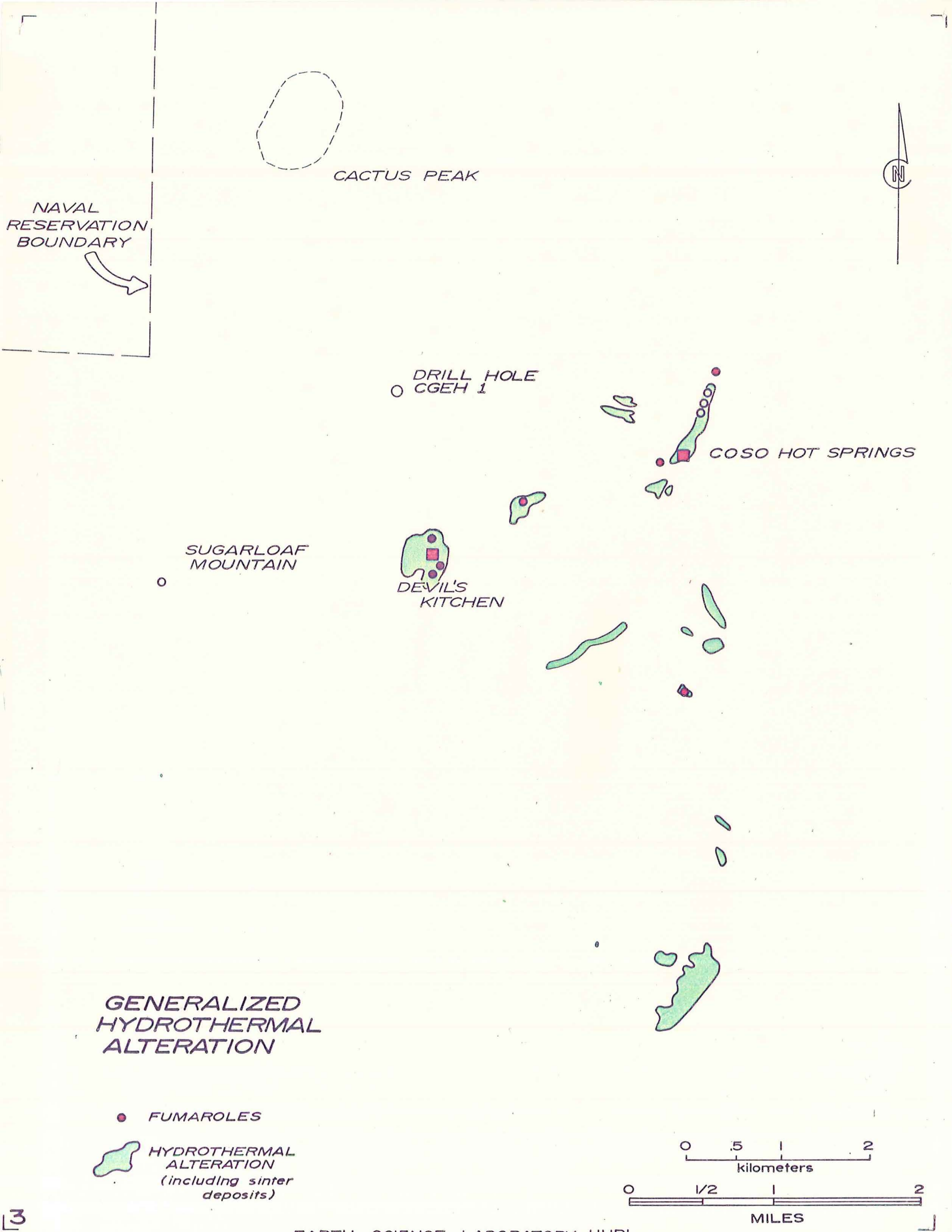
ELECTRICAL RESISTIVITY

(ohm-meters; 300 meter dipoles; n=3)





GENERALIZED GEOPHYSICAL DATA AT TIME OF DRILL SITE SELECTION

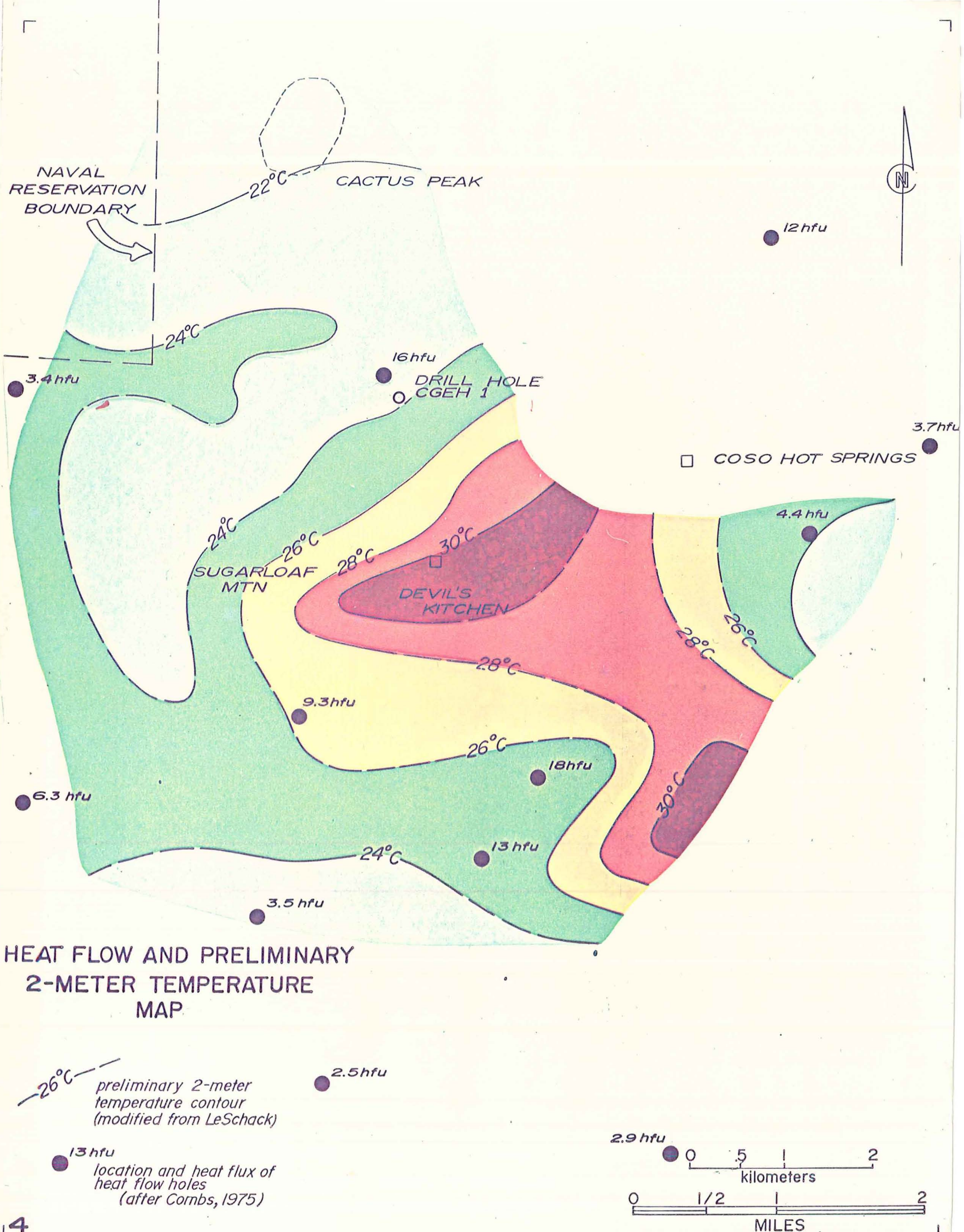


GENERALIZED HYDROTHERMAL ALTERATION

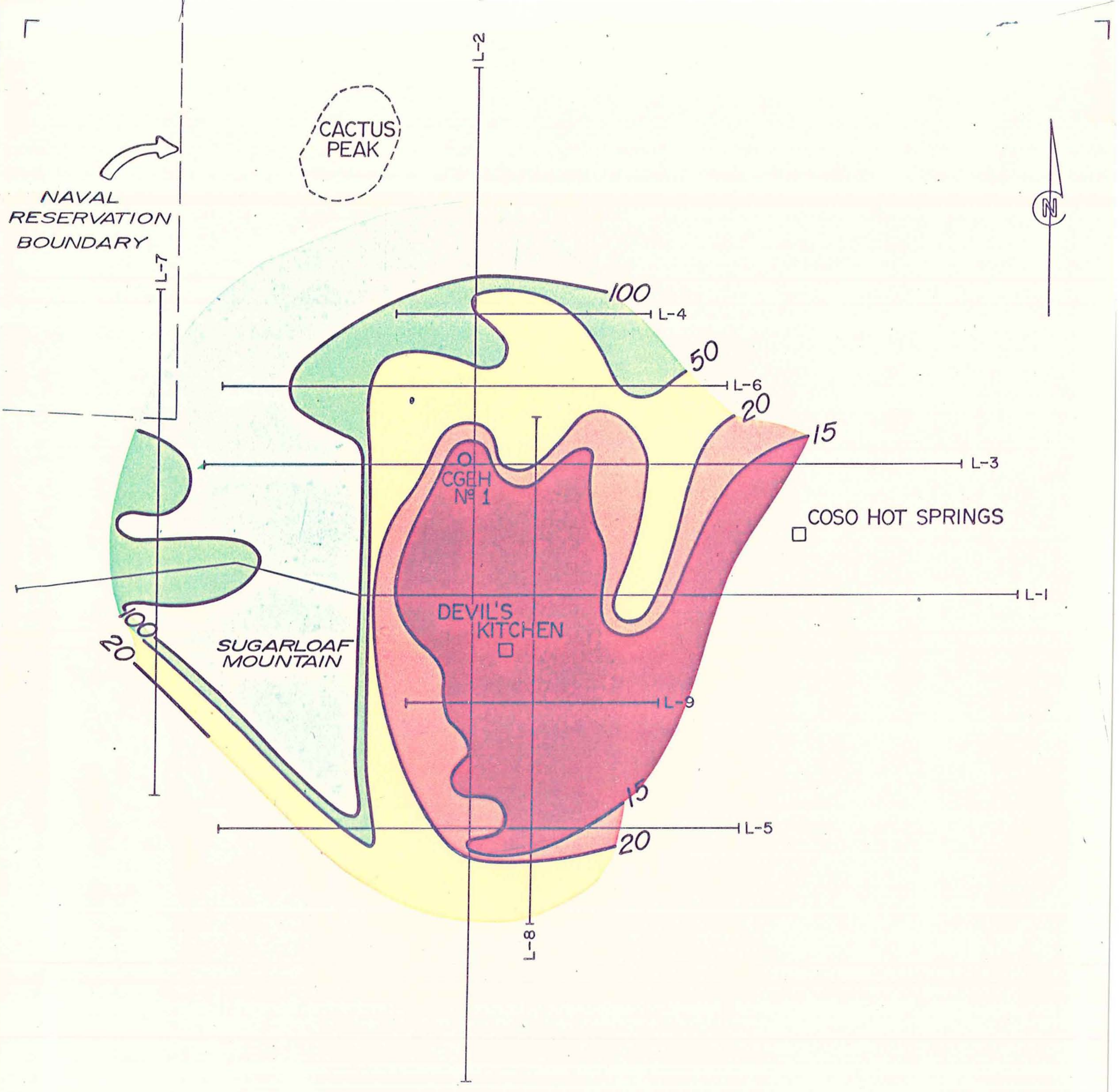
CALIFORNIA

INDEX MAP

COSO
HOT SPRINGS
KGRA

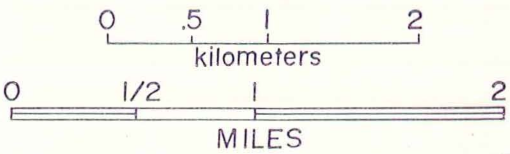


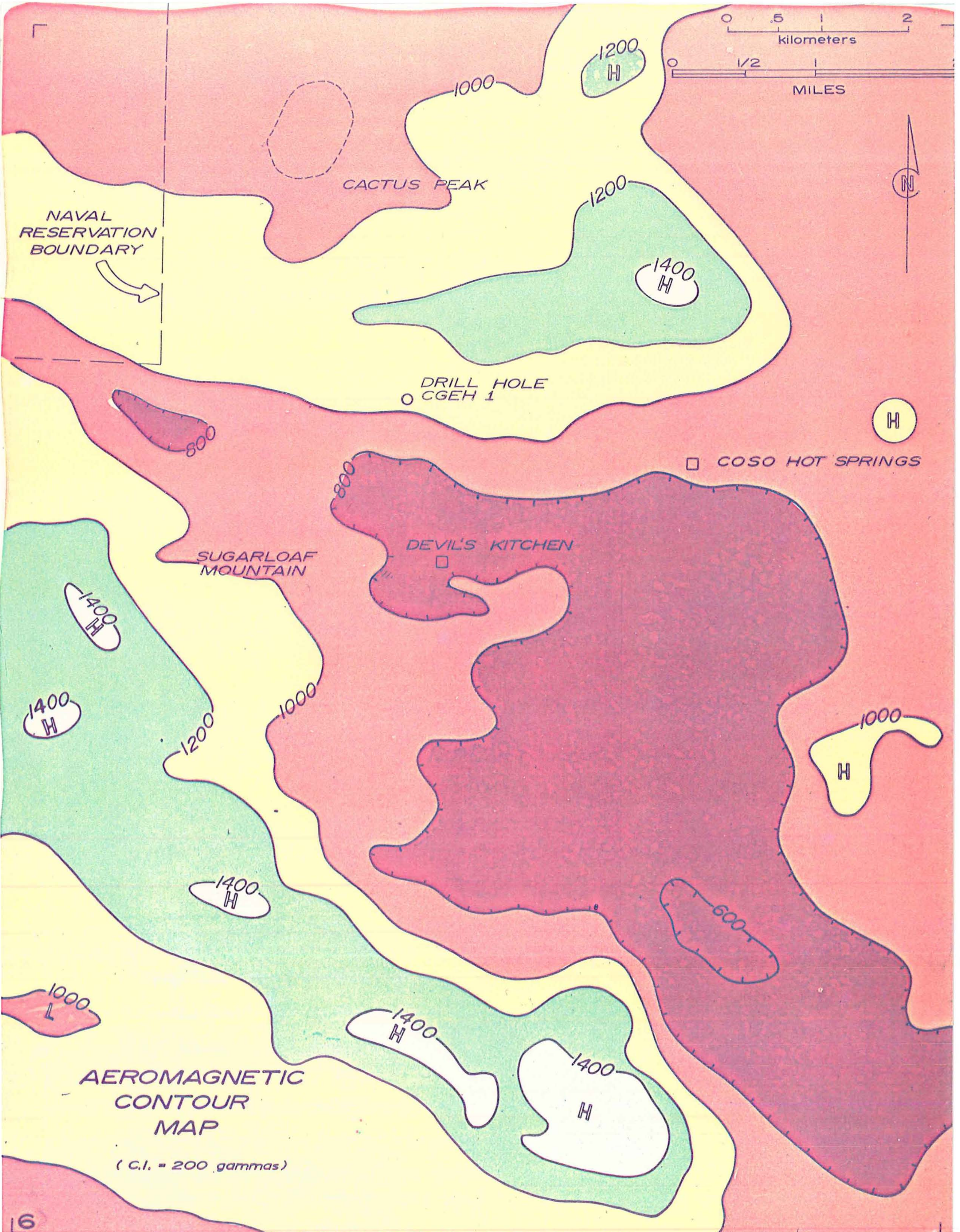
HEAT FLOW AND PRELIMINARY 2-METER TEMPERATURE MAP



ELECTRICAL RESISTIVITY

(ohm-meters; 300 meter dipoles; n=3)





AEROMAGNETIC
CONTOUR
MAP

(C.I. = 200 gammas)

that particular sample of two. This is another demonstration that the correlation must be either +1.00 or −1.00 for the case where $N = 2$ ($\cos 0^\circ = 1.00$ and $\cos 180^\circ = -1.00$).

Now N dimenstions are not needed to describe p vectors, where $p < N$. Think, for instance, of *two* test vectors in a *three*-dimensional space. The two test vectors define a plane, and only a plane is needed to describe the relationship between the two tests. The problem is to decide among the infinite sets of reference axes capable of adequately describing a particular configuration of tests. Figure 5.3 illustrates this problem by showing two of the pairs of axes which could serve as reference axes (factors) for describing the plane in which tests X and Y lie. Here axes A and B are rotated to positions C and D, respectively.

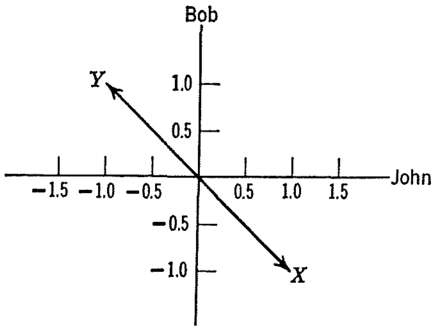


Figure 5.2.

TABLE 5.1 Standard Score Roster

Name	X	Y
John	1	−1
Bob	−1	1

Principal-components analysis defines a unique set of reference axes for a given combination of p variables using the maximum variance criterion as described. However, that procedure does not usually result in a satisfactory set of reference axes for psychological interpretation. A new set of axes is formed by rotating the derived principal-component axes. This rotation process can best be described by a fabricated example.