308 - - - Q200402160004
Scientific Notebook No. 610: Radionuclide
Transport (RT) Key Technical Issues
(09/16/2003 through 12/10/2003)

610 RADIONUCLIDE TRANSPORT

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

610-RT

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~~En~~ BW 9-16-03

Issued to Bradley Werling

210-522-6565

16 Sep 03

INVESTIGATOR	SIGNATURE	INITIALS
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This notebook is a continuation of scientific notebook 556 for radionuclide transport

The information on 610/3 is a continuation of the neptunium/calcite sorbtion exp series 13+14.

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Recorded mass of LSA vials with acid using Mettler AE240 balance

Solution	Mass (g) of vial + HNO_3	Mass(g) after adding sample
NpCa13f2b	7.7214	8.2175
NpCa13f3a	7.6621	8.1550
NpCa13f3b	7.7013	8.1943
NpCa14c1a	7.6676	8.1606
NpCa14c1b	7.6562	8.1505
NpCa14c2a	7.6805	8.1748
NpCa14c2b	7.6787	8.1738
NpCa14c3a	7.6510	8.1462
NpCa14c3b	7.6768	8.1725
NpCa14d1a	7.7083	8.2020
NpCa14d1b	7.7604	8.1560
NpCa14d2a	7.6716	8.1649
NpCa14d2b	7.8057	8.3010
NpCa14d3a	7.6729	8.1663
NpCa14d3b	7.6335	8.1289
NpCa14e1a	7.6579	8.1524
NpCa14e1b	7.6637	8.1586
NpCa14e2a	7.6650	8.1596
NpCa14e2b	7.6328	8.1280
NpCa14e3a	7.5906	8.0850
NpCa14e3b	7.6220	8.1180
NpCa14f1a	7.6680	8.1627
NpCa14f1b	7.8018	8.2980

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Sol'n	Mass vial + acid	Mass vial + acid + sample
NpCa14f2a	7.7651	8.2595
NpCa14f2b	7.6038	8.1000
NpCa14f3a	7.6731	8.1678
NpCa14f3b	BW 16 Sep 03 ~~7.7~~ 7.6015	8.0982

Transfered Exp Solns and LSA vials back into the glove box. Added 0.5 mL (eppendorf pipette) of sample to each LSA vial. Capped LSA vials and removed from glove box. Reweighed LSA vials (556/199 and 610/3-4) on Mettler AE240 balance. Added 5 mL (pump) of LSA Cocktail (Ultima Gold A+B lot 41-2111) to each LSA vial. Capped and shaken well.

pH of Experimental Solns

Conducted inside glove box.
pH meter: Orion 920A Serial # 039518 with Orion 8103 combo 3F with ATC probe
Calibrated with fresh solns transfered into glove box
pH 7 Fisher SB108 Lot # 030660
pH 10 Fisher SB116 lot # 023154
slope = 101.1% (acceptable 92-102%)

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pH Measurements taken with probe attached to stand. 50 mL centrifuge tube with sample held by hand and aggitated by hand to swirl soln (pH taken directly in exp soln). After measurement, experimental tube had cap loosely placed on it. Recorded pH values on 556/197-198. pH 7 buffer read 7.03 after all of the exp solns were measured.

Contents of glove box measured at 17:45. gas info on 556/186
Calibrated, then measured at 942 ppm CO_2
No adjustment made.

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CO_2 Conc of Glove Box at 08:55

gas info 556/186
Calibrated, then measured at 970 ppm CO_2
No Adjustments made

9-17-03 BW

Sept 17, 2003 MRJ

200 ppm Inorganic Carbon Stock Standard (1 L)
Na_2CO_3: Fisher, Certified ACS grade; Cat# S263-500
Lot# 006077

$$200\ ppm\ C = 200\ \frac{ug\ C}{mL} \times \frac{1\ L}{} \times \frac{1000\ mL}{1\ L} \times \frac{105.99\ g\ Na_2CO_3}{12.01\ g\ C} = 1.7650\ g\ Na_2CO_3$$

Tared Mettler AE240 balance with weighing paper & measured exactly 1.7650 g Na_2CO_3. Transferred salt to 250 mL vol flask, added ~200 mL type I nanopure water, capped, and stirred until dissolved. Transferred to 1 L vol flask & diluted to mark with type I nanopure H_2O.

100 ppm std: pipetted 50 mL of 200 ppm std into 100 mL vol flask and diluted to mark with H_2O (~1 mL spilled while inverting flask to mix)

50 ppm std: pipetted 25 mL of 200 ppm std ~~w~~ MRJ 9/17/03 into 100 mL vol flask and diluted to mark with H_2O

20 ppm std: pipetted 10 mL of 200 ppm std into 100 mL vol flask and diluted to mark with H_2O

10 ppm std: pipetted 5 mL of 200 ppm std into 100 mL vol flask and diluted to mark with H_2O.

A vol flask was filled with H_2O also to serve as a blank.

The water used was taken "fresh" - that is directly from the Barnstead unit. Stored stds in refridgerator - L104.

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LSA Blank

Added 0.5 mL (eppendorf pipette) of 0.1N HNO_3 (556/89) and 5 mL (pump) of cocktail (Ultima Gold AB lot# 91-2111) to a LSA vial (7 mL glass Packard 6000167). This was for the NpCA series 13+14 LSA analysis.

Inorganic Carbon Sampling for NpCA Series 13+14

Samples: Series 3 (8 total) 556/197-198
Series 1+2 used for ICP analysis.
Work performed inside glove box (1000 ppm CO_2)

Approximately 20 mL (oxford pipet w/ 10 mL tip) of sample was removed from the exp tube and placed in a 30 mL pp beaker. A 20 mL syringe (BD 9661) was used to draw up the soln from the 30 mL pp beaker. A filter (whatman 25 mm GD/X filter #6874-2504 lot # 11026) was placed on the tip of the syringe. Note: filter ~~pour~~ BAW 9-17-03 pore size was 0.45 µm. The sample was filtered into a 40 mL amber bottom for analysis on the Phoenix 8000 TOC in IC mode. Samples were labeled 13C3, 13D3, 14C3, 14D3, 13E3, 13F3, BAW 9-17-03

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14E3, and 14F3. The 40 amber bottles were capped (cap w/ septum) and removed from the glove box. The samples were then taken and stored in a refridgerator (L104).

ICP Analysis Sampling of NpCA Series 13+14 Exp. Solns

Samples: Series 13+14 suffixes 1+2 (556/197-198)
Series/Suffix 3 used for Inorganic Carbon analyses
Work performed outside glove box.

About 20 mL (oxford pipet w/ 10 mL tip) was removed from each soln and transferred into a 30 mL pp beaker. A 20 mL syringe (BD 9661) was used to draw up the soln from the 30 mL pp beaker. A filter (Whatman 25 mm GD/X filter # 6874-2504 lot # 11026) was placed on the tip of the syringe. Note filte pore size was 0.45 μm. The sample was filtered into an appropriately labeled 30 mL pp bottle. Samples labeled 13C1 to 14F2. Acid preserved by adding 60 μL (eppendorf pipet) of 1:1 HNO_3 (582/19) in each sample. Capped and parafilmed.

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Preparation for TOC analysis

Fresh nanopure water (straight from Barnstead unit) was used to rinse and fill the gas/liquid separator of the Phoenix 8000 TOC analyzer. 0.25 mL (eppendorf pipet) of phosphoric acid (Fisher A 242-4 lot 001815) was added to the water in the gas/liquid separator to prevent contamination.

Preparation of 21% Phosphoric Acid for TOC analysis

Rinsed 250 mL ~~75~~ BW 9-18-03 pc square bottle with fresh nanopure water (straight from Barnstead unit). Measured 188 mL of fresh nanopure water in a 250 mL grad cylinder. Added 37 mL (to 225 mL mark) of phosphoric acid (Fisher A 242-4 lot 001815). Transferred into 250 mL pc square bottle. Labeled 21% phosphoric acid, 610/9, date, & initials.

The reagent water reservior was also rinsed and filled with fresh nanopure water.

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Solns removed from refridgerator at 10:00
Started analysis around ~~HT~~ BW 9-18-03 12:30

Inorganic Carbon (IC) Analysis of NpCA
Series 13+14 exp and ref solns.

Analyzed on Phoenix 8000 TOC instrument in IC mode with range of 20 to 200 ppm IC using 40mL amber glass bottles. Stds run in triplicate while samples were run once due to limited volume. PRN file = 09181227. The relavent portion of the raw data file (prn file) was imported into Excel and printed out. The columns were numbered. The legend for the column numbers (source = ~~Phone~~ BW 9-18-03 Phoenix 8000 manual) is included. Sample IDs are in column 8 and area counts are in column 30.

9-18-03 BW

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Information Contained in the .PRN File	Depending on mode and range, not all sections of the .PRN file are active.

Information potentially subject to copyright protection was redacted from this location. The redacted material is from the reference listed on the previous page (a table from Phoenix 8000 manual).

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
~~v2.0	3	1	Done	2	9/18/03 12:56	USER1	0 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	1	1	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	2	9/18/03 13:00	USER1	0 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	2	1	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	2	9/18/03 13:04	USER1	0 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	3	1	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:08	USER1	10 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	1	2	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:12	USER1	10 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	2	2	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:16	USER1	10 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	3	2	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:20	USER1	20 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	1	3	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:24	USER1	20 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	2	3	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:28	USER1	20 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	3	3	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:33	USER1	50 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	1	4	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:37	USER1	50 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	2	4	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:41	USER1	50 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	3	4	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:46	USER1	100 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	1	5	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:50	USER1	100 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	2	5	IC20P40M	0.5	0	0
~~v2.0	3	1	Done	0	9/18/03 13:55	USER1	100 ppm IC	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	3	3	5	IC20P40M	0.5	0	0
~~v2.0	10	1	Done	0	9/18/03 13:58	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	1	1001	IC20P40M	0	0	0
~~v2.0	10	1	Done	0	9/18/03 14:00	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	2	1001	IC20P40M	0	0	0
~~v2.0	10	1	Done	0	9/18/03 14:02	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	3	1001	IC20P40M	0	0	0
~~v2.0	10	1	Done	0	9/18/03 14:04	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	4	1001	IC20P40M	0	0	0
~~v2.0	10	1	Done	0	9/18/03 14:07	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	5	1001	IC20P40M	0	0	0
~~v2.0	10	1	Done	0	9/18/03 14:09	USER1	blank	Blank IC Ranges 3 4 & 5	IC 20ppm for 40mL	2	2	6	6	1001	IC20P40M	0	0	0
~~v2.0	0	1	Done	0	9/18/03 14:13	USER1	13C3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	6	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:17	USER1	14C3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	7	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:21	USER1	REF C	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	8	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:26	USER1	13D3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	9	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:30	USER1	14D3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	10	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:34	USER1	REF D	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	11	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:39	USER1	1.30E+04	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	12	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:43	USER1	1.40E+04	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	13	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:47	USER1	REF E	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	14	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:52	USER1	13F3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	15	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 14:57	USER1	14F3	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	16	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 15:01	USER1	REF F	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	17	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 15:05	USER1	10 ppm std	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	18	IC20P40M	0.5	0	0
~~v2.0	0	1	Done	0	9/18/03 15:10	USER1	50 ppm std	IC Range 20 - 200 ppm C	IC 20ppm for 40mL	2	2	1	1	19	IC20P40M	0.5	0	0

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20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
5	0	0.5	0	10	0	1	4.825	4.853	120	57601	0	0	0	2.40E+05	2/16/97 12:24	0.99983	10500	9181227	9181254
5	0	0.5	0	10	0	1	4.806	4.832	120	64985	0	0	0	2.40E+05	2/16/97 12:24	0.99983	10500	9181227	9181258
5	0	0.5	0	10	0	1	4.793	4.823	120	61122	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181301
5	0	0.5	0	10	0	1	4.797	5.797	110	1352505	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181306
5	0	0.5	0	10	0	1	4.838	5.836	109	1363565	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181310
5	0	0.5	0	10	0	1	4.828	5.825	109	1373663	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181313
5	0	0.5	0	10	0	1	4.834	5.829	122	2642677	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181317
5	0	0.5	0	10	0	1	4.863	5.861	123	2796429	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181321
5	0	0.5	0	10	0	1	4.871	5.869	122	2725811	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181325
5	0	0.5	0	10	0	1	4.862	5.861	141	6616287	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181330
5	0	0.5	0	10	0	1	4.921	5.918	140	6643354	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181334
5	0	0.5	0	10	0	1	4.892	5.891	138	6619827	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181338
5	0	0.5	0	10	0	1	4.823	5.822	156	13619418	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181343
5	0	0.5	0	10	0	1	4.943	5.94	155	13963896	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181347
5	0	0.5	0	10	0	1	5.021	6.02	150	13694030	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181352
5	0	0.5	0	10	0	0.5	4.857	5.355	61	77597	0	0	0	0.00E+00	1/1/70 0:00	0.99983	10500	9181227	9181357
5	0	0.5	0	10	0	0.5	4.722	5.218	66	58333	0	0	0	0.00E+00	1/1/70 0:00	0.99995	65473	9181227	9181359
5	0	0.5	0	10	0	0.5	4.705	5.2	65	55208	0	0	0	0.00E+00	1/1/70 0:00	0.99995	65473	9181227	9181401
5	0	0.5	0	10	0	0.5	4.667	5.167	67	57305	0	0	0	0.00E+00	1/1/70 0:00	0.99995	65473	9181227	9181403
5	0	0.5	0	10	0	0.5	4.657	5.157	67	58378	0	0	0	0.00E+00	1/1/70 0:00	0.99995	65473	9181227	9181405
5	0	0.5	0	10	0	0.5	4.651	5.15	67	55906	0	0	0	0.00E+00	1/1/70 0:00	0.99995	65473	9181227	9181408
5	0	0.5	0	10	0	1	4.635	5.629	106	1066818	3.8423	7.6845	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181411
5	0	0.5	0	10	0	1	4.617	5.614	106	1076689	3.8798	7.7596	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181415
5	0	0.5	0	10	0	1	4.623	5.619	108	1113211	4.0188	8.0376	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181419
5	0	0.5	0	10	0	1	4.632	5.628	115	1702356	6.2609	12.5218	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181423
5	0	0.5	0	10	0	1	4.599	5.596	115	1696074	6.237	12.474	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181427
5	0	0.5	0	10	0	1	4.623	5.622	116	1740570	6.4063	12.8126	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181431
5	0	0.5	0	10	0	1	4.607	5.603	124	2905729	10.8405	21.681	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181436
5	0	0.5	0	10	0	1	4.595	5.588	126	2880089	10.7429	21.4858	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181440
5	0	0.5	0	10	0	1	4.602	5.6	126	2997976	11.1915	22.3831	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181445
5	0	0.5	0	10	0	1	4.595	5.59	136	5014231	18.8647	37.7294	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181449
5	0	0.5	0	10	0	1	4.591	5.589	135	5044168	18.9786	37.9572	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181454
5	0	0.5	0	10	0	1	4.566	5.563	136	5144662	19.3611	38.7221	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181458
5	0	0.5	0	10	0	1	4.579	5.578	112	1492513	5.4623	10.9246	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181503
5	0	0.5	0	10	0	1	4.487	5.485	140	6711862	25.3253	50.6505	57196	2.63E+05	9/18/03 13:57	0.99995	65473	9181227	9181507

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Please note for IC solns analyzed,
8 Experimental Solns 610/7+8
4 Reference Solns ~~610~~ BW 9-18-03 556/189-190
Taken in duplicate but dups not analyzed.
They were taken for back-up.
5 Standard solutions 610/6

Preparation of 1:1 Nitric Acid Solution for ~~ED~~ BW 9-18-03 EWDP Sampling Trip

Reagent: nanopure type I water
Nitric Acid - Trace Metal Grade
Fisher A509-212 lot# 1100040

Added about 50 mL of type I water to a 125 mL FEP bottle. Visually estimated where the "double volume" would be and marked it. Slowly added nitric acid in steps until mark reached

Chain of Custody for Div01 ICP Analysis of NpCA Series 13+14 Solutions

4 Ref. solns from 556/189
16 Exp solns from 610/8
2 QA solns from 556/194-195

18 Sept 03 CONT BAW

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Client Purchase Order/Other ID: BRAD WERLING
Site/Zone ID: CNWRA - DIV 20 BLD 57
Shipper Name/Address:
Client:

Requested Turnaround: ☐ 2 Weeks ☐ 3 Weeks ☒ Other: Hulk
SwRI Contact: Mike Dammann

Preservation: a = HCl to pH <2; b = HNO_3 to pH <2; c = H_2SO_4 to pH <2; d = NaOH to pH >12; e = Cool (4°C±2°C); f = Other (specify)

Analyses Requested: Ca, Na, K, Mn, Mg, Sr by ICP

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Ca, Na, K, Mn, Mg, Sr by ICP	REMARKS
13C1	9-17-03	9-17-03 BW	W		1	X	Intact
13C2						X	
13D1						X	
13D2						X	
13E1						X	
13E2						X	
13F1						X	
13F2						X	
13Q1	9-13-03	9-13-03 BW				X	
13Q2						X	

REMARKS: Nuclear Safety related - use appropriate QA procedures; POC - Brad Werling X6565; 20,06002,01,141

Relinquished by (Print/Signature): Brad Werling / Brad Werling — Date 9/18/03 Time 1050
Received by (Print/Signature): Date Time
Relinquished by (Print/Signature): Date Time
Received by (Print/Signature): Date Time
Relinquished by (Print/Signature): Date Time

SwRI Project#:
Received by SwRI Lab: (Signature) — Date 9/18/03 Time 10 50
Samples Disposed: Date Time
Samples Disposed by:

Page 1 of 3

Matrix Types: A - Air; B - Biota; D - Dust; E - Emission/Stack; L - Liquid; P - Product; Sd - Solid; S - Soil; SED - Sediment; T - Tissue; W - Water; WP - Wipe

Sample Types: D - Duplicate; ER - Equipment Rinsate; ES - Environmental Sample; FB - Field Blank; FD - Field Duplicate; MS - Matrix Spike; MSD - Matrix Spike Dup; TB - Trip Blank

Temp: 22°C
Therm #: 626
Comments: RADIOACTIVE - max Np 237 at 8.5×10^{-7} M or 1.4×10^{-11} µCi/mL SN 610/8

Div 01 COC Form 01-01-001, Rev 8/02

18 SEP 03 CONT BAW

Shipper Name/Address: BRAD WERLING CNWRA - DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Ca, Na, K, Mn, Mg, Sr by ICP								Intact		REMARKS
14C1	~~9-17-03~~ 9-17-03	8:15	W		1	X										Nuclear Safety Related - use appropriate QA procedures
14C2		9-17-03				X										
14D1						X										
14D2						X										
14E1						X										
14E2						X										POC - Brad Werling X 6565
14F1						X										
14F2						X										
NPCA1314RefC	9-11-03					X										
NPCA1314RefD						X										20.06002.01.141

Preservation:
- a = HCl to pH <2
- b = HNO_3 to pH <2
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22°C Therm #: 026

Comments: RADIOACTIVE - max Np-237 at 8.5×10^{-7} M or 1.4×10^{-4} μCi/mL SN 610/8

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	9/18/03	1050
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#:

Received by SwRI Lab: (Signature) [signature]

Date: 9/18/03 Time: 1050

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

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18 Sep 03 CONT BAW

Shipper Name/Address: BRAD WERLING CNWRA - DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wk

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Ca, Na, K, Mn, Mg, Sr by ICP									Intact	REMARKS
NPCA1314RefE	9-11-03		W		1	X										Nuclear Safety Related - use appropriate QA procedures
NPCA1314RefE	"					X										
																POC - Brad Werling X 6565
																20.06002.01.141

Preservation:
- a = HCl to pH <2
- b = HNO_3 to pH <2
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22°C Therm #: 026

Comments: Radioactive - max Np 237 at 8.5×10^{-7} M or 1.4×10^{-4} μCi/mL SN 610/8

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	9/18/03	1050
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#:

Received by SwRI Lab: (Signature) [signature]

Date: 9/18/03 Time: 1050

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

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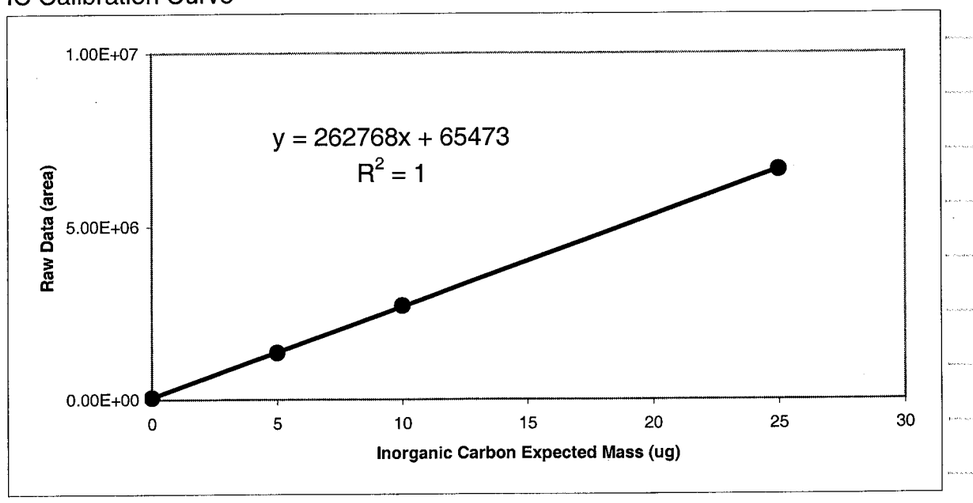
Inorganic Carbon (IC) Reanalysis
Range 20 ppm to 200 ppm IC
NpCA series 13 and 14 ref and exp solutions

IC Standard Data

IC Std (ppm)	IC expected mass (ug)	Raw Data rep 1	Raw Data rep 2	Raw Data rep 3	Raw Data Ave
0	0	57601	64985	61122	61236
10	5	1352505	1363565	1373663	1363244
20	10	2642677	2796429	2725811	2721639
50	25	6616287	6643354	6619827	6626489
100*	50	13619418	13963896	13694030	13759115

* 100ppm not used since no sample ppm was greater than 50ppm

IC Calibration Curve



IC Sample Data

Sample ID	Raw Data	mass # (ug) IC	conc (ppm)
13C3	1066818	3.8107570	7.621514
14C3	1076689	3.8483225	7.696645
REF C	1113211	3.9873120	7.974624
13D3	1702356	6.2293849	12.458770
14D3	1696074	6.2054778	12.410956
REF D	1740570	6.3748135	12.749627
13 E3	2905729	10.8089874	21.617975
14 E3	2880089	10.7114108	21.422822
REF E	2997976	11.1600461	22.320092
13F3	5014231	18.8331836	37.666367
14F3	5044168	18.9471130	37.894226
REF F	5144662	19.3295569	38.659114

\# Using calibration y intercept in calculation
* Calculated by dividing the mass by the volume of sample (0.5mL)

SOURCE of raw data: 610/9-14

23 September 2003 MARJ

The solutions to be used for calibration of instruments in field work from Sept 29 - Oct 2 are as follows:

pH standards:

Singlet pH buffer solution, Hach, pH 10.01 Cat # 27702
Singlet pH buffer solution, Hach, pH 4.01 Cat # 27700
Singlet pH buffer solution, Hach, pH 7.00 Cat # 27701
Respective Lot #'s: 10.01 = # A2298, 4.01 = # A2039, 7.00 = # A2053

Conductivity Standards:

Singlet conductivity Standard, Hach, 1000 µS/cm Cat # 27705
Singlet conductivity Standard, Hach, 1990 µS/cm Cat # 27706
Singlet conductivity Standard, Hach, 180 µS/cm Cat # 27704
Respective Lots: 180 µS/cm = A1292, 1000 µS/cm = A1348, 1990 µS/cm = A9344

Oxidation-reduction Potential Standard:

ORP standard Cat # 967901 Thermo Orion Application Solution Lot # GW1

Alkalinity solutions + additives:

Hach digital titration cartridge, Hach, Sulfuric Acid 1.600 N Cat # 14389-~~10~~ 01 9/23/03 Lot # A3204, 13 mL
Hach digital titration cartridge, Hach, Sulfuric Acid 0.1600 N Cat # 14388-01 Lot # A3218 13 mL
Hach Permachem Reagents, Bromcresol Green-Methyl Red Indicator Powder. Cat # 943-99 Lot # A1327
Phenolphthalein, Hach, Cat # 942-99 Lot # A2039

Hach pH probe storage solution: Cat # 27565-49, Lot # A3237 exp Aug/2005
Nitric Acid: 1:1 nitric acid/water made 9/18/03 by BAW

25 Sept 03 BAW

The equipment to be used in the EWDP field sampling event for groundwater includes the following:

Field Equipment

Meter type	Serial number	Battery Required	Probe
Orion 290A pH meter	012953	9-volt	Orion cat# 9179BN
Hach EC20 pH / ISE meter	981100001572	9-volt	Hach 50200 combination and Hach 51935-22
Hach C0150 Conductivity meter	990200007161	9-volt	Hach 50161
WTW A 375/K DO meter	02270024	4 AA	Oxical SL A 325/K
Two (2) Hach digital titrators	Pat# 4086062		
Scienceware magnetic stirrer	C9376	2 D cell	
Easy-load masterflex L/S model 7518-02	L01000353		
Masterflex E/S Model# 07571-00	G01003175	AC adaptor: P/N TD1J2400L12CP + automotive power adaptor: 07571-50	

26 SEP 03 BAW

LSA results for Np/LA Series 13 + 14

Blank = ~~556~~ BW 9-26-03 610/7
Np Spike = 556/191 + 192
Samples = 556/199 and 610/3-4

26 SEP 03 CONT BAW

9/18/03 8:38:25 PM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 1
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

```
Assay Definition-

Assay Description:

Assay Type: Alpha/Beta
Report Name: Np_Pa_Exp
Output Data Path: C:\Packard\Tricarb\Results\Bertetti\Pa_Np_Exp_AB
Raw Results Path: C:\Packard\Tricarb\Results\Bertetti\Pa_Np_Exp_AB\20030917_1317.results
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Bertetti\Pa_Np_Exp_AB\Np_Pa_AB.023
Assay File Name: C:\Packard\TriCarb\Assays\Pa_Np_Exp_AB.lsa

Count Conditions-

Nuclide: Manual Np/Pa
   Quench Indicator: SIS
   External Std Terminator (sec): n/a
   Pre-Count Delay (min): 0.00
Alpha/Beta Standards:
Count Time (min): 120.00
Count Mode: Normal
Assay Count Cycles: 1          Repeat Sample Count: 1
#Vials/Sample: 1               Calculate % Reference: Off

Background Subtract: On - 1st Vial
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

In Use Discriminator: 145

Regions        LL       UL  Bkg Subtract  2Sigma % Terminator
Beta A        0.0    400.0      1st Vial                 0.00
Beta B        0.0   2000.0      1st Vial                 0.00
Alpha       100.0    400.0      1st Vial                 2.00

Count Corrections-

Static Controller: On          Luminescence Correction: Off
Colored Samples: n/a           Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18    Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off
Regions    Half Life          Units      Reference Date      Reference Time
Beta A
Beta B
Alpha

IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: Tri-Carb 3100TR
Instrument Serial Number: 405314
3H Chi Square: 17.01     Date Processed: 9/17/03 1:17:21 PM
14C Chi Square: 15.16    Date Processed: 9/17/03 1:17:21 PM
3H E^2/B (1-18.6 keV): 272.81  Date Processed: 9/17/03 1:17:21 PM
14C E^2/B (4-156 keV): 525.25   Date Processed: 9/17/03 1:17:21 PM
3H Efficiency (0-18.6 keV): 65.29  Date Processed: 9/17/03 1:17:21 PM
14C Efficiency (0-156 keV): 96.24  Date Processed: 9/17/03 1:17:21 PM
IPA Background Date Processed: 9/17/03 1:17:21 PM
3H Background CPM (0-18.6 keV): 15.60  Date Processed: 9/17/03 1:17:21 PM
```

26 SEP03 CONT BAW

14C Background CPM (0-156 keV): 22.47 Date Processed: 9/17/03 1:17:21 PM
3H Calibration DPM: 285000
3H Reference Date: 10/29/99
14C Calibration DPM: 134100

Cycle 1 Results

S#	Count Time	CPMA	A:2S%	CPMB	B:2S%	CPMa	alpha2S%	SIS		
MESSAGES										
1	120.00	21.03	3.98	25.15	3.64	0.28	34.82	705.5	BLANK	
B										
2	0.49	17154.48	2.18	17152.40	2.18	20871.15	1.98	273.3	46Ab2	
3	0.48	17697.72	2.17	17695.68	2.17	21174.73	1.98	271.8	46Aa2	
Missing vial 4.										
5	32.02	62.45	5.34	62.83	5.47	312.03	2.00	340.6	>1	NPCA
6	32.40	66.53	5.10	66.55	5.24	308.40	2.00	302.1		
7	31.89	66.27	5.15	66.82	5.26	313.37	2.00	331.3	>2	13CXab
8	32.12	60.04	5.47	60.19	5.63	311.09	2.00	299.4		
9	32.02	70.35	4.95	70.67	5.06	312.06	2.00	317.4	>3	⊥
10	32.32	69.16	4.98	69.62	5.09	309.16	2.00	344.5		
Missing vial 11.										
12	33.07	68.99	4.93	68.77	5.08	302.11	2.00	269.4	>1	NPCA
13	33.52	63.19	5.19	63.48	5.32	298.14	2.00	299.9		
14	33.40	55.73	5.64	55.99	5.80	299.16	2.00	325.2	>2	13DXab
15	32.96	55.18	5.72	55.61	5.87	303.18	2.00	317.2		
16	32.54	59.42	5.48	59.52	5.63	307.13	2.00	327.4	>3	⊥
17	33.04	59.72	5.42	60.08	5.56	302.42	2.00	316.9		
Missing vial 18.										
19	32.57	67.18	5.06	67.94	5.16	306.85	2.00	323.3	>1	NPCA
20	33.14	64.42	5.15	65.10	5.26	301.51	2.00	316.3		
21	32.43	60.90	5.40	61.71	5.51	308.11	2.00	343.8	>2	13EXab
22	32.67	61.03	5.37	61.20	5.52	305.91	2.00	285.1		
23	32.51	64.48	5.20	64.76	5.33	307.32	2.00	316.6	>3	⊥
24	33.63	65.35	5.07	66.20	5.17	297.20	2.00	316.7		
Missing vial 25.										
26	33.11	67.07	5.02	67.51	5.14	301.81	2.00	331.9	>1	NPCA
27	32.81	70.28	4.89	70.64	5.01	304.54	2.00	291.4		
28	33.41	63.73	5.17	64.19	5.29	299.10	2.00	302.5	>2	13FXab
29	32.28	68.28	5.02	68.81	5.13	309.61	2.00	315.0		
30	32.63	67.72	5.03	68.72	5.11	306.25	2.00	333.2	>3	⊥
31	33.36	75.76	4.63	75.72	4.75	299.52	2.00	284.0		
Missing vial 32.										
Missing vial 33.										
Missing vial 34.										
Missing vial 35.										
Missing vial 36.										
37	36.10	69.38	4.72	70.17	4.81	276.73	2.00	320.2	>1	NPCA
38	36.09	72.76	4.58	73.35	4.67	276.95	2.00	304.2		
39	37.15	61.82	5.02	62.04	5.15	268.98	2.00	308.6	>2	14CXab
40	36.21	59.55	5.20	60.38	5.31	276.03	2.00	329.1		
41	37.57	69.89	4.61	70.40	4.71	266.05	2.00	301.1	>3	⊥
42	36.23	66.82	4.83	67.48	4.93	275.77	2.00	321.6		
Missing vial 43.										
44	39.32	53.10	5.41	53.46	5.56	254.10	2.00	318.9	>1	NPCA
45	38.15	53.65	5.44	54.19	5.58	261.93	2.00	344.9		
46	39.17	55.02	5.29	55.73	5.41	255.05	2.00	338.3	>2	14DXab
47	38.79	53.55	5.41	54.07	5.55	257.55	2.00	328.5		
48	37.72	55.53	5.35	55.13	5.55	264.89	2.00	264.2	>3	⊥
49	37.58	54.33	5.44	54.55	5.60	265.98	2.00	310.9		
Missing vial 50.										
Missing vial 51.										
Missing vial 52.										
Missing vial 53.										

26 SEP 03 CONT BAW

Missing vial 54.										
55	39.68	59.11	5.01	59.68	5.13	251.74	2.00	321.7	>1	NPCA
56	39.05	55.79	5.25	56.16	5.39	255.86	2.00	321.9		
57	38.81	48.74	5.76	48.88	5.95	257.52	2.00	300.2	>2	14EXab
58	39.24	51.09	5.55	51.51	5.71	254.72	2.00	351.6		
59	38.79	49.65	5.69	50.08	5.85	257.52	2.00	318.5	>3	⊥
60	38.55	55.41	5.30	55.91	5.44	259.13	2.00	328.1		
Missing vial 61.										
62	38.52	47.06	5.92	47.44	6.10	259.36	2.00	333.7	>1	NPCA
63	38.69	50.85	5.61	51.54	5.75	258.24	2.00	343.2		
64	38.57	51.22	5.59	51.13	5.79	259.10	2.00	310.2	>2	14FXab
65	38.78	55.50	5.28	56.57	5.38	257.62	2.00	364.4		
66	39.18	50.48	5.60	50.99	5.76	255.01	2.00	341.3	>3	⊥
67	37.54	54.75	5.41	55.56	5.53	266.11	2.00	342.8		

29 Sep 03 BW

29 September 2003 [illegible]
NC - EWDP-27P

Calibrated pH probe using pH 7 & pH 10 used Hach 5020 probe
Slope 58.9 Temp: 33.5°C

pH reading: Temp 31.7°C, pH = 8.26
Challenged with pH 7 buffer = 7.04

Calibrated ORP input 411.0 for 34.6°C
reading 221.6 out of 224 comparison
in mV reading 410.8

ORP reading is 586.3 @ 32.3°C

Conductivity
Cal temp 34.8°C
Instrument set pt at 25°C
~~1380~~ BW 9-29-03
180 µS std @ 35.1°C gave 148.2 µS
Sample reading 361 µS @ 33.7°C
Challanged with 1000 µS at 35.6°C was 791 µS

D.O. Slope = 0.96 @ 34.3°C
3.05 mg/L = 32.8°C

Alkalinity: (1.6N used) 100 mL Sample
blue green - gray @ 130 pink/brown @ 155
lavender - gray @ 150

29 Sept 03 CONT BW

2nd Alkalinity Check: used filtered water & 2 powder pillows
blue-gray-green @ 161
lavender-gray @ 176 (distinct gray-brown
pink @ 182 (more orange-tinted)

Unfilter samples taken at 1200 (2L)
Filtered (4L) samples taken at 13:20

Unfiltered water used for all field tests except for alkalinity. Stored samples were both filtered and unfiltered as indicated.
Filtered with Cole Parmer pump, 7518-02
Easy load head and 06429-24 tubing
3 mL 1:1 Nitric used to acidify 1L sample
Collected samples were placed in a cooler after being parafilmed.

Reagents + equipment listed on 610/19+20

As indicated above, unfiltered samples were taken in a 2L pp bottle and water for the filtered samples was collected in a 4L pp bottle

30 September 2003 – Well 28P MARJ
Initial air temp: 29.5°C

Calibrations: Dissolved oxygen Slope = 0.96% @ 25.8°C mmj 9/30/03

pH: used pH 7.00 & pH 10.00 Slope 60.2
challenge with pH 10 = 9.98 used Hach 50250 probe

ORP: used 967901 solution input #419.5
in mV reading 220.7 (compare to 224)
in Rel mV reading 419.5

Conductivity: 30.0°C Reads 903 µS (used 1000 µS)
in 180 µS std, reads 165.6 @ 31.7°C Setup @ 25°C

Samples: Air temp 30.8°C
pH: temp 29.6°C, 8.45 pH
challenge with pH 7 = 7.10 @ 30.3°C
~~ORP: 477.5 @ 25.0°C~~ probe not connected correctly mmj 9/30/03
Conductivity: 433 µS @ 29.1°C
Dissolved O_2 = 4.62 @ 29.2°C

Alkalinity: Filtered, strip test indicates ~180
175 – gray/green – yellow
182 – yellow-gray
(194 – completely orange – past endpoint)
used 2 indicator pillows
1.6N acid & 100 mL Sample

30 Sept 03 CONT BW

Recal & retest of ORP:
Init reading 221.7 @ 32.1°C
Input 413.4, mV reads 221.5 (should read 224)
reads 413.2 @ 32.1°C (Rel mV)
Reading of sample: 653.7 @ 31.2°C

Unfiltered and Filtered samples taken from the well at 0830

See 610/25 for sampling protocol.

– The two 40mL VOA bottles from NC-EWDP-27P (27P-1C-F4A-1 and 27P-1C-F4A-2) froze and the glass broke, Samples were placed in a ziplock bag and allowed to thaw (~~minime~~ BW 30 Sep 03 (minimized air space in zip lock). After thawing the two samples were decanted into a single 40mL VOA bottle and labelled "Composite". Extra sample was disposed of.

Suggest using aliquot from stable isotope analysis for IC analysis.

30 Sep 03 BW

MRJ 30 Sept 03

30 September 2003 - Well 24P MRJ

Calibrations:

pH - used Hach 50200 probe

Used pH 7 + pH 10 slope = 59.2 @ temp 34.7°C

challenge with pH 7 = 7.00 @ 34.7°C

ORP: used sol'n 967901 @ 35.9°C Input 410.0

in mV reading 223.7 (should read 224)

in Rel mV reading 409.9 @ 36.3°C

Dissolved O_2: Slope 0.97 @ 35.6°C

Conductivity: Temp - 37.0°C reading after cal (1000 µS) = 798

setup @ 25°C

Samples: pH temp 33.7°C pH = 7.74

pH challenge (7) = 7.03 @ 35.9°C

ORP: temp: ~~4~~ MRJ 9/30/03 33.9°C Reading: 456.0 Rel mV

Conductivity: 34.6°C 270 µS

challenge with 180 µS: @ 34.8°C = ~~153.0~~ 152.1 µS

Dissolved Oxygen 2.10 mg/L @ 32.9°C

Alkalinity - 100 mL filtered sample used

Test strip ~ 120

2 packs of indicator used

124 lav-gray (pH 4.8) 130 pink (pH 4.6)

Air Temp 36.9°C

1 October 2003 Well 29 MRJ

Air temp 23.8°C

pH calibration: used Hach 50200 probe & pH 7 & 10 solutions

Slope = 60.3

Dissolved O_2 @ 22.8°C. Slope = 0.93

ORP: @ 24.3°C entered 420.1, mV = 220.4 (should read 224)

Rel mV = 420.0

Conductivity: Temp 25.4°C entered 1000

(in 1000 µS solution) reads 990 µS @ 25.5°C

Challenge with 180 µS = 163.4 µS @ 25.2°C

READINGS: Air temp = 26.2°C

pH - temp 26.3°C pH = 8.12

challenge with pH 7.0 solution = 7.13 @ 25.6°C BLV 10-7-03

pH probe gave slow response and poor challange. Redone ~~610/30~~ 610/30

ORP - Temp = 26.2°C ORP = 547.4

Dissolved O_2 = 6.32 mg/L @ 24.3°C

Conductivity: 311 µS @ 27.0°C

challenge with 180 µS = 182.0 µS @ 26.6°C

Alkalinity - 100 mL Sample 1.6N Acid

Test strip ~ 120

pH 4.8 at 105 and pH 4.5 at 110

1 October 2003 Well 29 MARJ

Redo pH with new gel-filled probe

Recal with pH 7.0 & 10.0

Slope = 57.7 (well within acceptable limits)

pH reading: 8.36 @ 25.8°C

challenge with pH 7 = 6.96 @ 26.3°C

New probe responded fast. Use this pH #

This pH sample was taken in a 30 mL pp bottle at the well head and analyzed immediately.

See 610/25 for sampling protocol

for 7-03 BLV

1 October 2003 19P Well MARJ

Calibrations:

pH calibration - with new gel-filled electrode

& pH 7 + 10 solutions.

Slope 58.0 @ 32.5°C challenge (pH 10) = 9.98

ORP - 33.7°C Input 412.0 Rel mV,

mV reads 223.5 (should read 224)

Rel mV reads 412.0 @ 33.9°C

Conductivity: with 1000 µS standard, setpt 25°C

temp = 34.0°C, input 1000 µS

Reads 842 µS @ 34.0°C

Challenge with 180 µS — 161.4 µS @ 33.3°C

Dissolved O_2 Slope = 0.94 @ 34.6°C

Measurements: Air temp - 35.5

pH - temp = 28.4°C pH = 7.54

challenge @ 7 = 6.97

ORP - temp = 29.7°C ORP = 606.0 Rel mV

Conductivity = 253 µS @ 30.5°C

Diss. O_2: 5.24 @ 29.8°C

Alkalinity - strip test (unfiltered @ 120)

2 powder pillows, 1.6N Lavender gray @ 107-109

pink @ 114

2 October 2003 Well 4PB MAHJ

Calibrations:

pH: used new gel probe & pH 7 & pH 10 solutions
slope = 57.0
challenge with 10 → 10.09 @ 19.4°C

ORP: @ 19.5°C Input 423.9 mV reads 218.8 (should read 224)
Rel mV reads 423.8

Conductivity: setpt 25°C cal. in 1000 µS
input 1000, reads 1139 µS @ 19.2°C
Challenge with 180 µS: reads 212 µS @ 19.1°C

Diss O_2: 0.89 slope @ 16.8°C

Measurements: Air temp below 20, car reads temp as 61°F
pH – 9.51 @ 22.6°C challenge pH 10 = 10.15 @ 18.3°C

ORP – temp 22.7°C 507.8 Rel mV

Diss O_2 – 6.96 mg/L @ 20.8°C

Conductivity: 341 µS @ 22.5°C
challenge with 180 µS std – 205 µS @ 20.1°C MJ 10/2/03

02 OCT 03 CONT BW

Recalibration of pH: (with fresh sample)
Slope: 57.6 @ 22.8°C
new pH – 9.38 @ 23.4°C
challenge with pH 10 – 10.04 @ 19.4°C
Alkalinity – used 2 powder pillows + 1.6 N acid
lavender-gray @ 106
pink @ 110

Blanks taken at 4PB site – 4 total
one 1L Acidified and Filtered (FA)
One 250mL amber bottle – F4A
One 40mL " " F4A
One 500mL 4F4A

See 6/10/25 for sampling protocol

– 6 OCT 03 BW

All samples packed in coolers with blue ice on morning of 2 OCT (Thurs) and Fedexed next day to SWRI – San Antonio, Samples recieved on 3 OCT (Friday) and placed in refrigerator. Blue ice was still frozen upon openning in S.A. by Paul Bertetti.

8OCT03- BAW

Calculation of Conductivity for EWDP groundwater samples for Sep 28 to Oct3 event

Conductivity measurements require a temperature adjustment if not at the default reference temp (here 25°C). The correction can be made during calibration (see step 5 below). This was not done in the field. Instead the temp correction will be after the fact. Please use the conductivity values the appear on 610/35. Conductivity will be remeasured on some of the collected samples

Information potentially subject to copyright protection was redacted from this location.

The redacted material is from a manual of a calibration device for which the source is unknown.

8OCT03 CONT BAW

Well	Temp setpt C	measured cond (uS/cm)	temp C	temp difference	2.10% of cond	correction magnitude	corrected Cond (uS/cm)
27P	25	361	33.7	8.7	7.581	66.0	427.0
28P	25	433	29.1	4.1	9.093	37	470.3
24P	25	270	34.6	9.6	5.67	54.432	324.4
29P	25	311	25.5	0.5	6.531	3.2655	314.3
19P	25	253	30.5	5.5	5.313	29.2215	282.2
4PB	25	341	22.5	-2.5	7.161	-17.9025	323.1

Well	measured Conductivity (uS/cm)	corrected Conductivity (uS/cm)
27P	361	427.0
28P	433	470.3
24P	270	324.4
29P	311	314.3
19P	253	282.2
4PB	341	323.1

Source of data: 610/24-33

Correction magnitude calculated by multiplying the temp difference by the 2.10% of cond number

Corrected cond calculated by adding the correction magnitude to the measured cond.

The following pages contain summary data for the EWDP Sep 28-Oct03 event as documented in the field. Please note the conductivity values are not corrected for temp. Use the conductivity values from this page.

8OCT03- CONT BAW

Local Well Number	NC-EWDP-27P
Zone (if applicable)	na
Time	12:00
Date	9-29-03
Sampled by	Bradley Worling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.4 max	Water temperatrue	33.5	C
Minutes pumped before sampling	140 mins 9:40 to 12:00	Air temperature	34.5	C
Sampling method		Specific conductance (*)	361 @ 33.7°C	microS/cm
Sampling condition		Dissolved Oxygen	3.05 @ 32.8°C	mg/L
Static water level (feet)	na	Eh 586.3	BW 10-7-03 ~~410.8~~ @ 32.3°C	mV
Depth to top sample interval	580.7 ft	pH field	8.26	
Depth to bottom sample interval	620.6 ft	Alkalinity total field	176/182	mg/L as CaCO3
Finished well depth (feet)	631.0 ft		pH 4.8 / pH 4.5	
Hole depth (feet)	1900.0 ft	REMARKS: (*) Please see 610/34-35		

Sample ID	Volume	Sample Treatment Key
27P-FA	1000 mL	
27P-FUA	1000 mL	F - filtered
27P-4FUA	500 mL	A - acidifired
27P-5-FUA	250 mL	U - prefix "un"
27P-1C-FUA-1	40 mL	S - stable isotope
27P-1C-FUA-2	40 mL	IC - inorganic carbon

8OCT03 - CONT BAW

Local Well Number	NC-EWDP-28P
Zone (if applicable)	na
Time	0900
Date	9-30-03
Sampled by	Bradley Worling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.3	Water temperatrue	29.6	C
Minutes pumped before sampling	152 min 0536-0808	Air temperature	30.8	C
Sampling method		Specific conductance (*)	433 @ 29.1°C	microS/cm
Sampling condition		Dissolved Oxygen	4.62 @ 29.2°C	mg/L
Static water level (feet)	377.11 A	Eh	653.7 @ 31.2°C	mV
Depth to top sample interval	370.0 ft	pH field	8.45	
Depth to bottom sample interval	449.0 ft	Alkalinity total field	175/182	mg/L as CaCO3
Finished well depth (feet)	459.3 ft		pH 4.8 / pH 4.5	
Hole depth (feet)	2080.0 ft	REMARKS: (*) Please see 610/34-35		

Sample ID	Volume	Sample Treatment Key
28P-FA	1000 mL	
28P-FUA	1000 mL	F - filtered
28P-4FUA	500 mL	A - acidifired
28P-5-FUA	250 mL	U - prefix "un"
28P-1C-FUA-1	40 mL	S - stable isotope
28P-1C-FUA-2	40 mL	IC - inorganic carbon

8OCT03 - CONT - BAW

Local Well Number	NC-EWDP-24P
Zone (if applicable)	na
Time	BW 9.20.03 ~~0~~ 1425
Date	9-30-03
Sampled by	Bradley Werling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.34	Water temperatrue	33.7	C
Minutes pumped before sampling	72 min 1320 1209 - ~~1334~~ BW 9-30-03	Air temperature	36.9	C
Sampling method		Specific conductance (*)	270 at	microS/cm 34.6°C
Sampling condition		Dissolved Oxygen	2.10 at	mg/L 32.9°C
Static water level (feet)	406.71 ft.	Eh	456.0 at	mV 33.9°C
Depth to top sample interval	400.0 ft	pH field	7.74	
Depth to bottom sample interval	440.0 ft	Alkalinity total field	124 / 130	mg/L as CaCO3
Finished well depth (feet)	450.0 ft		pH 4.8 / pH 4.5	
Hole depth (feet)	1860.0 ft			

REMARKS:
(*) Please see 610/34-35

Sample ID	Volume	Sample Treatment Key
24P-FA	1000mL	
24P-FUA	1000mL	F - filtered
24P-4FUA	500mL	A - acidifired
24P-5-FUA	250mL	U - prefix "un"
24P-1C-FUA-1	40mL	S - stable isotope
24P-1C-FUA-2	40mL	IC - inorganic carbon

8OCT03 - CONT BAW

Local Well Number	NC-EWDP-29P
Zone (if applicable)	na
Time	0820
Date	10OCT03
Sampled by	Bradley Werling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.39	Water temperatrue	26.3	C
Minutes pumped before sampling	58 min 532-630	Air temperature	26.2	C
Sampling method		Specific conductance (*)	311 at	microS/cm 27°C
Sampling condition		Dissolved Oxygen	6.32 at	mg/L 24.3
Static water level (feet)	na	Eh	547.4 at	mV 26.2°C
Depth to top sample interval	340.0 ft	pH field	8.36 at	25.8°C
Depth to bottom sample interval	390.0 ft	Alkalinity total field	105 / 110	mg/L as CaCO3
Finished well depth (feet)	395.0 ft		pH 4.8 / pH 4.5	
Hole depth (feet)	790.7 ft			

REMARKS:
(*) Please see 610/34-35

Sample ID	Volume	Sample Treatment Key
29P-FA	1000mL	
29P-FUA	1000mL	F - filtered
29P-4FUA	500mL	A - acidifired
29P-5-FUA	250mL	U - prefix "un"
29P-1C-FUA-1	40mL	S - stable isotope
29P-1C-FUA-2	40mL	IC - inorganic carbon

8 OCT 03 - CONT - BAW

Local Well Number	NC-EWDP-19P
Zone (if applicable)	na
Time	~~BW 1-3 BW~~ 10CT03 BW 1450
Date	01OCT03
Sampled by	Bradley Werling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.61	Water temperatrue	28.4	C
Minutes pumped before sampling	139 min 11:41 - 14:00	Air temperature	35.5	C
Sampling method		Specific conductance (*)	2.53 qt	microS/cm 30.5°C
Sampling condition		Dissolved Oxygen	5.24 qt	mg/L 29.8°C
Static water level (feet)	368.49 ft	Eh	606.0 qt	mV 29.7°C
Depth to top sample interval	359.2 ft	pH field	7.54	
Depth to bottom sample interval	458.6 ft	Alkalinity total field	107-109/114 pH 4.8 / pH 4.5	mg/L as CaCO3
Finished well depth (feet)	468.6 ft			
Hole depth (feet)	499.2 ft			

REMARKS:
(*) Please see 610/34-35

Sample ID	Volume	Sample Treatment Key
19P-FA	1000mL	
19P-FUA	1000mL	F - filtered
19P-UFUA	500mL	A - acidifired
19P-S-FUA	250mL	U - prefix "un"
19P-IC-FUA-1	40mL	S - stable isotope
19P-IC-FUA-2	40mL	IC - inorganic carbon

8 OCT 03 - CONT - BAW

Local Well Number	NC-EWDP-4PB
Zone (if applicable)	na
Time	0820
Date	20CT03
Sampled by	Bradley Werling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.66	Water temperatrue	22.6	C
Minutes pumped before sampling	926 min 1718 (10CT) - 0844 (20CT)	Air temperature	Below 20°C	C <15°C 61°F
Sampling method		Specific conductance (*)	341 qt	microS/cm 22.5°C
Sampling condition		Dissolved Oxygen	6.96 qt	mg/L 20.8°C
Static water level (feet)	328.41 ft	Eh	507.8 qt	mV 22.7°C
Depth to top sample interval	739.5'	pH field	9.38 qt	23.4°C
Depth to bottom sample interval	839.2'	Alkalinity total field	106/110 pH 4.8 / pH 4.5	mg/L as CaCO3
Finished well depth (feet)	849.2'			
Hole depth (feet)	849.5'			

REMARKS:
(*) Please see 610/34-35

Sample ID	Volume	Sample Treatment Key
4PB-FA	1000mL	
4PB-FUA	1000mL	F - filtered
4PB-UFUA	500mL	A - acidifired
4PB-S-FUA	250mL	U - prefix "un"
4PB-IC-FUA-1	40mL	S - stable isotope
4PB-IC-FUA-2	40mL	IC - inorganic carbon

*4 Blanks taken - see 610/33

13 OCT 03 BAW

Preparation of EWDP samples for Stable Isotope Analysis

Samples: 250mL glass 5-FUA from 9-29-03 to 10-2-03 610/36-41

Each sample was split into two duplicate aliquots. Each aliquot was poured into a 60mL pp bottle with minimal head space.
The six wells generated 12 samples
Two field blanks were generated from 610/41
Two QA tap water samples were generated as describe.
16 total samples to be sent
Tap water from Lab 106 (1st room with ext door - cold water line) was run for 5 minutes A 60 mL pp bottle was rinsed with this water three times and then filled completely and capped. Process repeated for second bottle.
Suffixes -1 and -2 were used to ID ~~duplicated~~ BW 10-13-03 duplicates. NC-EWDP dropped from prefix.
Field Blank labeled 4FB-1003-5-FUA1+2
Tap water QA labeled 88Q-1003-5-FUA1+2

Aliquots from the 27P-0903-5-FUA were used to replace the lost 27P-0903-1C-FUA

13 OCT 03 CONT BAW MRJ

1 and 2 that were broken and used to create a composite sample. The composite sample was discarded. Two 40mL amber VOA bottles were filled with NC-EWDP-27P-0903-5FUA. The new samples were labeled NC-EWDP-27P-0903-5-FUA-IC-1+-2
" " " " "

(See 610/27 for composite sample info).

Made cation & anion standards:
Cation standard (20ppm Ca, 12ppm K, 40ppm Si, 60ppm Na) MRJ 10/13/03
Added 5mL of Calcium standard, 3mL of Potassium standard, 10mL of silicon standard, and 15mL of sodium standard into 250mL vol flask (used volumetric pipettes) and filled to mark with nanopure water. Labeled "88Q-1003-FA"
Anion standard (10ppm Cl and 2ppm nitrate)
Added 10mL of chloride standard and 2mL nitrate standard with volumetric pipettes into a 1L volumetric flask and filled to the mark with nanopure water. Labeled "89Q-1003-FUA"
Transferred both solutions into 500mL + 1L polypropylene bottles, same as those used in field sampling.
Standards used: (Assurance Spex Certiprep brand)
Calcium - 2% HNO_3, 1,000 mg/L Cat# PLCA2-2X Lot# 9-69CA
Sodium - 2% HNO_3, 1000 mg/L Cat# PLNA2-2Y Lot# 10-46NA
Silicon - H_2O/Tr HF, 1000 mg/L Cat# PLSI9-2Y Lot# 9-66SI

13 October 2003 MRJ cont.

Potassium - 2% HNO_3 1,000 mg/L Cat# PLK2-24 Lot# 9-03K
Spex Certiprep brand:
Nitrate - Matrix H_2O, 1000 mg/L, Cas# AS-N039-2X Lot# 23-24AS
Chloride - Matrix H_2O, 1000 mg/L, Cas# AS-CL9-2X Lot# 23-38AS

14 OCT 03 BAW

Shipment of EWDP Stable Isotope Samples

16 samples (610/42) were shipped Next Day via Fedex to Coastal Science Labs for H and O stable isotope analysis in a box.

15 OCT 03 BAW

Preparation of EWDP samples for cation + anion analysis by Div 01 and SGS labs and reanalysis of some field measurements

- 1 Liter Filtered - Unacidified Samples
  These FUA 1L samples (610/36-41) were to be analyzed for cation/trace metals and anions by both Div 01 and SGS Lakefield.

  Alkalinity was performed on the 4PB-1003-FUA sample since the pH was greater than 8.3 (9.38)

15 OCT 03 CONT BAW

For labeling, the NC-EWDP prefix was dropped. The following suffixes were used:
Div 01 Anions: 1 + 2 (dups)
SGS Anions: 3 + 4 (dups)
Div 01 Cation: 5 + 6 (dups)
SGS Cations: 7 + 8 (dups)
QA - dups for FUA 1L
Div 01 Anion: 2 QA Samples
89Q-1003-FUA 1+2 (610/43)
SGS Anion: 1 QA 89-1003-FUA-3 (610/43)
1 Dup 24P-0903-FUA-4 f BW 10-15-03
Div 01 Cation: none
SGS Cation: 1 Dup 27-0903-FUA-8

Div 01 and SGS Anion samples decanted into 125 mL pp bottles
Div 01 Cation samples decanted into 30 mL pp bottles
SGS Cation samples decanted into 60 mL pp bottles

Alkalinity performed by dig titration - see 610/19 for reagent + equipment list.

TWO 1L labeled 24P and none labeled 19P. Based on date, labeled one dated 10-1-03 19P

15 OCT 03 CONT BAW
Test strip ~ 120
2 pouches of phenolthalein used
Soln pink to clear 14
Added BGMR indicator (2 pouches)
light greenish blue-gray at 91
violet gray at 93
pink at 103

- 1 Liter Filtered Acidified Samples
These FA 1L samples (610/36-41) were to be analyzed by both Div01 and SGS Lakefield for cation/trace metals

Two 1L samples were labeled 24P and none were labeled 19P. Based on date, labeled one dated 10-1-03 the 19P sample

No reanalysis of any field measurements was performed on the FA 1L samples

For labeling, the NC-EWDP prefix was dropped. The following suffixes were used:
Div01 Cations: 5 + 6 (dups)
BAW 10-15-03 SGS Cations: 7 + 8 (dups)

15 OCT 03 CONT BAW

QA-dups for FA 1L
Div01 cation: 2 QA Samples
889-1003-FA-5 and 6
1 Dup - 28P 0903-FA-6
SGS cation: 2 QA samples
889-1008-FA-7 and 8

Div01 cation samples decanted into 30mL pp bottles
SGS cation samples decanted into 60mL pp bottles

- 500mL Unfiltered, Unacidified Samples
These UFUA samples (500mL - 610/36-41) were to be analyzed by Div01 for cation/trace metal and anion analyses.

ORP and Conductivity was remeasured on the well samples UFUA 500mL.

For labeling, the NC-EWDP prefix was dropped. The following suffixes were used:
Div01 anion: 1 + 2 (dups)
Div01 cation: 5+6 (dups)

15OCT03 CONT BAW

QA - dups for UFUA - 500mL
Divol anion - 1 dup 29P-1003-UFUA-2
Divol cation - none

ORP measurements
Orion 290A+ with 9179BN probe
Hach EC20 with Corning 476516

Conductivity measurements
Hach CO150 with 50161 probe

ORP
Use a pH4 soln of quinhydrone
(Arcos 41877-1000 lot B0010437-2)
pH4 buffer pillow Hach 22992-64 lot AB398A
100mL of nanopure water, quin, + pH4
290A+ read 259.4 mV + 462.4 at 21.6°C
EC20 read 345.0 mV - set at 25°C
Also used Orion 967901 lot# GW1 ORP std.

Conductivity
Used 1000 µS/cm std
Hach 27705 lot # A1348

15 OCT 03 CONT BAW

ORP Measurements - UFUA sample

Well	290A+ mV	290A+ Rel mV	290A Temp	EC20 mV	EC20 Temp
27P	78.3	280.1	14.8	143.7	25
28P	169.0	371.2	16.2	230.7	"
24P	230.4	433.4	16.2	293.2	"
29P	244.3	447.0	17.1	303.9	"
19P	267.8	470.2	16.6	329.2	"
4PB	193.8	396.4	17.0	257.2	"

Conductivity - UFUA sample

Well	µS/cm	°C
27P	471	16.0
28P	445	17.6
24P	334	16.9
29P	308	17.6
19P	296	17.8
4PB	294	17.7

Cond challange (1000) was 1013 µS/cm
ORP Challange EC20 of pH4 at 344 mV (25°C)
ORP challange 290A+ at
pH4 soln at 462.0 Rel mV or 259.2 mV at 21.4°C
ORP soln at 423.7 Rel mV or 221.1 mV at 20.5°C

15 OCT 03 CONT BAW

DO Comparison of field + lab measurements

well BW 10-15-03
27P

① Source: 610/33

Alkalinity (mg/L) as CaCO3 for NC-EWDP-4PB

pH	Field ①	Lab ②
8.3	na	14 ~~91~~ BW 10-16-03
4.8	106	98
4.5	110	103

② Source: 610/45-46

Sample NC-EWDP-4PB-1003-UFUA used for lab analysis

Well	CNWRA FIELD measured Eh (mV) ③	LAB measured Eh (mV) ④
27P	586.3	280.1
28P	653.7	371.2
24P	456	433.4
29P	547.4	447
19P	606	470.2
4PB	507.8	396.4

③ Source 610/24-33

④ Source: 610/48-49

Well	CNWRA FIELD measured ⑤ conductivity (uS/cm)	CNWRA FIELD corrected ⑥ conductivity (uS/cm)	LAB measured ⑦ conductivity (uS/cm)
27P	361	427	471
28P	433	470	445
24P	270	324	334
29P	311	314	308
19P	253	282	296
4PB	341	323	294

⑤ Source: 610/24-33
⑥ Source: 610/34-35
⑦ Source: 610/48-49

16 OCT 03 BAW

Chain of Custody for Div01 Anion and Cation/trace metal analyses of EWDP ground water samples Sep 29-Oct02

16 Anion Samples (610/43-48) consisting of
12 well samples
1 duplicate
1 field blank and
2 QA samples

23 Cation Samples (610/43-48) consisting of
18 well samples
1 duplicate
2 field blanks and
2 QA samples

10-16-03 BW

16 OCT 03 CONT BAW

Shipper Name/Address: BRAD WERLING CNWRA - DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround: ☐ 2 Weeks ☐ 3 Weeks ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

	Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC except phosphate	Phosphate by 365.3									REMARKS
24P	0903-FUA-1	10-15-03		W		1	X	X							intact		Preservation: a = HCl to pH <2; b = HNO3 to pH <2 (some); c = H2SO4 to pH <2; d = NaOH to pH >12; e = Cool (4°C±2°C); f = Other (specify)
19P	1003-FUA-1						X	X									Nuclear Safety
29P	1003-FUA-1						X	X									Related - Use
89Q	1003-FUA-1						X	X									appropriate QA
89Q	1003-FUA-2						X	X									procedures
27P	0903-FUA-1						X	X									POC Brad Werling
28P	0903-FUA-1						X	X									phone 6565
4PB	1003-FUA-1						X	X									fax 5184
29P	1003-UFUA-2						X	X									
29P	1003-UFUA-1						X	X									20.06002.01.141

Matrix Types: A – Air; B – Biota; D - Dust; E – Emission/Stack; L - Liquid; P – Product; Sd - Solid; S – Soil; SED – Sediment; T - Tissue; W - Water; WP - Wipe

Sample Types: D - Duplicate; ER – Equipment Rinsate; ES – Environmental Sample; FB – Field Blank; FD – Field Duplicate; MS – Matrix Spike; MSD – Matrix Spike Dup; TB – Trip Blank

Temp: 22°C Therm #: 026

Comments: 610/43-48

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	10-16-03	09:15
Received by (Print/Signature)		
Relinquished by (Print/Signature)		
Received by (Print/Signature)		
Relinquished by (Print/Signature)		

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature)

Date: 10/16/03 Time: 0915

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 1 of 2

Shipper Name/Address: BRAD WERLING CNWRA - DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround: ☐ 2 Weeks ☐ 3 Weeks ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

	Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC except phosphate	Phosphate by 365.3									REMARKS
19P	1003-UFUA-1	10-15-03		W		1	X	X							intact		Preservation: a = HCl to pH <2; b = HNO3 to pH <2 (some); c = H2SO4 to pH <2; d = NaOH to pH >12; e = Cool (4°C±2°C); f = Other (specify)
4FB	1003-UFUA-1						X	X									Nuclear Safety
24P	0903-UFUA-1						X	X									Related - Use
27P	0903-UFUA-1						X	X									appropriate QA
28P	0903-UFUA-1						X	X									procedures
4PB	1003-UFUA-1						X	X									POC Brad Werling
																	phone 6565
																	fax 5184
																	20.06002.01.141

Matrix Types: A – Air; B – Biota; D - Dust; E – Emission/Stack; L - Liquid; P – Product; Sd - Solid; S – Soil; SED – Sediment; T - Tissue; W - Water; WP - Wipe

Sample Types: D - Duplicate; ER – Equipment Rinsate; ES – Environmental Sample; FB – Field Blank; FD – Field Duplicate; MS – Matrix Spike; MSD – Matrix Spike Dup; TB – Trip Blank

Temp: 22°C Therm #: 026

Comments: 610/43-48

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	10-16-03	09:16
Received by (Print/Signature)		
Relinquished by (Print/Signature)		
Received by (Print/Signature)		
Relinquished by (Print/Signature)		

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature)

Date: 10/16/03 Time: 0915

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

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16 OCT 03 CONT BAW

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16 OCT 03 CONT BAUT

Shipper Name/Address: BRAD WERLING CNWRA- DIV 20 BLG-57

Client:

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Client Purchase Order/Other ID:

Site/Zone ID:

Requested Turnaround:
☐ 2 Weeks
☐ 3 Weeks
☒ Other: 4wks

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP									
28P-0903-FA-5	10-15-03		W		1	X								intact	
28P-0903-FA-6						X									
88Q-1003-FA-5						X									
88Q-1003-FA-6						X									
19P-1003-FA-5						X									
27P-0903-FA-5						X									
4PB-1003-FA-5						X									
29P-1003-FA-5						X									
4FB-1003-FA-5						X									
24P-0903-FA-5						X									

REMARKS
Preservation
a = HCl to pH <2
b = HNO_3 to pH <2 Some
c = H_2SO_4 to pH <2
d = NaOH to pH >12
e = Cool (4°C±2°C)
f = Other (specify)

Nuclear Safety Related- use appropriate QA procedures

POC- Brad Werling phone- 6565 fax- 5184

20.06002.01.141

Matrix Types:
A – Air
B – Biota
D - Dust
E – Emission/Stack
L - Liquid
P – Product
Sd - Solid
S – Soil
SED – Sediment
T - Tissue
W - Water
WP - Wipe

Sample Types:
D - Duplicate
ER – Equipment Rinsate
ES – Environmental Sample
FB – Field Blank
FD – Field Duplicate
MS – Matrix Spike
MSD – Matrix Spike Dup
TB – Trip Blank

Temp: 22°C Therm #: 026

Comments: 610/43-48

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	10-16-03	09:15
Received by (Print/Signature)		
Relinquished by (Print/Signature)		
Received by (Print/Signature)		
Relinquished by (Print/Signature)		

SwRI Project#:

Received by SwRI Lab: (Signature)

Date: 10/16/03 Time: 0915

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 1 of 3

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16 OCT 03 CONT BAUT

Shipper Name/Address: BRAD WERLING CNWRA- DIV 20 BLD-57

Client:

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Client Purchase Order/Other ID:

Site/Zone ID:

Requested Turnaround:
☐ 2 Weeks
☐ 3 Weeks
☒ Other: 4 wks

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP									
29P-1003-FUA-5	10-15-03		W		1	X								intact	
27P-0903-FUA-5						X									
19P-1003-FUA-5						X									
24P-0903-FUA-5						X									
28P-0903-FUA-5						X									
4PB-1003-FUA-5						X									
27P-0903-UFUA-5						X									
4FB-1003-UFUA-5						X									
19P-1003-UFUA-5						X									
4PB-1003-UFUA-5						X									

REMARKS
Preservation
a = HCl to pH <2
b = HNO_3 to pH <2 Some
c = H_2SO_4 to pH <2
d = NaOH to pH >12
e = Cool (4°C±2°C)
f = Other (specify)

Nuclear Safety Related- use appropriate QA procedures

POC- Brad Werling phone- 6565 fax 5184

20.06002.01.141

Matrix Types:
A – Air
B – Biota
D - Dust
E – Emission/Stack
L - Liquid
P – Product
Sd - Solid
S – Soil
SED – Sediment
T - Tissue
W - Water
WP - Wipe

Sample Types:
D - Duplicate
ER – Equipment Rinsate
ES – Environmental Sample
FB – Field Blank
FD – Field Duplicate
MS – Matrix Spike
MSD – Matrix Spike Dup
TB – Trip Blank

Temp: 22°C Therm #: 026

Comments: 610/43-48

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	10-16-03	09:15
Received by (Print/Signature)		
Relinquished by (Print/Signature)		
Received by (Print/Signature)		
Relinquished by (Print/Signature)		

SwRI Project#:

Received by SwRI Lab: (Signature)

Date: 10/16/03 Time: 0915

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 2 of 3

16 OCT 03 CONT BAW

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Client Purchase Order/Other ID: BRAD WERLING <NWRA - DIV 20 BLD-57

Site/Zone ID

Shipper Name/Address

Client

Requested Turnaround: ☐ 2 Weeks ☐ 3 Weeks ☒ Other: 4 wks

SwRI Contact: Mike Rammann

Preservation: a = HCl to pH <2; b = HNO_3 to pH <2; c = H_2SO_4 to pH <2; d = NaOH to pH >12; e = Cool (4°C±2°C); f = Other (specify). (b = HNO_3 to pH <2 Some)

REMARKS: Nuclear Safety Related - use appropriate QA procedures; fax. Brad Werling phone - 6565 fax - 5184

Analyses Requested: Analysis of major + minor elements by ICP

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP	Intact
29P-1003-UFUA-5	10-15-03		W		1	X	
27P-0903-UFUA-5					1	X	
28P-0903-UFUA-5					1	X	

Relinquished by (Print/Signature): Brad Werling / Brad Werling — Date 10-16-03 Time 09:15

Received by (Print/Signature) — Date — Time

Relinquished by (Print/Signature) — Date — Time

Received by (Print/Signature) — Date — Time

Relinquished by (Print/Signature) — Date — Time

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature) — Date 10/16/03 Time 1915

Samples Disposed: Date — Time

Samples Disposed by:

Page 3 of 3

Matrix Types: A – Air; B – Biota; D - Dust; E – Emission/Stack; L - Liquid; P – Product; Sd - Solid; S – Soil; SED – Sediment; T - Tissue; W - Water; WP - Wipe

Sample Types: D - Duplicate; ER – Equipment Rinsate; ES – Environmental Sample; FB – Field Blank; FD – Field Duplicate; MS – Matrix Spike; MSD – Matrix Spike Dup; TB – Trip Blank

Temp: 2.2°C Therm #: 026

Comments: 610/43-48

Div 01 COC Form 01-01-001, Rev 8/02

20 OCT 03 BAW

Preparation of 1:1 Nitric Acid Solution for EWDP Sampling Trip Oct 26-31, 2003

Reagents - Nitric Acid - Conc Trace Metal Grade
Fisher A509-212 lot # 1100040
nanopure type 1 water

Added about 50mL of type 1 water to a 125mL FEP bottle. Visually estimated where the "double volume" would be and marked it. Slowly added nitric acid in steps until mark reached.

Preparation of Quinhydrone Powder for EWDP Sampling Trip Oct 26-31, 2003

Reagents - Quinhydrone Acros 41877-1000
lot # B0010437-2

Prepared six 125mL pp bottles with 1g of Quinhydrone. This would be used to challange the meter for ORP readings. In the field, 100mL of water would be added with a pH buffer powder pillow pH 4 or pH 7. Weighed about 1g of quinhydrone (PR5002) and transfered into 125mL pp bottle. Estimated weight on other 5.

21OCT03 BAW

The following solutions were used in the EWDP groundwater sampling event 27 oct to 30 oct 03:

pH solutions

pH 10.01 Hach Cat# 27702 lot# 2298
pH 4.01 Hach Cat# 27700 lot# 2039
pH 7.00 Hach Cat# 27701 lot# 2053

Conductivity Stds

1000 µS/cm Hach Cat# 27705 lot# 1348
1990 µS/cm Hach Cat# 27706 lot# 9344
180 µS/cm Hach Cat# 27704 lot# 1292

Oxidation-Reduction Potential

ORP std: Orion Cat# 967901 lot# 6W1
Quinhydrone powder: 610/57
pH 4 buffer powder pillow Hach 22269-95 lot A1355
pH 7 buffer powder pillow Hach 22270-66 lot A3192

Alkalinity

Digital titration ~~Carting~~ 10-21-03 BW Cartridges
- 1.6N Sulfuric Acid Hach 14389-01 lot A3204
- 0.16N Sulfuric Acid Hach ~~14388-01~~ BW 10-21-03 lot A3218
14388-01

Bromocresol Green-Methyl Red indicator powder
Hach 943-99 lot A1327

Phenolphthalein indicator powder
Hach 942-99 lot A2039

Water Quality Test Strip: Hach 27552-50
lot 112111

21OCT03 CONT BAW

pH probe storage soln - Hach 27565-49 lot A3237
1:1 Nitric Acid from 610/57

The equipment to be used in the EWDP field sampling event for oct 27-30, 2003 includes the following:

Field Equipment

Meter type	Serial number	Battery Required	Probe
Orion 290A pH meter	012953	9-volt	Orion cat# 9179BN
Hach EC20 pH / ISE meter	981100001572	9-volt	Hach 50200 combination and Hach 51935-22
Hach C0150 Conductivity meter	990200007161	9-volt	Hach 50161
WTW A 375/K DO meter	02270024	4 AA	Oxical SL A 325/K
Two (2) Hach digital titrators	Pat# 4086062		
Scienceware magnetic stirrer	C9376	2 D cell	
Easy-load masterflex L/S model 7518-02	L01000353		
Masterflex E/S Model# 07571-00	G01003175	AC adaptor: P/N TD1J2400L12CP + automotive power adaptor: 07571-50	

21OCT03 BW

24 OCT 03 BAW

The following pages contain the procedures used during the Oct 27-30, 2003 EWDP sampling

The order of analyses should be as follows: Air Temp, Water temp, pH, Dissolved Oxygen, ORP, Conductivity, and alkalinity BW 10-24-03

pH Procedure

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information below. No additional information is available.

Source: Hach EC20 portable pH/ISE meter manual.

24 OCT 03 BW

24 OCT 03 CONT BAW

Dissolved Oxygen Procedure

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information below. No additional information is available.

Source:

WTW Oxi 330i and Oxi 340i meter manual.

WTW CellOx 325 probe manual.

24 OCT 03 BW

24 OCT 03 CONT BAW

ORP procedure

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information listed on page 63 of this scientific notebook. No additional information is available.

24 OCT 03 CONT BAW

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information below. No additional information is available.

Sources:

ASTM method D 1498-93 Standard Practice for Oxidation-Reduction Potential for Water.

ThermoOrion A+ Instruction Manual.

Hach EC20 Portable pH/ISE Meter Manual.

ORP Triode Elcetrode instruction manual for model 91-79.

Corning Electrode 476080 manual.

24 OCT 03 BAW

24 OCT 03 CONTINUED BW

Conductivity Procedure

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information below. No additional information is available.

Source: Hach CO150 Conductivity Meter Instruction Manual

24 OCT 03 BW

24 OCT 03 CONT BAW

Digital Titration Procedure

Information potentially subject to copyright protection was redacted from this location. The redacted material is from reference information below. No additional information is available.

Source: Hach Digital Ttitrator Model 16900 Manual

Additional items:
Thermometer: SN 183303 Calibration good-
due Dec 4, 2003. For Corrosion group
Corning Redox Combo probe # 476516
Electrode fill soln Corning # 477000 lot 2141

11-3-03 BW

24 OCT 03 CONT BAW

Sampling Procedure

Groundwater samples were collected in two 4 liter pp bottles. Each bottle was rinsed several times with sample water before being filled. One bottle was given to the person conducting field analyses. All field analyses were conducted using unfiltered groundwater except for alkalinity. The other 4 liter bottle was given to the person taking the sample splits for the laboratory analyses and alkalinity. Sample types and quantities for subsequent laboratory analyses are listed in Table 1.

Table 1. Sample Types and Volumes Collected for Each Groundwater Zone During the October 27-30, 2003 Early Warning Drilling Program Sampling Event.

Sample volume and container type	Filtration	Preservation	Analyses
Two 40mL, amber glass	filtered, 0.45 µm	none	Inorganic carbon (in duplicate)
250 mL, amber glass	filtered, 0.45 µm	none	stable isotope ratio, (H/D and $^{16}O/^{18}O$)
500 mL, high density polyethylene	not filtered	none	anions, cations, trace metals
1 liter, high density polyethylene	filtered, 0.45 µm	none	anions, cations, trace metals
1 liter, high density polyethylene	filtered, 0.45 µm	1+1 HNO_3 (trace metal grade)	cations, trace metals

Filtering was conducted using a Masterflex E/S Model 07571-00 sample pump with an Easy-load Masterflex L/S Model 7518-02 head, L/S 24 tygon tubing (Fisher 06429-24), and a Pall Gelman 12178 high capacity in-line groundwater sampling capsule. New tubing and filters were used for each zone. The bottles were not rinsed with sample before filling. The 40mL bottles were IChem T146-0040 VOA with septa. The 250mL bottles were IChem 349-0250 certified 300 series. The 500mL bottles were IChem N319-0500 certified 300 series. The 1000mL bottles were IChem N319-1000 certified 300 series. Sample bottles were filled completely to minimize headspace. Preservation consisted of 3mL (oxford pipet) of 1:1 nitric into 1 liter of solution. Samples were labeled, parafilmed, ziplocked, and placed in a cooler. The samples were transferred into a refrigerator once back at the motel.

27 OCT 03 BAW

EWDP Sampling - 19IM1 - Zone 5 (849.5-949.3')

Sampling conducted using the procedures, equipment, + reagents ~~in~~ BW 10-27-03 identified in 610/58-66

Calibrations
pH 7+10 used slope = ~~58.0~~ → 57.5 RVK 10-27-03

DO meter slope = 0.89 at 30°C

ORP probe used 468 soln
temp 30.5 set to 415 mV NHE

Cond cal w/ 180 µS/cm BW 27 OCT 03
temp 29.9 CF = 1.1352
temp 30.1 CF = 0.995 reads 176.8 µS/cm

SAMPLE
Air Temp = 31.3°C
pH - recalibrated - E-20 code for sample
pH - 8.86 at 27.2°C 15:08 - no challenge
DO at 5.55 mg/L at 31.5°C
ORP - 31.2°C at 431.0 (NHV - rel mV)
chal w/ quinhydrone pH 4 gives 450.5 at 30.3°C
COND - 418 µS/cm 31.6°C

27 OCT 03 CONT BAW

Alkalinity ~ 120 to 180 mg/L via test strip
2 phenol packets 10 for pink to clear (pH 8.3)
189 for light violet gray (pH 4.8)
192 for light pink (pH 4.5)
all in mg/L

28 OCT 03 - BAW

NC-EWDP-19IM-2 · Zone 5 (849.9-950.1')

Sampling conducted ~~using~~ using BW 10-28-03 the procedures, equipment, & reagents identified in 610/5866.

Calibrations

pH: using pH 7 + pH 10 slope = 57.7
Temp at 26.3°C
Dissolved Oxygen = slope 0.95 at 30.3°C
ORP = orp soln at 28.7 at 416 mV (NHE)
Cond = 30.4°C at 172.0 need 200 µS/cm
cell cor fact 1.163
30.3°C at 199.7 yields 172.3 µS/cm

SAMPLES Air Temp = 31.5°C
pH temp 28.3 pH 8.95 (8.95)
challenged with pH 10 reads 10.02
DO ~ 4.99 mg/L sample swirled
ORP ~ 430.2 at 29.4°C (mV-NHE)
challange ~ Quin pH buffer 4 ~ 448.8 at 30°C

Cond 426 ~~µ~~ µS/cm BW 10-28-03 at 30.7°C
challange w/ 180 read 171.3 at 29.2°C
Alkalinity ~ test strip at ~ 186 mg/L
pH 8.3 (pink to clear 17) mg/L
pH 4.8 (violet-gray) 188 mg/L
pH 4.5 (pink) 192 mg/L

NC-EWDP-16P

Air Temp 32.0°C

pH Cal ~ pH 7 + pH 10 slope = 57.6 at 28.1°C
sample 8.54 at 28.5°C
challenged with pH 10 reads 9.98 @ 27.1°C

Dissolved Oxygen = slope 0.94 @ 32.2°C
sample DO = 6.85 mg/L @ 31.5°C BW 10-28-03

ORP ~~Not Calibrated~~ BW 10-28-03 - ORP soln read
Temp 31°C set NHE 414.3 (rel mV)
673.9 at 30°C (mV NHE)
Chal w/ pH 4 in Quinhydrone measured 445.0 at 31.4°C (mV NHE)

Conductivity

Calibrate = Cell constant set to 1.000
cond = 180.4 µS/cm @ 31.7°C
sample = 460 µS/cm 30.9°C
chal w/ 180 read 173.2 µS/cm @ 30.2°C

28OCT03 CONT BAW / RVK

ORP remeasure with EC20+ Com 476576
ORP soln read 305.5 mV (Ag/AgCl)
Sample measured at 358 mV "
ORP pH4 Quin at 342 mV "

Alkalinity * test strip @ ≈ 120 mg/L
* Did not add phenolphthalein
– Titration = Add 2 packets bromcresol green – methyl red powder

pH 4.8 (violet gray) @ 147 mg/L
pH 4.5 (pink) @ 150 mg/L

ORP with Orion redo
ORP soln 413.5 at 27.4°C mV-NHE
Sample 662.7 at 30.0°C mV-NHE
Orp pH4 Quin. 444 at ~~25.1~~ BW 10-28-03
in mV (NHE). 31.5°C

For 16P - samples were collected early so each calibration was followed by sample analysis

11-3-03 BW

NC - EXDP - 19D

Air Temp = 29.5°C

CALIBRATIONS

pH : using pH 7 and pH 10 ; slope = 57.7
temp = 23.5°C

Dissolved O_2 : slope = 0.95 @ 26.2°C
ORP : ORP soln at 25.1°C set at 419.5 rel mV (NHE)
Cond : cal w/ 180 µS/cm at 177.4 µS/cm
cell const at 1.000 - no changes made

Sample
pH - at 27.2°C is 8.29
chal w/ pH 10 read 10.01 at 22.6°C
D.O - sample swirled (not stir bar)
read 4.30 at 27.8°C
ORP - Sample = 527.1 rel mV (NHE) at 28.3°C
chal 420.2 rel mV (NHE) at 24.4°C orp soln
Quin pH4 chal 459.2 at 23.3
Cond - 734 µS/cm at 28.6°C
chal with 1990 gave 1840 at 26.1°C

Alkalinity - test strip at lite blue (>240?)
pH 4.8 at 322
pH ~~4.6~~ 4.5 at 332
BW 10-29-03

29 OCT 03 - CONT BAW

NC-EWDP-75C Zone 4 (429.8 to 449.8')

30 OCT 03 - BAW

NC-EWDP-75C, Zone 4

Air Temp = 18.75°C

CALIBRATIONS

pH : Using pH 7.0 and pH 10.01
slope = 57.0
temp = 16.9°C

Dissolved O_2 : slope = 0.93 @ 18.9°C

ORP : ORP soln 19.1°C set at 424.4

SAMPLES:
pH 8.40 at 19.2
chal w/ pH 7 yields 7.09 15.7°C
Recalibrated with pH 7 & 10 slope 56.9 temp 15.6°C
sample 8.39 at 19.6°C
chal w/ pH 7 gave 7.03 @ 15.8°C

Dissolved O_2: swirled 3.43 mg/L at 20.3°C

11-3-03 BW

30 OCT 03 - BAW

ORP - chal w/ ORP soln 425.6 at 19.3°C
Sample = 550.0 mV (NHE)

Time lapse before samples read so used thermometer on pumped water at 22°C
After 18 min read 330.3 at 18.8°C. chal w/ ORP pH4 = 464 mV NHE at 20°C

COND : Calibrated w/ 180 µS/cm
For specified cond of 157 µS/cm @ 19°C, adjusted cell constant by correction factor:
1.000 x 0.8955 → resulted in
meter reading = 156.4 µS/cm @ 18.9°C

SAMPLE : 626 µS/cm @ 19.9°C
challenge w/ 1000 µS/cm standard = 871 µS/cm
" ~~w/ 180 µS/cm standard~~ = RLK 10-30-03

Re-calibrate conductivity meter w/ 1000 µS/cm standard

At 19°C for 1000 µS/cm standard, reads 971 µS/cm following recalibration.

Sample: 699 µS/cm @ 20.0°C

ORP redo w/ EL20 - orp soln 303.5
Sample an 92.3 orp Quin + pH4 at 355 mV (AgCl)

10-30-03 CONT BAW

Alkalinity - test strip lite blue (>240?)
pH 4.8 (violet) = 218 mg/L
pH 4.5 (pink) = 226 mg/L

All samples packed into coolers with blue ice on Thursday 10-30-03 and Fedex'ed next day air to San Antonio. Upon receipt Friday, samples are to be put into refrigerator in L156

03 NOV 03 BAW

The following pages contain summary data for the EWDP OCT 27-30 groundwater sampling event as documented in the field (610/58-74)

11-3-03 BW

03 NOV 03 CONT BAW

Local Well Number	NC-EWDP-19IM1	Zone (if applicable)	5 849.5 to 949.3
Time	1425	Date	10-27-03
Sampled by	Bradley & Working		
State	NV	District	nq
County	NYE		

	Value		Value	Units
Yeild when sampling (GPM)	1.6	Water temperatrue	31.5	C ORP
Minutes pumped before sampling	1057 - 1340 163 minutes	Air temperature	31.3	C
Sampling method		Specific conductance	418	microS/cm
Sampling condition		Dissolved Oxygen	5.55	mg/L
Static water level (feet)	352.04'	Eh	431	rel mV NHE
Depth to top sample interval	849.5'	pH field	8.86	
Depth to bottom sample interval	949.3'	Alkalinity total field	189/192 pH 4.8 / pH 4.5	mg/L as CaCO3
Finished well depth (feet)	949.3'	REMARKS:		
Hole depth (feet)	1012.5'			

Sample ID	Volume	Sample Treatment Key
19IM1-25-1003-FA	1000 mL	
19IM1-25-1003-FUA	1000 mL	F - filtered
19IM1-25-1003-UFUA	500 mL	A - acidifired
19IM1-25-1003-S-FUA	250 mL	U - prefix "un"
19IM1-25-1003-IC-FUA-1	40 mL	S - stable isotope
~~19IM1~~ BW 10-27-03		IC - inorganic carbon
19IM1-25-1003-IC-FUA-2	40 mL	

03 NOV 03 CONT BAW

Local Well Number	NC-EWDP-19IM2
Zone (if applicable)	5 849.9 to 950.1'
Time	12:30
Date	10-28-03
Sampled by	Bradley Worling
State	NV
District	
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	5	Water temperatrue	31.5	C
Minutes pumped before sampling	10:33 - 12:22 109 min	Air temperature	31.5	C
Sampling method		Specific conductance	426	microS/cm
Sampling condition		Dissolved Oxygen 4.99	~~5.55~~ BW 10-28-03	mg/L
Static water level (feet)	354.07'	Eh 430.2	~~431~~ BW 10-28-03	mV NHE
Depth to top sample interval	849.9'	pH field	8.95	
Depth to bottom sample interval	950.1'	Alkalinity total field	188/192	mg/L as CaCO3
Finished well depth (feet)	950.1'		pH 4.8 / pH 4.5	
Hole depth (feet)	945.6'	REMARKS:		

Sample ID	Volume	Sample Treatment Key
19IM2-25-1003-FA	1000 mL	
19IM2-25-1003-FUA	1000 mL	F - filtered
19IM2-25-1003-UFUA	500 mL	A - acidifired
19IM2-25-1003-S-FUA	250 mL	U - prefix "un"
19IM2-25-1003-IC-FUA-1	40 mL	S - stable isotope
19IM2-25-1003-IC-FUA-2	40 mL	IC - inorganic carbon

03 NOV 03 CONT BAW

Local Well Number	NC-EWDP-16P
Zone (if applicable)	na
Time	14:32
Date	10-28-03
Sampled by	Bradley Worling
State	NV
District	na
County	NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.41	Water temperatrue	31.5	C
Minutes pumped before sampling	5-6 8hr days	Air temperature	32.0	C
Sampling method		Specific conductance	460	microS/cm
Sampling condition		Dissolved Oxygen	6.85	mg/L
Static water level (feet)	498.91'	Eh	662.7	mV NHE
Depth to top sample interval	489.4'	pH field	8.54	
Depth to bottom sample interval	549.4'	Alkalinity total field	147/150	mg/L as CaCO3
Finished well depth (feet)	559.9'		pH 4.8 / pH 4.5	
Hole depth (feet)	2900.0'	REMARKS:		

Sample ID	Volume	Sample Treatment Key
16P-1003-FA	1000 mL	
16P-1003-FUA	1000 mL	F - filtered
16P-1003-UFUA	500 mL	A - acidifired
16P-1003-S-FUA	250 mL	U - prefix "un"
16P-1003-IC-FUA-1	40 mL	S - stable isotope
16P-1003-IC-FUA-2	40 mL	IC - inorganic carbon

03 NOV 03 CONT BAW

Local Well Number: NC-EWDP-19D

Zone (if applicable): 1 - sampled at 380'

Time: 10:50

Date: 10-29-03

Sampled by: Bradley Worling

State: NV

District: na

County: NYE

	Value		Value	Units
Yeild when sampling (GPM)	3.0	Water temperatrue	28.3	C
Minutes pumped before sampling	08:27 - 10:50 143 min	Air temperature	29.5	C
Sampling method		Specific conductance	734	microS/cm
Sampling condition		Dissolved Oxygen	4.30	mg/L
Static water level (feet)	3.56.00	Eh	527.1	mV NHE
Depth to top sample interval	see top of	pH field	8.29	
Depth to bottom sample interval	sheet	Alkalinity total field	322/332	mg/L as CaCO3
Finished well depth (feet)	1421.47'		pH 4.8 / pH 4.5	
Hole depth (feet)	1456.25'	REMARKS:		

Sample ID	Volume	Sample Treatment Key
19D-1003-FA	1000 mL	
19D-1003-FUA	1000	F - filtered
19D-1003-UFUA	BWS 10-29-03 ~~1000~~ 500	A - acidifired
19D-1003-5-FUA	250	U - prefix "un"
19D-1003-1C-FUA-1	40	S - stable isotope
19D-1003-1C-FUA-2	40	IC - inorganic carbon

03 NOV 03 CONT BAW

Local Well Number: NC-EWDP-75C

Zone (if applicable): 4 (429.8-449.8')

Time: 0905

Date: ~~10-29-03~~ 30 BW 10-30-03

Sampled by: Bradley Worling

State: NV

District: na

County: NYE

	Value		Value	Units
Yeild when sampling (GPM)	0.55 to 0.62	Water temperatrue	22.0	C
Minutes pumped before sampling	BW 10-30-03 ~~0530~~ 0450-0530 10-30-03; 12:00-16:00 10-29-03	Air temperature	18.75	C
Sampling method		Specific conductance	699	microS/cm
Sampling condition		Dissolved Oxygen	3.43	mg/L
Static water level (feet)	136 (normal) 10-29-03 172.0 after pumping 1 wk ago for 5 hrs	Eh	330.3	mV NHE
Depth to top sample interval	429.8'	pH field	8.39	
Depth to bottom sample interval	449.8'	Alkalinity total field	218/226	mg/L as CaCO3
Finished well depth (feet)	459.7'		pH 4.8 / pH 4.5	
Hole depth (feet)	778.5'	REMARKS:		

Sample ID	Volume	Sample Treatment Key
75C-24-1003-FA	1000 mL	
75C-24-1003-FUA	1000 mL	F - filtered
75C-24-1003-UFUA	500 mL	A - acidifired
75C-24-1003-5-FUA	250 mL	U - prefix "un"
75C-24-1003-1C-FUA-1	40 mL	S - stable isotope
75C-24-1003-1C-FUA-2	40 mL	IC - inorganic carbon

04 NOV 03 BAW

Preparation of EWDP samples for Stable Isotope Analysis

Samples: 250 mL glass S-FUA from 27-30 Oct 2003 on 610/74-79

Each sample was split into two duplicate aliquots. Each aliquot was poured into a 60 mL pp bottle with minimal head space
Five sets generated 10 samples
~~Two field blanks were generated~~
BW 11-4-03
Two QA tap water samples were generated as described so 12 total samples were sent.
Tap water from Lab 106 (1st room with exit door - cold water line) was run for 5 minutes
A 60 mL pp bottle was rinsed three times with this water. Then it was filled completely and capped. Process repeated for second bottle.
Suffixes -1 and -2 were used to ID duplicates.
NC-EWDP dropped from prefix
Tap water QA labeled 91Q-1003-S-FUA-1+2
Samples parafilmed and returned to refrigerator

04 NOV 03 CONT BAW

Preparation of QA standard - Cation Analysis for EWDP samples 27-30 OCT 03

Target values for cation QA std
10 ppm Calcium, 6 ppm Potassium, ~~40~~ BW 11-4-03
20 ppm Silicon, and 30 ppm Sodium

Reagents: nanopure typel water
1000 ppm Ca: Spex Certiprep PLCA2-2X lot 9-186CA
1000 ppm K: Spex Certiprep PLK2-2Y lot 9-140K
1000 ppm Si: Spex Certiprep PLSI9-2Y lot 10-075I
1000 ppm Na: Spex Certiprep PLNA2-2Y lot 10-46NA

Added 5 mL of Ca 1000 ppm, 3 mL of 1000 ppm K, 10 mL of Si 1000 ppm, + 15 mL of 1000 ppm Na (vol pipets) into 500 mL vol flask and filled to mark w/ nanopure typel water. Labeled 98Q-1003-FA after transferring into a 500 mL HDPE bottle (same as used in field)

Preparation of QA standard - Anion Analysis for EWDP samples 27-30 OCT 03

Target values for anion QA std:
5 ppm Chloride and 2 ppm Nitrate

04 NOV 03 CONT BAW

Std was prepared by Jon B.

Reagents: nanopure typel water
1000 ppm Cl: Spex Certiprep AS-CL9-2X lot 7-147JY4
1000 ppm Nitrate: Spex Certiprep AS-NO39-2X lot 25-68 A5

Added 5mL of 1000ppm chloride and 2mL of 1000 ppm nitrate (vol pipets) into a 1L vol flask and filled to mark w/ nanopure typel water. Transferred soln into a 1L HDPE bottle (same as used in field) and labeled 99Q-1003-F4A.

05 NOV 03 BAW

Preparation of EWDP samples for cation and anion analysis by DivOl and SGS labs and reanalysis of some field measurements

- 1 Liter Filtered Acidified Samples
  These FA 1 Liter Samples (610/75-79) were to be analyzed by both DivOl and SGS Lakefield for cation/trace metals.

  No reanalysis ~~was~~ BAW 11-5-03 of any field measurements was performed on the 1L FA samples

05 NOV 03 CONT BAW

For labeling, the NC-EWDP prefix was dropped. The following suffixes were used:
DivOl Cation: 5 and 6 (dups)
SGS Cation: 7 and 8 (dups)
QA + dups for FA 1L
DivOl cation
2 QA Samples: 98Q 1003-FA-5 and 6 (610/81)
No dups
SGS cation
2 QA samples 98Q-1003-FA-7 and 8 (610/81)
1 Dup: 19IM1-25-1003-FA-8

Samples were decanted by Jon B.
DivOl Samples (cation) decanted into 30mL pp bottles
SGS cation samples decanted into 60mL pp bottles

- 1 Liter Filtered Unacidified Samples
  These FUA 1L samples (610/75-79) were to be analyzed for cation/trace metals and anions by both DivOl and SGS Lakefield.

  No reanalysis of any field measurements was performed on the 1L FUA samples.

05 NOV 03 CONT BAW

For labeling, the NC-EWDP prefix was dropped
The following suffixes were used:
Div01 Anions: 1 and 2 (dups)
SGS Anions: 3 and 4 (dups)
Div01 Cation: 5 and 6 (dups)
SGS Cation: 7 and 8 (dups)
QA and Dups for 1L FUA
Div01 Anion:
1 QA: 99Q-1003-FUA-1 (610/81-82)
1 Dup: 75C-24-1003-FUA-2
SGS Anion:
1 QA: 99Q-1003-FUA-3 (610/81-82)
1 Dup: 16P-1003-FUA-4
Div01 Cation - none
SGS Cation - none

Samples were decanted by Jon B.
Div01 and SGS anion samples were decanted into 125 mL pp bottles
Div01 cation samples decanted into 30mL pp bottles
SGS cation samples decanted into 60mL pp bottles

- 500mL Unfiltered, Unacidified samples
These UFUA (610/75-79) samples were to be analyzed by Div01 for cation/trace metal and anion analysis.

05 NOV 03 CONT BAW

ORP was remeasured on the UFUA 500mL samples

For labeling, the NC-EWDP prefix was dropped. The following suffixes were used:
Div01 anion: 1 and 2 (dups)
Div01 cation: 5 and 6 (dups)

QA and Dups for 500mL UFUA
Div01 anion: none
Div01 cation: none

Samples were decanted by Jon B.
Div01 anion samples were decanted into 125mL pp bottles. Div01 cation samples were decanted into 30 mL pp bottles.

ORP remeasurement

reagents: nanopure type 1 water
pH4 buffer powder pillows Hach 22269-95 lot A1355
pH7 buffer powder pillows Hach 22270-66 lot A3192
Quinhydrone: Arcos 41877-1000 lot B0010437-2
ORP soln: Orion Cat #967901 lot H51

05 NOV 03 CONT BAW

Added 1g (visual estimation) of quinhydrone to a 125 mL pp bottle. Added pH 4 buffer powder pillow. Added 100 mL (grad cylinder) of typel water and shook. Repeated process for pH 7 solution.

Duplicate samples were decanted into 30 mL pp cups. Stir bars were added. Analysis performed simultaneously on both samples. One was measured with the Hach EC20 with Corning 476516 probe. The other was measured with the Orion 290A+ with 9179BN probe

Orion 290A+

set mode to mV (Ag/AgCl)
Placed probe in pH 4 quinhydrone soln.
Measured at 257.6 mV (AgCl) at 22.3°C
~~Reset to 265 mV (AgCl)~~ BW 11/5/03
Switched to rel mV (NHE) and reset to 466
Measured pH 4 quinhydrone at 258.6 mV (AgCl)

Hach EC20

place probe in pH 4 quinhydrone
Measured 343.1 mV (AgCl)

05 NOV 03 CONT BAW

ORP Measurement UFUA samples

Well	290A+ mV	290A+ rel mV	290A+ temp	EC20 mV	
19IM1-25	122.5	329.7	16.2°C	121	
19IM2	132.6	339.6	15.3	123	
19D	158.3	365.3	15.2	172	
75C-Z4	165.4	372.6	15.6	183	
16P	143	350.6	15.6	182	
Quin pH 4	257.7	465.3	22.5	345.5	
Quin pH 7	81.5	289.4	22.3	171.6	
ORP soln	219.4	426.9	22.3	304.4	
19IM1-25	411.2	~~411.2~~ 614.5 BW 11-5-03	22.8	182	at 11:45
19IM-25	222.3	430	22.3	204	at 12:00

Time lapse for ORP measurements ~ 45 minutes

Much colored red precipitate at bottom of 16P-1003-UFUA 500 mL bottle

note for ORP measurements
mV = AgCl and rel mV = NHE

6 Nov 03 BAW

Chain of Custody for Dirol Anion and Cation/Trace metal analyses of EWDP Ground water samples - Oct 27-30, 2003

12 Anion samples (610/81-85)
- 10 well samples
- 1 QA sample
- 1 Dup sample

17 CATION samples (610/81-85)
- 15 well samples
- 2 QA samples
- 0 Dup samples

11-6-03 BAW

6 NOV CONT BAW

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Shipper Name/Address: BRAD WERLING
Client: CNWRA - DIV 20
BLD 57

Client Purchase Order/Other ID | Site/Zone ID | SwRI Contact: Mike Dammann

Requested Turnaround: ☐ 2 Weeks ☐ 3 Weeks ☒ Other: 4 wks

REMARKS
Preservation
a = HCl to pH <2
b = HNO_3 to pH <2 Same
c = H_2SO_4 to pH <2
d = NaOH to pH >12
e = Cool (4°C±2°C)
f = Other (specify)

SwRI Project#: 20.06002.01.111

Received by SwRI Lab: (Signature) [signature]

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC except phosphate	Phosphate by 365.3									Intact	Nuclear Safety Related - Use appropriate QA procedures. PCC: Brad Werling phone 6565 fax 5184
19IM1-25-1003-UFUA-1	11-05-03		W		1	X	X									✓	
19IM2-25-1003-UFUA-1	11-05-03		W		1	X	X									✓	
16P-1003-UFUA-1	11-5-03		W		1	X	X									✓	
19D-1003-UFUA-1	11-5-03		W		1	X	X									✓	
75C-24-1003-UFUA-1	11-5-03		W		1	X	X									✓	

Relinquished by (Print/Signature): Brad Werling / Brad Werling — Date 11-6-03 Time 0910
Received by (Print/Signature): Brad Werling — Date Time
Relinquished by (Print/Signature): Date Time
Received by (Print/Signature): Date Time
Relinquished by (Print/Signature): Date Time

Received by SwRI Lab: Date 11/6/03 Time 0910
Samples Disposed: Date Time
Samples Disposed by: Date Time

Page 3 of 3

Matrix Types:
A – Air
B – Biota
D - Dust
E – Emission/Stack
L - Liquid
P – Product
Sd - Solid
S – Soil
SED – Sediment
T - Tissue
W - Water
WP - Wipe

Sample Types:
D - Duplicate
ER – Equipment Rinsate
ES – Environmental Sample
FB – Field Blank
FD – Field Duplicate
MS – Matrix Spike
MSD – Matrix Spike Dup
TB – Trip Blank

Temp: amb | Therm #: 020

Comments: 610/81-85 EWDP - 27-30 Oct

Relinquished by (Print/Signature)

Div 01 COC Form 01-01-001, Rev 8/02

6 Nov Cont

Shipper Name/Address: BRAD WERLING CNWRA- DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC except phosphate	Phosphate by 365.3							Intact		REMARKS
19IM1-Z5-	11-5-03		W		1	X	X							✓		Nuclear Safety
1003-FUA-1																Related - Use
19IM2-Z5-	11-5-03		W		1	X	X							✓		appropriate QA
1003-FUA-1																procedures
19D-1003-	11-5-03		W		1	X	X							✓		
FUA-1																POC: Brad Werling
16P-1003-	11-5-03		W		1	X	X							✓		phone 6565
FUA-1																fax 5184
7SC-Z4-	11-5-03		W		1	X	X							✓		
1003-FUA-1																

Preservation:
- a = HCl to pH <2
- b = HNO_3 to pH <2 Some
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22C Therm #: 026

Comments: 610/81-85 EWDP 27-30 OCT

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature) [signature]

Date: 11/6/03 Time: 0916

Samples Disposed: Date / Time

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 2 of 3

6 Nov Cont

Shipper Name/Address: BRAD WERLING CNWRA- DIV 20 BLD 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC except phosphate	Phosphate by 365.3							Intact		REMARKS
7SC-Z4-	11-5-03		W		1	X	X							✓		Nuclear Safety
1003-FUA-2																Related - Use
99Q-1003-	11-5-03		W		1	X	X							✓		appropriate QA
FUA-1																procedures
																POC: Brad Werling
																phone 6565
																fax 5184

Preservation:
- a = HCl to pH <2
- b = HNO_3 to pH <2 Some
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22C Therm #: 026

Comments: 610/81-85 EWDP 27-30 OCT

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature) [signature]

Date: 11/6/03 Time: 0916

Samples Disposed: Date / Time

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 3 of 3

Shipper Name/Address: BRAD WERLING X6565
CNWRA - DIV 20
BLD - 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP								intact		REMARKS
19IM1-Z5-1003-	11-5-03		W		1	X								✓		Nuclear Safty
UFUA-5																Related-use
19IM2-Z5-1003-	11-5-03		W		1	X								✓		appropriate QA
UFUA-5																procedures
7SC-Z4-1003-	11-5-03		W		1	X								✓		
UFUA-5																POC - Brad Werling
16P-1003-	11-5-03		W		1	X								✓		phone - 6565
UFUA-5																fax - 5184
19D-1003-	11-5-03		W		1	X								✓		
UFUA-5																

Preservation
- a = HCl to pH <2
- b = HNO_3 to pH <2
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22°C

Therm #: 026

Comments:
610/81-85 EWDP 27-Oct

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature)

Date: 11/6/03 Time: 0916

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 1 of 4

6 Nov Cont

Shipper Name/Address: BRAD WERLING
CNWRA - DIV 20
BLD - 57

Client:

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- ☐ 2 Weeks
- ☐ 3 Weeks
- ☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dammann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP								intact		REMARKS
98Q-1003-	11-5-03		W		1	X								✓		Nuclear Safty
FA-6																Related-use
98Q-1003-	11-5-03		W		1	X								✓		appropriate QA
FA-5																procedures
19IM1-Z5-1003-	11-5-03		W		1	X								✓		
FUA-5																POC - Brad Werling
19IM2-Z5-1003-	11-5-03		W		1	X								✓		phone - 6565
FUA-5																fax - 5184
19D-1003-	11-5-03		W		1	X								✓		
FUA-5																

Preservation
- a = HCl to pH <2
- b = HNO_3 to pH <2
- c = H_2SO_4 to pH <2
- d = NaOH to pH >12
- e = Cool (4°C±2°C)
- f = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22°C

Therm #: 026

Comments:
610/81-85 EWDP 27-30-Oct

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: 20.06002.01.141

Received by SwRI Lab: (Signature)

Date: 11/6/03 Time: 0916

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 2 of 4

6 Nov Cont

6 Nov Cont

Shipper Name/Address: Brad Werling CNWRA-DIV 20 BLD-57

Client:

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
☐ 2 Weeks
☐ 3 Weeks
☒ Other: 4 wks

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dunmann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP								Intact		REMARKS
16P-1003-	11-5-03		W		1	X								✓		Nuclear Safety
FUA-5																Related - use
7SC-Z4-1003-	11-5-03		W		1	X								✓		appropriate QA
FUA-5																procedures
19IM1-Z5-1003	11-5-03		W		1	X								✓		
FA-5																POC - Brad Werling
19IM2-Z5-	11-5-03		W		1	X								✓		phone - 6565
1003-FA-5																Fax - 5184
16P-1003-	11-5-03		W		1	X								✓		
FA-5																20.06002.01.141

Matrix Types:
A – Air
B – Biota
D - Dust
E – Emission/Stack
L - Liquid
P – Product
Sd - Solid
S – Soil
SED – Sediment
T - Tissue
W - Water
WP - Wipe

Sample Types:
D - Duplicate
ER – Equipment Rinsate
ES – Environmental Sample
FB – Field Blank
FD – Field Duplicate
MS – Matrix Spike
MSD – Matrix Spike Dup
TB – Trip Blank

Temp: 22°C Therm #: 026

Comments: 610/81-85 EWDP 27-30-Oct

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: —

Received by SwRI Lab: (Signature)

Date 11/6/03 Time 0916

Samples Disposed: Date Time

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

Page 3 of 4

Shipper Name/Address: BRAD WERLING CNWRA - DIV 20 BLD-57

Client:

SAMPLE LIST/CHAIN OF CUSTODY
Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
☐ 2 Weeks
☐ 3 Weeks
☒ Other: 4 WKS

Client Purchase Order/Other ID:

Site/Zone ID:

SwRI Contact: Mike Dunmann

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP								Intact		REMARKS
19D-1003-	11-5-03		W		1	X								✓		Nuclear Safety
FA-5																Related - use
7SC-Z4-1003-	11-5-03		W		1	X								✓		appropriate QA
FA-5																procedures
																POC - Brad Werling
																phone - 6565
																Fax - 5184
																20.06002.01.141

Matrix Types:
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MSD – Matrix Spike Dup
TB – Trip Blank

Temp: Therm #:

Comments: 610/81-85 EWDP 27-30-Oct

Relinquished by (Print/Signature)	Date	Time
Brad Werling / Brad Werling	11-6-03	0916
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time
Received by (Print/Signature)	Date	Time
Relinquished by (Print/Signature)	Date	Time

SwRI Project#: —

Received by SwRI Lab: (Signature)

Date 11/6/03 Time 0916

Samples Disposed: Date Time

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

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14 Nov 03 BAW

Div 01 ICP results for Neptunium/Calcite Series 13+14 Experimental + Reference Solns

Samples from 610/14-17 (chain of custody) consisted of 1's + 2's. The 3's were used for inorganic carbon analysis (610/18)

QA summary results followed by Div 01 spreadsheet info for all of the samples

13Q1 and 13Q2 were aliquots from the same prepared standard.
Source for target values: 556/194-195

For Sample 13Q1

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	100	92.4	-7.6
Potassium	20	23	15
Strontium	20	19.8	-1
Sodium	100	101	1

For Sample 13Q2

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	100	92.1	-7.9
Potassium	20	22.6	13
Strontium	20	20.2	1
Sodium	100	100	0

Duplicate Analysis of QA standard

Analyte	13Q1 Conc (ppm)	13Q2 Conc (ppm)	Percent Difference
Calcium	92.4	92.1	-0.3
Potassium	23	22.6	-1.7
Strontium	19.8	20.2	2.0
Sodium	101	100	-1.0

14 Nov 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
SRR: 24974

Client: Division 20
Date Received: 09/18/03
Project No.: 06002.01.141
TO: 030918-4

Sample ID	Lab System ID	Calcium Results (mg/L)	Magnesium Results (mg/L)	Manganese Results (mg/L)	Potassium Results (mg/L)	Sodium Results (mg/L)	Strontium Results (mg/L)
Prep Blank - 54 203	----	<0.05	<0.05	<0.005	<0.1	<0.25	<0.005
Lab Control - J23W1	----	19.3	19.2	0.486	16.4	17.3	4.03
True Value	----	20.0	20.0	0.500	20.0	20.0	4.00
Recovery	----	96.5%	96.0%	97.2%	82.0%	86.5%	101%
Prep Blank - 54 204	----	<0.05	<0.05	<0.005	<0.1	<0.25	<0.005
Lab Control - J23W2	----	19.4	19.3	0.490	16.3	17.1	3.97
True Value	----	20.0	20.0	0.500	20.0	20.0	4.00
Recovery	----	97.0%	96.5%	98.0%	81.5%	85.5%	99.3%
13 C1	234759	277	<0.05	<0.005	4.03	47.1	0.048
Duplicate result	234759	274	<0.05	<0.005	4.08	47.0	0.048
RPD	234759	1.09%	0.00%	0.00%	1.23%	0.21%	0.00%
13 C2	234760	274	<0.05	<0.005	2.52	46.4	0.048
Spike result	234760	471	19.9	0.487	26.4	70.1	4.08
Spike added	234760	200	20.0	0.500	20.0	20.0	4.00
Recovery	234760	98.5%	99.5%	97.4%	119%	119%	101%
13 D1	234761	74.8	<0.05	<0.005	2.16	51.5	0.022
13 D2	234762	73.8	<0.05	<0.005	2.15	53.1	0.022
13 E1	234763	21.3	<0.05	<0.005	2.07	69.0	0.014
13 E2	234764	21.5	<0.05	<0.005	2.38	67.6	0.013
13 F1	234765	7.09	<0.05	<0.005	2.65	103	0.010
13 F2	234766	6.93	<0.05	<0.005	2.18	99.1	0.010
13 Q1	234767	92.4	<0.05	<0.005	23.0	101	19.8
13 Q2	234768	92.1	<0.05	<0.005	22.6	100	20.2
14 C1	234769	277	<0.05	<0.005	2.52	47.3	0.048
14 C2	234770	271	<0.05	<0.005	2.28	47.0	0.048
14 D1	234771	73.8	<0.05	<0.005	2.61	52.7	0.022
14 D2	234772	73.7	<0.05	<0.005	3.00	52.7	0.022
14 E1	234773	21.6	<0.05	<0.005	2.99	68.6	0.014
14 E2	234774	21.5	<0.05	<0.005	2.05	68.9	0.014
14 F1	234775	6.94	<0.05	<0.005	3.10	102	0.010
14 F2	234776	6.95	<0.05	<0.005	2.52	104	0.010
NPCA1314 Ref C	234777	282	<0.05	<0.005	0.222	11.9	0.048
NPCA1314 Ref D	234778	75.5	<0.05	<0.005	0.160	18.8	0.022
NPCA1314 Ref E	234779	22.7	<0.05	<0.005	0.177	33.7	0.012
Duplicate result	234779	22.2	<0.05	<0.005	0.163	33.5	0.011
RPD	234779	2.23%	0.00%	0.00%	8.24%	0.60%	8.70%
NPCA1314 Ref F	234780	7.74	<0.05	<0.005	0.158	64.7	0.008
Spike result	234780	27.2	19.8	0.489	23.0	91.5	4.05
Spike added	234780	20.0	20.0	0.500	20.0	20.0	4.00
Recovery	234780	97.3%	99.0%	97.8%	114%	134%	101%
Reporting Limit:		0.05 mg/L	0.05 mg/L	0.005 mg/L	0.1 mg/L	0.25 mg/L	0.005 mg/L

17 Nov 03 BAW

SGS Cation/Trace Metal ~~result~~ BW 11-17-03 Results for EWDP groundwater sampling event 27~~Oct~~ BW 11-17-03 Sep to 03Oct 2003

Samples from 610/44-47
QA Samples from 610/43-44
From NC-EWDP wells 4PB, 19P, 24P, 27P, 28P, + 29P
Field blank - 4FB
2 QAs - duplicates - aliquots from ~~sample~~ BW 11-17-03 same stock solution

Accuracy and Precision Sumary data followed by complete results

QA Accuracy Results

Results in mg/L

For Sample 88Q-1003-FA7

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	20	18.6	-7.00
Potassium	12	15.5	29.17
Sodium	60	54.6	-9.00
Silicon	40	36.5	-8.75

For Sample 88Q-1003-FA8

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	20	18.6	-7.00
Potassium	12	15.5	29.17
Sodium	60	54.7	-8.83
Silicon	40	36.9	-7.75

17 NOV 03 CONT BAW

SGS Cation Results for EWDP groundwater sampling event Sep 28 to Oct 03, 2003

Duplicate Analysis Results - Precision info

Results in mg/L

	27P-0903 FUA7	27P-0903 FUA8	Percent Difference		88Q-1003 FA7	88Q-1003 FA8	Percent Difference
Ag	< 0.0001	< 0.0001	na	Ag	< 0.0001	< 0.0001	na
Al	0.39	0.40	-2.56	Al	0.007	0.007	0
As	0.025	0.024	4.00	As	< 0.005	< 0.005	na
Ba	0.004	0.004	0.00	Ba	< 0.001	< 0.001	na
Be	< 0.005	< 0.005	na	Be	< 0.005	< 0.005	na
B	0.22	0.22	0.00	B	< 0.05	< 0.05	na
Bi	< 0.05	< 0.05	na	Bi	< 0.05	< 0.05	na
Ca	3.66	3.68	-0.55	Ca	18.6	18.6	0
Cd	< 0.0001	< 0.0001	na	Cd	< 0.0001	< 0.0001	na
Co	< 0.0003	< 0.0003	na	Co	< 0.0003	< 0.0003	na
Cr	0.005	0.005	0.00	Cr	< 0.001	< 0.001	na
Cu	< 0.0008	< 0.0008	na	Cu	0.0011	0.0010	9.09
Fe	0.22	0.22	0.00	Fe	< 0.05	< 0.05	na
K	5.04	5.05	-0.20	K	15.5	15.5	0
Li	0.095	0.094	1.05	Li	< 0.004	< 0.004	na
Mg	0.81	0.82	-1.23	Mg	< 0.02	< 0.02	na
Mn	0.003	0.003	0.00	Mn	< 0.002	< 0.002	na
Mo	0.11	0.11	0.00	Mo	< 0.0003	< 0.0003	na
Na	100	101	-1.00	Na	54.6	54.7	-0.183
Ni	< 0.001	< 0.001	na	Ni	< 0.001	0.001	na
Pb	0.0004	0.0004	0.00	Pb	0.0002	0.0003	-50.0
Sb	0.0011	0.0010	9.09	Sb	< 0.0004	< 0.0004	na
Se	< 0.005	< 0.005	na	Se	< 0.005	< 0.005	na
Si	18.1	18.3	-1.10	Si	36.5	36.9	-1.10
Sn	< 0.001	< 0.001	na	Sn	< 0.001	< 0.001	na
Sr	0.045	0.043	4.44	Sr	0.0005	0.0005	0
Ti	0.003	0.003	0.00	Ti	< 0.003	< 0.003	na
Tl	< 0.0002	< 0.0002	na	Tl	< 0.0002	< 0.0002	na
U	0.0043	0.0044	-2.33	U	< 0.0002	< 0.0002	na
V	0.014	0.014	0.00	V	< 0.0009	< 0.0009	na
W	0.011	0.010	9.09	W	< 0.0002	< 0.0002	na
Y	< 0.0001	< 0.0001	na	Y	< 0.0001	< 0.0001	na
Zn	0.002	0.002	0.00	Zn	0.003	0.003	0
Zr	0.0005	0.0005	0.00	Zr	0.0009	0.0005	44.4

Precision + Accuracy numbers acceptable, Data from PO number 470275N accepted on 11-17-03 by Bradley Werling (Bradley Werling)

17 NOV 03 CONT BAW

Report No. CA4398-OCT03
PO# 470275N
Results in mg/L

	4PB-1003 FA7	4PB-1003 FUA7	19P-1003 FA7	19P-1003 FUA7	24P-0903 FA7	24P-0903 FUA7	27P-0903 FA7	27P-0903 FUA7	27P-0903 FUA8
Ag	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Al	0.058	0.038	0.007	< 0.004	0.014	0.009	0.15	0.39	0.40
As	0.041	0.059	< 0.005	< 0.005	< 0.005	< 0.005	0.015	0.025	0.024
Ba	0.001	< 0.001	0.006	0.004	0.028	0.022	0.006	0.004	0.004
Be	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
B	0.13	0.13	0.13	0.13	0.14	0.14	0.21	0.22	0.22
Bi	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ca	4.90	3.78	17.0	16.9	15.2	14.9	4.21	3.66	3.68
Cd	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Co	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Cr	0.003	0.005	< 0.001	0.002	< 0.001	0.003	< 0.001	0.005	0.005
Cu	0.0013	0.0009	0.0014	0.0008	0.0010	< 0.0008	0.0015	< 0.0008	< 0.0008
Fe	0.23	0.24	0.28	0.28	< 0.05	< 0.05	0.13	0.22	0.22
K	1.83	1.88	4.93	5.04	5.24	5.32	4.93	5.04	5.05
Li	0.040	0.038	0.040	0.040	0.056	0.055	0.093	0.095	0.094
Mg	0.058	0.056	1.38	1.39	1.28	1.29	0.79	0.81	0.82
Mn	0.015	0.009	0.096	0.070	0.16	0.12	0.007	0.003	0.003
Mo	0.0083	0.0090	0.0084	0.0087	0.063	0.064	0.10	0.11	0.11
Na	56.8	56.5	40.3	40.3	52.6	52.5	99.5	100	101
Ni	< 0.001	< 0.001	0.003	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Pb	< 0.0002	< 0.0002	0.0003	< 0.0002	< 0.0002	< 0.0002	0.0005	0.0004	0.0004
Sb	0.0004	0.0005	< 0.0004	< 0.0004	< 0.0004	0.0004	0.0009	0.0011	0.0010
Se	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Si	16.4	16.2	21.3	21.3	15.5	15.4	17.5	18.1	18.3
Sn	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sr	0.030	0.031	0.056	0.058	0.064	0.065	0.042	0.045	0.043
Ti	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.003	0.003
Tl	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
U	0.0005	0.0005	0.0008	0.0007	0.0007	0.0007	0.0042	0.0043	0.0044
V	0.015	0.021	0.0019	0.0085	< 0.0009	0.0083	0.0025	0.014	0.014
W	0.0052	0.013	0.0004	0.0016	0.0015	0.0025	0.0088	0.011	0.010
Y	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zn	0.003	0.001	0.006	0.003	0.004	< 0.001	0.002	0.002	0.002
Zr	< 0.0004	< 0.0004	0.0015	< 0.0004	< 0.0004	< 0.0004	< 0.0004	0.0005	0.0005

11-17-03 BAW

17 NOV 03 CONT BAW

	28P-0903 FA7	28P-0903 FUA7	29P-1003 FA7	29P-1003 FUA7	4FB-1003 FA7	88Q-1003 FA7	88Q-1003 FA8	Env Blank	Env Standard
Ag	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	100%
Al	0.033	0.51	0.022	0.009	< 0.004	0.007	0.007	< 0.004	99%
As	0.018	0.029	0.011	0.015	< 0.005	< 0.005	< 0.005	< 0.005	105%
Ba	0.006	0.003	0.014	0.012	< 0.001	< 0.001	< 0.001	< 0.001	105%
Be	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	97%
B	0.20	0.20	0.13	0.13	< 0.05	< 0.05	< 0.05	< 0.05	94%
Bi	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	98%
Ca	3.25	2.51	12.0	11.5	< 0.05	18.6	18.6	< 0.05	95%
Cd	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	101%
Co	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	99%
Cr	< 0.001	0.005	< 0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	96%
Cu	0.0018	0.0018	0.0010	< 0.0008	0.0008	0.0011	0.0010	< 0.0008	104%
Fe	0.06	0.31	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	98%
K	5.89	5.79	5.26	5.25	< 0.02	15.5	15.5	< 0.02	94%
Li	0.070	0.064	0.050	0.046	< 0.004	< 0.004	< 0.004	< 0.004	96%
Mg	0.29	0.36	1.02	1.00	< 0.02	< 0.02	< 0.02	< 0.02	95%
Mn	< 0.002	< 0.002	0.008	0.005	< 0.002	< 0.002	< 0.002	< 0.002	101%
Mo	0.013	0.014	0.0071	0.0071	< 0.0003	< 0.0003	< 0.0003	< 0.0003	100%
Na	97.2	98.9	49.0	48.6	< 0.05	54.6	54.7	< 0.05	91%
Ni	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	101%
Pb	0.0007	0.0008	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0003	< 0.0002	103%
Sb	0.0014	0.0016	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	104%
Se	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	102%
Si	27.5	28.7	24.6	24.8	< 0.05	36.5	36.9	< 0.05	106%
Sn	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	101%
Sr	0.032	0.032	0.066	0.068	< 0.0002	0.0005	0.0005	< 0.0002	96%
Ti	< 0.003	0.005	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	102%
Tl	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	104%
U	0.0046	0.0045	0.0010	0.0009	< 0.0002	< 0.0002	< 0.0002	< 0.0002	102%
V	0.0054	0.017	0.0062	0.012	< 0.0009	< 0.0009	< 0.0009	< 0.0009	96%
W	0.0023	0.0030	0.0034	0.0042	< 0.0002	< 0.0002	< 0.0002	< 0.0002	100%
Y	0.0019	0.0022	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	95%
Zn	0.002	0.004	0.003	< 0.001	< 0.001	0.003	0.003	< 0.001	105%
Zr	< 0.0004	0.0007	< 0.0004	< 0.0004	< 0.0004	0.0009	0.0005	< 0.0004	94%

11-17-03 BAW

SGS
SGS Lakefield Research Limited
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2038 FAX: 705-652-6441

PO#470275N

Southwest Research Institute
Attn : Bradley Werling bwerling@swri.org

6220 Culebra Road
San Antonio, TX, 78238-5166
USA

Phone: 210-522-6565
Fax:

Tuesday, November 04, 2003

Date Rec. : 21 October 2003
LR Report: **CA4398-OCT03**

Copy: #1

17 Nov 03 Const BAW

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Date	2: Analysis Time	3: 4FB-1003-FA7	4: 4PB-1003-FA7	5: 4PB-1003-FVA7	6: 19P-1003-FVA7	7: 19P-1003-FA7	8: 24P-0903-FA7	9: 24P-0903-FVA7	10: 27P-0903-FA7
Sample Date & Time			Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA
Temperature [°C]	---	---	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
Silver [mg/L]	03-Nov-03	20:00	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aluminum [mg/L]	03-Nov-03	20:00	< 0.004	0.058	0.038	< 0.004	0.007	0.014	0.009	0.15
Arsenic [mg/L]	03-Nov-03	20:00	< 0.005	0.041	0.059	< 0.005	< 0.005	< 0.005	< 0.005	0.015
Barium [mg/L]	03-Nov-03	20:00	< 0.001	0.001	< 0.001	0.004	0.006	0.028	0.022	0.006
Beryllium [mg/L]	03-Nov-03	20:00	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Boron [mg/L]	30-Oct-03	08:03	< 0.05	0.13	0.13	0.13	0.13	0.14	0.14	0.21
Bismuth [mg/L]	30-Oct-03	08:03	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Calcium [mg/L]	30-Oct-03	08:03	< 0.05	4.90	3.78	16.9	17.0	15.2	14.9	4.21
Cadmium [mg/L]	03-Nov-03	20:00	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Cobalt [mg/L]	03-Nov-03	20:00	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Chromium [mg/L]	03-Nov-03	20:00	< 0.001	0.003	0.005	0.002	< 0.001	< 0.001	0.003	< 0.001
Copper [mg/L]	03-Nov-03	20:00	0.0008	0.0013	0.0009	0.0008	0.0014	0.0010	< 0.0008	0.0015
Iron [mg/L]	30-Oct-03	08:03	< 0.05	0.23	0.24	0.28	0.28	< 0.05	< 0.05	0.13
Potassium [mg/L]	30-Oct-03	08:03	< 0.02	1.83	1.88	5.04	4.93	5.24	5.32	4.93
Lithium [mg/L]	03-Nov-03	20:00	< 0.004	0.040	0.038	0.040	0.040	0.056	0.055	0.093
Magnesium [mg/L]	30-Oct-03	08:03	< 0.02	0.058	0.056	1.39	1.38	1.28	1.29	0.79
Manganese [mg/L]	30-Oct-03	08:03	< 0.002	0.015	0.009	0.070	0.096	0.16	0.12	0.007
Molybdenum [mg/L]	03-Nov-03	20:00	< 0.0003	0.0083	0.0090	0.0087	0.0084	0.063	0.064	0.10
Sodium [mg/L]	30-Oct-03	08:03	< 0.05	56.8	56.5	40.3	40.3	52.6	52.5	99.5

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PO#470275N

LR Report : CA4398-OCT03

17 Nov 03 Const BAW

Analysis	1: Analysis Date	2: Analysis Time	3: 4FB-1003-FA7	4: 4PB-1003-FA7	5: 4PB-1003-FVA7	6: 19P-1003-FVA7	7: 19P-1003-FA7	8: 24P-0903-FA7	9: 24P-0903-FVA7	10: 27P-0903-FA7
Nickel [mg/L]	03-Nov-03	20:00	< 0.001	< 0.001	< 0.001	0.002	0.003	< 0.001	< 0.001	< 0.001
Lead [mg/L]	03-Nov-03	20:00	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003	< 0.0002	< 0.0002	0.0005
Antimony [mg/L]	03-Nov-03	20:00	< 0.0004	0.0004	0.0005	< 0.0004	< 0.0004	< 0.0004	0.0004	0.0009
Selenium [mg/L]	03-Nov-03	20:00	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Silicon [mg/L]	30-Oct-03	08:03	< 0.05	16.4	16.2	21.3	21.3	15.5	15.4	17.5
Tin [mg/L]	03-Nov-03	20:00	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Strontium [mg/L]	03-Nov-03	20:00	< 0.0002	0.030	0.031	0.058	0.056	0.064	0.065	0.042
Titanium [mg/L]	03-Nov-03	20:00	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Thallium [mg/L]	03-Nov-03	20:00	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Uranium [mg/L]	03-Nov-03	20:00	< 0.0002	0.0005	0.0005	0.0007	0.0008	0.0007	0.0007	0.0042
Vanadium [mg/L]	03-Nov-03	20:00	< 0.0009	0.015	0.021	0.0085	0.0019	< 0.0009	0.0083	0.0025
Tungsten [mg/L]	03-Nov-03	20:00	< 0.0002	0.0052	0.013	0.0016	0.0004	0.0015	0.0025	0.0088
Yttrium [mg/L]	03-Nov-03	20:00	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc [mg/L]	03-Nov-03	20:00	< 0.001	0.003	0.001	0.003	0.006	0.004	< 0.001	0.002
Zirconium [mg/L]	03-Nov-03	20:00	< 0.0004	< 0.0004	< 0.0004	< 0.0004	0.0015	< 0.0004	< 0.0004	< 0.0004

Brian Graham B.Sc.
Project Coordinator
Environmental Services, Analytical

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Tuesday, November 04, 2003

Date Rec. : 21 October 2003
LR Report: **CA4398-OCT03**

Copy: #1

17 Nov 03 CONT BAHS

CERTIFICATE OF ANALYSIS
Final Report

Analysis	11: 27P-0903-FVA7	12: 27P-0303-FVA8	13: 28P-0903-FVA7	14: 28P-0903-FA7	15: 29P-1003-FA7	16: 29P-1003-FVA7	17: 88Q-1003-FA7	18: 88Q-1003-FA8	19: Env Blank	20: Env Standard
Sample Date & Time	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA	Date:NA		
Temperature [°C]	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	---	---
Silver [mg/L]	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	100%
Aluminum [mg/L]	0.39	0.40	0.51	0.033	0.022	0.009	0.007	0.007	< 0.004	99%
Arsenic [mg/L]	0.025	0.024	0.029	0.018	0.011	0.015	< 0.005	< 0.005	< 0.005	105%
Barium [mg/L]	0.004	0.004	0.003	0.006	0.014	0.012	< 0.001	< 0.001	< 0.001	105%
Beryllium [mg/L]	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	97%
Boron [mg/L]	0.22	0.22	0.20	0.20	0.13	0.13	< 0.05	< 0.05	< 0.05	94%
Bismuth [mg/L]	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	98%
Calcium [mg/L]	3.66	3.68	2.51	3.25	12.0	11.5	18.6	18.6	< 0.05	95%
Cadmium [mg/L]	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	101%
Cobalt [mg/L]	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	99%
Chromium [mg/L]	0.005	0.005	0.005	< 0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001	96%
Copper [mg/L]	< 0.0008	< 0.0008	0.0018	0.0018	0.0010	< 0.0008	0.0011	0.0010	< 0.0008	104%
Iron [mg/L]	0.22	0.22	0.31	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	98%
Potassium [mg/L]	5.04	5.05	5.79	5.89	5.26	5.25	15.5	15.5	< 0.02	94%
Lithium [mg/L]	0.095	0.094	0.064	0.070	0.050	0.046	< 0.004	< 0.004	< 0.004	96%
Magnesium [mg/L]	0.81	0.82	0.36	0.29	1.02	1.00	< 0.02	< 0.02	< 0.02	95%
Manganese [mg/L]	0.003	0.003	< 0.002	< 0.002	0.008	0.005	< 0.002	< 0.002	< 0.002	101%
Molybdenum [mg/L]	0.11	0.11	0.014	0.013	0.0071	0.0071	< 0.0003	< 0.0003	< 0.0003	100%
Sodium [mg/L]	100	101	98.9	97.2	49.0	48.6	54.6	54.7	< 0.05	91%
Nickel [mg/L]	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	101%

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PO#470275N

LR Report : CA4398-OCT03

17 Nov 03 CONT BAHS

Analysis	11: 27P-0903-FVA7	12: 27P-0303-FVA8	13: 28P-0903-FVA7	14: 28P-0903-FA7	15: 29P-1003-FA7	16: 29P-1003-FVA7	17: 88Q-1003-FA7	18: 88Q-1003-FA8	19: Env Blank	20: Env Standard
Lead [mg/L]	0.0004	0.0004	0.0008	0.0007	< 0.0002	< 0.0002	0.0002	0.0003	< 0.0002	103%
Antimony [mg/L]	0.0011	0.0010	0.0016	0.0014	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	104%
Selenium [mg/L]	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	102%
Silicon [mg/L]	18.1	18.3	28.7	27.5	24.6	24.8	36.5	36.9	< 0.05	106%
Tin [mg/L]	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	101%
Strontium [mg/L]	0.045	0.043	0.032	0.032	0.066	0.068	0.0005	0.0005	< 0.0002	96%
Titanium [mg/L]	0.003	0.003	0.005	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	102%
Thallium [mg/L]	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	104%
Uranium [mg/L]	0.0043	0.0044	0.0045	0.0046	0.0010	0.0009	< 0.0002	< 0.0002	< 0.0002	102%
Vanadium [mg/L]	0.014	0.014	0.017	0.0054	0.0062	0.012	< 0.0009	< 0.0009	< 0.0009	96%
Tungsten [mg/L]	0.011	0.010	0.0030	0.0023	0.0034	0.0042	< 0.0002	< 0.0002	< 0.0002	100%
Yttrium [mg/L]	< 0.0001	< 0.0001	0.0022	0.0019	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	95%
Zinc [mg/L]	0.002	0.002	0.004	0.002	0.003	< 0.001	0.003	0.003	< 0.001	105%
Zirconium [mg/L]	0.0005	0.0005	0.0007	< 0.0004	< 0.0004	< 0.0004	0.0009	0.0005	< 0.0004	94%

Brian Graham B.Sc.
Project Coordinator
Environmental Services, Analytical

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18 NOV 03 BAW

SGS Anion Results for EWDP groundwater sampling event Sep 27 to Oct 3, 2003

Samples from 610/44-47
QA Samples from 610/43-44
From NC-EWDP wells 4PB, 19P, 24P, 27P, 28P, + 29P
No Field Blank
1 QA
1 Duplicate Sample (19P)

Nitrate/Nitrite data expressed in mg/L of nitrogen by SGS Lakefield. Converted into mg/L nitrate and nitrite for convenience

Accuracy and Precission Summary data followed by complete results. correct dates 27Sep to 30 Oct 03 BW 12-8-03

SGS Anion Results for EWDP groundwater sampling event Oct 27 to 30, 2003

Duplicate Analysis Results (in mg/L) - Precision info

	19P-1003-FUA-3	19P-1003-FUA-4	Percent Difference
F	1.90	1.92	1.05
Tot.Reactive P	< 0.03	< 0.03	na
Cl	6.9	6.4	-7.25
SO4	19.0	19.0	0
Br	< 0.3	< 0.3	na
NO2	<0.20	<0.20	na
NO3	5.44	5.44	0
NO2+NO3	5.53	5.53	0

18 NOV 03 CANT BAW correct dates 27Sep to 03 Oct 2003 BW 12-8-03

SGS Anion Results for EWDP groundwater sampling event Oct 27 to 30, 2003

For Sample 89Q-1003-FUA-3 - Accuracy Info

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Chloride	10	10.0	0.00
Nitrate	2	2.08	4.00

Report No. **CA3942-OCT03**
PO# **470274N**

Conversion of nitrogen mg/L to nitrate and nitrite mg/L

	NO2 as N mg/L	NO3 as N mg/L	NO2+NO3 as N mg/L	NO2 mg/L	NO3 mg/L	NO2+NO3 mg/L
4PB-1003-FUA-3	< 0.06	0.63	0.63	<0.20	2.79	2.79
19P-1003-FUA-3	< 0.06	1.23	1.25	<0.20	5.44	5.53
19P-1003-FUA-4	< 0.06	1.23	1.25	<0.20	5.44	5.53
24P-0903-FUA-3	< 0.06	0.32	0.33	<0.20	1.42	1.46
27P-0903-FUA-3	< 0.06	0.72	0.72	<0.20	3.19	3.19
28P-0903-FUA-3	< 0.06	1.62	1.62	<0.20	7.17	7.17
29P-1003-FUA-3	< 0.06	1.39	1.39	<0.20	6.15	6.15
89Q-1003-FUA-3	< 0.06	0.47	0.47	<0.20	2.08	2.08
Env Blank	< 0.06	< 0.05	---	<0.20	<0.27	---
Env Standard	102%	102%	---	102%	102%	---

Converted by dividing the measured value (N mg/L) by the percentage of nitrogen in nitrate (0.22590) and in nitrite (0.30446)

Results with nitrite and nitrate mg/L

	F mg/L	Tot.Reactive P in mg/L	Cl mg/L	SO4 mg/L	Br mg/L	NO2 mg/L	NO3 mg/L	NO2+NO3 mg/L
4PB-1003-FUA-3	1.83	< 0.03	4.4	24.0	< 0.3	<0.20	2.79	2.79
19P-1003-FUA-3	1.90	< 0.03	6.9	19.0	< 0.3	<0.20	5.44	5.53
19P-1003-FUA-4	1.92	< 0.03	6.4	19.0	< 0.3	<0.20	5.44	5.53
24P-0903-FUA-3	2.11	< 0.03	7.7	25.0	< 0.3	<0.20	1.42	1.46
27P-0903-FUA-3	3.36	< 0.03	9.2	39.0	< 0.3	<0.20	3.19	3.19
28P-0903-FUA-3	2.08	0.07	7.7	34.0	< 0.3	<0.20	7.17	7.17
29P-1003-FUA-3	1.96	< 0.03	6.1	23.0	< 0.3	<0.20	6.15	6.15
89Q-1003-FUA-3	< 0.04	< 0.03	10.0	< 0.5	< 0.3	<0.20	2.08	2.08
Env Blank	< 0.04	< 0.03	< 0.2	< 0.5	< 0.3	<0.20	<0.27	---
Env Standard	101%	102%	98%	97%	104%	102%	102%	---

Precision and accuracy numbers acceptable. Data from PO # 470274N accepted on 11-18-03 by Bradley Werling (Bradley Werling)

18 NOV 03 CONT BAW

PO No.: 470274N

Tuesday, November 04, 2003

Date Rec. : 20 October 2003
LR Report: **CA3942-OCT03**

Copy: #1

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CERTIFICATE OF ANALYSIS
Final Report

Sample ID	Sample Date & Time	Temperature °C	Fluoride mg/L	Tot.Reactive Phos. mg/L	Chloride mg/L	Sulphate mg/L	Bromide mg/L	Nitrite (as nitrogen) mg/L	Nitrate (as nitrogen) mg/L	Nitrate + Nitrite (as nitrogen) mg/L
1: *Approved Date		---	29-Oct-03	27-Oct-03	24-Oct-03	24-Oct-03	24-Oct-03	24-Oct-03	24-Oct-03	24-Oct-03
2: *Approved Time		---	16:34	10:41	10:56	10:56	10:56	10:56	10:56	10:56
3: 4PB-1003-FUA-3	15-Oct-03	13.0	1.83	< 0.03	4.4	24.0	< 0.3	< 0.06	0.63	0.63
4: 19P-1003-FUA-3	15-Oct-03	13.0	1.90	< 0.03	6.9	19.0	< 0.3	< 0.06	1.23	1.25
5: 19P-1003-FUA-4	15-Oct-03	13.0	1.92	< 0.03	6.4	19.0	< 0.3	< 0.06	1.23	1.25
6: 24P-0903-FUA-3	15-Oct-03	13.0	2.11	< 0.03	7.7	25.0	< 0.3	< 0.06	0.32	0.33
7: 27P-0903-FUA-3	15-Oct-03	13.0	3.36	< 0.03	9.2	39.0	< 0.3	< 0.06	0.72	0.72
8: 28P-0903-FUA-3	15-Oct-03	13.0	2.08	0.07	7.7	34.0	< 0.3	< 0.06	1.62	1.62
9: 29P-1003-FUA-3	15-Oct-03	13.0	1.96	< 0.03	6.1	23.0	< 0.3	< 0.06	1.39	1.39
10: 89Q-1003-FUA-3	15-Oct-03	13.0	< 0.04	< 0.03	10.0	< 0.5	< 0.3	< 0.06	0.47	0.47
11: Env Blank		---	< 0.04	< 0.03	< 0.2	< 0.5	< 0.3	< 0.06	< 0.05	---
12: Env Standard		---	101%	102%	98%	97%	104%	102%	102%	---

Brian Graham B.Sc.
Project Coordinator
Environmental Services, Analytical

01 DEC 03 BAW

DIV 01 Cation/Trace Metal Results for EWDP groundwater sampling event 27 Sep to 03 OCT, 2003

Samples from 610/44-47
Chain of Custody 610/54-56
From NC-EWDP wells 4PB, 19P, 24P, 27P, 28P, + 29P
Field blank - 4FB
2 QA's - duplicates - aliquots from same stock solution

These samples (aliquots from same salns) were also analyzed by SGS Lakefield Labs (610/98-105)

Note: Div 01 mistakenly analyzed the samples for anion analysis (610/52-53) for cation-trace metal. These were duplicates of the samples submitted for cation-trace metal analysis (610/54-56). Anion analysis will be performed on the 610/52-53 samples.

Accuracy + Precision Summary data followed by complete results.

01 DEC 03 CONT BAW

Div 01 Cation Results for EWDP groundwater sampling event Sep 28 to Oct 03, 2003

QA Accuracy Results

Results in mg/L

For Sample 88Q-1003-FA5

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	20	19.3	-3.50
Potassium	12	11.8	-1.67
Sodium	60	57.1	-4.83
Silicon	40	37.6	-6.00

For Sample 88Q-1003-FA6

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	20	19.8	-1.00
Potassium	12	11.8	-1.67
Sodium	60	57.2	-4.67
Silicon	40	37.9	-5.25

12-1-03 BAW

01 DEC 03 CONT BAW

Div 01 Cation Results for EWDP groundwater sampling event Sep 28 to Oct 03, 2003

Duplicate Analysis Results for CNWRA prepared Dup samples

Results in mg/L

	28P-0903 FA5	28P-0903 FA6	Percent Difference
Aluminum	<0.05	<0.05	na
Antimony	<0.01	<0.01	na
Arsenic	0.015	0.015	0.00
Barium	0.006	0.006	0.00
Beryllium	<0.005	<0.005	na
Bismuth	<0.01	<0.01	na
Boron	0.220	0.222	0.91
Cadmium	<0.005	<0.005	na
Calcium	3.47	3.61	4.03
Chromium	<0.005	<0.005	na
Cobalt	<0.005	<0.005	na
Copper	<0.005	<0.005	na
Iron	0.104	0.129	24.04
Lanthanum	<0.005	<0.005	na
Lead	<0.005	<0.005	na
Lithium	0.067	0.067	0.00
Magnesium	0.322	0.320	-0.62
Manganese	<0.005	<0.005	na
Molybdenum	0.008	0.008	0.00
Nickel	<0.005	<0.005	na
Palladium	<0.005	<0.005	na
Phosphorus	0.090	0.087	-3.33
Potassium	4.10	4.09	-0.24
Selenium	<0.01	<0.01	na
Silicon	29.1	29.5	1.37
Silver	<0.005	<0.005	na
Sodium	97.6	98.0	0.41
Strontium	0.036	0.036	0.00
Sulfur	11.3	11.4	0.88
Thallium	<0.02	<0.02	na
Thorium	<0.01	<0.01	na
Tin	<0.02	<0.02	na
Titanium	<0.005	<0.005	na
Tungsten	<0.02	<0.02	na
Uranium	<0.1	<0.1	na
Vanadium	0.006	0.006	0.00
Yttrium	<0.005	<0.005	na
Zinc	<0.005	<0.005	na
Zirconium	<0.005	<0.005	na

	88Q-1003 FA5	88Q-1003 FA6	Percent Difference
Aluminum	<0.05	<0.05	na
Antimony	<0.01	<0.01	na
Arsenic	<0.005	<0.005	na
Barium	<0.005	<0.005	na
Beryllium	<0.005	<0.005	na
Bismuth	<0.01	<0.01	na
Boron	<0.025	<0.025	na
Cadmium	<0.005	<0.005	na
Calcium	19.3	19.8	2.59
Chromium	<0.005	<0.005	na
Cobalt	<0.005	<0.005	na
Copper	<0.005	<0.005	na
Iron	<0.05	<0.05	na
Lanthanum	<0.005	<0.005	na
Lead	<0.005	<0.005	na
Lithium	<0.005	<0.005	na
Magnesium	<0.05	<0.05	na
Manganese	<0.005	<0.005	na
Molybdenum	<0.005	<0.005	na
Nickel	<0.005	<0.005	na
Palladium	<0.005	<0.005	na
Phosphorus	<0.025	<0.025	na
Potassium	11.8	11.8	0.00
Selenium	<0.01	<0.01	na
Silicon	37.6	37.9	0.80
Silver	<0.005	<0.005	na
Sodium	57.1	57.2	0.18
Strontium	<0.005	<0.005	na
Sulfur	<0.02	<0.02	na
Thallium	<0.02	<0.02	na
Thorium	<0.01	<0.01	na
Tin	<0.02	<0.02	na
Titanium	<0.005	<0.005	na
Tungsten	<0.02	<0.02	na
Uranium	<0.1	<0.1	na
Vanadium	<0.005	<0.005	na
Yttrium	<0.005	<0.005	na
Zinc	<0.005	<0.005	na
Zirconium	<0.005	<0.005	na

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19P-1003-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236235

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.008	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.143	0.025
Cadmium	<0.005	0.005
Calcium	17.9	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.330	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	1.47	0.05
Manganese	0.100	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.64	0.2
Selenium	<0.01	0.01
Silicon	23.1	0.05
Silver	<0.005	0.005
Sodium	42.0	0.2
Strontium	0.065	0.005
Sulfur	6.82	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.006	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236236

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.145	0.025
Cadmium	<0.005	0.005
Calcium	18.2	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.282	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	1.46	0.05
Manganese	0.093	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.68	0.2
Selenium	<0.01	0.01
Silicon	23.2	0.05
Silver	<0.005	0.005
Sodium	41.9	0.2
Strontium	0.065	0.005
Sulfur	6.88	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
19P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236236

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Aluminum	<0.05	<0.05	0.00%
Antimony	<0.01	<0.01	0.00%
Arsenic	<0.005	<0.005	0.00%
Barium	0.007	0.006	0.77%
Beryllium	<0.005	<0.005	0.00%
Bismuth	<0.01	<0.01	0.00%
Boron	0.145	0.144	0.43%
Cadmium	<0.005	<0.005	0.00%
Calcium	18.2	18.2	0.33%
Chromium	<0.005	<0.005	0.00%
Cobalt	<0.005	<0.005	0.00%
Copper	<0.005	<0.005	0.00%
Iron	0.282	0.319	12.4%
Lanthanum	<0.005	<0.005	0.00%
Lead	<0.005	<0.005	0.00%
Lithium	0.039	0.039	0.85%
Magnesium	1.46	1.47	0.39%
Manganese	0.093	0.095	1.70%
Molybdenum	<0.005	<0.005	0.00%
Nickel	<0.005	<0.005	0.00%
Palladium	<0.005	<0.005	0.00%
Phosphorus	<0.025	<0.025	0.00%
Potassium	3.68	3.67	0.38%
Selenium	<0.01	<0.01	0.00%
Silicon	23.2	23.2	0.03%
Silver	<0.005	<0.005	0.00%
Sodium	41.9	42.0	0.24%
Strontium	0.065	0.066	0.66%
Sulfur	6.88	6.87	0.21%
Thallium	<0.02	<0.02	0.00%
Thorium	<0.01	<0.01	0.00%
Tin	<0.02	<0.02	0.00%
Titanium	<0.005	<0.005	0.00%
Tungsten	<0.02	<0.02	0.00%
Uranium	<0.1	<0.1	0.00%
Vanadium	<0.005	<0.005	0.00%
Yttrium	<0.005	<0.005	0.00%
Zinc	<0.005	<0.005	0.00%
Zirconium	<0.005	<0.005	0.00%

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19P-1003-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236237

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.143	0.025
Cadmium	<0.005	0.005
Calcium	18.0	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.325	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	1.46	0.05
Manganese	0.096	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.66	0.2
Selenium	<0.01	0.01
Silicon	23.1	0.05
Silver	<0.005	0.005
Sodium	41.9	0.2
Strontium	0.066	0.005
Sulfur	6.79	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19P-1003-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236238

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.144	0.025
Cadmium	<0.005	0.005
Calcium	18.4	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.370	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	1.48	0.05
Manganese	0.101	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.80	0.2
Selenium	<0.01	0.01
Silicon	23.2	0.05
Silver	<0.005	0.005
Sodium	42.4	0.2
Strontium	0.065	0.005
Sulfur	6.87	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19P-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236239

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.145	0.025
Cadmium	<0.005	0.005
Calcium	18.2	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.346	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	1.47	0.05
Manganese	0.101	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.69	0.2
Selenium	<0.01	0.01
Silicon	23.3	0.05
Silver	<0.005	0.005
Sodium	42.1	0.2
Strontium	0.066	0.005
Sulfur	6.83	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Sample ID
19P-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236239

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Aluminum	<0.05	2.00	2.00	100.0%
Antimony	<0.01	0.501	0.500	100.2%
Arsenic	<0.005	2.15	2.00	107.5%
Barium	0.006	2.20	2.00	109.6%
Beryllium	<0.005	0.057	0.050	113.9%
Bismuth	NA	NA	NA	NA
Boron	NA	NA	NA	NA
Cadmium	<0.005	0.051	0.050	101.7%
Calcium	18.2	38.3	20.0	100.4%
Chromium	<0.005	0.203	0.200	101.3%
Cobalt	<0.005	0.514	0.500	102.8%
Copper	<0.005	0.270	0.250	107.8%
Iron	0.346	1.36	1.00	101.7%
Lanthanum	NA	NA	NA	NA
Lead	<0.005	0.533	0.500	106.5%
Lithium	NA	NA	NA	NA
Magnesium	1.47	22.2	20.0	103.5%
Manganese	0.101	0.624	0.500	104.7%
Molybdenum	NA	NA	NA	NA
Nickel	<0.005	0.505	0.500	101.0%
Palladium	NA	NA	NA	NA
Phosphorus	NA	NA	NA	NA
Potassium	3.69	23.0	20.0	96.6%
Selenium	<0.01	2.36	2.00	117.9%
Silicon	NA	NA	NA	NA
Silver	<0.005	0.051	0.050	102.0%
Sodium	42.1	61.1	20.0	94.5%
Strontium	NA	NA	NA	NA
Sulfur	NA	NA	NA	NA
Thallium	<0.02	2.23	2.00	111.6%
Thorium	NA	NA	NA	NA
Tin	NA	NA	NA	NA
Titanium	NA	NA	NA	NA
Tungsten	NA	NA	NA	NA
Uranium	NA	NA	NA	NA
Vanadium	<0.005	0.513	0.500	102.5%
Yttrium	NA	NA	NA	NA
Zinc	<0.005	0.528	0.500	105.6%
Zirconium	NA	NA	NA	NA

NA- Not Applicable.

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236240

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.031	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.159	0.025
Cadmium	<0.005	0.005
Calcium	15.9	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.055	0.005
Magnesium	1.39	0.05
Manganese	0.172	0.005
Molybdenum	0.053	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.82	0.2
Selenium	<0.01	0.01
Silicon	16.6	0.05
Silver	<0.005	0.005
Sodium	53.7	0.2
Strontium	0.073	0.005
Sulfur	8.23	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 BAW CONT

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236241

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.160	0.025
Cadmium	<0.005	0.005
Calcium	16.4	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.054	0.005
Magnesium	1.39	0.05
Manganese	0.174	0.005
Molybdenum	0.053	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.027	0.025
Potassium	3.97	0.2
Selenium	<0.01	0.01
Silicon	16.8	0.05
Silver	<0.005	0.005
Sodium	55.4	0.2
Strontium	0.073	0.005
Sulfur	8.32	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236242

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.158	0.025
Cadmium	<0.005	0.005
Calcium	16.0	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.054	0.005
Magnesium	1.38	0.05
Manganese	0.171	0.005
Molybdenum	0.052	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.026	0.025
Potassium	3.81	0.2
Selenium	<0.01	0.01
Silicon	16.7	0.05
Silver	<0.005	0.005
Sodium	53.6	0.2
Strontium	0.073	0.005
Sulfur	8.22	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236243

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.100	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.028	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.158	0.025
Cadmium	<0.005	0.005
Calcium	16.4	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.169	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.053	0.005
Magnesium	1.39	0.05
Manganese	0.174	0.005
Molybdenum	0.053	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.87	0.2
Selenium	<0.01	0.01
Silicon	17.0	0.05
Silver	<0.005	0.005
Sodium	54.3	0.2
Strontium	0.072	0.005
Sulfur	8.29	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236244

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.094	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.159	0.025
Cadmium	<0.005	0.005
Calcium	16.1	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.160	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.054	0.005
Magnesium	1.39	0.05
Manganese	0.174	0.005
Molybdenum	0.052	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	3.80	0.2
Selenium	<0.01	0.01
Silicon	16.9	0.05
Silver	<0.005	0.005
Sodium	53.7	0.2
Strontium	0.073	0.005
Sulfur	8.27	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236245

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.298	0.05
Antimony	<0.01	0.01
Arsenic	0.016	0.005
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.232	0.025
Cadmium	<0.005	0.005
Calcium	4.62	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.163	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.095	0.005
Magnesium	0.874	0.05
Manganese	0.009	0.005
Molybdenum	0.091	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.046	0.025
Potassium	3.42	0.2
Selenium	<0.01	0.01
Silicon	19.1	0.05
Silver	<0.005	0.005
Sodium	101	0.2
Strontium	0.048	0.005
Sulfur	13.3	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236246

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.451	0.05
Antimony	<0.01	0.01
Arsenic	0.011	0.005
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.231	0.025
Cadmium	<0.005	0.005
Calcium	4.55	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.216	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.097	0.005
Magnesium	0.886	0.05
Manganese	<0.005	0.005
Molybdenum	0.087	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.033	0.025
Potassium	3.46	0.2
Selenium	<0.01	0.01
Silicon	19.5	0.05
Silver	<0.005	0.005
Sodium	101	0.2
Strontium	0.049	0.005
Sulfur	13.3	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236247

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.437	0.05
Antimony	<0.01	0.01
Arsenic	0.010	0.005
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.230	0.025
Cadmium	<0.005	0.005
Calcium	4.53	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.220	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.096	0.005
Magnesium	0.878	0.05
Manganese	<0.005	0.005
Molybdenum	0.088	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.054	0.025
Potassium	3.34	0.2
Selenium	<0.01	0.01
Silicon	19.3	0.05
Silver	<0.005	0.005
Sodium	101	0.2
Strontium	0.049	0.005
Sulfur	13.2	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236248

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.630	0.05
Antimony	<0.01	0.01
Arsenic	0.011	0.005
Barium	0.008	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.234	0.025
Cadmium	<0.005	0.005
Calcium	4.55	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.507	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.102	0.005
Magnesium	0.896	0.05
Manganese	0.012	0.005
Molybdenum	0.101	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.030	0.025
Potassium	3.51	0.2
Selenium	<0.01	0.01
Silicon	18.9	0.05
Silver	<0.005	0.005
Sodium	103	0.2
Strontium	0.056	0.005
Sulfur	13.6	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 BAW CONT

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236249

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.608	0.05
Antimony	<0.01	0.01
Arsenic	0.010	0.005
Barium	0.008	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.232	0.025
Cadmium	<0.005	0.005
Calcium	4.59	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.508	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.099	0.005
Magnesium	0.891	0.05
Manganese	0.010	0.005
Molybdenum	0.101	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.042	0.025
Potassium	3.42	0.2
Selenium	<0.01	0.01
Silicon	18.8	0.05
Silver	<0.005	0.005
Sodium	102	0.2
Strontium	0.055	0.005
Sulfur	13.1	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236250

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

0.005

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	0.015	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.220	0.025
Cadmium	<0.005	0.005
Calcium	3.47	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.104	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.067	0.005
Magnesium	0.322	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.090	0.025
Potassium	4.10	0.2
Selenium	<0.01	0.01
Silicon	29.1	0.05
Silver	<0.005	0.005
Sodium	97.6	0.2
Strontium	0.036	0.005
Sulfur	11.3	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 28P-0903-FA-6

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236251

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	0.015	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.222	0.025
Cadmium	<0.005	0.005
Calcium	3.61	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.129	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.067	0.005
Magnesium	0.320	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.087	0.025
Potassium	4.09	0.2
Selenium	<0.01	0.01
Silicon	29.5	0.05
Silver	<0.005	0.005
Sodium	98.0	0.2
Strontium	0.036	0.005
Sulfur	11.4	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 28P-0903-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236252

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.521	0.05
Antimony	<0.01	0.01
Arsenic	0.014	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.221	0.025
Cadmium	<0.005	0.005
Calcium	3.64	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.282	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.066	0.005
Magnesium	0.392	0.05
Manganese	<0.005	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.094	0.025
Potassium	4.13	0.2
Selenium	<0.01	0.01
Silicon	30.7	0.05
Silver	<0.005	0.005
Sodium	99.0	0.2
Strontium	0.037	0.005
Sulfur	11.3	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236253

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.524	0.05
Antimony	<0.01	0.01
Arsenic	0.011	0.005
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.220	0.025
Cadmium	<0.005	0.005
Calcium	3.67	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.294	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.066	0.005
Magnesium	0.393	0.05
Manganese	<0.005	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.079	0.025
Potassium	4.13	0.2
Selenium	<0.01	0.01
Silicon	30.6	0.05
Silver	<0.005	0.005
Sodium	99.7	0.2
Strontium	0.037	0.005
Sulfur	11.2	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236254

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.377	0.05
Antimony	<0.01	0.01
Arsenic	0.013	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.252	0.025
Cadmium	<0.005	0.005
Calcium	6.06	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.468	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.077	0.005
Magnesium	0.661	0.05
Manganese	0.008	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.065	0.025
Potassium	4.96	0.2
Selenium	<0.01	0.01
Silicon	34.7	0.05
Silver	<0.005	0.005
Sodium	118	0.2
Strontium	0.065	0.005
Sulfur	12.9	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	0.009	0.005
Zirconium	<0.005	0.005

BW 12-1-03
01 ~~DEC~~ DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236255

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.426	0.05
Antimony	<0.01	0.01
Arsenic	0.011	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.257	0.025
Cadmium	<0.005	0.005
Calcium	6.17	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.498	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.078	0.005
Magnesium	0.681	0.05
Manganese	0.008	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.088	0.025
Potassium	5.23	0.2
Selenium	<0.01	0.01
Silicon	35.1	0.05
Silver	<0.005	0.005
Sodium	124	0.2
Strontium	0.066	0.005
Sulfur	13.2	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	0.009	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236256

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	0.007	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.145	0.025
Cadmium	<0.005	0.005
Calcium	12.5	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.043	0.005
Magnesium	1.05	0.05
Manganese	0.009	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	4.01	0.2
Selenium	<0.01	0.01
Silicon	26.2	0.05
Silver	<0.005	0.005
Sodium	53.3	0.2
Strontium	0.076	0.005
Sulfur	7.85	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236257

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.080	0.05
Antimony	<0.01	0.01
Arsenic	0.006	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.149	0.025
Cadmium	<0.005	0.005
Calcium	12.8	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.053	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.043	0.005
Magnesium	1.08	0.05
Manganese	0.009	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	4.05	0.2
Selenium	<0.01	0.01
Silicon	26.6	0.05
Silver	<0.005	0.005
Sodium	53.2	0.2
Strontium	0.076	0.005
Sulfur	7.90	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236258

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	0.007	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.144	0.025
Cadmium	<0.005	0.005
Calcium	12.7	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.043	0.005
Magnesium	1.05	0.05
Manganese	0.009	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	4.09	0.2
Selenium	<0.01	0.01
Silicon	26.2	0.05
Silver	<0.005	0.005
Sodium	53.1	0.2
Strontium	0.075	0.005
Sulfur	7.81	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
29P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236258

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Aluminum	<0.05	<0.05	0.00%
Antimony	<0.01	<0.01	0.00%
Arsenic	0.007	0.009	25.0%
Barium	0.015	0.015	1.03%
Beryllium	<0.005	<0.005	0.00%
Bismuth	<0.01	<0.01	0.00%
Boron	0.144	0.144	0.28%
Cadmium	<0.005	<0.005	0.00%
Calcium	12.7	12.5	1.95%
Chromium	<0.005	<0.005	0.00%
Cobalt	<0.005	<0.005	0.00%
Copper	<0.005	<0.005	0.00%
Iron	<0.05	<0.05	0.00%
Lanthanum	<0.005	<0.005	0.00%
Lead	<0.005	<0.005	0.00%
Lithium	0.043	0.043	0.40%
Magnesium	1.05	1.05	0.47%
Manganese	0.009	0.009	0.35%
Molybdenum	<0.005	<0.005	0.00%
Nickel	<0.005	<0.005	0.00%
Palladium	<0.005	<0.005	0.00%
Phosphorus	<0.025	<0.025	0.00%
Potassium	4.09	3.97	2.88%
Selenium	<0.01	<0.01	0.00%
Silicon	26.2	26.0	0.76%
Silver	<0.005	<0.005	0.00%
Sodium	53.1	53.1	0.12%
Strontium	0.075	0.075	0.61%
Sulfur	7.81	7.77	0.47%
Thallium	<0.02	<0.02	0.00%
Thorium	<0.01	<0.01	0.00%
Tin	<0.02	<0.02	0.00%
Titanium	<0.005	<0.005	0.00%
Tungsten	<0.02	<0.02	0.00%
Uranium	<0.1	<0.1	0.00%
Vanadium	0.006	0.008	19.6%
Yttrium	<0.005	<0.005	0.00%
Zinc	<0.005	<0.005	0.00%
Zirconium	<0.005	<0.005	0.00%

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236259

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.337	0.05
Antimony	<0.01	0.01
Arsenic	0.012	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.146	0.025
Cadmium	<0.005	0.005
Calcium	12.7	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.142	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.044	0.005
Magnesium	1.12	0.05
Manganese	0.006	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	4.14	0.2
Selenium	<0.01	0.01
Silicon	27.3	0.05
Silver	<0.005	0.005
Sodium	54.0	0.2
Strontium	0.077	0.005
Sulfur	7.87	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Sample ID
29P-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236259

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Aluminum	0.337	2.35	2.00	100.5%
Antimony	<0.01	0.484	0.500	96.8%
Arsenic	0.012	2.12	2.00	105.5%
Barium	0.015	2.20	2.00	109.1%
Beryllium	<0.005	0.055	0.050	109.9%
Bismuth	NA	NA	NA	NA
Boron	NA	NA	NA	NA
Cadmium	<0.005	0.050	0.050	100.7%
Calcium	12.7	32.5	20.0	98.7%
Chromium	<0.005	0.198	0.200	99.1%
Cobalt	<0.005	0.504	0.500	100.9%
Copper	<0.005	0.269	0.250	107.5%
Iron	0.142	1.16	1.00	101.4%
Lanthanum	NA	NA	NA	NA
Lead	<0.005	0.524	0.500	104.9%
Lithium	NA	NA	NA	NA
Magnesium	1.12	21.4	20.0	101.4%
Manganese	0.006	0.521	0.500	103.0%
Molybdenum	NA	NA	NA	NA
Nickel	<0.005	0.498	0.500	99.6%
Palladium	NA	NA	NA	NA
Phosphorus	NA	NA	NA	NA
Potassium	4.14	23.7	20.0	97.6%
Selenium	<0.01	2.33	2.00	116.6%
Silicon	NA	NA	NA	NA
Silver	<0.005	0.050	0.050	100.2%
Sodium	54.0	71.9	20.0	89.6%
Strontium	NA	NA	NA	NA
Sulfur	NA	NA	NA	NA
Thallium	<0.02	2.23	2.00	111.7%
Thorium	NA	NA	NA	NA
Tin	NA	NA	NA	NA
Titanium	NA	NA	NA	NA
Tungsten	NA	NA	NA	NA
Uranium	NA	NA	NA	NA
Vanadium	0.006	0.512	0.500	101.2%
Yttrium	NA	NA	NA	NA
Zinc	<0.005	0.516	0.500	103.1%
Zirconium	NA	NA	NA	NA

NA- Not Applicable.

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-UFUA-2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236260

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.340	0.05
Antimony	<0.01	0.01
Arsenic	0.011	0.005
Barium	0.017	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.146	0.025
Cadmium	<0.005	0.005
Calcium	12.9	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.146	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.044	0.005
Magnesium	1.13	0.05
Manganese	0.006	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.026	0.025
Potassium	4.17	0.2
Selenium	<0.01	0.01
Silicon	27.3	0.05
Silver	<0.005	0.005
Sodium	53.9	0.2
Strontium	0.076	0.005
Sulfur	7.84	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236261

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.322	0.05
Antimony	<0.01	0.01
Arsenic	0.012	0.005
Barium	0.015	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.146	0.025
Cadmium	<0.005	0.005
Calcium	12.8	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.136	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.044	0.005
Magnesium	1.12	0.05
Manganese	0.007	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.030	0.025
Potassium	4.17	0.2
Selenium	<0.01	0.01
Silicon	27.2	0.05
Silver	<0.005	0.005
Sodium	54.0	0.2
Strontium	0.077	0.005
Sulfur	7.77	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4FB-1003-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236262

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	<0.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4FB-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236263

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	<0.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4FB-1003-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236264

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	<0.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236265

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	0.038	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.144	0.025
Cadmium	<0.005	0.005
Calcium	5.08	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.254	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	0.058	0.05
Manganese	0.016	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.028	0.025
Potassium	1.38	0.2
Selenium	<0.01	0.01
Silicon	17.2	0.05
Silver	<0.005	0.005
Sodium	61.8	0.2
Strontium	0.035	0.005
Sulfur	8.54	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.014	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236266

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.054	0.05
Antimony	<0.01	0.01
Arsenic	0.038	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.145	0.025
Cadmium	<0.005	0.005
Calcium	5.14	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.240	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	0.061	0.05
Manganese	0.015	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.042	0.025
Potassium	1.31	0.2
Selenium	<0.01	0.01
Silicon	17.5	0.05
Silver	<0.005	0.005
Sodium	63.0	0.2
Strontium	0.035	0.005
Sulfur	8.66	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.015	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-FUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236267

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.052	0.05
Antimony	<0.01	0.01
Arsenic	0.039	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.147	0.025
Cadmium	<0.005	0.005
Calcium	5.18	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.255	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	0.062	0.05
Manganese	0.015	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.038	0.025
Potassium	1.53	0.2
Selenium	<0.01	0.01
Silicon	17.5	0.05
Silver	<0.005	0.005
Sodium	63.4	0.2
Strontium	0.035	0.005
Sulfur	8.80	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.015	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236268

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.143	0.05
Antimony	<0.01	0.01
Arsenic	0.038	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.144	0.025
Cadmium	<0.005	0.005
Calcium	5.06	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.481	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	0.094	0.05
Manganese	0.020	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.036	0.025
Potassium	1.52	0.2
Selenium	<0.01	0.01
Silicon	17.7	0.05
Silver	<0.005	0.005
Sodium	63.3	0.2
Strontium	0.035	0.005
Sulfur	8.74	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.014	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-UFUA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236269

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	0.138	0.05
Antimony	<0.01	0.01
Arsenic	0.038	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	0.146	0.025
Cadmium	<0.005	0.005
Calcium	5.19	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.502	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.039	0.005
Magnesium	0.096	0.05
Manganese	0.020	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	0.031	0.025
Potassium	1.47	0.2
Selenium	<0.01	0.01
Silicon	17.7	0.05
Silver	<0.005	0.005
Sodium	63.2	0.2
Strontium	0.035	0.005
Sulfur	8.62	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	0.015	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
88Q-1003-FA-5

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236270

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	19.3	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	11.8	0.2
Selenium	<0.01	0.01
Silicon	37.6	0.05
Silver	<0.005	0.005
Sodium	57.1	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
88Q-1003-FA-6

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236271

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	19.8	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	11.8	0.2
Selenium	<0.01	0.01
Silicon	37.9	0.05
Silver	<0.005	0.005
Sodium	57.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
89Q-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236272

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	7.12	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
89Q-1003-FUA-2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 236273

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	7.11	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
LABORATORY CONTROL SAMPLE

Sample ID
LCSW - K10W2 / K30W1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Aluminum	1.93	2.00	96.6%
Antimony	0.506	0.500	101.3%
Arsenic	2.10	2.00	104.9%
Barium	2.17	2.00	108.3%
Beryllium	0.056	0.050	113.0%
Bismuth	NA	NA	NA
Boron	NA	NA	NA
Cadmium	0.051	0.050	101.6%
Calcium	20.2	20.0	100.8%
Chromium	0.201	0.200	100.3%
Cobalt	0.508	0.500	101.6%
Copper	0.272	0.250	108.9%
Iron	1.02	1.00	102.1%
Lanthanum	NA	NA	NA
Lead	0.529	0.500	105.7%
Lithium	NA	NA	NA
Magnesium	20.2	20.0	101.0%
Manganese	0.521	0.500	104.1%
Molybdenum	NA	NA	NA
Nickel	0.501	0.500	100.2%
Palladium	NA	NA	NA
Phosphorus	NA	NA	NA
Potassium	18.9	20.0	94.7%
Selenium	2.19	2.00	109.4%
Silicon	NA	NA	NA
Silver	0.050	0.050	99.0%
Sodium	19.2	20.0	96.1%
Strontium	NA	NA	NA
Sulfur	NA	NA	NA
Thallium	2.19	2.00	109.4%
Thorium	NA	NA	NA
Tin	NA	NA	NA
Titanium	NA	NA	NA
Tungsten	NA	NA	NA
Uranium	NA	NA	NA
Vanadium	0.509	0.500	101.8%
Yttrium	NA	NA	NA
Zinc	0.515	0.500	102.9%
Zirconium	NA	NA	NA

NA- Not Applicable.

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
LABORATORY CONTROL SAMPLE

Sample ID
LCSW - L10W1 / K30W2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Aluminum	1.93	2.00	96.7%
Antimony	0.515	0.500	103.0%
Arsenic	2.12	2.00	105.9%
Barium	2.16	2.00	108.2%
Beryllium	0.058	0.050	115.3%
Bismuth	NA	NA	NA
Boron	NA	NA	NA
Cadmium	0.052	0.050	103.7%
Calcium	20.4	20.0	102.1%
Chromium	0.202	0.200	101.0%
Cobalt	0.514	0.500	102.8%
Copper	0.267	0.250	106.7%
Iron	1.02	1.00	102.2%
Lanthanum	NA	NA	NA
Lead	0.533	0.500	106.7%
Lithium	NA	NA	NA
Magnesium	20.4	20.0	102.0%
Manganese	0.526	0.500	105.2%
Molybdenum	NA	NA	NA
Nickel	0.505	0.500	101.0%
Palladium	NA	NA	NA
Phosphorus	NA	NA	NA
Potassium	18.2	20.0	91.2%
Selenium	2.19	2.00	109.3%
Silicon	NA	NA	NA
Silver	0.051	0.050	102.7%
Sodium	18.5	20.0	92.3%
Strontium	NA	NA	NA
Sulfur	NA	NA	NA
Thallium	2.21	2.00	110.4%
Thorium	NA	NA	NA
Tin	NA	NA	NA
Titanium	NA	NA	NA
Tungsten	NA	NA	NA
Uranium	NA	NA	NA
Vanadium	0.512	0.500	102.3%
Yttrium	NA	NA	NA
Zinc	0.523	0.500	104.7%
Zirconium	NA	NA	NA

NA- Not Applicable.

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
BLANK SUMMARY

Sample ID
PBW - K10W2 / K30W1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	<0.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

NA- Not Applicable.

01 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
BLANK SUMMARY

Sample ID
PBW - L10W1 / K30W2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

TO: 031016-9

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.01	0.01
Arsenic	<0.005	0.005
Barium	<0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.01	0.01
Boron	<0.025	0.025
Cadmium	<0.005	0.005
Calcium	<0.05	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	<0.005	0.005
Magnesium	<0.05	0.05
Manganese	<0.005	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.005	0.005
Phosphorus	<0.025	0.025
Potassium	<0.2	0.2
Selenium	<0.01	0.01
Silicon	<0.05	0.05
Silver	<0.005	0.005
Sodium	<0.2	0.2
Strontium	<0.005	0.005
Sulfur	<0.02	0.02
Thallium	<0.02	0.02
Thorium	<0.01	0.01
Tin	<0.02	0.02
Titanium	<0.005	0.005
Tungsten	<0.02	0.02
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.005	0.005
Zirconium	<0.005	0.005

NA- Not Applicable.

03 December 2003 MRJ

200 ppm Inorganic Carbon Stock Standard (1L)

Added 1.7650 g Na_2CO_3 (Fisher, Certified ACS grade, Cat # S263-500, Lot # 000077) to about 200 mL nanopure water in beaker. (See calculation for final concentration on p. 6, this book). Stirred about 30 min, then poured into 1L vol. flask, rinsed beaker out with nanopure water (added to flask) then filled flask to mark with nanopure H_2O.

100 ppm std: pipetted 50 mL of 200 ppm std into 100 mL vol flask and diluted to mark with H_2O.

50 ppm std: pipetted 25 mL of 200 ppm std into 100 mL vol flask, diluted to mark w/ H_2O.

20 ppm std: pipetted 20 mL of 200 ppm std into 200 mL vol flask, diluted to mark w/ H_2O

10 ppm std: pipetted 10 mL of 200 ppm std into 200 mL vol flask, diluted to mark w/ H_2O

5 ppm std: pipetted 5 mL of 200 ppm std into 200 mL vol flask, diluted to mark w/ H_2O

0.5 ppm std: pipetted 0.5 mL of 200 ppm std into 200 mL vol flask, diluted to mark w/ H_2O

A vol flask was filled with H_2O also to serve as a blank.

Water used was taken fresh, taken directly from the Barnstead unit. Stored stds in refrigerator L106.

~~0.5 ppm std: pipetted 5.0 mL~~ MRJ 12/3/03

Continued

Preparation For TOC analysis

Fresh nanopure water (straight from Barnsted unit) was used to rinse and fill the gas/liquid separator of the ~~ph~~ Phoenix 8000 TOC analyzed 0.25 mL (eppendorf pipet) of phosphoric acid (Fisher A 242-4 lot 001815) was added to the water in the gas/liquid separator to prevent contamination.

Preparation of 21% Phosphoric Acid for TOC analysis

Rinsed 250 mL ~~PE~~ PC square bottle with fresh nanopure water (straight from Barnstead unit). Measured 188 mL of fresh nano pure water in a 250 mL grad cylinder. Added 37 mL (to 225 mL mark) of phosphoric acid (Fisher A 242-4 lot 001815), Transferred into 250 mL ~~PE~~ PC square bottle. Labeled 21% phosphoric acid, 610/9, date, + initals

The reagent water reservoir was also rinsed and filled with fresh nanopure water.

3 DEC 03 CONT BAW

Preliminary Inorganic Carbon Analysis of EWDP ground water BW 12-3-03 samples from Sept and Oct sampling events

Preliminary analysis conducted to identify the calibration range/ranges to use for final analysis.

Analyzed on Phoenix 8000 TOC instrument in IC mode with range of 20 to 200 ppm IC using 40 mL amber glass bottles. Stds run individually (no reps) at 0, 5, 10, 20, 50, + 100 ppm IC from 610/159. Samples run individually (no reps) strait from sample collection vials. PRN file was 12031144. The prn file was imported into an EXCEL spreadsheet. The columns were numbered (legend at 610/11 from Phoenix 8000 manual). Sample IDs are in column 8 and area counts are in column 30.

Twelve samples from 610/36 to 41 and 610/75-79. X-IC-FUA-1/2 where X = NC EWDP well.

3 DEC 03 CONT BAW

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
~~v2.0	3	1	Done	2	12/3/03 12:13	USER1	0 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	1	IC20P40M	0.5	0
~~v2.0	3	1	Done	0	12/3/03 12:17	USER1	5 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	2	IC20P40M	0.5	0
~~v2.0	3	1	Done	3	12/3/03 12:24	USER1	10 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	3	IC20P40M	0.5	0
~~v2.0	3	1	Done	2	12/3/03 12:28	USER1	20 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	4	IC20P40M	0.5	0
~~v2.0	3	1	Done	0	12/3/03 12:33	USER1	50 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	5	IC20P40M	0.5	0
~~v2.0	3	1	Done	0	12/3/03 12:38	USER1	100 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	6	IC20P40M	0.5	0
~~v2.0	10	1	Done	0	12/3/03 12:41	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	1	1001	IC20P40M	0	0
~~v2.0	10	1	Done	0	12/3/03 12:43	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	2	1001	IC20P40M	0	0
~~v2.0	10	1	Done	0	12/3/03 12:45	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	3	1001	IC20P40M	0	0
~~v2.0	10	1	Done	0	12/3/03 12:48	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	4	1001	IC20P40M	0	0
~~v2.0	10	1	Done	0	12/3/03 12:50	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	5	1001	IC20P40M	0	0
~~v2.0	10	1	Done	0	12/3/03 12:52	USER1	blank	Blank IC Ranges 3 4 & 5	IC 5 - 100 ppm for 40ml	2	2	6	6	1001	IC20P40M	0	0
~~v2.0	0	1	Done	0	12/3/03 12:55	USER1	4FB blank	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	7	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:00	USER1	4PB	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	8	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:04	USER1	19P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	9	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:09	USER1	29P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	10	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:14	USER1	28P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	11	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:18	USER1	24P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	12	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:23	USER1	27P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	13	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:28	USER1	19D	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	14	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:32	USER1	7SC-Z4	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	15	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:37	USER1	19IM2-Z5	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	16	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:41	USER1	16P	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	17	IC20P40M	0.5	0
~~v2.0	0	1	Done	0	12/3/03 13:46	USER1	19IM1-Z5	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	18	IC20P40M	0.5	0
~~v2.0	3	1	Done	0	12/3/03 13:50	USER1	10 ppm IC	IC Range 20 - 200 ppm C	IC 5 - 100 ppm for 40ml	2	2	1	1	19	IC20P40M	0.5	0

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19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
0	5	0	0.5	0	10	0	1	5.365	5.348	120	57222	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031211
0	5	0	0.5	0	10	0	1	5.31	6.306	102	703229	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031215
0	5	0	0.5	0	10	0	1	5.352	6.614	240	1176076	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031219
0	5	0	0.5	0	10	0	1	5.378	5.576	120	80083	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031225
0	5	0	0.5	0	10	0	1	5.347	6.343	149	6675434	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031230
0	5	0	0.5	0	10	0	1	5.391	6.39	165	13919002	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031235
0	5	0	0.5	0	10	0	0.5	5.467	5.965	62	64692	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031240
0	5	0	0.5	0	10	0	0.5	5.348	5.844	65	45336	0	0	0	0.00E+00	1/1/70 0:00	0	0	12031144	12031242
0	5	0	0.5	0	10	0	0.5	5.292	5.792	64	41623	0	0	0	0.00E+00	1/1/70 0:00	0.99548	208867	12031144	12031244
0	5	0	0.5	0	10	0	0.5	5.264	5.762	64	40881	0	0	0	0.00E+00	1/1/70 0:00	0.99548	208867	12031144	12031246
0	5	0	0.5	0	10	0	0.5	5.277	5.777	64	39404	0	0	0	0.00E+00	1/1/70 0:00	0.99548	208867	12031144	12031249
0	5	0	0.5	0	10	0	0.5	5.286	5.782	63	37558	0	0	0	0.00E+00	1/1/70 0:00	0.99548	208867	12031144	12031251
0	5	0	0.5	0	10	0	1	5.226	6.225	64	76788	0.1387	0.2773	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031254
0	5	0	0.5	0	10	0	1	5.22	6.217	129	2828170	10.3109	20.6219	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031257
0	5	0	0.5	0	10	0	1	5.281	6.279	133	3751552	13.7248	27.4497	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031301
0	5	0	0.5	0	10	0	1	5.296	6.292	132	3615225	13.2208	26.4416	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031306
0	5	0	0.5	0	10	0	1	5.301	6.297	139	5686895	20.8801	41.7602	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031311
0	5	0	0.5	0	10	0	1	5.221	6.215	133	4321447	15.8318	31.6636	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031315
0	5	0	0.5	0	10	0	1	5.246	6.243	138	6043059	22.1969	44.3938	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031320
0	5	0	0.5	0	10	0	1	5.235	6.232	152	11722043	43.193	86.3859	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031324
0	5	0	0.5	0	10	0	1	5.317	6.316	141	7334835	26.9728	53.9456	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031329
0	5	0	0.5	0	10	0	1	5.291	6.289	136	5905708	21.6891	43.3782	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031334
0	5	0	0.5	0	10	0	1	5.264	6.261	130	5041820	18.4951	36.9903	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031339
0	5	0	0.5	0	10	0	1	5.182	6.181	135	5942374	21.8246	43.6493	39281	2.70E+05	12/3/03 12:43	0.99548	208867	12031144	12031343
0	5	0	0.5	0	10	0	1	5.215	6.214	119	2680364	0	0	0	0.00E+00	1/1/70 0:00	0.99548	208867	12031144	12031348

3 DEC 03 CONT BAW

Inorganic Carbon (IC)
Range 20 ppm to 200 ppm IC
Preliminary EWDP groundwater samples from Sep and Oct 2003 events

IC Standard Data

IC Std (ppm)	IC expected mass (ug)	Raw Data
0	0	57222
5	2.5	703229
10	5	1176076
20*	10	2680364
50	25	6675434
100	50	13919002

* 20ppm std from curve replaced with 20 ppm from end of analysis
20ppm from curve not used since no sample was detected
Unsure what the problem was with the 20ppm std
Replaced 10ppm std at end of analytical run with another aliquot from the 20ppm flask.
The 20 ppm std at the end of the run generated an appropriate area count

IC sample Data.

Sample ID	Raw Data
4FB blank	76788
4PB	2828170
19P	3751552
29P	3615225
28P	5686895
24P	4321447
27P	6043059
19D	11722043
7SC-Z4	7334835
19IM2-Z5	5905708
16P	5041820
19IM1-Z5	5942374

Area counts for samples fell within the area counts for the 20ppm and 100ppm stds. Based on this, the samples will be reanalyzed using the 20-200ppm IC range with 3 replicates for each standard and 2 or 3 reps for each sample.

Samples returned to refrigerator after analysis completed. Standards (610/159) decanted into 40 amber VOA bottles.

04 DEC 03 BAW

Inorganic ~~Cat~~ BW 12-4-03 Carbon Analysis of EWDP groundwater samples from Sept and Oct 2003 sampling events

Samples from Sept event (610/36-41) and Oct event (610/75-79)
Analyzed directly from 40 vials used for sample collection. Initial analysis conducted to determine appropriate range - 20-200ppm IC (610/161-164). Same sample vials used for initial and final analysis.
Analyzed on Phoenix 8000 TOC Analyzer IC mode - 20 to 200 ppm.
Standards used (610/159) were 0, 10, 20, 50, and 100ppm in 40 amber VOA bottles
Standards run in triplicate (new aliquots - 04Dec03)
Samples run in duplicate (limited sample volume concerns). Reused 03DEC03 samples.
PRN file - 12041045 imported into EXCEL
Relavent portion (no cleaning data + columns numbered) printed + included in SN. Legend ~~for~~ BW 12-4-03 for column numbers (610/11)
Source for legend - Phoenix 8000 manual. Sample IDs are in column 8 and area counts are in column 30.

04 DEC 03 CONT BW

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
~~v2.0	3	1	Done	2	12/4/03 11:13	USER1	0 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	1	1	IC20P40M	0.5
~~v2.0	3	1	Done	2	12/4/03 11:17	USER1	0 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	2	1	IC20P40M	0.5
~~v2.0	3	1	Done	2	12/4/03 11:21	USER1	0 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	3	1	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:25	USER1	10 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	1	2	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:28	USER1	10 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	2	2	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:32	USER1	10 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	3	2	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:37	USER1	20 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	1	3	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:40	USER1	20 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	2	3	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:44	USER1	20 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	3	3	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:49	USER1	50 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	1	4	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:53	USER1	50 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	2	4	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 11:57	USER1	50 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	3	4	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 12:02	USER1	100 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	1	5	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 12:07	USER1	100 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	2	5	IC20P40M	0.5
~~v2.0	3	1	Done	0	12/4/03 12:11	USER1	100 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	3	3	5	IC20P40M	0.5
~~v2.0	10	1	Done	0	12/4/03 12:14	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	1	1001	IC20P40M	0
~~v2.0	10	1	Done	0	12/4/03 12:16	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	2	1001	IC20P40M	0
~~v2.0	10	1	Done	0	12/4/03 12:18	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	3	1001	IC20P40M	0
~~v2.0	10	1	Done	0	12/4/03 12:20	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	4	1001	IC20P40M	0
~~v2.0	10	1	Done	0	12/4/03 12:23	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	5	1001	IC20P40M	0
~~v2.0	10	1	Done	0	12/4/03 12:25	USER1	blank	Blank IC Ranges 3 4 & 5	10 - 100 ppm IC for 40mL	2	2	6	6	1001	IC20P40M	0

Cal Curve data - columns 1-17

04 DEC 03 CONT BW

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
0	0	5	0	0.5	0	10	0	1	5.219	5.237	120	61733	0	0	0	2.40E+05	2/16/97 12:24	0	0	12041045	12041110
0	0	5	0	0.5	0	10	0	1	5.225	5.185	120	55017	0	0	0	2.40E+05	2/16/97 12:24	0	0	12041045	12041114
0	0	5	0	0.5	0	10	0	1	5.176	5.179	120	56069	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041118
0	0	5	0	0.5	0	10	0	1	5.149	6.147	110	1374138	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041122
0	0	5	0	0.5	0	10	0	1	5.335	6.33	106	1384257	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041126
0	0	5	0	0.5	0	10	0	1	5.296	6.295	108	1398808	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041130
0	0	5	0	0.5	0	10	0	1	5.278	6.277	121	2657780	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041134
0	0	5	0	0.5	0	10	0	1	5.358	6.356	119	2668435	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041138
0	0	5	0	0.5	0	10	0	1	5.298	6.296	121	2770618	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041142
0	0	5	0	0.5	0	10	0	1	5.229	6.226	139	6706035	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041146
0	0	5	0	0.5	0	10	0	1	5.344	6.342	136	6678731	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041150
0	0	5	0	0.5	0	10	0	1	5.301	6.3	137	6691017	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041154
0	0	5	0	0.5	0	10	0	1	5.324	6.323	155	13758422	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041159
0	0	5	0	0.5	0	10	0	1	5.457	6.457	153	14037105	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041203
0	0	5	0	0.5	0	10	0	1	5.472	6.47	153	13607869	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041208
0	0	5	0	0.5	0	10	0	0.5	5.386	5.883	61	101252	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041213
0	0	5	0	0.5	0	10	0	0.5	5.186	5.686	60	56212	0	0	0	0.00E+00	1/1/70 0:00	0	0	12041045	12041215
0	0	5	0	0.5	0	10	0	0.5	5.144	5.643	62	49041	0	0	0	0.00E+00	1/1/70 0:00	0.99968	-68757	12041045	12041217
0	0	5	0	0.5	0	10	0	0.5	5.094	5.594	63	51347	0	0	0	0.00E+00	1/1/70 0:00	0.99968	-68757	12041045	12041219
0	0	5	0	0.5	0	10	0	0.5	5.118	5.615	62	47493	0	0	0	0.00E+00	1/1/70 0:00	0.99968	-68757	12041045	12041221
0	0	5	0	0.5	0	10	0	0.5	5.061	5.561	62	47420	0	0	0	0.00E+00	1/1/70 0:00	0.99968	-68757	12041045	12041224

Cal Curve data - columns 18-39

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
~~v2.0	0	1	Done	0	12/4/03 12:28	USER1	4FB blank	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	6	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:31	USER1	4FB blank	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	6	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:36	USER1	4PB	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	7	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:39	USER1	4PB	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	7	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:44	USER1	19P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	8	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:48	USER1	19P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	8	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:52	USER1	29P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	9	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 12:56	USER1	29P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	9	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:01	USER1	28P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	10	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:05	USER1	28P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	10	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:09	USER1	24P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	11	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:13	USER1	24P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	11	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:18	USER1	27P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	12	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:22	USER1	27P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	12	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:27	USER1	19D	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	13	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:31	USER1	19D	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	13	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:36	USER1	7SC-Z4	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	14	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:40	USER1	7SC-Z4	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	14	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:45	USER1	19IM2-Z5	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	15	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:49	USER1	19IM2-Z5	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	15	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:53	USER1	16P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	16	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 13:57	USER1	16P	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	16	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 14:02	USER1	19IM1-Z5	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	17	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 14:06	USER1	19IM1-Z5	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	17	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 14:10	USER1	20 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	1	18	IC20P40M	0.5
~~v2.0	0	1	Done	0	12/4/03 14:14	USER1	20 ppm IC	IC Range 20 - 200 ppm C	10 - 100 ppm IC for 40mL	2	2	2	2	18	IC20P40M	0.5

Sample data - colums 1-17

04 DEC 03 CONT BHW

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
0	0	5	0	0.5	0	10	0	1	5.058	6.053	65	97899	0.178	0.3559	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041226
0	0	5	0	0.5	0	10	0	1	5.066	6.064	65	96353	0.1724	0.3447	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041229
0	0	5	0	0.5	0	10	0	1	5.026	6.026	121	2843537	10.1208	20.2416	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041233
0	0	5	0	0.5	0	10	0	1	5.064	6.064	121	2890371	10.2904	20.5809	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041237
0	0	5	0	0.5	0	10	0	1	5.026	6.025	127	3732743	13.3409	26.6819	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041241
0	0	5	0	0.5	0	10	0	1	5.091	6.09	125	3684227	13.1652	26.3305	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041245
0	0	5	0	0.5	0	10	0	1	5.032	6.031	125	3599568	12.8587	25.7173	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041249
0	0	5	0	0.5	0	10	0	1	5.056	6.052	124	3602403	12.8689	25.7379	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041253
0	0	5	0	0.5	0	10	0	1	4.972	5.97	135	5620336	20.1765	40.353	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041258
0	0	5	0	0.5	0	10	0	1	5.006	6.003	133	5607023	20.1283	40.2566	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041302
0	0	5	0	0.5	0	10	0	1	5.008	6.004	128	4306970	15.4204	30.8408	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041307
0	0	5	0	0.5	0	10	0	1	5.038	6.034	128	4264857	15.2679	30.5358	48754	2.76E+05	12/4/03 12:18	0.99968.	-68757	12041045	12041311
0	0	5	0	0.5	0	10	0	1	5.001	5.997	136	5932412	21.3067	42.6133	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041315
0	0	5	0	0.5	0	10	0	1	5.015	6.014	135	5967183	21.4326	42.8651	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041319
0	0	5	0	0.5	0	10	0	1	4.997	5.993	152	11786759	42.5072	85.0143	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041324
0	0	5	0	0.5	0	10	0	1	5.115	6.115	149	11869013	42.805	85.61	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041328
0	0	5	0	0.5	0	10	0	1	5.079	6.075	137	7366503	26.5	52.9999	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041333
0	0	5	0	0.5	0	10	0	1	5.054	6.053	139	7254285	26.0936	52.1872	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041337
0	0	5	0	0.5	0	10	0	1	5.027	6.025	134	5855808	21.0292	42.0585	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041342
0	0	5	0	0.5	0	10	0	1	4.987	5.982	134	5898517	21.1839	42.3678	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041346
0	0	5	0	0.5	0	10	0	1	4.995	5.99	130	4991972	17.901	35.802	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041350
0	0	5	0	0.5	0	10	0	1	4.979	5.978	130	5042225	18.083	36.166	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041354
0	0	5	0	0.5	0	10	0	1	4.91	5.909	134	5883141	21.1282	42.2565	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041359
0	0	5	0	0.5	0	10	0	1	4.985	5.983	132	5881557	21.1225	42.245	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041403
0	0	5	0	0.5	0	10	0	1	4.968	5.966	117	2698612	9.596	19.192	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041408
0	0	5	0	0.5	0	10	0	1	4.928	5.926	119	2725786	9.6944	19.3888	48754	2.76E+05	12/4/03 12:18	0.99968	-68757	12041045	12041411

Sample data - colums 18-39

05 DEC 03 BAW

Two curves were generated from the IC stds; one with the 100 ppm std and one without the 100 ppm std. The R^2 values for both curves were good, but the slopes and y-intercepts were different. The slope and y-intercept from the curve w/o the 100 ppm std provided a closer match to the last time the TOC analyzer was used (610/18). "Fresh" type one water was used (610/6) in making the standards used for that curve. The equation from the previous curve was $y = 262768X + 65473$ ($R^2 = 1$) from ~~0,5~~ BW 12-5-03 0, 10, 20, + 50 ppm stds. For calculations using the $y = mx + b$ equation, the value for B ~~that~~ BW 12-5-03 for samples is the average of the last 3 blanks while the value for B for continuing calibration verifications (ccvs) is the y-intercept from the curve. For samples, the b value for the curve with the 100 ppm std is the same as the one without the 100 ppm std – 48,753. Therefore, the differences in ~~calcut~~ sample BW 12-5-03 concentrations from the two curves is due to the different slopes. For the 20 ppm ccv, the calculated concentrations varied due to different slopes and different y-intercepts. I would be comfortable using numbers generated from either curve. I would select the curve

05 DEC 03 CONT BAW

without the 100 ppm std since the slope, BW 12-5-03 and y-intercept provided a closer match to the values from the curve from 610/18. It should be noted that two of the samples (19D and 75C - Zone 4) fell within the 50 to 100 ppm range while the others fell within the 20 to 50 ppm IC range. The area counts from this final analysis matched well with the preliminary analysis (610/164). The area counts for the field blank (4FB) were larger than the area counts for the curve blank. Also the area counts for the field blank (4FB) were larger on 04 Dec 03. Comparision results followed by individual cal curve information

Comparision of sample results from the two calibration curves

Sample ID	conc # (ppm) for curve without 100ppm	conc # (ppm) for curve with 100ppm
4FB (Blank)	0.365	0.352
4PB	21.241	20.515
19P	27.584	26.641
29P	26.773	25.858
28P	41.943	40.510
24P	31.936	30.844
27P	44.477	42.956
19D	88.780	85.746
7SC - ZONE 4	54.732	52.861
19IM2 - ZONE 5	43.929	42.428
16P	37.447	36.167
19IM1-ZONE 5	43.968	42.465
20 ppm std*	20.029	19.877

* calculated using y-intercept instead of average of last 3 blanks
# Calculated by dividing the mass by the volume of sample (0.5mL)

05 DEC 03 CONT BAW

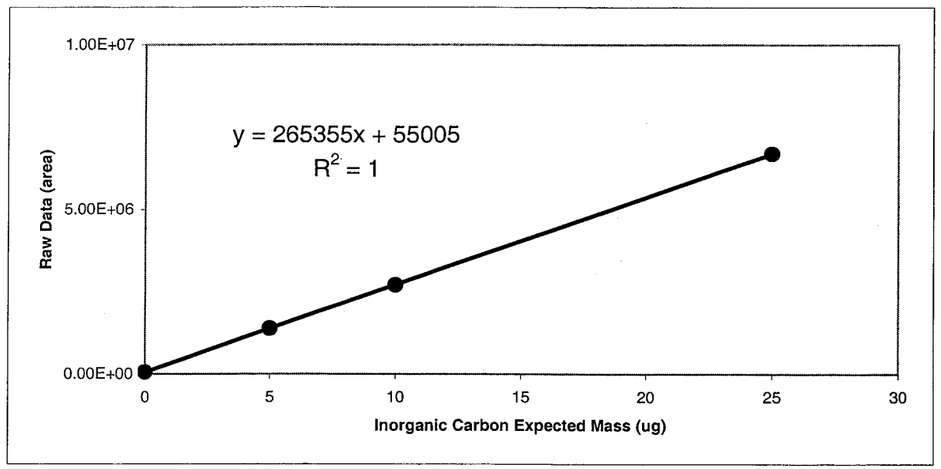
Inorganic Carbon (IC) Analysis
Range 20 ppm to 200 ppm IC
EWDP groundwater from Sep and Oct 2003 sampling events

IC Standard Data

IC Std (ppm)	IC expected mass (ug)	Raw Data rep 1	rep 2	rep 3	Raw Data Ave
0	0	61733	55017	56069	57606
10	5	1374138	1384257	1398808	1385734
20	10	2657780	2668435	2770618	2698944
50	25	6706035	6678731	6691017	6691928
100*	50	13758422	14037105	13607869	13801132
Blank (last 3)	0	51347	47493	47420	48753

*100 ppm std not used

IC Calibration Curve



IC Sample Data

Sample ID	Raw Data rep 1	rep 2	Raw Data Ave	mass (ug) IC	conc # (ppm)
4FB (Blank)	97899	96353	97126	0.1822954	0.364591
4PB	2843537	2890371	2866954	10.6204933	21.240987
19P	3732743	3684227	3708485	13.7918336	27.583667
29P	3599568	3602403	3600986	13.3867178	26.773436
28P	5620336	5607023	5613680	20.9716286	41.943257
24P	4306970	4264857	4285914	15.9678940	31.935788
27P	5932412	5967183	5949798	22.2383015	44.476603
19D	11786759	11869013	11827886	44.3900925	88.780185
7SC - ZONE 4	7366503	7254285	7310394	27.3657591	54.731518
19IM2 - ZONE 5	5855808	5898517	5877163	21.9645739	43.929148
16P	4991972	5042225	5017099	18.7233913	37.446783
19IM1-ZONE 5	5883141	5881557	5882349	21.9841194	43.968239
20 ppm std*	2698612	2725786	2712199	10.0144873	20.028975

* calculated using y-intercept instead of average of last 3 blanks
\# Calculated by dividing the mass by the volume of sample (0.5mL)

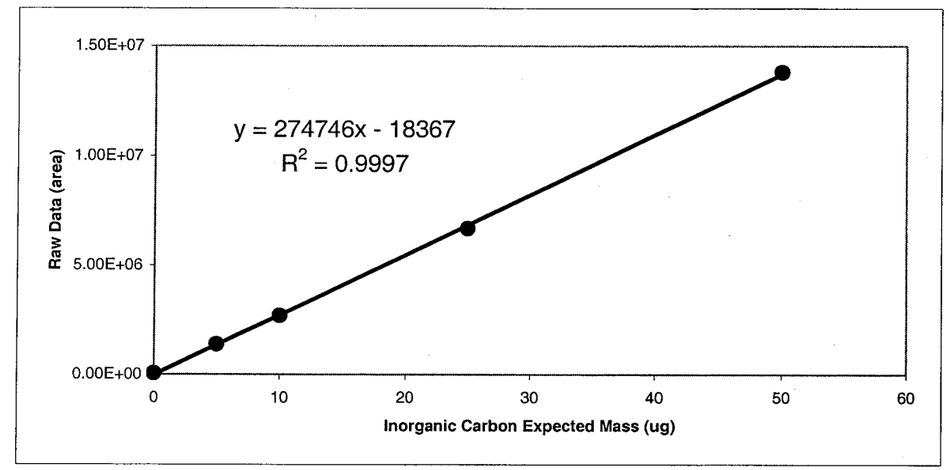
05 DEC 03 CONT BAW

Inorganic Carbon (IC) Analysis
Range 20 ppm to 200 ppm IC
EWDP groundwater from Sep and Oct 2003 sampling events

IC Standard Data

IC Std (ppm)	IC expected mass (ug)	Raw Data rep 1	rep 2	rep 3	Raw Data Ave
0	0	61733	55017	56069	57606
10	5	1374138	1384257	1398808	1385734
20	10	2657780	2668435	2770618	2698944
50	25	6706035	6678731	6691017	6691928
100	50	13758422	14037105	13607869	13801132
Blank (last 3)	0	51347	47493	47420	48753

IC Calibration Curve



IC Sample Data

Sample ID	Raw Data rep 1	rep 2	Raw Data Ave	mass (ug) IC	conc # (ppm)
4FB (Blank)	97899	96353	97126	0.1760644	0.352129
4PB	2843537	2890371	2866954	10.2574778	20.514956
19P	3732743	3684227	3708485	13.3204196	26.640839
29P	3599568	3602403	3600986	12.9291509	25.858302
28P	5620336	5607023	5613680	20.2548044	40.509609
24P	4306970	4264857	4285914	15.4221008	30.844202
27P	5932412	5967183	5949798	21.4781817	42.956363
19D	11786759	11869013	11827886	42.8728098	85.745620
7SC - ZONE 4	7366503	7254285	7310394	26.4303793	52.860759
19IM2 - ZONE 5	5855808	5898517	5877163	21.2138102	42.427620
16P	4991972	5042225	5017099	18.0834134	36.166827
19IM1-ZONE 5	5883141	5881557	5882349	21.2326876	42.465375
20 ppm std*	2698612	2725786	2712199	9.9385105	19.877021

* calculated using y-intercept instead of average of last 3 blanks
\# Calculated by dividing the mass by the volume of sample (0.5mL)

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SGS Anion Results for EWDP groundwater sampling event Oct 27-31, 2003

Samples from 610/82-85
QA Sample from 610/81-82
From NC-EWDP wells 16P, 19D, 19IM1-Zone5, 19IM2-Zone5, and 7SC-Zone4
No Field Blank
1 QA sample
1 Duplicate Sample (16P)

Nitrate/Nitrite data expressed in mg/L of nitrogen by SGS Lakefield. Converted into mg/L nitrate and nitrite for convenience.

Accuracy and Precission Summary data followed by complete results.

SGS Anion Results for EWDP groundwater sampling event Oct 27 to Oct 30, 2003

Duplicate Analysis Results (in mg/L) - Precision info

	16P-1003-FUA-3	16P-1003-FUA-4	Percent Difference
F	2.56	2.56	0.00
Tot.Reactive P	< 0.03	< 0.03	na
Cl	8.8	8.9	1.14
SO4	56.0	57.0	1.79
Br	< 0.3	< 0.3	na
NO2	<0.20	<0.20	na
NO3	5.44	5.44	0.00
NO2+NO3	5.44	5.44	0.00

8 DEC 03 CONT BAW

SGS Anion Results for EWDP groundwater sampling event Oct 27 to 30, 2003

For Sample 99Q-1003-FUA-3 - Accuracy Info

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Chloride	5	5.1	2.00
Nitrate	2	1.99	-0.40

Report No. **CA4349-NOV03**
PO# **477102N**

Conversion of nitrogen mg/L to nitrate and nitrite mg/L

	NO2 as N mg/L	NO3 as N mg/L	NO2+NO3 as N mg/L	NO2 mg/L	NO3 mg/L	NO2+NO3 mg/L
19IM2-Z5-1003-FUA-3	< 0.06	0.47	0.47	<0.20	2.08	2.08
16P-1003-FUA-3	< 0.06	1.23	1.23	<0.20	5.44	5.44
99Q-1003-FUA-3	< 0.06	0.45	0.45	<0.20	1.99	1.99
19IM1-Z5-1003-FUA-3	< 0.06	0.47	0.47	<0.20	2.08	2.08
19D-1003-FUA-3	< 0.06	<0.05	<0.06	<0.20	<0.27	na
7SC-Z4-1003-FUA-3	< 0.06	<0.05	<0.06	<0.20	<0.27	na
16P-1003-FUA-4	< 0.06	1.23	1.23	<0.20	5.44	5.44
Env Blank	< 0.06	< 0.05	---	<0.20	<0.27	---
Env Standard	98%	101%	---	98%	101%	---

Converted by dividing the measured value (N mg/L) by the percentage of nitrogen in nitrate (0.22590) and in nitrite (0.30446)

Results with nitrite and nitrate mg/L

	F mg/L	Tot.Reactive P in mg/L	Cl mg/L	SO4 mg/L	Br mg/L	NO2 mg/L	NO3 mg/L	NO2+NO3 mg/L
19IM2-Z5-1003-FUA-3	2.02	< 0.03	5.4	17	< 0.3	<0.20	2.08	2.08
16P-1003-FUA-3	2.56	< 0.03	8.8	56	< 0.3	<0.20	5.44	5.44
99Q-1003-FUA-3	<0.04	< 0.03	5.1	<0.5	< 0.3	<0.20	1.99	1.99
19IM1-Z5-1003-FUA-3	1.99	< 0.03	5.4	16	< 0.3	<0.20	2.08	2.08
19D-1003-FUA-3	3.76	< 0.03	7.6	28	< 0.3	<0.20	<0.27	na
7SC-Z4-1003-FUA-3	0.75	<0.03	17	140	< 0.3	<0.20	<0.27	na
16P-1003-FUA-4	2.56	< 0.03	8.9	57	< 0.3	<0.20	5.44	5.44
Env Blank	<0.04	< 0.03	< 0.2	< 0.5	< 0.3	<0.20	<0.27	---
Env Standard	102%	102%	105%	103%	96%	98%	101%	---

Precision and accuracy numbers acceptable. Data from PO # 477102N accepted on 12-8-03 by Bradley Werling (Bradley a Werling).

8DEC03 CONT BAW

PO No: 477102N

Friday, November 21, 2003

Date Rec. : 11 November 2003
LR Report: CA4349-NOV03

Copy: #1

SGS
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Southwest Research Institute
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CERTIFICATE OF ANALYSIS
Final Report

Sample ID	Sample Temperature Date & Time	Sample Temperature Upon Receipt °C	F mg/L	Tot.Reactive P mg/L	Cl mg/L	SO4 mg/L	Br mg/L	NO2 as N mg/L	NO3 as N mg/L	NO2+NO3 as N mg/L
1: *Approved Date	---		17-Nov-03	17-Nov-03	19-Nov-03	21-Nov-03	14-Nov-03	14-Nov-03	14-Nov-03	14-Nov-03
2: *Approved Time	---		08:23	11:22	06:55	14:48	15:49	15:49	15:49	15:49
3: 19IM2-Z5-1003-FVA3 BAW	05-Nov-03	9.1	2.02	< 0.03	5.4	17	< 0.3	< 0.06	0.47	0.47
4: 16P-1003-FVA-3 BAW	05-Nov-03	9.1	2.56	< 0.03	8.8	56	< 0.3	< 0.06	1.23	1.23
5: 99Q-1003-FVA-3 BAW	05-Nov-03	9.1	< 0.04	< 0.03	5.1	< 0.5	< 0.3	< 0.06	0.45	0.45
6: 19IMI-Z5-1003-FVA-3 BAW	05-Nov-03	9.1	1.99	< 0.03	5.4	16	< 0.3	< 0.06	0.47	0.47
7: 19D-1003-FVA-3 BAW	05-Nov-03	9.1	3.76	< 0.03	7.6	28	< 0.3	< 0.06	< 0.05	< 0.06
8: 7SC-Z4-1003-FVA-3 BAW	05-Nov-03	9.1	0.75	< 0.03	17	140	< 0.3	< 0.06	< 0.05	< 0.06
9: 16P-1003-FVA-4 BAW	05-Nov-03	9.1	2.56	< 0.03	8.9	57	< 0.3	< 0.06	1.23	1.23
10: Env Blank	---		< 0.04	< 0.03	< 0.2	< 0.5	< 0.3	< 0.06	< 0.05	---
11: Env Standard	---		102%	98%	105%	103%	96%	98%	101%	---

Chris Sullivan, B.Sc., C.Chem
Project Coordinator
Environmental Services, Analytical

Accredited by the Standards Council of Canada and CAEAL for specific registered tests.

8DEC03 CONT BAW

SGS Cation/Trace Metal Results from EWDP groundwater sampling event Oct 27-31, 2003

Samples from 610/82-85
QA Samples from 610/81
From wells NC-EWDP 16P, 19D, 19IM1-Zone5, 19IM2-Zone5, and 7SC-Zone4
Field blank- none
2 QAs- duplicates- aliquots from same stock solution
1 Sample Duplicate: 19IM1-Zone5

Accuracy + Precision Summary data followed by complete results

SGS Cation Results for EWDP groundwater sampling event Oct 27 to Oct 30, 2003

QA Accuracy Results

Results in mg/L

For Sample 98Q-1003-FA7

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	10	11.2	12.00
Potassium	6	8.24	37.33
Sodium	30	25.5	-15.00
Silicon	20	17.4	-13.00

For Sample 98Q-1003-FA8

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Calcium	10	11.4	14.00
Potassium	6	8.20	36.67
Sodium	30	25.3	-15.67
Silicon	20	18.3	-8.50

8 DEC 03 - CONT BAW

SGS Cation Results for EWDP groundwater sampling event Oct 27 to Oct 30, 2003

Duplicate Analysis Results - Precision info

Results in mg/L

	19IM1-Z5-1003 FA-7	19IM1-Z5-1003 FA-8	Percent Difference
Ag	< 0.0001	< 0.0001	na
Al	0.165	0.160	3.03
As	0.038	0.039	-2.63
Ba	0.003	0.002	33.33
Be	< 0.005	< 0.005	na
B	0.22	0.22	0.00
Bi	< 0.05	< 0.05	na
Ca	0.13	0.13	0.00
Cd	< 0.0001	< 0.0001	na
Co	< 0.0003	< 0.0003	na
Cr	< 0.001	< 0.001	na
Cu	0.0024	0.0024	0.00
Fe	0.08	0.08	0.00
K	5.17	5.17	0.00
Li	0.119	0.117	1.68
Mg	0.071	0.070	1.41
Mn	0.014	0.014	0.00
Mo	0.0059	0.0060	-1.69
Na	88.2	88.5	-0.34
Ni	< 0.001	< 0.001	na
Pb	0.0002	0.0002	0.00
Sb	0.0005	0.0004	20.00
Se	< 0.005	< 0.005	na
Si	24.4	24.8	-1.64
Sn	< 0.001	< 0.001	na
Sr	0.0024	0.0031	-29.17
Ti	< 0.003	< 0.003	na
Tl	< 0.0002	< 0.0002	na
U	0.0019	0.0019	0.00
V	0.0057	0.0058	-1.75
W	0.0022	0.0022	0.00
Y	< 0.0001	< 0.0001	na
Zn	0.003	0.002	33.33
Zr	0.0040	0.0004	90.00

	98Q-1003 FA7	98Q-1003 FA8	Percent Difference
Ag	< 0.0001	< 0.0001	na
Al	0.019	0.016	15.8
As	< 0.005	< 0.005	na
Ba	< 0.001	< 0.001	na
Be	< 0.005	< 0.005	na
B	0.05	0.05	0
Bi	< 0.05	< 0.05	na
Ca	11.2	11.4	-1.79
Cd	< 0.0001	< 0.0001	na
Co	< 0.0003	< 0.0003	na
Cr	< 0.001	< 0.001	na
Cu	0.0009	0.0008	11.1
Fe	< 0.05	< 0.05	na
K	8.24	8.20	0.485
Li	< 0.004	< 0.004	na
Mg	< 0.02	< 0.02	na
Mn	< 0.002	< 0.002	na
Mo	< 0.0003	< 0.0003	na
Na	25.5	25.3	0.784
Ni	< 0.001	< 0.001	na
Pb	< 0.0002	< 0.0002	na
Sb	< 0.0004	< 0.0004	na
Se	< 0.005	< 0.005	na
Si	17.4	18.3	-5.17
Sn	< 0.001	< 0.001	na
Sr	0.0007	0.0005	28.6
Ti	< 0.003	< 0.003	na
Tl	< 0.0002	< 0.0002	na
U	< 0.0002	< 0.0002	na
V	< 0.0009	< 0.0009	na
W	< 0.0002	< 0.0002	na
Y	< 0.0001	< 0.0001	na
Zn	0.001	0.001	0
Zr	0.0023	0.0009	60.9

12-8-03 BW

Precision + Accuracy ~~w~~ numbers acceptable. Data from PO # 477100N accepted on 12-8-03 by Bradley Worling (Bradley Worling)

8 DEC 03 CONT BAW

SGS Cation Results for EWDP groundwater sampling event Oct 27 to 30, 2003

Report No. CA4350-NOV03
PO# 477100N
Results in mg/L

	19D-1003 FA-7	19D-1003 FUA-7	7SC-Z4 FA-7	7SC-Z4 FUA-7	19IM2-Z5-1003 FA-7	19IM2-Z5-1003 FUA-7	16P-1003 FA-7	16P-1003 FUA
Ag	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Al	0.013	0.012	0.020	0.015	0.203	0.130	0.693	4.751
As	0.008	0.012	< 0.005	< 0.005	0.038	0.058	0.011	0.018
Ba	0.003	0.002	0.055	0.049	< 0.001	< 0.001	0.014	0.006
Be	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
B	0.28	0.29	0.31	0.31	0.21	0.22	0.25	0.26
Bi	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ca	1.71	1.57	28.9	29.5	< 0.05	< 0.05	1.52	1.00
Cd	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Co	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0006	< 0.0003
Cr	< 0.001	0.007	< 0.001	0.005	< 0.001	0.004	0.004	0.005
Cu	0.0035	0.0033	0.0021	0.0017	0.0022	0.0019	0.0042	0.0028
Fe	0.25	0.20	< 0.05	< 0.05	0.13	0.07	1.28	2.30
K	5.51	5.58	9.74	9.79	5.36	5.24	3.14	3.21
Li	0.210	0.196	0.098	0.092	0.121	0.111	0.078	0.069
Mg	0.095	0.092	29.0	29.0	0.060	0.048	0.44	0.92
Mn	0.040	0.022	0.072	0.065	0.004	0.006	0.024	0.013
Mo	0.0411	0.0428	0.0066	0.0067	0.0055	0.0060	0.0659	0.0772
Na	163	161	78.8	77.8	91.2	88.2	95.6	94.9
Ni	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.002	< 0.001
Pb	< 0.0002	< 0.0002	0.0013	< 0.0002	< 0.0002	< 0.0002	0.0022	0.0016
Sb	< 0.0004	< 0.0004	0.0011	0.0011	< 0.0004	0.0007	0.0011	0.0013
Se	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Si	5.62	5.82	11.5	11.5	25.0	24.8	31.6	30.1
Sn	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sr	0.0077	0.0072	0.39	0.38	0.0010	0.0027	0.0256	0.0174
Ti	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.005	0.036
Tl	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
U	< 0.0002	< 0.0002	0.0006	< 0.0002	0.0020	0.0019	0.0040	0.0041
V	0.0027	0.0183	0.0014	0.0122	0.0064	0.0134	0.0032	0.0099
W	0.0018	0.0026	0.0069	0.0084	0.0020	0.0032	0.0005	0.0020
Y	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0004	0.0006
Zn	0.003	< 0.001	0.004	< 0.001	0.002	< 0.001	0.015	0.008
Zr	< 0.0004	< 0.0004	< 0.0004	< 0.0004	0.0004	< 0.0004	0.0012	0.0047

12-8-03 BW

8 DEC 03 CONT BAW

	98Q-1003 FA-7	98Q-1003 FA-8	19IM1-Z5-1003 FA-7	19IM1-Z5-1003 FUA-7	19IM1-Z5-1003 FA-8	Env Blank	Env Standard
Ag	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	100%
Al	0.019	0.016	0.165	0.325	0.160	< 0.004	106%
As	< 0.005	< 0.005	0.038	0.060	0.039	< 0.005	98%
Ba	< 0.001	< 0.001	0.003	< 0.001	0.002	< 0.001	101%
Be	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	103%
B	0.05	0.05	0.22	0.21	0.22	< 0.05	97%
Bi	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	101%
Ca	11.2	11.4	0.13	< 0.05	0.13	< 0.05	98%
Cd	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	100%
Co	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	104%
Cr	< 0.001	< 0.001	< 0.001	0.004	< 0.001	< 0.001	104%
Cu	0.0009	0.0008	0.0024	0.0020	0.0024	< 0.0008	102%
Fe	< 0.05	< 0.05	0.08	0.16	0.08	< 0.05	97%
K	8.24	8.20	5.17	5.41	5.17	< 0.02	92%
Li	< 0.004	< 0.004	0.119	0.116	0.117	< 0.004	96%
Mg	< 0.02	< 0.02	0.071	0.056	0.070	< 0.02	98%
Mn	< 0.002	< 0.002	0.014	0.003	0.014	< 0.002	100%
Mo	< 0.0003	< 0.0003	0.0059	0.0060	0.0060	< 0.0003	104%
Na	25.5	25.3	88.2	90.2	88.5	< 0.05	97%
Ni	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	100%
Pb	< 0.0002	< 0.0002	0.0002	0.0002	0.0002	< 0.0002	100%
Sb	< 0.0004	< 0.0004	0.0005	0.0004	0.0004	< 0.0004	102%
Se	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	96%
Si	17.4	18.3	24.4	25.8	24.8	< 0.05	96%
Sn	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	99%
Sr	0.0007	0.0005	0.0024	0.0010	0.0031	< 0.0002	99%
Ti	< 0.003	< 0.003	< 0.003	0.004	< 0.003	< 0.003	102%
Tl	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	100%
U	< 0.0002	< 0.0002	0.0019	0.0020	0.0019	< 0.0002	102%
V	< 0.0009	< 0.0009	0.0057	0.0145	0.0058	< 0.0009	103%
W	< 0.0002	< 0.0002	0.0022	0.0028	0.0022	< 0.0002	101%
Y	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	100%
Zn	0.001	0.001	0.003	0.002	0.002	< 0.001	104%
Zr	0.0023	0.0009	0.0040	0.0005	0.0004	< 0.0004	94%

12-8-03 BW

9 DEC 03 CONT BAW

Div 01 Anion results for EWDP groundwater sampling event Sep 27-Oct 3, 2003

Samples from 610/44-47
QA Samples from 610/43-44
BW 12-9-03 ~~No~~ Field blank: 4FB
2 QA samples (dups - aliquots from same stock soln)
1 Dup sample: 29P UFUA

Nitrate/Nitrite data expressed in mg/L of nitrogen by Div 01. Converted into mg/L nitrate + nitrite for convenience.

Div 01 Anion Results for EWDP groundwater sampling event Sep 27 to Oct 3, 2003

Duplicate Analysis Results (in mg/L) - Precision info

	29P-1003-UFUA-1	29P-1003-UFUA-2	Percent Difference
Bromide	<0.1	<0.1	na
Chloride	6.82	6.74	1.17
Fluoride	1.91	1.90	0.524
Nitrite	<0.33	<0.33	na
Nitrate	8.46	8.41	0.524
Phosphate	0.0425	0.0240	43.5
Sulfate	23.4	23.2	0.855

Div 01 Anion Results for EWDP groundwater sampling event Sep 27 to Oct 3, 2003

QA Accuracy results

For Sample 89Q-1003-FUA-1

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Chloride	10	9.92	-0.80
Nitrate	2	1.93	-3.50

For Sample 89Q-1003-FUA-2

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Chloride	10	10.1	1.00
Nitrate	2	1.92	-4.00

9 DEC 03 CONT BAW

Div 01 Anion results for EWDP groundwater samples from Sep 27- Oct 3, 2003 event

Conversion of nitrogen mg/L to nitrate and nitrite mg/L

	NO2 as N mg/L	NO3 as N mg/L	NO2 mg/L	NO3 mg/L
19P-1003-FUA-1	<0.1	1.10	<0.33	4.87
19P-1003-UFUA-1	<0.1	1.10	<0.33	4.87
24P-0903-FUA-1	<0.1	0.346	<0.33	1.53
24P-0903-UFUA-1	<0.1	0.335	<0.33	1.48
27P-0903-FUA-1	<0.1	0.643	<0.33	2.85
27P-0903-UFUA-1	<0.1	0.475	<0.33	2.10
28P-0903-FUA-1	<0.1	1.38	<0.33	6.11
28P-0903-UFUA-1	<0.1	1.38	<0.33	6.11
29P-1003-FUA-1	<0.1	1.19	<0.33	5.27
29P-1003-UFUA-1	<0.1	1.19	<0.33	5.27
29P-1003-UFUA-2	<0.1	1.17	<0.33	5.18
4FB-1003-UFUA-1	<0.1	<0.1	<0.33	<0.33
4PB-1003-FUA-1	<0.1	0.538	<0.33	2.38
4PB-1003-UFUA-1	<0.1	0.564	<0.33	2.50
89Q-1003-FUA-1	<0.1	0.436	<0.33	1.93
89Q-1003-FUA-2	<0.1	0.433	<0.33	1.92

Converted by dividing the measured value (N mg/L) by the percentage of nitrogen in nitrate (0.22590) and in nitrite (0.30446)

Results with nitrite and nitrate mg/L

BW 12-10-03

	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Nitrite mg/L	Nitrate mg/L	Phosphate-P mg/L	Sulfate mg/L
19P-1003-FUA-1	<0.1	7.04	1.84	<0.33	4.87	0.0188	19.9
19P-1003-UFUA-1	<0.1	7.01	1.83	<0.33	4.87	0.0193	20.1
24P-0903-FUA-1	<0.1	7.11	2.00	<0.33	1.53	0.0168	23.9
24P-0903-UFUA-1	<0.1	7.01	2.00	<0.33	1.48	0.0162	23.9
27P-0903-FUA-1	<0.1	9.68	3.31	<0.33	2.85	0.0317	38.5
27P-0903-UFUA-1	<0.1	9.72	3.35	<0.33	2.10	0.0750	38.0
28P-0903-FUA-1	<0.1	8.41	2.01	<0.33	6.11	0.111	33.2
28P-0903-UFUA-1	<0.1	8.32	2.04	<0.33	6.11	0.156	33.4
29P-1003-FUA-1	<0.1	6.80	1.90	<0.33	5.27	0.0302	22.8
29P-1003-UFUA-1	<0.1	6.82	1.91	<0.33	5.27	0.0425	23.4
29P-1003-UFUA-2	<0.1	6.74	1.90	<0.33	5.18	0.0240	23.2
4FB-1003-UFUA-1	<0.1	<0.1	<0.1	<0.33	<0.33	<0.01	<0.1
4PB-1003-FUA-1	<0.1	5.54	1.76	<0.33	2.38	0.0462	26.3
4PB-1003-UFUA-1	<0.1	5.48	1.74	<0.33	2.50	0.0565	25.9
89Q-1003-FUA-1	<0.1	9.92	<0.1	<0.33	1.93	<0.01	<0.1
89Q-1003-FUA-2	<0.1	10.1	<0.1	<0.33	1.92	<0.01	<0.1

12-9-03 BAW

10 DEC 03 BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 19P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236236

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	7.04	0.1
Fluoride	1.84	0.1
Nitrate-N	1.10	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0188	0.01
Sulfate	19.9	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 19P-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236239

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	7.01	0.1
Fluoride	1.83	0.1
Nitrate-N	1.10	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0193	0.01
Sulfate	20.1	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236241

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	7.11	0.1
Fluoride	2.00	0.1
Nitrate-N	0.346	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0168	0.01
Sulfate	23.9	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
24P-0903-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236243

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	7.01	0.1
Fluoride	2.00	0.1
Nitrate-N	0.335	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0162	0.01
Sulfate	23.9	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236246

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	9.68	0.1
Fluoride	3.31	0.1
Nitrate-N	0.643	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0317	0.01
Sulfate	38.5	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
27P-0903-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236248

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	9.72	0.1
Fluoride	3.35	0.1
Nitrate-N	0.475	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0750	0.01
Sulfate	38.0	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-FUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/16/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031016-9

SRR: 25102

Lab System ID: 236252

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	8.41	0.1
Fluoride	2.01	0.1
Nitrate-N	1.38	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.111	0.01
Sulfate	33.2	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
28P-0903-UFUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/16/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031016-9

SRR: 25102

Lab System ID: 236254

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	8.32	0.1
Fluoride	2.04	0.1
Nitrate-N	1.38	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.156	0.01
Sulfate	33.4	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-FUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/16/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031016-9

SRR: 25102

Lab System ID: 236258

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	6.80	0.1
Fluoride	1.90	0.1
Nitrate-N	1.19	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0302	0.01
Sulfate	22.8	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-UFUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/16/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031016-9

SRR: 25102

Lab System ID: 236259

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	6.82	0.1
Fluoride	1.91	0.1
Nitrate-N	1.19	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0425	0.01
Sulfate	23.4	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
29P-1003-UFUA-2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236260

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	6.74	0.1
Fluoride	1.90	0.1
Nitrate-N	1.17	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0240	0.01
Sulfate	23.2	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4FB-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236263

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	<0.1	0.1
Fluoride	<0.1	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	<0.01	0.01
Sulfate	<0.1	0.1

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236266

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.54	0.1
Fluoride	1.76	0.1
Nitrate-N	0.538	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0462	0.01
Sulfate	26.3	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
4PB-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236268

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.48	0.1
Fluoride	1.74	0.1
Nitrate-N	0.564	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0565	0.01
Sulfate	25.9	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
89Q-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236272

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	9.92	0.1
Fluoride	<0.1	0.1
Nitrate-N	0.436	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	<0.01	0.01
Sulfate	<0.1	0.1

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
89Q-1003-FUA-2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236273

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	10.1	0.1
Fluoride	<0.1	0.1
Nitrate-N	0.433	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	<0.01	0.01
Sulfate	<0.1	0.1

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
19P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236236

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Bromide	<0.1	<0.1	0.00%
Chloride	7.04	6.93	1.57%
Fluoride	1.84	1.83	0.54%
Nitrate-N	1.10	1.10	0.00%
Nitrite-N	<0.1	<0.1	0.00%
Phosphate-P	0.0188	0.0173	8.31%
Sulfate	19.9	20.1	1.00%

SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Sample ID
19P-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: 236236

Client: Division 20

Date Received: 10/16/03

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Bromide	<0.1	4.11	4.00	103%
Chloride	7.04	8.97	2.00	96.5%
Fluoride	1.84	2.82	1.00	98.0%
Nitrate-N	1.10	1.98	0.904	97.3%
Nitrite-N	<0.1	1.14	1.00	114%
Phosphate-P	0.0188	0.215	0.200	98.1%
Sulfate	19.9	57.3	40.0	93.5%

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
LABORATORY CONTROL SAMPLE

Sample ID: LCSW

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Bromide	384	400	96.0%
Chloride	199	200	99.5%
Fluoride	98.5	100	98.5%
Nitrate-N	86.8	90.4	96.0%
Nitrite-N	96.1	100	96.1%
Phosphate-P	2.33	2.31	101%
Sulfate	384	400	96.0%

NA- Not Applicable.

SOUTHWEST RESEARCH INSTITUTE
BLANK SUMMARY

Sample ID: PBW

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031016-9

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 20.06002.01.141

SRR: 25102

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	<0.1	0.1
Fluoride	<0.1	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	<0.01	0.01
Sulfate	<0.1	0.1

NA- Not Applicable.

10 DEC 03 CONT BAW

Div 01 Anion results for EWDP groundwater sampling event Oct 27-Oct 30, 2003

Samples from 610/81-85
QA Sample from 610/81-82 (only one)
No field blank.
1 Dup Sample: 7SC-24 FUA
Note Sep 27-Oct 3 and Oct 27-Oct 30 sample were analyzed by both SGS Lakefield and Div 01.

Nitrate/Nitrite data expressed in mg/L of nitrogen by Div 01. Converted into mg/L nitrate + nitrite for convenience.

Div 01 Anion Results for EWDP groundwater sampling event Oct 27 to Oct 30, 2003

QA Accuracy results

For Sample 99Q-1003-FUA-1

Analyte	Target Conc (ppm)	Measured Conc (ppm)	Percent Difference
Chloride	5	5.03	0.60
Nitrate	2	2.01	0.50

Div 01 Anion Results for EWDP groundwater sampling event Oct 27 to Oct 30, 2003

Duplicate Analysis Results (in mg/L) - Precision info

	7SC-24-1003-FUA-1	7SC-24-1003-FUA-2	Percent Difference
Bromide	<0.1	<0.1	na
Chloride	17.3	17.4	-0.58
Fluoride	0.784	0.740	5.61
Nitrite	<0.33	<0.33	na
Nitrate	<0.44	<0.44	na
Phosphate - P	<0.01	0.0115	na
Sulfate	125	126	-0.80

10 DEC 03 CONT BAW

Div 01 Anion results for EWDP groundwater samples from Oct 27- Oct 30, 2003 event

Conversion of nitrogen mg/L to nitrate and nitrite mg/L

	NO2 as N mg/L	NO3 as N mg/L	NO2 mg/L	NO3 mg/L
16P-1003-FUA-1	<0.1	1.17	<0.33	5.18
16P-1003-UFUA-1	<0.1	1.17	<0.33	5.18
19D-1003-FUA-1	<0.1	<0.1	<0.33	<0.44
19D-1003-UFUA-1	<0.1	<0.1	<0.33	<0.44
19IM1-Z5-1003-FUA-1	<0.1	0.728	<0.33	3.22
19IM1-Z5-1003-UFUA-1	<0.1	0.461	<0.33	2.04
19IM2-Z5-1003-FUA-1	<0.1	0.467	<0.33	2.07
19IM2-Z5-1003-UFUA-1	<0.1	0.462	<0.33	2.05
7SC-Z4-1003-FUA-1	<0.1	<0.1	<0.33	<0.44
7SC-Z4-1003-UFUA-1	<0.1	<0.1	<0.33	<0.44
7SC-Z4-1003-FUA-2	<0.1	<0.1	<0.33	<0.44
99Q-1003-FUA-1	<0.1	0.454	<0.33	2.01

Converted by dividing the measured value (N mg/L) by the percentage of nitrogen in nitrate (0.22590) and in nitrite (0.30446)

Results with nitrite and nitrate mg/L

	Bromide mg/L	Chloride mg/L	Fluoride mg/L	Nitrite mg/L	Nitrate mg/L	Phosphate - P mg/L	Sulfate mg/L
16P-1003-FUA-1	<0.1	9.37	2.61	<0.33	5.18	0.0248	52.9
16P-1003-UFUA-1	<0.1	9.45	2.76	<0.33	5.18	0.0306	51.8
19D-1003-FUA-1	<0.1	8.30	3.90	<0.33	<0.44	0.0163	26.2
19D-1003-UFUA-1	<0.1	8.18	3.88	<0.33	<0.44	0.0333	26.3
19IM1-Z5-1003-FUA-1	<0.1	5.92	2.15	<0.33	3.22	0.0412	15.8
19IM1-Z5-1003-UFUA-1	<0.1	5.67	2.15	<0.33	2.04	0.0550	15.5
19IM2-Z5-1003-FUA-1	<0.1	5.69	2.15	<0.33	2.07	0.0412	16.1
19IM2-Z5-1003-UFUA-1	<0.1	5.62	2.12	<0.33	2.05	0.0396	16.1
7SC-Z4-1003-FUA-1	<0.1	17.3	0.784	<0.33	<0.44	<0.01	125
7SC-Z4-1003-UFUA-1	<0.1	17.3	0.777	<0.33	<0.44	<0.01	125
7SC-Z4-1003-FUA-2	<0.1	17.4	0.740	<0.33	<0.44	0.0115	126
99Q-1003-FUA-1	<0.1	5.03	<0.1	<0.33	2.01	<0.01	<0.1

12-10-03 BAW

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 16P-1003-FUA-1

Lab Name: Southwest Research Institute
Client: Division 20
Lab Code: SwRI
Date Received: 11/06/03
Matrix: Water
Project No.: 20.06002.01.141
Task Order: 031106-11
SRR: 25199
Lab System ID: 237566

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	9.37	0.1
Fluoride	2.61	0.1
Nitrate-N	1.17	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0248	0.01
Sulfate	52.9	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID: 16P-1003-UFUA-1

Lab Name: Southwest Research Institute
Client: Division 20
Lab Code: SwRI
Date Received: 11/06/03
Matrix: Water
Project No.: 20.06002.01.141
Task Order: 031106-11
SRR: 25199
Lab System ID: 237567

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	9.45	0.1
Fluoride	2.76	0.1
Nitrate-N	1.17	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0306	0.01
Sulfate	51.8	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19D-1003-FUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 11/06/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031106-11

SRR: 25199

Lab System ID: 237568

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	8.30	0.1
Fluoride	3.90	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0163	0.01
Sulfate	26.2	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19D-1003-UFUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 11/06/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031106-11

SRR: 25199

Lab System ID: 237569

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	8.18	0.1
Fluoride	3.88	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0333	0.01
Sulfate	26.3	1.0

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19IM1-25-1003-FUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 11/06/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031106-11

SRR: 25199

Lab System ID: 237570

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.92	0.1
Fluoride	2.15	0.1
Nitrate-N	0.728	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0412	0.01
Sulfate	15.8	0.1

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19IM1-25-1003-UFUA-1

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 11/06/03

Matrix: Water

Project No.: 20.06002.01.141

Task Order: 031106-11

SRR: 25199

Lab System ID: 237571

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.67	0.1
Fluoride	2.15	0.1
Nitrate-N	0.461	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0550	0.01
Sulfate	15.5	0.1

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19IM2-25-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031106-11

Lab System ID: 237572

Client: Division 20

Date Received: 11/06/03

Project No.: 20.06002.01.141

SRR: 25199

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.69	0.1
Fluoride	2.15	0.1
Nitrate-N	0.467	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0412	0.01
Sulfate	16.1	0.1

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
19IM2-25-1003-UFUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031106-11

Lab System ID: 237573

Client: Division 20

Date Received: 11/06/03

Project No.: 20.06002.01.141

SRR: 25199

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	5.62	0.1
Fluoride	2.12	0.1
Nitrate-N	0.462	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0396	0.01
Sulfate	16.1	0.1

10 DEC 03 CONT BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-24-1003-FUA-1

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031106-11

Lab System ID: 237574

Client: Division 20

Date Received: 11/06/03

Project No.: 20.06002.01.141

SRR: 25199

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	17.3	0.1
Fluoride	0.784	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	<0.01	0.01
Sulfate	125	1.0

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-24-1003-FUA-2

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Task Order: 031106-11

Lab System ID: 237576

Client: Division 20

Date Received: 11/06/03

Project No.: 20.06002.01.141

SRR: 25199

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Bromide	<0.1	0.1
Chloride	17.4	0.1
Fluoride	0.740	0.1
Nitrate-N	<0.1	0.1
Nitrite-N	<0.1	0.1
Phosphate-P	0.0115	0.01
Sulfate	126	1.0

10-DEC-03 CONT BAW
END OF SCIENTIFIC NOTEBOOK
ENTRIES CONTINUED IN SN 628

I have reviewed this scientific notebook and find it in agreement with QAP-001. There is sufficient information regarding methods used for conducting tests, acquiring and analyzing data so that another qualified individual could repeat the activity.

RCP 2/6/2004