

SOUTH-CENTRAL OREGON

PROJECT AREA

MINERALS EXPLORATION
TUCSON, ARIZONA

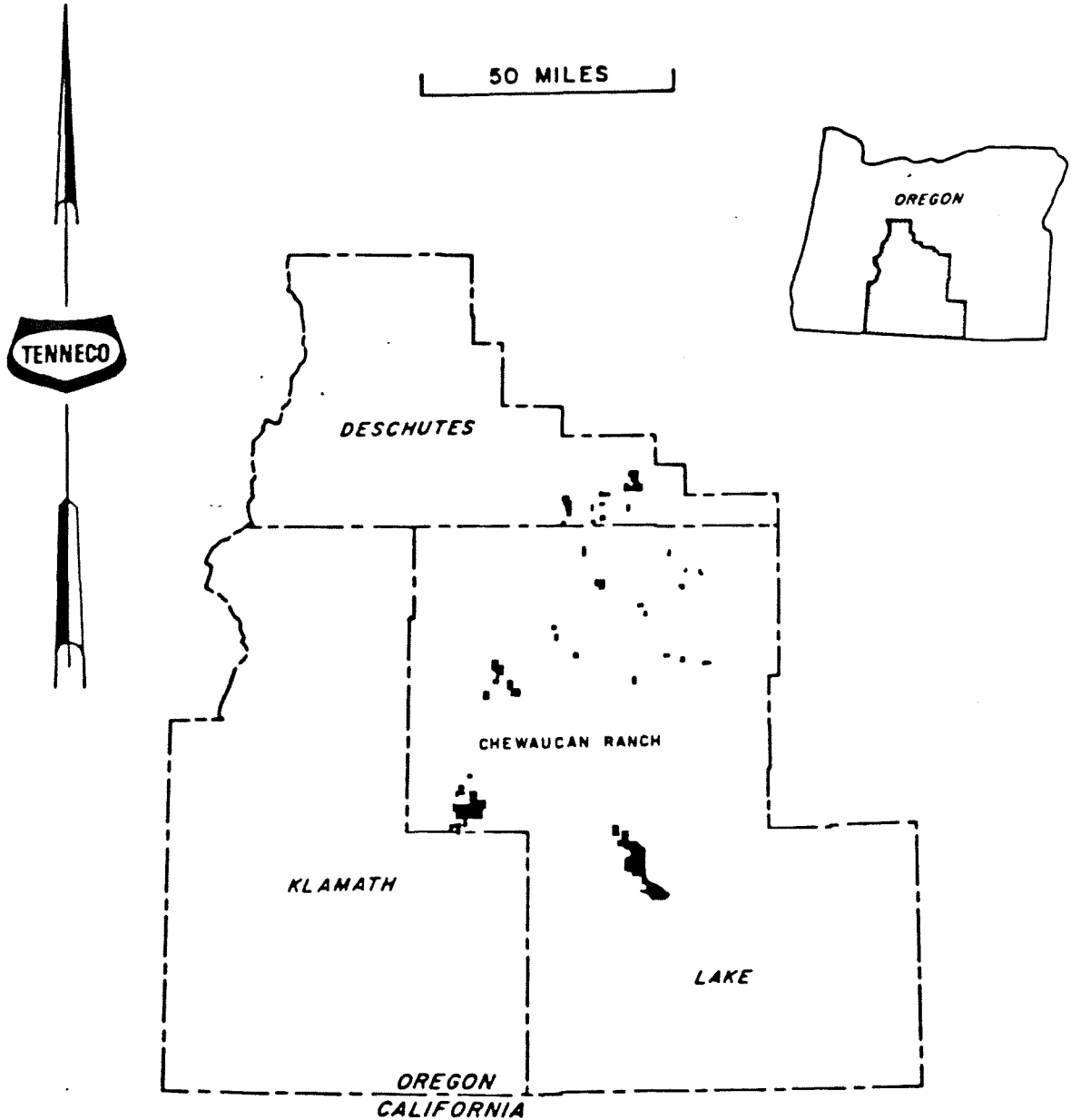


Figure 1. Location map for the Chewaucan Ranch,
South Central Oregon.

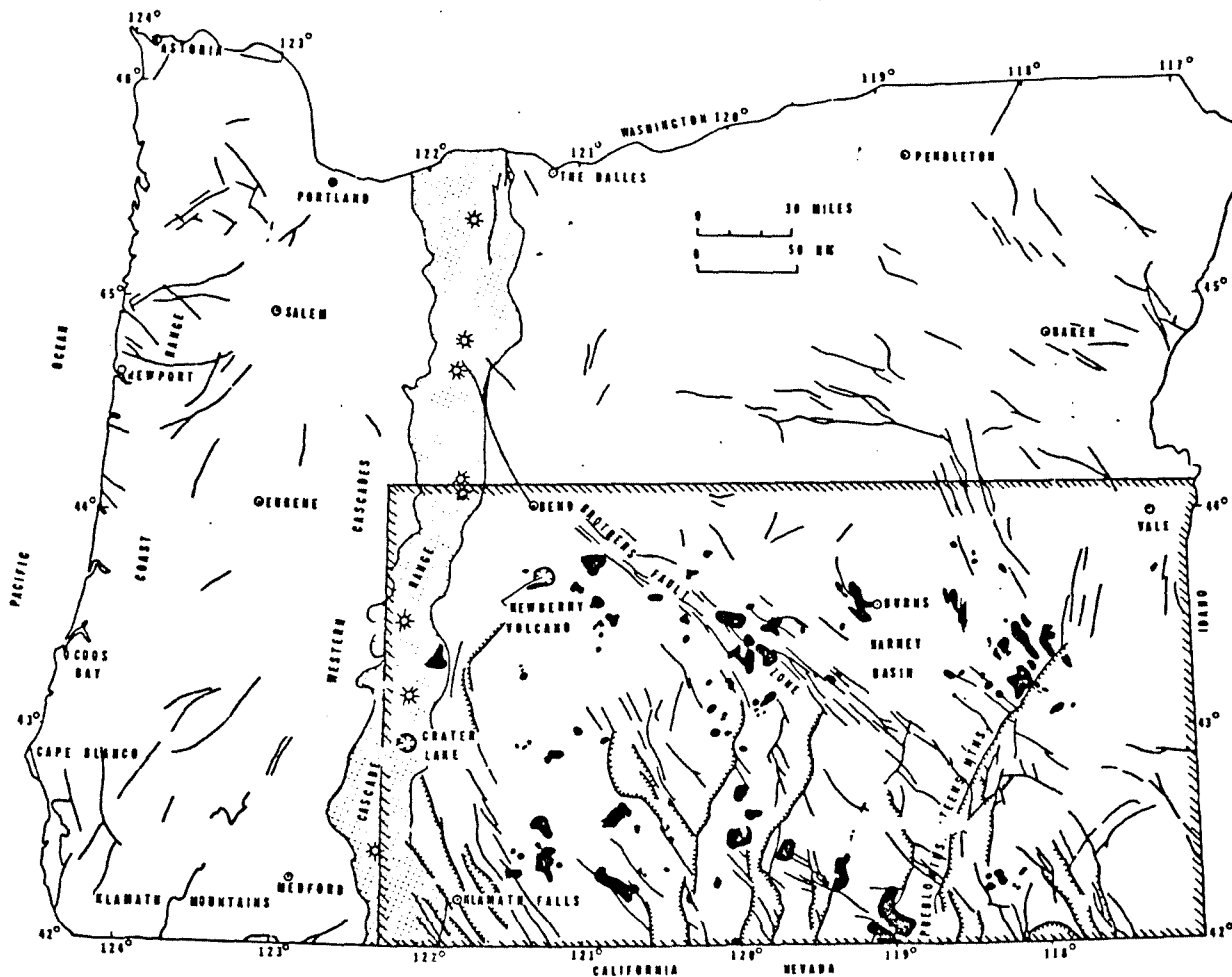


Figure 2. Map of Oregon showing the location of the rhyolitic domes in the southeastern part of the state (black). Major faults shown are from Walker and King (1969); hachures are shown on the downthrown side of the larger faults of the Basin and Range Province. The area shown in figures 2 and 4 is outlined.

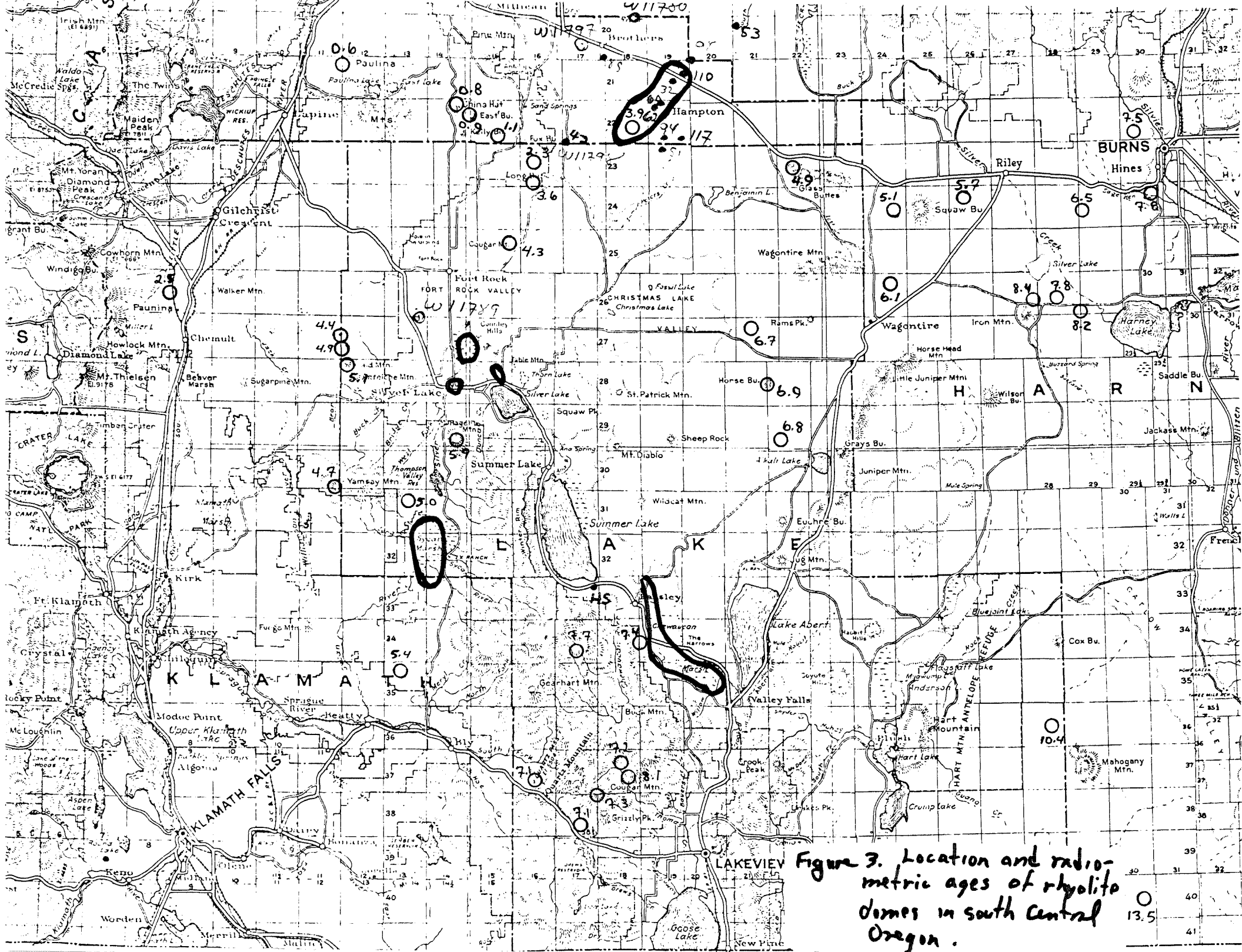


TABLE I: Chemical Analysis of Water Samples
from the Chervancan Ranch area
South Central Oregon

	Mariner et al 1974 Summer Lake HS <u>NE1/4S12T33SR17E</u>	X90227 JE Allen WS <u>NWNWS3ST30SR16E</u>	X90230 Emery HS <u>SESWS11T31SR16E</u>	X90233 Brittain WW <u>SESES22T31SR16E</u>
Temp °C	43	23	51	27
Flow (gpm)	--	60	30	150
pH	8.43	9.21	8.84	8.64
Cl	280.0	--	--	--
F	2.2	0.8	1.0	0.3
SO ₄	120.0	5.0	2.0	4.0
HCO ₃	406.0	477.0	92.0	259.0
CO ₃	10.0	16.0	0.0	0.0
SiO ₂	94.0	47.0	75.0	64.0
Na	390.0	330.0	230.0	510.0
K	4.6	12.0	4.1	14.0
Ca	2.1	2.0	5.0	7.0
Mg	0.1	1.0	0.3	1.0
Li	0.15	0.01	0.01	0.01
B	6.9	3.6	10.0	6.9
TDS	--	898.4	420.3	872.3
Ec(k)	1790	--	--	--
TqSiO ₂	130	100	120	113
TcSiO ₂	107	69	94	85
TNa-K	84	143	103	127
TNa-K-Ca	112	160	116	143
TLi/Na	32	--	--	--
TLi	97	--	--	--

Table I: (Continued)

	X90248 Murphy WW <u>SWNWS12T33SR17E</u>	X90250 Summer Lake HS <u>NENES12T33SR17E</u>	X90251 Blitz WW <u>NENES12SR17E</u>	X90259 Spider WW <u>NWNES15T33SR18E</u>
Temp °C	34	45	24	32
Flow (gpm)	3	150	25	750
pH	9.10	8.87	8.89	7.95
Cl	--	--	--	--
F	--	2.1	--	--
SO ₄	20.0	60.0	3.0	93.0
HCO ₃	168.0	440.0	507.0	144.0
CO ₃	0.0	0.0	12.0	0.0
SiO ₂	80.0	90.0	64.0	100.0
Na	100.0	450.0	410.0	130.0
K	4.5	5.9	8.3	5.9
Ca	1.0	1.0	1.0	6.0
Mg	0.1	0.1	0.4	0.8
Li	0.01	0.01	0.01	0.01
B	0.01	7.6	5.9	1.8
TDS	374.0	1058.4	1013.3	481.6
TqSiO ₂	123	128	113	133
TcSiO ₂	97	104	85	111
TNa-K	157	89	110	155
TNa-K-Ca	156	123	141	147
TLi/Na	--	--	--	--
TLi	--	--	--	--

Table I: (Continued)

	X90262 Red House WW <u>SWSES8T33SR19E</u>	X90263 Paisley WW <u>SWSWS24T33SR18E</u>	W11780 Circle F WW <u>S35T19SR18E</u>
Temp °C	23	34	18
Flow (gpm)	100	1001	1
pH	8.74	9.69	7.42
Cl	--	--	0.3
F	--	--	48.0
SO ₄	20.0	4.0	80.0
HCO ₃	321.0	113.0	253.0
CO ₃	32.0	0.0	0.0
SiO ₂	70.0	34.0	24.0
Na	190.0	57.0	60.0
K	14.0	0.7	1.0
Ca	3.0	1.0	81.0
Mg	2.0	0.01	29.0
Li	0.01	0.01	0.0
B	2.1	0.01	0.0
TDS	654.2	209.7	576.3
TqSiO ₂	117	88	75
TcSiO ₂	90	54	39
TNa-K	192	86	100
TNa-K-Ca	183	71	6
TLi/Na	--	3	--
TLi	37	37	--

Table I: (Continued)

	W11789 Horning Gap WW <u>T26SR15E</u>	W11797 King WW <u>NWNES27T20SR17E</u>	W11798 Sand WS <u>NESWS31T21SR16E</u>
Temp °C	20	21	24
Flow (gpm)	1000	40	--
pH	7.79	7.73	6.61
Cl	76.0	10.0	3.0
F	0.5	0.2	0.0
SO ₄ 120.0	110.0	0.0	
HCO ₃	196.0	116.0	87.0
CO ₃ 0.0	0.0	0.0	
SiO ₂	58.0	49.0	22.0
Na	130.0	26.0	6.0
K	8.6	4.4	11.0
Ca	81.0	14.0	10.0
Mg	18.0	11.0	7.0
Li	0.0	0.0	0.0
B	2.4	0.0	0.0
TDS	690.5	241.6	146.2
TqSiO ₂	109	102	72
TcSiO ₂	80	71	35
TNa-K	184	267	--
TNa-K-Ca	67	65	86
TLi/Na	--	--	--
TLi	--	--	--

Geochemical Manifestations

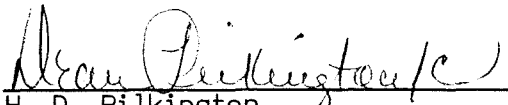
The chemistry of the Summer Lake Hot Springs has been published by Mariner et al (1974) and represents the only water analysis available within Chewaucan Ranch area (Table I). During the summer of 1974, the AMAX reconnaissance program collected a total of 64 water samples in the vicinity of our Paisley prospect. Ten examples of thermal waters in the Paisley area are given in Table I. In the summer of 1978, the AMAX recce program collected four (4) water samples from the northern part of the Chewaucan Ranch (Fig. 3).

The thermal waters in the Chewaucan Marsh area of Lake County appear to be the product of deep circulation and heating, then returning to the surface. The waters are sodium-bicarbonate water or sodium-bicarbonate-chloride-sulfate waters which have seen a maximum equilibrium temperature of 120-160°C. The discrepancy between the silica and alkali geothermometers is probably related to CO₂ loss and subsequent precipitation of silica.

The waters in the Brothers area are either normal groundwaters, or meteoric waters that have circulated only to rather shallow depths of, say, one kilometer, then come back to the surface.

Recommendations

The thermal anomaly in the Brothers area may be indicative of an area with some geothermal potential. However, unless deeper holes are drilled, it will be difficult to evaluate because of the abundant cold waters in the basalts. Therefore, based upon the 2-4 million year age for the nearby rhyolite domes, I cannot recommend any further action by AMAX on the northern most part of the Chewaucan Ranch. In the Chewaucan Marsh area, the hydrogeochemistry suggests a low temperature hydrothermal system, which is of no interest to AMAX.


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