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# MEMORANDUM

TO: H. J. Olson DATE: May 9, 1985

FROM: H. D. Pilkington cc: John Deymonaz

SUBJECT: Hydrogeochemistry Hillsboro Thermal Gradient Wells

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Waters were encountered in all five of the shallow thermal gradient wells drilled at Hillsboro, New Mexico in 1984-85. The range averaged about 150 meters in depth. The results of the chemical analysis and the chemical geothermometers are given in Table I. The location of the wells are given on the attached map.

Attachment

HDP/srs:5569A

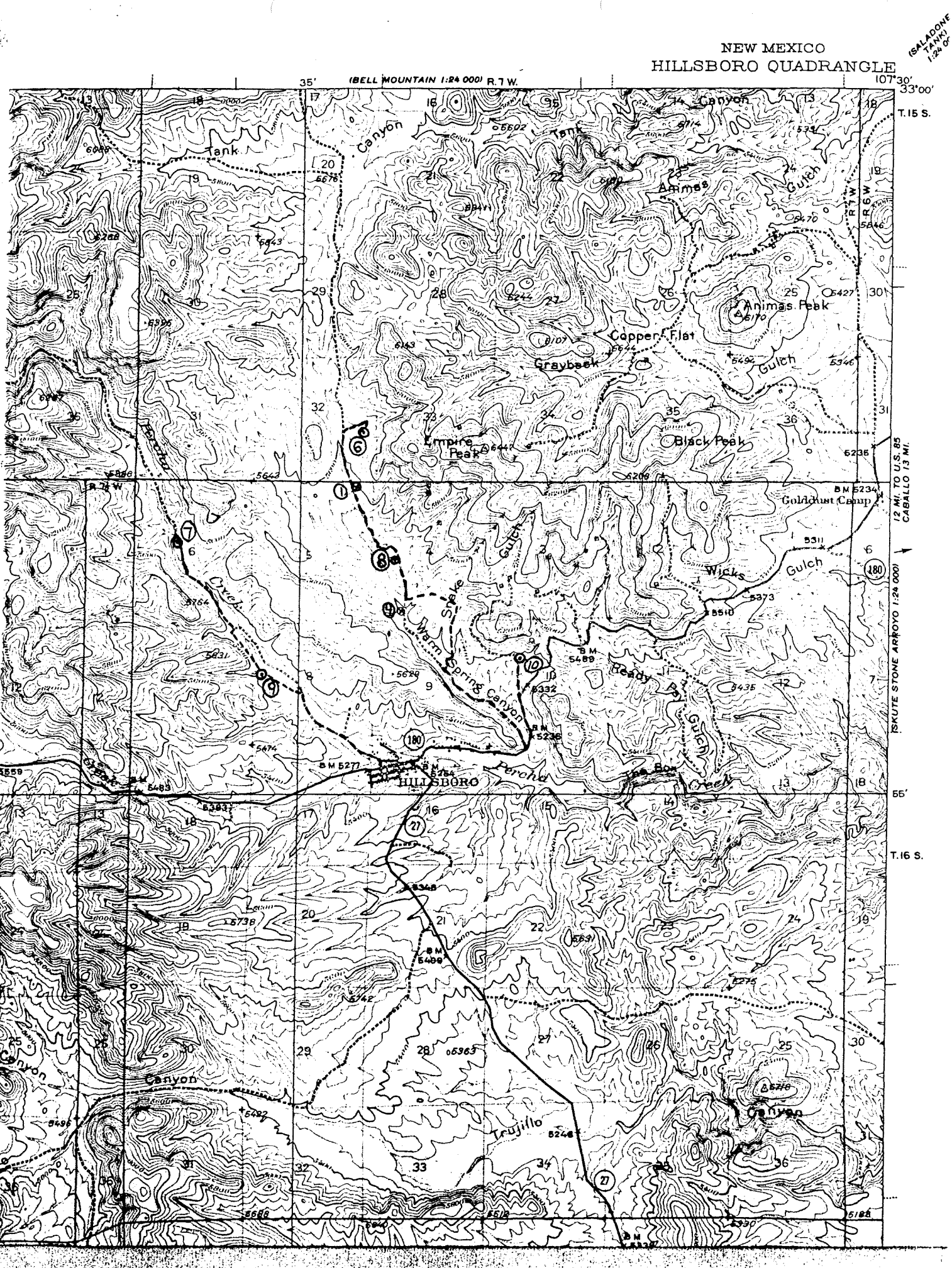
NEW MEXICO
HILLSBORO QUADRANGLE
(BELL MOUNTAIN 1:24 000)
(SALADONE TANK) 1:24 0
R. 7 W.
R. 6 W.
107°30'
33°00'
35'
55'
T. 15 S.
T. 16 S.
Canyon
Tank
Animas
Gulch
Animas Peak
Copper Flat
Graybeck
Empire Peak
Black Peak
Goldhurst Camp
Wicks Gulch
Warm Springs Canyon
Ready Pay Gulch
HILLSBORO
Percha
Creek
Trujillo
12 MI. TO U.S. 85
CABALLO 1.3 MI.
ISKUTE STONE ARROYO 1:24 000

TABLE I. CHEMICAL ANALYSIS AND CHEMICAL GEOTHERMOMETERS OF HILLSBORO WATERS

| | W14776<br>1124-6 @ 310'<br>NESESec32T155R7W | W14777<br>1124-7 @ 195'<br>SWNWSec6T16SR7W | W14778<br>1124-8 @ 136'<br>NWSWSec4T16SR7W |
|---|---|---|---|
| Temp°C | 21 | 21 | 23 |
| Flow (gpm) | 50 | 50 | 3 |
| pH | 8.1 | 8.2 | 8.4 |
| Cl | 15.0 | 6.1 | 26.0 |
| F | 1.2 | 0.5 | 5.6 |
| $SO_4$ | 93.4 | 49.0 | 139.0 |
| $HCO_3$ | 192.0 | 135.0 | 182.0 |
| $CO_3$ | 0.0 | 0.0 | 2.0 |
| $SiO_2$ | 61.1 | 51.5 | 91.9 |
| Na | 56.5 | 24.8 | 133.0 |
| K | 6.0 | 4.3 | 6.2 |
| Ca | 105.0 | 64.3 | 60.8 |
| Mg | 25.9 | 12.6 | 10.1 |
| Li | 0.1 | 0.03 | 0.2 |
| B | 0.05 | < 0.008 | 0.04 |
| TDS | 556.3 | 348.1 | 656.8 |
| Ec(k) | 585.0 | 380.0 | 740.0 |
| $TqSiO_2$ | 111 | 104 | 129 |
| $TcSiO_2$ | 82 | 73 | 105 |
| TNa-K | 222 | 269 | 159 |
| TNa-K-Ca | 44 | 36 | 63 |
| TNa/Li | 110 | 87 | 100 |
| TLi | 86 | 59 | 104 |

TABLE I. (Con't)

| | W14779<br>1124-9 @ 246'<br>NWSESec8T16SR7W | W14877<br>1124-7 @ 195'<br>SENWSec10T16SR7W |
|---|---|---|
| Temp°C | 20 | 31 |
| Flow (gpm) | 45 | 50 |
| pH | 8.4 | 8.4 |
| Cl | 5.4 | 21.0 |
| F | 1.9 | 7.1 |
| $SO_4$ | 26.7 | 93.8 |
| $HCO_3$ | 178.0 | 190.0 |
| $CO_3$ | 4.0 | 4.0 |
| $SiO_2$ | 46.4 | 93.8 |
| Na | 55.0 | 118.0 |
| K | 2.9 | 8.8 |
| Ca | 35.5 | 42.9 |
| Mg | 5.3 | 7.9 |
| Li | 0.07 | 0.2 |
| B | <0.008 | 0.1 |
| TDS | 361.2 | 583.6 |
| Ec(k) | 400.0 | 665.0 |
| $TqSiO_2$ | 100 | 130 |
| $TcSiO_2$ | 68 | 107 |
| TNa-K | 168 | 193 |
| TNa-K-Ca | 43 | 80 |
| TNa/Li | 90 | 107 |
| TLi | 78 | 104 |