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Scientific Notebook # 523: Neptunium -
Calcite Sorption Experiments

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B. Werling 522-6565

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Bradley Werling	Bradley Werling	BAW
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25 JUN 02 CONTINUATION OF NEPTUNIUM-CALCITE ADSORPTION EXPERIMENTS FROM LOGBOOK 463

8 JUL 02 Preparation of 2 Nitric Acid Solutions

BW

reagents conc HNO_3 Trace Metal Grade (16N)
Fisher A509-212, lot # 1100040 from
500 mL corning container (3-15-01 BW)
nanopure type1 water
eppendorf adjustable 100-1000 μL pipettor

Intermediate dilution step for 0.001N soln - 1.6N
Added 10 mL (vol pipet) of conc HNO_3 into a
100 mL vol flask + diluted to mark with
nanopure type1 water

0.01N HNO_3

Added 625 μL of conc HNO_3 into a partially
water filled 1000 mL vol flask and diluted to
mark with nanopure type1 water

$$\left(\frac{16 \text{ mol}}{\text{L}}\right) (625 \mu\text{L}) \left(\frac{1 \text{ L}}{10^6 \mu\text{L}}\right) / 1 \text{ L} = 0.01 \text{ N}$$

0.001N HNO_3

Added 625 μL (eppendorf) of conc BW 7-8-02
1.6N HNO_3 soln (this page) into a partially
water filled 1000 mL vol flask and diluted
to mark with nanopure type1 water

$$\left(\frac{1.6 \text{ mol}}{\text{L}}\right) (625 \mu\text{L}) \left(\frac{1 \text{ L}}{10^6 \mu\text{L}}\right) / 1 \text{ L} = 0.001 \text{ N}$$

Dumped remaining 1.6N soln into acid bath

22 Jul 02
BAWpH Measurement of Calcite Reference Solutions
B to F (463/127 4-17-02)pH meter: Orion 920A ^{bw 7-22-02} series serial # 039522
Orion 8103 combo probe 3D w/ ATC
Calibrated with

pH 7 (7-22-02) Fisher SB108-500 lot # 012717

pH 9 (7-22-02) Fisher SB114-500 lot # 007377

Cal temp = 19.8°C set pt 7.03 + 9.00

slope = 102.8

Soln B = 7.49

Soln C = 7.71

Soln D = 7.95

* Soln E = 8.17

Soln F = 8.45

pH 7 = 7.03

* pH 7 buffer measured after Soln E measurement
varied from 8.00 to 8.15. pH 7 at 7.03
Remeasured Soln E - result recorded at 8.17# pH 7 buffer measured after Soln F measurement
varied from 8.18 to 8.40. pH 7 at 7.03

26 Jul 02

BAW

26 Jul 02
BAW**Preparation of Neptunium/Calcite series 9&10 Test Tubes.**Reagents: calcite309/146S1 prepared previously and stored in dessicator.
Solutions B-F 463/127

40 polycarbonate test tubes with caps (no holes drilled in caps) were appropriately labeled (see following table). The NpCA label prefix used on all test tubes represented neptunium/calcite. Two different calcite masses were used: NpCA series 9 (0.1 g) and NpCA series 10 (0.4 g). Five different pH solutions were used: B(7.5), C(7.75), D(8.0), E(8.25), and F(8.5). Each test was prepared in quadruplicate as represented by the suffix 1 to 4.

Added the appropriate amount of calcite to a tarred weighing paper and recorded the weight. Removed cap of test tube and placed a funnel made from weighing paper into the appropriate test tube. Then the calcite was carefully transferred from the weighing paper to the test tube. Repeated procedure for all forty test tubes.

AE240 Balance used

Challenge mass at start (target 20.0001g) = 20.0001g
Challenge mass at end (target 20.0001g) = 20.0001g

26 Jul 02

BAW

26 July '02

cont.

JB

3w 26 Jul 02

Test Tube ID	Mass (g) of calcite	Test Tube ID	Mass (g) of calcite
NPCA9B1	0.1001	NPCA10B1	0.4008
NPCA9B2	0.1005	NPCA10B2	0.4004
NPCA9B3	0.1001	NPCA10B3	0.4003
NPCA9B4	0.1001	NPCA10B4	0.4000
NPCA9C1	0.1004	NPCA10C1	0.4009
NPCA9C2	0.1004	NPCA10C2	0.4000
NPCA9C3	0.1008	NPCA10C3	0.4001
NPCA9C4	0.1006	NPCA10C4	0.4000
NPCA9D1	0.1004	NPCA10D1	0.4007
NPCA9D2	* 0.1002 7-29-02 BW	NPCA10D2	0.4007
NPCA9D3	0.1002	NPCA10D3	0.4005
NPCA9D4	0.1008	NPCA10D4	0.4002
NPCA9E1	0.1008	NPCA10E1	0.4009
NPCA9E2	0.1008	NPCA10E2	0.4007
NPCA9E3	0.1002	NPCA10E3	0.4002
NPCA9E4	0.1000	NPCA10E4	0.4011
NPCA9F1	0.1001	NPCA10F1	0.4007
NPCA9F2	0.1007	NPCA10F2	* 0.4003 7-29-02 BW
NPCA9F3	0.1003	NPCA10F3	0.4011
NPCA9F4	0.1003	NPCA10F4	0.4002

* See 523/8

29 July '02

JB

Filtering & Addition of pre-equilibrated reference solutions to series 9 & 10 test tubes. Sampling of Reference Solutions for Div 01 ICP Analysis

Approximately 270 mL of each reference was removed from the 2 L bottle and filtered using the Masterflex Portable Sampler.
Ref sol'n: B to F from 463/127
Filter: AquaPrep 600 capsule 0.45 micrometer PN12176
Tubing: L/S 24 PN 06429-24
Each reference sol'n was collected in a labeled 400 mL glass beaker.

The 40 experimental test tubes (523/4) with calcite were weighed on the Mettler AE240. Their masses were recorded. 30 mL of the appropriate filtered reference sol'n was added to each test tube using an oxford pipet (10 mL disposable tip). Then the 40 test tubes with solutions were reweighed and recorded. Approximately 30mL of each reference solutions was transferred into a 30mL pp bottle. These bottles were labeled as follows: RefB, RefC, RefD, RefE, and RefF. These sample will be sent to Div 01 for ICP analysis.

challenge mass at beginning (target = 400.00) was 400.00 g.
challenge mass at end of calcite + test tube (target = 400.00) was 400.00 g
challenge mass at end of calcite + test tube + sol'n (target = 400.00) was 400.00 g.

29 Jul 02 BW

9 July 2002
cont.
KLB

Test Tube ID	Mass (g) of test tube + calcite	Mass (g) of test tube + calcite + solution
NPCA9B1	22.19	52.45
NPCA9B2	22.05	52.23
NPCA9B3	22.09	51.98
NPCA9B4	22.20	52.27
NPCA9C1	22.07	53.13
NPCA9C2	22.19	52.21
NPCA9C3	22.05	52.07
NPCA9C4	22.21	52.62
NPCA9D1	22.19	52.05
NPCA9D2	* 22.12	52.72 7-29-02
NPCA9D3	22.06	53.19
NPCA9D4	22.09	52.59
NPCA9E1	22.11	52.27
NPCA9E2	22.10	51.90
NPCA9E3	22.09	52.96
NPCA9E4	22.09	52.07
NPCA9F1	22.08	52.16
NPCA9F2	* 22.05	52.72 7-29-02
NPCA9F3	22.21	52.08
NPCA9F4	22.05	52.64

* See 523/8

29 July 2002
cont.
KLB

Test Tube ID	Mass (g) of test tube + calcite	Mass (g) of test tube + calcite + solution
NPCA10B1	22.41	52.44
NPCA10B2	22.39	52.08
NPCA10B3	22.39	52.30
NPCA10B4	22.45	52.25
NPCA10C1	22.36	52.28
NPCA10C2	22.34	52.34
NPCA10C3	22.50	52.32
NPCA10C4	22.52	52.36
NPCA10D1	22.49	53.28
NPCA10D2	22.42	52.59
NPCA10D3	22.46	52.84
NPCA10D4	22.41	53.15
NPCA10E1	22.41	52.97
NPCA10E2	22.42	52.19
NPCA10E3	22.39	52.42
NPCA10E4	22.40	52.27
NPCA10F1	22.42	52.29
NPCA10F2	* 22.41	52.72 7-29-02
NPCA10F3	22.78	53.03
NPCA10F4	22.48	52.57

* See 523/8

9 Jul 02
CONT
BAW
NPCA9D2 was spilled when adding the reference solution. This was redone from scratch. Also 10F2

Prep- Addition of ^{BAW 7-29-02} calcite
Followed procedure on 523/3

Test tube ID	Calcite mass (g)
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NPCA9D2	0.1008
NPCA10F2	0.4000

Filtering and addition of reference
Followed procedure on 523/5
Enough ref soln was filtered on 523/5, it was used here.

Test tube ID	Mass of test tube + calcite (g)
#NPCA9F2	22.05
NPCA9D2	22.10
NPCA10F2	22.41 ^{BAW 7-29-02} 22.42

Test tube ID	Mass of test tube + calcite + ref soln (g)
NPCA9D2	52.30
NPCA10F2	52.26
#NPCA9F2	52.12

#NPCA9F2 mistakenly data crossed out on page 523/6, original soln used. This soln was not redone. NPCA9D2 and NPCA10F2 were redone.

30 Jul 02
BAW

Neptunium Spiking of NPCA Series 9+10
Experimental Solutions

Solutions with suffixes 1 to 3 will have the neptunium spike step performed in a manner similar to past experiments. The experimental solutions will be weighed. A 50uL (eppendorf) neptunium spike will be added directly to each of the 30mL experimental solutions. The experimental solutions will be reweighed. Then a 50uL (eppendorf) base buffering addition will be added directly to each of the 30mL experimental solutions. The experimental solutions will be reweighed.

Solutions with the suffix 4 will have the neptunium spike step performed in a new manner. A 5mL (oxford pipet) aliquot of each experimental solution will be transferred to a pre-weighed and labeled 10-mL disposable microbeaker. Be careful not to include any calcite from the 30mL experimental solution in the 5mL aliquot. The 5mL aliquot solutions will be weighed. A 50uL (eppendorf) neptunium spike will be added to each of the 5mL aliquot solutions. The 5mL aliquot solutions will be reweighed to determine mass of Np spike added. Then a 50uL (eppendorf) base buffering addition will be added directly to each of the 5mL aliquot solutions. The 5mL aliquot solutions will be reweighed to determine mass of NaOH solution added. Each 5mL aliquot solution will be carefully decanted (returned) into the appropriate experimental solution, and the microbeakers will be reweighed to quantify any residual solution in the microbeaker. Each of the 30mL experimental solutions will be reweighed to verify total mass of the experimental solutions.

AE240 Balance used
challenge mass at start (target 20.0001g) = 20.0001g
" " " end " " = 20.0001g

Neptunium spike = 46A Total activity 5.242 uCi 118 ppm
Bases Base A 0.321N NaOH 5-24-02 463/134

~~BAW 8-6-02~~

30 Jul 02

CONT
BAW

Test Tube ID	Initial Mass (g) of container	Mass (g) after Np spike	Mass (g) after Base spike
NPCA9B1	52.3971	52.4476	52.4983
NPCA9B2	52.1831	52.2335	52.2842
NPCA9B3	51.9349	51.9856	52.0364
NPCA9C1	53.0860	53.1359	53.1868
NPCA9C2	52.1579	52.2081	52.2615
NPCA9C3	52.0265	52.0767	52.1248
NPCA9D1	52.0009	52.0509	52.1011
NPCA9D2	52.2443	52.2946	52.3453
NPCA9D3	53.1515	53.2018	53.2525
NPCA9E1	52.2193	52.2695	52.3204
NPCA9E2	51.8583	51.9085	51.9563
NPCA9E3	52.9157	52.9661	53.0146
NPCA9F1	52.1083	52.1586	52.2092
NPCA9F2	52.0709	52.1211	52.1720
NPCA9F3	52.0388	52.0890	52.1395

NPCA9B4 52.2223
 NPCA9C4 52.5687
 NPCA9D4 52.5420
 NPCA9E4 52.0197
 NPCA9F4 52.5880

For series 4, Np and Base spiked into 5mL aliquots (523/12+13)

30 Jul 02

CONT
BAW

Test Tube ID	Initial Mass (g) of container	Mass (g) after Np spike	Mass (g) after Base spike
NPCA10B1	52.3918	52.4416	52.4923
NPCA10B2	52.0604	52.1103	52.1608
NPCA10B3	52.2426	52.2919	52.3433
NPCA10C1	52.2362	52.2858	52.3315
NPCA10C2	52.3006	52.3505	52.4015
NPCA10C3	52.2743	52.3239	52.3747
NPCA10D1	53.2196	53.2700	53.3211
NPCA10D2	52.5346	52.5845	52.6356
NPCA10D3	52.7921	52.8420	52.8887
NPCA10E1	52.9147	52.9647	53.0164
NPCA10E2	52.1381	52.1881	52.2390
NPCA10E3	52.3645	52.4147	52.4682
NPCA10F1	52.2610	52.3116	52.3624
NPCA10F2	52.2150	52.2655	52.3166
NPCA10F3	52.9772	53.0273	53.0783

NPCA10B4 52.2043
 NPCA10C4 52.3087
 NPCA10D4 53.0946
 NPCA10E4 52.2316
 NPCA10F4 52.5297

3056/02
ONT
BUT

Sol'n ID	Empty MB Mass (g)	MB + exp sol'n aliquot Mass (g)	MB + aliquot + Np Mass (g)
NPCA9B4	0.4355	5.4690	5.5133
NPCA9C4	0.4421	5.4669	5.5118
NPCA9D4	0.4524	5.4566	5.5015
NPCA9E4	0.4565	5.4872	5.5325
NPCA9F4	0.4568	5.4349	5.4793
NPCA10B4	0.4468	5.4670	5.5125
NPCA10C4	0.4551	5.4761	5.5219
NPCA10D4	0.4521	5.4789	5.5244
NPCA10E4	0.4617	* 5.4865 ₇₋₃₀₋₀₂	5.3600
NPCA10F4	0.4594	5.4475	5.4931

MB = microbeaker

* 5.3133 spilled and reweighed

3056/02

BUT

30 Jul 02

CONT

BW

Sol'n ID	MB + aliquot + NP + base Mass (g)	MB after decant Mass (g)	Experimental solution with spike Mass (g)
NPCA9B4	5.5562	0.4355 #	52.2847
NPCA9C4	5.5616	0.4422	52.6452
NPCA9D4	5.5487	0.4560	52.6140
NPCA9E4	5.5794	0.4567	52.0954
NPCA9F4	5.5267	0.4570	52.6503
NPCA10B4	5.5616	0.4508 #	52.2931
NPCA10C4	5.5705	0.4552	52.3863
NPCA10D4	5.5728	0.4524	53.1674
NPCA10E4	5.4090	0.4630	52.1395
NPCA10F4	5.5422	0.4597	52.6128

MB = microbeaker

NPCA9B4 decant soln (~5 mL) was accidentally poured into NPCA10B4 exp soln (~25 mL). Then the NPCA10B4 decant soln (~5 mL) was intentionally poured into the NPCA9B4 exp soln (~25 mL). Empty microbeaker masses were entered as labeled into table (9B4 in 9B4 cell, 10B4 in 10B4 cell).

Jul 02
CONT
BAW All 40 exp solns were briefly vortexed at about 10:30 and with caps tightly on, were placed on gyratory shaker (RPM 150)
7-30-02

40 exp solns were vortexed again at 13:30.

40 exp solns vortexed at 15:00.

40 exp solns vortexed at 16:00 and left with caps resting on top (not sealed) to gyrate at 75 RPM overnight

Jul 02
cont.
B 40 exp solns vortexed at 9:00

40 exp solns vortexed at 11:00

" " at 13:00

" " at 15:00

" " at 16:30 and left

with caps resting on top (not sealed) to gyrate at 75 RPM overnight

Aug 02
cont.
B 40 exp. soln vortexed at 8:45

" 10:30

" 11:30

" 13:00

" 14:15

" 15:35

" 16:30

Loosed caps for overnight gyrator action

1 Aug 02

AB
CONT

0.1 N HNO_3 Soln

Conc. Nitric - Trace Metal Grade
Fisher A509-212 lot 1100040

~~Super Q Water~~ 7-1-02
NanoPure Type I water

Added 625 μL (Eppendorf pipet w/ disposable tip) HNO_3 to 100 mL (volumetric flask) of NanoPure Type I water

Acid matrix addition to LSA vials

Added 0.5 mL (Eppendorf pipet) of 0.1 N HNO_3 (523/15) to each series 9+10 LSA vial - samples done in duplicate (a/b)

02 AUG 02

BAW

NPCA Series 9+10 Sampling

Masses recorded with Mettler AE240

Challenge mass (20.0001g) at start = 20.0001g
Challenge mass (20.0001g) at end = 20.0001g

The experimental tubes (40 from 523/14) were weighed. Next the LSA vials with 0.5 mL of 0.1 N HNO_3 (523/15) were weighed

Next, 0.5 mL (Eppendorf pipet) of sample was added to each LSA vial. The LSA vials with sample were reweighed.

Next the pH of the experimental solns was taken.

Aug 2002 pH meter: Orion 920 A Serial # 039522
 orion 8103 combo electrode 3D w/ ATC probe
 calibrated with
 pH 7 (8-2-02) Fisher SB108-500 lot # 012717
 pH 9 (8-2-02) Fisher SB114-500 lot # 007377
 cal temp = 19.8 °C set pts 7.01, 9.02
 slope = 99.6%

took pH 7 buffer reading, 7.01, after NpCA9C2
 " " 7.01 after NpCA9C4
 " " 7.01 after NpCA9D1

Ran pH 7 buffer after each reading. All
 buffer readings were 7.01 or w/i $\pm .01$.
 Series 9 on meter # 039522

2-5-02 BAW

2 Aug 02 pH meter: Orion 920A Serial # 039518
 CONT orion 8103 combo electrode 3E w/ ATC probe
 BAW calibrated with - see 523/16
 cal temp = 20.4 cal set pts = 7.01, 9.02
 cal slope = 99.3

2nd calibration - same stds after NpCA10B1
 cal temp = 20.4 cal set pts = 7.01, 9.02
 cal slope = 98.8

Ran pH 7 buffer after each reading. Ran
 series 10 on meter # 039518

2-5-02 BAW

ug 2002
 25
 Cont.

Test Tube ID	Mass (g) before pH and LSA sampling	pH
NpCA9B1	52.3564	7.49
NpCA9B2	52.1178	7.52
NpCA9B3	51.8929	7.51
NpCA9B4	52.1386	7.49
NpCA9C1	53.0426	7.74
NpCA9C2	52.1106	7.60 #
NpCA9C3	51.9898	7.57 *
NpCA9C4	52.3366	7.67
NpCA9D1	51.9560	7.98
NpCA9D2	* 52.1810 8-202	7.89
NpCA9D3	53.1116	7.94
NpCA9D4	52.4569	7.95
NpCA9E1	52.1758	8.19
NpCA9E2	51.8435	8.10
NpCA9E3	52.8996	8.19
NpCA9E4	51.9688	8.18
NpCA9F1	52.0791	8.46
NpCA9F2	52.0313	8.48
NpCA9F3	51.9829	8.47
NpCA9F4	52.5178	8.47

* wrote incorrectly. value is 52.1805

7.71
 * 7.60

2 Aug 2002
 25
 Cont.

Test Tube ID	Mass (g) before pH and LSA sampling	pH	pH 7 reading
NpCA10B1	52.3691	7.55	7.05
NpCA10B2	52.0182	7.56	7.05
NpCA10B3	* 52.0182 8-202	7.51	7.04
NpCA10B4	52.1510	7.51	7.05
NpCA10C1	52.1190	7.72	7.82
NpCA10C2	52.2743	7.70	7.06
NpCA10C3	52.2286	7.55	7.02
NpCA10C4	52.2404	7.62	7.00
NpCA10D1	53.1538	7.90	7.02
NpCA10D2	52.3782	7.93	6.98
NpCA10D3	52.7323	7.91	7.00
NpCA10D4	53.0261	7.92	7.03
NpCA10E1	52.8692	8.06	7.00
NpCA10E2	52.1181	8.11	7.00
NpCA10E3	52.3327	8.20	6.98
NpCA10E4	52.0143	8.19	7.01
NpCA10F1	52.1327	8.48	7.01
NpCA10F2	52.1756	8.37	6.99
NpCA10F3	52.9000	8.47	6.99
NpCA10F4	52.4735	8.51	7.01

Redos 7 * 52.1989

NpCA10E1 — 8.06 6.97
 NpCA10E2 — 8.16 6.98

Aug 2002

2B

2002
-8-02

nt.

Test Tube ID	Mass (g) of Vial and HNO ₃	Mass (g) after adding sample
NpCA9B1a1	7.9303	8.4289
NpCA9B1b1	7.8488	8.3524
NpCA9B2a1	7.8953	8.3912
NpCA9B2b1	7.9070	8.4056
NpCA9B3a1	7.9165	8.4135
NpCA9B3b1	7.8836	8.3834
NpCA9B4a1	* 7.8642 ⁸⁻²⁻⁰² 7.8231 #	8.1425
NpCA9B4b1	7.8231 #	8.1713
NpCA9C1a1	7.8211	8.3193
NpCA9C1b1	7.8166	8.3168
NpCA9C2a1	7.8049	8.3022
NpCA9C2b1	7.8128	8.3115
NpCA9C3a1	7.8195	8.3169
NpCA9C3b1	7.8484	8.3464
NpCA9C4a1	7.8396	8.3366
NpCA9C4b1	7.8854	8.3830
NpCA9D1a1	7.7971	8.2955
NpCA9D1b1	7.8814	8.3813
NpCA9D2a1	7.9096	8.4066
NpCA9D2b1	7.8960	8.3952

* 7.6550

7.6717

2 Aug 2002

8/3
cont.

Test Tube ID	Mass (g) of Vial and HNO ₃	Mass (g) after adding sample
NpCA9D3a1	7.7958	8.2929
NpCA9D3b1	7.8121	8.3108
NpCA9D4a1	7.8802	8.3766
NpCA9D4b1	7.8569	8.3543
NpCA9E1a1	7.8769	8.3732
NpCA9E1b1	7.8602	8.3577
NpCA9E2a1	7.8207	8.3176
NpCA9E2b1	7.8308	8.3281
NpCA9E3a1	7.8449	8.3418
NpCA9E3b1	7.8166	8.3145
NpCA9E4a1	7.8754	8.3721
NpCA9E4b1	7.8380	8.3355
NpCA9F1a1	7.8334	8.3332
NpCA9F1b1	7.8781	8.3784
NpCA9F2a1	7.8661	8.3636
NpCA9F2b1	7.8163	8.3152
NpCA9F3a1	7.8984	8.3945
NpCA9F3b1	7.8910	8.3886
NpCA9F4a1	7.8824	8.3792
NpCA9F4b1	7.8840	8.3818

Aug 2002
PB
cont.

Test Tube ID	Mass (g) of Vial and HNO3	Mass (g) after adding sample
NpCA10B1a1	7.8877	8.3867
NpCA10B1b1	7.8926	8.3930
NpCA10B2a1	7.8300	8.3290
NpCA10B2b1	7.8045	8.252 8.3047
NpCA10B3a1	7.8847	8.3822
NpCA10B3b1	7.8527	8.3530
NpCA10B4a1	7.8848	8.3820
NpCA10B4b1	7.8258	8.3252
NpCA10C1a1	7.8835	8.3824
NpCA10C1b1	7.8893	8.3903
NpCA10C2a1	7.8783	8.3773
NpCA10C2b1	7.8992	8.4005
NpCA10C3a1	7.8712	8.3710
NpCA10C3b1	7.8390	8.3406
NpCA10C4a1	7.7824	8.2829
NpCA10C4b1	7.8387	8.3396
NpCA10D1a1	7.7844	8.2840
NpCA10D1b1	7.9908	8.4918
NpCA10D2a1	7.9171	8.4169
NpCA10D2b1	7.6696	8.1713

2 Aug 2002
PB
cont

Test Tube ID	Mass (g) of Vial and HNO3	Mass (g) after adding sample
NpCA10D3a1	7.6415	8.1398
NpCA10D3b1	7.6963	8.1987
NpCA10D4a1	7.6927	8.1901
NpCA10D4b1	7.6354	8.1350
NpCA10E1a1	7.7448	8.2455
NpCA10E1b1	7.6181	8.1184
NpCA10E2a1	7.7257	8.2245
NpCA10E2b1	7.6757	8.1765
NpCA10E3a1	7.6354	8.1343
NpCA10E3b1	7.6627	8.1647
NpCA10E4a1	7.6573	8.1574
NpCA10E4b1	7.6837	8.1228 8.1847
NpCA10F1a1	7.6219	8.2779 8.1228
NpCA10F1b1	7.7763	8.2013 8.2779
NpCA10F2a1	7.7016	8.0995 8.2013
NpCA10F2b1	7.5991	8.1197 8.0995
NpCA10F3a1	7.6201	8.1565 8.1197
NpCA10F3b1	7.6555	8.1564
NpCA10F4a1	7.6790	8.1788
NpCA10F4b1	7.6301	8.1307

Aug 02
ONT
3AW

Adding cocktail to LSA vials

Add 5 mL (bottle top dispenser) of Ultima Gold ABC Packard 6013309, lot 91-9031 to each of the series 9+10 LSA vials (523/20+23)

Sampling Series 9+10 NPCA for DVOI ICP Analysis

20 mL aliquots (10 mL Oxford pipet) of each experimental soln was transferred to an appropriately labeled 30 mL pp bottle.

9/20/02
3B

QA sample for NPCA series 9+10 ICP samples

Reagents

1000 ppm Potassium: Spex Certiprep PLK2-2Y,
lot # 8-33K-Y, Rec 1/4/02, opened
1-14-02

1000 ppm Sodium: Spex Certiprep PLNA2-2Y
lot # 8-66NA, Rec 1-4-02

1000 ppm Calcium: Spex Certiprep PLCA2-2Y
lot # 8-140CA Rec 1-4-02 opened 1-14-02

Added 10 mL (vol pipet) of 1000 ppm Ca, 2 mL (vol pipet) of 1000 ppm K, and 15 mL (vol pipet) of 1000 ppm Na into a 100 mL vol flask and diluted to mark with Nanopure type I water NPCA910Q.

5 Aug 2002
cont.

Shipper Name/Address		SAMPLE LIST/CHAIN OF CUSTODY										Requested Turnaround:	
Bradley Werling CNWRA - Div 20 BLD 57		Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										<input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks	
		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact	
Client		Analyses Requested										Mike Oammann	
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Ca, Na, K, Mg, Sr by ICP							REMARKS
NpCA9B1	8-2-02		W		1	X							Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)
NpCA9B2						X							None
NpCA9B3						X							Nuclear Safety
NpCA9B4						X							Related - use
NpCA9C1						X							appropriate QA
NpCA9C2						X							procedures
NpCA9C3						X							POC - Brad Werling
NpCA9C4						X							phone 6565
NpCA9D1						X							fax 5184
NpCA9D2						X							
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe Temp: 24.0°C Therm #: 026		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Received by (Print/Signature)		Date Time		SwRI Project#: 200402871 Received by SwRI Lab: (Signature)					
				Relinquished by (Print/Signature)		Date Time		Date Time					
				Received by (Print/Signature)		Date Time		Date Time					
				Relinquished by (Print/Signature)		Date Time		Samples Disposed: Date Time					
Comments: Radioactive - max Np 237 values 8.5 x 10 ⁻⁷ M or 1.4 x 10 ⁻⁴ µCi/ml 523/24				Relinquished by (Print/Signature)		Date Time		Samples Disposed by:					

6
1. 6/2002

Shipper Name/Address Bradley Werling CNWR - Div 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: <u>4 wks</u>			
		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact			
Client		Analyses Requested										REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)			
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									None Nuclear Safety Related - use appropriate QA procedure Doc - Brad Werling phone 6565 fax 5184
NpCA903	8-20		W		1	X									
NpCA904					1	X									
NpCA9E1					1	X									
NpCA9E2					1	X									
NpCA9E3					1	X									
NpCA9E4					1	X									
NpCA9E1					1	X									
NpCA9E2					1	X									
NpCA9E3					1	X									
NpCA9E4					1	X									
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe Temp: <u>22.0°C</u>		Sample Types: D - Duplicate ER - Equipment Rinse FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank Therm # <u>026</u>		Relinquished by (Print/Signature) <u>Brad Werling / Brad Werling</u> Received by (Print/Signature)					Date	Time	SwRI Project#: <u>20 01402.871</u> Received by SwRI Lab: (Signature) <u>Maria G. [Signature]</u>				
					Relinquished by (Print/Signature) Received by (Print/Signature)					Date	Time	Date <u>8/5/02</u>		Time <u>13:55</u>	
					Relinquished by (Print/Signature) Received by (Print/Signature)					Date	Time	Samples Disposed: Date Time			
Comments: <u>Radioactive - max Np 237 values</u> <u>523/24+</u> <u>8.5 x 10⁻⁷ Mgr</u> <u>1.4 x 10⁻⁴ mCi/ml</u>					Relinquished by (Print/Signature)					Date	Time	Samples Disposed by:			

5 Aug 2002
cont.
JJB

Shipper Name/Address		SAMPLE LIST/CHAIN OF CUSTODY										Requested Turnaround:					
Client		Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166					Client Purchase Order/Other ID					Site/Zone ID		SwRI Contact			
Analyses Requested												REMARKS					
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Co, No, K, Mg, Na, Sr by ICP											
NpCA 10 B1	8-2-02		W			X										Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C ± 2°C) f = Other (specify) none	
NpCA 10 B2						X										Nuclear Safety	
NpCA 10 B3						X										Related - use	
NpCA 10 B4						X										appropriate QA	
NpCA 10 C1						X										procedures	
NpCA 10 C2						X										PCR - Bradley	
NpCA 10 C3						X										Werling	
NpCA 10 C4						X										phone 6565	
NpCA 10 D1						X										fax 5184	
NpCA 10 D2						X											
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Temp: 22.0°C		Therm #: 026		Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date 8/5/02		Time 13:35		SwRI Project#: 20-01402-871	
Comments: Radioactive - max Np 237 values 8.5 x 10 ⁻⁷ Mx 1.4 x 10 ⁻⁴ uCi/ml		523/24+		Received by (Print/Signature)				Date		Time		Received by SwRI Lab: (Signature) Mike Dammann		Date		Time	
				Relinquished by (Print/Signature)				Date		Time		Date		Time		Samples Disposed:	
				Received by (Print/Signature)				Date		Time		Date		Time		Date	
				Relinquished by (Print/Signature)				Date		Time		Date		Time		Date	

9006

Shipper Name/Address Bradley Werling CNWRA-Div 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: <u>1 wks</u>			
		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact Mike Dammann			
Client		Analyses Requested										REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (Specify)			
Sample ID	Sample Collection Date (mm/dd/yyyy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Ca, Na, K, Mn, Mg, Sr by ICP									
NPCA1003	8-20		W		1	X									
NPCA1004						X									
NPCA10E1						X									
NPCA10E2						X									
NPCA10E3						X									
NPCA10E4						X									
NPCA10F1						X									
NPCA10F2						X									
NPCA10F3						X									
NPCA10F4						X									
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date 5-5-02		Time 13:35		SwRI Project#: 20-0422871 Received by SwRI Lab: (Signature) Mike Dammann			
Temp: 22°C Therm #: 026				Received by (Print/Signature)				Date		Time		Date 8/5/02		Time 13:55	
Comments: Radiocative-max Np 237 values 8.5 x 10 ⁻⁷ Mo/l 1.4 x 10 ⁻⁴ uCi/ml				Relinquished by (Print/Signature)				Date		Time		Samples Disposed: Date		Time	
5/3/24				Relinquished by (Print/Signature)				Date		Time		Samples Disposed by:		Date	

5 Aug 2002
cont.

Shipper Name/Address	Bradley Werling CNWRA-Div 20 BLD 57						SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: <u>41 wks</u>	
							Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact Mike Dammann	
Client							Analyses Requested										REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)	
							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					
	Ref B	7-27-02		W		1	X											
	Ref C						X											
	Ref D						X											
	Ref E						X											
	Ref F						X											
	NPLA91008-5-02			W		1	X											
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Bradley Werling / Bid Werling					Date	Time	SwRI Project #: 20 04102.871 Received by SwRI Lab (Signature) Name: J. H. G.							
				Received by (Print/Signature)					Date	Time								
				Relinquished by (Print/Signature)					Date	Time	Date: 8/5/02 Time: 13:55							
				Received by (Print/Signature)					Date	Time	Samples Disposed: Date: Time:							
				Relinquished by (Print/Signature)					Date	Time	Samples Disposed by:							
Comments: these are not radioactive (pg 5) 523/24+5																		

06 Aug 02
PBperiodic review of notebook entries completed
by principal investigator.08 Aug 02
PB8/8/02 5:36:14 AM 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\20020802_1754.results
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Bertetti\Pa_Np_Exp_AB\Np_Pa_AB.009
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: 143

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: 21.30 Date Processed: 8/2/02 5:54:34 PM
14C Chi Square: 18.59 Date Processed: 8/2/02 5:54:34 PM
3H E²/B (1-18.6 keV): 281.93 Date Processed: 8/2/02 5:54:34 PM
14C E²/B (4-156 keV): 495.61 Date Processed: 8/2/02 5:54:34 PM
3H Efficiency (0-18.6 keV): 65.78 Date Processed: 8/2/02 5:54:34 PM
14C Efficiency (0-156 keV): 96.64 Date Processed: 8/2/02 5:54:34 PM
IPA Background Date Processed: 8/2/02 5:54:34 PM
3H Background CPM (0-18.6 keV): 15.20 Date Processed: 8/2/02 5:54:34 PM

08 Aug 02
PB
cont.8/8/02 5:36:15 AM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 2
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

14C Background CPM (0-156 keV): 22.95 Date Processed: 8/2/02 5:54:34 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		19.54	4.13	24.03	3.72	0.23	38.49	769.6	B
2	0.82		5898.75	2.88	5904.02	2.88	12227.82	2.00	247.5	1
3	0.84		5887.60	2.85	5887.87	2.85	11999.78	1.99	241.0	2
4	0.59		4546.56	3.87	4542.07	3.87	17118.42	1.99	236.8	Np 8FI
5	0.61		4760.79	3.72	4764.49	3.72	16693.22	1.98	232.6	Np 8FI
6	0.57		6110.28	3.39	6105.79	3.40	17761.18	1.99	215.5	Np 3FI
7	0.57		6280.46	3.35	6279.48	3.35	17898.02	1.98	213.9	Np 3FI

Missing vial 8.

Missing vial 9.

Missing vial 10.

Missing vial 11.

Missing vial 12.

Missing vial 13.

Missing vial 14.

Missing vial 15.

Missing vial 16.

Missing vial 17.

Missing vial 18.

19	80.47	6.10	22.77	5.67	26.63	124.04	2.00	341.3	1	NpCA9Bxabi
20	78.00	7.02	20.21	6.89	22.42	127.99	2.00	534.8		
21	82.65	6.62	20.93	6.17	24.39	120.78	2.00	138.9	2	
22	83.20	6.92	20.03	6.51	23.15	119.97	2.01	321.9		
23	77.37	7.98	18.06	8.10	19.38	129.02	2.00	429.4	3	
24	76.74	7.13	20.03	6.75	22.99	130.14	2.00	183.5		
25	71.54	9.66	15.65	9.53	17.17	139.61	2.00	423.6	4	
26	70.50	9.49	15.97	9.43	17.43	141.63	2.00	391.9		

Missing vial 27.

28	77.00	7.81	18.43	8.06	19.50	129.65	2.00	536.2	1	NpCA9Cxabl
29	77.70	8.75	16.60	8.46	18.58	128.49	2.00	320.5		
30	85.43	7.56	18.34	7.79	19.42	116.85	2.01	514.0	2	
31	83.24	8.94	15.89	8.91	17.33	119.96	2.00	423.6		
32	74.33	9.17	16.16	9.30	17.31	134.34	2.00	440.0	3	
33	74.16	10.25	14.67	9.93	16.34	134.63	2.00	374.5		
34	71.93	11.99	12.93	12.09	13.87	138.84	2.00	405.9	4	
35	72.47	10.00	15.10	10.13	16.18	137.82	2.00	425.4		

Missing vial 36.

37	75.00	10.38	14.44	10.13	15.99	133.12	2.00	379.2	1	NpCA9Dxabl
38	75.67	12.57	12.19	12.37	13.34	131.93	2.00	349.1		
39	76.68	11.48	13.12	10.96	14.79	130.19	2.00	184.9	2	
40	77.04	11.49	13.09	11.08	14.62	129.58	2.00	322.2		
41	81.27	9.52	15.15	9.42	16.60	122.83	2.00	442.3	3	
42	81.62	10.11	14.35	10.17	15.47	122.32	2.00	448.8		
43	77.83	10.19	14.49	10.16	15.75	128.27	2.00	349.1	4	
44	76.70	11.63	12.97	11.21	14.49	130.18	2.00	240.0		

Missing vial 45.

46	77.65	11.91	12.66	11.29	14.34	128.56	2.00	209.4	1	NpCA9Exabi
47	77.48	15.37	10.19	15.02	11.17	128.89	2.00	280.8		
48	75.92	13.51	11.45	13.48	12.36	131.56	2.00	314.4	2	
49	77.59	16.61	9.55	16.32	10.40	128.66	2.00	291.7		
50	79.20	16.37	9.59	16.41	10.28	126.04	2.00	359.8	3	
51	77.56	15.32	10.21	14.75	11.35	128.73	2.00	237.1		
52	76.34	14.54	10.74	14.12	11.85	130.78	2.00	295.3	4	
53	75.16	14.88	10.59	14.54	11.62	132.86	2.00	252.0		

Missing vial 54.

55	76.99	19.68	8.33	19.57	8.95	129.66	2.00	287.6	1	NpCA9Fxabl
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08 Aug 02
JTB
cont.

8/8/02 5:36:15 AM

QuantaSmart (TM) - 1.31 - Serial# 405314

Page # 3

Protocol# 15 - Pa_Np_Exp_AB.lsa

User: Bertetti

56	76.26	17.97	9.00	17.73	9.75	130.96	2.00	303.7	1	NpCA9Fxabl
57	78.18	16.81	9.43	16.58	10.23	127.72	2.00	283.0	>2	
58	82.93	15.43	9.91	15.52	10.61	120.36	2.01	365.2		
59	77.66	17.96	8.95	17.85	9.63	128.57	2.00	343.4	>3	
60	75.51	16.41	9.74	16.23	10.56	132.23	2.00	288.9		
61	78.23	18.60	8.67	18.43	9.35	127.60	2.00	286.7	>4	
62	79.66	17.39	9.10	17.32	9.80	125.33	2.00	306.6		
Missing vial 63.										
64	106.58	9.62	13.74	9.14	15.64	93.61	2.01	241.7	>1	NpCA10Bxabl
65	104.91	10.00	13.34	9.44	15.26	95.10	2.01	213.1		
66	95.18	10.16	13.57	10.40	14.42	104.85	2.01	470.5	>2	
67	96.86	10.75	12.83	10.51	14.20	103.09	2.01	327.9		
68	100.46	11.10	12.33	11.04	13.43	99.32	2.01	374.1	>3	
69	99.61	10.65	12.82	10.31	14.32	100.20	2.01	265.1		
70	91.85	10.30	13.56	10.39	14.59	108.65	2.01	356.0	>4	
71	91.63	11.52	12.30	11.54	13.29	108.92	2.01	395.6		
Missing vial 72.										
73	111.53	10.43	12.59	10.20	13.97	89.44	2.01	305.6	>1	NpCA10Cxabl
74	110.74	10.38	12.67	10.43	13.72	90.12	2.01	391.3		
75	120.00	9.48	13.43	9.18	15.04	81.83	2.02	294.2	>2	
76	118.56	10.26	12.55	10.30	13.59	84.12	2.01	416.3		
77	117.27	10.51	12.32	10.29	13.65	85.05	2.01	322.5	>3	
78	113.71	10.47	12.48	10.39	13.66	87.73	2.01	408.8		
79	109.52	11.50	11.62	11.38	12.72	91.09	2.01	327.1	>4	
80	109.85	11.65	11.48	11.32	12.76	90.81	2.01	297.9		
Missing vial 81.										
82	120.00	9.80	13.03	9.78	14.21	76.73	2.09	389.6	>1	NpCA10Dxabl
83	120.00	11.57	11.23	10.87	12.90	75.78	2.10	140.2		
84	120.00	10.32	12.44	10.55	13.25	74.99	2.11	429.1	>2	
85	120.00	9.48	13.42	9.14	15.11	77.67	2.08	246.3		
86	120.00	9.62	13.25	9.54	14.52	78.06	2.07	374.7	>3	
87	120.00	11.00	11.75	10.54	13.26	75.07	2.11	218.4		
88	120.00	10.15	12.62	10.03	13.87	76.03	2.10	332.4	>4	
89	120.00	10.95	11.79	11.18	12.57	77.07	2.09	438.4		
Missing vial 90.										
91	120.00	10.57	12.17	9.93	14.01	69.48	2.20	198.0	>1	NpCA10Exabl
92	120.00	10.68	12.06	10.53	13.27	69.62	2.20	319.5		
93	120.00	11.93	10.93	11.48	12.28	69.18	2.20	209.5	>2	
94	120.00	11.08	11.67	11.03	12.73	69.92	2.19	403.5		
95	120.00	11.45	11.34	11.12	12.63	69.69	2.19	244.6	>3	
96	120.00	10.58	12.17	10.30	13.54	69.78	2.19	262.9		
97	120.00	21.62	6.58	21.79	7.00	71.34	2.17	275.3	>4	
98	120.00	11.11	11.64	11.26	12.49	70.33	2.18	423.6		
Missing vial 99.										
100	120.00	11.69	11.13	11.71	12.06	68.29	2.22	374.4	>1	NpCA10Fxabl
101	120.00	12.35	10.60	12.40	11.45	67.56	2.23	375.9		
102	120.00	12.27	10.67	12.28	11.55	66.29	2.25	335.0	>2	
103	120.00	12.33	10.61	11.80	11.97	68.88	2.21	231.5		
104	120.00	10.65	12.09	10.53	13.27	67.19	2.23	399.5	>3	
105	120.00	11.83	11.01	11.38	12.37	66.59	2.24	228.9		
106	120.00	12.93	10.18	12.59	11.29	66.35	2.25	216.9	>4	
107	120.00	13.46	9.83	13.17	10.85	65.14	2.27	249.6		

2640602 EWDP Field Sampling
BW

Reagents - pH 7 Hach 27701

pH 10 Hach 27702

1990 μ S/cm conductivity std Hach 27706

180 μ S/cm conductivity std Hach 27704

pH 4 powder pillow Hach 22269-95 lot A1355

pH 7 powder pillow Hach 22270-95 lot A1243

Bromocresol Green-Methyl Red indicator powder

cat # 943-99 Lot A1327

DO cal w good slope in 8s

Turbidity cal with

1.0 NTU. Hach 26598-42 lot A2189

20 NTU Hach 26601-42 lot A2183

Test of 1.0 was 1.0.

pH calibrated w/pH 7 and 10

conductivity - by JB

cal w/ 180 μ S/cm challenged at 1990 μ S/cm

ORP - by JB

w Quinhydrone and pH 4 powder pillow

Alkalinity titration done using 1.600N Sulfuric Acid

Hach cat # 14389-01 lot A2011 and

100mL of sample

NL-EWDP-18P

Air temp recorded w/ thermometer 1748 - Calibrated
(exp 21 Sep 02)

27 Aug 02
3B

DO cal 0.88 mg/L @ 29.9°C in Cal Chamber

Turbidity - Cal w/ 10 + 20.0 NTU @ 0830

ORP w/ Quinhydrone + pH 5 temp 30°C
263 at 0835

Conductivity cal w/ 180 μ S/cm
temp is 30.7°C. S-2 set at 25°C
temp difference is $30.7 - 25.0 = 5.7$
 $\cdot 2.1$ temp correction
 temperature 11.97
 compensation +180.00
 191.97

meter read 160.3 μ S/cm, so cell constant
was changed to .9839 by trial and error
until a reading of 180 μ S/cm was established

pH Hach EC20 cal w/ 4.01 and 10.01
Hach singlets 7.04 and 10.01
slope 59.7

alkalinity on test strip read about 120
sample used 100 mL titrated to 4.8 pH
followed by 4.5 pH digit multiplier
is 1.0 for 1.6 N H_2SO_4 @ 100 mL

Morning - NC-EWDP 10P shallow

Afternoon - NC-EWDP 10P deep

27 Aug 02

CONT

BW

ORP w/ Quinhydrone at pH 4 temp 30°C
259 at 1506

Dissolved Oxygen 0.89 at 37.5°C with Cal
Chamber at 15:05

Turbidity challenged old curve (0830) w/ 20.0 std
reading was 19.9

pH/ISE cal w/ Hach singlet 7.00 and 10.01
slope 58.8

Conductivity cal w/ 180 μ S/cm
temp is 36.0°C S-2 set at 25°C
temp diff = 11°C
 $\cdot 2.1$ temp correction value
 23.1
 +186
 203.1

meter read 176 μ S/cm, with cell constant .9999

27 Aug 02

BW

28 AUG 02
BAW

Well 22PA Deep Zone

Conductivity cal - 51 ATCon 5-2 at 25°C
std 180 μ S

Cal at 10:38 Temp = 32.6

std 180 μ S at 32.6°C was 154.7

std check 1990 at 32.6°C was 1578

ORP - w/ Quinhydrone and pH buffer 4
260.0 at 25°CpH - cal with 7.00 and 10.01
slope 58.9 temp = 32.8

Diss Oxygen - 0.83 slope at 33.1°C

Redo Conductivity cal - 51 ATCon 5-2 at 25°C
std 180 μ S for 33°C set 210 μ S
180 μ S Reads 181.3 μ STurbidity cal w/ 1.0 NTU + 20.0 NTU
Test of 1.0 std was 1.0

- Well 22PA Shallow Zone

Turbidity - Reuse stds from earlier in the day
Reoiled cells
Recalibrated w 1 and 20 NTU.Dissolved Oxy
Recal w/ std cal chamber 0.85 slope
at 15:00 at 35.1°C28 Aug 02
CONT
BAWpH Recalibrated w/ 7.00 and 10.01
slope = 58.5 temp = 35.5ORP - w/ Quinhydrone and pH buffer 4 from
the morning 256.2 mV Air = 37.5°C

Conductivity cal 51-ATCon, 5-2 at 25°C

std 180 μ S at 35.5°Csetpt = 222 μ S std reading at 177.5 μ STurbidity - recalibrated w/ 1 and 20 NTU
Test of 1.0 NTU at 1.0 NTU.28 AUG 02
BW

Well NC-EWDP-22PB - Shallow

pH meter calibration using 7.00 + 10.01
slope = 59.0 at 31.4°C @ 11:20
slope = 58.7 at 33.8°C @ 13:05ORP w/ Quinhydrone, pH 4, 100 mL H₂O
254.7 at 11:30Turbidity cal w/ 1.0 NTU and 20.0 NTU
Test of 1.0 std was 1.0 at 13:15Dissolved Oxygen cal in cal chamber at 36.3°C
slope = 0.89 at 13:09Conductivity cal - 51 ATCon 5-2 at 25°C
std 180 μ S for 36°C setpt 222 μ S
Reading of 180 was 180.1

29 Aug 02 N4E County Readings 13:15
CONT
BW Temp pH EC Turb DO OEP
29.0 7.85 0.321 0.0 9.31 243.1
USGS (Tom) pH = 7.90
pH 7.13 recal. slope = 60.5 pH 7.64
Questioned initial pH reading so recalibrated + remeasured

4 Sep 02 1:1 Nitric Acid soln for EWD P Sampling trip
BW
Reagent: Nitric Acid - Trace Metal Grade
Fisher A509-212 lot # 1100040
Nanopure type 1 water
Added ~ 100mL water. Made a mark on bottle
representing "double volume" on a 250mL
FEP bottle. Slowly + in steps added conc
nitric until mark reached
Labelled 1x1

6 Sep 02
BW
NPCA Series 7+8 Divol Results
Chain of Custody 463/156-159
QA Sample 463/155 Target 120ppm for
Na, Mg, + Ca.
Samples were taken in a manner to investigate
the source of potassium (pH measurement or
HNO₃ preserve). Brief initial comp BW 9-6-02
comments on this issue appear following the
raw data.

6 Sep 02
CONT
BW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 06/19/02
Matrix: Liquid Project No.: 20.01402.871
Work Order: 22684

Sample ID	Lab System ID	Calcium Results (mg/L)	Potassium Results (mg/L)	Magnesium Results (mg/L)	Manganese Results (mg/L)	Sodium Results (mg/L)	Strontium Results (mg/L)
Prep Blank - 22684a	----	<0.100	----	----	----	<0.200	----
Lab Control - 22684a	----	20.0	----	----	----	19.5	----
True Value	----	20.0	----	----	----	20.0	----
Recovery	----	100%	----	----	----	97.5%	----
Prep Blank - 22684b	----	<0.100	----	----	----	<0.200	----
Lab Control - 22684b	----	20.5	----	----	----	19.8	----
True Value	----	20.0	----	----	----	20.0	----
Recovery	----	103%	----	----	----	99.0%	----
Prep Blank - 22684c	----	----	<0.200	<0.050	<0.005	----	<0.010
Lab Control - 22684c	----	----	20.3	20.8	0.502	----	4.29
True Value	----	----	21.4	21.4	0.500	----	4.29
Recovery	----	----	94.9%	97.2%	100%	----	100%
Prep Blank - 22684d	----	----	<0.200	<0.050	<0.005	----	<0.010
Lab Control - 22684d	----	----	20.4	20.3	0.502	----	4.29
True Value	----	----	21.4	21.4	0.500	----	4.29
Recovery	----	----	95.3%	94.9%	100%	----	100%
NPCA78Q	208121	122	<0.200	121	0.010	117	0.015
Duplicate result	208121	121	<0.200	118	0.009	117	<0.010
RPD	208121	0.82%	0.00%	2.51%	10.5%	0.00%	200%
NPCA7B1	208122	1480	<0.200	0.306	0.036	252	0.200
Spike result	208122	1670	24.2	21.5	0.525	454	4.43
Spike added	208122	200	21.4	21.4	0.500	200	4.29
Recovery	208122	95.0%	113%	99.0%	97.8%	101%	98.6%
NPCA7B3	208123	1490	<0.200	0.105	0.037	252	0.203
NPCA7B4	208124	1490	0.263	<0.050	0.036	255	0.198
NPCA7C1	208125	472	0.256	<0.050	0.023	2280	0.077
NPCA7C3	208126	473	0.321	<0.050	0.020	2270	0.068
NPCA7C4	208127	472	0.273	0.097	0.021	2270	0.068
NPCA7D1	208128	145	<0.200	<0.050	0.010	2250	0.026
NPCA7D3	208129	143	<0.200	0.062	0.010	2250	0.026
NPCA7D4	208130	145	0.396	0.074	0.010	2240	0.028
NPCA7E1	208131	50.7	0.428	0.067	0.007	2270	0.016
NPCA7E3	208132	51.1	0.350	0.067	0.005	2250	0.011
NPCA7E4	208133	49.7	0.421	0.080	0.005	2260	0.014
NPCA7F1	208134	17.0	0.259	<0.050	<0.005	2260	0.011
NPCA7F3	208135	17.3	0.344	<0.050	<0.005	2250	0.015
NPCA7F4	208136	16.6	0.468	<0.050	<0.005	2270	0.010
NPCA8B1	208137	1490	<0.200	0.062	0.032	250	0.198

Reporting Limit: 0.100 mg/L 0.200 mg/L 0.050 mg/L 0.005 mg/L 0.200 mg/L 0.010 mg/L

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SOUTHWEST RESEARCH INSTITUTE SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 06/19/02

Matrix: Liquid

Project No.: 20.01402.871

Work Order: 22684

Sample ID	Lab System ID	Calcium Results (mg/L)	Potassium Results (mg/L)	Magnesium Results (mg/L)	Manganese Results (mg/L)	Sodium Results (mg/L)	Strontium Results (mg/L)
NPCA8B3	208138	1480	<0.200	0.069	0.034	249	0.201
NPCA8B4	208139	1490	0.219	<0.050	0.034	251	0.198
NPCA8C1	208140	472	0.255	<0.050	0.017	2250	0.068
NPCA8C3	208141	468	0.411	0.104	0.020	2240	0.087
Duplicate result	208141	465	0.411	<0.050	0.019	2240	0.067
RPD	208141	0.64%	0.00%	200%	5.13%	0.00%	26.0%
NPCA8C4	208142	470	0.457	0.088	0.016	2270	0.069
Spike result	208142	673	28.0	20.4	0.515	2450	4.31
Spike added	208142	200	21.4	21.4	0.500	200	4.29
Recovery	208142	102%	129%	94.9%	99.8%	90.0%	98.9%
NPCA8D1	208143	146	0.329	0.090	0.008	2200	0.029
NPCA8D3	208144	146	0.222	<0.050	0.009	2200	0.028
NPCA8D4	208145	145	0.381	0.108	0.007	2220	0.029
NPCA8E1	208146	51.0	0.380	<0.050	<0.005	2230	0.014
NPCA8E3	208147	53.9	0.390	<0.050	<0.005	2220	0.016
NPCA8E4	208148	51.0	0.410	<0.050	<0.005	2230	0.014
NPCA8F1	208149	17.6	0.513	0.074	<0.005	2250	0.014
NPCA8F3	208150	24.7	0.424	<0.050	<0.005	2250	0.015
NPCA8F4	208151	19.2	0.392	<0.050	<0.005	2230	0.014
SOLNB	208152	1515	0.307	<0.050	0.030	225	0.196
SOLNC	208153	481	0.200	0.050	0.013	2210	0.064
SOLND	208154	145	0.323	<0.050	<0.005	2210	0.022
SOLNE	208155	47.9	0.258	<0.050	<0.005	2220	0.011
SOLNF	208156	14.6	0.597	<0.050	0.009	2220	<0.010

Reporting Limit: 0.100 mg/L 0.200 mg/L 0.050 mg/L 0.005 mg/L 0.200 mg/L 0.010 mg/L

Just to jog your memory, we setup the series 7 & 8 sampling in order to investigate whether the source of the potassium was the pH sampling or the HNO₃ preservative. Included in the hardcopy of the results is a table with the sampling scheme used to identify the potassium source. Samples with suffix 1 had the Div 01 sample taken before the pH measurement and no HNO₃ was added. Samples with suffix 3 had the Div 01 sample taken before the pH measurement and had HNO₃ was added. Samples with suffix 4 had the Div 01 sample taken after the pH measurement and no HNO₃ was added.

It looks like the pH sampling adds the potassium to the sample. Eight of ten suffix 1 samples had lower potassium levels than suffix 4 samples. From this data, I noticed the trend that the potassium levels were lower in samples that had the Div 01 sample aliquot removed before measuring the pH. Four of ten suffix 1 samples had lower potassium levels than suffix 3 samples. This random or evenly split data indicated that addition of HNO₃ preservation to a sample did not result in a increase in the potassium level. Eight of ten suffix 3 samples had lower potassium levels the suffix 4 samples. From this data, I noticed the trend that potassium levels were lower in samples that had HNO₃ preservative added (also sample aliquot removed before measuring the pH) compared to samples that were taken after the pH was measured. Therefore, I concluded that the pH measurement step was responsible for the addition of potassium to the sample.

9 Sep 02
BAW

EWOP Field Sampling

No field measurements - collecting water samples only

NC-EWOP-225 Zone 4 (1142.0' to 1179.5')

Yield when sampling (GPM) = 3.8 GPM

Pumping time (11:52-12:40 or 50 min)

Static water level = 473.3'

Depth to top of sample interval = 1142.0'

Depth to bottom of sample interval = 1179.5'

Finished well depth = 1190.1'

Hole depth = 1196.5'

Six samples taken. 1 Liter samples were HDPE bottles. 250 mL samples in amber glass bottles

Bottle size Treatment* LABELED
(mL)

Bottle size (mL)	Treatment*	LABELED
1000	FA1	NC EWOP-225 Zone 4 FA
1000	FA2	" " FA
1000	FUA	" " FUA
1000	UFUA	" " UFUA
250	FUA	" 9-18-02 " FUA SF
250	UFUA	" " UFUA SF

BAW 9-18-2002

* F = Filtered

A = Acidified

U = un prefix

S = Stable isotope

Filter = Gelman Aquaprep 600 capsule 0.45 µm
lot # 35670

Acid = 1+1 523/38

9 Sep 02
CONT
BAW N4E County Readings 225 Zone 4

Time	TEMP	pH	EC	Turb	DO	ORP
1159	28.19	7.70	0.300	3.3	2.41	154.3
1224	28.43	7.69	0.302	3.0	2.50	178.0
1240	28.49	7.69	0.303	2.7	2.61	186.6
	°C		MS	NTU	mg/L	mV

Filter attached to end of N4E County pump line at 13:05, completely filled each Filtered sample. Then filled unfiltered sample at large main line. A BAW 9-9-02 Filt BAW 9-9-02 Decanted small amount out of "Acidified" bottles and added 3mL of 1+1.

Ezra Wasson (BSC) conducted an introduction/safety meeting at 12:20.

10 Sep 02
BAW

EWDP Field Sampling

NC EWDP 225 Zone 3 at 0855 mg sampling

Yield when sampling = 4.0 gpm
Pumping time = 6:15 to 8:30 or 14:15 min
Static Water level = 473.1'
Depth to top of sample interval = 882.0'
Depth to bottom of sample interval = 979.5'
Finished well depth = 1190.1'
Hole depth = 1196.5'

Six samples taken (see 523/41) labeled Zone 3

Filter Aqua Prep 600 capsule 0.45mm

lot # 52230

Acid 1+1 523/38

Sampling Procedure see 523/42

10 Sep 02
CONT
BAW N4E County Readings 225 Zone 3

Time	TEMP	pH	EC	Turb	DO	ORP
0857	28.30	7.77	0.286	34.8	3.00	161.6
0827	28.40	7.78	0.287	1.3	2.66	169.1
	°C		MS	NTU	mg/L	mV

BAW
9-10-02

NC EWDP 225 Zone 2 662-759.5'

Yield when sampling = 4.0 GPM

Pump time = 1145-1400

Static Water level = 473.10'

Depth to top of sample interval = 862.0'

Depth to bottom of sample interval = 759.5'

Finished well depth = 1190.1'

Hole depth = 1196.5'

Six samples taken (see 523/41) labeled Zone 2

Time = 1425

Filter = Aqua prep 600 capsule 0.45mm

lot # 35670

Acid = 1+1 523/38

Sampling procedure 523/42

N4E County Readings 225 Zone 2

Time	TEMP	pH	EC	Turb	DO*	ORP*
	°C		MS	NTU	mg/L	mV
1224	28.84	7.74	0.279	2.1	1.16	187.2
1310	28.81	7.79	0.280	0.4	0.83	-102.9
1400	28.80	7.76	0.281	0.1	1.21	-116.4

* Kathy Gilmore (N4E County) questioned validity of these measurements

11 Sep 02
BAWEWDP Field SamplingNLEWDP 225 | Zone 1 522-579.5'

Yield when sampling = 4.0 GPM

Pump time = 0635-0800

Static Water level = 473.05'

Depth to top of sample interval = 522.0'

Depth to bottom of sample interval = 579.5'

Finished well depth = 1190.1'

Hole depth = 1196.5'

Six Sampler taken (see 523/41) labeled zone 1
Time 0822Filter = Gelman Aquaprep 600 capsule 0.45 μ m

lot # 52230

Acid 1+1 523/38

Sampling procedure 523/42

NYE COUNTY Readings 225 Zone 1

Time	Temp °C	pH	EC MS	Turb NTU	DO* mg/L	ORP mV
0805	27.41	7.38	0.271	33.1	6.22	116.5

Note negative Turbidity value and DO still questionable.

11 Sep 02
CONT
BAWNC EWDP 105 | Zone 2

Yield when sampling = 3.0 GPM

Pump time = 1255-1430 ⁹⁻¹¹⁻⁰²Static water level = 635 ^{BW} 581.17'

Depth to top of sample interval = 802.0'

Depth to bottom of sample interval = 859.5'

Finished well depth = 880'

Hole depth = 900.0'

Six samples taken (see 523/41) labeled zone 2, 105

Time sampler taken ~~1440~~ ^{BW} 9-11-02 1540Filter = Gelman Aquaprep 600 capsule 0.45 μ m

lot # 52230

Acid 1+1 ~~538~~ ^{BW} 9-11-02 523/38

Sampling procedure 523/42

NYE County Readings 105 Zone 2

Time	TEMP °C	pH	EC MS	Turb* NTU	DO# mg/L	ORP mV
1320	30.33	8.16	0.385	-24.0	1.11	-36.0
1400	30.96	8.01	0.310	-17.2	2.76	36.3
1423	30.92	7.91	0.308	-4.4	3.33	65.0
1431	31.00	7.88	0.309	-1.7	3.33	76.5

* Turb all negative

DO - Kathy (NYE County) questionable values

Sulfur smell detected when initial pumping started.

12 Sep 02
BAW

EWDP Field Sampling

NC EWDP 105
ZONE 1 662-699.5'

Yield when sampling = 2.5 GPM (3.0 at start)
Pump time = 0745 - 0840
Static Water level = 581.04'
Depth to top of sample interval = 662.0'
Depth to bottom of sample interval = 699.5'
Finished well depth = 880.0'
Hole depth = 900.0'

Six samples taken (see 523/41) labeled zone 1, 105
Time samples taken at 0914
Filter = Gelman Aquaprep 600 capsule 0.45µm
lot # 35670
Acid 1+1 523/38
Sampling procedure 523/42

NYE COUNTY READINGS 105 Zone 1

Time	TEMP °C	pH	EC MS	Turb* NTU	DO± mg/L	ORP mV
0758	26.19	7.54	0.306	-181.2	4.02	255.5
0801	27.38	7.83	0.282	-243.2	3.84	248.9
0822	29.60	7.77	0.277	-244.7	5.42	254.6
0841	29.80	7.67	0.280	-244.9	6.17	256.5

* Turbidity negative
Kathy (NYE county) questions values

13 Sep 02
BAW

EWDP Field Sampling

NC EWDP 75C ZONE 1 80-90'

Yield when sampling = ~~0.5 GPM~~ ^{BW 9-13-02} set at 1.5 GPM
Pump time = 1328
Static Water level = 25.68'
Depth to top of sample interval = 80.0'
Depth to bottom of sample interval = 90.0'
~~Fin~~ BW 9-13-02 Finished well depth = 459.7'
Hole depth = 778.5'

Six samples taken (523/41) labeled zone 1, 75C
Time samples taken ~ 16:15
Filter = Gelman Aquaprep 600 capsule 0.45µm
lot # 52230
Acid = 1+1 523/38
Sampling Procedure 523/42

NYE COUNTY READINGS 75C Zone 1

Time	TEMP °C	pH	EC MS	Turb NTU	DO mg/L	ORP mV
1357	29.48	7.32	0.667	-133.6	7.77	39.7
1439	32.20	7.52	0.869	-195.8	6.19	65.1
1450	32.70	7.42	0.886	-247	6.07	52.7
1501	33.18	7.39	0.905	-242.3	5.97	38.6

13 Sep 02

CONT

BAW

EWDP Field Sample

NC EWDP 75C - Zone 2

Yield when sampling = 5

Pump time = 10:20 - 11:05

Static water level = 25.41'

Depth to top of sampling interval = 180.0'

Depth to bottom of sampling interval = 210.0'

Finished well depth = 439.7'

Hole depth = 778.5'

Six Samples Taken (see 523/41) labeled zone 2, 75C

Time samples taken = 11:20

Filter = Gelman Aqua Prep 600 Capsule 0.45 μ m

lot # 35670

Acid = 1+1 523/38

Procedure = 523/42

Nye County Readings 75C Zone 2

Time	Temp °C	pH	EC MS	Turb* NTU	DO mg/L	ORP mV
1030	23.84	7.40	0.855	-132.0	2.09	22.0
1040	23.45	7.19	0.904	-208.4	1.95	9-13-02 ^{BAW} 32 - 30.2
1054	23.37	7.15	0.923	-240.2	2.00	-39.4

* Note negative turbidity + ORP

13 Sep 02

CONT

BAW

EWDP Field Sample

NC EWDP 75C - Zone 3 270'-370'

Nye County initial attempts at pump at a rate of about 15 GPM resulted in the zone 3 going dry.

18 Sep 02

BAW

EWDP Field Sampling from 26 Aug 02 - 29 Aug 02
523/33-38Procedure - Two 4L pp bottles were filled with unfiltered water from the well. Water was filtered using a Cole Palmer portable sampler pump and a Gelman Aqua Prep 600 Capsule 0.45 μ m Filter. All field tests, except for alkalinity, was performed with unfiltered water. Filtered water was used for alkalinity field measurement.

Six Samples were taken back to the lab. One liter samples were in HDPE bottles. 250 mL samples were in amber glass bottles.

Bottle size Treatment* LABEL
(mL)

1000	FA1	NC EWDP 18P	Zone X	FA1
1000	FA2	"	"	FA2
1000	F4A	"	"	F4A
1000	UF4A	"	"	UF4A
250	F4A	"	" 9-18-02	BAW F4A SF
250	UF4A	"	"	UF4A SF

* F = Filtered, A = Acidified, U = un., S = stable isotope
9-18-2002 BAW

19 Sep 02
BW

EWDP Samples for Divol Anion Analysis

Aliquots of the EWDP groundwater samples for the August (523/33-38) and Sept (523/41-49) sampling events were taken to Divol for anion analysis. The following anions were requested for ion chromatography - F⁻, Cl⁻, Sulfate, Br⁻, nitrate and nitrite. Phosphate was requested by colorimetric method (EPA 335.3) in order to lower the reporting limit from 0.1 ppm (by IC) to 0.01 ppm (335.3). No bicarbonate analysis was requested. Aliquots were transferred by decanting into 125 mL pp bottles. These bottles were labeled as followed: "well - zone - filter status - duplicate" where well = Nye County EWDP id, zone = 1 to 4, refer to Sample Custody Entry for far details.

filter status = F for filtered or UF for unfiltered

ALL Samples were Unacidified (UFA's)

duplicate - All samples were in duplicate so the suffix

1 or 2 was used to distinguish the dups

The NC EWDP wells and zone included in this sampling were as follows:

75C zones 1+2

22S zones 1, 2, 3, + 4

18P (only 1 zone) ^{BW} 9-19-02 in well)

22PA zones 1+2

22PB (only present on site for 1 zone) zone 1

10P zones 1+2

10S zones 1+2

56 Samples total - Chain of Custody on following pages.

195002
CENT
RAW

Shipper Name/Address BRADLEY WERLING CNWAR - DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input checked="" type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input type="checkbox"/> Other:					
		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact					
Client		Analyses Requested										Mike Dammann					
Sample ID		Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC	expt phosphate	Phosphate by 335.13							REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) none	
10S-2-UF-1				W		1	X	X								Nuclear Safety	
10S-2-UF-2							X	X								Related Use	
10S-2-F-1							X	X								appropriate QA	
10S-2-F-2							X	X								procedures	
10S-1-UF-1							X	X									
10S-1-UF-2							X	X								POC Brad Werling	
10S-1-F-1							X	X								phone 6565	
10S-1-F-2							X	X								fax 5184	
10P-2-UF-1							X	X									
10P-2-UF-2							X	X								20,01402, 871	
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe Temp: 22°C Comments: 523/50 Rec'd. intact		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank Therm #: 7 9/19/02		Relinquished by (Print/Signature)				Date	Time	SwRI Project#							
				Received by (Print/Signature)				Date	Time	Received by SwRI Lab: (Signature)							
				Relinquished by (Print/Signature)				Date	Time	Date	Time	Samples Disposed:					
				Received by (Print/Signature)				Date	Time	Date	Time	Samples Disposed by:					
				Relinquished by (Print/Signature)				Date	Time								

14 Sep 02
cont
BW

Shipper Name/Address BRADLEY WERLING CNRA - DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166						Requested Turnaround: <input checked="" type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input type="checkbox"/> Other:					
Client		Client Purchase Order/Other ID				Site/Zone ID				SwRI Contact Mike Rammann			
Sample ID		Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analyses Requested				REMARKS		
											Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C ± 2°C) f = Other (specify) <u>none</u>		
10P-2-F-1				W		1	X	X					Nuclear Safety Related - use appropriate QA procedures POC Brad Werling phone 6565 fax 5184 20,01402,871
10P-2-F-2							X	X					
10P-1-UF-1							X	X					
10P-1-UF-2							X	X					
10P-1-F-1							X	X					
10P-1-F-2							X	X					
22PB-1-UF-1							X	X					
22PB-1-UF-2							X	X					
22PB-1-F-1							X	X					
22PB-1-F-2							X	X					
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date 7-17-02	Time 10:37		SwRI Project#: Received by SwRI Lab: (Signature) Khalid PC		
Temp: 22.0°C		Therm #: 027		Received by (Print/Signature)				Date	Time		Date 7/19/02	Time 10:37	
Comments: 523/50 rec'd intact		Relinquished by (Print/Signature)				Date	Time		Samples Disposed: Date		Time		
		Relinquished by (Print/Signature)				Date	Time		Samples Disposed by:				

193602
CST
RAW

Shipper Name/Address BRADLEY WERLING CNWRA- DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input checked="" type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input type="checkbox"/> Other:			
Client		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact Mike Dammann			
		Analyses Requested										REMARKS			
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Anions by IC	except phosphate	Phosphate by 335.3							Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) none
22PA-2-UF-1			W		1	X	X								Nuclear Safety
22PA-2-UF-2						X	X								Related - use
22PA-2-F-1						X	X								appropriate QA
22PA-2-F-2						X	X								procedures
22PA-1-UF-1						X	X								
22PA-1-UF-2						X	X								POC Brad Werling
22PA-1-F-1						X	X								phone 6565
22PA-1-F-2						X	X								fax 5184
18P-UF-1						X	X								
18P-UF-2						X	X								20.01402.871
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling					Date 9-19-02	Time 10:37	SwRI Project# Received by SwRI Lab: (Signature) Karee Deen				
Temp: 22°C		Therm #: 027		Received by (Print/Signature)					Date	Time	Date 9/19/02				
Comments: 523/50		Relinquished by (Print/Signature)					Date	Time	Time 10:35						
		Received by (Print/Signature)					Date	Time	Samples Disposed: Date						
		Relinquished by (Print/Signature)					Date	Time	Samples Disposed by:						

Page 4 of 6

195402
CONT
BLU

Shipper Name/Address BRADLEY WERLING CNWRA - DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166						Requested Turnaround: <input checked="" type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input type="checkbox"/> Other:	
Client		Client Purchase Order/Other ID				Site/Zone ID		SwRI Contact	
		Analyses Requested						Mike Pammann REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) none	
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Amians by LC- except phosphate by 335.3			
22S-2-UF-1			W		1	X	X		
22S-2-UF-2					1	X	X		
22S-2-F-1					1	X	X		
22S-2-F-2					1	X	X		
22S-1-UF-1					1	X	X		
22S-1-UF-2					1	X	X		
22S-1-F-1					1	X	X		
22S-1-F-2					1	X	X		
75C-2-UF-1					1	X	X		
75C-2-UF-2					1	X	X		
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling		Date	Time	SwRI Project: Received by SwRI Lab: (Signature) Kene P...	
Temp: 22°C		Therm #: #027		Received by (Print/Signature)		Date	Time	Date 9-19-02 Time 10:38	
Comments: 523/50				Relinquished by (Print/Signature)		Date	Time	Date 9/19/02 Time 10:38	
Build in fact				Received by (Print/Signature)		Date	Time	Samples Disposed: Date Time	
				Relinquished by (Print/Signature)		Date	Time	Samples Disposed by:	

19 Sep 02
CONT
78405

Shipper Name/Address BRADLEY WERLING CNWRA - DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input checked="" type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input type="checkbox"/> Other:						
Client		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact Mike Dammann						
Sample ID		Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analyses Requested										REMARKS	
							Anions by IC (except phosphate) Phosphate by 335.3										Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) none	
75C-2-F-1				W		1	X	X									Nuclear Safety Related-use appropriate QA procedures	
75C-2-F-2						1	X	X										
75C-1-UF-1						1	X	X										
75C-1-UF-2						1	X	X										
75C-1-F-1						1	X	X										
75C-1-F-2						1	X	X									POC Brad Werling phone 6565 fax 5184	
																	20,01402,871	
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank				Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date 9-19-02	Time 10:38	SwRI Project#: Received by SwRI Lab: (Signature) Kimberly						
		Received by (Print/Signature)				Relinquished by (Print/Signature)				Date	Time	Date 9/19/02	Time 10:37					
		Received by (Print/Signature)				Relinquished by (Print/Signature)				Date	Time	Samples Disposed: Date Time						
		Received by (Print/Signature)				Relinquished by (Print/Signature)				Date	Time	Samples Disposed by:						
Temp: 22°C		Therm #: 027																
Comments: 523/50 Rec'd intact.																		

9-23-02

BAW

QA sample for EWDP ICP cation Divol Analysis

QA sample for EWDP ICP cation analysis

Target conc = 5 ppm of Ca, K, Mg, + Na (each)

Reagents: Spexcertiprep Ca 1000 ppm cat# PLCA2-2Y

lot# 8-140CA exp 12-30-02 open 1-14-02

Spexcertiprep K 1000 ppm cat# PLK2-2Y

lot# 8-33K-Y exp 12-30-02, open 1-14-02

Spexcertiprep Mg 1000 ppm cat# PLMG2-2Y

lot# 8-155MG exp 12-30-02, open 1-4-02

Spexcertiprep Na 1000 ppm cat# PLNA2-2Y

lot# 8-66NA exp 12-30-02, open 1-4-02

nanopure type1 water

Added 5 mL (vol pipet) of 1000 ppm Ca, 5 mL (vol pipet) of 1000 ppm K, 5 mL (vol pipet) of 1000 ppm Mg, and 5 mL of 1000 ppm Na to a 1000 mL vol flask and diluted to mark with nanopure type1 water. Labelled 10Q-FAL-3. Q = QA sample, Rest is info to mark QA sample from Divol.

9-24-02

BAW

EWDP ICP cation Analysis

August and Sept 2002 EWDP samples taken to Divol for ICP cation analysis (523/33-38 and 523/41-49). Samples were 3 types from each of the 14 zones: 1L PP 4F4A, 1L PP F4A, and 1L PP FAL labeled; well-zone-treatment-3 note: suffix 1+2 used for quinu analysis (523-51-56)

Duplicates on 10P zone 2, 18P, and 75C zone 2 used ~4 for suffix

Total 52 samples including QA (523/57)

Aliquots transferred into 125 mL PP bottle.

245002
COST
BHU

Shipper Name/ Address	BRADLEY WERLING CNWRA-DINZO BLD 57						SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166						Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks			
	Client							Client Purchase Order/Other ID						Site/Zone ID		SwRI Contact
						Analyses Requested								Mike Dammann		
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major + minor elements by ICP										REMARKS
TSC-1-UFOA-3			W		1	✓										Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)
TSC-1-FUA-3																varies
TSC-1-FAI-3																per sample
10P-1-UFOA-3																
10P-1-FUA-3																
10P-1-FAI-3																
10S-2-UFOA-3																
10S-2-FUA-3																
10S-2-FAI-3																
10S-1-UFOA-3																
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling		Date 9-24-02		Time 0928		SwRI Project#:						
Temp: 22.0 °C		Therm #: 026		Received by (Print/Signature)		Date		Time		Received by SwRI Lab: (Signature) K. Calver						
				Relinquished by (Print/Signature)		Date		Time		Date 9/24/02		Time 0928				
				Received by (Print/Signature)		Date		Time		Samples Disposed: Date		Time				
Comments: Rec'd. intact				Relinquished by (Print/Signature)		Date		Time		Samples Disposed by:						

24SEP02
LWT
BAUS

Shipper Name/Address	BRADLEY WERLING CNWRA-DIV 20 BLD 57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks		
Client			Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact		
			Analyses Requested										Mike Hammann		
Sample ID			Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Analysis of major/minor elements by ICP						REMARKS Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)	
10S-1-FUA-3					W		1	✓						Nuclear Safety Related - use appropriate QA procedures POC: Brad Werling phone 6565 fax 5184 20.01402.871	
10S-1-FAI-3															
22PA-1-UFUA-3															
22PA-1-FUA-3															
22PA-1-FAI-3															
22PA-2-UFUA-3															
22PA-2-FUA-3															
22PA-2-FAI-3															
22PB-1-UFUA-3															
22PB-1-FUA-3															
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe			Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank				Relinquished by (Print/Signature) Brad Werling / Brad Werling					Date	Time	SwRI Project#: Received by SwRI Lab: (Signature) [Signature]	
Received by (Print/Signature) [Signature]							Date	Time	Date 9/24/02		Time 0928	Date 9/24/02		Time 0928	
Relinquished by (Print/Signature) [Signature]							Date	Time	Date 9/24/02		Time 0928	Samples Disposed: Date [Blank]		Time [Blank]	
Received by (Print/Signature) [Signature]							Date	Time	Date 9/24/02		Time 0928	Samples Disposed by: [Blank]			
Relinquished by (Print/Signature) [Signature]							Date	Time	Date 9/24/02		Time 0928	Samples Disposed by: [Blank]			
Temp: 22.0°C			Therm #: 026			Comments: Rec'd. Intact									

24502
CONT
BRAD

Shipper Name/Address		SAMPLE LIST/CHAIN OF CUSTODY										Requested Turnaround:	
Client		Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										<input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks	
		Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact	
		Analyses Requested										Mike Dammann	
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Major + minor elements by ICP							REMARKS
22PB-1-FAI-3			W		1	✓							Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) Varies per sample Nuclear Safety Related - use appropriate QA procedures Doc - Brad Werling phone 6565 fax 5184
22S-4-UFA-3													
22S-4-FUA-3													
22S-4-FAI-3													
22S-3-UFA-3													
22S-3-FUA-3													
22S-3-FAI-3													
22S-2-UFA-3													
22S-2-FUA-3													
22S-2-FAI-3													20.01402.871
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date	Time	SwRI Project#: Received by SwRI Lab: (Signature) K. P. E.			
Temp: 22.0°C Therm #: 026				Received by (Print/Signature)				Date	Time	Date 9/24/02 Time 0928			
Comments: Rec'd. intact				Relinquished by (Print/Signature)				Date	Time	Samples Disposed: Date Time			
				Relinquished by (Print/Signature)				Date	Time	Samples Disposed by:			

24602
ent
BWS

Shipper Name/Address	BRADLEY WERLING CNWRA-DIV 20 BL057		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks			
Client			Client Purchase Order/Other ID					Site/Zone ID					SwRI Contact			
			Analyses Requested										Mike Dammann			
			REMARKS										Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)			
Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Major + Minor Elements by ICP										Variations per sample
2251-UFUA-3			W		1											Nuclear Safety
2251-FUA-3																Related-use
2251-FAI-3																appropriate QA
10P2-UFUA-3																procedures
10P2-FUA-3																POC-Brad Werling
10P2-FAI-3																phone 6565
10P2-UFUA-4																fax 5784
10P2-FUA-4																
10P2-FAI-4																
18P-UFUA-3																20.01402.871
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe Temp: 22.0°C Comments:			Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank Therm #: 026			Relinquished by (Print/Signature) Brad Werling / Brad Werling				Date 9/24/02		Time 0928		SwRI Project#: Received by SwRI Lab: (Signature) K. Leif...		
Received by (Print/Signature)						Date		Time		Date 9/24/02				Time 0928		
Relinquished by (Print/Signature)						Date		Time		Date 9/24/02				Time 0928		
Received by (Print/Signature)						Date		Time		Date 9/24/02				Time 0928		
Relinquished by (Print/Signature)						Date		Time		Date 9/24/02				Time 0928		

245002
CONT
HAW

Shipper Name/ Address	BRADLEY WERLING CNWRA-DIV20 BLO 57					SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166					Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other: 4 wks			
	Client						Client Purchase Order/Other ID					Site/Zone ID		SwRI Contact
					Analyses Requested							Mike Dammann		
Sample ID	Sample Collection Date (mm/dd/yyyy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	Major + Minor elements by ICP								REMARKS
18P-FUA-3			W		1	✓								Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify)
18P-FAL-3														
18P-UFUA-4														
18P-FUA-4														
18P-FAL-4														
75C-2-UFUA-3														
75C-2-FUA-3														
75C-2-FAL-3														
75C-2-UFUA-4														
75C-2-FUA-4														
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling / Brad Werling		Date 7/24/02		Time 0928		SwRI Project#: Received by SwRI Lab: (Signature) K. H. P. E.				
Temp: 22.02 Comments:		Therm #: 026		Relinquished by (Print/Signature)		Date		Time		Date 7/24/02		Time 0928		
				Relinquished by (Print/Signature)		Date		Time		Samples Disposed: Date		Time		
				Relinquished by (Print/Signature)		Date		Time		Samples Disposed by:				

Redd in fact

245902
CONT
9/24/02

Shipper Name/ Address BRADLEY WERLING CNWRA-DIV20 BLO57		SAMPLE LIST/CHAIN OF CUSTODY Southwest Research Institute Chemistry and Chemical Engineering Division 6220 Culebra Road San Antonio, Texas 78238-5166										Requested Turnaround: <input type="checkbox"/> 2 Weeks <input type="checkbox"/> 3 Weeks <input checked="" type="checkbox"/> Other 4 wks			
Client 		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	Major + minor elements by ICP								REMARKS	
JSC-2-FAI-4			W		1	X								Preservation a = HCl to pH <2 b = HNO ₃ to pH <2 c = H ₂ SO ₄ to pH <2 d = NaOH to pH >12 e = Cool (4°C±2°C) f = Other (specify) Sample Nuclear Safety Related - use appropriate QA procedures POC - Brad Werling phone 6565 fax 5184	
10QFAI-3			L		1	X									
Matrix Types: A - Air B - Biota D - Dust E - Emission/Stack P - Product S - Soil SED - Sediment T - Tissue W - Water WP - Wipe		Sample Types: D - Duplicate ER - Equipment Rinsate FB - Field Blank FD - Field Duplicate MS - Matrix Spike MSD - Matrix Spike Dup TB - Trip Blank		Relinquished by (Print/Signature) Brad Werling				Date 9/24/02		Time 0928		SwRI Project#: 20.01402.871			
Temp: 22.02				Therm #: 026				Received by (Print/Signature) Brad Werling				Date 9/24/02		Time 0928	
Comments: Rec. in tact.				Relinquished by (Print/Signature)				Date		Time		Samples Disposed: Date		Time	
Relinquished by (Print/Signature)				Date		Time		Samples Disposed by:							

25 Sep 02
BAW

Aug 2002 EWOP Field Measurements

calibration data for Aug 2002 EWOP Field measurements located in 523/33-38. In-probe
In-line probe measurements and other info available
in 333/37-43. Copy of Field Equipment
below followed by data sheets

Field Equipment

Meter type	Serial number	Battery Required	Probe
Orion 290 pH meter	001761	9-volt	Corning cat# 476516
Hach EC20 pH / ISE meter	981100001572	9-volt	Hach 50200 combination
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		
Hach P/N 52600-60 Turbidity meter	990500001889	4 AAA	
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 external battery: P/N WDLE1000LCP-N	

25 Sep 02
CONT
BAW

Local Well Number NC-EWOP-18P		Zone (if applicable) NA	
Time 13:00	Date 8-26-02	Sampled by GB	
State NV	District	County Nye	

	Value	Remarks		Value	Remarks
Yield when sampling (GPM)	0.5		Water temperature	34.8	°C
Minutes pumped before sampling			Air temperature	37.0	°C
Sampling method			Specific conductance	328 $\mu S/cm$	
Sampling condition	pumped		Dissolved Oxygen	2.91	mg/L
Static water level (feet)	776.3'		ORP BW 924-02	826-02	11.7 mV
Altitude (feet)			pH field	8.135	
Depth to top sample interval	835.8 ft	bottom 885.0 ft	Turbidity	1.0	NTU
Finished well depth (feet)	885.0'		Alkalinity total field	128-131	mg/L $CaCO_3$
Hole depth (feet)	890.4'		endpt pH 4.8 - pH 4.5		

Sample ID	Volume	Sample Treatment Key
18P-zone1-FA1	1 L	
18P-zone1-FA2	1 L	
18P-zone1-FUA	1 L	F - filtered
18P-zone1-UFUA	1 L	A - acidified
18P-zone1-SF	250 mL*	U - unacidified
18P-zone1-SUF	250 mL*	S - stable isotope

* UA also

25 Sep 02
CONT
BAW

Local Well Number NC-EWDP-10P		Zone (if applicable) Shallow
Time 9:00	Date 8-27-02	Sampled by JB
State NV	District	County Nye

Value	Remarks	Value	Remarks
Yield when sampling (GPM) 0.5		Water temperature 28.0	°C
Minutes pumped before sampling		Air temperature 31.8	°C
Sampling method pumped		Specific conductance 263.0	MS/cm
Sampling condition		Dissolved Oxygen 7.71	mg/L
Static water level (feet) 581.4		Eh ORP 9-24-02 BAW 175.0	mV
Altitude Isd (feet)		pH field 7.66	
Depth to top sample interval 663.5 ft	bottom 702.7'	Turbidity 0.8	NTU
Finished well depth (feet) 722.7'		Alkalinity total field 94, 97	mg/L as CaCO ₃
Hole depth (feet) 910.5'		endpt pH 4.8, pH 4.5	

Sample ID	Volume	Sample Treatment Key
10P-zone1-FA1	1L	
10P-zone1-FA2	1L	
10P-zone1-FA4	1L	F - filtered
10P-zone1-UFUA	1L	A - acidified
10P-zone1-SF	250mL*	U - unacidified
10P-zone1-SUF	250mL*	S - stable isotope.

* UA also

25 Sep 02
CONT
BAW

Local Well Number NC-EWDP-10P		Zone (if applicable) deep
Time ~ 13:30	Date 9-27-02	Sampled by JB
State NV	District	County Nye

Value	Remarks	Value	Remarks
Yield when sampling (GPM)		Water temperature 30.4	°C
Minutes pumped before sampling		Air temperature 37.6	°C
Sampling method		Specific conductance 263	MS/cm
Sampling condition		Dissolved Oxygen 7.12	mg/L
Static water level (feet) 581.67		Eh ORP 9-24-02 BAW 137.3	mV
Altitude Isd (feet)		pH field 7.34	
Depth to top sample interval 801.2 ft	bottom 860.0 ft	Turbidity 1.2	NTU
Finished well depth (feet) 879.9'		Alkalinity total field 91-96	mg/L as CaCO ₃
Hole depth (feet) 910.5'		endpt pH 4.8-pH 4.5	

Sample ID	Volume	Sample Treatment Key
10P-zone2-FA1	1L	
10P-zone2-FA2	1L	
10P-zone2-FA4	1L	FB = Field blank (run out of sample at well site)
10P-zone2-UFUA	1L	F - filtered
10P-zone2-SF	250mL*	A - acidified
10P-zone2-SUF	250mL*	U - unacidified
10P-zone2-FB	250mL*	S - stable isotope

* UA also

25 Sep 02
CONT
BAW

Local Well Number NC-EWDP-22PA		Zone (if applicable) Deep Zone	
Time 11:40	Date 8-28-02	Sampled by BAW	
State NV	District	County Nye	

Value	Remarks	Value	Remarks
Yield when sampling (GPM) 0.5		Water temperature 28.6	°C
Minutes pumped before sampling 280 pump at 0700		Air temperature 33.3	°C
Sampling method		Specific conductance 261 $\mu S/cm$ at 29.7°C	
Sampling condition		Dissolved Oxygen 8.10 mg/L at 27.9°C	
Static water level (feet)		Eh ORP 199.6 mV	
Altitude (feet)		pH field 7.13	std 7.21
Depth to top sample interval 661.4 ft	Bottom 759.8'	Turbidity 0.3 NTU	
Finished well depth (feet) 769.7 ft		Alkalinity total field 92.5-96.5 mg/L $CaCO_3$	
Hole depth (feet) 779.8'		endpt pH 4.8-pH 4.5 Reanalyzed same sample using same cal curve.	

Sample ID	Volume	Sample Treatment Key
22PA-zone2-FA1	1L	
22PA-zone2-FA2	1L	
22PA-zone2-FUA	1L	F - filtered
22PA-zone2-UFUA	1L	A - acidified
22PA-zone2-SF	250 mL*	U - unacidified
22PA-zone2-SUF	250 mL*	S - stable isotope

*UA also

25 Sep 02
CONT
BAW

Local Well Number NC-EWDP-22PA		Zone (if applicable) Shallow	
Time ~ 400 (1600)	Date 8-28-02	Sampled by Bradley Walling	
State NV	District	County Nye	

Value	Remarks	Value	Remarks
Yield when sampling (GPM) 0.5		Water temperature 28.8	°C
Minutes pumped before sampling 120 min pump at 1:25 at 3:25		Air temperature 36.5	°C
Sampling method		Specific conductance 185.5 $\mu S/cm$ at 30.4°C	
Sampling condition		Dissolved Oxygen 8.42 mg/L at 28.9°C	
Static water level (feet)		Eh ORP 148.2	
Altitude (feet)		pH field 7.27	
Depth to top sample interval 520.8 ft	Bottom 579.7 ft	Turbidity 1.5 NTU	
Finished well depth (feet) 599.9 ft		Alkalinity total field 96.5-98 mg/L $CaCO_3$	
Hole depth (feet) 779.8 ft		endpt pH 4.8-pH 4.5	

Sample ID	Volume	Sample Treatment Key
22PA-zone1-FA1	1L	
22PA-zone1-FA2	1L	
22PA-zone1-FUA	1L	F - filtered
22PA-zone1-UFUA	1L	A - acidified
22PA-zone1-SF	250 mL*	U - unacidified
22PA-zone1-SUF	250 mL*	S - stable isotope

*UA also

25 Sep 02
CONT
BAW

Local Well Number NC EWDP - 22PB		Zone (if applicable) Shallow	
Time 0200 (1400)	Date 8-29-02	Sampled by Bradley Worthing	
State NV	District	County Nye	

Value	Remarks	Value	Remarks
Yield when sampling (GPM)	0.5	Water temperature	29.8 °C
Minutes pumped before sampling	started 5:32 ended 13:30	Air temperature	36.9 °C
Sampling method		Specific conductance	299 $\mu S/cm$ 30.5
Sampling condition		Dissolved Oxygen	1474 7.30 mg/L 29.8 °C
Static water level (feet)	473.90 ft	pH field	1405 7.64 27.9 °C
Altitude (feet)		Turbidity	0.4 NTU 1420
Depth to top sample interval	881.3 ft	Alkalinity total field	1446 112-116 mg/L as $CaCO_3$
Finished well depth (feet)	989.9 ft		
Hole depth (feet)	1199.7 ft		

Sample ID	Volume	Sample Treatment Key
22PB-zone1-FA1	1L	
22PB-zone1-FA2	1L	
22PB-zone1-FUA	1L	F - filtered
22PB-zone1-UFA	1L	A - acidified
22PB-zone1-SF	250mL*	U - unacidified
22PB-zone1-SUF	250mL*	S - stable isotope

*UFA also

25 Sep 02
CONT
BAW

EWDP Field Sampling - Sept 2002

Personnel on site 9-9 to 9-13-2002 included:

USGS - Pete Strittler
LANL - Arend Meijer
Nye Co - Reina Downing, Kathy Gilmore, Bob Wilcoxan, and Rocky?
State of Nevada - Don Shettel + Robyn Hawley
UNLV - James Cizdziel, Irene?, Julie?
+ others

Drew Coleman (DOE) and Ezra Wasson (BSC) visited site on 9-9-02.

27 Sep 02
BW

NPCA Series 9+10 Dissol ICP Results

Chain of Custody for series 9+10 of NPCA 523/25-29
QA Sample NPCA 910Q (523/24) Target masses were 100 ppm Ca, 20 ppm K, and 150 ppm Na.
QA Sample run in duplicate - recoveries were
Ca = 89.4 and 88.4%, K = 107.5 + 107%, Na = 83.3 + 82%

Np spiking technique different for suffix 1-3 compared to suffix 4. See 523/9 for details

The same ref solns B-F were used for NPCA series 7+8 and NPCA series 9+10. The ref solns were analyzed with both sets. Series 9+10 on following pages. Series 7+8 results on 523/39-40

27Sep02
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 08/05/02

Matrix: Liquid

Project No.: 20.01402.871

Work Order: 22955

Sample ID	Lab System ID	Calcium Results (mg/L)	Potassium Results (mg/L)	Magnesium Results (mg/L)	Manganese Results (mg/L)	Sodium Results (mg/L)	Strontium Results (mg/L)
Prep Blank - j05n1	----	<0.100	----	----	----	<0.250	----
Lab Control - j05n1	----	18.5	----	----	----	17.7	----
True Value	----	20.0	----	----	----	20.0	----
Recovery	----	92.5%	----	----	----	88.5%	----
Prep Blank - j05n2	----	<0.100	----	----	----	<0.250	----
Lab Control - j05n2	----	18.9	----	----	----	18.4	----
True Value	----	20.0	----	----	----	20.0	----
Recovery	----	94.5%	----	----	----	92.0%	----
Prep Blank - j05n3	----	<0.100	----	----	----	<0.250	----
Lab Control - j05n3	----	19.0	----	----	----	17.7	----
True Value	----	20.0	----	----	----	20.0	----
Recovery	----	95.0%	----	----	----	88.5%	----
Prep Blank - j10n2	----	----	<0.200	<0.050	<0.005	----	<0.010
Lab Control - j10n2	----	----	19.5	20.3	1.04	----	5.15
True Value	----	----	20.0	20.0	1.00	----	5.00
Recovery	----	----	97.5%	102%	104%	----	103%
Prep Blank - j10n3	----	----	<0.200	<0.050	<0.005	----	<0.010
Lab Control - j10n3	----	----	20.1	19.7	1.05	----	5.25
True Value	----	----	20.0	20.0	1.00	----	5.00
Recovery	----	----	101%	98.5%	105%	----	105%
Prep Blank - j10n4	----	----	<0.200	<0.050	<0.005	----	<0.010
Lab Control - j10n4	----	----	20.2	19.3	1.07	----	5.38
True Value	----	----	20.0	20.0	1.00	----	5.00
Recovery	----	----	101%	96.5%	107%	----	108%
NPCA10B1	210559	1460	7.75	0.072	0.039	223	0.214
Duplicate result	210559	1450	7.66	<0.050	0.036	228	0.203
RPD	210559	0.69%	1.17%	200%	8.00%	2.22%	5.28%
NPCA10B2	210560	1450	4.76	<0.050	0.037	225	0.208
Spike result	210560	1660	30.2	21.0	0.554	425	5.37
Spike added	210560	200	20.0	20.0	0.500	200	5.00
Recovery	210560	105%	127%	105%	103%	100%	103%
NPCA10B3	210561	1450	4.44	0.058	0.038	226	0.212
NPCA10B4	210562	1490	5.25	<0.050	0.036	229	0.205
NPCA10C1	210563	466	4.93	<0.050	0.018	2170	0.068
NPCA10C2	210564	458	6.23	0.068	0.019	2190	0.069
NPCA10C3	210565	462	5.92	0.055	0.018	2180	0.066
NPCA10C4	210566	464	6.21	<0.050	0.018	2190	0.070
NPCA10D1	210567	138	5.78	0.059	0.005	2130	0.029
NPCA10D2	210568	169	6.94	<0.050	0.005	2150	0.028
NPCA10D3	210569	138	7.96	<0.050	0.007	2140	0.025
NPCA10D4	210570	136	6.20	0.067	0.007	2160	0.026
NPCA10E1	210571	46.4	15.0	0.067	<0.005	2290	0.014
NPCA10E2	210572	45.8	13.0	0.081	<0.005	2250	0.018

Reporting Limit: 0.100 mg/L 0.200 mg/L 0.050 mg/L 0.005 mg/L 0.200 mg/L 0.010 mg/L

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27Sep02
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 08/05/02

Matrix: Liquid

Project No.: 20.01402.871

Work Order: 22955

Sample ID	Lab System ID	Calcium Results (mg/L)	Potassium Results (mg/L)	Magnesium Results (mg/L)	Manganese Results (mg/L)	Sodium Results (mg/L)	Strontium Results (mg/L)
NPCA10E3	210573	46.6	6.93	<0.050	<0.005	2320	0.015
NPCA10E4	210574	45.7	6.64	<0.050	<0.005	2310	0.015
NPCA10F1	210575	13.3	6.12	<0.050	<0.005	2210	0.012
NPCA10F2	210576	13.0	6.61	<0.050	<0.005	2210	0.012
NPCA10F3	210577	14.1	6.97	<0.050	<0.005	2280	0.013
NPCA10F4	210578	12.5	6.26	<0.050	<0.005	2230	<0.010
NPCA910Q	210579	89.4	21.5	<0.050	0.006	123	0.013
Duplicate result	210579	88.4	21.4	<0.050	<0.005	125	<0.010
RPD	210579	1.12%	0.47%	0.00%	200%	1.61%	200%
NPCA9B1	210580	1460	2.81	<0.050	0.037	229	0.203
Spike result	210580	1650	28.0	21.3	0.547	442	5.38
Spike added	210580	200	20.0	20.0	0.500	200	5.00
Recovery	210580	95.0%	126%	107%	102%	107%	104%
NPCA9B2	210581	1450	2.49	<0.050	0.035	229	0.205
NPCA9B3	210582	1380	2.14	<0.050	0.037	220	0.202
NPCA9B4	210583	1360	3.03	<0.050	0.037	216	0.209
NPCA9C1	210584	441	2.51	<0.050	0.018	2150	0.067
NPCA9C2	210585	440	5.56	0.082	0.018	2090	0.066
NPCA9C3	210586	448	2.73	0.056	0.018	2170	0.064
NPCA9C4	210587	446	2.75	0.062	0.018	2120	0.067
NPCA9D1	210588	131	2.92	<0.050	<0.005	2080	0.027
NPCA9D2	210589	135	2.60	0.064	<0.005	2060	0.025
NPCA9D3	210590	131	1.34	<0.050	<0.005	2130	0.025
NPCA9D4	210591	132	1.84	<0.050	<0.005	2070	0.027
NPCA9E1	210592	47.4	1.06	0.052	<0.005	2210	0.016
NPCA9E2	210593	45.3	1.18	0.065	<0.005	2250	0.014
NPCA9E3	210594	44.6	1.52	0.083	<0.005	2150	0.019
Duplicate result	210594	43.8	1.52	0.055	<0.005	2150	0.014
RPD	210594	1.81%	0.00%	40.6%	0.00%	0.00%	30.3%
NPCA9E4	210595	44.6	1.53	<0.050	<0.005	2150	0.015
Spike result	210595	243	30.0	19.8	0.526	2450	5.11
Spike added	210595	200	20.0	20.0	0.500	200	5.00
Recovery	210595	99.2%	142%	99.0%	105%	150%	102%
NPCA9F1	210596	12.4	1.20	0.056	<0.005	2100	0.018
NPCA9F2	210597	12.0	1.24	<0.050	<0.005	1920	0.012
NPCA9F3	210598	12.2	1.19	<0.050	<0.005	2050	0.010
NPCA9F4	210599	11.3	0.818	0.074	<0.005	2140	0.012
Ref B	210600	1400	<0.200	0.051	0.038	207	0.204
Ref C	210601	430	<0.200	<0.050	0.018	1980	0.065
Ref D	210602	128	0.247	0.051	0.007	2040	0.027
Ref E	210603	44.1	0.27	<0.050	<0.005	2180	0.013
Ref F	210604	11.8	0.217	<0.050	<0.005	2170	0.012

Reporting Limit: 0.100 mg/L 0.200 mg/L 0.050 mg/L 0.005 mg/L 0.200 mg/L 0.010 mg/L

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1 OCT 02
BAWRelabeling of NC-EWDP samples for Stable Isotope Analysis

The Aug 2002 (523/65-70) and Sept 2002 (523/41-49) 250mL amber glass bottles were relabeled. The bottles will be sent to another lab for analysis. We used new non-descript labels (see table below) of CNWRA 1 to 27 so the samples would be blind. There was no 10P shallow SF sample to send because the bottle broke + the sample was lost. There was no 10P deep SF because none was taken in the field.

Well	Zone or String	Old label information Depth (feet)	Treatment	Date	New label for Coastal Science Labs
18P	na	835.8 to 885.0	SF	8/26/02	CNWRA 1
			SUF		CNWRA 2
10P	Shallow	663.5 to 722.7	SUF	8/27/02	CNWRA 3
10P	Deep	801.2 to 879.9	SUF	8/27/02	CNWRA 4
22PA	Deep	661.4 to 769.7	SF	8/28/02	CNWRA 5
			SUF		CNWRA 6
22PA	Shallow	520.8 to 599.9	SF	8/28/02	CNWRA 7
			SUF		CNWRA 8
22PB	Shallow	881.3 to 989.9	SF	8/29/02	CNWRA 9
			SUF		CNWRA 10
22S	Zone 4	1142.0 to 1179.5	SF	9/9/02	CNWRA 11
			SUF		CNWRA 12
22S	Zone 3	882.0 to 979.5	SF	9/10/02	CNWRA 13
			SUF		CNWRA 14
22S	Zone 2	662.0 to 759.5	SF	9/10/02	CNWRA 15
			SUF		CNWRA 16
22S	Zone 1	522.0 to 579.5	SF	9/11/02	CNWRA 17
			SUF		CNWRA 18
10S	Zone 2	802.0 to 859.5	SF	9/11/02	CNWRA 19
			SUF		CNWRA 20
10S	Zone 1	662.0 to 699.5	SF	9/12/02	CNWRA 21
			SUF		CNWRA 22
7SC	Zone 2	180.0 to 210.0	SF	9/13/02	CNWRA 23
			SUF		CNWRA 24
7SC	Zone 1	80.0 to 90.0	SF	9/13/02	CNWRA 25
			SUF		CNWRA 26
Field Blank	na	na	SF	8/27/02	CNWRA 27

3 OCT 02
BAWQA Samples for Stable Isotope Analysis

Blanks will be used to investigate the quality of work of Coastal Science Labs stable isotope analysis of EWDP groundwater samples. Tap water will be used as the blank. Four 1L HDPE bottles filled with tap water will be used. Tap water will be run for 5 minutes. Then a single 1L bottle will be rinsed three times with this tap water. The bottle will then be filled completely (minimize headspace) with tap water and capped. This procedure will be repeated for the three other bottles. Two bottles will be sent to Coastal Science Labs. These were labeled CNWRA 28+29. Two bottles will be sent to Geochron Labs (labeled CNWRA 30+31).

Tap water from Building 57 Lab 106 (1st room with exit door) cold water line

After samples labeled they were stored in Bld 57 Lab 104 refrigerator

8 OCT 02
BAWEWDP Aug + Sept 2002 Groundwater anion results

The following pages contain the anion analysis results from Div 01 for the EWDP groundwater samples collected on Aug 2002 and Sep 2002 (523/51-56). The phosphate method was changed from 335.3 to 365.3 (see emails on 523/76). Samples were from wells 10P, 10S, 22PA, 22PB, 22S, + 7SC. Each zone or screen had four samples: 2 filtered and 2 unfiltered.

8 OCT 02
CONT
BW

Bradley Werling

From: Bradley Werling [bwerling@cnwra.swri.edu]
Sent: Friday, October 04, 2002 9:15 AM
To: 'Radonna Spies'
Subject: RE: phosphate

Radonna,

Thanks for bringing this to my attention. I will write a separate email requesting a change to the purchase order. Sorry for the error. Let me know if there is anything else I can do to help. Talk to you later.

Bradley

-----Original Message-----

From: Radonna Spies [mailto:radonna.spies@swri.org]
Sent: Friday, October 04, 2002 8:58 AM
To: Bradley A. Werling
Subject: phosphate

Bradley-

You requested the wrong method # on the chain of custody. Phosphate is 365.3 not 335.3. Please send me an email agreeing to this error. Since this is QA Nuclear, I have to have the correction documented.

Radonna Spies
Wet Chemistry Group Leader
Southwest Research Institute
6220 Culebra Rd
San Antonio, TX 78238
tel. 210.522.3242
fax 210.522.3649

Bradley Werling

To: Radonna S. Spies
Subject: Correction on WO 23174

Radonna,

I need to make a correction on work order 23174. Please change the phosphate analysis requested from method 335.3 to method 365.3. I apologize for this error and any inconvenience this may have caused. Please let me know if you have any questions.

Bradley Werling

8 OCT 02
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-1-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213067

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.99	0.1
Chloride	6.57	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.67	0.1
Sulfate	20.1	0.2
Phosphate-P	0.0371	0.005

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
10P-1-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213067

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Fluoride	1.99	2.01	1.00%
Chloride	6.57	6.58	0.15%
Nitrite	<0.1	<0.1	0.00%
Bromide	<0.1	<0.1	0.00%
Nitrate	1.67	1.68	0.60%
Sulfate	20.1	20.5	1.97%
Phosphate-P	0.0371	0.0381	2.66%

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SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Sample ID
10P-1-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213067

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Fluoride	1.99	2.97	1.00	98.0%
Chloride	6.57	8.47	2.00	95.0%
Nitrite	<0.1	0.853	1.00	85.3%
Bromide	<0.1	3.65	4.00	91.3%
Nitrate	1.67	2.49	0.904	90.7%
Sulfate	20.1	27.4	8.00	91.3%
Phosphate-P	0.0371	0.242	0.20	102%

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-1-F-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213068

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.05	0.1
Chloride	6.58	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.66	0.1
Sulfate	20.3	0.1
Phosphate-P	0.0440	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-1-UF-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213069

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.05	0.1
Chloride	6.60	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.67	0.1
Sulfate	20.3	0.1
Phosphate-P	0.0430	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-1-UF-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213070

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.01	0.1
Chloride	6.61	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.66	0.1
Sulfate	20.3	0.1
Phosphate-P	0.0451	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-F-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213071 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.98	0.1
Chloride	6.57	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.61	0.1
Sulfate	20.0	0.1
Phosphate-P	0.0398	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-F-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213072 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.02	0.1
Chloride	6.53	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.61	0.1
Sulfate	20.0	0.1
Phosphate-P	0.0398	0.005

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CONT
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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-UF-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213073 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.00	0.1
Chloride	6.67	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.61	0.1
Sulfate	20.0	0.1
Phosphate-P	0.0381	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-UF-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213074 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.98	0.1
Chloride	6.48	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.63	0.1
Sulfate	20.0	0.1
Phosphate-P	0.0430	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213075

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
10S-1-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.96	0.1
Chloride	6.56	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.38	0.1
Sulfate	19.2	0.1
Phosphate-P	0.0424	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213076

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
10S-1-F-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.99	0.1
Chloride	6.56	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.37	0.1
Sulfate	19.1	0.1
Phosphate-P	0.0440	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213077

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
10S-1-UF-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.94	0.1
Chloride	6.59	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.35	0.1
Sulfate	19.2	0.1
Phosphate-P	0.0430	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213078

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
10S-1-UF-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.96	0.1
Chloride	6.57	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.35	0.1
Sulfate	19.2	0.1
Phosphate-P	0.0414	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-2-F-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213079 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.90	0.1
Chloride	6.71	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.25	0.1
Sulfate	22.5	0.2
Phosphate-P	0.0606	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-2-F-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213080 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.96	0.1
Chloride	6.74	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.26	0.1
Sulfate	22.6	0.2
Phosphate-P	0.0606	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-2-UF-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213081 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.97	0.1
Chloride	6.73	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.25	0.1
Sulfate	22.9	0.2
Phosphate-P	0.0643	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-2-UF-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213082 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.97	0.1
Chloride	6.71	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.24	0.1
Sulfate	22.6	0.2
Phosphate-P	0.0643	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213083

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.58	0.1
Chloride	7.21	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.862	0.1
Sulfate	21.0	0.2
Phosphate-P	0.0296	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-F-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213084

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.60	0.1
Chloride	7.22	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.864	0.1
Sulfate	21.0	0.2
Phosphate-P	0.0301	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-UF-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213085

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.61	0.1
Chloride	7.18	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.674	0.1
Sulfate	21.1	0.2
Phosphate-P	0.0130	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-UF-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213086

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	2.56	0.1
Chloride	7.20	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.671	0.1
Sulfate	21.0	0.2
Phosphate-P	0.0125	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213087

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PA-1-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.88	0.1
Chloride	7.22	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	274	5.0
Sulfate	26.8	0.2
Phosphate-P	0.0307	0.005

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213087

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PA-1-F-1

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Fluoride	1.88	2.02	7.18%
Chloride	7.22	7.30	1.10%
Nitrite	<0.1	<0.1	0.00%
Bromide	<0.1	<0.1	0.00%
Nitrate	274	274	0.00%
Sulfate	26.8	27.2	1.48%
Phosphate-P	0.0307	0.0376	20.2%

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SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213087

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PA-1-F-1

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Fluoride	1.88	2.99	1.00	111%
Chloride	7.22	9.25	2.00	102%
Nitrite	<0.1	0.844	1.00	84.4%
Bromide	<0.1	3.65	4.00	91.3%
Nitrate	274	319	45.2	99.6%
Sulfate	26.8	33.5	8.00	83.8%
Phosphate-P	0.0307	0.235	0.20	102%

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213088

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PA-1-F-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.94	0.1
Chloride	7.15	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	275	5.0
Sulfate	27.0	0.2
Phosphate-P	0.0323	0.005

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BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-1-UF-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213089
Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.89	0.1
Chloride	6.66	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.85	0.1
Sulfate	23.9	0.2
Phosphate-P	0.0381	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-1-UF-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213090
Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.92	0.1
Chloride	6.65	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.72	0.1
Sulfate	23.7	0.2
Phosphate-P	0.0376	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213091
Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.61	0.1
Chloride	6.52	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.62	0.1
Sulfate	21.5	0.2
Phosphate-P	0.0275	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-F-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213092
Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.61	0.1
Chloride	6.52	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.62	0.1
Sulfate	21.3	0.2
Phosphate-P	0.0259	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-UF-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213093 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.62	0.1
Chloride	6.51	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.61	0.1
Sulfate	21.2	0.2
Phosphate-P	0.0253	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-UF-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213094 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.64	0.1
Chloride	6.50	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.61	0.1
Sulfate	21.3	0.2
Phosphate-P	0.0280	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PB-1-F-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213095 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.01	0.1
Chloride	6.68	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.68	0.1
Sulfate	24.9	0.2
Phosphate-P	0.0483	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PB-1-F-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213096 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.02	0.1
Chloride	6.69	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.70	0.1
Sulfate	24.8	0.2
Phosphate-P	0.0504	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

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Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213097

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PB-1-UF-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.03	0.1
Chloride	6.67	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.70	0.1
Sulfate	24.8	0.2
Phosphate-P	0.0488	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213098

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22PB-1-UF-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.941	0.1
Chloride	6.66	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.69	0.1
Sulfate	24.7	0.2
Phosphate-P	0.0494	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

80CT02
CONT
BAW

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213099

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-1-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.54	0.1
Chloride	6.41	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.05	0.1
Sulfate	18.7	0.1
Phosphate-P	0.0285	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213100

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-1-F-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.55	0.1
Chloride	6.47	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.06	0.1
Sulfate	18.8	0.1
Phosphate-P	0.0291	0.005

80102
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213101

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-1-UF-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.58	0.1
Chloride	6.45	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.06	0.1
Sulfate	18.7	0.1
Phosphate-P	0.0259	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213102

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-1-UF-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.53	0.1
Chloride	6.41	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	1.05	0.1
Sulfate	18.8	0.1
Phosphate-P	0.0194	0.005

80102
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213103

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-2-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.21	0.1
Chloride	6.28	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.272	0.1
Sulfate	19.6	0.1
Phosphate-P	0.00983	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213104

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID
22S-2-F-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.18	0.1
Chloride	6.26	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.276	0.1
Sulfate	19.7	0.1
Phosphate-P	0.0109	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

80702
CONT
BAW

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213105

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
22S-2-UF-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.21	0.1
Chloride	6.27	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.272	0.1
Sulfate	19.7	0.1
Phosphate-P	0.0136	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213106

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
22S-2-UF-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.20	0.1
Chloride	6.27	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.275	0.1
Sulfate	19.6	0.1
Phosphate-P	0.0136	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

80702
CONT
BAW

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213107

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
22S-3-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.00	0.2
Chloride	6.18	0.2
Nitrite	<0.2	0.2
Bromide	<0.2	0.2
Nitrate	0.570	0.2
Sulfate	19.8	0.2
Phosphate-P	0.00983	0.005

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213107

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Sample ID
22S-3-F-1

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Fluoride	1.00	0.967	3.36%
Chloride	6.18	6.18	0.00%
Nitrite	<0.2	<0.2	0.00%
Bromide	<0.2	<0.2	0.00%
Nitrate	0.570	0.576	1.05%
Sulfate	19.8	19.7	0.51%
Phosphate-P	0.00983	0.00983	0.00%

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
MATRIX SPIKE SUMMARY

Sample ID
22S-3-F-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213107 Work Order: 23174

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Fluoride	1.00	2.84	2.00	92.0%
Chloride	6.18	10.0	4.00	95.5%
Nitrite	<0.2	1.71	2.00	85.5%
Bromide	<0.2	7.45	8.00	93.1%
Nitrate	0.570	2.14	1.81	86.7%
Sulfate	19.8	26.9	8.00	88.8%
Phosphate-P	0.00983	0.214	0.20	102%

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-F-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213108 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.08	0.1
Chloride	6.24	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.608	0.1
Sulfate	19.8	0.1
Phosphate-P	0.0109	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-UF-1

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213109 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.09	0.1
Chloride	6.24	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.595	0.1
Sulfate	19.7	0.1
Phosphate-P	0.0189	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-UF-2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/19/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213110 Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.05	0.1
Chloride	6.25	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.597	0.1
Sulfate	19.7	0.1
Phosphate-P	0.0146	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213111

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.986	0.1
Chloride	6.20	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.486	0.1
Sulfate	18.2	0.1
Phosphate-P	0.00769	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-F-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213112

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.00	0.1
Chloride	6.19	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.493	0.1
Sulfate	18.0	0.1
Phosphate-P	0.0168	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-UF-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213113

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.997	0.1
Chloride	6.27	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.493	0.1
Sulfate	19.0	0.1
Phosphate-P	0.0104	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-UF-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213114

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	1.01	0.1
Chloride	6.30	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.488	0.1
Sulfate	19.1	0.1
Phosphate-P	0.0125	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
75C-1-F-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213115

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.756	0.1
Chloride	15.9	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.383	0.1
Sulfate	148	2.0
Phosphate-P	0.00876	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
75C-1-F-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213116

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.763	0.1
Chloride	15.9	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.391	0.1
Sulfate	149	2.0
Phosphate-P	0.0120	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
75C-1-UF-1

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213117

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.754	0.1
Chloride	15.9	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.383	0.1
Sulfate	146	2.0
Phosphate-P	0.00609	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
75C-1-UF-2

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213118

Client: Division 20
Date Received: 09/19/02
Project No.: 20.06002.01.141
Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.777	0.1
Chloride	15.9	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.392	0.1
Sulfate	148	2.0
Phosphate-P	0.00769	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213119

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID

75C-2-F-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.765	0.1
Chloride	15.9	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.350	0.1
Sulfate	148	2.0
Phosphate-P	0.0120	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213120

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID

75C-2-F-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.772	0.1
Chloride	15.8	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.349	0.1
Sulfate	148	2.0
Phosphate-P	<0.005	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213121

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID

75C-2-UF-1

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.767	0.1
Chloride	15.8	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.342	0.1
Sulfate	146	2.0
Phosphate-P	<0.005	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213122

Client: Division 20

Date Received: 09/19/02

Project No.: 20.06002.01.141

Work Order: 23174

Sample ID

75C-2-UF-2

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	0.770	0.1
Chloride	15.8	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	0.346	0.1
Sulfate	147	2.0
Phosphate-P	0.0114	0.005

8 OCT 02
CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
LABORATORY CONTROL SAMPLE

Sample ID
LCSW

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: NA
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: NA Work Order: 23174

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Fluoride	98.9	100	98.9%
Chloride	203	200	102%
Nitrite	98.3	100	98.3%
Bromide	393	400	98.3%
Nitrate	86.0	90.4	95.1%
Sulfate	386	400	96.5%
Phosphate-P	3.11	3.09	101%

NA- Not Applicable.

SOUTHWEST RESEARCH INSTITUTE
BLANK SUMMARY

Sample ID
PBW

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: NA
Matrix: Liquid Project No.: 20.06002.01.141
Lab System ID: NA Work Order: 23174

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Fluoride	<0.1	0.1
Chloride	<0.1	0.1
Nitrite	<0.1	0.1
Bromide	<0.1	0.1
Nitrate	<0.1	0.1
Sulfate	<0.1	0.1
Phosphate-P	<0.005	0.005

NA- Not Applicable.

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
LABORATORY CONTROL SAMPLE

Sample ID
LCSW2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: NA
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: NA Work Orders: 23174

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Fluoride	97.0	100	97.0%
Chloride	198	200	99.0%
Nitrite	NA	NA	NA
Bromide	385	400	96.3%
Nitrate	85.9	90.4	95.0%
Sulfate	392	400	98.0%
Phosphate-P	NA	NA	NA

NA- Not Applicable.

SOUTHWEST RESEARCH INSTITUTE
BLANK SUMMARY

Sample ID
PBW2

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: NA
Matrix: Liquid Project No.: 20.06002.01.141
Lab System ID: NA Work Orders: 23174

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

NA- Not Applicable.

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Completed periodic notebook review.

8 Nov 02
BAW

Aug + Sept 2002 EWDP groundwater cation results for SWRI-02 from Div 01

Chain of Custody for EWDP samples 523/57-63
QA Sample 10P-FAI-3 (523/57) Target mass were 5ppm each for Ca, K, Mg, and Ni.
QA Sample recoveries were as follows:
Ca = 107.8%, K = 81.8%, Mg = 105.8%, Ni = 88.2%

Duplicates - CNWRA suffix -4 indicates duplicate
Div 01 used same id (-3) the Duplicate
For legend on IDs see 523/57 - table below
related relates zone or string to depth

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Well	Zone or String	Depth (feet)
18P	na	835.8 to 885.0
10P	Shallow	663.5 to 722.7
10P	Deep	801.2 to 879.9
22PA	Deep	661.4 to 769.7
22PA	Shallow	520.8 to 599.9
22PB	Shallow	881.3 to 989.9
22S	Zone 4	1142.0 to 1179.5
22S	Zone 3	882.0 to 979.5
22S	Zone 2	662.0 to 759.5
22S	Zone 1	522.0 to 579.5
10S	Zone 2	802.0 to 859.5
10S	Zone 1	662.0 to 699.5
7SC	Zone 2	180.0 to 210.0
7SC	Zone 1	80.0 to 90.0

Source 523/65-70
and 523/41-49

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213298

Client: Division 20

Date Received: 09/24/02

Project No.: 20.06002.01.141

Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.012	0.01
Barium	0.010	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.151	0.02
Cadmium	<0.005	0.005
Calcium	14.0	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	0.039	0.005
Magnesium	2.24	0.05
Manganese	0.006	0.005
Molybdenum	0.013	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.034	0.025
Potassium	6.17	0.1
Selenium	<0.01	0.01
Silicon	27.0	0.025
Silver	<0.005	0.005
Sodium	42.5	0.1
Strontium	0.070	0.005
Sulfur	7.75	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213298

Client: Division 20

Date Received: 09/24/02

Project No.: 20.06002.01.141

Work Order: 23189

Sample ID
10P-1-FA1-3

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Aluminum	<0.05	<0.05	0.00%
Antimony	<0.02	<0.02	0.00%
Arsenic	0.012	0.013	10.71%
Barium	0.010	0.009	9.53%
Beryllium	<0.005	<0.005	0.00%
Bismuth	<0.015	<0.015	0.00%
Boron	0.151	0.149	1.35%
Cadmium	<0.005	<0.005	0.00%
Calcium	14.0	13.8	1.44%
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	0.039	0.040	2.78%
Magnesium	2.24	2.19	1.92%
Manganese	0.006	0.006	7.99%
Molybdenum	0.013	0.013	4.71%
Nickel	<0.005	<0.005	0.00%
Palladium	<0.02	<0.02	0.00%
Phosphorus	0.034	0.031	11.18%
Potassium	6.17	6.38	3.34%
Selenium	<0.01	<0.01	0.00%
Silicon	27.0	26.7	1.31%
Silver	<0.005	<0.005	0.00%
Sodium	42.5	44.1	3.83%
Strontium	0.070	0.070	0.38%
Sulfur	7.75	7.64	1.43%
Thallium	<0.01	<0.01	0.00%
Thorium	<0.015	<0.015	0.00%
Tin	<0.005	<0.005	0.00%
Titanium	<0.005	<0.005	0.00%
Tungsten	<0.01	<0.01	0.00%
Uranium	<0.1	<0.1	0.00%
Vanadium	0.006	0.006	0.85%
Yttrium	<0.005	<0.005	0.00%
Zinc	<0.015	<0.015	0.00%
Zirconium	<0.005	<0.005	0.00%

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Water

Lab System ID: 213299

Client: Division 20

Date Received: 09/24/02

Project No.: 20.06002.01.141

Work Order: 23189

Sample ID
10P-1-FUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.014	0.01
Barium	0.009	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	14.4	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	0.041	0.005
Magnesium	2.29	0.05
Manganese	0.006	0.005
Molybdenum	0.013	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.027	0.025
Potassium	6.50	0.1
Selenium	<0.01	0.01
Silicon	27.7	0.025
Silver	<0.005	0.005
Sodium	45.2	0.1
Strontium	0.072	0.005
Sulfur	7.82	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213300

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
10P-1-UFUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.014	0.01
Barium	0.009	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.149	0.02
Cadmium	<0.005	0.005
Calcium	14.4	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	0.040	0.005
Magnesium	2.30	0.05
Manganese	0.006	0.005
Molybdenum	0.013	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.44	0.1
Selenium	<0.01	0.01
Silicon	27.4	0.025
Silver	<0.005	0.005
Sodium	45.1	0.1
Strontium	0.071	0.005
Sulfur	7.72	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213301

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
10P-2-FA1-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.156	0.02
Cadmium	<0.005	0.005
Calcium	15.7	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	0.038	0.005
Magnesium	2.52	0.05
Manganese	<0.005	0.005
Molybdenum	0.011	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.031	0.025
Potassium	6.23	0.1
Selenium	<0.01	0.01
Silicon	28.2	0.025
Silver	<0.005	0.005
Sodium	41.9	0.1
Strontium	0.077	0.005
Sulfur	7.73	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-FA1-4

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213302
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.013	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.154	0.02
Cadmium	<0.005	0.005
Calcium	15.7	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	0.039	0.005
Magnesium	2.52	0.05
Manganese	<0.005	0.005
Molybdenum	0.011	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.029	0.025
Potassium	6.21	0.1
Selenium	<0.01	0.01
Silicon	28.2	0.025
Silver	<0.005	0.005
Sodium	42.0	0.1
Strontium	0.077	0.005
Sulfur	7.71	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213303
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.014	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.151	0.02
Cadmium	<0.005	0.005
Calcium	15.6	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	0.040	0.005
Magnesium	2.50	0.05
Manganese	<0.005	0.005
Molybdenum	0.010	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.027	0.025
Potassium	6.40	0.1
Selenium	<0.01	0.01
Silicon	28.1	0.025
Silver	<0.005	0.005
Sodium	42.6	0.1
Strontium	0.077	0.005
Sulfur	7.69	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-FUA-4

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213304

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.014	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.150	0.02
Cadmium	<0.005	0.005
Calcium	15.8	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	0.040	0.005
Magnesium	2.53	0.05
Manganese	<0.005	0.005
Molybdenum	0.010	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.030	0.025
Potassium	6.39	0.1
Selenium	<0.01	0.01
Silicon	28.2	0.025
Silver	<0.005	0.005
Sodium	42.9	0.1
Strontium	0.077	0.005
Sulfur	7.68	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213305

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.014	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.149	0.02
Cadmium	<0.005	0.005
Calcium	15.7	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	0.040	0.005
Magnesium	2.51	0.05
Manganese	<0.005	0.005
Molybdenum	0.010	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.36	0.1
Selenium	<0.01	0.01
Silicon	27.8	0.025
Silver	<0.005	0.005
Sodium	42.7	0.1
Strontium	0.077	0.005
Sulfur	7.63	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10P-2-UFUA-4

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213306

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.015	0.01
Barium	0.011	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.147	0.02
Cadmium	<0.005	0.005
Calcium	15.7	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	0.040	0.005
Magnesium	2.51	0.05
Manganese	<0.005	0.005
Molybdenum	0.009	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.31	0.1
Selenium	<0.01	0.01
Silicon	27.8	0.025
Silver	<0.005	0.005
Sodium	42.4	0.1
Strontium	0.077	0.005
Sulfur	7.64	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-1-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213308

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.144	0.02
Cadmium	<0.005	0.005
Calcium	14.0	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	0.040	0.005
Magnesium	2.65	0.05
Manganese	0.018	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.034	0.025
Potassium	6.34	0.1
Selenium	<0.01	0.01
Silicon	26.6	0.025
Silver	<0.005	0.005
Sodium	42.3	0.1
Strontium	0.069	0.005
Sulfur	7.26	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-1-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213309
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.144	0.02
Cadmium	<0.005	0.005
Calcium	14.2	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	0.041	0.005
Magnesium	2.70	0.05
Manganese	0.019	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.038	0.025
Potassium	6.40	0.1
Selenium	<0.01	0.01
Silicon	26.7	0.025
Silver	<0.005	0.005
Sodium	42.9	0.1
Strontium	0.069	0.005
Sulfur	7.24	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
10S-1-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213310
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.029	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.145	0.02
Cadmium	<0.005	0.005
Calcium	14.1	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.060	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.040	0.005
Magnesium	2.69	0.05
Manganese	0.019	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.030	0.025
Potassium	6.33	0.1
Selenium	<0.01	0.01
Silicon	26.7	0.025
Silver	<0.005	0.005
Sodium	42.2	0.1
Strontium	0.069	0.005
Sulfur	7.24	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.006	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213311

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
10S-2-FA1-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.016	0.01
Barium	0.013	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.143	0.02
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	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.042	0.005
Magnesium	2.12	0.05
Manganese	0.024	0.005
Molybdenum	0.017	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.060	0.025
Potassium	5.99	0.1
Selenium	<0.01	0.01
Silicon	25.7	0.025
Silver	<0.005	0.005
Sodium	48.8	0.1
Strontium	0.059	0.005
Sulfur	8.60	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.008	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213312

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
10S-2-FUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.013	0.01
Barium	0.013	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.138	0.02
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	0.042	0.005
Magnesium	2.10	0.05
Manganese	0.024	0.005
Molybdenum	0.017	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.056	0.025
Potassium	6.05	0.1
Selenium	<0.01	0.01
Silicon	25.6	0.025
Silver	<0.005	0.005
Sodium	49.7	0.1
Strontium	0.058	0.005
Sulfur	8.46	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.007	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213313

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
10S-2-UFUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.013	0.01
Barium	0.013	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.143	0.02
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	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.042	0.005
Magnesium	2.12	0.05
Manganese	0.025	0.005
Molybdenum	0.018	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.049	0.025
Potassium	6.00	0.1
Selenium	<0.01	0.01
Silicon	25.7	0.025
Silver	<0.005	0.005
Sodium	48.4	0.1
Strontium	0.058	0.005
Sulfur	8.64	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.008	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213314

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
18P-FA1-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.010	0.01
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.182	0.02
Cadmium	<0.005	0.005
Calcium	10.7	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	0.065	0.005
Magnesium	0.167	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	2.14	0.1
Selenium	<0.01	0.01
Silicon	22.8	0.025
Silver	<0.005	0.005
Sodium	69.9	0.1
Strontium	0.025	0.005
Sulfur	7.89	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-FA1-4

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/24/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213315 Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.182	0.02
Cadmium	<0.005	0.005
Calcium	10.8	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	0.064	0.005
Magnesium	0.169	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	2.12	0.1
Selenium	<0.01	0.01
Silicon	22.8	0.025
Silver	<0.005	0.005
Sodium	68.9	0.1
Strontium	0.025	0.005
Sulfur	7.92	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-FUA-3

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/24/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213316 Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.180	0.02
Cadmium	<0.005	0.005
Calcium	10.9	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	0.064	0.005
Magnesium	0.168	0.05
Manganese	<0.005	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	2.09	0.1
Selenium	<0.01	0.01
Silicon	22.9	0.025
Silver	<0.005	0.005
Sodium	68.8	0.1
Strontium	0.025	0.005
Sulfur	8.02	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213317

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
18P-FUA-4

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.011	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.180	0.02
Cadmium	<0.005	0.005
Calcium	10.8	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	0.066	0.005
Magnesium	0.166	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.027	0.025
Potassium	2.15	0.1
Selenium	<0.01	0.01
Silicon	22.8	0.025
Silver	<0.005	0.005
Sodium	70.7	0.1
Strontium	0.025	0.005
Sulfur	7.93	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213318

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
18P-UFUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.012	0.01
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.179	0.02
Cadmium	<0.005	0.005
Calcium	10.9	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	0.066	0.005
Magnesium	0.180	0.05
Manganese	<0.005	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.029	0.025
Potassium	2.15	0.1
Selenium	<0.01	0.01
Silicon	22.8	0.025
Silver	<0.005	0.005
Sodium	69.9	0.1
Strontium	0.025	0.005
Sulfur	7.92	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
18P-UFUA-3

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/24/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213318 Work Order: 23189

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Aluminum	<0.05	<0.05	0.00%
Antimony	<0.02	<0.02	0.00%
Arsenic	0.012	0.012	3.96%
Barium	0.006	0.005	5.25%
Beryllium	<0.005	<0.005	0.00%
Bismuth	<0.015	<0.015	0.00%
Boron	0.179	0.177	1.02%
Cadmium	<0.005	<0.005	0.00%
Calcium	10.9	10.7	1.20%
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	0.066	0.065	0.74%
Magnesium	0.180	0.186	2.94%
Manganese	<0.005	<0.005	0.00%
Molybdenum	0.007	0.007	4.01%
Nickel	<0.005	<0.005	0.00%
Palladium	<0.02	<0.02	0.00%
Phosphorus	0.029	<0.025	200%
Potassium	2.15	2.15	0.17%
Selenium	<0.01	<0.01	0.00%
Silicon	22.8	22.6	0.93%
Silver	<0.005	<0.005	0.00%
Sodium	69.9	69.5	0.58%
Strontium	0.025	0.025	0.80%
Sulfur	7.92	7.79	1.54%
Thallium	<0.01	<0.01	0.00%
Thorium	<0.015	<0.015	0.00%
Tin	<0.005	<0.005	0.00%
Titanium	<0.005	<0.005	0.00%
Tungsten	<0.01	<0.01	0.00%
Uranium	<0.1	<0.1	0.00%
Vanadium	<0.005	<0.005	0.00%
Yttrium	<0.005	<0.005	0.00%
Zinc	<0.015	<0.015	0.00%
Zirconium	<0.005	<0.005	0.00%

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
18P-UFUA-4

Lab Name: Southwest Research Institute Client: Division 20
Lab Code: SwRI Date Received: 09/24/02
Matrix: Water Project No.: 20.06002.01.141
Lab System ID: 213319 Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	0.012	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.184	0.02
Cadmium	<0.005	0.005
Calcium	10.9	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	0.064	0.005
Magnesium	0.168	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	2.09	0.1
Selenium	<0.01	0.01
Silicon	23.1	0.025
Silver	<0.005	0.005
Sodium	67.8	0.1
Strontium	0.025	0.005
Sulfur	8.04	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213320

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
22PA-1-FA1-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.155	0.02
Cadmium	<0.005	0.005
Calcium	15.8	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	0.041	0.005
Magnesium	2.75	0.05
Manganese	<0.005	0.005
Molybdenum	0.020	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.04	0.1
Selenium	<0.01	0.01
Silicon	24.4	0.025
Silver	<0.005	0.005
Sodium	42.6	0.1
Strontium	0.073	0.005
Sulfur	8.80	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213321

Sample ID
22PA-1-FUA-3

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.156	0.02
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	<0.05	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.040	0.005
Magnesium	2.83	0.05
Manganese	<0.005	0.005
Molybdenum	0.020	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.029	0.025
Potassium	5.91	0.1
Selenium	<0.01	0.01
Silicon	24.6	0.025
Silver	<0.005	0.005
Sodium	41.5	0.1
Strontium	0.073	0.005
Sulfur	8.95	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-1-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213322
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.006	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	16.2	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	0.041	0.005
Magnesium	2.83	0.05
Manganese	<0.005	0.005
Molybdenum	0.020	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.026	0.025
Potassium	6.13	0.1
Selenium	<0.01	0.01
Silicon	24.8	0.025
Silver	<0.005	0.005
Sodium	43.3	0.1
Strontium	0.074	0.005
Sulfur	8.85	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213323
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.162	0.02
Cadmium	<0.005	0.005
Calcium	21.4	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	0.039	0.005
Magnesium	3.19	0.05
Manganese	<0.005	0.005
Molybdenum	0.009	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.45	0.1
Selenium	<0.01	0.01
Silicon	26.7	0.025
Silver	<0.005	0.005
Sodium	35.8	0.1
Strontium	0.073	0.005
Sulfur	7.97	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213324

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.163	0.02
Cadmium	<0.005	0.005
Calcium	21.6	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	0.039	0.005
Magnesium	3.22	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.40	0.1
Selenium	<0.01	0.01
Silicon	26.8	0.025
Silver	<0.005	0.005
Sodium	35.3	0.1
Strontium	0.073	0.005
Sulfur	8.07	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PA-2-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213325

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.005	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.161	0.02
Cadmium	<0.005	0.005
Calcium	21.4	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	0.039	0.005
Magnesium	3.18	0.05
Manganese	<0.005	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.49	0.1
Selenium	<0.01	0.01
Silicon	26.6	0.025
Silver	<0.005	0.005
Sodium	35.9	0.1
Strontium	0.073	0.005
Sulfur	7.99	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PB-1-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213326
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.155	0.02
Cadmium	<0.005	0.005
Calcium	26.9	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	0.039	0.005
Magnesium	3.68	0.05
Manganese	<0.005	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.037	0.025
Potassium	6.11	0.1
Selenium	<0.01	0.01
Silicon	25.3	0.025
Silver	<0.005	0.005
Sodium	38.3	0.1
Strontium	0.104	0.005
Sulfur	9.36	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PB-1-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213327
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	26.9	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	0.040	0.005
Magnesium	3.68	0.05
Manganese	<0.005	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.040	0.025
Potassium	6.24	0.1
Selenium	<0.01	0.01
Silicon	25.2	0.025
Silver	<0.005	0.005
Sodium	39.2	0.1
Strontium	0.104	0.005
Sulfur	9.31	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22PB-1-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213328
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.156	0.02
Cadmium	<0.005	0.005
Calcium	27.2	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	0.039	0.005
Magnesium	3.74	0.05
Manganese	<0.005	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.041	0.025
Potassium	6.10	0.1
Selenium	<0.01	0.01
Silicon	25.6	0.025
Silver	<0.005	0.005
Sodium	38.3	0.1
Strontium	0.104	0.005
Sulfur	9.32	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-1-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213329
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.010	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	16.5	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.059	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	2.96	0.05
Manganese	0.017	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.62	0.1
Selenium	<0.01	0.01
Silicon	22.0	0.025
Silver	<0.005	0.005
Sodium	36.6	0.1
Strontium	0.064	0.005
Sulfur	6.97	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213330

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
22S-1-FUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.010	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.152	0.02
Cadmium	<0.005	0.005
Calcium	16.5	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.072	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	2.98	0.05
Manganese	0.017	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.62	0.1
Selenium	<0.01	0.01
Silicon	22.0	0.025
Silver	<0.005	0.005
Sodium	36.8	0.1
Strontium	0.065	0.005
Sulfur	6.98	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213331

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Sample ID
22S-1-UFUA-3

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.010	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.151	0.02
Cadmium	<0.005	0.005
Calcium	16.5	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.131	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	2.97	0.05
Manganese	0.018	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.66	0.1
Selenium	<0.01	0.01
Silicon	21.9	0.025
Silver	<0.005	0.005
Sodium	37.1	0.1
Strontium	0.065	0.005
Sulfur	6.92	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-2-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213332

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.152	0.02
Cadmium	<0.005	0.005
Calcium	19.6	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.124	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	3.17	0.05
Manganese	0.026	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.51	0.1
Selenium	<0.01	0.01
Silicon	20.3	0.025
Silver	<0.005	0.005
Sodium	35.9	0.1
Strontium	0.081	0.005
Sulfur	7.34	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-2-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213333

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.150	0.02
Cadmium	<0.005	0.005
Calcium	19.4	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.113	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	3.15	0.05
Manganese	0.027	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.61	0.1
Selenium	<0.01	0.01
Silicon	20.3	0.025
Silver	<0.005	0.005
Sodium	36.6	0.1
Strontium	0.081	0.005
Sulfur	7.34	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-2-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213334

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.008	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.151	0.02
Cadmium	<0.005	0.005
Calcium	19.7	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.189	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	3.20	0.05
Manganese	0.027	0.005
Molybdenum	0.007	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.66	0.1
Selenium	<0.01	0.01
Silicon	20.4	0.025
Silver	<0.005	0.005
Sodium	37.0	0.1
Strontium	0.082	0.005
Sulfur	7.33	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213335

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	21.2	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.164	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	3.33	0.05
Manganese	0.022	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.87	0.1
Selenium	<0.01	0.01
Silicon	21.6	0.025
Silver	<0.005	0.005
Sodium	36.4	0.1
Strontium	0.089	0.005
Sulfur	7.32	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213336

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	21.3	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	0.038	0.005
Magnesium	3.34	0.05
Manganese	0.022	0.005
Molybdenum	0.005	0.005
Nickel	<0.005	0.005
Palladium	0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.82	0.1
Selenium	<0.01	0.01
Silicon	21.8	0.025
Silver	<0.005	0.005
Sodium	35.6	0.1
Strontium	0.090	0.005
Sulfur	7.51	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-3-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213337

Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.007	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.155	0.02
Cadmium	<0.005	0.005
Calcium	21.3	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.225	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.037	0.005
Magnesium	3.36	0.05
Manganese	0.023	0.005
Molybdenum	0.006	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.72	0.1
Selenium	<0.01	0.01
Silicon	21.8	0.025
Silver	<0.005	0.005
Sodium	35.0	0.1
Strontium	0.090	0.005
Sulfur	7.52	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213338
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.158	0.02
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	0.167	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.038	0.005
Magnesium	2.86	0.05
Manganese	0.022	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	5.98	0.1
Selenium	<0.01	0.01
Silicon	19.4	0.025
Silver	<0.005	0.005
Sodium	39.0	0.1
Strontium	0.087	0.005
Sulfur	7.39	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BW

SOUTHWEST RESEARCH INSTITUTE
DUPLICATE SUMMARY

Sample ID
22S-4-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213338
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Aluminum	<0.05	<0.05	0.00%
Antimony	<0.02	<0.02	0.00%
Arsenic	<0.01	<0.01	0.00%
Barium	0.012	0.012	2.10%
Beryllium	<0.005	<0.005	0.00%
Bismuth	<0.015	<0.015	0.00%
Boron	0.158	0.155	2.11%
Cadmium	<0.005	<0.005	0.00%
Calcium	18.2	18.1	0.52%
Chromium	<0.005	<0.005	0.00%
Cobalt	<0.005	<0.005	0.00%
Copper	<0.005	<0.005	0.00%
Iron	0.167	0.153	8.66%
Lanthanum	<0.005	<0.005	0.00%
Lead	<0.005	<0.005	0.00%
Lithium	0.038	0.037	2.49%
Magnesium	2.86	2.84	0.63%
Manganese	0.022	0.022	0.99%
Molybdenum	0.008	0.008	5.63%
Nickel	<0.005	<0.005	0.00%
Palladium	<0.02	<0.02	0.00%
Phosphorus	<0.025	<0.025	0.00%
Potassium	5.98	5.88	1.84%
Selenium	<0.01	<0.01	0.00%
Silicon	19.4	19.1	1.54%
Silver	<0.005	<0.005	0.00%
Sodium	39.0	38.5	1.26%
Strontium	0.087	0.086	1.56%
Sulfur	7.39	7.29	1.23%
Thallium	<0.01	<0.01	0.00%
Thorium	<0.015	<0.015	0.00%
Tin	<0.005	<0.005	0.00%
Titanium	<0.005	<0.005	0.00%
Tungsten	<0.01	<0.01	0.00%
Uranium	<0.1	<0.1	0.00%
Vanadium	<0.005	<0.005	0.00%
Yttrium	<0.005	<0.005	0.00%
Zinc	<0.015	<0.015	0.00%
Zirconium	<0.005	<0.005	0.00%

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213339
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.153	0.02
Cadmium	<0.005	0.005
Calcium	17.5	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.134	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.036	0.005
Magnesium	2.79	0.05
Manganese	0.022	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.10	0.1
Selenium	<0.01	0.01
Silicon	19.3	0.025
Silver	<0.005	0.005
Sodium	40.4	0.1
Strontium	0.085	0.005
Sulfur	6.90	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	<0.015	0.015
Zirconium	<0.005	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
22S-4-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213340
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.012	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.152	0.02
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	0.275	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.037	0.005
Magnesium	2.84	0.05
Manganese	0.023	0.005
Molybdenum	0.008	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	6.13	0.1
Selenium	<0.01	0.01
Silicon	19.4	0.025
Silver	<0.005	0.005
Sodium	40.9	0.1
Strontium	0.086	0.005
Sulfur	7.18	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.022	0.015
Zirconium	<0.005	0.005

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CONT
B.A.W

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-1-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213341
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.027	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.276	0.02
Cadmium	<0.005	0.005
Calcium	79.8	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.123	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.121	0.005
Magnesium	39.7	0.05
Manganese	0.014	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.026	0.025
Potassium	7.76	0.1
Selenium	<0.01	0.01
Silicon	11.0	0.025
Silver	<0.005	0.005
Sodium	92.9	0.1
Strontium	0.545	0.005
Sulfur	56.8	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.058	0.015
Zirconium	<0.005	0.005

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CONT
B.A.W

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-1-FUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213342
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.026	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.278	0.02
Cadmium	<0.005	0.005
Calcium	79.4	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	0.121	0.005
Magnesium	39.4	0.05
Manganese	0.013	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.041	0.025
Potassium	7.53	0.1
Selenium	<0.01	0.01
Silicon	11.1	0.025
Silver	<0.005	0.005
Sodium	89.8	0.1
Strontium	0.543	0.005
Sulfur	57.4	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.055	0.015
Zirconium	<0.005	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-1-UFUA-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213343
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.027	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.273	0.02
Cadmium	<0.005	0.005
Calcium	80.8	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	0.126	0.005
Magnesium	40.2	0.05
Manganese	0.013	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	0.044	0.025
Potassium	7.67	0.1
Selenium	<0.01	0.01
Silicon	11.0	0.025
Silver	<0.005	0.005
Sodium	92.9	0.1
Strontium	0.538	0.005
Sulfur	56.3	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.060	0.015
Zirconium	<0.005	0.005

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CONT
BAW

SOUTHWEST RESEARCH INSTITUTE
SAMPLE ANALYSIS DATA SHEET

Sample ID
7SC-2-FA1-3

Lab Name: Southwest Research Institute
Lab Code: SwRI
Matrix: Water
Lab System ID: 213344
Client: Division 20
Date Received: 09/24/02
Project No.: 20.06002.01.141
Work Order: 23189

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Aluminum	<0.05	0.05
Antimony	<0.02	0.02
Arsenic	<0.01	0.01
Barium	0.026	0.005
Beryllium	<0.005	0.005
Bismuth	<0.015	0.015
Boron	0.274	0.02
Cadmium	<0.005	0.005
Calcium	80.6	0.05
Chromium	<0.005	0.005
Cobalt	<0.005	0.005
Copper	<0.005	0.005
Iron	0.611	0.05
Lanthanum	<0.005	0.005
Lead	<0.005	0.005
Lithium	0.124	0.005
Magnesium	40.2	0.05
Manganese	0.017	0.005
Molybdenum	<0.005	0.005
Nickel	<0.005	0.005
Palladium	<0.02	0.02
Phosphorus	<0.025	0.025
Potassium	7.68	0.1
Selenium	<0.01	0.01
Silicon	10.6	0.025
Silver	<0.005	0.005
Sodium	93.2	0.1
Strontium	0.534	0.005
Sulfur	56.2	0.025
Thallium	<0.01	0.01
Thorium	<0.015	0.015
Tin	<0.005	0.005
Titanium	<0.005	0.005
Tungsten	<0.01	0.01
Uranium	<0.1	0.1
Vanadium	<0.005	0.005
Yttrium	<0.005	0.005
Zinc	0.023	0.015
Zirconium	<0.005	0.005

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CONT
BAW

END OF NOTEBOOK

CONTINUED in Scientific Mbk 556

02 Dec 02
PB

Periodic notebook review completed by principal investigator.

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.

~~NO FURTHER ENTRIES~~
~~02 DEC 02 PB~~

E.C.P.
3/14/2003