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HOAGLAND

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Preliminary Evaluation of Fluid Chemistry
in the East Mesa KGRA

by

MASTER

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INTRODUCTION

One of the major problems needing consideration when bringing a geothermal field into production is the anticipation and control of mineral precipitation in both the producing formations and production equipment. The problem becomes especially critical when reinjection of spent geothermal brines into the subsurface is envisioned, as the effects of unknowingly abetting the sealing of producing formations may far outweigh the benefits of subsurface pressure maintenance and brine disposal. Prediction of the chemical interactions between natural multicomponent thermal fluids and the minerals comprising a producing formation is a non-trivial task. The least expensive and most general approach to the problem is the study of equilibrium models approximating the natural system, models constructed from theoretically and experimentally-derived thermodynamic data for the involved minerals and aqueous species. This paper is concerned with the application of this equilibrium modeling approach to the rock-water system at the East Mesa geothermal area in the Imperial Valley of California.

PETROLOGY OF RESERVOIR AQUIFERS

A knowledge of the mineralogic composition and paragenetic relationships among authigenic minerals in the producing aquifers provides a useful check on thermochemical calculations of aquifer fluid chemistry. The compatibility of hydrothermal mineral assemblages and calculated subsurface fluid chemistry can be evaluated by comparing equilibrium ion activity products for individual minerals and equilibrium constants for reactions between coexisting minerals with corresponding ion activity products calculated for the fluid. Alternatively, when analytical data for the produced fluids is insufficient to define the chemistry of the fluid in the subsurface, the assumption of chemical equilibrium between the latest hydrothermal minerals and the fluid often helps define boundary conditions for the fluid composition (e.g., Hoagland, 1976a). For these reasons, a cursory examination of postdepositional mineralogy is included in this study.

Existing petrologic data on the Mesa wells includes bulk rock x-ray diffraction studies of cuttings from 6-1 and 6-2 (Fournier, 1973, 1976), petrographic and x-ray diffraction studies of cuttings from 6-2 (Hoagland, 1976a), and hand sample descriptions of existing core from Mesa wells (C. Kendall, personal communication). To supplement this information, cursory petrographic analyses were made of core and cuttings samples from production intervals in all wells except 6-2 (Table 1). X-ray diffraction analyses of <2 μ size fractions from each sample were performed to define the phyllosilicate assemblages and interpreted using standard procedures.

Studies of the 6-2 borehole indicate the Mesa reservoir strata to consist of interlayered sandstone, siltstone, and mudstone beds. Detrital mineralogy of sandstones is homogenous throughout the section and of Colorado

Table 1

Samples Chosen for Petrographic and X-ray Diffraction Analysis

<u>Well</u>	<u>Production Interval</u>	<u>Sample Depth</u>	<u>Type</u>
6-1	6809-7150'	1875'	core
	7341-7982'	4454.5'	core
		7967'	cuttings
8-1	4946-6002'	5807.5'	core
		5817'	core
31-1	5420-6175'	6026-6036'	cuttings
		6226-6236'	cuttings
5-1	5003-6003'	5602'	core
		5619'	core

River association, and consists of (in order of abundance): quartz, lithic fragments of extrabasinal and intrabasinal origin, microcline, plagioclase, and orthoclase. Minor detrital minerals include calcite, dolomite, muscovite, biotite, chlorite, zircon, tourmaline, garnet, glauconite, and several opaque minerals. Detrital clays consist of illite, interlayered illite/montmorillonite, montmorillonite, kaolinite, and minor chloritic clays. Calcite of diagenetic origin is abundant.

Initial hydrothermal alteration below 2500' produced an authigenic assemblage of quartz, illite, chlorite, and pyrite, and resulted in the alteration or dissolution of calcite, dolomite, montmorillonite, kaolinite, and interlayered clays. Minor amounts of authigenic K-feldspar were also precipitated. Later hydrothermal alteration resulted in the partial replacement of silicate minerals and precipitation of abundant authigenic calcite.

Hydrothermal mineralogy and paragenesis in the samples from wells 6-1, 8-1, 31-1, and 5-1 are essentially the same as described above. Quartz cement is abundant in the samples from 1875' and 7967' (6-1); the former contains abundant later calcite while the latter contains very little calcite. The 1875' sample is significant in that it is the shallowest occurrence of abundant hydrothermal quartz yet found at Mesa, and in that it has been extensively fractured since quartz cementation. Sample 4454.5' (6-1) contains abundant authigenic K-mica, very little authigenic quartz or feldspar, and minor secondary calcite. This sample has also been extensively fractured.

Authigenic minerals in the 5-1 samples include calcite, hematite, and possibly chlorite. No authigenic K-mica, quartz, or pyrite was observed.

Sandstone from 31-1 contains only slight amounts of authigenic quartz but has up to 25% authigenic calcite. Replacement of quartz by calcite is common and locally extensive.

Mesa 8-1 samples (5807.5', 5817') contain abundant authigenic quartz, chert, K-mica, and minor authigenic feldspar (adularia?). 5807.5' contains no later calcite; secondary calcite is moderately abundant at 5817'.

X-ray diffraction studies of clay fractions of the core samples show the dominant phyllosilicate minerals in production interval strata to be interlayered sillite/montmorillonite and chlorite. Montmorillonite and kaolinite are sparse to absent. $10\text{\AA}$ K-mica (illite) is invariably present but often subordinate in abundance to interlayered clay. The preliminary data reported here allows no detailed comparison of phyllosilicate abundances between wells; all of the samples, however, contain a phyllosilicate assemblage markedly different from the detrital clay assemblage in the Mesa area (see Hoagland, 1976a) and hence reflect reaction of the sediment with hydrothermal fluids.

FLUID ANALYSES

Evaluation of chemical analyses of hydrothermal fluids involves several major difficulties, including uncertainties introduced by inconsistent and poorly defined sampling and storage procedure, analytical error, and actual changes in fluid composition with time under production conditions. It will become evident that all of these problems are manifested within the recorded analyses of Mesa fluids.

Sampling-related problems include possible mineral precipitation in the production line prior to sampling, separation of volatile gases from the fluid sample, inadequate knowledge of the liquid/vapor mix of a flashed sample, equilibration of a sampled fluid with the atmosphere before analysis, and reaction of the fluid with the sampling vessel. Samples collected immediately after the opening of a shut-down well are notoriously non-representative of the actual formation fluid and are hence to be avoided.

Analytical inconsistencies should be expected in analyses of geothermal fluids since many commonly employed analytical techniques are not adequate when applied to highly-complexed multicomponent solutions unless appropriate corrections are made to determined values. An example is the determination of carbonate species by acidimetric or alkalimetric titration; unless provision is made for the effects of non-carbonate aqueous species which form protonated complexes values reported for carbonate species will be in error.

It is not the purpose of this paper nor within the expertise of the author to propose specific sampling or analytical techniques. It is important to stress, however, that a lack of a well-defined and standardized sampling and analytical technique renders detailed evaluation and interpretation of chemical analyses extremely difficult. An annotated bibliography

of papers addressing sampling and analytical problems is included as Appendix I.

Early fluid samples

Tables 2-7 summarize the currently available analytical data on Mesa fluid compositions. Table 8 is a compilation of various molecular ratios of solute concentrations. Solute ratios are much less affected by inconsistencies in sampling procedure than are absolute elemental concentrations and hence are a useful indicator of analytical consistency when temporal variations can be ignored.

Information on the fluid chemistry from Mesa 6-1 before perforation consists of one flashed fluid and one unflashed fluid analysis from USBR (1974), and three flashed fluid analyses from the University of Nevada at Reno (Sanders and Miles, 1974). The USBR analyses are inconsistent with each other (Tables 2, 8); USBR 459.2 (flashed) has an unreasonably low SiO_2 value and less Mg and HCO_3^- than the USBR unflashed analysis. The UNR analyses differ significantly from USBR values but show internal consistency. Additionally, analytical techniques were specified by Sanders and Miles. With no additional data it is necessary to assume that a steam-loss corrected UNR analysis is representative of the pre-perforation 6-1 fluid chemistry.

Unflashed samples collected from 6-1 after perforation on the same day (2-19-74) were analyzed by both UNR and USBR (Table 3); Table 7 demonstrates the inconsistencies between those analyses. It is difficult to choose the best sample of the two, but the anomalously low SiO_2 value in USBR W84.4, its inconsistency with USBR W1033 (sampled 6-11-74, unflashed fluid), and better knowledge of analytical procedure and consistency at the UNR lab suggests use of UNR 2-19-74 for any thermochemical calculations.

A less severe problem exists for early samples from the 6-2 well: USBR W609.3 and UNR 10-23-73 are analyses of unflushed fluid collected on the same day and are reasonably consistent except for calcium values. Earlier 6-2 analyses are from drill stem tests subject to contamination and steam loss and are hence unreliable.

No critical evaluation of early analyses from wells 8-1, 5-1, or 31-1 can be made since insufficient data exists.

Table 2

Fluid Analyses from Mesa 6-1 Prior to Perforation

<u>mg/l</u>	<u>USBR</u> <u>W459.2</u> <u>8-26-72</u>	<u>UNR</u> <u>8-1-73a</u>	<u>UNR</u> <u>8-1-73b</u>	<u>UNR</u> <u>7-1-73</u>	<u>UNR</u> <u>7-1-73c</u>	<u>USBR</u> <u>W30.3</u> <u>1-23-73</u>
TDS	28,110	32,516	33,461	32,247	26,765	16,180
pH	7.5	7.65	7.60	7.70	--	6.1
SiO ₂	128	364	347	341	283	220
Na	9,002	9,845	10,240	9,845	8,171	5,129
K	1,047	1,178	1,255	1,173	974	632
Ca	896	1,360	1,391	1,360	1,130	389
Mg	15	20.7	21.8	20.8	17.3	22
Cl	15,868	19,670	20,150	19,400	16,100	9,014
HCO ₃	126	42.8	34.8	45.7	37.4	305
SO ₄	192	<20	<20	<20	<17	20
Ba	--	43	45	42	35	--
Be	--	<0.004	<0.004	<0.004	<0.0033	--
Cd	---	<0.01	<0.01	<0.01	<0.083	--
Cr	--	0.03	0.04	0.03	0.02	--
Cs	--	12.4	12.5	12.4	10.3	--
Cu	--	0.06	0.11	0.06	0.05	--
F	--	1.6	1.6	1.6	1.3	--
Fe	--	0.25	1.00	0.25	0.21	--
Li	--	30	30	30	25	--
Mn	--	1.26	1.31	1.26	1.05	--
NH ₄	--	55	37	83	69	--
NO ₃	--	<0.5	<0.5	<0.5	<0.42	--
Pb	--	0.20	0.20	0.20	0.17	--
PO ₄	--	<1.0	<1.0	<1.0	<0.83	--
Rb	---	6.0	6.2	6.0	5.0	--
Sb	--	<1.0	<1.0	<1.0	<0.8	--
Se	---	<0.001	<0.001	<0.001	--	--
Sn	--	<0.2	<0.2	<0.2	<0.17	--
Sr	--	56	57	56	46	--
Zn	--	<0.005	<0.005	<0.005	<0.004	--

Source: USBR (1974) Sanders & Sanders & Sanders & -- USBR (1974)
Miles (1974) Miles (1974) Miles (1974)

Descrip- tion	Flashed	Flashed	Flashed	Flashed	recalcu- lated for	unflashed
	MFS	MFS	MFS	brine	17% steam	fluid
	feed-in	brine out	from	separa- tor	loss	

Table 3

Fluid Analyses from Mesa 6-1 after Perforation

	USBR W84.4	UNR	USBR W1033	USBR W1074	USBR W1365	USBR 6-9-76	USBR 7-76
mg/l	2-19-74	2-19-74	6-11-74	7-22-74	9-23-74	0930	
TDS	19,360	18,847	21,967	24,211	25,701	26,300	
pH	6.8	6.66	--	7.37	7.19	5.45	5.63
SiO ₂	163	300	257	--	277	320	
CO ₂ *	--	--	--	--	--	--	>1700
Na	6,263	5,774	6,362	--	8,771	8,100	
K	782	898	1,124	--	--	1,050	
Ca	642	642	759	710	938	1,360	
Mg	2.8	13.8	9	--	--	17.2	
Cl	11,053	10,942	11,668	13,084	13,629	15,850	
HCO ₃	204	223	221	--	85	202	
SO ₄	17.3	<10	51	34	35	42.8	
S	--	--	--	--	--	3.0	
Ag	--	0.06	--	--	--	--	
As	--	0.009	--	--	--	0.26	
Au	--	--	--	--	--	<0.01	
B	--	--	--	--	--	9.75	
Ba	--	18	--	--	--	14	
Be	--	0.007	--	--	--	<0.02	
Bi	--	0.4	--	--	--	3	
Cd	--	<0.04	--	--	--	<0.01	
Co	--	--	--	--	--	0.06	
Cr	--	<0.02	--	--	--	<0.01	--
Cs	--	26	--	--	--	2.75	--
Cu	--	0.03	--	--	--	<0.10	--
F	--	1.23	--	--	--	0.99	--
Fe	--	0.34	--	--	--	8.8	--
Ge	--	--	--	--	--	--	--
Hg	--	<0.0005	--	--	--	<0.002	--
In	--	--	--	--	--	<0.1	--
Ir	--	--	--	--	--	<0.1	--
Li	--	37	--	--	--	40.0	--
Mn	--	0.95	--	--	--	0.95	--
Mo	--	--	--	--	--	<0.005	--
Nb	--	--	--	--	--	0.40	--
NH ₄	--	41	--	--	--	40.75	--
Ni	--	0.10	--	--	--	0.10	--
NO ₃	--	<0.5	--	--	--	<0.02	--
Pb	--	0.17	--	--	--	--	--
PO ₄	--	<1.0	--	--	--	<0.01	--
Pt	--	--	--	--	--	<0.1	--
Rb	--	7.2	--	--	--	--	--
Sb	--	0.7	--	--	--	5.5	--
Se	--	<0.001	--	--	--	<0.1	--

Table 3 (continued)

<u>mg/l</u>	<u>USBR</u> <u>W84.4</u> <u>2-19-74</u>	<u>UNR</u> <u>2-19-74</u>	<u>USBR</u> <u>W1033</u> <u>6-11-74</u>	<u>USBR</u> <u>W1074</u> <u>7-22-74</u>	<u>USBR</u> <u>W1364</u> <u>9-23-74</u>	<u>USBR</u> <u>6-9-76</u> <u>0930</u>	<u>USBR</u> <u>7-76</u>
Sn	--	0.2	--	--	--	--	--
Sr	--	58	--	--	--	320	--
Ta	--	--	--	--	--	0.14	--
Ti	--	--	--	--	--	<0.10	--
W	--	--	--	--	--	<0.10	--
Zn	--	0.10	--	--	--	0.07	--
Al	--	--	--	--	--	0.04	--
Source:	USBR (1974)	Sanders & Miles (1974)	USBR (1974)	USBR (1974)	USBR (1974)	USBR unpub- lished data	USBR H. Papazian unpublished data
Com- ments:	unflashed	unflashed downhole sample	unflashed	flashed at well head	flashed feed to desalt- ing plant	unflashed fluid from wellhead	unflashed fluid from wellhead

* total = CO₂ in solution

Table 4

Fluid Analyses from Mesa 6-2

mg/l	USBR W433.3 8-6-73	USBR W611.3 8-6-73	USBR W609.3 10-23-73	UNR 10-23-73	USBR 1032 4-30-74	USBR 6-3-76 1430	USBR 7-21-76 (a) (b)	
TDS	2,830	2,760	2,130	2,377	2,687	5,000	--	
pH	7.2	8.6	7.4	7.7	--	6.12	5.75	8.35
CO ₂ *	--	--	--	--	--	--	1544	603
SiO ₂	195	140	200	250	301	269	--	
Na	918	907	704	760	725	1,700	--	
K	65.3	73.9	68.4	68.8	83	150	--	
Ca	40	39.3	2.6	13	8.5	16.4	--	
Mg	--	--	--	0.012	0.8	0.24	--	
Cl	776	760	665	710	793	2,142	--	
HCO ₃	1,248	908	662	715	749	560	466	521
SO ₄	204	207	188	202	182	156	--	
S	--	--	--	--	--	1.5	--	
Ag	--	--	--	<0.004	--	--	--	
Al	--	--	--	--	--	0.03	--	
As	--	--	--	0.045	--	0.22	--	
Au	--	--	--	--	--	<0.01	--	
B	--	--	--	--	--	7.45	--	
Ba	--	--	--	<0.10	--	0.25	--	
Be	--	--	--	<0.005	--	<0.02	--	
Bi	--	--	--	<0.10	--	<0.005	--	
Cd	--	--	--	<0.002	--	<0.01	--	
Co	--	--	--	--	--	<0.01	--	
Cr	--	--	--	<0.04	--	<0.01	--	
Cs	--	--	--	1.82	--	0.38	--	
Cu	--	--	--	0.88	--	<0.10	--	
F	--	--	--	3.2	--	1.23	--	
Fe	--	--	--	0.06	--	<0.10	--	
Ge	--	--	--	--	--	<0.1	--	
Hg	--	--	--	<0.00735	--	<0.002	--	
In	--	--	--	--	--	<0.1	--	
Ir	--	--	--	--	--	<0.1	--	
Li	--	--	--	4.0	--	4.0	--	
Mn	--	--	--	<0.01	--	0.05	--	
Mo	--	--	--	--	--	<0.005	--	
Nb	--	--	--	<10	--	0.40	--	
NHy	--	--	--	17	--	14.7	--	
Ni	--	--	--	<0.02	--	<0.10	--	
NO ₃	--	--	--	<0.1	--	0.1	--	
Pb	--	--	--	<0.02	--	--	--	
PO ₄	--	--	--	0.8	--	<0.2	--	
Pt	--	--	--	--	--	<0.1	--	
Rb	--	--	--	0.60	--	--	--	
Sb	--	--	--	<0.2	--	0.90	--	

Table 4 (continued)

<u>mg/l</u>	USBR W433.3 8-6-73	USBR W611.3 8-6-73	USBR W609.3 10-23-73	UNR 10-23-73	USBR 1032 4-30-74	USBR 6-3-76 1430	USBR 7-21-76 (a) (b)
Se	--	--	--	<0.001	--	<0.1	--
Sn	--	--	--	0.2	--	--	--
Sr	--	--	--	0.17	--	6.4	--
Ta	--	--	--	<0.5	--	0.17	--
Ti	--	--	--	--	--	<0.10	--
W	--	--	--	--	--	<0.1	--
Zn	--	--	--	0.08	--	<0.01	--
Source:	USBR (1974)	USBR (1974)	USBR (1974)	Sanders & Miles (1974)	USBR (1974)	USBR unpub- lished data	USBR H. Papazian, unpublished data
Com- ments:	Drill stem tests, 5523-5625'		Unflashed filtered fluid	Unflashed filtered fluid sampled downhole	Unflashed fluid	Un- flashed fluid from wellhead	a) Unflashed fluidffrom wellhead b) flashed fluid

*total CO₂ in solution

Table 5

Fluid Analyses from Mesa 8-1

<u>mg/l</u>	USBR 1234	USBR 6-22-76 <u>0910</u>	USBR 7-76 <u>(c)</u>	USBR 7-76 <u>(d)</u>
	1235 1236 <u>9-10-74</u>			
TDS	2463	1600	--	--
pH	7.68	6.27	6.28	8.48
CO ₂ *	--	--	515	343
SiO ₂	263	389	--	--
Na	723	610	--	--
K	42	70	--	--
Ca	41.1	8.5	--	--
Mg	1.6	<0.05	--	--
Cl	556	500	--	--
HCO ₃	668	417	--	--
SO ₄	225	173	--	--
S	--	1.0	--	--
Al	--	0.02	--	--
As	--	0.053	--	--
Au	--	0.024	--	--
B	3.3	1.60	--	--
Ba	--	0.15	--	--
Be	--	<0.02	--	--
Bi	--	<0.005	--	--
Cd	--	<0.01	--	--
Co	--	<0.01	--	--
Cr	--	<0.01	--	--
Cs	--	0.14	--	--
Cu	--	<0.10	--	--
F	--	1.60	--	--
Fe	1.1	<0.10	--	--
Ge	--	<0.1	--	--
Hg	--	0.014	--	--
In	--	<0.1	--	--
Ir	--	<0.1	--	--
Li	2.0	1.1	--	--
Mn	--	<0.05	--	--
Mo	--	<0.005	--	--
Nb	--	0.40	--	--
NH ₄	--	4.95	--	--
Ni	--	<0.10	--	--
NO ₃	--	0.34	--	--
PO ₄	--	<0.1	--	--
Pt	--	<0.1	--	--
Sb	--	1.2	--	--
Se	--	0.5	--	--

Table 5 (continued)

<u>mg/l</u>	USBR 1234 1235 1236 <u>9-10-74</u>	USBR 6-22-76 <u>0910</u>	USBR 7-76 <u>(c)</u>	USBR 7-76 <u>(d)</u>
	(a)	(b)		
Sr	1.6	2.1	--	--
Ta	--	0.12	--	--
Ti	--	<0.10	--	--
W	--	<0.1	--	--
Zn	--	<0.1	--	--

Source:

- (a) USBR (1974)
- (b) USBR, unpublished data
- (c) USBR, H. Papazian, unpublished data
- (d) Same as (c)

Comments:

- (a) unflashed downhole sample
- (b) unflashed sample from wellhead
- (c) unflashed sample from wellhead
- (d) flashed fluid

* total CO₂ in solution

Table 6

Fluid Analyses from Mesa 31-1

<u>mg/l</u>	USBR 1225 1226 1227 <u>9-13-74</u>	USBR 6-18-76 <u>0830</u>	USBR 7-76 <u>(c)</u>	USBR 7-76 <u>(d)</u>
TDS	2311	2900	--	--
pH	7.72	6.27	6.25	8.27
CO ₂ *	--	--	1090	572
SiO ₂	88	274	--	--
Na	782	730	--	--
K	25	85	--	--
Ca	96.6	8.9	--	--
Mg	1.1	<0.05	--	--
Cl	490	510	--	--
HCO ₃	467	845	--	--
SO ₄	172	183	--	--
S	--	0.3	--	--
Al	---	0.02	--	--
As	--	0.025	--	--
Au	--	0.080	---	--
B	2.2	2.50	--	--
Be	--	<0.01	--	--
Bi	--	<0.005	--	--
Cd	--	0.02	--	--
Co	--	<0.01	--	--
Cr	--	<0.01	--	--
Cs	--	0.20	--	--
Cu	--	<0.10	--	--
F	--	1.42	--	--
Fe	2.4	<0.10	--	--
Ge	--	<0.1	--	--
Hg	--	0.008	--	--
In	--	<0.1	--	--
Ir	--	<0.1	--	--
Li	1.8	0.60	--	--
Mn	--	<0.05	--	--
Mo	--	<0.005	--	--
Nb	--	0.40	--	--
NH ₄	--	2.45	--	--
Ni	--	<0.10	--	--
NO ₃	--	0.43	--	--
PO ₄	--	<0.1	--	--
Pt	--	<0.1	--	--
Sb	--	1.0	--	--
Se	--	1.8	--	--

APPENDIX II

X-ray Diffraction Patterns of $<2\mu$ Size Fractions of Lithologic Samples from Producing Stratigraphic Intervals

note: computer-analyzed mineral percentages of these samples should
be disregarded.

MINERAL NAME PERCENT INTENSITY

ALBITE	9.1	0.6
ANHYDRITE	7.1	0.4
CALCITE	1.2	0.1
CHLORITE	18.9	0.7
HEMATITE	3.1	0.2
KAOLINITE	6.5	0.5
MICA	28.0	0.6
ORTHOCLASE	18.5	0.7
PYRITE	1.5	0.1
QUARTZ	14.1	2.4

MINERAL NAME	PERCENT	INTENSITY
ALBITE	0 1	0 6
ANHYDRITE	7 1	0 4
CALCITE	1 2	0 1
CLORITE	18 9	0 7
HEMATITE	3 1	0 2
KAOLINITE	6 5	0 5
MICA	20 0	0 6
ORTHOCLASE	18 5	0 7
PyRITE	1 5	0 1
QUARTZ	14 1	2 4

MESA S-1 5602 S
MESA 01 CORE

BOY 1 76 UNCLV
 MESA S-1 5619 2
 MESA 02 CORE

MEEM S-1 5619 2
MEEM 02 CORE

SOCT 1.78 UNGLV
 MESH 6-1 4454 S
 MESH 03 CORE

MESN 6-1 4454 S.
MESN 03 CORE

OCT 1 76 UNGLY
 MESH 6-1 7023
 MESH 04 COPE

MEAN 6-1 7023
MEAN 04 COPE

BOCT 1.78 UNCLV
MECH 6-1 7023 SS
MECH 05 COPE

ME34 6-1 7023 55
ME34 05 CORE

SOCT 1.76 UNGLY
MESA 9-1 SECT 5
MESH 06 CORE

MECH S-1 5307 S
MECH 06 CORE

MINERAL NAME	PERCENT	INTENSITY
AMPHIBOLITE	15	0.7
CALCITE	0.0	0.8
CHLORITE	92	2.6
EPIDOTITE	30	1.9
MICA	56.5	13.4
ORTHOCLASE	0.6	0.2
QUARTZ	3.3	4.8
YALC	25.0	11.9

MEGA S-1 5917
MEGA 07 CODE

APPENDIX III

Species Distributions for Unflashed Fluid

From Wells 6-1, 6-2, 8-1, 31-1

M-1 UNFLASHED FLUID
A/C/L CAT= 462.0912

SAMPLED: 6-9-76 ANALYSIS: USHR
ANAL MEC/L AN= 451.3283

ITER	S1-ANALC03	S2-ANALS04	S3-ANALF	S4-ANALP04	S5-ANALCL	ELEC. IMBALANCE
1	8.11094E-04	4.45260E-04	3.83221E-06	0.00000E+00	8.47438E-03	0.000000
2	4.08811E-04	2.25234E-04	2.00565E-06	0.00000E+00	4.27054E-03	0.000000
3	2.05354E-04	1.13143E-04	1.04964E-06	0.00000E+00	2.14315E-03	0.000000
4	1.02961E-04	5.66566E-05	5.49315E-07	0.00000E+00	2.14420E-03	0.000000
5	5.16237E-05	2.83708E-05	2.87571E-07	0.00000E+00	2.14477E-03	0.000000
6	2.58830E-05	1.42061E-05	1.50565E-07	0.00000E+00	2.14505E-03	0.000000
7	1.29770E-05	7.11322E-06	1.50602E-07	0.00000E+00	2.14519E-03	0.000000
8	1.29860E-05	3.55999E-06	1.50614E-07	0.00000E+00	2.14525E-03	0.000000
9	1.29902E-05	1.78138E-06	1.50619E-07	0.00000E+00	2.14528E-03	0.000000

DATE=09/28/76

DM	EM	T	ION STRENGTH	PCO2 ATM	HC03 ALK	MG/L HC03 ALK	MG/L TCT HC03	MG/L TCT CO3			
5.45	9.0000	20.00	0.50185	0.5043959	3.409033E-03	202.3138	202.2533	0.0027			
CALC MG/L CAT		CALC MG/L AN		AM2G	CO3CALC	PH2O ATM	DENSITY	TCS MG/L			
455.209		444.321		C.9844	5.8340E-C8	0.0231	1.0000	27427.28			
ION		ANAL PPM	CALC PPM	ANAL MG/L	CALC MG/L	ANAL MOLAL	CALC MOLAL	ALFA	GAMMA	P ION	
2	CA +2	2	1360.0000	1342.8188	1360.0000	1342.8188	3.4889E-02	3.4448E-02	9.070HF-C3	0.203310	2.0424
1	MG +2	2	17.2000	17.0747	17.2000	17.0747	7.2742E-04	7.2212E-04	2.0269F-C4	0.200003	3.0352
2	NA +1	1	8100.0000	7903.5715	8100.0000	7903.5715	3.6227E-01	3.5348E-01	2.4131E-C1	0.002079	0.0174
3	K +1	1	1050.0000	1048.2000	1050.0000	1048.2000	2.7610E-02	2.7563E-02	1.7745E-02	0.003700	1.7504
4	CL -1	-1	15850.0000	15634.2562	15850.0000	15634.2562	4.5568E-01	4.5342E-01	2.5151E-01	0.003700	0.5247
5	SA -2	-2	42.8000	21.6771	42.8000	21.6771	4.5811E-04	2.3202E-04	4.3810E-C5	0.100010	4.3534
6	MG23 -1	-1	202.0000	163.4591	202.0000	163.4591	3.4039E-03	2.7544E-03	2.0003E-03	0.120000	2.0000
7	H +1	1		0.0043		0.0043		4.4245E-06	3.5481E-C6	0.001021	0.0010
8	CA -1	-1		0.0000		0.0000		2.8153E-09	1.8697E-C9	0.000000	0.0000
9	SA23	0		511.8467		511.8467		5.4755E-C3	6.2339E-C3	1.130010	2.2052
10	SA23	0	320.0000	320.0000	320.0000	320.0000	5.4760E-03	5.4760E-03		0.001100	0.0011
11	SA +1	1		0.0001	0.0400	0.0001	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
12	AL +3	3	14.0000	13.7506	14.0000	13.7506	1.0481E-04	1.0294E-04	2.3368E-C5	0.000000	0.0000
13	CA +1	1		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
14	CA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
15	SA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
16	SA +3	3		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
17	SA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
18	SA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
19	SA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
20	SA +2	2		0.0000	0.0000	0.0000	1.5243E-06	1.9143E-09	1.8073E-10	0.000000	0.0000
21	LI +1	1	40.0000	40.0000	40.0000	40.0000	5.9271E-03	5.9271E-03	4.3971E-C2	0.100000	2.3500
22	SA +2	2	0.9500	0.9107	0.9500	0.9107	1.7780E-05	1.7045E-05	4.4481E-C6	0.200010	5.3470
23	NA +3	3		0.0000		0.0000	1.7780E-05	1.7045E-05	4.4481E-C6	0.000000	0.0000
24	SA +2	2		0.0000	0.0000	0.0000	1.7780E-05	1.7045E-05	4.4481E-C6	0.000000	0.0000
25	SA +2	2	320.0000	316.3736	320.0000	316.3736	3.7551E-03	3.7126E-03	8.4274E-C4	0.200000	0.0000
26	SA +2	2	0.0700	0.0521	0.0700	0.0521	1.1010E-06	8.2007E-07	2.1594E-C7	0.000000	0.0000
27	HA2503 -	-1	0.5000	0.0001	0.5000	0.0001	3.9263E-06	6.9183E-10	4.7210E-10	0.000000	0.0000
28	SA -3	-3		0.9235	0.9900	0.9235	5.3579E-05	4.5975E-05	3.3146E-C5	0.000000	0.0000
29	F -1	-1	0.9900	0.9235	0.9900	0.9235	5.3579E-05	4.5975E-05	3.3146E-C5	0.000000	0.0000
30	HA23 AQ	0	55.7600	55.7451	55.7600	55.7451	9.2721E-04	9.2696E-04	1.0554E-C3	1.130010	2.4700
31	HA23 AQ	0	38.4700	38.4700	38.4700	38.4700	2.3226E-C3	2.3226E-C3		1.130010	0.0000
32	HA23 AQ	0	5.4716	5.4716	5.4716	5.4716	1.7197E-04	1.6508E-04	1.8794E-C4	1.130010	3.7200
33	ALF +2	2		0.0101		0.0101		2.2515E-07	5.4435E-C8	0.201001	7.2001
34	ALF2 +1	1		0.0656		0.0656		1.0373E-06	7.5329E-C7	0.720000	5.1200
35	ALF3	0		0.0201		0.0201		2.4576E-07	2.7560E-C7	1.130010	6.5500
36	ALF4 -1	-1		0.0003		0.0003		3.2625E-09	2.2821E-C9	0.000000	0.0000
37	ALF4 +2	2		0.0001		0.0001		2.3897E-09	5.7775E-C9	0.000000	0.0000
38	ALF4 +2	1		0.0005		0.0005		8.5040E-09	6.1756E-C9	0.720000	6.2000
39	ALF4 +2	-1		0.0000		0.0000		2.3135E-12	1.6182E-12	0.000000	0.0000
40	ALF4 +2	1		0.0000		0.0000		1.1131E-11	7.7862E-12	0.000000	0.0000
41	ALF4 +2	-1		0.0000		0.0000		3.6278E-14	2.5376E-14	0.000000	0.0000
42	AGCL	0								1.130010	0.0000
43	AGCL2 -1	-1								0.000000	0.0000
44	AGCL3 -2	-2								0.000000	0.0000
45	AGCL4 -3	-3								0.000000	0.0000
46	AGCL4 -1	-1								0.000000	0.0000

0.000000	
1.130510	5.345
0.000000	22.0023
1.130510	9.7752
0.000000	5.9410
0.714844	11.1523
1.130510	6.6665
1.130510	6.5055
0.714866	3.5587
0.714866	9.5601
0.726198	
1.130510	
0.726198	
1.130510	4.1104
1.130510	
0.602079	
0.226997	
0.602079	
1.130510	
0.602079	
0.226997	
0.602079	
1.130510	
0.602079	24.9060
1.130510	25.4408
0.602079	25.9755
0.226997	26.5103
0.714844	7.3643
1.130510	11.4270
0.714844	16.7281
1.130510	0.3068
0.226997	18.3757
0.714844	18.2603
1.130510	19.8240
0.602079	22.3225
0.714844	19.5069
0.602079	37.2400
0.226997	16.1380
0.726198	16.5745
1.130510	16.9077
0.726198	20.1354
0.625000	6.8082
0.211707	12.0220
0.602079	6.4768
0.226997	17.9897
0.226997	16.4748
0.602079	14.9423
1.130510	18.1511
1.130510	6.7871
1.130510	1.7556
0.211707	7.0239
0.226997	
0.726198	
0.604199	5.3393
0.226997	16.9637
0.694490	7.9243
1.138510	
0.602079	
1.138510	
0.602079	

100	HL4 -2 -2	0
101	574	0
109	HGSH2512	0
110	HG(HS)3-	-1
111	HG	0
112	ACL	0
113	AC33 -1	-1
114	K4534	0
115	K524 -1	-1
116	KHPD4 -1	-1
117	L1(7M)	0
118	L1(5741-	-1
119	MG374 AQ	0
120	MGHC33+	1
121	MGF +1	1
122	MG(7M)+1	1
123	MS374 AQ	0
124	MS(PD4)-	-1
125	MSHPD4	0
126	MGH2PD4+	1
127	MACL +1	1
128	MACL2	0
129	MACL3 -1	-1
130	MACL4 -2	-2
131	MGHC33+1	1
132	MS374 AQ	0
133	MACL +2	2
134	MACL2 +1	1
135	MS3 -1	-1
136	MACL	0
137	MS33 -1	-1
138	MSHC33	0
139	MS23740	0
140	MS252+AQ	0
141	MS34 -1	-1
142	MSHPD4-1	-1
143	MS4 +1	1
144	MS47M	0
145	MS4PD4-2	-2
146	MS45341-	-1
147	PBCL +1	1
148	PACL2	0
149	PACL3 -1	-1
150	PBCL4 -2	-2
151	PS304 AQ	0
152	PS3242-2	-2
153	SP(7M)-1	-1
154	SPC3 AQ	0
155	SPHC33+	1
156	SP374 AQ	0
157	ZACL +1	1
158	ZACL2	0
159	ZACL3 -1	-1
160	ZACL4 -2	-2
161	ZAS24 AQ	0
162	ALF5 -2	-2
163	ALF6 -3	-3
164	PG(7M)+	1
165	PG(7M)2	0
166	MCL AQ	0

2.9484
0.0000
0.0000
0.8767

C.0000
0.0000
0.0009
0.2919
0.0235
0.0000
0.1419

0.0000
0.0748
0.0151
0.0000
0.0000
0.0041
0.0000
0.0000
47.4735
0.0092
19.4793
C.0000
0.0000
16.9339

40.7444
0.0047

0.0000

0.0000
0.0017
5.4347
0.8840
0.0195
0.0069
0.0034
0.0016
0.0003
C.0000
0.0000

0.0000

2.9484
0.0000
0.0000
0.8767

0.0000
0.0000
0.0009
0.2919
0.0235
0.0000
0.1419

0.0000
0.0748
0.0151
0.0000
0.0000
0.0041
0.0000
0.0000
477.4735
0.0092
19.4793
0.0000
0.0000
16.9339

40.7444
0.0047

0.0000

0.0000
0.0017
5.4347
0.8840
0.0195
0.0069
0.0034
0.0016
0.0003
0.0000
0.0000

0.0000

4.0662E-05	4.6254E-05
6.2456E-30	4.2189E-30
1.8552E-30	2.1121E-30
6.6691E-06	4.8431E-06
1.1085E-11	1.2620E-11
2.6948E-27	1.9264E-27
1.0623E-08	1.2054E-C6
3.5172E-06	2.4011E-C6
5.5763E-07	3.50C5E-C7
1.9572E-10	1.4754E-1C
1.2125E-06	1.38C4E-06
1.9191E-26	1.3101E-26
6.1126E-07	6.9553E-07
9.6294E-08	6.5738E-08
1.4356E-27	3.2589E-28
1.3150E-28	8.9715E-29
2.7722E-08	3.1561E-08
5.2392E-53	1.1893E-53
5.0853E-54	3.4717E-54
8.4003E-03	9.5639E-03
1.1426E-07	8.2576E-C8
2.3842E-04	2.7144E-C4
2.5407E-10	2.8976E-10
2.2408E-26	2.5512E-26
1.4625E-04	1.C621E-04
2.3224E-03	1.4426E-03
1.3931E-07	1.5861E-07
8.8412E-28	6.3201E-28
1.4113E-11	1.0C89E-11
1.1585E-08	1.3189E-08
3.7595E-05	2.5665E-05
4.9482E-06	5.6336E-06
1.9920E-07	1.3559E-07
5.1743E-08	5.8510E-C8
2.0298E-08	1.3857E-08
8.0232E-09	1.8212E-C9
1.6990E-09	1.9344E-09
7.7173E-12	1.7518E-12
3.9178E-15	1.8356E-16
4.1278E-13	

0.220997	
1.130510	
1.130510	
0.602679	
1.130510	
1.130510	4.3345
0.615500	29.3740
1.130510	29.6753
0.720198	5.3149
0.720198	
1.130510	10.8989
0.714044	26.7153
1.130510	7.7174
0.602679	5.6190
0.697690	6.4009
0.753014	9.0311
1.130510	5.8600
0.720198	
1.130510	
0.720198	
0.602679	25.0827
1.130510	6.1574
0.602679	7.1822
0.220997	27.4009
0.602679	28.0460
1.130510	7.5003
0.220997	52.9242
0.602679	53.4995
0.693790	
1.130510	2.0194
0.720198	7.0810
1.130510	3.9663
1.130510	9.5307
1.130510	25.5933
0.720198	3.9739
0.720198	
0.621165	2.0408
1.130510	6.7997
0.220997	
0.714044	27.1993
0.602679	
1.130510	
0.602679	
0.220997	
1.130510	
0.220997	
0.714044	
1.130510	10.9962
0.602679	7.8798
0.602679	4.5927
1.130510	5.2492
0.602679	6.8655
1.130510	7.2258
0.602679	7.0583
0.220997	8.7396
1.130510	0.7135
0.220997	11.7565
0.000052	15.7362
0.602679	
1.130510	
1.130510	

-1.5352E+07MHG12= -5.7663E+00MHG13= 1.3494E+08MHG14= 28E-57

MOLE RATIOS BASED ON ANALYTICAL MOLALITY

CL/CA	CL/MG	CL/NA	CL/K	CL/AL	CL/FE	CL/SO4	CL/MCO3	CA/MG	SORT(CA)/NA
1.3175E+01	6.3193E+02	1.2689E+00	1.6649E+01	3.0157E+05	2.8372E+03	1.0334E+03	1.3504E+02	4.7903E+01	5.1560E-01
NH3/NA	LI/NA	K/NA	MG/CA	SR/CA	BA/CA	SO4/CL	MCO3/CL	F/LL	B/CL
6.4112E-03	1.6361E-02	7.6215E-02	2.0850E-02	1.0763E-01	3.0041E-03	9.9659E-04	7.4049E-02	1.1050E-04	2.0171E-03

LOG OF ACTIVITY RATIOS

CA/M2	MG/M2	NA/M	K/H	AL/M3	FE/M2	CA/MG	NA/K
8.8576	7.2063	4.8326	3.6991	6.6070	6.5287	1.0508	1.1335

LOG(NA/K)+1/3LOG(SORT(CA)/NA) = 1.022E+00 LOG(NA/K)+4/3LOG(SORT(CA)/NA) = 7.344E-01

SUBSURFACE TEMPERATURE (OC) FROM CHEMICAL DATA

QTZ TEMP (CONDUCTIVE)= 216.4	QTZ TEMP (ADIABATIC)= 195.9
AM.SILICA TEMP WITH SI02= 89.6	AM.SILICA TEMP WITH H4SI04= 89.6
CHAL. TEMP WITH SI02= 199.2	CHAL. TEMP WITH H4SI04= 199.2
A.CRISTOB. TEMP WITH SI02= 166.4	A.CRISTOB. TEMP WITH H4SI04= 166.4
LOG(NA/K)+1/3LOG(SORT(CA)/NA) TEMP= 216.1	LOG(NA/K)+1/3LOG(SORT(CA)/NA) TEMP= 231.7
LOG(NA/K)+4/3LOG(SORT(CA)/NA) TEMP= 280.6	LOG(NA/K)+4/3LOG(SORT(CA)/NA) TEMP - 1PCO2 = 113.5

IF THE SPRING IS BOILING OR STEAM IS LOST DURING REDUCTION THEN SELECT QTZ TEMP ADIABATIC ELSE SELECT QTZ TEMP CONDUCTIVE
 AM.SILICA TEMP SHOULD BE CONSIDERED IF SAMPLE IS SATURATED WITH AM.SILICA I.E. IF DELG OF MIN.NC.275 IS POSITIVE
 H4/K TEMP IS USEFUL IF CONC. OF CA IS LOW (MORE DECS) VS NA
 USE --4/3LOG-- TEMP IF <100 ELSE USE--1/3-- TEMP
 READ FOURNIER & TROUSCELL 1973

MESA 6-1 UNFLASHED FLUID

SAMPLED: 6-9-76

ANALYSIS: USBR

PHASE	AP	KT	LOG AP	LOG KT	AP/KT	DELG	LCG AP/KT
139 AG		2.1090E-01		-0.6759			
140 AG2S A		1.5773E-22		-21.8021			
141 AGCL		1.1537E-10		-9.9379			
142 ADJLARIA	5.2199E+03	2.5966E+01	3.7177	1.4144	2.0103E+02	3.0896	2.3033
143 AKEPMANI	3.2997E+20	4.2863E+46	20.5185	46.6321	7.6583E-27	-35.0289	-26.1136
144 ALBITE L	7.0986E+04	1.4618E+04	4.8512	4.1649	4.8562E+00	0.9206	0.6863
145 ALPITE M	7.0986E+04	1.8217E+05	4.8512	5.2605	3.8967E-01	-0.5490	-0.4093
146 ALUNITE			-92.0657	-85.9178		-8.2469	-6.1480
147 ANALCIME	1.0863E+07	4.8173E+09	7.0360	9.6828	2.2551E-03	-3.5505	-2.6468
148 ANALUSI	1.0046E+11	1.5831E+13	11.0020	13.1995	6.3459E-03	-2.9477	-2.1975
149 ANHYDRIT	3.9739E-07	2.4770E-05	-6.4008	-4.6061	1.6043E-02	-2.4074	-1.7947
150 ANNITE	1.8903E+23	2.0640E+27	23.2765	27.3147	9.1581E-05	-5.4169	-4.0382
151 APATCHUR		1.2585E-66		-65.9000			
152 APATELUP				-71.6225			
153 APATHYDIX		9.4293E-62		-61.0255			
154 APASCHIT	2.1566E-10	4.8137E-09	-9.6662	-8.3175	4.4802E-02	-1.8092	-1.3487
155 BASITE	1.0238E-09	1.6581E-10	-8.5898	-9.7804	6.1744E+00	1.0605	0.7506
156 BILITE		9.9770E+59		59.9990			
157 BIFENITE	3.9210E+06	6.7773E+08	6.5934	8.9434	4.4672E-03	-3.1522	-2.3500
158 BOPHITE				-117.0616			
159 BPOCITE	7.0474E-22	5.9781E-12	-21.1495	-11.2234	1.1856E-10	-13.3149	-9.9261
160 CALCITE	2.1566E-10	3.2876E-09	-9.6662	-8.4831	6.5599E-02	-1.5870	-1.1831
161 CACIZ	7.7294E-04	5.4260E+11	-3.1119	11.7345	1.4245E-15	-19.5149	-14.8463
162 CAD LIME	7.0910E+08	1.6245E+33	8.8508	33.2107	4.3662E-25	-32.6765	-24.3559
163 CAICHIZ	3.1717E-20	4.8906E-06	-19.4987	-5.3106	6.4853E-15	-19.0319	-14.1881
164 CAS	1.1703E-02	1.3991E+12	-1.9317	12.1458	8.3651E-15	-18.8837	-14.0775
165 CELESTIT	3.6921E-08	4.0828E-07	-7.4327	-6.3890	9.0429E-02	-1.4030	-1.0437
166 CHALCEDON	6.4328E-03	2.4647E-04	-2.1916	-3.6082	2.6100E+01	1.9003	1.4166
167 CHLOR MG	3.9054E+42	4.3926E+60	42.5917	60.6427	8.8908E-19	-24.2138	-18.0511
168 CRYSTICOL		9.9770E+59		59.9990			
169 CRYSTIL	1.5967E+17	7.4377E+32	17.2032	32.8714	2.1468E-16	-21.0174	-15.6682
170 CRYSTAPAR		3.8350E-41		-40.4162			
171 CRYSTMET		9.5552E-40		-39.0198			
172 CLINENST	1.0196E+05	4.0926E+11	5.0084	11.6120	2.4913E-07	-8.8581	-6.6036
173 CLINPTIL	2.9501E+07	9.9770E+59	7.4658	59.9990			
174 COPJNCUM	1.5618E+13	2.1558E+18	13.1936	18.3336	7.2446E-06	-6.8948	-5.1400
175 CRISTODIA	6.4328E-03	3.8328E-04	-2.1916	-3.4165	1.6783E+01	1.6431	1.2249
176 CRISTORR	6.4328E-03	1.3980E-03	-2.1916	-2.8545	4.6013E+00	0.8892	0.6629
177 CU		1.7711E+04		4.2482			
178 CU2O		2.7335E-02		-1.5633			
179 CU2S		5.1135E-36		-35.2913			
180 CUSFES6		9.9770E+59		59.9990			
181 CUFES2		2.7265E-45		-44.5644			
182 CUFES23		9.9770E+59		59.9990			
183 CUD		1.0900E+08		8.0374			
184 CUS		4.6191E-23		-22.3354			
185 CUMMINGT	1.2990E+28	9.9770E+59	28.1136	59.9990			
186 CICKITE	6.2629E+08	1.1605E+09	8.7968	9.0648	5.3948E-01	-0.3595	-0.2680
187 DIMPSIDE	4.6521E+11	1.8382E+20	11.6676	20.2644	2.5307E-09	-11.5317	-8.5968
188 DOLOMITE	1.0393E-21	1.2512E-17	-20.9833	-16.9025	8.3028E-05	-5.4740	-4.0808
189 ENSTATIT	1.0196E+05	9.9770E+59	5.0084	59.9990			
190 ERICHITE	4.8377E+13	9.9770E+59	13.6846	59.9990			
191 FAYALITE	7.1152E+10	4.7652E+17	10.8522	17.6781	1.4932E-07	-9.1563	-6.8259
192 FEASS		9.9770E+59		59.9990			
193 FECL2	3.6242E-06	1.3728E+08	-5.4408	8.1376	2.6401E-14	-18.2141	-13.5784

194	FECL3	1.4830E-21	6.1004E+12	-20.8274	12.7854	2.4391E-34	-45.0883	-33.6128
195	FECC3	1.0112E-12	2.3464E-11	-11.9952	-10.6296	4.3056E-02	-1.8318	-1.3656
196	FEJ	3.3258E+06	4.6217E+12	6.5219	12.6648	7.1961E-07	-8.2401	-6.1429
197	FEZD3MEN	1.7107E-06	2.8377E-02	-5.7668	-1.5470	6.0294E-05	-5.6604	-4.2197
198	FEZD3JH	1.7107E-06	2.5119E+06	-5.7668	6.4000	6.8114E-13	-16.3206	-12.1668
199	FE374	5.6902E+00	1.5560E+07	0.7551	7.1920	3.6570E-07	-8.6344	-6.4369
200	FECH3BM	3.9112E-46	3.4527E-38	-45.4077	-37.4618	1.1328E-08	-10.6586	-7.7458
201	FE52 PYR	2.2822E-65		-64.6416	-104.6442		53.6597	40.0026
202	FE52PCLT	5.4876E-05	1.6774E-50	-4.2606	-49.7754	3.2714E+45	61.0537	45.5147
203	FE5HAKIN	5.4476E-05	9.9777E+59	-4.2606	59.9990			
204	FE5TEPI	1.6109E+12	8.0415E+29	12.2084	29.9054	2.0095E-18	-23.7387	-17.6969
205	FLUCPITE	9.9990E-12	1.7336E-11	-11.0002	-10.7610	5.7657E-01	-0.3208	-0.2391
206	CRATHITE	1.2773E-03	1.2845E-01	-2.8868	-0.8911	1.0100E-02	-2.6770	-1.9557
207	GIPPS AV	1.1417E-36	2.6033E-33	-35.9275	-32.5845	4.5392E-04	-4.4843	-3.3430
208	GIPPS C	1.1417E-36	1.1360E-33	-35.9275	-32.9446	1.0403E-03	-4.0012	-2.9829
209	GREENALL	1.4752E+15	6.3096E+23	15.1688	73.8000	2.3380E-09	-11.5777	-8.6312
210	CRIGITE	4.2176E-43	1.9953E-20	-42.3749	-19.7000	2.1138E-23	-30.4163	-22.6749
211	GYPSSUM	3.8511E-07	1.3627E-05	-6.4144	-4.8656	2.8261E-02	-2.0776	-1.5488
212	HALITE	7.0442E-07	3.6860E+01	-1.1522	1.5666	1.9111E-03	-3.6469	-2.7187
213	HALLCYSI	6.2627E+08	7.0120E+11	8.7968	11.8458	8.9317E-04	-4.0900	-3.0491
214	HJLANDI	4.5953E+06	9.9777E+59	6.6623	59.9990			
215	KOJ		3.5521E+02		2.5505			
216	KUATITE	2.4137E-44	1.3840E-32	-43.6173	-31.9650	2.2266E-12	-15.6305	-11.6523
217	KYCPYAGN	7.5674E-56	6.3096E-31	-55.1211	-30.2000	1.1994E-25	-33.4292	-24.4211
218	ILLITE	3.2550E+11	8.4008E+10	11.5126	10.9243	3.8754E+00	0.7892	0.5883
219	KACLINIT	6.2625E+08	1.2990E+08	8.7968	8.1136	4.8214E+00	0.9164	0.6832
220	KENVAITE	4.8451E-20	1.0000E-25	-19.3125	-25.0000	4.8691E+05	7.6292	5.6875
221	KYALITE	1.0746E+11	1.9657E+13	11.0020	13.2935	5.1108E-03	-3.0738	-2.2915
222	KZT	2.4627E+07		7.3913	85.1804		-104.3466	-77.7891
223	LAPLITE	3.2761E+15	2.9074E+39	15.5101	39.4638	1.1123E-24	-32.1317	-23.9538
224	LALMYTIT	1.7614E+13	2.7568E+12	13.2508	12.4404	6.4619E+00	1.0870	0.8104
225	LEJITE	8.1145E+05	1.4465E+10	5.5093	10.1603	5.6098E-05	-5.7024	-4.2511
226	LELITE	1.1574E-16	9.9777E+59	-15.5391	59.9990			
227	MAGADITE	2.8660E-11	4.5705E-15	-10.5427	-14.3400	6.2701E+03	5.0937	3.7573
228	MAGNESIT	4.8192E-12	1.0816E-08	-11.3170	-7.9658	4.4546E-04	-4.4953	-3.3512
229	MELACRIT		4.8404E-34		-33.3144			
230	MALIALIT	2.5197E+13	1.4765E+02	13.4014	2.1694	1.7061E+11	15.0666	11.2320
231	MELOLITE	2.0772E+43	9.9777E+59	43.3175	59.9990			
232	MERANIT	2.3405E+29	6.2621E+69	29.3693	69.7967	3.7375E-41	-54.2295	-40.4274
233	MOL2	1.7272E-05	4.0873E+22	-4.7627	22.6114	4.2257E-28	-36.7197	-27.3741
234	MSEF234	2.7118E+01	4.0896E+19	1.4333	19.6117	6.6310E-19	-24.3846	-18.1784
235	MCPERIC	1.5850E+07	1.3120E+22	7.2000	22.1179	1.2081E-15	-20.0109	-14.9179
236	MICROCLIN	5.2179E+03	2.7522E+01	3.7177	1.4397	1.8566E+02	3.0557	2.7780
237	MICROCLIT	2.1805E-06	4.2768E-02	-5.6614	-1.3689	5.0985E-05	-5.7581	-4.7926
238	MOL2	3.2244E-07	1.0425E+09	-6.4174	9.0181	3.6685E-16	-20.7053	-15.4355
239	MOL73	1.0671E-13	3.1827E-11	-12.9718	-10.4972	3.3527E-03	-3.3194	-2.4746
240	MOL	3.5055E+05	2.1094E+18	5.5452	18.3242	1.6637E-13	-17.1417	-12.7789
241	MOL2	2.2614E-38		-37.6456	-79.9479		56.7445	42.3023
242	MOL	5.7907E-06	5.2723E-01	-5.2373	-0.2780	1.0983E-05	-6.6524	-4.9553
243	MOLYTICEL	7.2318E+13	9.6578E+30	13.8592	30.9849	7.4881E-18	-22.9724	-17.1256
244	MONT CA	6.2900E+08	4.9059E+06	8.7986	6.6907	1.2821E+02	2.8276	2.1079
245	MONT R	3.4684E+08	2.3817E+06	8.5401	6.3769	1.4563E+02	2.9018	2.1633
246	MONT MG	3.1700E+08	3.9562E+06	8.5012	6.5973	8.0147E+01	2.5539	1.9039
247	MONT NA	8.2068E+08	4.4734E+06	8.9142	6.6506	1.8346E+02	3.0363	2.2635
248	MONTICANA		9.9777E+59		59.9990			
249	MONTSEAN		9.9777E+59		59.9990			
250	MORGENIT	1.2042E+00	9.9777E+59	0.0807	59.9990			
251	MUSCOVIT	8.0253E+16	2.1435E+10	16.9045	10.3311	3.7440E+06	8.8175	6.5733
252	NA2O	4.5035E+09	1.7604E+68	9.6583	68.2456	2.5867E-59	-78.5842	-58.5873
253	NA2S74	2.5512E-06	6.1921E-01	-5.5933	-0.2082	4.1200E-06	-7.2236	-5.1851

254	ADCOLIT	4.8269E-04	6.6558E+05	-3.3163	5.8232	7.2522E-10	-12.2598	-9.1395
255	ADTECA	1.1834E-09	2.2833E-02	-8.9269	-1.6414	5.1827E-08	-9.7727	-7.2654
256	ADTTHOM	1.3629E-09	1.7425E+00	-8.8655	0.0181	1.3074E-09	-11.9165	-8.8836
257	ADTFLIN	1.7155E+09	1.2458E+15	9.2344	15.0954	1.3770E-06	-7.8621	-5.8611
258	ADTJUCH	4.5975E-12	2.8215E-05	-11.3375	-4.5455	1.6254E-07	-9.1054	-6.7880
259	ADCLITE		9.9770E+59		59.9990			
260	ADCL2IC		7.0921E-19		-18.1498			
261	ADCL2		8.7531E-06		-5.0578			
262	ADCL3		2.9802E-14		-13.5258			
263	ADCLITHR		8.7951E+12		12.9442			
264	ADCLASIC		1.2253E+13		13.0882			
265	ADCL5		1.2410E-15		-14.9062			
266	ADCL54		1.6175E-08		-7.7910			
267	ADCLLIPS	1.8950E+04	1.2589E-07	4.2776	-6.9000	1.5052E+11	14.9937	11.1776
268	ADCLGPTF	2.9250E+05	3.9344E+21	5.4667	21.5949	7.4446E-17	-21.6344	-16.1282
269	ADCLG(AM)	4.5339E+17	4.7584E+25	17.6612	25.6773	9.6373E-09	-10.7528	-8.0160
270	ADCLITE	2.0599E+24	2.4233E+33	24.3136	33.3844	8.4966E-10	-12.1676	-9.0708
271	ADCLPMYL	2.6326E+04	5.0211E+01	4.4204	1.7008	5.2431E+02	3.6481	2.7196
272	ADCLTZ	6.4328E-03	8.8194E-05	-2.1916	-4.0546	7.2939E+01	2.4990	1.8630
273	ADCLTMI	5.2199E+03	4.7395E+01	3.7177	1.6812	1.0876E+02	2.7317	2.0365
274	ADCLTIT	6.4405E+07	1.4336E+19	7.8116	19.1565	4.5159E-12	-15.2181	-11.3449
275	ADCLICAM	6.4328E-03	8.3900E-04	-2.1916	-3.0762	7.6672E+00	1.1867	0.8846
276	ADCLICGEL	6.4328E-03	1.7682E-03	-2.1916	-2.7525	3.6381E+00	0.7524	0.5609
277	ADCLITMAN	1.0546E+11	3.9674E+13	11.0020	13.5987	2.5310E-03	-3.4832	-2.5967
278	ADCLJEL	2.6754E+20	7.8386E+33	20.3936	33.8942	3.1579E-14	-18.1098	-13.5006
279	ADCLJ	2.0337E-11	9.5852E-12	-10.6982	-11.0184	2.0904E+00	0.4296	0.3202
280	ADCLJGPT		6.5750E-28		-27.1818			
281	ADCLVITE	5.1759E-03	5.2959E+00	-2.2857	0.7232	9.7976E-04	-4.0361	-3.0089
282	ADCLC	6.7119E+12	2.8195E+19	12.8268	19.4502	2.3802E-07	-8.8847	-6.6234
283	ADCLJGPT	1.4526E+36	5.4240E+57	36.1621	57.7343	2.6780E-22	-28.9370	-21.5722
284	ADCLLA	6.4764E-13	6.6060E-03	-12.1887	-2.1800	9.8024E-11	-13.4257	-10.0087
285	ADCLJGPT	1.8332E+13	1.7238E+18	13.2644	18.2365	1.0664E-05	-6.6656	-4.9721
286	ADCLJGPT	5.5555E-13	4.3495E-14	-12.2552	-13.3615	1.2772E+01	1.4840	1.1063
287	ADCLLASIC	4.5627E+06	1.8457E+13	6.6552	13.2662	2.4721E-07	-8.8626	-6.6069
288	ADCLJGPT	5.1340E-15	2.1466E-10	-14.2895	-9.6682	2.3916E-05	-6.1990	-4.6213
289	ADCLJGPT	1.6885E+04	9.4206E+11	4.2275	11.9741	1.7924E-08	-10.3913	-7.7466
290	ADCLJGPT	2.7361E-07	1.1730E-12	-6.5550	-11.9307	2.3753E+05	7.2110	5.3757
291	ADCLJGPT	9.4600E-12	7.4913E+04	-11.0241	4.8746	1.2628E-16	-21.3265	-15.8987
292	ADCLJGPT	8.2009E+30	1.4155E+41	30.9139	41.1510	5.7919E-11	-13.7322	-10.2372
293	ADCLJGPT		1.0000E-36		-36.0000			
294	ADCLJGPT	1.0000E+00	1.0662E-07	0.0000	-6.9722	9.3791E+06	9.3525	6.9722
295	ADCL2IC		5.0872E-15		-14.2935			

DU*MY VALUE FOR LCGKT=59.9990,KT=9.9770E+59

UNFLASHED FLUID
Q/L CAT= 79.3678

SAMPLED: 6-3-76
ANAL MEC/L AN= 72.9132

ANALYSIS: USBR

ITER

S1-ANALCC3

S2-ANALSO4

S3-ANALF

S4-ANALPD4

S5-ANALCL

ELEC. IMBALANCE

1

2.75058E-04

4.92647E-04

2.45035E-06

0.00000E+00

3.65467E-04

0.000000

2

1.37915E-04

2.46905E-04

1.25769E-06

0.00000E+00

1.83078E-04

0.000000

3

6.93744E-05

1.24488E-04

6.46175E-07

0.00000E+00

1.83606E-04

0.000000

4

3.48974E-05

6.27495E-05

3.32035E-07

0.00000E+00

1.83873E-04

0.000000

5

3.49594E-05

3.16214E-05

1.70624E-07

0.00000E+00

1.84006E-04

0.000000

6

3.50460E-05

1.59191E-05

1.70692E-07

0.00000E+00

1.84065E-04

0.000000

7

3.50695E-05

8.01393E-06

1.70725E-07

0.00000E+00

1.84095E-04

0.000000

DATE=09/28/76

PH	EM	T	ION STRENGTH	PCO2 ATM	HCO3 ALK	MG/L HCO3 ALK	MG/L TCT HCO3	MG/L TOT CO3		
6.12	9.0000	20.00	0.07776	0.3543056	9.250893E-03	561.6305	561.4500	0.0887		
CALC MEQ/L CAT	CALC MEQ/L AN	AM2O	CO3CALC	PH2O ATM	DENSITY	TCS MG/L				
79.160	72.120	0.9971	9.6042E-07	0.0231	1.0000	5064.68				
ION	ANAL PPM	CALC PPM	ANAL MG/L	CALC MG/L	ANAL MOLAL	CALC MOLAL	ALFA	GAMMA	P ION	
0 CA +2	2	16.4000	14.9108	16.4000	14.9108	4.1126E-04	3.7392E-04	1.6255E-04	0.434719	3.7890
1 MG +2	2	0.2400	0.2266	0.2400	0.2266	9.9219E-06	9.3660E-06	4.1709E-06	0.443320	5.3798
2 NA +1	1	1700.0000	1678.2122	1700.0000	1678.2122	7.4322E-02	7.3370E-02	5.8238E-02	0.793767	1.2348
3 K +1	1	150.0000	149.5133	150.0000	149.5133	3.8556E-03	3.8431E-03	2.9989E-03	0.780317	2.5230
4 CL -1	-1	2142.0000	2135.5929	2142.0000	2135.5929	6.0726E-02	6.0544E-02	4.7243E-02	0.730317	1.3257
5 SO4 -2	-2	156.0000	120.2428	156.0000	120.2428	1.6322E-03	1.2581E-03	4.8872E-04	0.388462	3.3109
6 HCC3 -1	-1	560.0000	545.6535	560.0000	545.6535	9.2244E-03	8.9881E-03	7.2816E-03	0.811130	2.1378
7 H +1	1		0.0009		0.0009		9.0025E-07	7.5858E-07	0.862628	6.1200
8 OH -1	-1		0.0002		0.0002		1.1253E-08	8.8550E-09	0.787246	8.0526
9 AM2O	0								1.021401	
10 H4SiO4	0	430.1710		430.1710		4.4983E-03	4.5949E-03		1.021401	2.3377
11 SiO2 AQ	0	269.0000	269.0000	269.0000	269.0000	4.4998E-03	4.4998E-03		1.021401	
12 AG +1	1								0.772940	
13 AL +3	3	0.0300	0.0000	0.0300	0.0000	1.1175E-06	2.9786E-10	6.0202E-11	0.202112	10.2204
14 BA +2	2	0.2500	0.2204	0.2500	0.2204	1.8296E-06	1.6130E-06	6.6517E-07	0.412393	6.1771
15 CU +1	1								0.772940	
16 CU +2	2								0.434719	
17 FE +2	2								0.202112	
18 FE +3	3								0.388462	
19 HG2 +2	2								0.412393	
20 HG +2	2								0.412393	
21 LI +1	1	4.0000	4.0000	4.0000	4.0000	5.7939E-04	5.7939E-04	4.7302E-04	0.816413	3.3251
22 MN +2	2	0.5000	0.4830	0.5000	0.4830	9.1475E-06	8.8369E-06	3.8416E-06	0.434719	5.4155
23 MN +3	3								0.202112	
24 PB +2	2								0.403036	
25 SR +2	2	6.4000	5.8834	6.4000	5.8834	7.3415E-05	6.7488E-05	2.7832E-05	0.412393	4.5555
26 ZN +2	2								0.434719	
27 H2ASO3 -	-1	0.4200	0.0003	0.4200	0.0003	3.2240E-06	2.5455E-09	2.0206E-09	0.793767	8.6945
28 PO4 -3	-3								0.135059	
29 F -1	-1	1.2300	1.1873	1.2300	1.1873	6.5072E-05	6.2814E-05	4.9450E-05	0.787246	4.3058
30 H3BO3 AQ	0	42.6100	42.5708	42.6100	42.5708	6.9262E-04	6.9198E-04	7.0683E-04	1.021401	3.1507
31 NH3 AQ	0	13.9000	13.9000	13.9000	13.9000	8.2033E-04	8.2033E-04		1.021401	
32 H2S AQ	0	1.6000	1.3939	1.6000	1.3939	4.7187E-05	4.1110E-05	4.1993E-05	1.021401	4.3768
33 ALF +2	2		0.0029		0.0029		6.4082E-08	2.7011E-08	0.421509	7.5685
34 ALF2 +1	1		0.0444		0.0444		6.8731E-07	5.5681E-07	0.810130	6.2543
35 ALF3	0		0.0252		0.0252		3.0162E-07	3.0809E-07	1.021401	6.5113
36 ALF4 -1	-1		0.0005		0.0005		4.6796E-09	3.7433E-09	0.799515	8.4267
37 ALICM+2	2		0.0001		0.0001		2.1631E-09	9.1175E-10	0.421509	9.0431
38 ALIDM+2	1		0.0035		0.0035		5.6994E-08	4.6172E-08	0.810130	7.3356
39 ALIDM+4-	-1		0.0000		0.0000		3.3949E-10	2.7157E-10	0.799915	9.5661
40 ALIS04+	1		0.0000		0.0000		3.6170E-11	2.8933E-11	0.799915	10.5336
41 ALS0412-	-1		0.0000		0.0000		1.3150E-12	1.0519E-12	0.799915	11.9780
42 AGCL	0								1.021401	
43 AGCL2 -1	-1								0.793767	
44 AGCL3 -2	-2								0.412393	
45 AGCL4 -3	-3								0.152070	
46 AGIS041-	-1								0.793767	

47	AGSO42-3 -3						0.152070	
48	H3AS03 0	0.4037	0.4037	3.2215E-06	3.2906E-06	1.021461	5.4827	
49	AS04 -3 -3					0.152070		
50	BAC03 AC 0	0.0000	0.0000	7.9612E-11	8.1320E-11	1.021461	10.0898	
51	BAHC03+ 1	0.0295	0.0295	1.4954E-07	1.1870E-07	0.793767	6.9256	
52	BA10H+1 1	0.0000	0.0000	1.1787E-12	9.4973E-13	0.805720	12.0224	
53	BAS04 AC 0	0.0156	0.0156	6.6997E-08	6.8435E-08	1.021461	7.1647	
54	CAC03 AQ 0	0.0093	0.0093	9.3272E-08	9.5274E-08	1.021461	7.0210	
55	CAMC03+ 1	2.2202	2.2202	2.2073E-05	1.8021E-05	0.816410	4.7442	
56	CA10H+1 1	0.0000	0.0000	2.8638E-11	2.3380E-11	0.816410	10.6311	
57	CAPO4 -1 -1					0.810136		
58	CAMP04 0					1.021461		
59	CAM2PO4+ 1					0.810136		
60	CAS04 AQ 0	2.0560	2.0560	1.5178E-05	1.5504E-05	1.021461	4.8056	
61	CUCL 0					1.021461		
62	CUCL2 -1 -1					0.793767		
63	CUCL3 -2 -2					0.412393		
64	CUCL +1 1					0.793767		
65	CUCL2 0					1.021461		
66	CUCL3 -1 -1					0.793767		
67	CUCL4 -2 -2					0.412393		
68	CUI0H+1 1					0.793767		
69	CUS04 0					1.021461		
70	FECL +1 1					0.793767		
71	FECL2 0					1.021461		
72	FECL3 -1 -1					0.793767		
73	FECL4 -2 -2					0.412393		
74	FE10H+1 1					0.805720		
75	FE10H2 0					1.021461		
76	FE00H -1 -1					0.805720		
77	FES04 0					1.021461		
78	FECL +2 2					0.412393		
79	FECL2 +1 1					0.805720		
80	FECL3 0					1.021461		
81	FECL4 -1 -1					0.793767		
82	FES04 +1 1					0.805720		
83	FES0412- -1					0.793767		
84	FE10H+2 2					0.412393		
85	FE10H2+ 1					0.810136		
86	FE10H3 0					1.021461		
87	FE10H4- -1					0.810136		
88	H418041- -1	0.0500	0.0500	6.3719E-07	4.9347E-07	0.774453	6.3067	
89	H2S104-2 -2	0.0000	0.0000	5.7633E-12	2.4293E-12	0.421509	11.6145	
90	H3S1041- -1	0.1371	0.1371	1.4487E-06	1.1459E-06	0.793767	5.9393	
91	HAS03 -2 -2	0.0000	0.0000	6.5292E-16	2.6526E-16	0.412393	15.5698	
92	HAS04 -2 -2					0.412393		
93	H2AS04 - -1					0.793767		
94	H3AS04 0					1.021461		
95	HF AQ 0	0.0010	0.0010	5.0908E-08	5.2001E-08	1.021461	7.2840	
96	H2CO3 0	825.5218	825.5218	1.3377E-02	1.3664E-02	1.021461	1.8644	
97	CO3 -2 -2	0.0573	0.0573	9.6042E-07	4.0482E-07	0.421509	6.3927	
98	HP04 -2 -2					0.412393		
99	H2PC4 -1 -1					0.810136		
100	HS -1 -1	0.2000	0.2000	6.0772E-06	4.7842E-06	0.787246	5.3202	
101	S -2 -2	0.0000	0.0000	1.2885E-16	5.3139E-17	0.412393	16.2746	
102	HS04 -1 -1	0.0034	0.0034	3.5485E-08	2.8389E-08	0.799913	7.5469	
103	HNO3 AQ 0	0.0000	0.0000	3.1111E-14	3.1778E-14	1.021461	13.4979	
104	MGCL +1 1					0.793767		
105	MGCL2 0					1.021461		
106	MGCL3 -1 -1					0.793767		

IC	MGCL4 -2 -2	0.0919	0.0919	1.2396E-06	1.2662E-06	0.412393
107	MGCL4 -2 -2	0.0000 <td>0.0000 <td>1.5344E-29</td> <td>1.2140E-25</td> <td>1.021461</td> </td>	0.0000 <td>1.5344E-29</td> <td>1.2140E-25</td> <td>1.021461</td>	1.5344E-29	1.2140E-25	1.021461
108	MG504	0.0000 <td>0.0000 <td>8.3345E-31</td> <td>8.5133E-31</td> <td>1.021461</td> </td>	0.0000 <td>8.3345E-31</td> <td>8.5133E-31</td> <td>1.021461</td>	8.3345E-31	8.5133E-31	1.021461
109	MGSH2512 0	1.5156 <td>1.5156 <td>1.1270E-05</td> <td>9.1306E-06</td> <td>0.793767</td> </td>	1.5156 <td>1.1270E-05</td> <td>9.1306E-06</td> <td>0.793767</td>	1.1270E-05	9.1306E-06	0.793767
110	MGH513- -1	0.0000 <td>0.0000 <td>6.2968E-12</td> <td>6.4320E-12</td> <td>1.021461</td> </td>	0.0000 <td>6.2968E-12</td> <td>6.4320E-12</td> <td>1.021461</td>	6.2968E-12	6.4320E-12	1.021461
111	MG	0.0000 <td>0.0000 <td>2.8692E-27</td> <td>2.3117E-27</td> <td>0.805720</td> </td>	0.0000 <td>2.8692E-27</td> <td>2.3117E-27</td> <td>0.805720</td>	2.8692E-27	2.3117E-27	0.805720
112	KCL	0.0000 <td>0.0000 <td>4.1483E-09</td> <td>4.2373E-09</td> <td>1.021461</td> </td>	0.0000 <td>4.1483E-09</td> <td>4.2373E-09</td> <td>1.021461</td>	4.1483E-09	4.2373E-09	1.021461
113	KC03 -1 -1	0.0000 <td>0.0000 <td>2.2659E-07</td> <td>1.7986E-07</td> <td>0.793767</td> </td>	0.0000 <td>2.2659E-07</td> <td>1.7986E-07</td> <td>0.793767</td>	2.2659E-07	1.7986E-07	0.793767
114	KMS04	0.0192	0.0192	1.4947E-08	1.1956E-08	0.799915
115	KSC4 -1 -1	0.0006	0.0006	1.7512E-11	1.4383E-11	0.821342
116	KMPC4 -1 -1	0.0000	0.0000	3.1022E-07	3.1688E-07	1.021461
117	L1(OM)	0.0372	0.0372			0.810136
118	L1(S04)- -1	0.0000	0.0000			1.021461
119	MGCO3 AQ 0	0.0000	0.0000			0.810136
120	MGHC03+ 1	0.0000	0.0000			0.793767
121	MGF +1 1	0.0000	0.0000			1.021461
122	MG(OM)+1 1	0.0000	0.0000			0.810136
123	MG504 AQ 0	0.0000	0.0000			1.021461
124	MG(PC4)- -1	0.0000	0.0000			0.810136
125	MGMP04	0.0000	0.0000			0.793767
126	MGH2PC4+ 1	0.0000	0.0000			1.021461
127	MNCL +1 1	0.0019	0.0019			0.793767
128	MNCL2	0.0000	0.0000			1.021461
129	MNCL3 -1 -1	0.0000	0.0000			0.793767
130	MNCL4 -2 -2	0.0000	0.0000			1.021461
131	MNHC03+1 1	0.0000	0.0000			0.793767
132	MNS04 AQ 0	0.0443	0.0443			1.021461
133	MNCL +2 2	0.0000	0.0000			0.412393
134	MNCL2 +1 1	0.0000	0.0000			0.793767
135	NO3 -1 -1	0.1000	0.1000			0.793767
136	NACL	21.2645	21.2645			1.021461
137	NACC3 -1 -1	0.0348	0.0348			0.810136
138	NAMCO3	19.5131	19.5131			1.021461
139	NA2CO3AQ 0	0.0000	0.0000			1.021461
140	NA2SO4AQ 0	0.0000	0.0000			0.810136
141	NAS04 -1 -1	41.8066	41.8066			0.810136
142	NAHP04-1 -1	14.7169	14.7169			0.772740
143	NH4 +1 1	0.0113	0.0113			1.021461
144	NH4OH	0.0000	0.0000			0.412393
145	NH4PD4-2 -2	0.0000	0.0000			0.805720
146	NH4SO4- -1	0.0000	0.0000			0.793767
147	PBCL +1 1	0.0000	0.0000			1.021461
148	P2CL2	0.0000	0.0000			0.793767
149	PBCL3 -1 -1	0.0000	0.0000			0.412393
150	PBCL4 -2 -2	0.0000	0.0000			1.021461
151	PBS04 AQ 0	0.0000	0.0000			0.412393
152	PBS042-2 -2	0.0000	0.0000			0.805720
153	SR(OM)-1 -1	0.0011	0.0011			1.021461
154	SRCO3 AQ 0	0.5749	0.5749			0.793767
155	SRHCC3+ 1	0.3713	0.3713			1.021461
156	SPS04 AQ 0	0.0000				

MHG1= -1.5352E+07MHG12= -5.7660E+00MHG13= 1.3494E+08MHG14= 2.7528E-57

MOLE RATIOS BASED ON ANALYTICAL MOLALITY

CL/CA	CL/MG	CL/NA	CL/K	CL/AL	CL/FE	CL/SO4	CL/HCO3	CA/MG	SQRT(CA)/NA
1.4766E+02	6.1203E+03	8.1706E-01	1.5750E+01	5.4339E+04		3.7204E+01	6.5831E+00	4.1450E+01	2.7286E-01
NH3/NA	LI/NA	K/NA	MG/CA	SR/CA	BA/CA	SO4/CL	HCO3/CL	F/CL	B/CL
1.1038E-02	7.7956E-03	5.1877E-02	2.4125E-02	1.7851E-01	4.4486E-03	2.6879E-02	1.5190E-01	1.0716E-03	1.1406E-02

LOG OF ACTIVITY RATIOS

CA/H2	MG/H2	NA/H	K/H	AL/H3	FE/H2	CA/MG	NA/K
8.4510	6.8602	4.8852	3.5970	8.1396		1.5908	1.2883

LCG(NA/K)+1/3LOG(SQRT(CA)/NA) = 1.057E+00 LCG(NA/K)+4/3LOG(SQRT(CA)/NA) = 5.329E-01

SUBSURFACE TEMPERATURE (OC) FROM CHEMICAL DATA

QTZ TEMP (CONDUCTIVE)=	201.1	QTZ TEMP (ADIABATIC)=	185.2
AP.SILICA TEMP WITH SI02=	76.6	AM.SILICA TEMP WITH H4SI04=	76.5
CHAL. TEMP WITH SI02=	183.4	CHAL. TEMP WITH H4SI04=	183.4
A.CRISTOB. TEMP WITH SI02=	152.3	A.CRISTOB. TEMP WITH H4SI04=	152.3
LCG(NA/K) TEMP=	169.6	LOG(NA/K)+1/3LCG(SQRT(CA)/NA) TEMP=	220.4
LOG(NA/K)+4/3LOG(SQRT(CA)/NA) TEMP=	320.8	LOG(NA/K)+4/3LCG(SQRT(CA)/NA) TEMP - IPCO2 =	136.6

IF THE SPRING IS BOILING OR STEAM IS LOST DURING REDUCTION THEN SELECT QTZ TEMP ADIABATIC ELSE SELECT QTZ TEMP CONDUCTIVE
 AP.SILICA TEMP SHOULD BE CONSIDERED IF SAMPLE IS SATURATED WITH AM.SILICA I.E. IF DELG OF MIN.NO.275 IS POSITIVE
 NA/K TEMP IS USEFUL IF CONC. OF CA IS LOW (MORE DECS) VS NA
 USE --4/3LCG-- TEMP IF <100 ELSE USE--1/3-- TEMP
 READ FOURNIER & TRUESDELL 1973

MESA 6-2 UNFLASHED FLUID SAMPLED: 6-3-76

ANALYSIS: USBR

PHASE	AP	KT	LOG AP	LOG KT	AP/KT	DELG	LOG AP/KT
139 AG		2.109CE-01		-0.6759			
140 AG2S A		1.5773E-22		-21.8021			
141 AGCL		1.1537E-10		-9.9379			
142 ADULARIA	5.3507E+04	2.5966E+01	4.7284	1.4144	2.0607E+03	4.4454	3.3140
143 AKERMANT	1.2246E+19	4.2863E+46	19.0880	46.6321	2.8571E-28	-36.5477	-27.5441
144 ALBITE L	1.0391E+06	1.4618E+04	6.0167	4.1649	7.1085E+01	2.4840	1.8518
145 ALBITE M	1.0391E+06	1.8217E+05	6.0167	5.2605	5.7040E+00	1.0143	0.7562
146 ALUNITE			-88.1218	-85.9178		-2.9565	-2.2040
147 ANALCIME	2.2419E+08	4.8173E+09	8.3506	9.6828	4.6540E-02	-1.7870	-1.3322
148 ANDALUSI	8.7145E+13	1.5831E+13	13.9402	13.1995	5.5046E+00	0.9936	0.7407
149 ANHYDRIT	7.9442E-08	2.477CE-05	-7.1000	-4.6061	3.2072E-03	-3.3453	-2.4939
150 ANNITE		2.0640E+27		27.3147			
151 APATCLLR		1.2585E-66		-65.9000			
152 APATFLUR				-71.6225			
153 APATHYCK		9.4293E-62		-61.0255			
154 ARAGONIT	6.5804E-11	4.8137E-09	-10.1817	-8.3175	1.3670E-02	-2.5007	-1.8642
155 RAPITE	3.2508E-10	1.6581E-10	-9.4880	-5.7804	1.9606E+00	0.3922	0.2924
156 BLOTITE		9.977CE+59		59.9990			
157 BGEHMITE	1.3712E+08	8.1773E+08	8.1371	8.9434	1.5622E-01	-1.0815	-0.8063
158 BCPNITE				-117.0616			
159 BRUCITE	3.2734E-22	5.9781E-12	-21.4850	-11.2234	5.4757E-11	-13.7649	-10.2616
160 CALCITE	6.5804E-11	3.2876E-09	-10.1817	-8.4831	2.0016E-02	-2.2785	-1.6986
161 CACL2	3.6200E-07	5.426CE+11	-6.4403	11.7345	6.6864E-19	-24.3798	-18.1748
162 CAO LIME	2.8167E+08	1.6245E+33	8.4497	33.2107	1.7337E-25	-33.2145	-24.7610
163 CAICHI2	1.2757E-20	4.8906E-06	-19.8942	-5.3106	2.6086E-15	-19.5625	-14.5036
164 CAS	1.0252E-03	1.3991E+12	-2.9892	12.1458	7.3276E-16	-20.3022	-15.1350
165 CELESTIT	1.3602E-08	4.0828E-07	-7.8664	-6.3890	3.3315E-02	-1.9817	-1.4774
166 CHALCEDON	4.6215E-03	2.4647E-04	-2.3352	-3.6082	1.8751E+01	1.7076	1.2730
167 CHLOR MG	3.6279E+43	4.3928E+60	43.5597	60.6427	8.2592E-18	-22.9153	-17.0831
168 CRYSOCOL		9.977CE+59		59.9990			
169 CRYSCITIL	8.0163E+15	7.4377E+32	15.9040	32.8714	1.0778E-17	-22.7602	-16.9675
170 CINABAR		3.8350E-41		-40.4162			
171 CINARMET		9.5552E-40		-39.0198			
172 CLINENST	3.3401E+04	4.0926E+11	4.5238	11.6120	8.1612E-08	-9.5082	-7.0882
173 CLINPTIL	4.9043E+09	9.977CE+59	9.6906	59.9990			
174 CCRUNDUM	1.8856E+16	2.1555E+18	16.2755	18.3336	8.7470E-03	-2.7608	-2.0581
175 CRISTCBA	4.6215E-03	3.8328E-04	-2.3352	-3.4165	1.2058E+01	1.4504	1.0813
176 CRISTCRB	4.6215E-03	1.398CE-01	-2.3352	-2.8545	3.3057E+00	0.6965	0.5193
177 CU		1.7711E+04		4.2482			
178 CU2O		2.7335E-02		-1.5633			
179 CU2S		5.1135E-36		-35.2913			
180 CU5FES6		9.977CE+59		59.9990			
181 CUFES2		2.7265E-45		-44.5644			
182 CUFE2S3		9.977CE+59		59.9990			
183 CUD		1.090CE+08		8.0374			
184 CUS		4.6191E-23		-22.3354			
185 CUMMINGT		9.977CE+59		59.9990			
186 CICKITE	4.0042E+11	1.1605E+09	11.6025	9.0648	3.4492E+02	3.4041	2.5377
187 DIOPSIDOE	4.3478E+10	1.8382E+20	10.6383	20.2644	2.3652E-10	-12.9125	-9.6261
188 COLCMTIE	1.1111E-22	1.2518E-17	-21.9543	-16.9025	8.8762E-06	-6.7765	-5.0518
189 ENSTATIT	3.3401E+04	9.977CE+59	4.5238	59.9990			
190 ERICNITE	5.2392E+16	9.977CE+59	16.7193	59.9990			
191 FAYALITE		4.7652E+17		17.6781			
192 FEASS		9.977CE+59		59.9990			
193 FECL2		1.372EE+08		8.1376			

154 FECL3		6.1004E+12		12.7854			
155 FECO3		2.3464E-11		-10.6296			
156 FE3		4.6217E+12		12.6648			
157 FE2C3HFM		2.8377E-02		-1.5470			
158 FE2O3MGH		2.5119E+06		6.4000			
159 FE3C4		1.5560E+07		7.1920			
200 FEOH3AM		3.4527E-38		-37.4618			
201 FES2 PYR				-104.6442			
202 FESTAULT		1.6774E-50		-49.7754			
203 FESPAKIN		9.9770E+59		59.5990			
204 FOPSTERI	2.4139E+11	8.0415E+29	11.3827	29.9054	3.0017E-19	-24.8463	-18.5226
205 FLUCRITE	3.9745E-13	1.7336E-11	-12.4007	-10.7610	2.2928E-02	-2.1994	-1.6396
206 COETMITE		1.2845E-01		-0.8911			
207 GIBBS AM	4.1857E-35	2.5033E-33	-34.3782	-32.5845	1.6079E-02	-2.4061	-1.7938
208 GIBBS C	4.1857E-35	1.1360E-13	-34.3782	-32.9446	3.6848E-02	-1.9230	-1.4336
209 GREENALI		6.3096E+23		23.8000			
210 GREIGITE		1.9953E-20		-19.7000			
211 GYPSUM	7.8985E-08	1.3627E-05	-7.1025	-4.8656	5.7962E-03	-3.0005	-2.2369
212 HALITE	2.7514E-C3	3.6060E+01	-2.5604	1.5666	7.4643E-05	-5.5360	-4.1270
213 HALLCVSI	4.0042E+11	7.0120E+11	11.6025	11.8458	5.7105E-01	-0.3264	-0.2433
214 HEULANDI	2.3504E+C8		8.3711	55.9990			
215 HGO		3.5521E+02		2.5505			
216 HUNTITE	3.1676E-46	1.0840E-32	-45.4993	-31.9650	2.9221E-14	-18.1550	-13.5343
217 HYDRMAGN	1.5621E-57	6.3056E-31	-56.8063	-30.2000	2.4758E-27	-35.6898	-26.6063
218 ILTITE	2.5950E+14	8.4008E+10	14.4148	10.9243	3.0937E+03	4.6822	3.4905
219 KALINIT	4.0942E+11	1.2790E+08	11.6025	8.1136	3.0826E+03	4.6800	3.4889
220 KENVAITE	1.5521E-21	1.0002E-25	-20.8091	-25.0000	1.5521E+04	5.6217	4.1909
221 KYANITE	8.7145E+13	1.9657E+13	13.9402	13.2935	4.4332E+00	0.6675	0.6467
222 K2O	1.5583E+07		7.1927	85.1804		-104.6131	-77.9877
223 LARNITE	3.6665E+14	2.9096E+39	14.5642	39.4638	1.2601E-25	-33.4004	-24.8996
224 LAUMNTIT	2.3950E+15	2.7560E+12	15.3793	12.4404	8.6877E+02	3.9423	2.9389
225 LEUCITE	1.1578E+07	1.4465E+10	7.0636	10.1603	8.0040E-04	-4.1539	-3.0967
226 LEONITE	8.8563E-18	9.9770E+59	-17.0527	59.5990			
227 MACADITE	3.4074E-12	4.5709E-15	-11.4676	-14.3400	7.4545E+02	3.8531	2.8724
228 MAGNESIT	1.6885E-12	1.0818E-08	-11.7725	-7.9658	1.5607E-04	-5.1063	-3.8067
229 MALACHIT		4.8484E-34		-33.3144			
230 MAPIALIT	3.0870E+15	1.4765E+02	15.4895	2.1694	2.0901E+13	17.8677	13.3202
231 MEICHITE	9.6056E+49	9.9770E+59	49.9825	59.9990			
232 MERINIT	3.4493E+27	6.2621E+69	27.5377	69.7967	5.5083E-43	-56.6864	-42.2590
233 PGCL2	9.3051E-09	4.0873E+22	-8.0311	22.6114	2.2776E-31	-41.1040	-30.6425
234 MGFE2O4		4.0856E+19		19.6117			
235 MGOPERIC	7.2272E+C6	1.3120E+22	6.8550	22.1179	5.5087E-16	-20.4684	-15.2589
236 MICRCLN	5.3507E+04	2.7522E+01	4.7284	1.4397	1.9441E+03	4.4115	3.2827
237 MIRABILT	1.6104E-06	4.2768E-02	-5.7931	-1.3689	3.7655E-C5	-5.9346	-4.4242
238 MNCL2	8.5747E-C9	1.0425E+09	-8.0668	9.0181	8.2245E-18	-22.9177	-17.0849
239 MNCC3	1.5552E-12	3.1827E-11	-11.8082	-10.4972	4.8862E-02	-1.7586	-1.3110
240 MNO	6.6566E+06	2.1094E+18	6.8233	18.3242	3.1557E-12	-15.4274	-11.5009
241 MNO2				-79.9479			
242 MNS	2.4228E-05	5.2723E-01	-4.6157	-0.2780	4.5954E-05	-5.8186	-4.3377
243 MONTICEL	9.4078E+12	9.6578E+30	12.9735	30.9849	9.7411E-19	-24.1606	-18.0114
244 MONT CA	6.3170E+11	4.9059E+06	11.8005	6.6907	1.2876E+05	6.8543	5.1098
245 PCNT K	3.7687E+11	2.3817E+06	11.5742	6.3769	1.5824E+05	6.5744	5.1993
246 PCNT PG	3.2387E+11	3.9562E+06	11.5104	6.5973	8.1865E+04	6.5904	4.9131
247 PCNT NA	1.0030E+12	4.4734E+06	12.0013	6.6506	2.2422E+05	7.1774	5.3507
248 PCATCANA		9.9770E+59		59.9990			
249 MONTSEAN		9.9770E+59		59.9990			
250 MORDENIT	2.3133E+01	9.9770E+59	1.3642	59.9990			
251 MUSCOVIT	1.0960E+21	2.1435E+10	21.0026	10.3311	4.6935E+10	14.3148	10.6715
252 NA2O	5.8771E+09	1.7604E+68	9.7692	68.2456	3.3386E-59	-78.4406	-58.4764
253 NA2SO4	1.6576E-C6	6.1921E-01	-5.7805	-0.2082	2.6770E-06	-7.4748	-5.5724

254	NAMECLIT	4.2407E-04	6.6558E+05	-3.3726	5.8232	6.3714E-10	-12.3352	-9.1958
255	NATPCN	1.3340E-09	2.2833E-02	-8.8749	-1.6414	5.8424E-08	-9.7029	-7.2334
256	NATRTHRM	1.3691E-09	1.0425E+00	-8.8636	0.0181	1.3133E-09	-11.9139	-8.8816
257	NEPHELIN	4.8651E+10	1.2458E+15	10.6871	15.0954	3.9053E-05	-5.9134	-4.4083
258	NESCUON	1.6739E-12	2.8215E-05	-11.7763	-4.5455	5.9327E-08	-9.6940	-7.2267
259	NICCLITE		9.9770E+59		59.9990			
260	HGZCLZIC		7.0821E-19		-18.1498			
261	PBCL2		8.7531E-06		-5.0578			
262	PBCC3		2.9802E-14		-13.5258			
263	PBOLITHR		8.7951E+12		12.9442			
264	PBCPASIC		1.2253E+13		13.0882			
265	PBS		1.241CE-15		-14.5062			
266	PBSO4		1.6179E-08		-7.7910			
267	PHILLIPS	2.3511E+05	1.2589E-07	5.3713	-6.9000	1.8676E+12	16.4608	12.2713
268	PHLCGPTF	2.85C5E+04	3.7344E+21	4.4549	21.5949	7.2450E-18	-22.9916	-17.1400
269	PLAG(AN)	1.1344E+20	4.7564E+25	20.0548	25.6773	2.3849E-06	-7.5421	-5.6225
270	PREMITE	1.4724E+26	2.4233E+33	26.1680	33.3844	6.076CE-08	-5.6801	-7.2164
271	PYPCPHYL	8.5770E+06	5.0211E+01	6.9333	1.7008	1.7082E+05	7.0189	5.2325
272	QUARTZ	4.6215E-03	8.8154E-05	-2.3352	-4.0546	5.2401E+01	2.3063	1.7193
273	SANADNMJ	5.3507E+04	4.7955E+01	4.7284	1.6812	1.1148E+03	4.0875	3.0472
274	SEPICLI	5.1261E+06	1.4338E+19	6.7098	19.1565	3.5752E-13	-16.6961	-12.4467
275	SILICAA	4.6215E-03	8.3900E-04	-2.3352	-3.0762	5.5084E+00	0.9940	0.7410
276	SILICG'L	4.6215E-03	1.7682E-03	-2.3352	-2.7525	2.6137E+00	0.5597	0.4173
277	SILLIM.N	8.7145E+13	3.9694E+13	13.5402	13.5987	2.1754E+00	0.4581	0.3415
278	SPINEI	1.3628E+23	7.8386E+33	23.1344	33.8942	1.7386E-11	-14.4133	-10.7598
279	SPCO3	1.1267E-11	9.5852E-12	-10.5482	-11.0184	1.1755E+00	0.0942	0.0702
280	STREIGIT		6.579CE-28		-27.1818			
281	SYLV TE	1.4168E-04	5.2865E+00	-3.8487	0.7232	2.6798E-05	-6.1328	-4.5716
282	TALC	1.7171E+11	2.8155E+19	11.2348	19.4502	6.0891E-09	-11.0202	-8.2154
283	TRE CLIT	3.2459E+32	5.4240E+57	32.5113	57.7343	5.9843E-26	-33.8342	-25.2230
284	TRC.A	5.7892E-13	6.6065E-03	-12.2374	-2.1800	8.7623E-11	-13.4910	-10.0574
285	WA PAKIT	2.4089E+15	1.7238E+18	15.3818	18.2365	1.3974E-03	-3.8293	-2.8547
286	W HERIT	2.6928E-13	4.3455E-14	-12.5658	-13.3615	6.1904E+00	1.0620	0.7917
287	W LLASTO	1.3017E+06	1.8457E+13	6.1145	13.2662	7.0527E-08	-9.5932	-7.1516
288	Z.CO3		2.1466E-10		-9.6682			
289	ZO		9.4206E+11		11.9741			
290	ZNS		1.173CE-12		-11.9307			
291	ZNSC4		7.4913E+04		4.8746			
292	ZOISITE	2.0248E+34	1.4159E+41	34.3064	41.1510	1.4300E-07	-9.1815	-6.8447
293	VIVIANIT		1.0000E-36		-36.0000			
294	HGILL	1.0000E+00	1.0662E-07	0.0000	-6.9722	9.3791E+06	9.3525	6.9722
295	HGCLZIC		5.0872E-15		-14.2935			

DUMMY VALUE FOR LOCKT=59.9990,KT=9.9770E+59

MESA 8-1 UNFLASHEC FLUID SAMPLEC: 6-22-76 ANALYSIS: USBR
 ANAL MEC/L CAT= 28.9630 ANAL MEC/L AN= 24.6296

ITER	S1-ANALCC3	S2-ANALSD4	S3-ANALF	S4-ANALPO4	S5-ANALCL	ELEC. IMBALANCE
1	9.80162E-05	2.77777E-04	1.74497E-06	0.00000E+00	3.60255E-05	0.000000
2	4.91194E-05	1.39094E-04	8.85505E-07	0.00000E+00	3.60440E-05	0.000000
3	2.47155E-05	7.03194E-05	4.49854E-07	0.00000E+00	3.61011E-05	0.000000
4	2.47930E-05	3.55406E-05	2.28545E-07	0.00000E+00	3.61298E-05	0.000000
5	2.48299E-05	1.79470E-05	2.28653E-07	0.00000E+00	3.61432E-05	0.000000
6	2.48485E-05	9.06249E-06	2.28708E-07	0.00000E+00	3.61500E-05	0.000000
7	2.48580E-05	4.57611E-06	2.28736E-07	0.00000E+00	3.61535E-05	0.000000

DATE=09/28/76

PH	EH	T	ION	STRENGTH	PCO2 ATM	HCO3 ALK	MG/L HCO3 ALK	MG/L TCT HCO3	MG/L TOT CG3						
-6.27	9.0000	20.00		0.02843	0.1987143	6.861887E-03	417.7959	417.6640	0.0649						
CALC	MEQ/L CAT	CALC	MEQ/L AN	AN2D	CO3CALC	PH2O ATM	DENSITY	TCS	MG/L						
	28.854		24.316	0.9989	8.3810E-07	0.0231	1.0000		2188.69						
ION	ANAL	PPM	CALC	PPM	ANAL	MG/L	CALC	MG/L	ANAL	MOLAL	CALC	MOLAL	ALFA	GAMMA	P ION
0	CA +2	2	8.5000	7.4163	8.5000	7.4163	2.1254E-04	1.8544E-04	1.0258E-04	0.555338	3.9872				
1	MG +2	2	0.0500	0.0456	0.0500	0.0456	2.0611E-06	1.8778E-06	1.0554E-06	0.555338	5.9766				
2	NA +1	1	610.0000	602.5470	610.0000	602.5470	2.6592E-02	2.6267E-02	2.2418E-02	0.853479	1.6496				
3	K +1	1	70.0000	69.6420	70.0000	69.6420	1.7941E-03	1.7849E-03	1.5118E-03	0.853479	2.8205				
4	CL -1	-1	500.0000	500.0000	500.0000	500.0000	1.4134E-02	1.4134E-02	1.1941E-02	0.853479	1.9219				
5	SO4 -2	-2	173.0000	150.1677	173.0000	150.1677	1.8049E-03	1.5667E-03	8.2471E-04	0.526411	3.3337				
6	HCO3 -1	-1	417.0000	412.4744	417.0000	412.4744	6.8491E-03	6.7748E-03	5.8379E-03	0.801712	2.2337				
7	H +1	1		0.0006		0.0006		6.1079E-07	5.3703E-07	0.874234	6.2700				
8	CH -1	-1		0.0003		0.0003		1.4743E-08	1.2536E-08	0.853479	7.9018				
9	AN2D	0													
10	H4SiO4	0		622.0096		622.0096		6.4857E-03	6.5366E-03	1.007846	2.1847				
11	SIC2 AQ	0	389.0000	389.0000	389.0000	389.0000	6.4884E-03	6.4884E-03		1.007846					
12	AG +1	1													
13	AL +3	3	0.0200	0.0000	0.0200	0.0000	7.4287E-07	6.0672E-11	1.8653E-11	0.307435	10.7293				
14	BA +2	2	0.1500	0.1267	0.1500	0.1267	1.0946E-06	9.2443E-07	5.0040E-07	0.541308	6.3007				
15	CU +1	1													
16	CU +2	2													
17	FE +2	2													
18	FE +3	3													
19	MG2 +2	2													
20	HG +2	2	0.0140	0.0000	0.0140	0.0000	6.9947E-08	2.1671E-35	1.1720E-35	0.541308	34.9307				
21	LI +1	1	1.1000	1.1000	1.1000	1.1000	1.5887E-04	1.5887E-04	1.3742E-04	0.853479	3.8620				
22	MN +2	2													
23	MN +3	3													
24	PB +2	2													
25	SR +2	2	2.1000	1.8681	2.1000	1.8681	2.4020E-05	2.1367E-05	1.1566E-05	0.541308	4.9368				
26	ZN +2	2													
27	H2ASO3 -	-1	0.1000	0.0001	0.1000	0.0001	7.6541E-07	8.0443E-10	6.8656E-10	0.853479	9.1633				
28	PO4 -3	-3													
29	F -1	-1	1.6000	1.5714	1.6000	1.5714	8.4402E-05	8.2893E-05	7.0484E-05	0.853479	4.1519				
30	H3BO3 AQ	0	9.1500	5.1392	9.1500	5.1392	1.4830E-04	1.4813E-04	1.4929E-04	1.007846	3.8260				
31	NH3 AQ	0	4.6700	4.6700	4.6700	4.6700	2.7481E-04	2.7481E-04		1.007846					
32	H2S AQ	0	1.9000	1.5956	1.9000	1.5956	5.5874E-05	4.6923E-05	4.7291E-05	1.007846	4.3252				
33	ALF +2	2		0.0010		0.0010		2.1807E-08	1.1929E-08	0.547020	7.9234				
34	ALF2 +1	1		0.0264		0.0264		4.0675E-07	3.5050E-07	0.801712	6.4553				
35	ALF3	0		0.0230		0.0230		2.7427E-07	2.7643E-07	1.007846	6.5584				
36	ALF4 -1	-1		0.0006		0.0006		5.5889E-09	4.7871E-09	0.853479	8.3199				
37	AL(CH) +2	2		0.0000		0.0000		7.3075E-10	3.9573E-10	0.547020	9.3982				
38	AL(CH)2 +	1		0.0020		0.0020		3.3242E-08	2.8645E-08	0.801712	7.5430				
39	AL(CH)4 -	-1		0.0000		0.0000		3.9385E-10	3.3734E-10	0.853479	9.4719				
40	AL(SO4) +	1		0.0000		0.0000		1.7661E-11	1.5127E-11	0.853479	10.8202				
41	AL(SO4)2 -	-1		0.0000		0.0000		1.0835E-12	9.2808E-13	0.853479	12.0324				
42	AGCL	0								1.007846					
43	AGCL2 -1	-1								0.853479					
44	AGCL3 -2	-2								0.541308					
45	AGCL4 -3	-3								0.265349					
46	AG(SO4) -	-1								0.853479					

47	AGS042-3	-3						0.265349	
48	M3AS03	0	0.0961	0.0961	7.6460E-07	7.7060E-07	1.007846	6.1132	
49	AS04	-3					0.265349		
50	BAC03 AQ	0	0.0000	0.0000	6.8742E-11	6.5281E-11	1.007846	10.1594	
51	BAMC031+	1	0.0166	0.0166	8.3881E-08	7.1590E-08	0.853479	7.1451	
52	BA10M1+1	1	0.0000	0.0000	1.1763E-12	1.0110E-12	0.859454	11.9953	
53	BAS04 AQ	0	0.0201	0.0201	8.6200E-08	8.6876E-08	1.007846	7.0611	
54	CAC03 AQ	0	0.0068	0.0068	6.7826E-08	6.8358E-08	1.007846	7.1652	
55	CAHC031+	1	1.0675	1.0675	1.0582E-05	9.1535E-06	0.864469	5.0384	
56	CA10M1+1	1	0.0000	0.0000	2.4233E-11	2.0961E-11	0.864469	10.6786	
57	CAPO4 -1	-1					0.861712		
58	CAHPC4	0					1.007846		
59	CAH2PO4+	1					0.861712		
60	CAS04 AQ	0	2.2342	2.2342	1.6447E-05	1.6576E-05	1.007846	4.7805	
61	CUCL	0					1.007846		
62	CUCL2 -1	-1					0.853479		
63	CUCL3 -2	-2					0.541308		
64	CUCL +1	1					0.853479		
65	CUCL2	0					1.007846		
66	CUCL3 -1	-1					0.853479		
67	CUCL4 -2	-2					0.541308		
68	CU10M1+1	1					0.853479		
69	CUS04	0					1.007846		
70	FECL +1	1					0.853479		
71	FECL2	0					1.007846		
72	FECL3 -1	-1					0.853479		
73	FECL4 -2	-2					0.541308		
74	FE10M1+1	1					0.859454		
75	FE10M12	0					1.007846		
76	FECCM -1	-1					0.859454		
77	FES04	0					1.007846		
78	FECL +2	2					0.541308		
79	FECL2 +1	1					0.859454		
80	FECL3	0					1.007846		
81	FECL4 -1	-1					0.853479		
82	FES04 +1	1					0.859454		
83	FES0412-	-1					0.853479		
84	FE10M1+2	2					0.541308		
85	FE10M12+	1					0.861712		
86	FE10M13	0					1.007846		
87	FE10M14-	-1					0.861712		
88	HG18041-	-1	0.0137	0.0137	1.7470E-07	1.4748E-07	0.844227	6.8313	
89	H2S1C4-2	-2	0.0000	0.0000	1.2605E-11	6.8952E-12	0.547020	11.1615	
90	H3S1J41-	-1	0.2569	0.2569	2.7074E-06	2.3107E-06	0.853479	5.6363	
91	HAS03 -2	-2	0.0000	0.0000	4.1134E-16	2.2266E-16	0.541308	15.6524	
92	HASC4 -2	-2					0.541308		
93	H2ASC4 -	-1					0.853479		
94	M3AS04	0					1.007846		
95	HF AQ	0	0.0010	0.0010	5.2064E-08	5.2473E-08	1.007846	7.2801	
96	H2CO3	0	476.2562	476.2562	7.6953E-03	7.7556E-03	1.007846	2.1104	
97	CO3 -2	-2	0.0502	0.0502	8.3810E-07	4.5846E-07	0.547020	6.3387	
98	HP04 -2	-2					0.541308		
99	H2PO4 -1	-1					0.861712		
100	HS -1	-1	0.2954	0.2954	8.9505E-06	7.6106E-06	0.850301	5.1186	
101	S -2	-2	0.0000	0.0000	2.2059E-16	1.1940E-16	0.541308	15.9230	
102	HS04 -1	-1	0.0038	0.0038	3.9595E-08	3.3914E-08	0.856527	7.4696	
103	HNC3 AQ	0	0.0000	0.0000	8.2142E-14	8.2787E-14	1.007846	13.0820	
104	HGCL +1	1	0.0000	0.0000	3.3694E-31	2.8757E-31	0.853479	30.5413	
105	HGCL2	0	0.0000	0.0000	4.4871E-26	4.5224E-26	1.007846	25.3446	
106	HGCL3 -1	-1	0.0000	0.0000	8.2277E-26	7.0221E-26	0.853479	25.1535	

107	MGCL4 -2 -2	0.0000	0.0000	5.4692E-28	2.96CPE-28	0.541308	27.5286
108	MG504	0.0000	0.0000	2.4112E-37	2.4301E-37	1.007846	36.6144
109	MGSH2512 0	0.0000	0.0000	1.6455E-19	1.6588E-19	1.007846	18.7802
110	MG(MS13)- -1	0.0209	0.0209	6.9547E-08	5.5658E-08	0.853479	7.2243
111	MG	0	0			1.007846	
112	KCL	0	0			1.007846	6.7912
113	KCC3 -1 -1	0.0119	0.0119	1.6049E-07	1.6175E-07	0.852224	64.0859
114	KHS04	0.0000	0.0000	9.5403E-65	8.1304E-65	1.007846	30.2901
115	KSC4 -1 -1	0.0000	0.0000	5.0873E-31	5.1272E-31	0.861712	5.1097
116	KHP04 -1 -1	1.2157	1.2157	9.0141E-06	7.7675E-06	0.861712	
117	LI(OM)	0	0			1.007846	11.5777
118	LI(S04)- -1	0.0000	0.0000	2.6215E-12	2.6441E-12	0.854454	26.9456
119	MGC03 AQ 0	0.0000	0.0000	1.3186E-27	1.1333E-27	1.007846	8.9157
120	MGMCO31+ 1	0.0001	0.0001	1.2045E-09	1.2143E-09	0.853479	7.4373
121	PGF +1 1	0.0036	0.0036	4.2754E-08	3.6490E-08	0.854527	8.3653
122	MG(OM)+1 1	0.0002	0.0002	5.0345E-09	4.3125E-09	0.857571	11.2382
123	MGSC4 AC 0	0.0000	0.0000	5.9364E-12	5.1502E-12	1.007846	6.8687
124	MGIPC4)- -1	0.0161	0.0161	1.3426E-07	1.3531E-07	0.861712	
125	MGMPC4	0	0			1.007846	
126	MGM2P04+ 1	0	0			0.853479	
127	MHCL +1 1	0	0			1.007846	
128	MHCL2	0	0			0.853479	
129	MHCL3 -1 -1	0	0			0.853479	
130	MHCL4 -2 -2	0	0			1.007846	
131	MNMCC3+1 1	0	0			0.853479	
132	MNS04 AQ 0	0	0			0.853479	
133	MNCL +2 2	0	0			0.853479	
134	MNCL2 +1 1	0.3400	0.3400	5.4955E-06	5.4955E-06	0.853479	5.3321
135	NO3 -1 -1	2.1083	2.1083	3.6153E-05	3.6437E-05	1.007846	4.4385
136	NACL	0.0143	0.0143	1.7249E-07	1.4864E-07	0.861712	6.8279
137	NAC03 -1 -1	6.1211	6.1211	7.3024E-05	7.3557E-05	1.007846	4.1331
138	NAMCO3	0.0000	0.0000	4.7763E-11	4.8128E-11	1.007846	10.3175
139	NA2CO3AQ 0	0.0000	0.0000	4.1125E-27	4.1447E-27	1.007846	26.3825
140	NA2S04AQ 0	25.6050	25.6050	2.1555E-04	1.8574E-04	0.861712	3.7311
141	NAS04 -1 -1					0.861712	
142	NAHP04-1 -1	4.9433	4.9433	2.7464E-04	2.3167E-04	0.843522	3.6351
143	NH4 +1 1	0.0059	0.0059	1.6943E-07	1.7076E-07	1.007846	6.7676
144	NH4OH	0	0			0.541308	
145	NH4PO4-2 -2	0.0000	0.0000	2.2230E-27	1.9106E-27	0.853479	26.7188
146	NH4S04)- -1					0.853479	
147	PBCL +1 1					1.007846	
148	PBCL2					0.853479	
149	PBCL3 -1 -1					0.541308	
150	PBCL4 -2 -2					1.007846	
151	PBS04 AC 0					0.541308	
152	PBS042-2 -2	0.0000	0.0000	1.0801E-12	9.2826E-13	0.854454	12.0323
153	SP(OM)-1 -1	0.0005	0.0005	3.4634E-09	3.4906E-09	1.007846	8.4571
154	SPC03 AQ 0	0.1786	0.1786	1.2045E-06	1.0281E-06	0.853479	5.9380
155	SPMC03)+ 1	0.2647	0.2647	1.4442E-06	1.4555E-06	1.007846	5.8370
156	SPS04 AQ 0					0.853479	
157	ZNCL +1 1					1.007846	
158	ZNCL2					0.853479	
159	ZNCL3 -1 -1					0.541308	
160	ZNCL4 -2 -2					1.007846	
161	ZNS04 AC 0	0.0000	0.0000	1.4415E-11	7.8027E-12	0.541308	11.1078
162	ALF5 -2 -2	0.0000	0.0000	6.5421E-15	1.7359E-15	0.265349	14.7605
163	ALF6 -3 -3	0.0000	0.0000	5.9434E-33	5.0726E-33	0.853479	32.2548
164	MG(OM)+ 1	0.0000	0.0000	2.1513E-29	2.1682E-29	1.007846	28.6639
165	MG(OM)2 0	0.0000	0.0000	2.8943E-15		1.007846	
166	MCL AQ 0	0.0000	0.0000				

MG1= 0.0000E+00 MG12= 0.0000E+00 MG13= 0.0000E+00 MG14= 0.0000E+00

MOLE RATIOS BASED ON ANALYTICAL MOLALITY

CL/CA	CL/MG	CL/NA	CL/K	CL/AL	CL/FE	CL/SO4	CL/HCO3	CA/MG	SURTICA/NA
6.6501E+01	6.8575E+03	5.3152E-01	7.8780E+00	1.9026E+04		7.8311E+00	2.0636E+00	1.0312E+02	5.4625E-01
NH3/NA	LI/NA	K/NA	MG/CA	SR/CA	BA/CA	SO4/CL	HCO3/CL	F/CL	B/CL
1.0335E-02	5.9745E-03	6.7469E-02	9.6975E-03	1.1301E-01	5.1499E-03	1.2770E-01	4.8458E-01	5.9715E-03	1.0493E-02

LOG OF ACTIVITY RATIOS

CA/M2	MG/M2	NA/H	K/H	AL/H3	FE/M2	CA/MG	NA/K
8.5528	6.5634	4.6206	3.4495	8.0807		1.9893	1.1711

LOG(NA/K)+1/3LOG(SORT(CA)/NA) = 1.084E+00 LCG(NA/K)+4/3LOG(SORT(CA)/NA) = 8.229E-01

SUBSURFACE TEMPERATURE (OC) FROM CHEMICAL DATA

QTZ TEMP (CONDUCTIVE)=	230.3	QTZ TEMP (ADIABATIC)=	208.5
AM.SILICA TEMP WITH SI02=	105.6	AM.SILICA TEMP WITH H4SI04=	105.5
CHAL. TEMP WITH SI02=	218.3	CHAL. TEMP WITH H4SI04=	218.2
A.CRISTOB. TEMP WITH SI02=	183.5	A.CRISTOB. TEMP WITH H4SI04=	183.4
LCG(NA/K) TEMP=	200.4	LOG(NA/K)+1/3LCG(SORT(CA)/NA) TEMP=	222.3
LCG(NA/K)+4/3LOG(SORT(CA)/NA) TEMP=	264.6	LCG(NA/K)+4/3LOG(SORT(CA)/NA) TEMP - (PCO2 =	114.8

IF THE SPRING IS BOILING OR STEAM IS LOST DURING REDUCTION THEN SELECT QTZ TEMP ADIABATIC ELSE SELECT QTZ TEMP CONDUCTIVE
 AM.SILICA TEMP SHOULD BE CONSIDERED IF SAMPLE IS SATURATED WITH AM.SILICA I.E. IF DELG OF MIN.NO.275 IS POSITIVE
 NA/K TEMP IS USEFUL IF CONC. OF CA IS LOW (MORE DECS) VS NA
 USE --4/3LOG-- TEMP IF <100 ELSE USE--1/3-- TEMP
 READ FOURNIER & TRUESDELL 1973

MESA 8-1 UNFLASHED FLUID SAMPLED: 6-22-76 ANALYSIS: USBR

PHASE	AP	KT	LOG AP	LOG KT	AP/KT	DELG	LOG AP/KT
139 AG		2.109CE-01		-0.6759			
140 AG2S A		1.5773E-22		-21.8021			
141 AGCL		1.1537E-10		-9.9379			
142 ADULARIA	9.5113E+04	2.5966E+01	4.9782	1.4144	3.6630E+03	4.7805	3.5638
143 AKERMANI	1.9960E+19	4.2862E+46	19.3002	46.6321	4.6567E-28	-36.6632	-27.3319
144 ALBITE L	1.4104E+06	1.4618E+04	6.1493	4.1649	9.6485E+01	2.6620	1.9845
145 ALBITE M	1.4104E+06	1.8217E+05	6.1493	5.2605	7.7421E+00	1.1923	0.8889
146 ALUNITE			-88.5868	-85.9178		-3.5802	-2.6690
147 ANALCIME	2.1504E+08	4.8173E+09	8.3325	9.6828	4.4640E-02	-1.8113	-1.3503
148 ANDALUSI	9.4698E+13	1.5831E+13	13.9763	13.1995	5.9816E+00	1.0420	0.7768
149 ANHYDRIT	8.4932E-08	2.477CF-05	-7.0709	-4.6061	3.4289E-03	-3.3064	-2.4648
150 ANNITE		2.064CE+27		27.3147			
151 APATCHLR		1.2589E-66		-65.9000			
152 APATFLUR				-71.6225			
153 APATHYDX		9.4293E-62		-61.0255			
154 APAGONIT	4.7214E-11	4.8137E-09	-10.3259	-8.3175	9.8082E-03	-2.6941	-2.0C84
155 RAPITE	4.1269E-10	1.6581E-10	-9.3844	-9.7804	2.4890E+00	0.5312	0.3960
156 PIOTITE		9.9770E+59		59.9990			
157 BCEHWITE	1.2016E+08	8.7773E+08	8.0798	8.9434	1.3690E-01	-1.1584	-0.8636
158 BCRNITE				-117.0616			
159 BRUCITE	1.6586E-22	5.9781E-12	-21.7803	-11.2234	2.7745E-11	-14.1610	-10.5568
160 CALCITE	4.7214E-11	3.2876E-09	-10.3259	-8.4831	1.4361E-02	-2.4720	-1.8428
161 CACL2	1.4759E-08	5.426CE+11	-7.8309	11.7345	2.7201E-20	-28.2451	-19.5654
162 CAO LIME	3.5668E+08	1.6245E+33	8.5523	33.2107	2.1956E-25	-33.0769	-24.6584
163 CAICP12	1.6184E-20	4.8906E-06	-19.7909	-5.3106	3.1091E-15	-19.4239	-14.4803
164 CAS	1.4555E-C3	1.3991E+12	-2.8358	12.1458	1.0432E-15	-20.0965	-14.9816
165 CELESTIT	9.5350E-09	4.0828E-07	-8.0205	-6.3890	2.3364E-02	-2.1884	-1.6315
166 CHALCEDON	6.5513E-03	2.4647E-04	-2.1837	-3.6082	2.6581E+01	1.9109	1.4246
167 CHLOR MG	2.6411E+42	4.3526E+60	42.4218	60.6427	6.0125E-19	-24.4417	-18.2209
168 CRYSOCL		9.977CE+59		59.9990			
169 CRYTOTIL	2.0918E+15	7.4377E+32	15.3205	32.8714	2.8124E-18	-23.5429	-17.5509
170 CINABAR	1.6624E-34	3.8350E-41	-33.7793	-40.4162	4.3349E+06	8.9029	6.6370
171 CINARMET	1.6624E-34	9.5552E-40	-33.7793	-39.0198	1.7398E+05	7.0296	5.2405
172 CLINENST	2.3948E+04	4.0926E+11	4.3793	11.6120	5.8516E-08	-9.7020	-7.2327
173 CLINPTIL	1.2944E+10	9.977CE+59	10.1121	59.9990			
174 COPUNCUM	1.4455E+16	2.1558E+18	16.1600	18.3336	6.7052E-03	-2.9157	-2.1736
175 CRISTOBA	6.5513E-03	3.8328E-04	-2.1837	-3.4165	1.7092E+01	1.6537	1.2328
176 CRISTOBB	6.5513E-03	1.3980E-03	-2.1837	-2.8545	4.6860E+00	0.8998	0.6708
177 CU		1.7711E+04		4.2482			
178 CU2O		2.7335E-02		-1.5633			
179 CU2S		5.1135E-36		-35.2913			
180 CUSFES6		9.977CE+59		59.9990			
181 CUFES2		2.7265E-45		-44.5644			
182 CUFES23		9.977CF+59		59.9990			
183 CUO		1.09CCE+08		8.0374			
184 CUS		4.6191E-23		-22.3354			
185 CUMMINGT		9.977CE+59		59.9990			
186 DICKITE	6.1900E+11	1.1605E+09	11.7917	9.0648	5.3320E+02	3.6579	2.7269
187 DIOPSIDE	5.596CE+10	1.8382E+20	10.7479	20.2644	3.0442E-10	-12.7655	-9.5165
188 CCLCHITE	2.2845E-23	1.2518E-17	-22.6412	-16.9025	1.8251E-06	-7.6979	-5.7387
189 ENSTATIT	2.3948E+04	9.977CF+59	4.3793	59.9990			
190 FRIGNITE	5.6911E+17	9.977CF+59	17.7552	59.9990			
191 FAYALITE		4.7652E+17		17.6781			
192 FEASS		9.977CE+59		59.9990			
193 FECL2		1.3728E+08		8.1376			

194 FECL3		6.1004E+12		12.7854		
195 FEC03		2.3464E-11		-10.6296		
196 FEQ		4.6217E+12		12.6648		
197 FE203HEM		2.8377E-02		-1.5470		
198 FE203PMH		2.5119E+06		6.4000		
199 FE304		1.556CE+07		7.1920		
200 FECH3AM		3.4527E-38		-37.4618		
201 FES2 PYR				-104.6442		
202 FESIRCLT		1.6774E-50		-49.7754		
203 FESMAKIN		9.977CE+59		59.9990		
204 FORSTERI	8.7543E+10	8.0415E+29	10.9422	29.9054	1.0886E-19	-25.4372 -18.9631
205 FLUCRITE	5.1163F-13	1.7336E-11	-12.2910	-10.7610	2.9512E-02	-2.0524 -1.5300
206 CCETHITE		1.2846F-01		-0.8911		
207 GIBBS AM	3.6745E-35	2.6033E-33	-34.4348	-32.5845	1.4115E-02	-2.4820 -1.8503
208 GIBBS C	3.6745E-35	1.136CE-33	-34.4348	-32.9446	3.2347E-02	-1.5989 -1.4902
209 GREENAL		6.3096E+23		23.8000		
210 GREGITE		1.9953E-20		-19.7000		
211 GYPSUM	8.4742E-08	1.3627E-05	-7.0719	-4.8656	6.2187E-03	-2.9595 -2.2063
212 HALITE	2.6838F-C4	3.6860E+01	-3.5713	1.5666	7.2809E-06	-6.8919 -5.1378
213 HALCYSI	6.1900E+11	7.0120E+11	11.7917	11.8458	8.8277E-01	-0.0726 -0.0542
214 HEULANDI	2.6524E+09	9.977CE+59	9.4236	59.9990		
215 HGO	4.0628E-23	3.5521E+02	-22.3912	2.5505	1.1438E-25	-33.4568 -24.9417
216 HUNITE	5.3489E-48	1.0840E-32	-47.2717	-31.9650	4.9343E-16	-20.5326 -15.3068
217 HYCMAGN	1.8727E-59	6.3056E-31	-58.7275	-30.2000	2.9681E-29	-38.2670 -28.5275
218 ILLITE	4.4767E+14	8.4008E+10	14.6510	10.9243	5.3289E+03	4.9989 3.7266
219 KACLIAIT	6.1900E+11	1.2990F+08	11.7917	8.1136	4.7653E+03	4.9338 3.6781
220 KENYAITE	3.9581E-20	1.0000E-25	-19.4025	-25.0000	3.9581E+05	7.5085 5.5975
221 KYANITE	9.4696E+13	1.9657E+13	13.5763	13.2935	4.8175E+00	0.9159 0.6828
222 KZO	7.9161E+06		6.8985	85.1804		-105.0077 -78.2819
223 LARNITE	8.3347E+14	2.9096E+39	14.9209	39.4638	2.8645E-25	-32.9223 -24.5430
224 LAUMNTIT	9.4547E+15	2.7568E+12	15.9756	12.4404	3.4296E+03	4.7422 3.5352
225 LEUCITE	1.4518E+07	1.4465E+10	7.1619	10.1603	1.0037E-03	-4.0221 -2.9984
226 LECNITE	1.6334E-18	9.9770E+59	-17.7869	55.9990		
227 MAGACITE	2.1500E-11	4.5709E-15	-10.6676	-14.3400	4.7037E+03	4.9262 3.6724
228 MAGNESIT	4.8387E-13	1.0818E-08	-12.3153	-7.9658	4.4727E-05	-5.8343 -4.3494
229 MALACHIT		4.8484E-34		-33.3144		
230 MARIALIT	7.5294E+14	1.4769E+02	14.8768	2.1694	5.0980E+12	17.0458 12.7074
231 PEICNITE	5.1157E+50	9.977CE+59	50.7087	59.9990		
232 MERWINIT	7.1194E+27	6.2621E+69	27.8524	69.7967	1.1369E-42	-56.2642 -41.9443
233 PGCL2	1.5126E-10	4.0873E+22	-9.8203	22.6114	3.7007E-33	-43.5041 -32.4317
234 PGFE204		4.0896E+19		19.6117		
235 MGCPERIC	3.6555E+06	1.3120E+22	6.5629	22.1179	2.7863E-16	-20.8655 -15.5550
236 PICOCCLN	9.5113E+04	2.7522E+01	4.5782	1.4397	3.4559E+03	4.7466 3.5386
237 PIRABILT	4.0985E-07	4.2768E-02	-6.3874	-1.3689	9.5831E-06	-6.7318 -5.0185
238 PACL2		1.0425E+09		9.0181		
239 PNCC3		3.1827E-11		-10.4972		
240 PNC		2.1094E+18		18.3242		
241 PNO2				-79.9479		
242 PMS		5.2723E-01		-0.2780		
243 MCNTICEL	8.5419E+12	9.6578E+30	12.9316	30.9849	8.8445E-19	-24.2168 -18.0533
244 MCNT CA	1.7381E+12	4.9059E+06	12.2401	6.6907	3.5429E+05	7.4439 5.5494
245 MCNT K	8.9145E+11	2.3817E+06	11.9501	6.3769	3.7430E+05	7.4759 5.5732
246 MCNT MG	7.6344E+11	3.9562E+06	11.8828	6.5973	1.9297E+05	7.0900 5.2855
247 MCNT NA	2.1705E+12	4.4734E+06	12.3366	6.6506	4.8520E+05	7.6271 5.6859
248 MCNTCANA		9.977CE+59		59.9990		
249 MCNTSEAM		9.977CE+59		59.9990		
250 MORDENIT	7.4496E+02	9.977CE+59	2.8721	59.9990		
251 MLSCCVIT	1.3733E+21	2.1435E+10	21.1378	10.3311	6.4069E+10	14.4961 10.8066
252 NA2C	1.7407E+09	1.7604E+68	9.2407	68.2456	9.8881E-60	-79.1494 -59.0049
253 NA2SO4	4.1448E-07	6.1921E-01	-6.3825	-0.2082	6.6937E-07	-8.2823 -6.1743

254	NAMCOLIT	1.3088E-04	6.6558E+05	-3.8831	5.8232	1.9663E-10	-13.0201	-9.7063
255	NATRON	2.2784E-10	2.2832E-02	-9.6424	-1.6414	9.9784E-09	-10.7325	-8.0009
256	NATRTHRM	2.3015E-10	1.0425E+00	-9.6380	0.0181	2.2076E-10	-12.9527	-9.6561
257	NFP+ELIN	3.2862E+10	1.2458E+15	10.5167	15.0954	2.6378E-05	-6.1420	-4.5788
258	NESCUFON	4.8225E-13	2.8215E-05	-12.3167	-4.5495	1.7092E-08	-10.4190	-7.7672
259	NICCLITE		9.9770E+59		55.9990			
260	MG2CL2IC		7.0821E-19		-18.1498			
261	PECL2		8.7531E-06		-5.0578			
262	PBCO3		2.9802E-14		-13.5258			
263	PPOLITHR		8.7951E+12		12.9442			
264	PBC+ASIC		1.2253E+13		13.0882			
265	PBS		1.2410E-15		-14.9062			
266	PRSO4		1.6179E-08		-7.7910			
267	PHILLIPS	3.6585E+05	1.2585E-07	5.5633	-6.9000	2.9060E+12	16.7183	12.4633
268	PMLCGPTF	6.6643E+03	3.9344E+21	3.8238	21.5949	1.6939E-18	-23.8383	-17.7711
269	PLAG(ANI)	2.2128E+20	4.7564E+25	20.3449	25.6773	4.6523E-06	-7.1528	-5.3323
270	PREHNITE	5.1650E+26	2.4233E+33	26.7131	33.3844	2.1314E-07	-8.9490	-6.6713
271	PVRCPHYL	2.6597E+07	5.0211E+01	7.4248	1.7008	5.2970E+05	7.6782	5.7240
272	QUARTZ	6.5513E-03	8.8154E-05	-2.1837	-4.0546	7.4282E+01	2.5096	1.8709
273	SAPACMI	9.5113E+04	4.7955E+01	4.9782	1.6812	1.9817E+03	4.4227	3.2970
274	SEPTCLIT	3.7469E+06	1.4318E+19	6.5719	19.1565	2.6147E-13	-16.8783	-12.5826
275	SILICAAM	6.5513E-03	8.3900E-04	-2.1837	-3.0762	7.8085E+00	1.1973	0.8926
276	SILICGEL	6.5513E-03	1.7682E-03	-2.1837	-2.7525	3.7051E+00	0.7630	0.5688
277	SILLIPAN	9.4698E+13	3.9694E+13	13.9763	13.5987	2.3857E+00	0.5065	0.3776
278	SPINEL	5.2840E+22	7.8386E+33	22.7230	33.8542	6.7410E-12	-14.9852	-11.1713
279	SRCO3	5.3027E-12	9.5852E-12	-11.2755	-11.0184	5.5322E-01	-0.3449	-0.2571
280	STRENGIT		6.5750E-28		-27.1818			
281	SYLVITE	1.8099E-05	5.2869E+00	-4.7424	0.7232	3.4233E-06	-7.3315	-5.4656
282	TALC	8.9878E+10	2.8195E+19	10.9537	19.4502	3.1872E-09	-11.3974	-8.4966
283	TREPCIT	2.8146E+32	5.4240E+57	32.4494	57.7343	5.1891E-26	-33.9173	-25.2849
284	TRONA	3.0087E-14	6.6069E-03	-13.5216	-2.1800	4.5539E-12	-15.2137	-11.3416
285	HAIPAKIT	9.4759E+15	1.7238E+18	15.9766	18.2365	5.4972E-03	-3.0314	-2.2599
286	WITHERIT	2.2941E-13	4.3455E-14	-12.6354	-13.3615	5.2739E+00	0.9687	0.7221
287	WALLASTO	2.3367E+06	1.8457E+13	6.3686	13.2662	1.2660E-07	-9.2524	-6.8976
288	ZNCC3		2.1466E-10		-9.6682			
289	ZNJ		9.4206E+11		11.9741			
290	ZNS		1.1730E-12		-11.9307			
291	ZNSC4		7.4912E+04		4.8746			
292	ZCISITE	6.2132E+34	1.4155E+41	34.7933	41.1510	4.3881E-07	-8.5283	-6.3577
293	VIVIANIT		1.0000E-36		-36.0000			
294	MGIL1	1.0000E+00	1.0662E-07	0.0000	-6.9722	9.3791E+06	9.3525	6.9722
295	MGCL2(IC)		5.0872E-15	-129.0175	-14.2935		-153.8913	-114.7240

DUMMY VALUE FOR LOGKT=59.9990,KT=9.9770E+59

MESA 31-1 UNFLASHED FLUID SAMPLED: 6-18-76 ANALYSIS: USBR
ANAL MEC/L CAT= 34.4982 ANAL MEC/L AN= 32.1259

ITER	S1-ANALCO3	S2-ANALSO4	S3-ANALF	S4-ANALPO4	S5-ANALCL	ELEC. IMBALANCE
1	2.01859E-04	3.26057E-04	1.67814E-06	0.00000E+00	4.25837E-05	0.000000
2	1.01281E-04	1.63625E-04	8.52244E-07	0.00000E+00	4.26338E-05	0.000000
3	5.10190E-05	8.27595E-05	4.33242E-07	0.00000E+00	4.27075E-05	0.000000
4	5.12054E-05	4.18445E-05	2.20249E-07	0.00000E+00	4.27444E-05	0.000000
5	5.12903E-05	2.11258E-05	2.20365E-07	0.00000E+00	4.27608E-05	0.000000
6	5.13333E-05	1.06653E-05	2.20424E-07	0.00000E+00	4.27691E-05	0.000000
7	5.13550E-05	5.38426E-06	2.20454E-07	0.00000E+00	4.27733E-05	0.000000

MESA 31-1 UNFLASHED FLUID SAMPLED: 6-18-76 ANALYSTS: USBR
DATA IN MG/L

PH	EM	T	ION STRENGTH	PCO2 ATM	HC03 ALK	MG/L HC03 ALK	MG/L TCT HC03	MG/L TCT CC3		
6.27	9.0000	20.00	0.03483	0.3987736	1.393151E-02	847.8417	847.5604	0.1383		
CALC MEQ/L CAT	CALC MEQ/L AN	AM2D	CO3CALC	PH2D ATM	DENSITY	TCS MG/L				
34.098	31.694	0.9586	1.7620E-06	0.0231	1.0000	2657.24				
ION	ANAL PPM	CALC PPM	ANAL MG/L	CALC MG/L	ANAL MOLAL	CALC MOLAL	ALFA	GAMMA		
								P ICH		
0 CA +2	2	8.9000	7.4497	8.9000	7.4497	2.2265E-04	1.8637E-04	9.8882E-05	0.530580	4.0049
1 MG +2	2	0.0500	0.0448	0.0500	0.0448	2.0621E-06	1.8490E-06	9.5483E-07	0.538333	6.0023
2 NA +1	1	730.0000	719.2441	730.0000	719.2441	3.1838E-02	3.1369E-02	2.6420E-02	0.842234	1.5781
3 K +1	1	85.0000	84.5720	85.0000	84.5720	2.1796E-03	2.1696E-03	1.8101E-03	0.834072	2.7423
4 CL -1	-1	510.0000	510.0000	510.0000	510.0000	1.4424E-02	1.4424E-02	1.2039E-02	0.834072	1.9194
5 S24 -2	-2	183.0000	156.5675	183.0000	156.5675	1.9101E-03	1.6342E-03	8.1444E-04	0.440309	3.0591
6 HCO3 -1	-1	845.0000	835.6906	845.0000	835.6906	1.3885E-02	1.3732E-02	1.1647E-02	0.871794	1.9319
7 H +1	1		0.0006		0.0006		6.1598E-07	5.3703E-07	0.871794	6.2700
8 OH -1	-1		0.0003		0.0003		1.4945E-08	1.2532E-08	0.838550	7.9020
9 AM2O	0								1.009013	
10 H4SiO4	0								1.009013	2.3359
11 SiO2 AQ	0	274.0000	274.0000	274.0000	274.0000	4.5724E-03	4.5724E-03	4.6144E-03	0.830007	
12 AG +1	1		0.0000		0.0000	7.4322E-07	8.7975E-11	2.4945E-11	0.283343	10.6030
13 AL +3	3	0.0200	0.1188	0.0200	0.1188	1.0951E-06	8.6715E-07	4.4656E-07	0.514777	6.3501
14 BA +2	2								0.830007	
15 CU +1	1								0.530580	
16 CU +2	2								0.530580	
17 FE +2	2								0.283343	
18 FE +3	3								0.448309	
19 HG2 +2	2								0.514777	33.6656
20 HG +2	2	0.0080	0.0000	0.0080	0.0000	3.9987E-08	4.1542E-34	2.1599E-34	0.405540	4.1297
21 LI +1	1	0.6000	0.6000	0.6000	0.6000	8.6698E-05	8.6698E-05	7.4174E-05	0.533580	
22 MN +2	2								0.283343	
23 MN +3	3								0.506804	
24 PB +2	2								0.514777	5.1527
25 SR +2	2	1.4000	1.1939	1.4000	1.1939	1.6021E-05	1.3663E-05	7.0360E-06	0.530580	
26 ZN +2	2								0.842234	9.4649
27 H2ASO3 -	-1	0.0500	0.0001	0.0500	0.0001	3.8288E-07	4.0705E-10	3.4284E-10	0.223751	
28 PO4 -3	-3								0.838550	4.2102
29 F -1	-1	1.4200	1.3925	1.4200	1.3925	7.4942E-05	7.3493E-05	6.1628E-05	1.009013	3.6311
30 H3RO3 AQ	0	14.3000	14.2829	14.3000	14.2829	2.3188E-04	2.3161E-04	2.3383E-04	1.009013	
31 NH3 AQ	0	2.3100	2.3100	2.3100	2.3100	1.3600E-04	1.3600E-04		1.009013	4.8260
32 H2S AQ	0	0.6000	0.5026	0.6000	0.5026	1.7653E-05	1.4787E-05	1.4930E-05	1.009013	7.8555
33 ALF +2	2		0.0							

47	AGSC42-3 -3					0.239293	
48	H3AS03 0	0.0480	0.0480	3.8248E-07	3.8615E-07	1.009613	6.4132
49	AS04 -3 -3					0.239293	
50	BAC03 AC 0	0.0000	0.0000	1.2270E-10	1.2388E-10	1.009613	9.9070
51	BAMC03+ 1	0.0301	0.0301	1.5198E-07	1.2801E-07	0.842254	6.8928
52	BAIOM+1 1	0.0000	0.0000	1.0621E-12	9.0154E-13	0.849185	12.0448
53	BAS04 AQ 0	0.0177	0.0177	7.5834E-08	7.6563E-08	1.009613	7.1160
54	CAC03 AQ 0	0.0130	0.0130	1.3026E-07	1.3151E-07	1.009613	6.8610
55	CAHC03+ 1	2.0754	2.0754	2.0583E-05	1.7610E-05	0.855546	4.7542
56	CAIOM+1 1	0.0000	0.0000	2.3516E-11	2.0119E-11	0.855546	10.6964
57	CAP04 -1 -1					0.851794	
58	CAMP04 0					1.009613	
59	CAH2P04+ 1					0.851794	
60	CAS04 AQ 0	2.1138	2.1138	1.5568E-05	1.5717E-05	1.009613	4.8036
61	CUCL 0					1.009613	
62	CUCL2 -1 -1					0.842254	
63	CUCL3 -2 -2					0.514977	
64	CUCL +1 1					0.842254	
65	CUCL2 0					1.009613	
66	CUCL3 -1 -1					0.842254	
67	CUCL4 -2 -2					0.514977	
68	CUIOM+1 1					0.842254	
69	CUS04 0					1.009613	
70	FECL +1 1					0.842254	
71	FECL2 0					1.009613	
72	FECL3 -1 -1					0.842254	
73	FECL4 -2 -2					0.514977	
74	FEIOM+1 1					0.849185	
75	FEIOM+2 0					1.009613	
76	FEIOM -1 -1					0.849185	
77	FES04 0					1.009613	
78	FECL +2 2					0.514977	
79	FECL2 +1 1					0.849185	
80	FECL3 0					1.009613	
81	FECL4 -1 -1					0.842254	
82	FES04 +1 1					0.849185	
83	FES04+2 -1					0.842254	
84	FEIOM+2 2					0.514977	
85	FEIOM+2+ 1					0.851794	
86	FEIOM+3 0					1.009613	
87	FEIOM+4 -1					0.851794	
88	H4I034- -1	0.0218	0.0218	2.7775E-07	2.3093E-07	0.831436	6.6365
89	H2S104-2 -2	0.0000	0.0000	9.3368E-12	4.8676E-12	0.521334	11.3127
90	H3S134- -1	0.1837	0.1837	1.9367E-06	1.6312E-06	0.842254	5.7875
91	HAS03 -2 -2	0.0000	0.0000	1.9541E-16	1.0063E-16	0.514977	15.9973
92	HAS04 -2 -2					0.514977	
93	H2ASC4 - -1					0.842254	
94	H3ASC4 0					1.009613	
95	HF AQ 0	0.0009	0.0009	4.5442E-08	4.5879E-08	1.009613	7.3384
96	H2C73 0	952.1395	952.1395	1.5392E-02	1.5540E-02	1.009613	1.8086
97	C03 -2 -2	0.1055	0.1055	1.7620E-06	9.1859E-07	0.521334	6.0369
98	HPO4 -2 -2					0.514977	
99	H2P04 -1 -1					0.851794	
100	HS -1 -1	0.0945	0.0945	2.8652E-06	2.4026E-06	0.838550	5.6193
101	S -2 -2	0.0000	0.0000	7.3198E-17	3.7695E-17	0.514977	16.4237
102	HS04 -1 -1	0.0038	0.0038	3.5548E-08	3.3492E-08	0.845796	7.4751
103	HNG3 AQ 0	0.0000	0.0000	1.0224E-13	1.0323E-13	1.009613	17.9862
104	HGCL +1 1	0.0000	0.0000	6.3221E-30	5.3248E-30	0.842254	29.2737
105	HGCL2 0	0.0000	0.0000	8.3410E-25	8.4212E-25	1.009613	24.0746
106	HGCL3 -1 -1	0.0000	0.0000	1.5613E-24	1.3150E-24	0.842254	23.8611

107	HGCL4 -2 -2	0.0000	0.0000	1.0827E-26	5.5758E-27	0.514977	26.2537
108	HGSJ4 0	0.0000	0.0000	4.3766E-36	4.4187E-36	1.009613	35.3547
109	HGS42512 0	0.0000	0.0000	9.5515E-20	9.6437E-20	1.009613	15.0158
110	HGHS13- -1	0.0120	0.0120	3.5989E-08	3.3681E-08	0.842254	7.4726
111	HG 0					1.009613	
112	KCL 0	0.0143	0.0143	1.9290E-07	1.9475E-07	1.009613	6.7105
113	KCO3 -1 -1	0.0000	0.0000	4.2714E-63	3.5913E-63	0.842254	62.4447
114	KHSO4 0	0.0000	0.0000	6.0046E-31	6.6233E-31	1.009613	30.2174
115	KSO4 -1 -1	1.4535	1.4535	1.0782E-05	9.1841E-06	0.851794	5.0370
116	KHPO4 -1 -1					0.851794	
117	LI10H1 0	0.0000	0.0000	1.4132E-12	1.4268E-12	1.009613	11.8457
118	LI15O41- -1	0.0000	0.0000	7.1139E-28	6.0410E-28	0.842254	27.2189
119	HGCO3 AQ 0	0.0002	0.0002	2.2715E-09	2.2934E-09	1.009613	8.6355
120	HGHCJ31+ 1	0.0070	0.0070	8.1822E-08	6.8915E-08	0.842254	7.1617
121	PGF +1 1	0.0002	0.0002	4.2020E-09	3.5541E-09	0.842254	8.4493
122	HGICH1+1 1	0.0000	0.0000	5.6526E-12	4.8529E-12	0.858533	11.3140
123	HGSJ4 AQ 0	0.0150	0.0150	1.2475E-07	1.2555E-07	1.009613	6.8998
124	HGIPG41- -1					0.851794	
125	HGHPD4 0					1.009613	
126	HGHPD4+ 1					0.851794	
127	HNCL +1 1					0.842254	
128	HNCL2 0					1.009613	
129	HNCL3 -1 -1					0.842254	
130	HNCL4 -2 -2					0.514977	
131	HNNHCC3+1 1					0.842254	
132	HNSO4 AQ 0					1.009613	
133	HNCL +2 2					0.514977	
134	HNCL2 +1 1					0.642254	
135	NO3 -1 -1	0.4300	0.4300	6.9534E-06	6.9534E-06	5.8038E-06	5.2353
136	NACL 0	2.4932	2.4932	4.2773E-05	4.3185E-05	1.009613	4.3647
137	NACC3 -1 -1	0.0341	0.0341	4.1207E-07	3.5100E-07	0.851794	6.4547
138	NAHC03 0	14.4221	14.4221	1.7213E-04	1.7379E-04	1.009613	3.7630
139	NA2CC3AO 0	0.0000	0.0000	1.3269E-10	1.3397E-10	1.009613	5.8733
140	NA2S74AO 0	0.0000	0.0000	5.6308E-27	5.6850E-27	1.009613	26.2453
141	NASO4 -1 -1	30.1330	30.1330	2.5378E-04	2.1617E-04	0.851794	3.6652
142	NAHPO4-1 -1					0.851794	
143	NH4 +1 1	2.4452	2.4452	1.3592E-04	1.1289E-04	0.830607	3.9473
144	NH4OH 0	0.0029	0.0029	8.2393E-08	8.3185E-08	1.009613	7.0800
145	NH4PC4-2 -2					0.514977	
146	NH4SO41- -1	0.0000	0.0000	1.0827E-27	9.1945E-28	0.842254	27.0365
147	PBCL +1 1					0.842254	
148	PBCL2 0					1.009613	
149	PBCL3 -1 -1					0.842254	
150	PBCL4 -2 -2					0.514977	
151	PBSO4 AQ 0					1.009613	
152	PBSO42-2 -2					0.514977	
153	SR(OH1)-1 -1	0.0000	0.0000	6.6475E-13	5.6449E-13	0.842254	12.2483
154	SPO3 AQ 0	0.0006	0.0006	4.2140E-09	4.2545E-09	1.009613	8.3712
155	SPHCJ31+ 1	0.2205	0.2205	1.4877E-06	1.2530E-06	0.842254	5.4020
156	SUSO4 AQ 0	0.1587	0.1587	8.6606E-07	8.7438E-07	1.009613	6.0583
157	ZNCL +1 1					0.842254	
158	ZNCL2 0					1.009613	
159	ZNCL3 -1 -1					0.842254	
160	ZNCL4 -2 -2					0.514977	
161	ZNSO4 AQ 0					1.009613	
162	ALFS -2 -2	0.0000	0.0000	1.0354E-11	5.3320E-12	0.514977	11.2731
163	ALF6 -3 -3	0.0000	0.0000	4.3345E-15	1.0372E-15	0.239295	14.9841
164	HG(OH1)+ 1	0.0000	0.0000	1.1086E-31	9.3371E-32	0.842254	31.0298
165	HG(OH1)2 0	0.0000	0.0000	3.9518E-28	3.9898E-28	1.009613	27.3991
166	HCL AQ 0	0.0000	0.0000	2.9056E-15		1.009613	

MG1= 0.0000E+00MHG12= 0.0000E+00MHG13= 0.0000E+00MHG14= 0.0000E+00

MCL RATIOS BASED ON ANALYTICAL MCLALITY

CL/CA 6.4782E+01	CL/MG 6.9947E+03	CL/NA 4.5303E-01	CL/K 6.6175E+00	CL/AL 1.9407E+04	CL/FE 7.5512E+00	CL/SO4 1.0388E+00	CL/HCO3 1.0797E+02	CA/MG 4.6667E-01	SQRT(CA)/NA 4.6667E-01
NH3/NA 4.2716E-03	LI/NA 2.7231E-03	K/NA 6.8459E-02	MG/CA 9.2616E-03	SR/CA 7.1955E-02	BA/CA 4.9185E-03	SO4/CL 1.3243E-01	HCO3/CL 9.6269E-01	F/CL 5.1958E-03	B/CL 1.6077E-02

LOG OF ACTIVITY RATIOS

CA/H2 8.5351	MG/H2 6.5377	NA/H 4.6919	K/H 3.5277	AL/H3 8.2070	FE/H2	CA/MG 1.9974	NA/K 1.1642
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LOG(NA/K)+1/3LOG(SQRT(CA)/NA) = 1.055E+00 LOG(NA/K)+4/3LOG(SQRT(CA)/NA) = 7.257E-01

SUBSURFACE TEMPERATURE (OC) FROM CHEMICAL DATA

QTZ TEMP (CONDUCTIVE)= 202.5	QTZ TEMP (ADIABATIC)= 186.3
AM.SILICA TEMP WITH SI02= 77.9	AM.SILICA TEMP WITH H4SI04= 77.9
CHAL. TEMP WITH SI02= 185.0	CHAL. TEMP WITH H4SI04= 185.0
A.CRISTOB. TEMP WITH SI02= 153.8	A.CRISTOB. TEMP WITH H4SI04= 153.7
LOG(NA/K) TEMP= 202.2	LOG(NA/K)+1/3LOG(SQRT(CA)/NA) TEMP= 226.7
LOG(NA/K)+4/3LOG(SQRT(CA)/NA) TEMP= 282.2	LOG(NA/K)+4/3LOG(SQRT(CA)/NA) TEMP - 1PCO2 = 116.7

IF THE SPRING IS BOILING OR STEAM IS LOST DURING REDUCTION THEN SELECT QTZ TEMP ADIABATIC ELSE SELECT QTZ TEMP CONDUCTIVE
 AM.SILICA TEMP SHOULD BE CONSIDERED IF SAMPLE IS SATURATED WITH AM.SILICA I.E. IF DELG OF MIN.NO.275 IS POSITIVE
 NA/K TEMP IS USEFUL IF CONC. OF CA IS LOW (MORE DECS) VS NA
 USE --4/3LOG-- TEMP IF <100 ELSE USE--1/3-- TEMP
 READ FOURNIER & TRUESDELL 1973

MESA 31-1 UNFLASHED FLUID SAMPLED: 6-18-76 ANALYSIS: USBR

PHASE	AP	KT	LOG AP	LOG KT	AP/KT	DELG	LOG AP/KT
139 AG		2.1095E-01		-0.6759			
140 AG2S A		1.5773E-22		-21.8021			
141 AGCL		1.1537E-10		-9.9379			
142 ACULARIA	5.3643E+04	2.5966E+01	4.7295	1.4144	2.0659E+03	4.4469	3.3151
143 AKERMANI	8.6464E+18	4.2863E+46	18.9368	46.6321	2.0172E-28	-37.1505	-27.6952
144 ALBITE L	7.8298E+05	1.4618E+04	5.8938	4.1649	5.3564E+01	2.3191	1.7289
145 ALBITE H	7.8298E+05	1.8217E+05	5.8938	5.2605	4.2981E+00	0.8495	0.6333
146 ALUNITE			-89.1416	-85.9178		-2.9830	-2.2238
147 ANALCIME	1.6855E+08	4.8173E+09	8.2278	9.6828	3.5072E-02	-1.9518	-1.4550
148 ANDALUSI	1.1952E+14	1.5831E+13	14.0774	13.1995	7.5495E+00	1.1776	0.8779
149 ANHYDRIT	8.0533E-08	2.4777E-05	-7.0940	-4.6061	3.2513E-03	-3.3373	-2.4879
150 ANNITE		2.064CE+27		27.3147			
151 APATCHMLR		1.2585E-66		-65.9000			
152 APATFLUR				-71.6225			
153 APATHYCK		9.4293E-62		-61.0255			
154 ARAGENIT	9.0832E-11	4.8137E-09	-10.0418	-8.3175	1.8870E-02	-2.3129	-1.7242
155 RAPIITE	3.6370E-10	1.6581E-10	-9.4393	-9.7804	2.1935E+00	0.4576	0.3411
156 BIOTITE		9.9777E+59		59.9990			
157 BCCMITE	1.6059E+08	8.7773E+08	8.2057	8.9434	1.8296E-01	-0.5875	-0.7376
158 BCCNITE				-117.0616			
159 BRUCITE	1.5624E-22	5.9781E-12	-21.8062	-11.2234	2.6135E-11	-14.1958	-10.5828
160 CALCITE	9.0832E-11	3.2874E-09	-10.0418	-8.4831	2.7629E-02	-2.0908	-1.5586
161 CACL2	1.4332E-08	5.4260E+11	-7.8437	11.7345	2.6413E-20	-26.2623	-19.5782
162 CAD LIME	3.4237E+08	1.6245E+33	8.5345	33.2107	2.1075E-25	-33.1008	-24.6762
163 CAICM12	1.5529E-20	4.8906E-06	-19.8089	-5.3106	3.1753E-15	-19.4480	-14.4582
164 CAS	4.4239E-04	1.3991E+12	-3.3542	12.1458	3.1620E-16	-20.7918	-15.5000
165 CELESTIT	5.7304E-09	4.0828E-07	-8.2418	-6.3890	1.4035E-02	-2.4853	-1.8528
166 CHALCEDON	4.6277E-03	2.4647E-04	-2.3346	-3.6082	1.8776E+01	1.7084	1.2736
167 CHLOR MG	1.2139E+42	4.3926E+60	42.0913	60.6427	2.8091E-19	-24.8850	-18.5514
168 CRYSCCOL		9.9777E+59		59.9990			
169 CRYSOTIL	8.7266E+14	7.4377E+32	14.9408	32.8714	1.1733E-18	-24.0522	-17.9306
170 CINABAR	9.6632E-34	3.8350E-41	-33.0149	-40.4162	2.5198E+07	9.9282	7.4614
171 CINABMET	9.6632E-34	9.5552E-40	-33.0149	-39.0198	1.0113E+06	8.0550	6.0049
172 CLINENST	1.5940E+04	4.0926E+11	4.2025	11.6120	3.8948E-08	-9.9392	-7.4095
173 CLINPYIL	2.8127E+09	9.9777E+59	9.4491	59.9990			
174 CCRUNDUM	2.5827E+16	2.1558E+18	16.4121	18.3336	1.1981E-02	-2.5775	-1.9215
175 CRISTOBA	4.6277E-03	3.8328E-04	-2.3346	-3.4165	1.2074E+01	1.4512	1.0818
176 CRISTOBB	4.6277E-03	1.3980E-03	-2.3346	-2.8545	3.3101E+00	0.6973	0.5198
177 CU		1.7711E+04		4.2482			
178 CU2O		2.7335E-02		-1.5633			
179 CU2S		5.1135E-36		-35.2913			
180 CUSFES6		9.9777E+59		59.9990			
181 CUFES2		2.7265E-45		-44.5644			
182 CUFE2S3		9.9777E+59		59.9990			
183 CUJ		1.090CE+08		8.0374			
184 CUS		4.6151E-23		-22.3354			
185 CUMMINGT		9.9777E+59		59.9990			
186 CICKITE	5.5151E+11	1.1605E+09	11.7416	9.0648	4.7506E+02	3.5906	2.6768
187 CIOPSIDE	2.5255E+10	1.8382E+20	10.4023	20.2644	1.3739E-10	-13.2290	-9.8621
188 DOLCMTIE	8.3006E-23	1.2518E-17	-22.0809	-16.9025	6.6312E-06	-6.9463	-5.1784
189 ENSTATIT	1.5940E+04	9.9777E+59	4.2025	59.9990			
190 ERICNITE	6.7123E+16	9.9777E+59	16.8269	59.9990			
191 FAYALITE		4.7652E+17		17.6781			
192 FEASS		9.9777E+59		59.9990			
193 FECL2		1.3728E+08		8.1376			

194	FECL3	6.1004E+12		12.7854			
195	FEC03	2.3464E-11		-10.6296			
196	FEO	4.6217E+12		12.6648			
197	FE203HEM	2.8377E-02		-1.5470			
198	FE203MGH	2.5119E+06		6.4000			
199	FE3C4	1.556CE+07		7.1920			
200	FECH3AM	3.4527E-38		-37.4618			
201	FES2 PYR			-104.6442			
202	FESTROLT	1.6774E-5C		-49.7754			
203	FESMAKIN	9.9770E+59		59.9990			
204	FJPSTERI	5.4905E+10	8.0419E+29	10.7396	29.9054	6.8273E-20	-25.7090
205	FLUCRITE	3.7555E-13	1.7336E-11	-12.4253	-10.7610	2.1662E-02	-2.2325
206	GCETHITE		1.2849E-01		-0.8911		
207	GIBBS AM	4.9093E-35	2.6033E-33	-34.3090	-32.5845	1.8858E-02	-2.3133
208	GIBBS C	4.9093E-35	1.1360E-33	-34.3090	-32.9446	4.3218E-02	-1.8301
209	GPEENALI		6.3096E+23		23.8000		
210	GREIGITE		1.9953E-20		-19.7000		
211	GYP SUM	8.03C2E-08	1.3627E-05	-7.0953	-4.8656	5.8929E-03	-2.9909
212	HALITE	3.1807E-04	3.686CE+01	-3.4975	1.5666	8.6292E-06	-6.7929
213	HALLCYSI	5.5151E+11	7.0120E+11	11.7416	11.8458	7.8652E-01	-0.1399
214	HEULANDI	3.9844E+08	9.7770E+59	8.60C4	59.9990		
215	HGO	7.4784E-22	3.5521E+02	-21.1262	2.5505	2.1054E-24	-31.7600
216	HUMTITE	6.9315E-47	1.0840E-32	-46.1591	-31.9650	6.3946E-15	-19.0401
217	HYCRMAGN	1.1872E-58	6.3096E-31	-57.9255	-30.2000	1.8816E-28	-37.1911
218	ILLITE	2.8363E+14	8.4008E+10	14.4527	10.9243	3.3762E+03	4.7330
219	KACLINIT	5.5151E+11	1.2990E+08	11.7416	8.1136	4.2457E+03	4.8666
220	KENYAITE	1.0174E-21	1.0000E-25	-20.9925	-25.0000	1.0174E+04	5.3757
221	KYANITE	1.1952E+14	1.9657E+13	14.0774	13.2935	6.0802E+00	1.0516
222	K2O	1.1344E+07		7.0548	85.18C4		-104.7981
223	LAPNITE	5.4244E+14	2.9096E+39	14.7343	39.4638	1.0643E-25	-33.1723
224	LAUMNIT	4.0320E+15	2.7568E+12	15.6055	12.4404	1.4626E+03	4.2457
225	LEUCITE	1.1592E+07	1.4465E+10	7.0641	10.1603	8.0136E-04	-4.1532
226	LECNITE	2.1496E-18	9.977CE+59	-17.6676	59.9990		
227	PAGADITE	2.2200E-12	4.5709E-15	-11.6536	-14.3400	4.8568E+02	3.6035
228	PAGNESIT	9.1384E-13	1.0818E-08	-12.0391	-7.9658	8.4472E-05	-5.4639
229	PALACHIT		4.8484E-34		-33.3144		
230	PARTALIT	1.5268E+14	1.4765E+02	14.1838	2.1694	1.0338E+12	16.1162
231	PEICNITE	6.1677E+50	9.977CE+59	50.7901	59.9990		
232	PERWINIT	2.9603E+27	6.2621E+69	27.4713	69.7567	4.7273E-43	-56.7755
233	PGCL2	1.4419E-10	4.0873E+22	-9.8411	22.6114	3.5277E-33	-43.5320
234	PGFE2O4		4.0856E+19		19.6117		
235	HGCPERTC	3.4445E+06	1.3120E+22	6.5371	22.1179	2.6255E-16	-20.9002
236	PICRCLN	5.3643E+04	2.7522E+01	4.7295	1.4397	1.9491E+03	4.4130
237	PIFABILT	5.6039E-07	4.2768E-02	-6.2515	-1.3689	1.3103E-05	-6.5456
238	PACL2		1.0425E+09		9.0181		
239	MNCO3		3.1827E-11		-10.4972		
240	PNC		2.1094E+18		18.3242		
241	MNO2				-79.9479		
242	PAS		5.2723E-01		-0.2780		
243	PCNTICEL	5.4573E+12	9.6578E+30	12.7370	30.5849	5.6507E-19	-24.4778
244	PCNT CA	9.4751E+11	4.9055E+06	11.5766	6.6907	1.9314E+05	7.0905
245	PCNT K	5.1923E+11	2.3817E+06	11.7154	6.3769	2.1801E+05	7.1611
246	PCNT MG	4.1490E+11	3.9562E+06	11.6179	6.5973	1.0487E+05	6.7347
247	PCNT NA	1.2577E+12	4.4734E+06	12.0996	6.6506	2.8114E+05	7.3092
248	MONT CANA		9.977CE+59		59.9990		
249	PCNTSEAM		9.977CE+59		59.9990		
250	MORDENIT	3.9429E+01	9.977CE+59	1.5958	59.9990		
251	MUSCOVIT	1.3835E+21	2.1435E+10	21.1410	10.3311	6.4542E+10	14.5004
252	NA2O	2.4169E+09	1.7604E+68	9.3833	68.2456	1.3730E-59	-78.9582
253	NA2SO4	5.6851E-07	6.1921E-01	-6.2453	-0.2082	9.1812E-07	-8.0982

254	NAHCLIT	3.0905E-04	6.6558E+05	-3.5100	5.8232	4.6433E-10	-12.5196	-9.3332
255	NATRON	6.3205E-10	2.2833E-02	-9.1992	-1.6414	2.7682E-08	-10.1381	-7.5578
256	NATRTM	6.4029E-10	1.0423E+00	-9.1936	0.0181	6.1418E-10	-12.3566	-9.2117
257	NEPHELIN	3.6562E+10	1.2458E+15	10.5630	15.0954	2.9349E-05	-6.0798	-4.5324
258	NESCUON	9.0991E-13	2.8215E-05	-12.0410	-4.5495	3.2249E-08	-10.0491	-7.4915
259	NICCLITE		9.9770E+59		59.9990			
260	PGCLZIC		7.0821E-19		-18.1498			
261	PECL2		8.7531E-06		-5.0578			
262	PECG3		2.9802E-14		-13.5258			
263	POCLITHR		8.7951E+12		12.9442			
264	PROVASIC		1.2253E+13		13.0882			
265	PRS		1.2410E-15		-14.9062			
266	PRSO4		1.6179E-08		-7.7910			
267	PHILLIPS	2.0465E+05	1.2589E-07	5.3110	-6.9000	1.6256E+12	16.3799	12.2110
268	PHLOGPTF	2.4047E+03	3.9344E+21	3.3811	21.5949	6.1119E-19	-24.4321	-18.2138
269	PLAGIAN	1.8936E+20	4.7564E+25	20.2773	25.6773	3.9812E-06	-7.2436	-5.4000
270	PPELITE	2.9959E+26	2.4233E+33	26.4765	33.3844	1.2363E-07	-9.2663	-6.9079
271	PYRPHYR	1.1828E+07	5.0211E+01	7.0729	1.7008	2.3556E+05	7.2062	5.3721
272	QUARTZ	4.6277E-03	8.8154E-05	-2.3346	-4.0546	5.2471E+01	2.3071	1.7199
273	SANADHMI	5.3643E+04	4.7755E+01	4.7295	1.6812	1.1177E+03	4.0890	3.0483
274	SEPICLIT	1.1724E+06	1.4338E+19	6.0651	19.1565	8.1772E-14	-17.5555	-13.0874
275	SILICAM	4.6277E-03	8.3900E-04	-2.3346	-3.0762	5.5157E+00	0.9948	0.7416
276	SILICGEL	4.6277E-03	1.7682E-03	-2.3346	-2.7525	2.6172E+00	0.5605	0.4178
277	SILLIMAN	1.1952E+14	3.9694E+13	14.0774	13.5987	3.0111E+00	0.6422	0.4787
278	SPINEL	8.8961E+22	7.8386E+33	22.9492	33.8542	1.1349E-11	-14.6817	-10.9450
279	SRCO3	6.4632E-12	9.5852E-12	-11.1896	-11.0184	6.7429E-01	-0.2296	-0.1712
280	STRENGIT		6.5750E-28		-27.1818			
281	SYLVITE	2.1792E-05	5.2869E+00	-4.6617	0.7232	4.1218E-06	-7.2233	-5.3849
282	TALC	1.8715E+10	2.8195E+19	10.2722	19.4502	6.6368E-10	-12.3115	-9.1780
283	TRECLIT	1.1937E+31	5.4240E+57	31.0769	57.7343	2.2007E-27	-35.7584	-26.6574
284	TPOHA	1.9759E-13	6.6069E-03	-12.7042	-2.1800	2.9907E-11	-14.1172	-10.5242
285	WATRANIT	4.0436E+15	1.7238E+18	15.6068	18.2365	2.3458E-03	-3.5275	-2.6297
286	WITHERIT	4.1021E-13	4.3495E-14	-12.3870	-13.3615	9.4303E+00	1.3072	0.9745
287	WALLASTO	1.5844E+06	1.8457E+13	6.1999	13.2662	8.5841E-08	-9.4788	-7.0663
288	ZNCO3		2.1466E-10		-9.6682			
289	ZAC		9.4206E+11		11.9741			
290	ZAS		1.1730E-12		-11.9307			
291	ZASCO4		7.4913E+04		4.8746			
292	ZOISITE	4.8181E+34	1.4155E+41	34.6829	41.1510	3.4028E-07	-8.6764	-6.4682
293	VIVIANIT		1.0000E-36		-36.0000			
294	HGILI	1.0000E+00	1.0662E-07	0.0000	-6.9722	9.3791E+06	9.3525	6.9722
295	HGCLZIC		5.0872E-15	-124.0287	-14.2935		-147.1992	-109.7351

DUMMY VALUE FOR LOCKT=59.9990,KT=9.9770E+59

FIGURE 2. MAP OF EAST MESA GEOTHERMAL ANOMALY
(after USBR, 1974)

Fig 3.