TA 50

From: "Richard D. Mayer Jr." <MAYER.RICHARD@epamail.epa.gov>
To: LAAO.LAAO WPO(ADUBOIS)
Date: 1/22/99 10:06am
Subject: LANL sampling results

ENTERED

Ann:

Attached are the draft data tables which summarize the results of the samples collected at the LANL during August and September. Please note that the information/data contained within these tables are preliminary.

If you have any other questions, call me. Thanks, Rich.

LANL/ER/FRAMEWORK

UPDES

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Summary for Table X: Summary of Inorganic Analysis Results

I. Introduction

Samples collected for inorganic analysis were analyzed for total metals (fourteen analytes) and dissolved metals (thirteen analytes) according to SW846, Method 6010 and Method 7470 (mercury). Water quality standards set by the U.S. Environmental Protection Agency (EPA) and the State of New Mexico are included on each of the tables for easy comparison and reference. EPA guidelines included for reference and comparison include the National Pollutant Discharge Elimination System (NPDES) permit limits for discharges from the TA-50 Radioactive Wastewater Treatment Plant, the EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply, and the EPA Region 6 Human Health Medium-Specific Screening Levels (EPA SL) for inorganic chemicals in tap water. State guidelines included for reference and comparison include the New Mexico Maximum Contaminant Levels (NM MCL) for inorganic chemicals in community and non-transient, non-community water systems, the New Mexico Standards for Interstate and Intrastate Streams for Livestock Watering Limits (NM LWL), and the New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/ℓ total dissolved solids (TDS) concentration or less. All concentrations are reported in micrograms per liter (μg/ℓ). These data have not been validated and should be considered as preliminary. Sample results that exceeded any of the referenced water quality standards are noted below.

II. Results

The following samples exceeded the limits for:

<u>NPDES Limits</u>

None

<u>EPA MCL</u>

TA-502B (Fe and Mn), MCO-2 (Fe and Mn), MCO-6 (Pb), MCO-7 (Fe), MCO-7.5B (Pb), MT-3 (Pb), MT-4 (Fe), LAO-0.3 (Fe and Pb), LAO-0.6 (Mn), LAO-0.91 (Fe), LAO-1.2 (Fe), LAO-1.6g (Fe), LAO-2 (Fe and Mn), LAO-2F (Fe), LAO-5 (Fe), LAUZ-1 (Mn and Hg), LAUZ-2 (Fe and Mn), APCO-1 (Fe and Mn), TW-2A (Fe, Pb, and Mn), TW-4 (Fe and Pb), La Mesita Spring (Fe), Bayo-1 (Fe), and Bayo-2 (Fe and Mn).

<u>EPA SL</u>

MCO-2 (Fe, Mn, and Mo), MCO-6 (Pb), MCO-7.5B (Pb), MT-3 (Pb), LAO-0.3 (Pb), LAO-1.6g (Mo), LAO-3A (Mo), TW-2A (Fe), and TW-4 (Pb)

NM MCL

LAUZ-1 (Hg)

NM WQCC

MCO-2 (Cr), LAO-0.3 (Pb), and LAUZ-1 (Hg)

TABLE X: Summary of Inorganic Analysis Results*

Analyte	Sample Location, Result, and Date																
	Reference					Mortandad Canyon											
	NPDES limits[a]	EPA MCL[b]	EPA SL[c]	NM MCL[d]	NM WQCC[e]	TA-50 (8/19/98)		TA-50-2A (8/28/98)		TA-50-2B (8/28/98)		MCO-2 (8/19/98)		MCO-3 (8/20/98)		MCO-4B (8/20/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			49.6	57.0	305	312	2330	177	14900	6080	65.8	61.0	152	150
Arsenic	40	50		50	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	9.2	6.8	2.30	2.0	<2.0	<2.0
Barium		2000	2600	2000	1000	34.6	35	7.6	9.1	44.4	30.6	173	128	62.7	62.4	77.0	78.8
Beryllium		4	73	4		0.67	0.68	<0.60	0.64	<0.60	<0.60	1.90	1.0	<0.60	<0.60	<0.60	<0.60
Boron	5000		3300			192	222	105	106	119	103	84.0	93.4	179	220	70.8	113
Chromium	5100	100		100	50	<4.2	<4.2	4.5	5.2	6.4	<4.2	**77.31**	30.6	<4.2	<4.2	<4.2	<4.2
Copper	1600	1300[f]/ 1000[g]	1400			41.4	41.1	145	155	110	100	13.9	<6.2	14.9	17.0	<6.2	<6.2
Iron		300[g]	11000			73.4	61.2	113	123	**1780**	103	**14900**	**9090**	58.1	34.7	82.2	71.5
Lead	400	15[f]	15		50	<1.6	<1.6	6.9	6.1	2.9	2.7	5.6	<1.6	<1.6	<1.6	<1.6	<1.6
Manganese		50[g]	1700			10.8	11.2	5.0	6.4	**77.2**	10.6	**13200**	**1240**	5.4	3.9	2.4	2.5
Mercury	10	2	11	2	2	<0.10	<0.10	0.26	0.29	0.16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum			180			28.8	24.4	117	118	151	143.	**1040**	**962**	153	156	124	127
Selenium	50	50	180	50	50	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date																
	Reference					Mortandad Canyon											
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	MCO-5 (8/20/98)		MCO-5X (8/20/98)		MCO-6 (8/21/98)		MCO-7 (8/21/98)		MCO-7.5B (8/25/98)		MCWB-6.5E (8/24/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			152	121	139	108	213	96.8	2310	365	51.7	136	64.2	36.8
Arsenic	40	50		50	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.5	<2.0	<2.0	<2.0	<2.0	<2.0
Barium		2000	2600	2000	1000	93.8	91.6	91.2	89.4	88.4	88.4	195	187	166	160	179	182
Beryllium		4	73	4		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	0.62	<0.60	<0.60	<0.60	<0.60	<0.60
Boron	5000		3300			111	114	106	122	91.7	90.9	107	107	115	86.8	80.4	104
Chromium	5100	100		100	50	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	4.5	<4.2	4.2	4.2
Copper	1600	1300†/ 1000‡	1400			7.0	9.0	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	13.0	6.2	6.2
Iron		300‡	11000			107	56.6	93.1	180	204	63.3	**1390**	213	71.2	128	50.1	45.0
Lead	400	15†	15		50	<1.6	<1.6	<1.6	<1.6	<1.6	**43.3**	<1.6	11.1	**22.3**	<1.6	1.6	1.6
Manganese		50‡	1700			2.5	2.9	2.3	2.6	6.1	2.4	26.9	2.9	1.3	2.2	1.0	0.86
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.10
Molybdenum			180			113	110	109	106	126	126	114	117	80.4	79.8	85.7	86.8
Selenium	50	50	180	50	50	<2.6	NR	2.6	NR	<2.6	NR	4.2	NR	2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date																
	Reference					Mortandad Canyon						Los Alamos Canyon					
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	MCWB-7.7B (8/26/98)		MT-3 (8/27/98)		MT-4 (8/26/98)		LAO-B (8/31/98)		LAO-0.3 (9/1/98)		LAO-0.6 (8/31/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			91.0	40.0	237	87.8	623	85.2	225	218	936	978	<23.6	<23.6
Arsenic	40	50		50	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Barium		2000	2600	2000	1000	126	134	147	146	109	105	28.4	29.1	39.3	44.1	48.6	49.7
Beryllium		4	73	4		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Boron	5000		3300			91.6	97.2	109	102	105	125	25.6	34.4	44.2	39.2	54.6	44.0
Chromium	5100	100		100	50	<4.2	<4.2	6.1	<4.2	<4.2	4.5	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
Copper	1600	1300†/ 1000‡	1400			7.7	<6.2	9.3	<6.2	16.6	8.2	<6.2	7.0	<6.2	<6.2	<6.2	<6.2
Iron		300‡	11000			49.0	74.5	228	60.3	**385**	277	119	112	**479**	14.0	40.2	16.8
Lead	400	15†	15		50	<1.6	3.2	<1.6	**15.2**	3.5	10.5	<1.6	6.6	<1.6	**480**	<1.6	7.6
Manganese		50‡	1700			1.4	0.94	3.5	1.0	6.5	3.0	1.3	<2.0	3.4	6.6	**138**	114
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum			180			32.1	30.0	60.0	58.5	33.0	33.9	7.3	7.3	<7.3	8.3	<7.3	<7.3
Selenium	50	50	180	50	50	<2.6	NR	<2.6	NR	<2.6	NR	2.6	NR	<2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date												
	Reference					Los Alamos Canyon							
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	LAO-0.91 (9/3/98)		LAO-1.2 (8/31/98)		LAO-1.6g (9/1/98)		LAO-2 (8/31/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			818	612	731	152	953	912	746	577
Arsenic	40	50		50	100	2.1	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Barium		2000	2600	2000	1000	36.5	36.0	41.4	39.0	49.5	49.0	54.4	52.6
Beryllium		4	73	4		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Boron	5000		3300			33.4	40.3	38.9	31.9	48.6	63.8	64.5	103
Chromium	5100	100		100	50	<4.2	<4.2	12.6	12.0	<4.2	<4.2	<4.2	<4.2
Copper	1600	1300†/ 1000‡	1400			<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2	<6.2
Iron		300‡	11000			**481**	**329**	**471**	72.9	**475**	**446**	**403**	5.0
Lead	400	15†	15		50	<1.6	5.9	<1.6	4.0	<1.6	7.0	<1.6	2.6
Manganese		50‡	1700			33.3	2.4	19.0	0.94	3.1	3.0	3.8	**149**
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum			180			<7.3	9.2	<7.3	8.5	**183**	**182**	151	149
Selenium	50	50	180	50	50	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date												
	Reference					Los Alamos Canyon							
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	LAO-2F (8/31/98)		LAO-3A (8/31/98)		LAO-4.5C (8/31/98)		LAO-5 (8/31/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			781	587	247	195	361	248	2520	320
Arsenic	40	50		50	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Barium		2000	2600	2000	1000	54.2	53.2	47.3	47.1	40.8	40.2	36.0	27.7
Beryllium		4	73	4		<0.60	<0.60	<0.60	<0.60	0.64	<0.60	<0.60	<0.60
Boron	5000		3300			88.7	78.6	62.1	57.0	61.8	77.3	69.0	64.7
Chromium	5100	100		100	50	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
Copper	1600	1300†/ 1000‡	1400			<6.2	<6.2	<6.2	<6.2	8.2	<6.2	<6.2	<6.2
Iron		300‡	11000			**415**	**315**	141	111	204	139	**1340**	143
Lead	400	15†	15		50	<1.6	3.1	<1.6	3.2	<1.6	5.7	3.5	4.5
Manganese		50‡	1700			4.0	2.6	1.3	2.0	3.4	13.7	19.6	1.9
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum			180			148	149	**315**	**317**	11.0	16.2	10.1	10.4
Selenium	50	50	180	50	50	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date																
	Reference					DP Canyon						Pueblo Canyon					
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	LAUZ-1 (9/4/98)		LAUZ-2 (9/4/98)		DP Spring (9/2/98)		APCO-1 (9/3/98)		POI-4 (9/2/98)		TW-2A (9/1/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			273	115	41.8	<23.6	1170	707	60.5	33.8	<23.6	<23.6	36.0	<23.6
Arsenic	40	50		50	100	<2.0	<2.0	3.6	3.2	2.2	2.0	5.3	6.6	2.8	3.1	<2.0	<2.0
Barium		2000	2600	2000	1000	75.8	74.2	97.4	95.2	42.1	40.8	44.9	43.3	94.6	89.4	40.8	53.6
Beryllium		4	73	4		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<6.0	<0.60
Boron	5000		3300			76.2	55.7	90.7	79.0	96.2	62.9	334	314	210	197	114	136
Chromium	5100	100		100	50	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
Copper	1600	1300†/ 1000‡	1400			<6.2	<6.2	<6.2	<6.2	7.1	<6.2	7.4	<6.2	8.0	8.3	<6.2	<6.2
Iron		300‡	11000			161	72.0	**1190**	**879**	596	376	**460**	**452**	10.8	6.4	**21300**	**4850**
Lead	400	15†	15		50	<1.6	1.7	<1.6	1.8	<1.6	7.2	<1.6	7.1	<1.6	5.3	**28.4**	6.2
Manganese		50‡	1700			**50.8**	48.8	**627**	**577**	4.5	8.3	**925**	**942**	1.6	1.5	**377**	**128**
Mercury	10	2	11	2	2	**3.0**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum			180			<7.3	7.7	<8.4	<7.3	<7.3	<7.3	8.0	<7.3	<7.3	<7.3	<7.3	<7.3
Selenium	50	50	180	50	50	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR

Analyte	Sample Location, Result, and Date																
	Reference					San Ildefonso Wells and Springs											
	NPDES limits	EPA MCL	EPA SL	NM MCL	NM WQCC	LLAO-5 (9/8/98)		Basalt Spring (9/9/98)		Sacred Spring (9/8/98)		Otowi Spring (9/8/98)		La Mesita Sp. (9/8/98)		LA Spring (9/9/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum	5000		37000			150	34.9	62.3	31.2	417	28.3	32.6	26.0	253	28.8	31.9	<20.6
Arsenic	40	50		50	100	<1.8	<1.8	4.5	3.7	2.1	<1.8	2.4	3.2	<1.8	<1.8	<1.8	<1.8
Barium		2000	2600	2000	1000	238	228	62.8	62.6	72.9	72.4	146	144	111	99.5	38.6	37.7
Beryllium		4	73	4		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000		3300			106	103	269	262	60.6	70.5	86.6	119	80.0	71.4	42.2	36.2
Chromium	5100	100		100	50	<2.7	<2.7	<2.7	<2.7	<2.7	3.0	<2.7	<2.7	<2.7	<2.7	<5.1	3.8
Copper	1600	1300†/ 1000‡	1400			<2.9	<2.9	10.9	14.8	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9
Iron		300‡	11000			131	32.6	54.2	38.1	284	28.0	28.4	33.8	**425**	34.2	30.9	22.7
Lead	400	15†	15		50	<0.90	5.8	<0.90	5.1	<0.90	4.4	<0.90	4.5	2.0	4.3	<0.90	5.7
Manganese		50‡	1700			33.6	2.3	49.4	0.91	13.4	6.4	2.0	1.7	13.5	1.7	0.75	2.2
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Molybdenum			180			<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4	<8.4
Selenium	50	50	180	50	50	<2.2	NR	<2.2	NR	<2.2	NR	<2.2	NR	<2.2	NR	<2.2	NR

Analyte	Sample Location, Results, and Date																
	Reference					Main Aquifer Wells								Bayo Wastewater and Sewage Treatment Effluent			
	EPA MCL	EPA SL	NM MCL	NM LWL[f]	NM WQCC	TW-1 (9/1/98)		TW-3 (9/1/98)		TW-4 (9/1/98)		TW-8 (9/2/98)		Bayo-1 (9/1/98)		Bayo-2 (9/3/98)	
						Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved	Total	Dis-solved
Aluminum		37000		5000		<23.6	<23.6	<23.6	<23.6	<23.6	<23.6	<23.6	<23.6	306	167	41.2	<23.6
Arsenic	50		50	200	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.6	5.4	8.8	9.0
Barium	2000	2600	2000		1000	74.4	72.7	23.4	23.9	58.2	55.8	7.0	6.8	12.8	8.6	20.9	18.3
Beryllium	4	73	4			<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Boron		3300		5000		112	84.1	51.0	49.6	40.2	24.5	36.6	36.0	298	257	328	324
Chromium	100		100	1000	50	<4.2	<4.2	16.8	4.2	49.0	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
Copper	1300[†]/ 1000[‡]	1400		500		<6.2	<6.2	<6.2	<6.2	13.0	<6.2	<6.2	<6.2	29.4	23.2	7.3	8.2
Iron	300[‡]	11000				44.1	31.0	221	99.6	**659**	178	141	57.8	**301**	243	**754**	**614**
Lead	15[†]	15		100	50	4.0	11.9	<1.6	5.7	**19.4**	12.1	4.1	4.8	<1.6	6.4	<1.6	2.4
Manganese	50[‡]	1700				41.3	33.5	8.7	8.4	37.7	33.8	3.6	3.7	18.7	16.9	**306**	**299**
Mercury	2	11	2	10	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10
Molybdenum		180				<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3	<7.3
Selenium	50	180	50	50	50	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR	<2.6	NR

* All results reported in micrograms per liter ($\mu g/\ell$).
† Action level
‡ Secondary water standard
a National Pollutant Discharge Elimination System (NPDES) permit limits for discharges from the TA-50 Radioactive Wastewater Treatment Plant.
b EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply.
c EPA Region 6 Human Health Medium-Specific Screening Levels (EPA SL) for inorganic chemicals in tap water.
d New Mexico Maximum Contaminant Levels (NM MCL) for inorganic chemicals in community and nontransient, non-community water systems.
e New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/ℓ total dissolved solids (TDS) concentration or less.
f New Mexico Standards for Interstate and Intrastate Streams for Livestock Watering Limits (NM LWL).

Table X Summary: Summary of Radionuclide Results

I. Introduction

Samples were collected and analyzed for Isotopic Uranium (U), Gross Alpha (α), Gross Beta (β), Strontium 90 (Sr-90), and Tritium (H^3). Water quality standards set by the U.S. Environmental Protection Agency (EPA), State of New Mexico, and Department of Energy (DOE) are included on each of the tables for easy comparison and reference. EPA guidelines included for reference and comparison include the EPA proposed Maximum Contaminant Levels (EPA MCLs) and proposed Screening Levels (EPA SLs) for radiochemicals in the water supply. State guidelines included for reference and comparison include the New Mexico Maximum Contaminant Levels (NM MCLs) for beta particle and photon radioactivity from manmade radionuclides in community water systems and the New Mexico Standards for Interstate and Intrastate Streams for Livestock Watering Limits (NM LWL). DOE guidelines included for reference and comparison include the DOE Derived Concentration Guides (DOE DCG) for drinking water systems and for water ingestion in uncontrolled areas. All concentrations are reported in pico Curies per liter (pCi/L). These data have not been validated and should be considered as preliminary. Sample results that exceeded any of the referenced water quality standards are noted below.

II. Results

Water quality standards were exceeded by the following sample results:

<u>EPA MCLs</u>

TA-50 (α), TA-502A (α), TA-502B (α), MCO-3 (α), and MCO-5 (α)

<u>EPA SLs</u>

TA-50 (α and β), TA-502A (α and β), TA-502B (α and β), MCO-3 (α and β), MCO-4B (α and β), MCO-5 (α and β), MCO-5X (α and β), MCO-6 (α and β), MCO-7 (α), MT-3 (α), LAO-B (α), LAO-0.6 (α), LAO-1.2 (α), LAO-3A (α and β), LAUZ-1 (α and β), LAUZ-2 (β), DP Spring (β), TW-2A (α), TW-1 (α), and La Mesita Spring (α)

<u>NM MCLs</u>

TA-50 (α and Sr-90), TA-502A (α), TA-502B (α), MCO-3 (α and Sr-90), MCO-4B (Sr-90), MCO-5 (α and Sr-90), MCO-5X (Sr-90), MCWB-7.7B (H^3), LAO-3A (Sr-90), LAUZ-1 (Sr-90), LAUZ-2 (Sr-90), and DP Spring (Sr-90)

NM LWL

None

DOE DCG (drinking water systems)

MCO-5X (Sr-90), MCO-6 (Sr-90), LAUZ-1 (Sr-90), LAUZ-2 (Sr-90), DP Spring (Sr-90)

DOE DCG (water ingestion in uncontrolled areas)

None

TABLE X: Summary of Radionuclide Results*

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	TA-50 (8/19/98)			TA-502A (8/28/98)			TA-502B (8/28/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.44	0.24	0.26	0.95	0.66	0.74	1.04	0.41	0.18
Uranium-238				600	24	0.29	0.19	0.24	0.79	0.54	0.21	0.84	0.36	0.18
Uranium-235/236				600	24	-0.017	0.064	0.24	<0.72	0.24	0.72	0.11	0.14	0.24
Gross Alpha	15	5	15			**31.9**	5.3	2.89	**133**	17	3.18	**49.5**	7.7	2.45
Gross Beta		50				**141**	14	1.74	**489**	49	2.76	**410**	41	2.49
Strontium-90			8	1000	40	**9.83**	2.13	1.03	0.39	0.45	0.75	2.12	0.59	0.59
Tritium (H^3)			20000	2000000	80000	8170	710	17.5	4800	420	18.4	4290	380	18.4

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	MCO-2 (8/19/98)			MCO-3 (8/20/98)			MCO-4B (8/20/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.75	0.34	0.20	5.62	1.52	0.38	1.43	0.53	0.19
Uranium-238				600	24	0.67	0.32	0.18	2.07	0.70	0.33	0.36	0.23	0.22
Uranium-235/236				600	24	0.17	0.16	0.17	0.34	0.28	0.41	0.030	0.076	0.18
Gross Alpha	15	5	15			3.30	2.05	3.12	**19.7**	4.1	3.67	**12.7**	3.0	2.5
Gross Beta		50				5.36	1.35	1.78	**148**	15	2.24	**118**	12	2.29
Strontium-90			8	1000	40	0.44	0.38	0.62	**28.1**	5.6	0.46	**32.4**	6.4	0.47
Tritium (H^3)			20000	2000000	80000	105	20	17.5	19200	140	21.5	8720	760	21.5

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	MCO-5 (8/20/98)			MCO-5X (8/20/98)			MCO-6 (8/21/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.59	0.37	0.30	1.12	0.43	0.076	3.23	0.90	0.14
Uranium-238				600	24	0.37	0.28	0.23	0.41	0.24	0.13	0.93	0.37	0.16
Uranium-235/236				600	24	0.15	0.21	0.33	0.06	0.10	0.20	0.08	0.11	0.17
Gross Alpha	15	5	15			**15.1**	3.5	3.30	**14.4**	3.3	2.85	**14.2**	3.1	2.31
Gross Beta		50				**104**	11	2.25	**107**	11	1.78	**111**	11	1.72
Strontium-90			8	1000	40	**19.0**	3.8	0.47	**41.1**	8.1	0.62	**63.5**	12.6	1.11
Tritium (H^3)			20000	2000000	80000	11600	1000	17.5	12300	1100	17.5	13300	1100	17.5

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	MCO-7 (8/21/98)			MCO-7.5B (8/25/98)			MCWB-6.5E (8/24/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.84	0.39	0.25	0.54	0.29	0.27	1.14	0.40	0.15
Uranium-238				600	24	0.32	0.22	0.088	0.41	0.25	0.26	0.47	0.23	0.14
Uranium-235/236				600	24	0.08	0.11	0.11	0.12	0.14	0.22	0.16	0.14	0.07
Gross Alpha	15	5	15			**7.29**	2.39	2.59	1.02	1.29	2.15	2.28	1.45	2.02
Gross Beta		50				40.4	4.5	1.76	30.9	3.6	1.81	31.8	3.7	1.78
Strontium-90			8	1000	40	0.58	0.30	0.44	0.28	0.27	0.44	1.66	0.66	0.88
Tritium (H^3)			20000	2000000	80000	17200	1500	17.5	17800	1500	21.5	12600	1100	21.5

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	MCWB-7.7B (8/26/98)			MT-3 (8/27/98)			MT-4 (8/26/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.65	0.45	0.40	0.60	0.28	0.18	0.38	0.31	0.27
Uranium-238				600	24	0.44	0.35	0.17	0.83	0.34	0.15	0.53	0.38	0.32
Uranium-235/236				600	24	0.08	0.16	0.21	0.10	0.12	0.21	0.12	0.20	0.33
Gross Alpha	15	5	15			2.92	1.51	1.92	**5.52**	2.02	2.13	4.62	2.01	2.53
Gross Beta		50				38.4	4.39	1.99	32.7	3.8	1.87	35.8	4.1	1.98
Strontium-90			8	1000	40	0.12	0.57	0.98	0.01	0.28	0.49	-0.05	0.46	0.80
Tritium (H^3)			20000	2000000	80000	**27900**	2400	21.5	17500	1500	21.5	19200	1700	17.5

Parameter	Sample Location and Date Collected													
	Reference					Los Alamos Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	LAO-B (8/31/98)			LAO-0.3 (9/01/98)			LAO-0.6 (8/31/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.21	0.21	0.33	0.28	0.22	0.29	0.24	0.27	0.46
Uranium-238				600	24	0.47	0.29	0.22	0.16	0.16	0.21	0.32	0.29	0.42
Uranium-235/236				600	24	0.10	0.16	0.30	0.05	0.11	0.26	0.12	0.24	0.50
Gross Alpha	15	5	15			**5.23**	1.41	1.15	-0.42	0.91	1.86	**6.94**	2.32	2.46
Gross Beta		50				6.13	1.45	1.89	3.70	1.23	1.77	7.65	1.54	1.81
Strontium-90			8	1000	40	0.51	0.34	0.53	0.31	0.33	0.55	0.29	0.29	0.48
Tritium (H^3)			20000	2000000	80000	85.1	19	18.4	68.5	18	18.4	3100	280	17.5

Parameter	Sample Location and Date Collected													
	Reference					Los Alamos Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	LAO-0.91 (9/03/98)			LAO-1.2 (8/31/98)			LAO-1.6g (9/01/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.26	0.24	0.38	0.14	0.16	0.22	0.71	0.39	0.43
Uranium-238				600	24	0.14	0.19	0.35	0.12	0.16	0.27	0.38	0.26	0.29
Uranium-235/236				600	24	0.04	0.13	0.35	0.038	0.098	0.23	0.02	0.16	0.45
Gross Alpha	15	5	15			0.31	1.17	2.10	**11.9**	2.8	2.20	0.32	0.74	1.35
Gross Beta		50				6.26	1.60	2.18	8.75	1.59	1.72	3.94	1.27	1.83
Strontium-90			8	1000	40	1.29	0.44	0.54	0.31	0.35	0.57	0.12	0.56	0.97
Tritium (H^3)			20000	2000000	80000	127	25	21.5				149	24	18.4

Parameter	Sample Location and Date Collected													
	Reference					Los Alamos Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	LAO-2 (8/31/98)			LAO-2F (8/31/98)			LAO-3A (8/31/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA[f]	Result	Sigma Error	MDA
Uranium-234				500	20	0.90	0.30	0.15	0.22	0.21	0.35	0.07	0.12	0.24
Uranium-238				600	24	0.16	0.12	0.16	0.25	0.21	0.31	0.22	0.20	0.26
Uranium-235/236				600	24	0.13	0.11	0.13	-0.02	0.12	0.38	-0.008	0.091	0.32
Gross Alpha	15	5	15			3.42	1.50	1.72	3.27	1.84	2.62	**11.2**	2.8	2.55
Gross Beta		50				37.1	4.2	1.82	35.2	4.0	1.92	**80.4**	8.4	1.73
Strontium-90			8	1000	40	7.21	1.51	0.55	5.82	1.23	0.46	**15.2**	3.1	0.54
Tritium (H^3)			20000	2000000	80000	134	23	18.4	126	22	18.4	99.8	20	17.5

Parameter	Sample Location and Date Collected										
	Reference					Los Alamos Canyon					
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	LAO-4.5C (8/31/98)			LAO-5 (8/31/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA
Uranium-234				500	20	0.31	0.25	0.37	0.22	0.18	0.16
Uranium-238				600	24	0.98	0.42	0.25	0.32	0.22	0.16
Uranium-235/236				600	24	0.17	0.21	0.39	0.11	0.14	0.19
Gross Alpha	15	5	15			2.86	1.34	1.68	1.35	1.39	2.25
Gross Beta		50				9.71	1.72	1.86	7.07	1.48	1.79
Strontium-90			8	1000	40	0.91	0.41	0.57	0.60	0.41	0.57
Tritium (H^3)			20000	2000000	80000	169	26	18.4	161	26	18.4

Parameter	Sample Location and Date Collected													
	Reference					DP Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	LAUZ-1 (9/04/98)			LAUZ-2 (9/04/98)			DP Spring (9/02/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.50	0.27	0.16	0.82	0.45	0.49	1.14	0.47	0.19
Uranium-238				600	24	0.32	0.21	0.18	0.31	0.28	0.43	0.26	0.19	0.089
Uranium-235/236				600	24	0.06	0.10	0.20	-0.08	0.13	0.53	0.10	0.15	0.26
Gross Alpha	15	5	15			**9.15**	2.37	2.17	2.89	1.38	1.67	3.94	1.27	1.20
Gross Beta		50				**175**	18	1.74	**174**	18	1.81	**112**	12	1.87
Strontium-90			8	1000	40	**43.2**	8.5	0.67	**45.7**	9.0	0.63	**40.7**	8.1	0.56
Tritium (H^3)			20000	2000000	80000	†	†	†	186	29	21.5	156	25	18.4

Parameter	Sample Location and Date Collected													
	Reference					Pueblo Canyon								
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	APCO-1 (9/03/98)			POI-4 (9/02/98)			TW-2A (9/01/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.40	0.24	0.19	3.35	1.06	0.34	0.15	0.18	0.30
Uranium-238				600	24	0.31	0.21	0.19	1.11	0.49	0.11	0.19	0.18	0.10
Uranium-235/236				600	24	0.04	0.11	0.25	0.49	0.33	0.13	0.00	0.00	0.13
Gross Alpha	15	5	15			4.20	1.78	2.09	1.55	1.20	1.76	**7.96**	2.91	3.71
Gross Beta		50				12.0	1.9	1.92	8.97	1.70	1.95	4.72	1.53	2.24
Strontium-90			8	1000	40	0.06	0.40	0.69	0.35	0.36	0.59	0.02	0.27	0.48
Tritium (H^3)			20000	2000000	80000	31.2	18	21.5	65.1	17	18.4	1380	130	17.5

Parameter	Sample Location and Date Collected										
	Reference					Main Aquifer Wells					
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	TW-1 (9/01/98)			TW-3 (9/01/98)		
						Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA
Uranium-234				500	20	2.31	0.82	0.19	0.53	0.30	0.16
Uranium-238				600	24	0.92	0.44	0.19	0.40	0.25	0.16
Uranium-235/236				600	24	0.01	0.11	0.34	0.033	0.085	0.20
Gross Alpha	15	5	15			**6.16**	2.02	2.17	1.62	1.67	2.73
Gross Beta		50				13.9	2.2	2.26	4.60	1.51	2.23
Strontium-90			8	1000	40	0.81	0.64	1.02	0.25	0.31	0.52
Tritium (H^3)			20000	2000000	80000	191	27	17.5	3.14	12	17.5

Parameter	Sample Location and Date Collected										
	Reference					Main Aquifer Wells					
						TW-4 (9/01/98)			TW-8 (9/02/98)		
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA
Uranium-234				500	20	0.49	0.33	0.38	0.66	0.33	0.15
Uranium-238				600	24	0.30	0.24	0.26	0.47	0.27	0.15
Uranium-235/236				600	24	0.01	0.11	0.35	0.07	0.11	0.19
Gross Alpha	15	5	15			1.84	1.25	1.86	1.07	0.79	1.18
Gross Beta		50				4.02	1.23	1.72	2.28	1.16	1.81
Strontium-90			8	1000	40	0.44	0.32	0.51	-0.15	0.33	0.58
Tritium (H^3)			20000	2000000	80000	2.07	12	17.5	18.5	14	18.4

Parameter	Sample Location and Date Collected													
	Reference					San Ildefonso Wells and Springs								
						LLAO-5 (9/08/98)			Basalt Spring (9/09/98)			Sacred Spring (9/08/98)		
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	1.78	0.40	0.038	0.29	0.10	0.055	1.26	0.30	0.015
Uranium-238				600	24	1.26	0.30	0.038	0.20	0.09	0.083	0.55	0.16	0.051
Uranium-235/236				600	24	0.057	0.050	0.068	0.022	0.033	0.054	0.067	0.045	0.018
Gross Alpha	15	5	15			3.25	1.61	1.98	1.54	1.31	2.01	3.55	1.34	1.45
Gross Beta		50				5.28	1.37	1.81	7.25	1.67	2.19	4.70	1.27	1.71
Strontium-90			8	1000	40	0.26	0.36	0.60	NA	NA	NA	NA	NA	NA
Tritium (H^3)			20000	2000000	80000	123	18	10.5	42.1	12	10.5	34.1	11	10.5

Parameter	Sample Location and Date Collected													
	Reference					San Ildefonso Wells and Springs								
						Otowi Spring (9/08/98)			La Mesita Spring (9/08/98)			LA Spring (9/09/98)		
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	DOE DCG1[e]	DOE DCG2[f]	Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA	Result	Sigma Error	MDA
Uranium-234				500	20	0.78	0.20	0.080	5.12	1.06	0.013	0.066	0.063	0.095
Uranium-238				600	24	1.00	0.24	0.093	3.36	0.71	0.059	0.077	0.064	0.090
Uranium-235/236				600	24	-0.012	0.063	0.12	0.16	0.07	0.045	-0.022	0.049	0.11
Gross Alpha	15	5	15			2.45	1.56	2.16	12.1	2.6	1.74	3.42	1.82	2.54
Gross Beta		50				5.91	1.44	1.87	4.92	1.31	1.76	5.43	1.36	1.80
Strontium-90			8	1000	40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tritium (H^3)			20000	2000000	80000	72.5	14	10.5	54.5	13	10.5	2.70	9.3	10.5

Parameter	Sample Location and Date Collected											
	Reference						Bayo Wastewater and Sewage Treatment Effluent					
							Bayo-1 (outfall) (9/01/98)			Bayo-2 (intersection w/Route 4) (8/28/98)		
	EPA MCLs[a]	EPA SLs[b]	NM MCLs[c]	NM LWL[d]	DOE DCG1[e]	DOE DCG2[f]	Result	Sigma Error	MDA[g]	Result	Sigma Error	MDA
Uranium-234					500	20	0.23	0.24	0.40	1.00	0.45	0.18
Uranium-238					600	24	0.38	0.27	0.26	0.18	0.17	0.18
Uranium-235/236					600	24	0.15	0.24	0.47	-0.037	0.038	0.32
Gross Alpha	15	5	15	15			3.39	1.90	2.65	1.08	1.20	1.94
Gross Beta		50					13.2	2.0	1.77	8.04	1.61	1.91
Strontium-90			8		1000	40	-0.18	0.39	0.69	0.34	0.32	0.52
Tritium (H^3)			20000	20000	2000000	80000	26	14	17.5	22.3	17	21.5

* All results are reported in pico Curies per liter (pCi/L).
a EPA proposed Maximum Contaminant Levels for Radiochemicals in the water supply.
b EPA proposed Screening Levels for Radiochemicals in the water supply.
c New Mexico Maximum Contaminant Levels for Beta Particle and Photon Radioactivity from manmade radionuclides in community water systems.
d New Mexico Standards for Interstate and Intrastate Streams for Livestock Watering Limits.
e Department of Energy Derived Concentration Guides for water ingestion in uncontrolled areas.
f Department of Energy Derived Concentration Guides for drinking water systems.
g Minimum Detected Activity.
† Sample container broken during shipment and therefore not analyzed.

Table X Summary: Summary of Volatile Organic Results

I. Introduction

Samples were collected and analyzed for volatile organic compounds (VOCs) according to SW846, Method 8260. Water quality standards set by the U.S. Environmental Protection Agency (EPA) and the State of New Mexico are included on each of the tables for easy comparison and reference. EPA guidelines included for reference and comparison include the EPA Maximum Contaminant Levels (EPA MCL) for organic chemicals in the water supply and the EPA Region 6 Human Health Medium-Specific Screening Levels (EPA SL) for organic chemicals in tap water. State guidelines included for reference and comparison include the New Mexico Maximum Contaminant Levels (NM MCL) for organic chemicals in community and non-transient, non-community water systems and the New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/ℓ total dissolved solids (TDS) concentration or less. All concentrations are reported in micrograms per liter (μg/ℓ). These data have not been validated and should be considered as preliminary. Sample results that exceeded any of the referenced water quality standards are noted below.

II. Results

Water quality standards were exceeded by the following sample results:

<u>EPA MCL</u>

None

<u>EPA SL</u>

MT-3 (methylene chloride)

<u>NM MCL</u>

None

<u>NM WQCC</u>

None

TABLE X: Summary of Volatile Organic Results*

Compound	Sample Location, Result, and Date Collected								
	Reference				Montandad Canyon				
	EPA MCL[a]	EPA SL[b]	NM MCL[c]	NM WQCC[d]	TA-50 (8/19/98)	TA-502A (8/28/98)	TA-502B (8/28/98)	MCO-2 (8/19/98)	MCO-3 (8/20/98)
Acetone	--	610	--	--	18 JB	49 B	29 B	<20	21 B
Benzene	5	0.39	5	10	<5	<5	<5	<5	<5
Bromodichloromethane	--	0.18	--	--	<5	<5	<5	<5	<5
Bromoform	--	8.5	--	--	<5	<5	<5	<5	<5
Bromomethane	--	8.7	--	--	<10	<10	<10	<10	<10
2-Butanone	--	1900	--	--	<20	<20	<20	<20	<20
Carbon Disulfide	--	1000	--	--	<5	<5	<5	<5	<5
Carbon Tetrachloride	5	0.17	5	10	<5	<5	<5	<5	<5
Chlorobenzene	--	39	--	--	<5	<5	<5	<5	<5
Chlorodibromomethane	--	0.8	--	--	<5	<5	<5	<5	<5
Chloroethane	--	--	--	--	<10	<10	<10	<10	<10
Chloroform	--	0.16	--	100	<5	<5	<5	<5	<5
Chloromethane	--	1.5	--	--	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5	<5
1,1-Dichloroethane	--	810	--	25	<5	<5	<5	<5	<5
1,2-Dichloroethane	5	0.12	5	10	<5	<5	<5	<5	<5
1,1-Dichloroethene	7	0.46	7	5	<5	<5	<5	<5	<5
1,2-Dichloroethene	--	61	70	--	<5	<5	<5	<5	<5
1,2-Dichloropropane	5	0.16	5	--	<5	<5	<5	<5	<5
Ethylbenzene	700	1300	700	750	<5	<5	<5	<5	<5
2-Hexanone	--	--	--	--	<20	<20	<20	<20	<20
4-Methyl-2-pentanone	--	160	--	--	<20	<20	<20	<20	<20
Methylene Chloride	--	4.3	--	100	3 JB	2 J	<5	2 JB	<5
Styrene	100	1600	100	--	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	--	0.55	--	10	<5	<5	<5	<5	<5
Tetrachloroethene	5	1.1	5	--	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5	<5
Toluene	1000	720	1000	750	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	200	790	200	60	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5	0.2	5	10	<5	<5	<5	<5	<5
Trichloroethene	5	1.6	5	100	<5	<5	<5	<5	<5
Vinyl Chloride	2	0.02	2	1	<10	<10	<10	<10	<10
Xylenes (total)	10000	1400	10000	620	<5	<5	<5	<5	<5

Compound	Sample Location and Date Collected							
	Reference				Montandad Canyon			
	EPA MCL	EPA SL	NM MCL	NM WQCC	MCO-4B (8/20/98)	MCO-5 (8/20/98)	MCO-5X (8/20/98)	MCO-6 (8/21/98)
Acetone	--	610	--	--	12 JB	<20	<20	<20
Benzene	5	0.39	5	10	<5	<5	<5	<5
Bromodichloromethane	--	0.18	--	--	<5	<5	<5	<5
Bromoform	--	8.5	--	--	<5	<5	<5	<5
Bromomethane	--	8.7	--	--	<10	<10	<10	<10
2-Butanone	--	1900	--	--	<20	<20	<20	<20
Carbon Disulfide	--	1000	--	--	<5	<5	<5	<5
Carbon Tetrachloride	5	0.17	5	10	<5	<5	<5	<5
Chlorobenzene	--	39	--	--	<5	<5	<5	<5
Chlorodibromomethane	--	0.8	--	--	<5	<5	<5	<5
Chloroethane	--	--	--	--	<10	<10	<10	<10
Chloroform	--	0.16	--	100	<5	<5	<5	<5
Chloromethane	--	1.5	--	--	<10	<10	<10	<10
cis-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
1,1-Dichloroethane	--	810	--	25	<5	<5	<5	<5
1,2-Dichloroethane	5	0.12	5	10	<5	<5	<5	<5
1,1-Dichloroethene	7	0.46	7	5	<5	<5	<5	<5
1,2-Dichloroethene	--	61	70	--	<5	<5	<5	<5
1,2-Dichloropropane	5	0.16	5	--	<5	<5	<5	<5
Ethylbenzene	700	1300	700	750	<5	<5	<5	<5
2-Hexanone	--	--	--	--	<20	<20	<20	<20
4-Methyl-2-pentanone	--	160	--	--	<20	<20	<20	<20
Methylene Chloride	--	4.3	--	100	<5	<5	<5	<5
Styrene	100	1600	100	--	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	--	0.55	--	10	<5	<5	<5	<5
Tetrachloroethene	5	1.1	5	--	<5	<5	<5	<5
trans-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
Toluene	1000	720	1000	750	<5	<5	<5	<5
1,1,1-Trichloroethane	200	790	200	60	<5	<5	<5	<5
1,1,2-Trichloroethane	5	0.2	5	10	<5	<5	<5	<5
Trichloroethene	5	1.6	5	100	<5	<5	<5	<5
Vinyl Chloride	2	0.02	2	1	<10	<10	<10	<10
Xylenes (total)	10000	1400	10000	620	<5	<5	<5	<5

Compound	Sample Location and Date Collected							
	Reference				Montandad Canyon			
	EPA MCL	EPA SL	NM MCL	NM WQCC	MCO-7 (8/21/98)	MCO-7.5B (8/25/98)	MCWB-6.5E (8/24/98)	MCWB-7.7B (8/26/98)
Acetone	--	610	--	--	8 JB	10 JB	<20	<20
Benzene	5	0.39	5	10	<5	<5	<5	<5
Bromodichloromethane	--	0.18	--	--	<5	<5	<5	<5
Bromoform	--	8.5	--	--	<5	<5	<5	<5
Bromomethane	--	8.7	--	--	<10	<10	<10	<10
2-Butanone	--	1900	--	--	<20	<20	<20	<20
Carbon Disulfide	--	1000	--	--	<5	<5	<5	<5
Carbon Tetrachloride	5	0.17	5	10	<5	<5	<5	<5
Chlorobenzene	--	39	--	--	<5	<5	<5	<5
Chlorodibromomethane	--	0.8	--	--	<5	<5	<5	<5
Chloroethane	--	--	--	--	<10	<10	<10	<10
Chloroform	--	0.16	--	100	<5	<5	<5	<5
Chloromethane	--	1.5	--	--	<10	<10	<10	<10
cis-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
1,1-Dichloroethane	--	810	--	25	<5	<5	<5	<5
1,2-Dichloroethane	5	0.12	5	10	<5	<5	<5	<5
1,1-Dichloroethene	7	0.46	7	5	<5	<5	<5	<5
1,2-Dichloroethene	--	61	70	--	<5	<5	<5	<5
1,2-Dichloropropane	5	0.16	5	--	<5	<5	<5	<5
Ethylbenzene	700	1300	700	750	<5	<5	<5	<5
2-Hexanone	--	--	--	--	<20	<20	<20	<20
4-Methyl-2-pentanone	--	160	--	--	<20	<20	<20	<20
Methylene Chloride	--	4.3	--	100	<5	2 J	<5	<5
Styrene	100	1600	100	--	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	--	0.55	--	10	<5	<5	<5	<5
Tetrachloroethene	5	1.1	5	--	<5	<5	<5	<5
trans-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
Toluene	1000	720	1000	750	<5	<5	<5	<5
1,1,1-Trichloroethane	200	790	200	60	<5	<5	<5	<5
1,1,2-Trichloroethane	5	0.2	5	10	<5	<5	<5	<5
Trichloroethene	5	1.6	5	100	<5	<5	<5	<5
Vinyl Chloride	2	0.02	2	1	<10	<10	<10	<10
Xylenes (total)	10000	1400	10000	620	<5	<5	<5	<5

Compound	Sample Location and Date Collected							
	Reference				Montandad Canyon		DP Canyon	
	EPA MCL	EPA SL	NM MCL	NM WQCC	MT-3 (8/27/98)	MT-4 (8/26/98)	LAUZ-1 (9/04/98)	LAUZ-2 (9/04/98)
Acetone	--	610	--	--	15 JB	<20	<20	<20
Benzene	5	0.39	5	10	<5	<5	<5	<5
Bromodichloromethane	--	0.18	--	--	<5	<5	<5	<5
Bromoform	--	8.5	--	--	<5	<5	<5	<5
Bromomethane	--	8.7	--	--	<10	<10	<10	<10
2-Butanone	--	1900	--	--	<20	<20	<20	<20
Carbon Disulfide	--	1000	--	--	<5	<5	<5	<5
Carbon Tetrachloride	5	0.17	5	10	<5	<5	<5	<5
Chlorobenzene	--	39	--	--	<5	<5	<5	<5
Chlorodibromomethane	--	0.8	--	--	<5	<5	<5	<5
Chloroethane	--	--	--	--	<10	<10	<10	<10
Chloroform	--	0.16	--	100	<5	<5	<5	<5
Chloromethane	--	1.5	--	--	<10	<10	<10	<10
cis-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
1,1-Dichloroethane	--	810	--	25	<5	<5	<5	<5
1,2-Dichloroethane	5	0.12	5	10	<5	<5	<5	<5
1,1-Dichloroethene	7	0.46	7	5	<5	<5	<5	<5
1,2-Dichloroethene	--	61	70	--	<5	<5	<5	<5
1,2-Dichloropropane	5	0.16	5	--	<5	<5	<5	<5
Ethylbenzene	700	1300	700	750	<5	<5	<5	<5
2-Hexanone	--	--	--	--	<20	<20	<20	<20
4-Methyl-2-pentanone	--	160	--	--	<20	<20	<20	<20
Methylene Chloride	--	4.3	--	100	6 B	2 JB	<5	2 JB
Styrene	100	1600	100	--	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	--	0.55	--	10	<5	<5	<5	<5
Tetrachloroethene	5	1.1	5	--	<5	<5	<5	<5
trans-1,3-Dichloropropene	--	0.081	--	--	<5	<5	<5	<5
Toluene	1000	720	1000	750	<5	<5	<5	<5
1,1,1-Trichloroethane	200	790	200	60	<5	<5	<5	<5
1,1,2-Trichloroethane	5	0.2	5	10	<5	<5	<5	<5
Trichloroethene	5	1.6	5	100	<5	<5	<5	<5
Vinyl Chloride	2	0.02	2	1	<10	<10	<10	<10
Xylenes (total)	10000	1400	10000	620	<5	<5	<5	<5

*	All results are reported in micrograms per liter ($\mu g/\ell$).
a	EPA Maximum Contaminant Levels for organic chemicals in the water supply.
b	EPA Region 6 Human Health Medium-Specific Screening Levels for organic chemicals in tap water.
c	New Mexico Maximum Contaminant Levels for organic chemicals in community and nontransient, non-community water systems.
d	New Mexico Water Quality Control Commission standards for groundwater of less than 10,000 mg/ℓ total dissolved solids (TDS) concentration or less.

TABLE X: Summary of QC Sample Results for Volatile Organics

Compound	Sample Number				
	TP-01	TB#2	TB#3	TB#4	TRP-5
Acetone	52	21 B	13 JB	<20	<20
Benzene	<5	<5	<5	<5	<5
Bromodichloromethane	<5	<5	<5	<5	<5
Bromoform	<5	<5	<5	<5	<5
Bromomethane	<10	<10	<10	<10	<10
2-Butanone	32	<20	<20	<20	<20
Carbon Disulfide	<5	<5	<5	<5	<5
Carbon Tetrachloride	<5	<5	<5	<5	<5
Chlorobenzene	1 J	<5	<5	<5	<5
Chlorodibromomethane	<5	<5	<5	<5	<5
Chloroethane	<10	<10	<10	<10	<10
Chloroform	<5	<5	<5	<5	<5
Chloromethane	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	<5	<5	<5	<5	<5
1,1-Dichloroethane	<5	<5	<5	<5	<5
1,2-Dichloroethane	<5	<5	<5	<5	<5
1,1-Dichloroethene	<5	<5	<5	<5	<5
1,2-Dichloroethene	<5	<5	<5	<5	<5
1,2-Dichloropropane	<5	<5	<5	<5	<5
Ethylbenzene	<5	<5	<5	<5	<5
2-Hexanone	<20	<20	<20	<20	<20
4-Methyl-2-pentanone	<20	<20	<20	<20	<20
Methylene Chloride	4 J	6 B	4 JB	3 JB	5 B
Styrene	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	<5	<5	<5
Tetrachloroethene	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene	<5	<5	<5	<5	<5
Toluene	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	<5	<5	<5	<5	<5
Trichloroethene	<5	<5	<5	<5	<5
Vinyl Chloride	<10	<10	<10	<10	<10
Xylenes (total)	<5	<5	<5	<5	<5

Compound	Sample Number				
	TB#6	TB#7	TRPBLK8	TRPBLK12	LANLFB1
Acetone	14 JB	18 J	68 B	35 B	35 B
Benzene	<5	<5	<5	<5	<5
Bromodichloromethane	<5	<5	<5	<5	<5
Bromoform	<5	<5	<5	<5	<5
Bromomethane	<10	<10	<10	<10	<10
2-Butanone	<20	<20	<20	<20	<20
Carbon Disulfide	<5	<5	<5	<5	<5
Carbon Tetrachloride	<5	<5	<5	<5	<5
Chlorobenzene	<5	<5	<5	<5	<5
Chlorodibromomethane	<5	<5	<5	<5	<5
Chloroethane	<10	<10	<10	<10	<10
Chloroform	<5	<5	<5	<5	<5
Chloromethane	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene	<5	<5	<5	<5	<5
1,1-Dichloroethane	<5	<5	<5	<5	<5
1,2-Dichloroethane	<5	<5	<5	<5	<5
1,1-Dichloroethene	<5	<5	<5	<5	<5
1,2-Dichloroethene	<5	<5	<5	<5	<5
1,2-Dichloropropane	<5	<5	<5	<5	<5
Ethylbenzene	<5	<5	<5	<5	<5
2-Hexanone	<20	<20	<20	<20	<20
4-Methyl-2-pentanone	<20	<20	<20	<20	<20
Methylene Chloride	4 J	4 JB	43	28 B	20 B
Styrene	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	<5	<5	<5
Tetrachloroethene	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene	<5	<5	<5	<5	<5
Toluene	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	<5	<5	<5	<5	<5
Trichloroethene	<5	<5	<5	<5	<5
Vinyl Chloride	<10	<10	<10	<10	<10
Xylenes (total)	<5	<5	<5	<5	<5

Table X Summary: Summary of Wet Chemistry Results

I. Introduction

Samples were collected and analyzed for chloride, fluoride, sulfate, bicarbonate alkalinity, total suspended solids (TSS), total dissolved solids (TDS), total Kjedahl nitrogen (TKN), total phosphorous, nitrate/nitrite nitrogen, and ammonia nitrogen. Water quality standards set by the U.S. Environmental Protection Agency (EPA) and the State of New Mexico are included on each of the tables for easy comparison and reference. EPA guidelines included for reference and comparison include the EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply. State guidelines included for reference and comparison include the New Mexico Maximum Contaminant Levels (NM MCL) for inorganic chemicals in community and non-transient, non-community water systems and the New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/ℓ TDS concentration or less and for domestic water supply. These data have not been validated and should be considered as preliminary. Sample results that exceeded any of the referenced water quality standards are noted below.

II. Results

Water quality standards were exceeded by the following sample results:

<u>EPA MCL</u>

TA-50 (TDS), MCO-3 (TDS), TW-1 (TDS), and LLAO-5 (TDS)

<u>NM MCL</u>

TA-50 (nitrate/nitrite), TA-502A (nitrate/nitrite), TA-502B (nitrate/nitrite), MCO-3 (nitrate/nitrite), MCO-4B (nitrate/nitrite), MCO-5 (nitrate/nitrite), MCO-5X (nitrate/nitrite), MCO-6 (nitrate/nitrite), MCO-7 (nitrate/nitrite), MCO-7.5B (nitrate/nitrite), MCWB-7.7B (nitrate/nitrite), and MT-4 (nitrate/nitrite)

<u>NM WQCC</u>

TA-502A (fluoride), and TA-502B (fluoride)

TABLE X: Summary of Wet Chemistry Results

Parameter	Sample Location, Result, and Date										
	Reference			Mortandad Canyon							
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	TA-50 (8/19/98)	TA-502A (8/28/98)	TA-502B (8/28/98)	MCO-2 (8/19/98)	MCO-3 (8/20/98)	MCO-4B (8/20/98)	MCO-5 (8/20/98)	MCO-5X (8/20/98)
Chloride (mg/ℓ)	250		250	14.7	20.8	20.2	20.5	24.2	17.4	18.8	19.0
Fluoride (mg/ℓ)	4	4	1.6	0.93	**3.09**	**2.69**	0.73	1.06	1.15	1.27	1.26
Sulfate (mg/ℓ)	500		600	53.2	125	109	14.3	25.2	14.7	16.4	16.4
Alkalinity (mg/ℓ)				398	90.9	129	101	226	156	172	166
TSS (mg/ℓ)				4.0	61.0	122	91.0	4.0	<1.00	10.0	5.0
TDS (mg/ℓ)	500		1000	**678**	426	380	405	**538**	340	404	324
TKN (μg/ℓ)				18600	2430	2200	679	344	128	<50	220
Total Phosphorus (μg/ℓ)				86.3	288	327	146	178	85.9	119	115
Nitrate/Nitrite (μg/ℓ)		10000		**14900**	**17700**	**15400**	<50	**37800**	**13200**	**15400**	**15500**
Ammonia (μg/ℓ)				1960	3860	2690	<50	<50	<50	<50	<50

Parameter	Sample Location, Result, and Date									
	Reference			Mortandad Canyon						
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	MCO-6 (8/21/98)	MCO-7 (8/21/98)	MCO-7.5B (8/25/98)	MCWB-6.5E (8/24/98)	MCWB-7.7B (8/26/98)	MT-3 (8/27/98)	MT-4 (8/26/98)
Chloride (mg/ℓ)	250		250	21.0	18.7	18.8	18.1	19.2	18.8	19.5
Fluoride (mg/ℓ)	4	4	1.6	1.46	1.56	1.51	0.96	1.03	1.58	0.89
Sulfate (mg/ℓ)	500		600	17.7	16.3	16.7	15.9	17.8	16.6	17.1
Alkalinity (mg/ℓ)				154	176	178	139	172	174	164
TSS (mg/ℓ)				14.0	47.0	9.0	3.0	5.0	4.0	9.0
TDS (mg/ℓ)	500		1000	374	381	413	355	386	405	377
TKN (μg/ℓ)				165	57.5	105	123	110	99.2	101
Total Phosphorus (μg/ℓ)				143	388	127	929	119	134	133
Nitrate/Nitrite (μg/ℓ)		10000		**17500**	**18200**	**13700**	**17000**	**22400**	6720	**20700**
Ammonia (μg/ℓ)				<50	<50	<50	<50	<50	<50	<50

Parameter	Sample Location, Result, and Date										
	Reference			Los Alamos Canyon							
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	LAO-B (8/31/98)	LAO-0.3 (9/01/98)	LAO-0.6 (8/31/98)	LAO-0.91 (9/03/98)	LAO-1.2 (8/31/98)	LAO-1.6g (9/01/98)	LAO-2 (8/31/98)	LAO-2F (8/31/98)
Chloride (mg/ℓ)	250		250	9.77	44.7	73.6	39.1	45.6	27.3	21.3	21.4
Fluoride (mg/ℓ)	4	4	1.6	0.10	0.17	0.25	0.20	0.26	0.30	0.53	0.53
Sulfate (mg/ℓ)	500		600	3.33	4.14	5.70	4.41	5.68	6.14	8.49	8.56
Alkalinity (mg/ℓ)				56.6	60.6	92.9	74.7	62.6	68.7	94.9	90.9
TSS (mg/ℓ)				1.0	3.0	2.0	1.0	35.0	1.0	9.0	5.0
TDS (mg/ℓ)	500		1000	141	188	113	184	125	194	166	198
TKN (μg/ℓ)				<50	145	140	77.7	89.5	107	<50	<50
Total Phosphorus (μg/ℓ)				<50	114	160	167	131	268	167	162
Nitrate/Nitrite (μg/ℓ)		10000		<50	<50	310	149	138	624	602	605
Ammonia (μg/ℓ)				<50	<50	<50	<50	<50	<50	<50	<50

Parameter	Sample Location, Result, and Date											
	Reference			Los Alamos Canyon			DP Canyon			Pueblo Canyon		
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	LAO-3A (8/31/98)	LAO-4.5C (8/31/98)	LAO-5 (8/31/98)	LAUZ-1 (9/04/98)	LAUZ-2 (9/04/98)	DP Spring (9/02/98)	APCO-1 (9/03/98)	POI-4 (9/02/98)	TW-2A (9/01/98)
Chloride (mg/ℓ)	250		250	21.0	32.8	40.5	17.7	41.4	28.6	37.6	40.9	69.9
Fluoride (mg/ℓ)	4	4	1.6	0.64	0.58	0.45	0.91	1.34	1.06	0.45	0.29	0.24
Sulfate (mg/ℓ)	500		600	9.77	6.45	7.83	4.81	1.21	5.77	14.3	20.6	8.82
Alkalinity (mg/ℓ)				109	64.6	78.8	133	176	86.9	158	162	56.6
TSS (mg/ℓ)				6.0	9.0	30.0	1.0	3.0	4.0	4.0	2.0	45.0
TDS (mg/ℓ)	500		1000	151	193	208	203	299	178	359	326	220
TKN (μg/ℓ)				58.3	<50	59.0	112	332	125	1210	173	695
Total Phosphorus (μg/ℓ)				272	60.2	75.7	111	148	178	278	630	151
Nitrate/Nitrite (μg/ℓ)		10000		617	61.6	<50	<50	<50	275	473	3750	767
Ammonia (μg/ℓ)				<50	<50	<50	<50	111	<50	771	<50	306

Parameter	Sample Location and Date										
	Reference			Main Aquifer Wells				San Ildefonso Wells and Springs			
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	TW-1 (9/01/98)	TW-3 (9/01/98)	TW-4 (9/01/98)	TW-8 (9/02/98)	LLAO-5 (9/08/98)	Basalt Spring (9/09/98)	Sacred Spring (9/08/98)	Otowi Spring (9/08/98)
Chloride (mg/ℓ)	250		250	36.3	3.15	1.98	2.07	70.6	35.2	3.12	32.3
Fluoride (mg/ℓ)	4	4	1.6	0.35	0.35	0.18	0.16	0.36	0.37	0.44	0.48
Sulfate (mg/ℓ)	500		600	23.2	2.92	2.09	2.03	35.9	23.6	7.68	22.2
Alkalinity (mg/ℓ)				111	103	72.7	74.7	259	113	105	170
TSS (mg/ℓ)				3.0	2.0	6.0	3.0	29.0	1.0	11.0	10.0
TDS (mg/ℓ)	500		1000	777	162	125	127	508	346	211	321
TKN (μg/ℓ)				113	120	<50	<50	100	332	<50	<50
Total Phosphorus (μg/ℓ)				85.3	167	132	130	133	3580	85.6	168
Nitrate/Nitrite (μg/ℓ)		10000		5570	569	285	226	1530	3470	269	352
Ammonia (μg/ℓ)				<50	<50	<50	<50	<50	<50	<50	<50

Parameter	Sample Location, Result, and Date						
	Reference			San Ildefonso Wells and Springs		Bayo Wastewater and Sewage Treatment Effluent	
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	La Mesita Spring (9/08/98)	LA Spring (9/09/98)	Bayo-1 (outfall) (9/01/98)	Bayo-2 (intersection w/Route 4) (8/28/98)
Chloride (mg/ℓ)	250		250	7.73	19.6	39.8	39.4
Fluoride (mg/ℓ)	4	4	1.6	0.27	0.90	0.35	0.63
Sulfate (mg/ℓ)	500		600	14.3	34.8	24.6	20.6
Alkalinity (mg/ℓ)				137	94.9	158	170
TSS (mg/ℓ)				63.0	3.0	21.0	3.0
TDS (mg/ℓ)	500		1000	206	261	312	358
TKN (μg/ℓ)				87.9	<50	225000	529
Total Phosphorus (μg/ℓ)				134	53.5	215	230
Nitrate/Nitrite (μg/ℓ)		10000		2950	3180	3010	1250
Ammonia (μg/ℓ)				<50	<50	11500	145

a EPA Maximum Contaminant Levels for inorganic chemicals in the water supply.
b New Mexico Maximum Contaminant Levels for inorganic chemicals in community water systems.
c New Mexico Water Quality Control Commission standards for maximum allowable concentration of contaminants in groundwater and domestic water supply.