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Scientific Notebook # 215

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and Saturated

Unsaturated, ^ Flow Under Isothermal Conditions

20-5708-861

David R. Turner / Sr. Research Scientist

Page

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Objectives (20-5708-861) - KTI on Unsaturated and Saturated Flow Under Isothermal Conditions (3/14/97)

The purpose of the research discussed in this scientific notebook is to evaluate available geochemical, geological, and hydrologic data in the vicinity of Yucca Mountain. These data will be used to help delineate regional flow patterns and constrain the potential for dilution of radionuclide-bearing waters through mixing between different bodies of groundwater. These data will be evaluated by developing geographic information system (GIS) coverages specific to hydrologic flow and transport. The data used in constructing the GIS coverages are largely pre-existing data acquired and/or compiled by the DOE and its contractors (e.g., USGS). Therefore, one of the main objectives of this scientific notebook is to document data sources and data quality (where possible). An additional objective is to document assumptions and conditions used in setting up modeling simulations of groundwater flow.

SATURATED ZONE WATER CHEMISTRY

A comprehensive source of water chemistry data is found in the USGS report of Perfect et al. (1995).

Perfect, D.L., C.C. Faunt, W.C. Steinkampf, and A.K. Turner. 1995. *Hydrochemical Data Base for the Death Valley Region, California and Nevada*. USGS Open-File Report 94-305. Denver, CO: U.S. Geological Survey.

This report includes compressed Lotus 1-2-3 (*.WK1) files with major and minor element analyses compiled over several decades for the region surrounding Yucca Mountain. One contains the raw data for over 4700 wells and springs from USGS and DOE reports and the USGS National Water Information Sevice (NWIS) database. A second file has been edited to remove duplicates, make chemical data consistent, and calculate charge balance. The "editing" philosophy used by Perfect et al. (1995) is described in the report. These data were not generally collected under a DOE-approved QA program, but are freely used here. The sources referenced in Perfect et al. (1995) should be consulted for determining the quality of the data.

Some modifications have been made to the comprehensive water chemistry database of Perfect et al. (1995). The Lotus 1-2-3 file DATAEDIT.WK1 file of Perfect et al. (1995) has been converted to an Excel 5.0 for Windows file (*.XLW). As mentioned earlier, the second file has been edited by Perfect et al. (1995) to remove duplicates, make chemical data consistent, and calculate charge balance. The "editing" philosophy used by Perfect et al. (1995) is described in the report.

The edited file consists of some 3733 water chemistry analyses. Most of the analyses are replicated samples collected at different times from springs and wells in the Yucca Mountain region. Complete major and minor element concentrations are commonly reported, but in some instances only trace contaminants such as Cd, Cu, and Zn were reported for a given analyses. All concentrations are reported in mg/L, and -99998 indicates no reported value. The file dataedsi.xls that is included in this notebook has been sorted using Excel to remove analyses that are not charge-balanced and/or do not include a reported measurement for either pH or Ca as reported in the initial The Lotus 1-2-3 file DATAEDIT.WK1 file of Perfect et al. (1995). This eliminates more than 2000 analyses and results in a total of 1448 analyses.

Once entered in Excel 5.0, these data files have been modified using spreadsheet formulas in several ways:

1) A column was added and Arc ID# were assigned to each analysis. The analyses were first ordered by increasing latitude from south to north, and numbered sequentially from 1-3733. These ID#'s should be maintained in subsequent analyses.

2) Sampling locations are reported in terms of latitude and longitude (degrees, minutes, seconds). For incorporation into existing ArcInfo coverages, additional columns have been developed that convert locations first to decimal degrees (degrees + (minutes/60) + (seconds/3600)), and then projected to UTM coordinates. The UTM projection conversion is based on UTM Zone 11, with a central meridian of -117°, and using the Clarke 1866 ellipsoid. The formulas used in the conversion were taken from:

Snyder, J. 1987. *Map Projections, A Working Manual*. USGS Professional Paper 1395. Washington, DC: U.S. Geological Survey.

and checked against examples given in Snyder (1987). A check of the conversion is reported in CNWRA Scientific Notebook No. 157A (KTI on Radionuclide Transport) in the CNWRA QA records facility.

3) Analyses for each element are checked for positive concentrations (to account for the -99998, not reported), converted to molality (m_i), and total groundwater ionic strength was calculated such that:

$$I = 0.5(\Sigma m_i z_i^2)$$

This requires adding two rows. The first added row identifies the assumed aqueous species. In most cases, this was assumed to be the unspeciated cation or anion (e.g., Ca^{++}, Cl^-), but in some cases, particularly for anions, other species were assumed such as SO_4^{-2}, PO_4^{-3}, and $VO_2(OH)_3^{-2}$. The second added row contains the gram formula weight for each of the assumed species. Checks for the ionic strength calculation are included in CNWRA Scientific Notebook No. 157A (KTI on Radionuclide Transport) in the CNWRA QA records facility.

4) Three additional columns have been added to report log $p(CO_2)$, and the saturation indices with respect to calcite and cristobalite calculated using MINTEQA2, version 3.11.

Trilinear plots (Piper diagrams) have been calculated for saturated zone water chemistry in the Amargosa Valley region.

UNSATURATED ZONE WATER CHEMISTRY

Water chemistry for the unsaturated zone has been summarized in:

Cang, I-C., G.W. Rattray, and P. Yu. 1996. Interpretation of Chemical and Isotopic Data from Boreholes in the Unsaturated Zone at Yucca Mountain, Nevada. U.S. Geological Survey Water Resources Investigations Report 96-4058.

These data have been entered into an Excel 5.0 spreadsheet and are included in this scientific notebook.

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DATAEDSI.XLS

	A	B	C	D	E	F	G	H	I
1	SITE NAME,	SITE ID	ARC ID#	LAT	LAT (DEC)	UTM(north)	LONG	LONG (DEC)	UTM(east)
2	Assumed Predominant Species,								
3	Gram Molecular Weight,								
4	CO-1 NESENE SEC10 T11N,R2E CO-1-1	-99998	1	350347	35.06306	3879865	1164521	-116.756	522264
5	CO-1 NESENE SEC10 T11N,R2E CO-1-2	-99998	2	350347	35.06306	3879865	1164521	-116.756	522264
6	SD-1 NENE SEC 31 T13N, R9E SD-1-1	-99998	3	351036	35.17667	3892843	1160330	-116.058	585746.8
7	SD-1 NENE SEC 31 T13N, R9E SD-1-2	-99998	4	351036	35.17667	3892843	1160330	-116.058	585746.8
8	CU-2 SWNWSW SEC 22 T30S,R42E	-99998	7	351823	35.30639	3906923	1172804	-117.468	457473.1
9	CU-1 SWSESW SEC 10 T30S,R42E CU1-2	-99998	8	351957	35.3325	3909818	1172754	-117.465	457739.2
10	CU-1 SWSESW SEC 10 T30S,R42E CU1-1	-99998	9	351957	35.3325	3909818	1172754	-117.465	457739.2
11	IV-1 SENE SEC 35 T15.5N, R15E	-99998	11	352546	35.42944	3921748	1151954	-115.332	651449.1
12	IVANPAH VALLEY WELL 15.5/15-23N1,	-99998	13	352712	35.45333	3924377	1152042	-115.345	650194.3
13	IVANPAH VALLEY WELL 15.5/15-20J1,	-99998	14	352724	35.45667	3924685	1152312	-115.387	646406.6
14	IVANPAH VALLEY WELL 16/16-33L1,	-99998	15	352800	35.46667	3925978	1151600	-115.267	657277.9
15	CRESENT SPRING,	-99998	17	352843	35.47861	3927445	1151047	-115.18	665143.4
16	IVANPAH VALLEY WELL 16/14-23Q1,	-99998	18	352853	35.48139	3927397	1152424	-115.407	644547.2
17	IVANPAH VALLEY WELL 16/14-12Q1,	-99998	23	353117	35.52139	3931814	1152512	-115.42	643266.4
18	IVANPAH VALLEY WELL 16/14-1H1,	-99998	62	353236	35.54333	3934253	1152500	-115.417	643529.6
19	IVANPAH VALLEY WELL 17/14-36M1,	-99998	71	353312	35.55333	3935343	1152548	-115.43	642303.1
20	PINE SPRING,	-99998	73	353425	35.57361	3938022	1150923	-115.156	667063.4
21	IVANPAH VALLEY WELL 27/59-8a1,	-99998	88	353700	35.61667	3942436	1152300	-115.383	646417.9
22	SALT SPRING 18N/7E-30FS1,	-99998	90	353718	35.62167	3942032	1161618	-116.272	565957.2
23	ORA HANA SPRING,	-99998	91	353725	35.62361	3943721	1150407	-115.069	674909.7
24	OWL HOLE SPRING 18N/3E-22CS1,	-99998	106	353821	35.63917	3943786	1163854	-116.648	531839.4
25	SOUTH DEATH VALLEY 18N/5E-14?1,	-99998	112	353854	35.64833	3944909	1162412	-116.403	554015.5
26	018N006E12M S,	-99998	118	353953	35.66472	3946791	1161745	-116.296	563734.4
27	018N005E02ES1S SARATOGA SPRING,	-99998	123	354053	35.68139	3948565	1162517	-116.421	552359.3
28	018N005E02ES1S SARATOGA SPRING,	-99998	127	354053	35.68139	3948565	1162517	-116.421	552359.3
29	018N005E02ES1S SARATOGA SPRING,	-99998	130	354053	35.68139	3948565	1162517	-116.421	552359.3
30	018N005E02ES1S SARATOGA SPRING,	-99998	131	354053	35.68139	3948565	1162517	-116.421	552359.3
31	018N005E02ES1S SARATOGA SPRING,	-99998	135	354053	35.68139	3948565	1162517	-116.421	552359.3
32	018N005E02ES1S SARATOGA SPRING,	-99998	136	354053	35.68139	3948565	1162517	-116.421	552359.3
33	018N005E02ES1S SARATOGA SPRING,	-99998	138	354053	35.68139	3948565	1162517	-116.421	552359.3
34	018N005E02ES1S SARATOGA SPRING,	354053116251701	140	354053	35.68139	3948565	1162517	-116.421	552359.3
35	018N005E02ES1S SARATOGA SPRING,	-99998	141	354053	35.68139	3948565	1162517	-116.421	552359.3
36	MESQUITE VALLEY WELL 18/13-8Q1,	-99998	148	354136	35.69333	3950642	1153553	-115.598	626848.4
37	MCCLANAHAN SPRING,	-99998	149	354142	35.695	3951439	1151105	-115.185	664247
38	019N006E19N01S,	-99998	153	354258	35.71611	3952435	1162315	-116.388	555402
39	MESQUITE VALLEY WELL 19/12-26H1,	-99998	157	354441	35.74472	3956279	1153851	-115.648	622295.8
40	MESQUITE VALLEY WELL 19/12-26H2,	-99998	158	354441	35.74472	3956279	1153851	-115.648	622295.8
41	MESQUITE VALLEY WELL 19/13-19N1,	-99998	159	354506	35.75167	3957078	1153728	-115.624	624369.8
42	MESQUITE VALLEY WELL 19/12-15R1,	-99998	161	354607	35.76861	3958905	1154000	-115.667	620526.5
43	MESQUITE VALLEY WELL 19/12-14M1,	-99998	162	354619	35.77194	3959278	1153948	-115.663	620822.8
44	MESQUITE VALLEY WELL 19/12-14E1,	-99998	165	354632	35.77556	3959680	1153946	-115.663	620867.6
45	MESQUITE VALLEY WELL 19/12-14D1,	-99998	166	354648	35.78	3960173	1153945	-115.663	620886
46	MESQUITE VALLEY WELL 19/12-11Q1,	-99998	167	354700	35.78333	3960556	1153906	-115.652	621860.1
47	JEAN LAKE VALLEY WELL 25/60-10d1,	-99998	169	354728	35.79111	3961962	1151524	-115.257	657547.3
48	MESQUITE VALLEY WELL 25/57-9a1,	-99998	170	354730	35.79167	3961563	1153512	-115.587	627721.7
49	MESQUITE VALLEY WELL 19/12-11D1,	-99998	171	354740	35.79444	3961775	1153946	-115.663	620639
50	ROSECHRIST WELL,	-99998	175	354818	35.805	3962907	1154141	-115.695	617936.5
51	MESQUITE VALLEY WELL 25/57-5a1,	-99998	176	354822	35.80611	3963144	1153612	-115.603	626192.6
52	MESQUITE VALLEY WELL 19/12-2A1,	-99998	177	354830	35.80833	3963335	1153850	-115.647	622223.5
53	MESQUITE VALLEY WELL 19/12-3B1,	-99998	178	354830	35.80833	3963306	1154012	-115.67	620165.4
54	MESQUITE VALLEY WELL 19/12-2D1,	-99998	179	354831	35.80861	3963348	1153940	-115.661	620968.1
55	MESQUITE VALLEY WELL 19/12-4B1,	-99998	180	354835	35.80972	3963439	1154116	-115.688	618557
56	MESQUITE VALLEY WELL 20/12 33Q1,	-99998	181	354848	35.81333	3963840	1154115	-115.688	618576.7
57	CASTILLO WELL,	-99998	183	355002	35.83389	3966454	1152609	-115.436	641278.6
58	MESQUITE VALLEY WELL 20/12-19F1,	-99998	185	355057	35.84917	3967766	1154340	-115.728	614886
59	TECOPA HOT SPRING,	-99998	186	355219	35.87194	3969819	1161350	-116.231	569462.4
60	TECOPA HOT SPRING,	-99998	187	355219	35.87194	3969819	1161350	-116.231	569462.4
61	TECOPA HOT SPRING,	-99998	188	355219	35.87194	3969819	1161350	-116.231	569462.4
62	BIRD SPRING,	-99998	189	355320	35.88889	3972652	1152212	-115.37	647123.6
63	WELL 21N/7E-28P1,	-99998	190	355340	35.89444	3972318	1161330	-116.225	569944.2
64	SQUAW SPRING 23S/46E-33DS1,	-99998	191	355342	35.895	3972103	1170124	-117.023	497894.2
65	GREATER VIEW SPRING 23S/45E-23QS1,	-99998	192	355447	35.91306	3974108	1170512	-117.087	492180.2
66	WILSON'S TANK,	-99998	194	355602	35.93389	3977563	1152528	-115.424	642128.5
67	RHODES SPRING 21N/4E-11MS1,	-99998	195	355608	35.93556	3976705	1163125	-116.524	542971.9
68	SKY HARBOR AIRPORT,	-99998	201	355816	35.97111	3982131	1150850	-115.147	667060.4
69	SHOSHONE SPRING SESWNW 30-21.5N-7E,	-99998	202	355848	35.98	3981774	1161623	-116.273	565536.4
70	022N007E30ES1S,	355848116162301	203	355848	35.98	3981774	1161623	-116.273	565536.4
71	GALENA CANYON 22S/47E-19QS1,	-99998	206	360000	36	3983750	1165618	-116.938	505558
72	212 S22 E60 27ABB 1,	360042115150501	219	360042	36.01167	3986456	1151505	-115.251	657586.3
73	212 S22 E60 27ABB 1,	360042115150501	220	360042	36.01167	3986456	1151505	-115.251	657586.3
74	HIDDEN HILLS RANCH WELL,	-99998	221	360051	36.01417	3985916	1155151	-115.864	602356.2
75	S22/54-24DCC,	-99998	222	360053	36.01472	3985984	1155130	-115.858	602881.1
76	MT. SPRINGS FIRE STATION,	-99998	225	360108	36.01889	3988874	1153024	-115.507	634566.4
77	SHOWBOAT COUNTRY CLUB #2,	-99998	237	360251	36.0475	3990722	1150448	-115.08	672955.4
78	GENSTAR GYPSUM PLANT WELL,	-99998	240	360304	36.05111	3990608	1152343	-115.395	644545.7
79	RAINBOW SPRING,	-99998	245	360310	36.05278	3990630	1153032	-115.509	634308.6
80	MESQUITE WELL 23N/1E-35Z1,	-99998	248	360311	36.05306	3989645	1165018	-116.838	514561.2
81	212 S22 E62 04DCCC1,	360322115030801	253	360322	36.05611	3991727	1150308	-115.052	675438.8
82	212 S22 E58 03CBA 1 SANDSTONE SPRING #1,	360347115280901	268	360347	36.06306	3991826	1152809	-115.469	637868.8
83	SANDSTONE SPRING #1,	-99998	269	360347	36.06306	3991826	1152809	-115.469	637868.8
84	212 S22 E62 01CAAA1,	360348115000901	273	360348	36.06333	3992619	1150009	-115.003	679901.4
85	212 S22 E61 01CBA1,	360349115064901	275	360349	36.06361	3992450	1150649	-115.114	669892.6
86	212 S22 E62 01ABBC1,	360414115000501	286	360414	36.07056	3993422	1150005	-115.001	679985.1
87	212 S22 E62 01BAAA1,	360414115000801	288	360414	36.07056	3993421	1150006	-115.002	679910
88	212 S22 E62 02AABA1,	360414115005001	293	360414	36.07056	3993399	1150050	-115.014	678859.2
89	212 S22 E62 02AABA1,	360414115005001	294	360414	36.07056	3993399	1150050	-115.014	678859.2
90	212 S22 E62 02AABA1,	360414115005001	295	360414	36.07056	3993399	1150050	-115.014	678859.2
91	HIDDEN SPRING 23N/3E-37QS1,	-99998	304	360425	36.07361	3993730	1163610	-116.603	535768.3
92	212 S21 E62 36BABD1,	360506115001101	315	360503	36.08417	3993730	1150014	-115.004	679728.9
93	21/53-25daa2 PAHRUMP VALLEY,	-99998	318	360508	36.08556	3993730	1155731	-115.959	593760.2
94	SEC 29 T21S R54E,	-99998	333	360542	36.095	3993730	1155554	-115.932	596174.7
95	SEC 29 T21S R54E,	-99998	334	360542	36.095	3993730	1155554	-115.932	596174.7
96	SEC 29 T21S R54E,	-99998	335	360542	36.095	3993730	1155554	-115.932	596174.7
97	SEC 29 T21S R54E,	-99998	336	360542	36.095	3993730	1155554	-115.932	596174.7
98	SEC 30 T21S R54E,	-99998	337	360542	36.095	3993730	1155651	-115.948	594749.3
99	SEC 25 T21S R53E,	-99998	338	360542	36.095	3993730	1155753	-115.965	593196.9

	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	DATE	TIME	TEMP	ALK	HARDNESS	COND	pH	Ca	Mg	Na	K	Cl	SO4	HCO3	CO3	PO4	NO3	F	SiO2	As
2								Ca++	Mg++	Na+	K+	Cl-	SO4-2	HCO3-	CO3-2	PO4-3	NO3-	F-	SiO2(aq)	HAsO4-2
3								40.078	24.305	22.98977	39.0983	35.4527	96.0142	61.01714	60.0092	94.97136	62.00494	18.9984	60.0843	139.9271
4	780621	-99998	24.3	320	54	7165	8.4	15	3.8	1600	4.7	1900	530	390	-99998	0.09	-99998	14	43	-99998
5	780621	-99998	25.6	150	330	7207	7.9	100	19	1500	7.4	1800	790	183	-99998	0	-99998	7.1	29	-99998
6	780708	-99998	25.5	892	770	12000	7.6	150	92	2300	29	4000	31	109	-99998	0	-99998	4.7	26	-99998
7	780708	-99998	28.5	110	56	1027	8.4	16	3.7	220	3.9	180	140	134	-99998	0	-99998	7.6	15	-99998
8	780617	-99998	21.2	170	220	16000	8	65	13	4000	100	6000	340	207	-99998	0.03	-99998	1.2	56	-99998
9	780616	-99998	25.3	97	340	5717	7.8	110	15	1100	49	1800	120	118	-99998	0	-99998	1.1	75	-99998
10	780616	-99998	22.4	120	250	1805	7.8	77	13	300	20	480	120	146	-99998	0	-99998	1	59	-99998
11	780616	-99998	24.8	72	55	362	8.4	17	3	50	3	33	45	88	-99998	0.03	-99998	0.9	15	-99998
12	540914	-99998	20	-99998	161	464	7.3	28	22	43	5.5	28	39	189	0	-99998	10	1	-99998	-99998
13	540508	-99998	23.9	-99998	89	845	8.1	24	9	129	8	175	38	109	0	-99998	6	2	-99998	-99998
14	540508	-99998	25.6	-99998	25	528	8.2	8	1.1	105	2.5	65	41	131	0	-99998	19	2.1	-99998	-99998
15	850622	-99998	20.5	-99998	-99998	990	7.8	108	25	37	5	66	235	168	-99998	-99998	-99998	0.6	55	-99998
16	540508	-99998	-99998	-99998	237	794	7.6	45	31	71	4	121	76	136	0	-99998	17	0.9	-99998	-99998
17	540508	-99998	-99998	-99998	143	643	7.9	25	19	83	4.7	96	38	156	0	-99998	19	1.4	-99998	-99998
18	530911	-99998	22.2	-99998	187	641	7.8	42	19	60	3	67	44	194	-99998	-99998	15	0.3	-99998	-99998
19	550221	-99998	-99998	-99998	312	19200	8.2	99	28	4600	45	6800	629	134	7	-99998	0	2.3	-99998	-99998
20	850622	-99998	30	-99998	-99998	960	7.6	99	31	81	2.2	76	208	300	-99998	-99998	-99998	0.6	18	-99998
21	550521	-99998	22.2	-99998	143	19200	9	583	0	5000	105	7800	1060	20	12	-99998	13	1	-99998	-99998
22	670425	-99998	19	-99998	1135	10100	7.7	177	169	2030	56	2870	912	534	-99998	-99998	3.1	8.1	-99998	-99998
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	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1	Ba	Be	B	Cd	Cr	Co	Cu	Fe	TOTAL Fe	Pb	Mn	Mo	Ni	Ag	Sr
2	Ba++	Be++	H3BO4(aq)	Cd++	Cr++++	Co++	Cu++	Fe++		Pb++	Mn++	MoO4-2	Ni++	Ag+	Sr++
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51	-99998	-99998	0.16	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
52	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
53	-99998	-99998	0.16	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
54	-99998	-99998	0.04	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
55	-99998	-99998	0.12	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
56	-99998	-99998	0.1	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
57	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
58	-99998	-99998	0.15	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
59	-99998	-99998	-99998	-99998	-99998	-99998	-99998	0	-99998	-99998	0	-99998	-99998	-99998	-99998
60	-99998	-99998	8.6	-99998	-99998	-99998	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998
61	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
62	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
63	-99998	-99998	9.1	-99998	-99998	-99998	-99998	0.1	-99998	-99998	-99998	-99998	-99998	-99998	-99998
64	-99998	-99998	0.2	-99998	-99998	-99998	-99998	0.01	-99998	-99998	-99998	-99998	-99998	-99998	-99998
65	-99998	-99998	0.2	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
66	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
67	-99998	-99998	1.4	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
68	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
69	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-0.01	-99998	-99998	-0.01	-99998	-99998	-99998	1.2
70	0.04	0	4.1	0	-99998	0.01	0.03	0.01	-99998	0.03	0	0.03	-99998	-99998	1.1
71	-99998	-99998	0.55	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
72	0.03	-99998	0.14	0	0	-99998	0	0.03	-99998	0	0.01	-99998	0	0	-99998
73	0.03	0	0.14	0	-99998	0	0.01	0.04	-99998	0.01	0.01	0.01	-99998	-99998	1.7
74	-99998	-99998	-99998	-99998	-99998	-99998	-99998	0.01	-99998	-99998	-99998	-99998	-99998	-99998	1
75	-99998	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
76	-99998	-99998	-99998	-99998	-99998	-99998	-99998	0.05	-99998	-99998	-99998	-99998	-99998	-99998	0.12
77	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
78	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
79	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	0.13
80	-99998	-99998	6.7	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
81	0.03	0	0.47	0	-99998	0	0.01	0.01	-99998	0.01	0	0.01	-99998	-99998	1
82	0.1	0	-99998	0	-99998	0	0.01	0	-99998	0.01	0.02	0.01	-99998	-99998	0.09
83	-99998	-99998	-99998	-99998	-99998	-99998	-99998	0.04	-99998	-99998	-99998	-99998	-99998	-99998	0.09
84	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
85	0.02	0	0.33	0	-99998	0	0.01	0.01	-99998	0.01	0	0.01	-99998	-99998	2.2
86	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
87	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
88	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
89	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
90	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
91	-99998	-99998	0.3	-99998	-99998	-99998	-99998	0.2	-99998	-99998	-99998	-99998	-99998	-99998	-99998
92	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998
93	-99998	-99998	0.05	-99998	-99998	-99998	0	0	-99998	-99998	0	-99998	-99998	-99998	0
94	0.07	-99998	0	-99998	-99998	-99998	0	0.07	-99998	-99998	0	-99998	-99998	-99998	-99998
95	0.05	-99998	0	-99998	-99998	-99998	0	0.12	-99998	-99998	0.01	-99998	-99998	-99998	-99998
96	0.06	-99998	0	-99998	-99998	-99998	0	0.11	-99998	-99998	0	-99998	-99998	-99998	-99998
97	0.03	-99998	0	-99998	-99998	-99998	0	0.29	-99998	-99998	0	-99998	-99998	-99998	-99998
98	0.05	-99998	0	-99998	-99998	-99998	0	0.23	-99998	-99998	0.01	-99998	-99998	-99998	-99998
99	0.06	-99998	0	-99998	-99998	-99998	0	0.38	-99998	-99998	0.01	-99998	-99998	-99998	-99998

	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI
1	V	Zn	Li	Se	I	Br	TOTAL N	Hg	DO	DOC	TDS	I.S. (major)	I.S. (trace)	I.S. (total)	BALANCE	DS#	LAB
2	VO2(OH)3-2	Zn++	Li+	SeO4-2	I-	Br-		Hg++									
3	133.9623	65.39	6.941	142.9576	126.9045	79.904		200.59									
4	-99998	-99998	0.03	-99998	0.38	-99998	0.05	-99998	-99998	-99998	4140	7.73E-02	2.10E-05	7.73E-02	B	14	USGS
5	-99998	-99998	0.1	-99998	0.31	-99998	0.07	-99998	-99998	-99998	4480	8.28E-02	8.35E-05	8.29E-02	B	14	USGS
6	-99998	-99998	0.35	-99998	0.36	-99998	0.14	-99998	-99998	-99998	7520	1.24E-01	2.98E-04	1.24E-01	B	5	USGS
7	-99998	-99998	0.08	-99998	0.07	-99998	2.8	-99998	-99998	-99998	670	1.27E-02	2.71E-05	1.27E-02	B	5	USGS
8	-99998	-99998	4.7	-99998	0.11	-99998	0.12	-99998	-99998	-99998	9770	1.86E-01	3.84E-04	1.86E-01	B	15	USGS
9	-99998	-99998	0.64	-99998	0.16	-99998	2.3	-99998	-99998	-99998	3410	6.02E-02	1.00E-04	6.03E-02	B	15	USGS
10	-99998	-99998	0.37	-99998	0.05	-99998	4.3	-99998	-99998	-99998	1180	2.22E-02	6.44E-05	2.22E-02	B	15	USGS
11	-99998	-99998	0.02	-99998	0.03	-99998	1.8	-99998	-99998	-99998	215	4.37E-03	1.79E-05	4.39E-03	B	4	USGS
12	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	7.06E-03	0.00E+00	7.06E-03	B	18	CA DWR,
13	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	9.10E-03	0.00E+00	9.10E-03	B	18	CA DWR,
14	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	5.86E-03	0.00E+00	5.86E-03	B	18	CA DWR,
15	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.55E-02	0.00E+00	1.55E-02	B	33	X
16	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.10E-02	0.00E+00	1.10E-02	B	18	CA DWR,
17	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	8.29E-03	0.00E+00	8.29E-03	B	18	CA DWR,
18	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	8.58E-03	0.00E+00	8.58E-03	B	18	CA DWR,
19	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2.18E-01	0.00E+00	2.18E-01	B	18	CA DWR,
20	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.72E-02	0.00E+00	1.72E-02	B	33	X
21	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2.72E-01	0.00E+00	2.72E-01	B	18	CA DWR,
22	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	6700	1.32E-01	0.00E+00	1.32E-01	B	24	CA DWR,
23	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.03E-02	0.00E+00	1.03E-02	B	33	X
24	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1960	3.72E-02	0.00E+00	3.72E-02	B	24	CA DWR,
25	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	4760	9.20E-02	0.00E+00	9.20E-02	B	24	CA DWR,
26	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3290	6.53E-02	4.30E-06	6.53E-02	B	24	USGS
27	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3080	6.07E-02	1.07E-06	6.07E-02	B	20	USGS
28	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3040	6.07E-02	0.00E+00	6.07E-02	B	24	USDA
29	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3080	6.13E-02	1.79E-06	6.13E-02	B	24	USGS
30	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3080	6.07E-02	1.07E-06	6.07E-02	B	24	USGS
31	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3080	6.14E-02	0.00E+00	6.14E-02	B	24	USGS
32	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3050	6.02E-02	0.00E+00	6.02E-02	B	24	USGS
33	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3040	6.12E-02	0.00E+00	6.12E-02	B	24	USGS
34	0.02	0.02	0.42	-99998	-99998	-99998	-99998	-99998	5.7	-99998	-99998	5.96E-02	1.01E-04	5.97E-02	B	35	NWQL
35	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	6.08E-02	0.00E+00	6.08E-02	B	33	X
36	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	4.17E-02	0.00E+00	4.17E-02	B	18	CA DWR,
37	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	9.95E-03	0.00E+00	9.95E-03	B	33	X
38	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3900	7.64E-02	1.07E-06	7.64E-02	B	24	USGS
39	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3.09E-02	0.00E+00	3.09E-02	B	18	CA DWR,
40	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.52E-02	0.00E+00	1.52E-02	B	18	USGS
41	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3.15E-02	0.00E+00	3.15E-02	B	18	CA DWR,
42	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.03E-02	0.00E+00	1.03E-02	B	18	USGS
43	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.90E-02	0.00E+00	1.90E-02	B	18	CA DWR,
44	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.50E-02	0.00E+00	1.50E-02	B	18	CA DWR,
45	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.91E-02	0.00E+00	1.91E-02	B	18	CA DWR,
46	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.24E-02	0.00E+00	1.24E-02	B	18	CA DWR,
47	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.41E-02	0.00E+00	1.41E-02	B	18	CA DWR,
48	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.16E-02	0.00E+00	1.16E-02	B	18	USGS
49	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.10E-02	0.00E+00	1.10E-02	B	18	CA DWR,
50	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.05E-02	0.00E+00	1.05E-02	B	33,35	USGS
51	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.29E-02	0.00E+00	1.29E-02	B	18	CA DWR,
52	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.15E-02	0.00E+00	1.15E-02	B	18	USGS
53	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.30E-02	0.00E+00	1.30E-02	B	18	CA DWR,
54	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.26E-02	0.00E+00	1.26E-02	B	18	CA DWR,
55	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.16E-02	0.00E+00	1.16E-02	B	18	CA DWR,
56	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	9.81E-03	0.00E+00	9.81E-03	B	18	CA DWR,
57	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2.22E-02	0.00E+00	2.22E-02	B	33	X
58	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.13E-02	0.00E+00	1.13E-02	B	18	CA DWR,
59	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2190	3.98E-02	0.00E+00	3.98E-02	B	20	USGS
60	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2300	4.27E-02	0.00E+00	4.27E-02	B	24	USGS
61	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2	-99998	-99998	4.20E-02	0.00E+00	4.20E-02	B	33,35	NWQL
62	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	9.92E-03	0.00E+00	9.92E-03	B	33	X
63	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2500	4.64E-02	3.58E-06	4.64E-02	B	24	USGS
64	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	229	3.74E-03	3.58E-07	3.74E-03	B	24	USGS
65	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	305	7.16E-03	0.00E+00	7.16E-03	B	24	USGS
66	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.48E-02	0.00E+00	1.48E-02	B	33	X
67	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	667	1.49E-02	0.00E+00	1.49E-02	B	24	USGS
68	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.65E-02	0.00E+00	1.65E-02	B	33	X
69	-99998	-99998	0.36	-99998	-99998	-99998	-99998	-99998	-99998	-99998	938	1.95E-02	5.33E-05	1.96E-02	B	36,8	USGS
70	0.01	0.01	0.38	-99998	-99998	-99998	-99998	-99998	4.4	-99998	-99998	1.97E-02	5.67E-05	1.98E-02	B	35	NWQL
71	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	314	8.31E-03	0.00E+00	8.31E-03	B	24	USGS
72	-99998	0.42	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	780	2.04E-02	1.49E-05	2.04E-02	B	35	NWQL
73	0.01	0.6	0.05	-99998	-99998	0.12	-99998	-99998	3.8	-99998	-99998	2.03E-02	6.43E-05	2.03E-02	B	35,33	NWQL
74	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	8.59E-03	2.32E-05	8.61E-03	B	32	DRI
75	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	324	9.29E-03	0.00E+00	9.29E-03	B	23	USGS
76	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.12E-02	4.53E-06	1.12E-02	B	32	DRI
77	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.78E-02	0.00E+00	1.78E-02	B	33	X
78	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	1.35E-02	0.00E+00	1.35E-02	B	33	X
79	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	9.69E-03	2.97E-06	9.69E-03	B	32	DRI
80	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	8160	1.71E-01	0.00E+00	1.71E-01	B	24	USGS
81	0.01	0.03	0.08	-99998	-99998	0.15	-99998	-99998	3.6	-99998	-99998	1.46E-02	3.31E-05	1.47E-02	B	35,33	NWQL
82	0.01	0.02	0.01	-99998	-99998	-99998	-99998	-99998	6.6	-99998	-99998	8.37E-03	6.10E-06	8.38E-03	B	35,33	NWQL
83	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	8.35E-03	3.49E-06	8.35E-03	B	32	DRI
84	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	11100	2.40E-01	0.00E+00	2.40E-01	B	35	NWQL
85	0.01	0.03	0.14	-99998	-99998	0.14	-99998	-99998	3.4	-99998	-99998	2.67E-02	6.42E-05	2.68E-02	B	35,33	NWQL
86	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	16900	3.35E-01	0.00E+00	3.35E-01	B	35	NWQL
87	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	17400	3.18E-01	0.00E+00	3.18E-01	B	35	NWQL
88	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2120	5.36E-02	0.00E+00	5.36E-02	B	35	NWQL
89	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2120	4.96E-02	0.00E+00	4.96E-02	B	35	NWQL
90	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	2120	5.13E-02	0.00E+00	5.13E-02	B	35	NWQL
91	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	212	3.11E-03	7.16E-06	3.11E-03	B	24	USGS
92	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	3400	5.91E-02	0.00E+00	5.91E-02	B	35	NWQL
93	-99998	0	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	268	7.65E-03	0.00E+00	7.65E-03	B	36	USGS
94	-99998	0.04	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	299	8.02E-03	4.75E-06	8.02E-03	B	9	NSHL
95	-99998	0.07	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	307	8.74E-03	7.53E-06	8.75E-03	B	9	NSHL
96	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	257	7.19E-03	4.81E-06	7.19E-03	B	9	NSHL
97	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	602	1.61E-02	1.08E-05	1.61E-02	B	9	NSHL
98	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	327	8.37E-03	9.47E-06	8.38E-03	B	9	NSHL
99	-99998	0	-99998	-99998	-99998	-99998	-99998	-99998	-99998	-99998	291	8.40E-03	1.48E-05	8.41E-03	B	9	NSHL

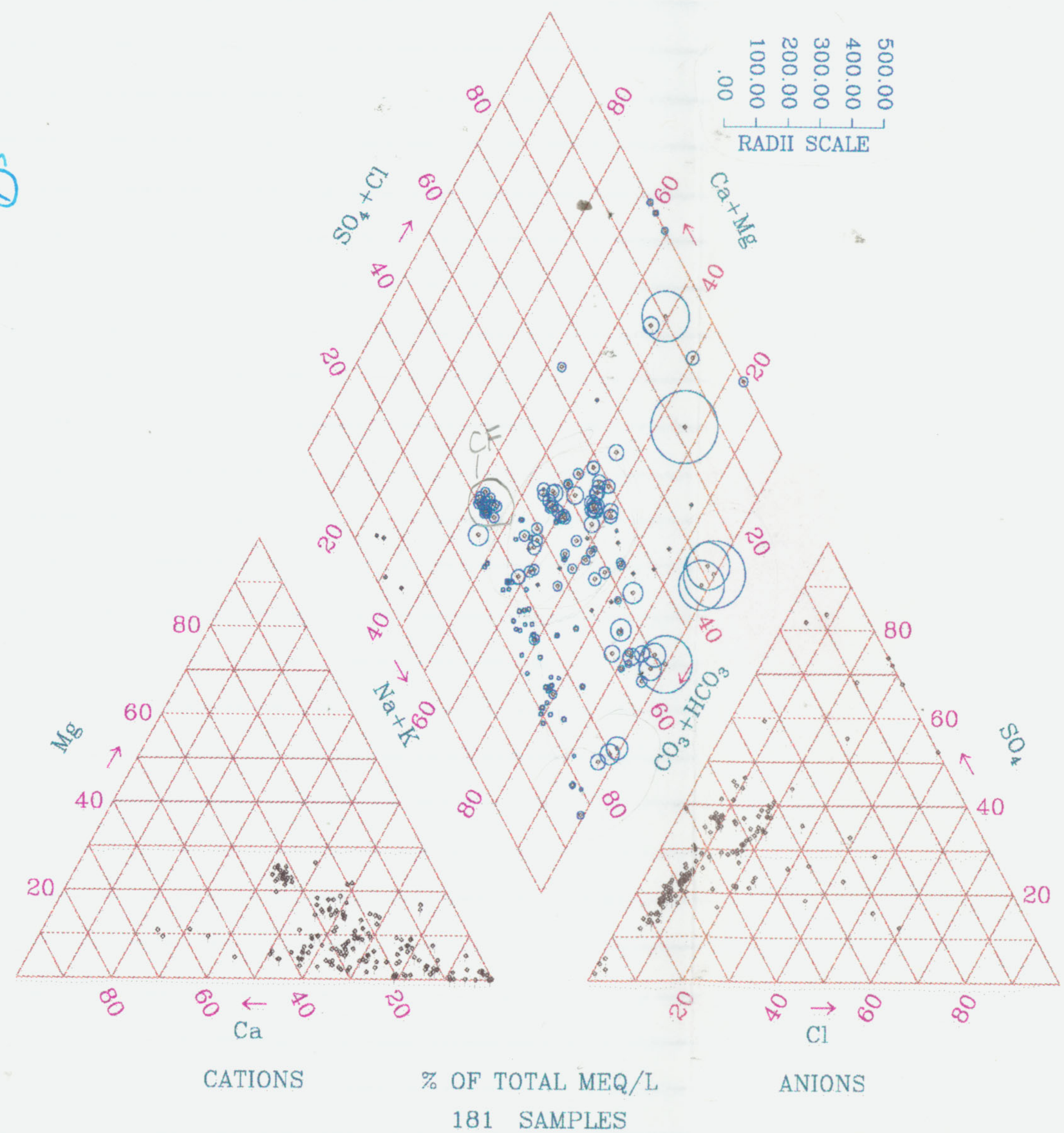
6

6/7/97

	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
1	AQUIFER	LITHOLOGY	SAMPLE SOURCE	COMMENTS	ALTITUDE	WELL DEPTH	WATER DEPTH	WL ALT	SITE NAME,	ARC ID#	Log P(CO2)	S.I. (Cc)	S.I. (Cristobalite)
2													
3													
4	X	SAND	WELL	DOCKTER, R.D. COYOTE DRY LAKE, CA	-99998	235	-99998	-99998	CO-1 NESENE SEC10 T11N,R2E CO-1-1	ArcID=1	-2.881	0.316	0.039
5	X	SAND	WELL	DOCKTER, R.D. COYOTE DRY LAKE, CA	-99998	455	-99998	-99998	CO-1 NESENE SEC10 T11N,R2E CO-1-2	ArcID=2	-2.703	0.316	-0.14
6	X	CLAY, SANDY	WELL	CALZIA, SODA DRY LAKE, CA	-99998	75	-99998	-99998	SD-1 NENE SEC 31 T13N, R9E SD-1-1	ArcID=3	-2.659	-0.043	-0.175
7	X	SAND	WELL	CALZIA, SODA DRY LAKE, CA	-99998	400	-99998	-99998	SD-1 NENE SEC 31 T13N, R9E SD-1-2	ArcID=4	-3.256	0.225	-0.485
8	X	SAND	WELL	DOCKTER, R.D.,CUDDEBACK DRY LAKE, CA	-99998	75	-99998	-99998	CU-2 SWNWSW SEC 22 T30S,R42E	ArcID=7	-2.816	0.136	0.223
9	X	GRAVEL,	WELL	DOCKTER, R.D.,CUDDEBACK DRY LAKE, CA	-99998	400	-99998	-99998	CU-1 SWSESW SEC 10 T30S,R42E CU1-2	ArcID=8	-2.787	0.176	0.276
10	X	SAND	WELL	DOCKTER, R.D.,CUDDEBACK DRY LAKE, CA	-99998	-99998	-99998	-99998	CU-1 SWSESW SEC 10 T30S,R42E CU1-1	ArcID=9	-2.683	0.212	0.207
11	X	CLAY, SANDY, SILTY	WELL	CALZIA, J.P. IVANPAH VALLEY, CA	-99998	335	-99998	-99998	IV-1 SENE SEC 35 T15.5N, R15E	ArcID=11	-3.443	0.142	-0.434
12	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 15.5/15-23N1,	ArcID=13	-2.089	-0.538	n.d.
13	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 15.5/15-20J1,	ArcID=14	-3.069	0.02	n.d.
14	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 16/16-33L1,	ArcID=15	-3.067	-0.221	n.d.
15	X	X	X	X	-99998	-99998	-99998	-99998	CRESENT SPRING,	ArcID=17	-2.627	0.413	0.202
16	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 16/14-23Q1,	ArcID=18	-2.484	-0.135	n.d.
17	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 16/14-12Q1,	ArcID=23	-2.707	0.013	n.d.
18	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 16/14-1H1,	ArcID=62	-2.538	0.184	n.d.
19	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 17/14-36M1,	ArcID=71	-3.17	0.36	n.d.
20	X	X	X	X	-99998	-99998	-99998	-99998	PINE SPRING,	ArcID=73	-2.118	0.542	-0.41
21	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	IVANPAH VALLEY WELL 27/59-8a1,	ArcID=88	-4.758	1.094	n.d.
22	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING	TABLE 3,	-99998	-99998	-99998	-99998	SALT SPRING 18N/7E-30FS1,	ArcID=90	-2.116	0.662	n.d.
23	X	X	X	X	-99998	-99998	-99998	-99998	ORA HANA SPRING,	ArcID=91	-1.713	-0.093	0.366
24	LACUSTRINE DEPOSITS,	X	SPRING	TABLE 3; OWLSHEAD MTNS,	-99998	-99998	-99998	-99998	OWL HOLE SPRING 18N/3E-22CS1,	ArcID=108	-3.485	0.342	n.d.
25	ALLUVIAL FAN,	X	WELL?,	TABLE 3,	-99998	67	-99998	-99998	SOUTH DEATH VALLEY 18N/5E-14?1,	ArcID=112	-2.4	0.136	n.d.
26	X	X	RIVER,	TABLE 3; AMARGOSA RIVER AT HIGHWAY 127,	-99998	-99998	-99998	-99998	018N006E12M S,	ArcID=118	-2.792	0.868	-0.114
27	X	X	SPRING	SAMPLE FROM ALONG AMARGOSA RIVER DRAINAGE - TABLE 13,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=123	-2.53	0.388	0.044
28	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING POOL,	TABLE 3,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=127	-2.592	0.574	-0.07
29	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING HOUSE,	TABLE 3; FR CONCRETE SPRING HOUSE,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=130	-2.225	0.097	0.017
30	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING POOL,	TABLE 3,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=131	-2.51	0.427	0.002
31	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING HOUSE,	TABLE 3; FR CONCRETE SPRING HOUSE,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=135	-2.315	0.237	-0.025
32	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING HOUSE,	TABLE 3; FR CONCRETE SPRING HOUSE,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=136	-2.388	0.369	-0.061
33	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	SPRING POOL,	TABLE 3,	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=138	-2.306	0.329	-0.083
34	X	X	X	X	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=140	-2.328	0.194	-0.053
35	X	X	X	X	-99998	-99998	-99998	-99998	018N005E02ES1S SARATOGA SPRING,	ArcID=141	-2.418	0.288	-0.034
36	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 18/13-8Q1,	ArcID=148	-2.205	0.464	n.d.
37	X	X	X	X	-99998	-99998	-99998	-99998	MCCLANAHAN SPRING,	ArcID=149	-2.778	0.491	-0.142
38	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	WELL?,	TABLE 3,	-99998	268	-99998	-99998	019N006E19N01S,	ArcID=153	-2.679	0.922	-0.065
39	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-26H1,	ArcID=157	-2.667	0.596	n.d.
40	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-26H2,	ArcID=158	-2.615	0.593	n.d.
41	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/13-19N1,	ArcID=159	-2.641	-0.073	n.d.
42	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-15R1,	ArcID=161	-2.185	0.192	n.d.
43	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-14M1,	ArcID=162	-3.225	0.811	n.d.
44	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-14E1,	ArcID=165	-2.368	-0.225	n.d.
45	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-14D1,	ArcID=166	-2.66	0.475	n.d.
46	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-11Q1,	ArcID=167	-2.519	0.418	n.d.
47	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	JEAN LAKE VALLEY WELL 25/60-10d1,	ArcID=169	-2.585	-0.236	n.d.
48	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 25/57-9a1,	ArcID=170	-2.663	0.816	n.d.
49	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-11D1,	ArcID=171	-2.696	0.492	n.d.
50	X	X	X	X	-99998	-99998	-99998	-99998	ROSECHRIST WELL,	ArcID=175	-1.969	-0.207	-0.133
51	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 25/57-5a1,	ArcID=176	-2.424	0.508	n.d.
52	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-2A1,	ArcID=177	-2.709	0.738	n.d.
53	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-3B1,	ArcID=178	-2.041	-0.008	n.d.
54	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-2D1,	ArcID=179	-2.323	0.121	n.d.
55	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 19/12-4B1,	ArcID=180	-2.444	0.318	n.d.
56	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 20/12 33Q1,	ArcID=181	-2.471	0.275	n.d.
57	X	X	X	X	-99998	-99998	-99998	-99998	CASTILLO WELL,	ArcID=183	-1.863	0.12	-0.328
58	X	X	WELL	TABLE 14,	-99998	-99998	-99998	-99998	MESQUITE VALLEY WELL 20/12-19F1,	ArcID=185	-2.716	0.513	n.d.
59	X	X	SPRING	SAMPLE FROM ALONG AMARGOSA RIVER DRAINAGE - TABLE 13,	-99998	-99998	-99998	-99998	TECOPA HOT SPRING,	ArcID=186	-2.383	0.342	0.16
60	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	HOT SPRING,	TABLE 3,	-99998	-99998	-99998	-99998	TECOPA HOT SPRING,	ArcID=187	-2.729	0.599	-0.928
61	X	X	X	X	-99998	-99998	-99998	-99998	TECOPA HOT SPRING,	ArcID=188	-2.286	0.099	0.127
62	X	X	X	X	-99998	-99998	-99998	-99998	BIRD SPRING,	ArcID=189	-2.362	-0.092	-0.478
63	FOLDED & FAULTED PC SEDIMENTARY ROCKS,	SEDIMENTARY ROCKS,	FLOWING WELL,	TABLE 3,	-99998	200	-99998	-99998	WELL 21N/7E-28P1,	ArcID=190	-2.962	0.292	-0.068
64	X	VOLCANIC ROCK,	SPRING	TABLE 3; SOUTH PANAMINT RANGE; MAP SHOWS SQUAW SPR TO N OF GIVEN LOC,	-99998	-99998	-99998	-99998	SQUAW SPRING 23S/46E-33DS1,	ArcID=191	-1.993	-1.397	0.299
65	CRYSTALLINE BEDROCK,	CRYSTALLINE ROCKS,	SPRING	TABLE 3; FR SOUTH PANAMINT RANGE,	-99998	-99998	-99998	-99998	GREATER VIEW SPRING 23S/45E-23QS1,	ArcID=192	-2.785	0.424	-0.058
66	X	X	X	X	-99998	-99998	-99998	-99998	WILSON'S TANK,	ArcID=194	-1.847	0.276	-0.191
67	CRYSTALLINE BEDROCK,	CRYSTALLINE ROCKS,	SPRING	TABLE 3; FR BLACK MTNS,	-99998	-99998	-99998	-99998	RHODES SPRING 21N/4E-11MS1,	ArcID=195	-2.323	0.313	-0.011
68	X	X	X	X	-99998	-99998	-99998	-99998	SKY HARBOR AIRPORT,	ArcID=201	-2.627	0.223	-0.118
69	X	CARBONATE	SPRING	CLEAR, CARBONATE ROCKS, JUST BELOW CONTACT WITH ALLUV/COLLUV SCOPE	1640	-99998	-99998	-99998	SHOSHONE SPRING SESWNW 30-21.5N-7E,	ArcID=202	-2.382	0.7	-0.112
70	X	X	X	X	-99998	-99998	-99998	-99998	022N007E30ES1S,	ArcID=203	-2.2	0.47	-0.081
71	CRYSTALLINE BEDROCK,	CRYSTALLINE ROCKS,	X	TABLE 3; FR SOUTH PANAMINT RANGE,	-99998	-99998	-99998	-99998	GALENA CANYON 22S/47E-19QS1,	ArcID=206	-2.847	0.234	-0.284
72	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E60 27ABB 1,	ArcID=219	-2.224	0.276	-0.369
73	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E60 27ABB 1,	ArcID=220	-2.617	0.613	-0.345
74	X	X	WELL	X	2759	-99998	-99998	-99998	HIDDEN HILLS RANCH WELL,	ArcID=221	-1.833	-0.174	-0.207
75	X	X	WELL	X	-99998	-99998	-99998	-99998	S22/54-24DCC,	ArcID=222	-2.557	0.786	-0.303
76	X	X	WELL ,	X	5447	-99998	-99998	-99998	MT. SPRINGS FIRE STATION,	ArcID=225	-1.836	0.065	-0.442
77	X	X	X	X	-99998	-99998	-99998	-99998	SHOWBOAT COUNTRY CLUB #2,	ArcID=237	-2.725	0.367	-0.034
78	X	X	X	X	-99998	-99998	-99998	-99998	GENSTAR GYPSUM PLANT WELL,	ArcID=240	-1.69	-0.288	-0.595
79	X	X	SPRING	X	5584	-99998	-99998	-99998	RAINBOW SPRING,	ArcID=245	-1.982	0.026	-0.336
80	GW FROM EDGE OF SALTPAN,	X	WELL	TABLE 3,	-99998	10	-99998	-99998	MESQUITE WELL 23N/1E-35Z1,	ArcID=248	-2.298	0.646	0.13
81	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 04DCCC1,	ArcID=253	-3.04	0.379	0.131
82	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E58 03CBA 1 SANDSTONE S	ArcID=268	-2.449	0.345	-0.49
83	X	X	SPRING	X	-99998	-99998	-99998	-99998	SANDSTONE SPRING #1,	ArcID=269	-1.783	-0.375	-0.026
84	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 01CAAA1,	ArcID=273	-2.197	0.111	0.348
85	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E61 01CBA1,	ArcID=275	-2.407	0.566	-0.197
86	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 01ABBC1,	ArcID=286	-2.271	-0.53	0.556
87	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 01BAAA1,	ArcID=288	-1.479	0.177	0.457
88	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 02AABA1,	ArcID=293	-2.337	0.251	0.104
89	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 02AABA1,	ArcID=294	-2.331	0.178	0.1
90	X	X	X	X	-99998	-99998	-99998	-99998	212 S22 E62 02AABA1,	ArcID=295	-2.334	0.19	0.104
91	X	VOLCANIC ROCK,	SPRING	TABLE 3; BLACK MTNS,	-99998	-99998	-99998	-99998	HIDDEN SPRING 23N/3E-37QS1,	ArcID=304	-2.846	-0.974	0.339
92	X	X	X	X	-99998	-99998	-99998	-99998	212 S21 E62 36BABD1,	ArcID=315	-2.275	0.451	0.285
93	X	ALLUVIAL FILL,	WELL	COLORED,	-99998	-99998	27	-99998	21/53-25daa2 PAHRUMP VALLEY,	ArcID=318	-2.489	0.279	-0.295
94	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 29 T21S R54E,	ArcID=333	-2.588	0.44	-0.302
95	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 29 T21S R54E,	ArcID=334	-2.349	0.258	-0.28
96	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 29 T21S R54E,	ArcID=335	-2.61	0.338	-0.282
97	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 29 T21S R54E,	ArcID=336	-2.336	0.403	-0.221
98	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 30 T21S R54E,	ArcID=337	-2.619	0.369	0.208
99	X	X	WELL	FROM UNIVERITY OF NEV, RENO - NEV ST HEALTH LAB, NEV DIV OF HEALTH	-99998	-99998	-99998	-99998	SEC 25 T21S R53E,	ArcID=338	-2.715	0.728	-0.226

Amargosa Desert Hydrochemistry
(Perfect et al., 1996)

Plotted using Plotchem



Saturated Zone
CNWRA/SwRI

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10 6/7/97 DRJ

DRJ/cmm

Yang et al. (1996)(mg)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	SITE NUMBER	Depth (m)	Elev (masl)	UTM(east)	UTM(north)	Date dd-mm-yyyy	Temp (C)	Sp. Cond (microS/cm)	Lab pH (units)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	SiO2 (mg/L)	Al (mg/L)	HCO3 (mg/L)	CO3 (mg/L)	Cl (mg/L)	Br (mg/L)	NO3 (mg/L)	SO4 (mg/L)	Anion-Cation balance (percent)	comments	14-C (PMC)	Tritium (T.U.)	Del 13-C (per mil)	Del-D (per mil)	Del 18-O (per mil)
2	0	0								40.0780	24.3050	22.9898	39.0983	60.0843	26.9815	61.0171	60.0092	35.4527	79.9040	62.0049	96.0636							
3										2.0000	2.0000	1.0000	1.0000	0.0000	3.0000	-1.0000	-2.0000	-1.0000	-1.0000	-1.0000	-2.0000							
4																												
5	UZ water samples																											
6	n.a.=data not available																											
7	n.d.=not detected																											
8								n.a.	n.a.	0.7	0.5	0.8	n.a.	0.9	0.0	23.3	0.0	2.4	0.0	2.0	4.1	-0.5	precip					
9	UE-25 UZ-N2	0.00	1203.0	549859.0	4079446.0	3/31/92		308.0	7.7	14.0	2.3	51.0	n.a.	18.0	n.a.	112.0	0.0	10.0	0.5	n.a.	29.0	0.4	porewater					
10		15.80	1187.2	549859.0	4079446.0	8/18/89		n.a.	n.a.	1.4	0.5	1.7	n.a.	0.0	0.0	11.7	0.0	12.2	0.0	8.2	7.8	-0.6	porewater					
11		15.80	1187.2	549859.0	4079446.0	2/14/92		n.a.	n.a.	14.4	3.9	25.1	n.a.	5.8	0.0	58.2	0.0	10.0	1.7	27.3	21.0	0.0	porewater					
12		15.80	1187.2	549859.0	4079446.0	3/16/92		n.a.	n.a.	25.0	4.7	16.2	n.a.	11.8	0.0	127.6	0.0	5.8	0.9	19.7	15.6	-0.6	porewater					
13		15.80	1187.2	549859.0	4079446.0	3/31/92		n.a.	n.a.	0.8	0.5	1.6	n.a.	0.2	0.0	23.3	0.0	3.3	0.0	1.6	4.7	-0.5	porewater					
14		30.10	1172.9	549859.0	4079446.0	2/14/92																						
15								425.0	7.6	42.5	13.4	21.5	n.a.	77.5	0.5	114.7	45.0	32.4	0.0	23.1	72.3	-2.0	porewater					
16	UE-25 UZ#16	49.90	1262.8	549484.0	4076986.0	12/2/92		430.0	7.5	55.0	11.0	20.0	n.a.	83.0	0.1	120.0	0.0	38.0	0.5	33.0	38.0	0.2	porewater					
17		55.20	1257.5	549484.0	4076986.0	11/16/92		710.0	8.7	28.9	13.7	83.6	n.a.	57.1	0.0	196.0	0.0	82.0	0.0	17.0	28.0	-1.4	porewater					
18		367.74	944.9	549484.0	4076986.0	9/27/94		430.0	8.1	26.5	6.2	47.9	n.a.	62.2	0.3	137.0	0.0	24.0	0.0	23.0	26.0	1.2	porewater					
19		374.17	938.5	549484.0	4076986.0	8/9/93		480.0	8.2	33.5	7.9	51.3	n.a.	52.9	0.0	154.0	0.0	52.0	0.0	26.0	29.0	-4.7	porewater					
20		376.52	936.1	549484.0	4076986.0	8/11/93		430.0	8.5	14.1	2.4	67.5	n.a.	57.1	0.0	139.0	13.0	27.0	0.0	18.0	14.0	-2.7	porewater					
21		387.04	925.6	549484.0	4076986.0	8/4/93		530.0	8.3	20.5	3.7	92.0	n.a.	71.8	1.5	192.0	0.0	28.0	0.0	19.0	19.0	6.9	porewater					
22		390.33	922.3	549484.0	4076986.0	9/2/93		930.0	7.4	32.4	19.7	96.2	n.a.	46.7	0.0	324.0	12.0	50.0	0.0	19.0	18.0	-1.9	porewater					
23		395.33	917.3	549484.0	4076986.0	9/23/93		420.0	7.3	20.6	5.1	60.1	n.a.	131.6	1.1	171.0	0.0	32.0	0.0	20.0	18.0	-4.0	porewater					
24		401.76	910.9	549484.0	4076986.0	9/9/93		530.0	8.4	17.0	2.4	99.0	n.a.	62.1	1.7	47.6	58.8	56.0	0.0	18.0	23.0	6.5	porewater					
25		409.62	903.0	549484.0	4076986.0	7/1/93		550.0	7.5	3.4	0.3	76.7	n.a.	47.9	1.1	140.3	0.0	22.8	0.0	16.1	18.7	-0.1	porewater					
26		413.98	898.7	549484.0	4076986.0	5/6/93		490.0	8.6	4.4	0.6	95.0	n.a.	66.3	2.6	72.0	46.8	21.0	0.0	18.0	25.0	0.3	porewater					
27		420.56	892.1	549484.0	4076986.0	6/29/93		530.0	7.0	3.6	0.9	114.6	n.a.	62.5	2.0	122.0	36.0	23.5	0.0	18.5	23.8	0.6	porewater					
28		423.52	889.1	549484.0	4076986.0	5/18/93		710.0	7.8	5.4	0.3	155.0	n.a.	88.0	3.9	216.0	24.0	17.0	0.0	16.0	22.0	11.9	porewater					
29		425.41	887.3	549484.0	4076986.0	3/31/94		550.0	8.7	5.0	0.5	124.0	n.a.	79.2	4.7	131.8	35.4	45.0	0.0	25.0	45.0	-0.3	porewater					
30		426.08	886.6	549484.0	4076986.0	7/7/93		710.0	8.0	5.0	0.4	145.0	n.a.	123.0	7.8	237.0	31.0	14.0	0.0	16.0	20.0	4.8	porewater					
31		426.29	886.4	549484.0	4076986.0	4/5/94		580.0	9.2	3.3	0.3	104.0	n.a.	68.5	3.4	72.0	70.8	20.0	0.0	14.0	16.0	0.1	porewater					
32		429.28	883.4	549484.0	4076986.0	7/28/93		450.0	8.7	1.2	0.1	101.0	n.a.	75.9	1.0	165.0	0.0	26.0	0.0	24.0	30.0	0.1	porewater					
33		430.71	882.0	549484.0	4076986.0	9/16/93		570.0	8.8	1.9	0.1	134.0	n.a.	80.5	3.4	160.0	43.0	23.0	0.0	19.0	23.0	3.9	porewater					
34		435.35	877.3	549484.0	4076986.0	9/14/93		550.0	8.5	3.2	0.6	113.0	n.a.	109.1	6.1	72.0	70.8	23.0	0.0	16.0	19.0	0.3	porewater					
35		437.21	875.5	549484.0	4076986.0	7/13/93		550.0	7.6	1.7	0.8	79.9	n.a.	68.9	1.2	18.3	87.6	18.9	0.0	11.3	13.7	-0.6	porewater					
36		439.83	872.8	549484.0	4076986.0	6/17/93		360.0	9.2	6.3	0.8	79.5	n.a.	233.3	26.2	137.0	0.0	38.0	0.0	6.0	11.0	2.7	porewater					
37		453.27	859.4	549484.0	4076986.0	9/21/93		570.0	8.9	10.0	0.3	100.0	n.a.	36.0	0.7	181.0	0.0	53.0	0.0	13.0	27.0	-3.6	porewater					
38		488.08	824.6	549484.0	4076986.0	12/30/93																						
39	Static Water = 489.2 m							660.0	9.0	25.0	0.3	108.0	n.a.	34.0	1.0	170.0	0.0	71.0	0.0	10.0	33.0	2.8	porewater					
40		490.09	822.6	549484.0	4076986.0	1/24/94		490.0	9.0	91.0	12.0	34.0	n.a.	70.0	3.0	162.0	0.0	70.0	0.0	8.0	28.0	13.6	porewater					
41		501.49	811.2	549484.0	4076986.0	3/1/94		420.0	8.4	17.3	0.3	66.0	n.a.	47.4	0.7	87.0	19.0	27.0	0.0	6.0	20.0	6.1	porewater					
42		503.44	809.2	549484.0	4076986.0	3/15/94		n.a.	n.a.	11.4	1.6	79.2	n.a.	36.2	1.2	210.6	0.0	10.6	0.6	0.2	29.1	-0.2	groundwater					
43		491.19	821.5	549484.0	4076986.0	2/24/93		n.a.	n.a.	10.3	1.8	76.1	n.a.	170.6	19.9	164.2	0.0	13.4	0.0	0.3	27.7	0.3	groundwater					
44		504.22	808.4	549484.0	4076986.0	3/8/93		n.a.	n.a.	8.6	0.7	65.4	n.a.	18.4	0.0	151.6	0.0	10.6	0.0	0.0	25.5	0.0	groundwater					
45		504.22	808.4	549484.0	4076986.0	3/9/93		n.a.	n.a.	8.4	1.3	67.2	n.a.	16.5	0.1	197.3	0.0	8.6	1.0	0.0	27.7	0.3	groundwater					
46		508.33	804.3	549484.0	4076986.0	3/15/93																						
47								1320.0	8.6	19.6	6.1	249.3	n.a.	59.5	1.0	245.0	18.0	245.0	0.0	35.0	33.0	-1.8	porewater					
48	USW UZ-14	13.78	1438.3	548033.0	4080262.0	9/19/94		630.0	6.9	49.9	13.2	43.5	n.a.	89.8	0.3	131.0	0.0	60.0	0.0	22.0	66.0	-0.9	porewater					
49		26.03	1426.1	548033.0	4080262.0	3/24/94		530.0	7.6	40.7	10.1	37.1	n.a.	80.6	0.0	87.0	0.0	47.0	0.0	26.0	81.0	-4.1	porewater					
50		27.80	1424.3	548033.0	4080262.0	3/17/94		600.0	7.2	53.3	13.2	38.1	n.a.	81.5	0.0	73.0	0.0	79.0	0.0	29.0	83.0	-1.9	porewater					
51		29.17	1422.9	548033.0	4080262.0	4/21/94		550.0	6.9	46.9	12.7	33.6	n.a.	79.6	0.0	79.0	0.0	59.0	0.0	26.0	75.0	-0.9	porewater					
52		29.38	1422.7	548033.0	4080262.0	5/3/94		600.0	7.0	51.1	13.8	41.3	n.a.	91.8	0.0	128.0	0.0	44.0	0.0	23.0	83.0	0.5	porewater					
53		30.66	1421.4	548033.0	4080262.0	3/22/94		540.0	6.6	49.0	10.5	35.9	n.a.	93.9	0.0	67.0	0.0	61.0	0.0	25.0	90.0	-2.1	porewater					
54		35.02	1417.1	548033.0	4080262.0	9/1/94		690.0	6.9	68.5	14.3	56.2	n.a.	92.0	0.0	105.0	0.0	83.0	0.0	23.0	96.0	4.6	porewater					
55		41.36	1410.7	548033.0	4080262.0	4/12/94		650.0	7.7	65.5	12.0	48.2	n.a.	81.5	0.0	118.0	0.0	77.0	0.0	22.0	102.0	-1.7	porewater					
56		44.20	1407.9	548033.0	4080262.0	8/11/94		640.0	6.9	54.8	11.5	51.6	n.a.	77.3	0.0	79.0	0.0	83.0	0.0	22.0	102.0	-1.5	porewater					
57		45.08	1407.0	548033.0	4080262.0	4/14/94		730.0	6.5	67.8	11.3	48.7	n.a.	77.5	0.0	49.0	0.0	100.0	0.0	23.0	130.0	-2.0	porewater					
58		54.19	1397.9	548033.0	4080262.0	9/12/94		740.0	6.8	64.0	10.6	49.1	n.a.	93.1	0.0	62.0	0.0	97.0	0.0	21.0	120.0	-3.0	porewater					
59		54.35	1397.8	548033.0	4080262.0	4/19/94		710.0	6.9	65.5	10.7	39.4	n.a.	97.8	0.0	55.0	0.0	85.0	0.0	14.0	130.0	-3.0	porewater					
60		65.81	1386.3	548033.0	4080262.0	4/21/94		640.0	7.9	58.6	10.4	48.4	n.a.	91.2	0.0	55.0	0.0	93.0	0.0	16.0	116.0	-2.6	porewater					
61		68.92	1383.2	548033.0	4080262.0	10/31/94		630.0	7.1	67.0	10.5	29.0	n.a.	63.0	0.0	96.0	n.a.	84.0	0.0	15.0	94.0	-5.7	porewater					
62		71.72	1380.4	548033.0	4080262.0	3/2/94		810.0	7.6	32.0	1.0	103.0	n.a.	61.0	3.0	162.0	n.a.	99.0	0.0	17.0	100.0	-11.7	porewater					
63		73.46	1378.6	548033.0	4080262.0	3/2/94		580.0	6.8	65.0	12.0	9.0	n.a.	46.0	0.0	66.0	n.a.	77.0	0.0	12.0	79.0	-4.7	porewater					
64		74.89	1377.2	548033.0	4080262.0	2/7/94		n.a.	n.a.	43.0	3.7	67.0	n.a.	35.0	0.0	170.0	n.a.	88.0	0.0	16.0	19.0	-4.9	porewater					
65		383.65	1068.5	548033.0	4080262.0	1/14/94		n.d.	n.d.	62.0	4.5	49.0	n.a.	44.0	0.0	170.0	n.a.	87.0	0.0	17.0	45.0	-7.1	porewater					
66		389.41	1062.7	548033.0	4080262.0	1/14/94		n.d.	n.d.	74.0	5.1	45.0	n.a.	38.0	0.0	170.0	n.a.	130.0	0.0	15.0	38.0	-10.3	porewater					
67		389.50	1062.6	548033.0	4080262.0	1/14/94		720.0	7.8	30.0	0.7	88.0	n.a.	57.0	0.1	160.0	0.0	75.0	0.0	5.0	106.0	-13.2	porewater					
68		429.65	1022.5	548033.0	4080262.0	1/30/95		410.0	8.3	20.0	0.6	68.0	n.a.	60.0	1.4	166.0	0.0	24.0	0.0	6.0	21.0	1.0	porewater					
69		432.72	1019.4	548033.0	4080262.0	12/22/94		570.0	7.6	9.2	0.1	128.0	n.a.	68.7	1.2	265.0	0.0	24.2	0.0	6.2	37.3	1.1	porewater					
70		445.62	1006.5	548033.0	4080262.0	4/4/95		500.0	8.4	2.1	0.0	122.0	n.a.	56.7	0.3	228.0	0.0	28.0	0.0	10.8	14.3	3.9	porewater					
71		455.95	996.2	548033.0	4080262.0	4/11/95		560.0	7.7	1.1	0.1	137.0	n.a.	54.8	1.1	232.0	0.0	26.2	0.0	12.5	22.3	7.2	porewater					
72		464.73	987.4	548033.0	4080262.0	4/14/95		760.0	8.6	3.6	0.5	207.0	n.a.	143.0	13.8	384.0	46.0	20.0	0.0	4.0	28.0	1.0	porewater					
73		470.18	981.9	548033.0	4080262.0	7/25/94		660.0	8.7	1.2	0.2	155.0	n.a.	72.0	13.9	160.0	97.0	16.0	0.0	4.0	14.0	1.2	porewater					
74		476.62	975.5	548033.0	4080262.0	8/30/94		590.0	9.0	1.3	0.2	129.0	n.a.	140.4	9.4	61.0	113.0	16.0	0.0	4.0	17.0	0.4	porewater					
75		476.92	975.2	548033.0	4080262.0	8/23/94		690.0	8.3	1.7	0.5	169.0	n.a.	54.0	15.5	376.0	0.0	23.0	0.0	1.0	30.0	0.1	porewater					
76		477.01	975.1	548033.0	4080262.0	8/17/94		480.0	8.9	0.9	0.3	106.8	n.a.	74.5	5.0	98.0	67.0	14.0	0.0	7.0	10.0	1.6	porewater					
77		483.14	969.0	548033.0	4080262.0	9/14/94		400.0	9.3	1.2	0.5	85.0	n.a.	75.0	16.3	148.0	18.0	11.0	0.0	6.0	9.0	2.4	porewater					
78		483.23	968.9	548033.0	4080262.0	10/3/94		470.0	8.9	1.0	0.3	87.8	n.a.	67.2	6.0	178.0	0.0	18.0	0.0	6.0	9.0	2.4	porewater					
79		489.51	962.6	548033.0	4080262.0	10/7/94		420.0	8.8	2.2	0.7	110.0	n.a.	74.0	30.9	74.0	79.0	14.0	0.0	0.0	9.0	5.5	porewater					
80		501.21	950.9	548033.0	4080262.0	1/19/95		n.a.	7.2	1.8	0.6	58.0	n.a.	64.6	18.0	104.0	0.0	10.0	0.0	4.0	9.0	8.6	porewater					
81		510.54	941.6	548033.0	4080262.0	10/24/94		n.d.	7.9	1.4	1.1	115.8	n.a.	55.9	10.0	203.0	18.0	21.0	0.0	5.0	26.0	0.6	porewater					
82		516.79	935.3	548033.0	4080262.0	12/29/94		390.0	7.3	0.2	0.0	88.0	n.a.	52.9	0.6	168.0	0.0	11.9	0.0	3.1	16.0	5.1	porewater					
83		522.79	929.3	548033.0	4080262.0	3/28/95		750.0	8.7	2.0	0.3	184.0	n.a.	50.7	0.1	211.0	79.0	39.4	0.0	5.6	17.5	2.9	porewater					
84		528.71	923.4	548033.0	4080262.0	5/2/95		n.a.	9.4	2.1	0.7	143.0	n.a.	352.0	38.0	229.0	19.0	10.0	0.0	4.0	23.0	10.1	porewater					
85		641.33	810.8	548033.0	4080262.0	4/22/94																						
86								1070.0	6.4	122.0	23.3	35.6	n.a.	97.4	0.0	34.0	0.0	185.0	1.0	32.0	159.0		porewater					
87	UE-25 NRG-6	48.28	1294.2	549274.0	4078871.0	7/6/94		860.0	7.0	104.0	18.0	35.0	n.a.	84.0	1.6	55.0	0.0	148.0	0.9	35.0	139.0		porewater					
88		49.07	1293.5	549274.0	4078871.0	1/17/95		620.0	7.0	70.5	11.5	29.2	n.a.	79.4	0.0	48.0	13.0	58.0	0.0	43.0	94.0		porewater					
89		52.18	1290.3	549274.0	4078871.0	7/21/94		520.0	6.6	49.2	8.6	29.4	n.a.	78.1	0.0	60.0	0.0	47.0	0.0	42.0	64.0		porewater					
90		53.58	1288.9	549274.0	4078871.0	8/1/94		660.0	7.0	24.3	4.2	99.3	n.a.	61.4	1.0	92.0	0.0	77.0	0.0	47.0	77.0		porewater					
91		67.09	1275.4	549274.0	4078871.0	11/30/94		630.0	6.6	33.0	4.9	72.0	n.a.	51.0	0.6	61.0	0.0	49.0	0.1	40.0	115.0		porewater					
92		74.62	1267.9	549274.0	4078871.0	1/10/95																						

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	SITE NUMBER	Depth (m)	Elev (masl)	UTM(east)	UTM(north)	Date	Temp	Sp. Cond	Lab pH	Ca	Mg	Na	K	SiO2	Al	HCO3	CO3	Cl	Br	NO3	SO4	Anion-Cation balance	comments	14-C	Tritium	Del 13-C	Del-D	Del 18-O
93		78.03	1264.5	549274.0	4078871.0	1/12/95		1920.0	6.7	176.0	19.0	215.0	n.a.	68.0	0.9	61.0	0.0	115.0	0.0	35.0	840.0		porewater					
94																												
95	UE-25 NRG-7a	455.04				5/26/94		n.a.	n.a.	30.6	0.3	74.7	n.a.	71.5	0.0	104.0	34.0	39.0	0.0	18.0	23.0		porewater					
96		456.83				6/28/94		500.0	7.5	28.7	0.5	73.2	n.a.	83.0	1.0	156.0	0.0	50.0	0.0	17.0	18.0		porewater					
97																												
98	**Perched Water**																											
99																												
100	UE-25 NRG-7a	460.25				3/7/94	n.a.	224.0	8.7	3.0	0.0	42.0	6.8	9.0	0.0	114.0	n.a.	7.0	0.0	1.0	4.0	-1.9	perched water	66.9	10.4	-16.6	-93.9	-12.8
101																												
102	UE-25 ONC#1	432.97	819.0			12/15/94	n.a.	302.0	8.7	13.3	1.1	50.6	3.6	26.5	11.0	115.0	8.8	7.1	0.0	5.2	23.6	8.4	perched water					
103																												
104	USW G-2	649.22	602.8	548139.0	4082554.0	2/8/95	n.a.	259.0	7.7	7.9	0.5	46.0	5.2	51.0	n.a.	116.0	n.a.	6.5	0.1	n.a.	13.0	6.9	perched water					
105																												
106	USW SD-7	479.76	986.8			3/8/95	n.a.	n.a.	n.a.	14.2	0.13	45.5	5.3	62.3	0.3	112.0	0.0	4.4	0.0	33.8	9.1	-6.1	perched water	34.4	6.2	-10.4	-99.8	-13.4
107		488.29	978.3			3/16/95	21.8	239.0	8.1	13.3	0.13	45.3	5.3	57.4	0.4	128.0	0.0	4.1	0.0	33.8	9.1	-4.6	perched water	28.6	n.a.	-9.4	-99.7	-13.3
108		488.29	978.3			3/17/95	22.6	285.0	8.2	12.8	0.08	45.8	5.5	50.9	0.0	130.0	0.0	4.1	0.0	22.8	8.6	-2.4	perched water	28.4	n.a.	-9.5	-99.6	-13.4
109		488.29	978.3			3/20/95	23.3	265.0	8.0	12.9	0.07	45.5	5.4	55.0	0.0	127.0	0.0	4.1	0.0	13.4	8.5	0.6	perched water	27.9	n.a.	-9.5	-99.6	-13.4
110		488.29	978.3			3/21/95	23.2	259.0	8.2	13.5	0.08	44.6	5.5	55.9	0.0	128.0	0.0	4.1	0.0	13.2	10.3	-1.0	perched water	28.4	n.a.	-9.5	-99.6	-13.3
111																												
112	USW SD-9/TS	453.85	1012.7			7/17/94	27.0	445.0	8.6	2.9	0.2	98.0	9.8	64.2	2.1	197.0	10.0	5.6	0.0	3.3	27.6	-6.6	perched water	41.8	0	-14.4	-97.8	-13.3
113																												
114	USW UZ-14	384.60	1067.5	548133.0	4080262.0	8/2/93	27.1	312.0	7.6	23.0	1.8	39.0	5.6	34.2	0.7	150.0	0.0	7.9	0.2	8.6	14.3	-0.1	perched water	41.7	0.3	-10.2	-98.6	-13.8
115		384.60	1067.5	548133.0	4080262.0	8/2/93	27.1	308.0	7.8	24.0	1.8	38.0	3.9	36.4	1.0	148.8	0.0	9.1	0.1	12.5	13.8	-0.2	perched water	40.6	3.1	-10.1	-97.5	-13.5
116		387.68	1064.4	548133.0	4080262.0	8/3/93	23.8	335.0	8.1	31.0	2.7	40.0	4.4	51.4	6.1	147.6	0.0	8.3	0.4	16.9	16.3	0.2	perched water	36.6	0	-9.5	-97.1	-13.4
117		390.75	1061.4	548133.0	4080262.0	8/5/93	24.2	518.0	8.3	45.0	4.1	88.0	5.8	7.7	0.0	106.1	0.0	15.5	0.4	0.0	223.0	-0.4	perched water	66.8	0.4	-9.2	-87.4	-12.1
118		390.75	1061.4	548133.0	4080262.0	8/17/93	n.a.	n.a.	n.a.	37.0	3.1	40.0	6.3	21.4	0.0	144.0	0.0	7.2	0.1	12.7	57.3	-0.1	perched water	32.3	1.8	-9.8	-97.8	-13.3
119		390.75	1061.4	548133.0	4080262.0	8/19/93	n.a.	n.a.	n.a.	30.0	2.4	35.0	3.3	25.7	0.0	144.0	0.0	7.0	0.1	15.4	22.9	-0.1	perched water	28.9	3.1	n.a.	-97.9	-13.4
120		390.75	1061.4	548133.0	4080262.0	8/27/93	n.a.	n.a.	n.a.	27.0	2.1	34.0	1.8	32.1	0.0	141.5	0.0	6.7	0.1	14.5	14.1	0.1	perched water	27.2	0	-9.6	-97.3	-13.4
121		390.75	1061.4	548133.0	4080262.0	8/31/93	n.a.	n.a.	7.8	31.0	2.5	35.0	4.1	40.7	0.0	146.4	0.0	7.0	0.1	17.1	24.2	-0.3	perched water	29.2	0	-11.3	-97.6	-13.1
122																												
123																												
124	**AVERAGES:**																											
125																												
126	**UE-25 UZ-N2**									**11.1**	**2.4**	**19.1**		**7.2**	**0.0**	**66.6**	**0.0**	**8.3**	**0.6**	**14.2**	**15.6**							
127	**UE-25 UZ#16**							**540.6**	**8.3**	**18.2**	**3.9**	**87.0**		**75.1**	**2.8**	**146.3**	**22.0**	**35.0**	**0.0**	**16.8**	**25.5**							
128	**USW UZ-14**							**623.1**	**7.8**	**31.1**	**5.4**	**86.9**		**80.2**	**4.9**	**147.7**	**17.3**	**57.4**	**0.0**	**13.5**	**55.3**							
129	**UE-25 NRG-6**							**897.1**	**6.8**	**82.7**	**12.8**	**73.6**		**74.2**	**0.6**	**58.7**	**1.9**	**97.0**	**0.3**	**39.1**	**212.6**							
130	**UE-25 NRG-7a**							**500.0**	**7.5**	**29.7**	**0.4**	**74.0**		**77.3**	**0.5**	**130.0**	**17.0**	**44.5**	**0.0**	**17.5**	**20.5**							
131	**overall AVG**							**613.2**	**7.9**	**29.2**	**5.1**	**81.0**		**73.1**	**3.5**	**135.1**	**15.7**	**48.4**	**0.1**	**16.5**	**54.6**							
132	**Perched Water**							**312.6**	**8.1**	**20.1**	**1.3**	**47.8**	**5.2**	**40.1**	**1.4**	**135.0**	**1.3**	**6.8**	**0.1**	**14.0**	**29.4**					**-10.6**	**-97.4**	**-13.3**

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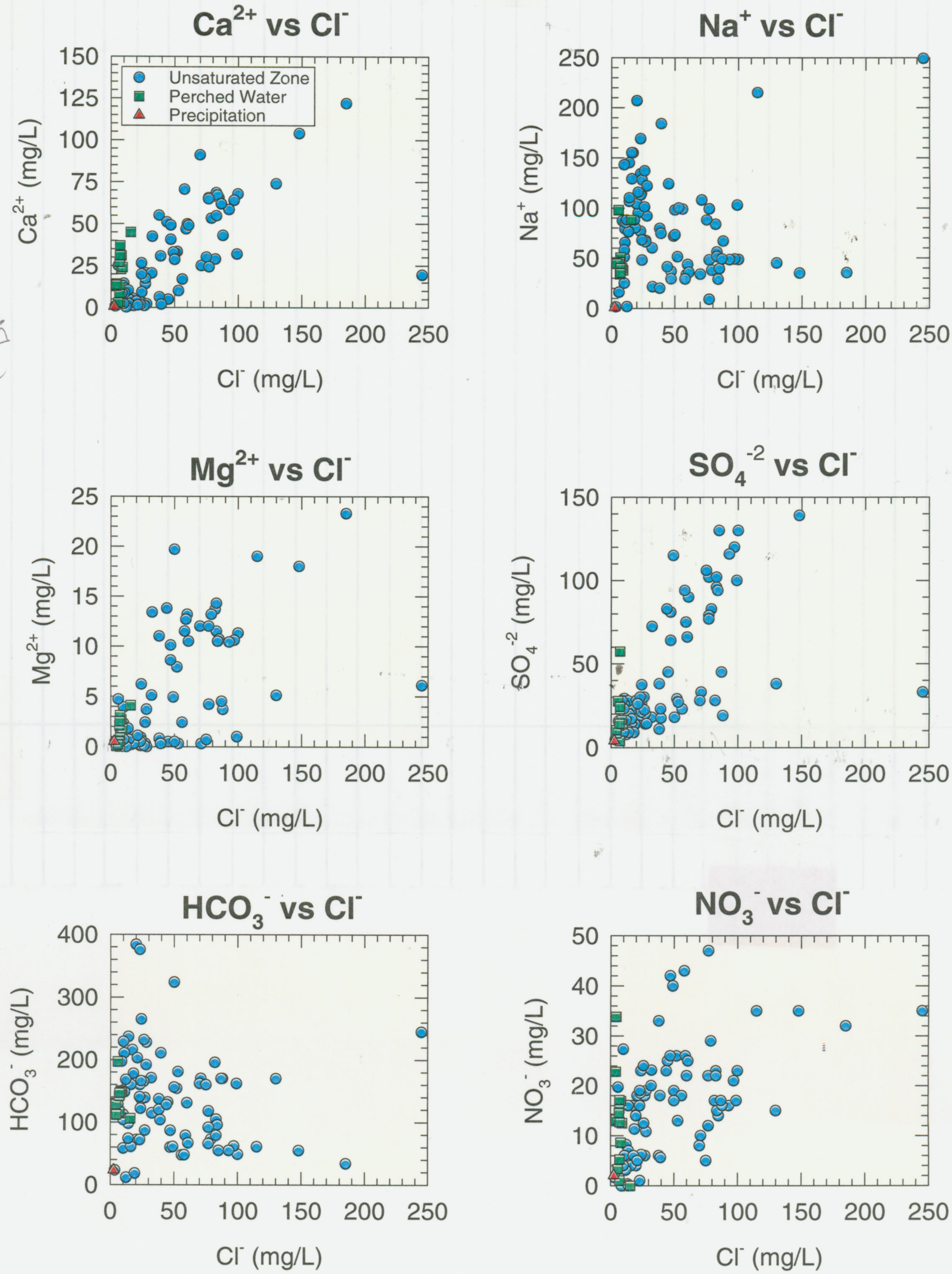
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	SITE NUMBER	Depth (m)	Elev (masl)	UTM(east)	UTM(north)	Date	Temp	Sp. Cond	Lab pH	Ca	Mg	Na	K	SiO2	Al	HCO3	CO3	Cl	Br	NO3	SO4	Anion-Cation balance	comments	14-C	Tritium	Del 13-C	Del-D	Del 18-O
2	()	()				dd-mm-yyyy	(C)	(microS/cm)	(units)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(mol/L)	(percent)		(PMC)	(T.U.)	(per mil)	(per mil)	(per mil)
3										40.07800	24.30500	22.98977	39.09830	60.08430	26.98154	61.01714	60.00920	35.45270	79.90400	62.00494	96.06360							
4										2.00000	2.00000	1.00000	1.00000	0.00000	3.00000	-1.00000	-2.00000	-1.00000	-1.00000	-1.00000	-2.00000							
5	UZ water samples																											
6	n.a.=data not available																											
7	n.d.=not detected																											
8																												
9	UE-25 UZ-N2	0.00	1203.0	549859.0	4079446.0	3/31/92		n.a.	n.a.	1.747E-05	2.057E-05	3.480E-05	n.a.	1.498E-05	0.000E+00	3.819E-04	0.000E+00	6.770E-05	0.000E+00	3.226E-05	4.268E-05	-0.5	precip					
10		15.80	1187.2	549859.0	4079446.0	8/18/89		308.0	7.7	3.493E-04	9.463E-05	2.218E-03	n.a.	2.996E-04	n.a.	1.836E-03	0.000E+00	2.821E-04	6.758E-06	n.a.	3.019E-04	0.4	porewater					
11		15.80	1187.2	549859.0	4079446.0	2/14/92		n.a.	n.a.	3.493E-05	2.057E-05	7.395E-05	n.a.	0.000E+00	0.000E+00	1.917E-04	0.000E+00	3.441E-04	0.000E+00	1.322E-04	8.120E-05	-0.6	porewater					
12		15.80	1187.2	549859.0	4079446.0	3/16/92		n.a.	n.a.	3.593E-04	1.605E-04	1.092E-03	n.a.	9.653E-05	0.000E+00	9.538E-04	0.000E+00	2.821E-04	2.126E-05	4.403E-04	2.186E-04	0.0	porewater					
13		15.80	1187.2	549859.0	4079446.0	3/31/92		n.a.	n.a.	6.238E-04	1.934E-04	7.047E-04	n.a.	1.964E-04	0.000E+00	2.091E-03	0.000E+00	1.636E-04	1.126E-05	3.177E-04	1.624E-04	-0.6	porewater					
14		30.10	1172.9	549859.0	4079446.0	2/14/92		n.a.	n.a.	1.996E-05	2.057E-05	6.960E-05	n.a.	3.329E-06	0.000E+00	3.819E-04	0.000E+00	9.306E-05	0.000E+00	2.580E-05	4.893E-05	-0.5	porewater					
15																												
16	UE-25 UZ#16	49.90	1262.8	549484.0	4076986.0	12/2/92		425.0	7.6	1.060E-03	5.513E-04	9.352E-04	n.a.	1.290E-03	1.853E-05	1.880E-03	7.499E-04	9.139E-04	0.000E+00	3.726E-04	7.526E-04	-2.0	porewater					
17		55.20	1257.5	549484.0	4076986.0	11/16/92		430.0	7.5	1.372E-03	4.526E-04	8.700E-04	n.a.	1.381E-03	3.706E-06	1.967E-03	0.000E+00	1.072E-03	6.258E-06	5.322E-04	3.956E-04	0.2	porewater					
18		367.74	944.9	549484.0	4076986.0	9/27/94		710.0	8.7	7.211E-04	5.637E-04	3.636E-03	n.a.	9.503E-04	0.000E+00	3.212E-03	0.000E+00	2.313E-03	0.000E+00	2.742E-04	2.915E-04	-1.4	porewater					
19		374.17	938.5	549484.0	4076986.0	8/9/93		430.0	8.1	6.612E-04	2.551E-04	2.084E-03	n.a.	1.035E-03	1.112E-05	2.245E-03	0.000E+00	6.770E-04	0.000E+00	3.709E-04	2.707E-04	1.2	porewater					
20		376.52	936.1	549484.0	4076986.0	8/11/93		480.0	8.2	8.359E-04	3.250E-04	2.231E-03	n.a.	8.804E-04	0.000E+00	2.524E-03	0.000E+00	1.467E-03	0.000E+00	4.193E-04	3.019E-04	-4.7	porewater					
21		387.04	925.6	549484.0	4076986.0	8/4/93		430.0	8.5	3.518E-04	9.875E-05	2.936E-03	n.a.	9.503E-04	0.000E+00	2.278E-03	2.166E-04	7.616E-04	0.000E+00	2.903E-04	1.457E-04	-2.7	porewater					
22		390.33	922.3	549484.0	4076986.0	9/2/93		530.0	8.3	5.115E-04	1.522E-04	4.002E-03	n.a.	1.195E-03	5.559E-05	3.147E-03	0.000E+00	7.898E-04	0.000E+00	3.064E-04	1.978E-04	6.9	porewater					
23		395.33	917.3	549484.0	4076986.0	9/23/93		930.0	7.4	8.084E-04	8.105E-04	4.271E-03	n.a.	7.772E-04	0.000E+00	5.310E-03	2.000E-04	1.410E-03	0.000E+00	3.064E-04	1.874E-04	-1.9	porewater					
24		401.76	910.9	549484.0	4076986.0	8/9/93		420.0	7.3	5.140E-04	2.098E-04	2.614E-03	n.a.	2.190E-03	4.077E-05	2.802E-03	0.000E+00	9.026E-04	0.000E+00	3.226E-04	1.874E-04	-4.0	porewater					
25		409.62	903.0	549484.0	4076986.0	7/1/93		530.0	8.4	4.242E-04	9.875E-05	4.306E-03	n.a.	1.034E-03	6.301E-05	7.801E-04	9.798E-04	1.580E-03	0.000E+00	2.903E-04	2.394E-04	6.5	porewater					
26		413.96	898.7	549484.0	4076986.0	5/6/93		550.0	7.5	8.483E-05	1.234E-05	3.336E-03	n.a.	7.972E-04	4.077E-05	2.299E-03	0.000E+00	6.431E-04	0.000E+00	2.597E-04	1.947E-04	-0.1	porewater					
27		420.56	892.1	549484.0	4076986.0	6/29/93		490.0	8.6	1.098E-04	2.469E-05	4.132E-03	n.a.	1.103E-03	9.636E-05	1.180E-03	7.799E-04	5.923E-04	0.000E+00	2.903E-04	2.602E-04	0.3	porewater					
28		423.52	889.1	549484.0	4076986.0	5/18/93		530.0	7.0	8.982E-05	3.703E-05	4.985E-03	n.a.	1.040E-03	7.412E-05	1.999E-03	5.999E-04	6.629E-04	0.000E+00	2.984E-04	2.478E-04	0.6	porewater					
29		425.41	887.3	549484.0	4076986.0	3/31/94		710.0	7.8	1.347E-04	1.234E-05	6.742E-03	n.a.	1.465E-03	1.445E-04	3.540E-03	3.999E-04	4.795E-04	0.000E+00	2.580E-04	2.290E-04	11.9	porewater					
30		426.08	886.6	549484.0	4076986.0	7/7/93		550.0	8.7	1.248E-04	2.057E-05	5.394E-03	n.a.	1.318E-03	1.742E-04	2.160E-03	5.899E-04	1.269E-03	0.000E+00	4.032E-04	4.684E-04	-0.3	porewater					
31		426.29	886.4	549484.0	4076986.0	4/5/94		710.0	8.0	1.248E-04	1.646E-05	6.307E-03	n.a.	2.047E-03	2.891E-04	3.884E-03	5.166E-04	3.949E-04	0.000E+00	2.580E-04	2.082E-04	4.8	porewater					
32		429.28	883.4	549484.0	4076986.0	7/28/93		580.0	9.2	8.234E-05	1.234E-05	4.524E-03	n.a.	1.140E-03	1.260E-04	1.180E-03	1.180E-03	5.641E-04	0.000E+00	2.258E-04	1.666E-04	0.1	porewater					
33		430.71	882.0	549484.0	4076986.0	9/16/93		450.0	8.7	2.994E-05	4.114E-06	4.393E-03	n.a.	1.263E-03	3.706E-05	2.704E-03	0.000E+00	7.334E-04	0.000E+00	3.871E-04	3.123E-04	0.1	porewater					
34		435.35	877.3	549484.0	4076986.0	9/14/93		570.0	8.8	4.741E-05	4.114E-06	5.829E-03	n.a.	1.340E-03	1.260E-04	2.622E-03	7.166E-04	6.488E-04	0.000E+00	3.064E-04	2.394E-04	3.9	porewater					
35		437.21	875.5	549484.0	4076986.0	7/13/93		550.0	8.5	7.984E-05	2.469E-05	4.915E-03	n.a.	1.816E-03	2.261E-04	1.180E-03	1.180E-03	6.488E-04	0.000E+00	2.580E-04	1.978E-04	0.3	porewater					
36		439.83	872.8	549484.0	4076986.0	6/17/93		550.0	7.6	4.242E-05	3.292E-05	3.475E-03	n.a.	1.147E-03	4.447E-05	2.999E-04	1.460E-03	5.331E-04	0.000E+00	1.822E-04	1.426E-04	-0.6	porewater					
37		453.27	859.4	549484.0	4076986.0	9/21/93		360.0	9.2	1.572E-04	3.292E-05	3.458E-03	n.a.	3.883E-03	9.710E-04	2.245E-03	0.000E+00	1.072E-03	0.000E+00	9.677E-05	1.145E-04	2.7	porewater					
38		488.08	824.6	549484.0	4076986.0	12/30/93		570.0	8.9	2.495E-04	1.234E-05	4.350E-03	n.a.	5.992E-04	2.594E-05	2.966E-03	0.000E+00	1.495E-03	0.000E+00	2.097E-04	2.811E-04	-3.6	porewater					
39	Static Water = 489.2 m																											
40		490.09	822.6	549484.0	4076986.0	1/24/94		660.0	9.0	6.238E-04	1.234E-05	4.698E-03	n.a.	5.659E-04	3.706E-05	2.786E-03	0.000E+00	2.003E-03	0.000E+00	1.613E-04	3.435E-04	2.8	porewater					
41		501.49	811.2	549484.0	4076986.0	3/1/94		490.0	9.0	2.271E-03	4.937E-04	1.479E-03	n.a.	1.165E-03	1.112E-04	2.655E-03	0.000E+00	1.974E-03	0.000E+00	1.290E-04	2.915E-04	13.6	porewater					
42		503.44	809.2	549484.0	4076986.0	3/15/94		420.0	8.4	4.317E-04	1.234E-05	2.871E-03	n.a.	7.889E-04	2.594E-05	1.426E-03	3.166E-04	7.616E-04	0.000E+00	9.677E-05	2.082E-04	6.1	porewater					
43		491.19	821.5	549484.0	4076986.0	2/24/93		n.a.	n.a.	2.844E-04	6.583E-05	3.445E-03	n.a.	6.025E-04	4.447E-05	3.451E-03	0.000E+00	2.990E-04	7.509E-06	3.226E-06	3.029E-04	-0.2	groundwater					
44		504.22	808.4	549484.0	4076986.0	3/8/93		n.a.	n.a.	2.570E-04	7.406E-05	3.310E-03	n.a.	2.839E-03	7.375E-04	2.691E-03	0.000E+00	3.760E-04	0.000E+00	4.838E-06	2.884E-04	0.3	groundwater					
45		504.22	808.4	549484.0	4076986.0	3/9/93		n.a.	n.a.	2.146E-04	2.880E-05	2.845E-03	n.a.	3.062E-04	0.000E+00	2.485E-03	0.000E+00	2.990E-04	0.000E+00	0.000E+00	2.654E-04	0.0	groundwater					
46		508.33	804.3	549484.0	4076986.0	3/15/93		n.a.	n.a.	2.096E-04	5.349E-05	3.793E-03	n.a.	2.746E-04	3.706E-06	3.234E-03	0.000E+00	2.426E-04	1.252E-05	0.000E+00	2.884E-04	0.3	groundwater					
47																												
48	USW UZ-14	13.78	1438.3	548033.0	4080262.0	9/19/94		1320.0	8.6	4.890E-04	2.510E-04	1.064E-02	n.a.	9.903E-04	3.706E-05	4.015E-03	3.000E-04	6.911E-03	0.000E+00	5.645E-04	3.435E-04	-1.8	porewater					
49		26.03	1426.1	548033.0	4080262.0	3/24/94		630.0	6.9	1.245E-03	5.431E-04	1.892E-03	n.a.	1.495E-03	1.112E-05	2.147E-03	0.000E+00	1.692E-03	0.000E+00	3.548E-04	6.870E-04	-0.9	porewater					
50		27.80	1424.3	548033.0	4080262.0	3/17/94		530.0	7.6	1.016E-03	4.156E-04	1.614E-03	n.a.	1.341E-03	0.000E+00	1.426E-03	0.000E+00	1.326E-03	0.000E+00	4.193E-04	8.432E-04	-4.1	porewater					
51		29.17	1422.9	548033.0	4080262.0	4/21/94		600.0	7.2	1.330E-03	5.431E-04	1.657E-03	n.a.	1.356E-03	0.000E+00	1.196E-03	0.000E+00	2.228E-03	0.000E+00	4.677E-04	8.840E-04	-1.9	porewater					
52		29.38	1422.7	548033.0	4080262.0	5/3/94		550.0	6.9	1.170E-03	5.225E-04	1.462E-03	n.a.	1.325E-03	0.000E+00	1.295E-03	0.000E+00	1.664E-03	0.000E+00	4.193E-04	7.807E-04	-0.9	porewater					
53		30.86	1421.4	548033.0	4080262.0	3/22/94		600.0	7.0	1.275E-03	5.678E-04	1.796E-03	n.a.	1.528E-03	0.000E+00	2.098E-03	0.000E+00	1.241E-03	0.000E+00	3.709E-04	8.640E-04	0.5	porewater					
54		35.02	1417.1	548033.0	4080262.0	3/1/94		540.0	6.6	1.223E-03	4.320E-04	1.562E-03	n.a.	1.563E-03	0.000E+00	1.098E-03	0.000E+00	1.721E-03	0.000E+00	4.032E-04	9.369E-04	-2.1	porewater					
55		41.36	1410.7	548033.0	4080262.0	4/12/94		690.0	6.9	1.709E-03	5.884E-04	2.445E-03	n.a.	1.531E-03	0.000E+00	1.721E-03	0.000E+00	2.341E-03	0.000E+00	3.709E-04	9.993E-04	4.6	porewater					
56		44.20	1407.9	548033.0	4080262.0	8/11/94		650.0	7.7	1.334E-03	4.937E-04	2.097E-03	n.a.	1.356E-03	0.000E+00	1.934E-03	0.000E+00	2.172E-03	0.000E+00	3.548E-04	1.062E-03	-1.7	porewater					
57		45.08	1407.0	548033.0	4080262.0	4/14/94		640.0	6.9	1.367E-03	4.732E-04	2.244E-03	n.a.	1.287E-03	0.000E+00	1.295E-03	0.000E+00	2.341E-03	0.000E+00	3.548E-04	1.062E-03	-1.5	porewater					
58		54.19	1397.9	548033.0	4080262.0	9/12/94		730.0	6.5	1.692E-03	4.649E-04	2.118E-03	n.a.	1.290E-03	0.000E+00	8.031E-04	0.000E+00	2.821E-03	0.000E+00	3.709E-04	1.353E-03	-2.0	porewater					
59		54.35	1397.6	548033.0	4080262.0	4/19/94		740.0	6.8	1.597E-03	4.361E-04	2.135E-03	n.a.	1.549E-03	0.000E+00	1.016E-03	0.000E+00	2.736E-03	0.000E+00	3.387E-04	1.249E-03	-3.0	porewater					
60		65.81	1386.3	548033.0	4080262.0	4/21/94		710.0	6.9	1.634E-03	4.402E-04	1.714E-03	n.a.	1.628E-03	0.000E+00	9.014E-04	0.000E+00	2.398E-03	0.000E+00	2.258E-04	1.353E-03	-3.0	porewater					
61		68.92	1383.2	548033.0	4080262.0	10/31/94		640.0	7.9	1.462E-03	4.279E-04	2.105E-03	n.a.	1.518E-03	0.000E+00	9.014E-04	0.000E+00	2.623E-03	0.000E+00	2.580E-04	1.206E-03	-2.6	porewater					
62		71.72	1380.4	548033.0	4080262.0	3/2/94		630.0	7.1	1.672E-03	4.320E-04	1.261E-03	n.a.	1.049E-03	0.000E+00	1.573E-03	n.a.	2.369E-03	0.000E+00	2.419E-04	9.785E-04	-5.7	porewater					
63		73.46	1378.8	548033.0	4080262.0	3/2/94		810.0	7.6	7.984E-04	4.114E-05	4.480E-03	n.a.	1.015E-03	1.112E-04	2.655E-03	n.a.	2.782E-03	0.000E+00	2.742E-04	1.041E-03	-11.7	porewater					
64		74.89	1377.2	548033.0	4080262.0	2/7/94		580.0	6.8	1.622E-03	4.937E-04	3.916E-04	n.a.	7.856E-04	0.000E+00	1.082E-03	n.a.	2.172E-03	0.000E+00	1.935E-04	8.224E-04	-4.7	porewater					
65		383.65	1068.5	548033.0	4080262.0	1/14/94		n.a.	n.a.	1.073E-03	1.522E-04	2.914E-03	n.a.	5.825E-04	0.000E+00	2.786E-03	n.a.	2.482E-03	0.000E+00	2.580E-04	1.978E-04	-4.9	porewater					
66		389.41	1062.7	548033.0	4080262.0	1/14/94		n.d.	n.d.	1.547E-03	1.851E-04	2.131E-03	n.a.	7.323E-04	0.000E+00	2.786E-03	n.a.	2.454E-03	0.000E+00	2.742E-04	4.684E-04	-7.1	porewater					
67		389.50	1062.6	548033.0	4080262.0	1/14/94		n.d.	n.d.	1.846E-03	2.098E-04	1.957E-03	n.a.	6.324E-04	0.000E+00	2.786E-03	n.a.	3.667E-03	0.000E+00	2.419E-04	3.956E-04	-10.3	porewater					
68		429.65	1022.5	548033.0	4080262.0	1/30/95		720.0	7.8	7.485E-04	2.880E-05	[illegible]828E-03	n.a.	9.487E-04	3.706E-06	2.622E-03	0.000E+00	2.115E-03	0.000E+00	8.064E-05	1.103E-03	-13.2	porewater					
69		432.72	1019.4	548033.0	4080262.0	12/22/94		410.0	8.3	4.990E-04	2.469E-05	2.958E-03	n.a.	9.986E-04	5.189E-05	2.721E-03	0.000E+00	8.770E-04	0.000E+00	9.677E-05	2.186E-04	1.0	porewater					
70		445.62	1006.5	548033.0	4080262.0	4/4/95		570.0	7.8	2.296E-04	4.114E-06	5.568E-03	n.a.	1.143E-03	4.447E-05	4.343E-03	0.000E+00	8.826E-04	0.000E+00	9.999E-05	3.863E-04	1.1	porewater					
71		455.95	996.2	548033.0	4080262.0	4/11/95		500.0	8.4	5.240E-05	0.000E+00	5.307E-03	n.a.	9.437E-04	1.112E-05	3.737E-03	0.000E+00	7.898E-04	0.000E+00	1.742E-04	1.469E-04	3.9	porewater					
72		464.73	987.4	548033.0	4080262.0	4/14/95		560.0	7.7	2.745E-05	4.114E-06	5.959E-03	n.a.	9.121E-04	4.077E-05	3.802E-03	0.000E+00	7.390E-04	0.000E+00	2.016E-04	2.321E-04	7.2	porewater					
73		470.18	981.9	548033.0	4080262.0	7/25/94		760.0	8.6	8.962E-05	2.057E-05	9.004E-03	n.a.	2.380E-03	5.115E-04	6.293E-03	7.665E-04	5.641E-04	0.000E+00	6.451E-05	2.915E-04	1.0	porewater					
74		476.62	975.5	548033.0	4080262.0	8/30/94		660.0	8.7	2.994E-05	8.229E-06	6.742E-03	n.a.	1.198E-03	5.152E-04	2.822E-03	1.616E-03	4.513E-04	0.000E+00	6.451E-05	1.457E-04	1.2	porewater					
75		476.92	975.2	548033.0	4080262.0	8/23/94		590.0	9.0	3.244E-05	8.229E-06	5.611E-03	n.a.	2.337E-03	3.484E-04	9.997E-04	1.883E-03	4.513E-04	0.000E+00	6.451E-05	1.770E-04	0.4	porewater					
76		477.01	975.1	548033.0	4080262.0	8/17/94		690.0	8.3	4.242E-05	2.057E-05	7.351E-03	n.a.	8.987E-04	5.745E-04	6.162E-03	0.000E+00	6.488E-04	0.000E+00	1.613E-05	3.123E-04	0.1	porewater					
77		483.14	969.0	548033.0	4080262.0	9/14/94		460.0	8.9	2.246E-05	1.234E-05	4.646E-03	n.a.	1.240E-03	1.853E-04	1.606E-03	1.116E-03	3.949E-04	0.000E+00	1.129E-04	1.041E-04	1.6	porewater					
78		483.23	968.9	548033.0	4080262.0	10/3/94		400.0	9.3	2.994E-05	2.057E-05	3.697E-03	n.a.	1.248E-03	6.041E-04	2.426E-03	3.000E-04	3.103E-04	0.000E+00	9.677E-05	9.369E-05	2.4	porewater					
79		489.51	962.6	548033.0	4080262.0	10/7/94		470.0	8.9	2.495E-05	1.234E-05	3.819E-03	n.a.	1.118E-03	2.224E-04	2.917E-03	0.000E+00	5.077E-04	0.000E+00	9.677E-05	9.369E-05	2.4	porewater					
80		501.21	950.9	548033.0	4080262.0	1/19/95		420.0	8.8	5.489E-05	2.880E-05	4.785E-03	n.a.	1.232E-03	1.145E-03	1.213E-03	1.316E-03	3.949E-04	0.000E+00	0.000E+00	9.369E-05	5.5	porewater					
81		510.54	941.6	548033.0	4080262.0	10/24/94		n.a.	7.2	4.491E-05	2.469E-05	2.523E-03	n.a.	1.075E-03	6.671E-04	1.704E-03	0.000E+00	2.821E-04	0.000E+00	6.451E-05	9.369E-05	8.6	porewater					
82		516.79	935.3	548033.0	4080262.0	12/29/94		n.d.	7.9	3.493E-05	4.526E-05	5.037E-03	n.a.	9.304E-04	3.706E-04	3.327E-03	3.000E-04	5.923E-04	0.000E+00	8.064E-05	2.707E-04	0.6	porewater					
83		522.79	929.3	548033.0	4080262.0	3/28/95		390.0	7.3	4.990E-06	0.000E+00	3.828E-03	n.a.	8.804E-04	2.224E-05	2.753E-03	0.000E+00	3.357E-04	0.000E+00	5.000E-05	1.666E-04	5.1	porewater					
84		526.71	923.4	548033.0	4080262.0	5/2/95		750.0	8.7	4.990E-05	1.234E-05	8.004E-03	n.a.	8.438E-04	3.706E-06	3.458E-03	1.316E-03	1.111E-03	0.000E+00	9.032E-05	1.822E-04	2.9	porewater					
85		641.33	810.8	548033.0	4080262.0	4/22/94		n.a.	9.4	5.240E-05	2.880E-05	6.220E-03	n.a.	5.858E-03	1.408E-03	3.753E-03	3.166E-04	2.821E-04	0.000E+00	6.451E-05	2.394E-04	10.1	porewater					
86																												
87	UE-25 NRG-6	48.28	1294.2	549274.0	4078871.0	7/6/94		1070.0	6.4	3.044E-03	9.587E-04	1.549E-03	n.a.	1.621E-03	0.000E+00	5.572E-04	0.000E+00	5.218E-03	1.252E-05	5.161E-04	1.655E-03		porewater					
88		49.07	1293.5	549274.0	4078871.0	1/17/95		860.0	7.0	2.595E-03	7.406E-04	1.522E-03	n.a.	1.398E-03	5.930E-05	9.014E-04	0.000E+00	4.175E-03	1.126E-05	5.645E-04	1.447E-03		porewater					
89		52.18	1290.3	549274.0	4078871.0	7/21/94		620.0	7.0	1.759E-03	4.732E-04	1.270E-03	n.a.	1.321E-03	0.000E+00	7.867E-04	2.166E-04	1.636E-03	0.000E+00	6.935E-04	9.765E-04		porewater					
90		53.58	1288.9	549274.0	4078871.0	8/1/94		520.0	6.6	1.228E-03	3.538E-04	1.279E-03	n.a.	1.300E-03	0.000E+00	9.833E-04	0.000E+00	1.326E-03	0.000E+00	6.774E-04	6.662E-04		porewater					
91		67.09	1275.4	549274.0	4078871.0	11/30/94		660.0	7.0	8.063E-04	1.728E-04	4.319E-03	n.a.	1.022E-03	3.706E-05	1.508E-03	0.000E+00	2.172E-03	0.000E+00	7.580E-04	8.016E-04		porewater					
92		74.62	1267.9	549274.0	4078871.0	1/10/95		630.0	6.6	8.234E-04	2.016E-04	3.132E-03	n.a.	8.488E-04	2.224E-05	9.997E-04	0.000E+00	1.382E-03	1.252E-06	6.451E-04	1.197E-03		porewater					
93		78.03	1264.5	549274.0	4078871.0	1/12/95		1920.0	6.7	4.391E-03	7.817E-04	9.352E-03	n.a.	1.132E-03	3.336E-05	9.997E-04	0.000E+00	3.244E-03	0.000E+00	5.645E-04	8.744E-03		porewater					
94																												
95	UE-25 NRG-7a	455.04				5/26/94		n.a.	n.a.	7.635E-04	1.234E-05	3.249E-03	n.a.	1.190E-03	0.000E+00	1.704E-03	5.666E-04	1.100E-03	0.000E+00	2.903E-04	2.394E-04		porewater					
96		458.83				6/28/94		500.0	7.5	7.161E-04	2.057E-05	3.184E-03	n.a.	1.381E-03	3.706E-05	2.557E-03	0.000E+00	1.410E-03	0.000E+00	2.742E-04	1.874E-04		porewater					
97																												
98	Perched Water																											
99																												
100	UE-25 NRG-7a	460.25				3/7/94	n.a.	224.0	8.7	7.485E-05	0.000E+00	1.827E-03	1.739E-04	1.498E-04	0.000E+00	1.868E-03	n.a.	1.974E-04	0.000E+00	1.613E-05	4.164E-05	-1.9	perched water	66.9	10.4	-16.6	-93.9	-12.8
101																												
102	UE-25 ONC#1	432.97	819.0			12/15/94	n.a.	302.0	8.7	3.319E-04	4.526E-05	2.201E-03	9.208E-05	4.410E-04	4.077E-04	1.885E-03	1.466E-04	2.003E-04	0.000E+00	8.386E-05	2.457E-04	6.4	perched water					
103																												
104	USW G-2	649.22	602.8	548139.0	4082554.0	2/8/95	n.a.	259.0	7.7	1.971E-04	2.057E-05	2.001E-03	1.330E-04	8.486E-04	n.a.	1.901E-03	n.a.	1.833E-04	1.252E-06	n.a.	1.353E-04	6.9	perched water					
105																												
106	USW SD-7	479.76	986.8			3/8/95	n.a.	n.a.	n.a.	3.543E-04	5.349E-06	1.979E-03	1.356E-04	1.037E-03	1.038E-05	1.836E-03	0.000E+00	1.241E-04	0.000E+00	5.451E-04	9.473E-05	-6.1	perched water	34.4	6.2	-10.4	-99.8	-13.4
107		488.29	978.3			3/16/95	21.8	239.0	8.1	3.319E-04	5.349E-06	1.970E-03	1.356E-04	9.553E-04	1.631E-05	2.098E-03	0.000E+00	1.156E-04	0.000E+00	5.451E-04	9.473E-05	-4.6	perched water	28.6	n.a.	-9.4	-99.7	-13.3
108		488.29	978.3			3/17/95	22.6	285.0	8.2	3.194E-04	3.292E-06	1.882E-03	1.407E-04	8.471E-04	0.000E+00	2.131E-03	0.000E+00	1.156E-04	0.000E+00	3.677E-04	8.952E-05	-2.4	perched water	28.4	n.a.	-9.5	-99.8	-13.4
109		488.29	978.3			3/20/95	23.3	265.0	8.0	3.219E-04	2.880E-06	1.879E-03	1.381E-04	9.154E-04	0.000E+00	2.081E-03	0.000E+00	1.156E-04	0.000E+00	2.161E-04	8.848E-05	0.6	perched water	27.9	n.a.	-9.5	-99.5	-13.4
110		488.29	978.3			3/21/95	23.2	259.0	8.2	3.368E-04	3.292E-06	1.840E-03	1.407E-04	9.304E-04	0.000E+00	2.098E-03	0.000E+00	1.156E-04	0.000E+00	2.129E-04	1.072E-04	-1.0	perched water	28.4	n.a.	-9.5	-99.6	-13.3

Yang et al. (1996)(molarity)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	SITE NUMBER	Depth (m)	Elev (masl)	UTM(east)	UTM(north)	Date	Temp	Sp. Cond	Lab pH	Ca	Mg	Na	K	SiO2
111														
112	USW SD-9/TS	453.85	1012.7			7/17/94	27.0	445.0	8.6	7.236E-05	8.229E-06	4.263E-03	2.507E-04	1.068E-03
113														
114	USW UZ-14	384.60	1067.5	548133.0	4080262.0	8/2/93	27.1	312.0	7.6	5.739E-04	7.406E-05	1.696E-03	1.432E-04	5.692E-04
115		384.60	1067.5	548133.0	4080262.0	8/2/93	27.1	308.0	7.8	5.968E-04	7.406E-05	1.653E-03	9.975E-05	6.058E-04
116		387.68	1064.4	548133.0	4080262.0	8/3/93	23.8	335.0	8.1	7.735E-04	1.111E-04	1.740E-03	1.125E-04	8.555E-04
117		390.75	1061.4	548133.0	4080262.0	8/5/93	24.2	518.0	8.3	1.123E-03	1.687E-04	3.828E-03	1.483E-04	1.282E-04
118		390.75	1061.4	548133.0	4080262.0	8/17/93	n.a.	n.a.	n.a.	9.232E-04	1.275E-04	1.740E-03	1.611E-04	3.562E-04
119		390.75	1061.4	548133.0	4080262.0	8/19/93	n.a.	n.a.	n.a.	7.485E-04	9.875E-05	1.522E-03	8.440E-05	4.277E-04
120		390.75	1061.4	548133.0	4080262.0	8/27/93	n.a.	n.a.	n.a.	6.737E-04	8.640E-05	1.479E-03	4.604E-05	5.342E-04
121		390.75	1061.4	548133.0	4080262.0	8/31/93	n.a.	n.a.	7.8	7.735E-04	1.029E-04	1.522E-03	1.049E-04	6.774E-04
122														
123														
124	AVERAGES													
125														
126	UE-25 UZ-N2									2.775E-04	9.792E-05	8.317E-04		1.192E-04
127	UE-25 UZ#16							540.6	8.3	4.529E-04	1.611E-04	3.786E-03		1.251E-03
128	USW UZ-14							623.1	7.8	7.756E-04	2.215E-04	3.782E-03		1.335E-03
129	UE-25 NRG-6							897.1	6.8	2.064E-03	5.261E-04	3.203E-03		1.235E-03
130	UE-25 NRG-7a							500.0	7.5	7.398E-04	1.646E-05	3.217E-03		1.286E-03
131	overall AVG							613.2	7.9	7.280E-04	2.089E-04	3.523E-03		1.216E-03
132	Perched Water							312.6	8.1	5.017E-04	5.516E-05	2.078E-03	1.318E-04	6.675E-04

	A	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	SITE NUMBER	Al	HCO3	CO3	Cl	Br	NO3	SO4	Anion-Cation balance	comments	14-C	Tritium	Del 13-C	Del-D	Del 18-O
111															
112	USW SD-9/TS	7.783E-05	3.229E-03	1.866E-04	1.580E-04	0.000E+00	5.322E-05	2.873E-04	-6.6	perched water	41.8	0	-14.4	-97.8	-13.3
113															
114	USW UZ-14	2.594E-05	2.458E-03	0.000E+00	2.226E-04	2.503E-06	1.387E-04	1.489E-04	-0.1	perched water	41.7	0.3	-10.2	-96.6	-13.8
115		3.706E-05	2.439E-03	0.000E+00	2.567E-04	1.252E-06	2.016E-04	1.437E-04	-0.2	perched water	40.6	3.1	-10.1	-97.5	-13.5
116		2.261E-04	2.419E-03	0.000E+00	2.341E-04	5.006E-06	2.726E-04	1.697E-04	0.2	perched water	36.6	0	-9.5	-97.1	-13.4
117		0.000E+00	1.739E-03	0.000E+00	4.372E-04	5.006E-06	0.000E+00	2.321E-03	-0.4	perched water	66.8	0.4	-9.2	-87.4	-12.1
118		0.000E+00	2.360E-03	0.000E+00	2.031E-04	1.252E-06	2.048E-04	5.965E-04	-0.1	perched water	32.3	1.8	-9.8	-97.8	-13.3
119		0.000E+00	2.360E-03	0.000E+00	1.974E-04	1.252E-06	2.484E-04	2.384E-04	-0.1	perched water	28.9	3.1	n.a.	-97.9	-13.4
120		0.000E+00	2.319E-03	0.000E+00	1.890E-04	1.252E-06	2.339E-04	1.468E-04	0.1	perched water	27.2	0	-9.6	-97.3	-13.4
121		0.000E+00	2.399E-03	0.000E+00	1.974E-04	1.252E-06	2.758E-04	2.519E-04	-0.3	perched water	29.2	0	-11.3	-97.6	-13.1
122															
123															
124	AVERAGES														
125															
126	UE-25 UZ-N2	0.000E+00	1.091E-03	0.000E+00	2.330E-04	7.859E-06	2.290E-04	1.626E-04							
127	UE-25 UZ#16	1.032E-04	2.397E-03	3.861E-04	9.874E-04	5.099E-07	2.707E-04	2.659E-04							
128	USW UZ-14	1.813E-04	2.420E-03	2.885E-04	1.618E-03	0.000E+00	2.178E-04	5.754E-04							
129	UE-25 NRG-6	2.171E-05	9.623E-04	3.095E-05	2.736E-03	3.576E-06	6.313E-04	2.213E-03							
130	UE-25 NRG-7a	1.853E-05	2.131E-03	2.833E-04	1.255E-03	0.000E+00	2.822E-04	2.134E-04							
131	overall AVG	1.310E-04	2.214E-03	2.618E-04	1.365E-03	1.105E-06	2.653E-04	5.685E-04							
132	Perched Water	5.008E-05	2.213E-03	2.089E-05	1.920E-04	1.178E-06	2.260E-04	3.060E-04					-10.6	-97.4	-13.3


Ca2+ vs Cl-
Ca2+ (mg/L)
Cl- (mg/L)
Unsaturated Zone
Perched Water
Precipitation
Na+ vs Cl-
Na+ (mg/L)
Cl- (mg/L)
Mg2+ vs Cl-
Mg2+ (mg/L)
Cl- (mg/L)
SO4-2 vs Cl-
SO4-2 (mg/L)
Cl- (mg/L)
HCO3- vs Cl-
HCO3- (mg/L)
Cl- (mg/L)
NO3- vs Cl-
NO3- (mg/L)
Cl- (mg/L)

GIS/MAPPING

Figure 6-1 of (Ahola, 1992) was scanned and imported into ARC/Info. The image (rice84.tif) was then projected into UTM, zone 11 using an ARC/Info command called REGISTER. REGISTER takes a vector coverage that has already been projected and relates that information to the un-projected image. The vector coverage was created by digitizing points from figure 5-1 (Ahola, 1992) that had latitude and longitude information. The latitude and longitude information was the converted into UTM, zone 11 using ARC/Info.

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The projected image was then converted from rasters to vectors through a process called autovectorization. This involved converting the image into a grid using the IMAGEGRID command in ARC/Info. The grid (rice84grd) is then converted into a vector coverage (rice_cntr) by the GRIDLINE command. This vector coverage is now an ARC/Info coverage that has GIS capabilities. Each contour line was assigned information regarding its hydraulic head value.

The next objective was to create flow paths perpendicular to the hydraulic head. This was done by writing a C program that took coverages containing the partial derivative of X and the partial derivative of Y of the rice_cntr coverage, and computed the gradient of rice_cntr over a grid. The C program then draws arrows in the direction of the flow. The magnitude of the arrows indicates the rate of change of the flow. (i.e. the larger arrows indicate higher, local gradients).

The coverages containing the partial derivatives of X and Y were computed using earthVision. First, rice_cntr--the vector coverage--was converted into a .dat file called rice_tin_hydro.dat. This file was then brought into the graphic editor where non-vertical faults were added in high gradient areas to minimize first and second derivatives. This was neccessary due to the minimum tension grid that was fit to the data. The minimum tension gridding algorithm created a dome of water uphill and a basin downhill from steep gradients in an attempt to best fit the data. Clearly, this would not happen in a real world situation. The non-vertical faults eliminated or minimized the doming and downwarping effects by reducing the importance of first and second derivatives. The non-vertical fault file is called keeper.nvflt.

After the non-vertical faults were in place, a minimum tension grid was created from the rice_tin_hydro.dat file and keeper.nvflt. This grid (keeper.2grd) was then brought into the formula processor of earthVision where the partial derivatives X and Y were taken. The partial derivatives were initially placed into the earthVision .2grd (or grid) format. These files are called keeper_partx.2grd for the partial of X and keeper_party.2grd for the partial of Y. In order for the C program to be able to read these files, they were converted to .dat files by a program called ev_export. After the .dat files were created, the C program was called to use the partial derivative coverages to create the gradient vectors and place them in a new file with a .lin extension. Keeper.lin is the file with the flow vector data.

ARC/Info was then accessed in order to create a vector coverage from keeper.lin. GENERATE--a sub-program of ARC/Info--was called to create the coverage rice_ev_33 from keeper.lin file. The GENERATE command takes the data from the .lin file and produces the flow vectors in the correct map locations. The flow model can now be layered with other ARC/Info coverages that have the same projection.

Ahola, M., 1992, Regional Groundwater Modeling of the Saturated Zone in the Vicinity of Yucca Mountain, Nevada: Iterative Performance Assessment--Phase II, CNWRA92-001, San Antonio, Texas: Center for Nuclear Waste Regulatory Analysis.

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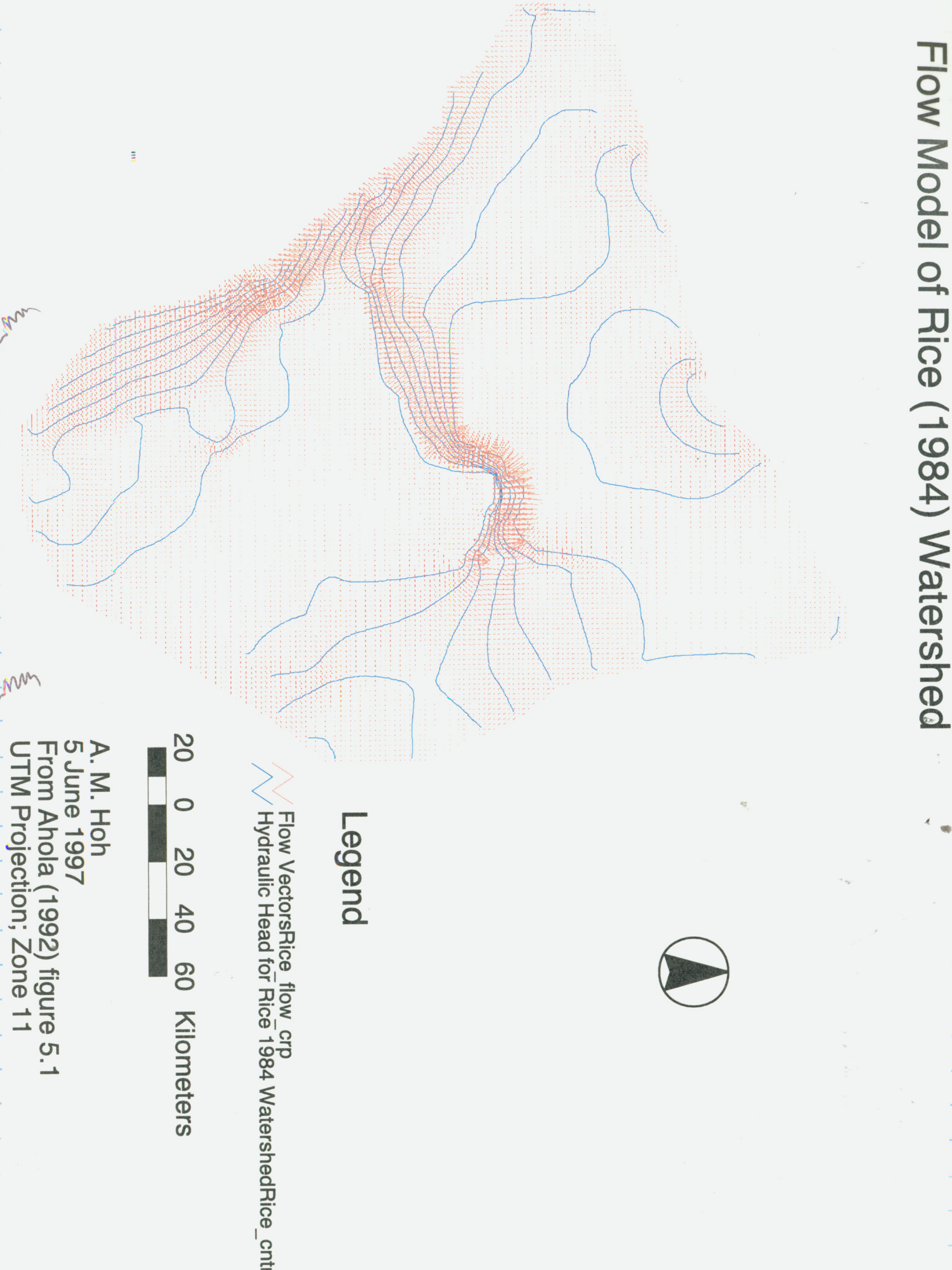

This Notebook appears to comply with QAPP-001.

E. C. [signature]
2/3/2000

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK #: 215

Document Date:	03/14/1997
Availability:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, Texas 78228
Contact:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, TX 78228-5166 Attn.: Director of Administration 210.522.5054
Data Sensitivity:	■"Non-Sensitive" □ Sensitive □"Non-Sensitive - Copyright" □ Sensitive - Copyright
Date Generated:	06/07/1997
Operating System: (including version number)	Windows
Application Used: (including version number)	
Media Type: (CDs, 3 1/2, 5 1/4 disks, etc.)	2 - 3 ½ disks
File Types: (.exe, .bat, .zip, etc.)	xls
Remarks: (computer runs, etc.)	Media contains: Saturated Water Chemistry; Unsaturated/Perched Zone Water Chemistry