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GEOTHERMAL BRANCH

INTER-OFFICE MEMORANDUM

SUBJECT: Hydrogeochemistry of Alum Drill Holes (4133A). DATE: June 14, 1983

TO: J. E. Deymonaz

cc: W. M. Dolan
Wim Lodder
H. J. Olson

FROM: H. D. Pilkington

A water sample was collected from well 51-29 since my memorandum of January 10, 1983. For comparative purposes the chemical analyses of the water samples from the intermediate depth gradient holes are shown in Table I. The chemistry of the fluids from well 51-29 suggest the waters are mixed with much more groundwater than the waters from wells 24-33 and 56-29. That assumption is supported by the waters from well 51-29 plotted on the silica mixing diagram for the Alum waters (Fig. 5) and the Enthalpy versus chloride concentration diagram (Fig. 6) from my memo of January 10, 1983.

The chemistry of the waters from well 51-29 indicate a much more rapid dilution of the thermal waters occurs as one goes northward across the thermal anomaly than occurs along the west-northwest axis of the thermal anomaly.

H. D. Pilkington

HDP/c

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Table I. Chemical Analyses of the Water Samples From The Intermediate Depth Thermal Gradient Wells, Alum Area.

	W14280 24-33 @ 1226'	W14282 24-33 @ 122'	W14297 56-29 @ 785'	W14392 51-29 @ 666'
Temp°C	80	80	110	46
Flow (gpm)	100	100	60	60
pH	7.6	7.6	8.4	8.6
Cl	3600.0	3600.0	4700.0	1000.0
F	4.8	4.8	5.1	0.7
SO_4	160.0	160.0	210.0	1000.0
HCO_3	242.0	240.0	135.0	222.0
CO_3	0.0	0.0	9.0	28.0
SiO_2	150.0	140.0	190.0	110.0
Na	2500.0	2400.0	2700.0	1200.0
K	290.0	280.0	320.0	36.0
Ca	150.0	160.0	87.0	57.0
Mg	45.0	46.0	20.0	23.0
Li	9.5	9.3	10.0	1.9
B	40.0	36.0	33.0	5.0
TDS	7191.3	7086.1	8419.1	3683.0
Ec(k)	11000.0	12000.0	13000.0	5500.0
Tq SiO_2	153	149	165	137
Tc SiO_2	137	133	154	116
TNa-K	230	233	232	132
TNa-K-Ca	223	221	232	144
TLi/Na	166	167	163	63
TLi	252	250	254	178

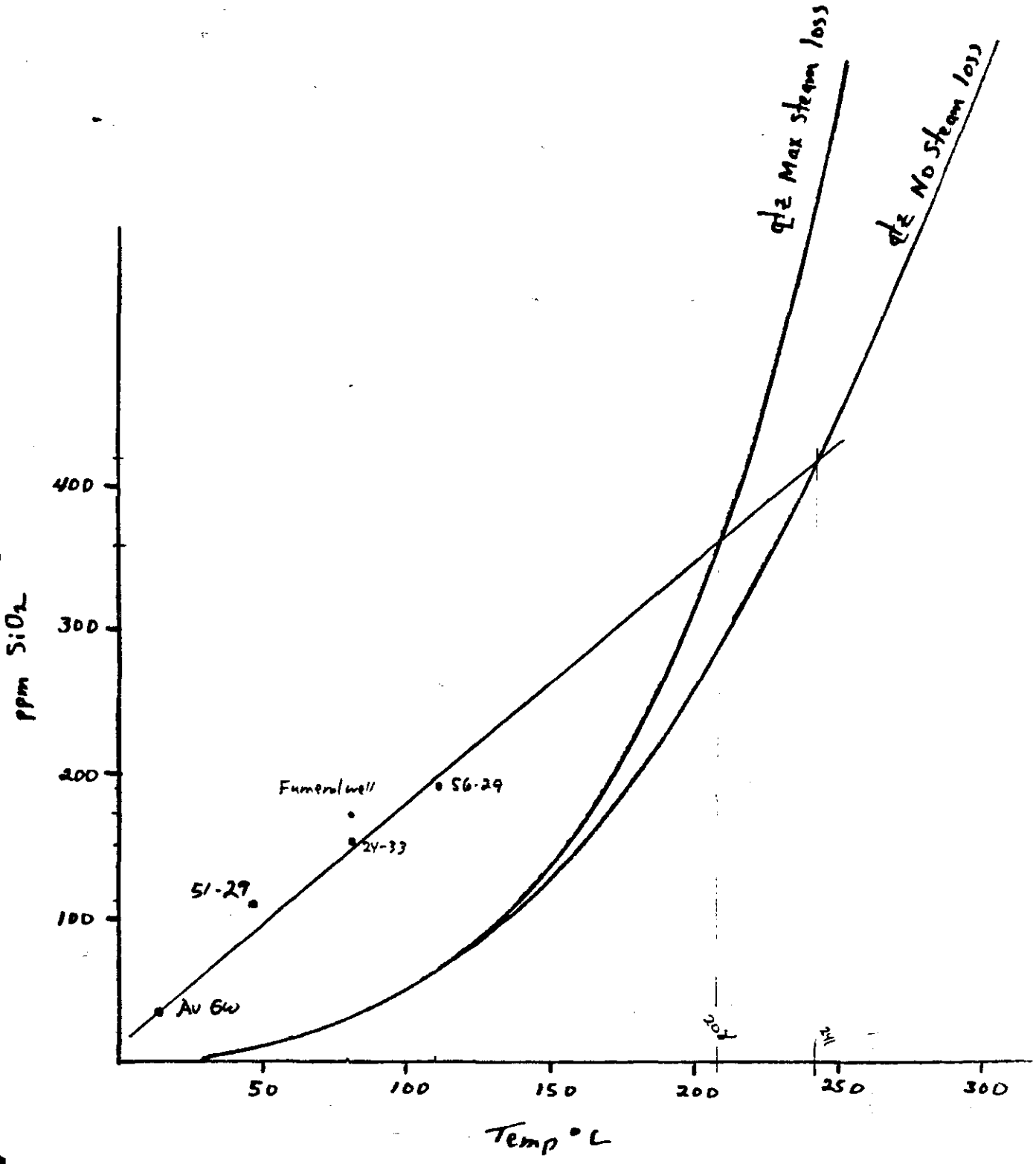

Figure 5 Silica mixing model for Alum Waters

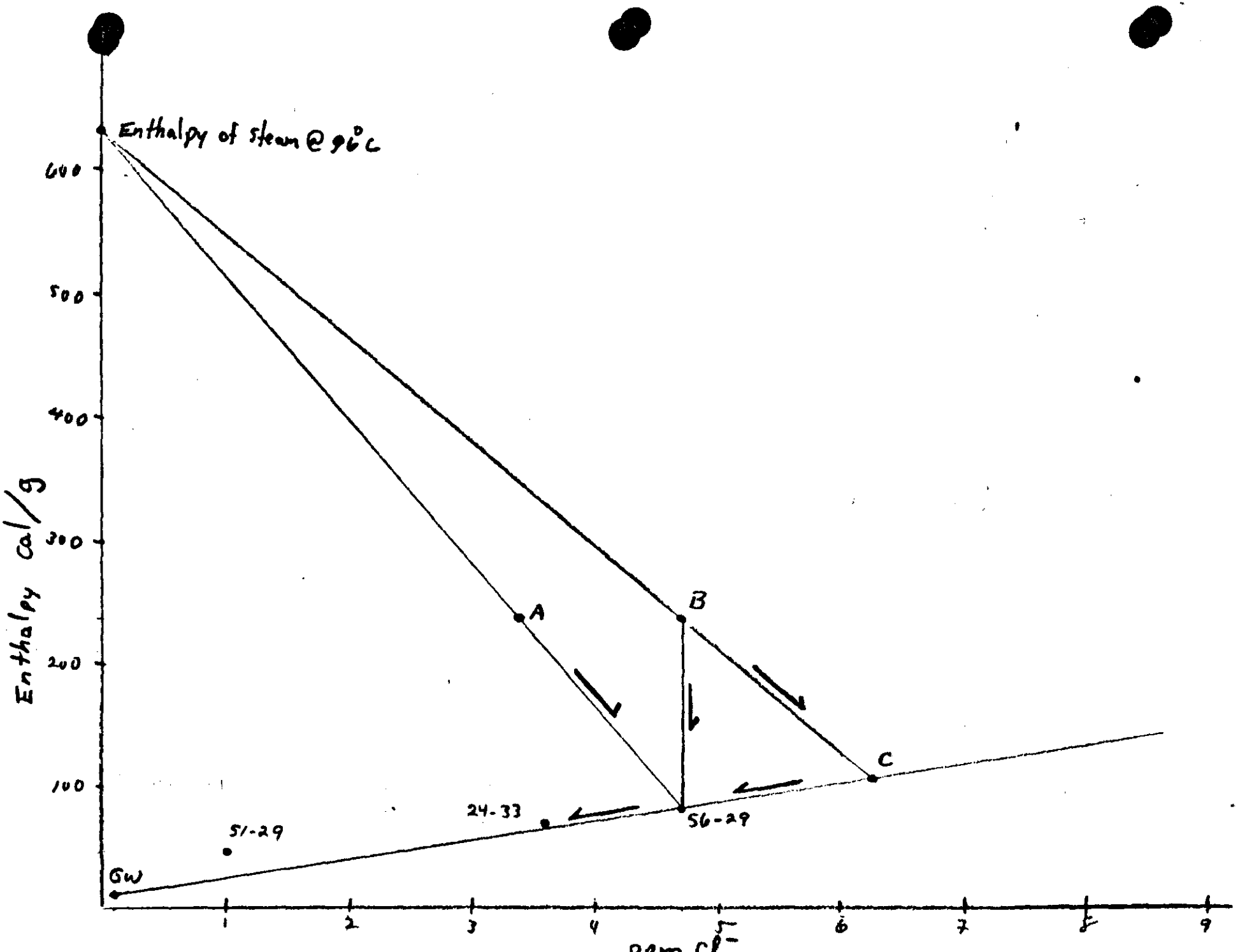

Figure 6. Enthalpy vs chlorine concentration for Alum waters