

AMAX EXPLORATION, INC.

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INTER-OFFICE MEMORANDUM

SUBJECT: Hydrogeochemistry of selected springs,
Box Elder Co., Utah

DATE June 14, 1982

TO: J. E. Deymonaz

cc: Stan Hamilton

FROM: H. D. Pilkington

Three warm springs were reported by Doelling et al (1980) in the northwestern portion of Box Elder County, Utah. The area lies within the Basin and Range Province and is characterized by a series of north-south trenching mountains and valleys. Paleozoic sediments make up the dominant rocks in the mountain blocks. Tertiary volcanics often overlie the Paleozoics.

Coyote Spring (see attached map) Sec.33T14NR10W issue from a small mound in the Lake Bonneville sediments. The spring was developed by the government as a water source many years ago. The spring lies off the north edge of a large mass of Tertiary volcanics. No visible fault can be linked to the spring. Warm Spring located in S19T12NR15W is located on the east side of Dove Creek Mountains (see attached map). The waters probably issue from abounding fault which has cut the Cambrian quartzites. The third spring is located on the Cross X Ranch about two miles northwest of Etna in Sec.11T11NR18W (see map). The steeply dipping Paleozoics have been bleached and altered to some extent by the warm waters.

The chemical analyses and geothermometers for the Box Elder County waters as shown below:

	W14702 Coyote Spring SWNWS33T14NR10W	W14703 Warm Spring NENES19T12NR15W	W14704 Cold Spring SWSWS23T13NR16W	W14705 Rhus Spring SENWS30T12NR15W
T°C	43	25	15	11
Flow (gpm)	2	300	55	1
pH	7.0	6.9	8.4	7.0
Cl	1400.0	52.0	35.0	64.0
F	2.5	0.2	0.1	0.2
SO ₄	64.0	12.0	7.0	22.0
HCO ₃	262.0	94.0	138.0	142.0
SiO ₂	29.0	19.0	15.0	27.0
Na	1200.0	29.0	19.0	38.0
K	77.0	1.7	0.2	4.3

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Ca	85.0	37.0	47.0	62.0
Mg	16.0	8.0	8.1	12.0
Li	1.1	<0.1	<0.1	<0.1
B	1.0	<0.2	<0.2	<0.2
TDS	3137.6	253.2	269.7	371.8
Ec(K)	5600.0	370.0	401.0	636.0
T _g SiO ₂	82	67	60	79
T _c SiO ₂	47	29	21	44
TNa/K	182	175*	79	228*
TNa-K-Ca	179	24	N.A.	41
TNa/Li	72	158*	195*	137*
TLi	158 *	86	86	86

	W14706 Rabbit Springs SENWS24T8NR18W	W14707 Etna Hot Springs NESES11T11NR19W	W14708 Hot Well NESES11T11NR19W
T°C	12	43	37
Flow (GPM)	7	20	50
pH	7.4	7.7	7.4
Cl	58.0	11.0	13.0
F	0.6	0.5	0.4
SO ₄	52.0	25.0	28.0
HCO ₃	214.0	142.0	132.0
SiO ₂	62.0	27.0	24.0
Na	84.0	12.0	12.0
K	17.0	4.2	3.5
Ca	54.0	42.0	43.0
Mg	15.0	13.0	14.0
Li	<0.1	<0.1	<0.1
B	<0.2	<0.2	<0.2
TDS	556.9	277.0	270.2
EC(K)	848.0	370.0	360.0
T _g SiO ₂	111	79	75
T _c SiO ₂	83	44	39
TNa/K	286*	355*	330*
TNa-K-Ca	93	37	32
TNa/Li	86	243*	243*
TLi	86	86	86

*Do not reflect true subsurface temperatures.

/jp

