

Data Report for
Shenandoah Watershed Study
and
Virginia Trout Stream Sensitivity Study
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1. Data Reported:

- a) Analyses of Stream Samples (quarterly sample sites, weekly/episode sample sites, and synoptic survey sites)

Time period: 1 January 2004 through 31 December 2004

- b) Analyses of Precipitation Samples (weekly sample sites)

Time period: 1 January 2004 through 31 December 2004, collection interval for each sample must begin in this time period.

- c) Volatile residue analyses (quarterly samples)

Time period: 1 January 2004 through 31 December 2004

- d) Daily Stream Discharge

Time period: 1 January 2004 through 31 December 2004

2. Summary Description of Sampling Program

The reported data are for stream and precipitation samples collected from forested mountain watersheds in Shenandoah National Park and western Virginia. The reported data include chemical analysis of water samples collected quarterly, weekly, and more-frequently during storm flows, and volatile residue analyses of water samples collected quarterly in Shenandoah National Park.

Quarterly samples were collected at 60 headwater stream sites in 20 western Virginia counties. Most of the streams drain National Forest, National Park or other public land. Samples are collected during the last seven days of January, April, July, and October.

Weekly stream samples were collected at six sites in Shenandoah National Park. Weekly precipitation samples were collected at two sites in or near Shenandoah National Park. This report includes data for three streams for which continuous discharge measurements and flow-actuated episodic high-flow event samples were also obtained. This report includes analyses of weekly and episodic event samples, as well as estimated daily discharge.

A listing of all sites is provided in Table 1. Table 1A lists precipitation sites and Table 1B lists stream sites.

3. Data Collection and Analysis:

Staff and volunteers from the Department of Environmental Sciences at UVA (UVA), the Shenandoah National Park (SNP), the USDA Forest Service (USDA), the Virginia Department of Game and Inland Fisheries (VDGIF), and Trout Unlimited (TU) collect the samples at established sites.

Samples are collected in 500 mL low-density and 250 mL high-density polyethylene (Nalgene) bottles that are pre-washed with laboratory-grade detergent and hydrochloric acid and rinsed with de-ionized water. Prior to sample collection each bottle is rinsed three times with the sampled streamwater. Upon collection the samples are placed in insulated containers with refrigerant for delivery to the project laboratory at the Department of Environmental Sciences at the University of Virginia. Upon receipt at the laboratory the samples, minus an aliquot poured off for DOC and aluminum analysis (stream samples only), are preserved by addition of chloroform (0.5mL/500mL) and stored at ambient laboratory temperature (about 23 deg. C). The DOC/aluminum aliquot is preserved by refrigeration. Analyses include major acid-base constituents and DOC. Samples from all projects are analyzed concurrently. Methods of analysis are summarized in Table 2. DOC analysis is performed at the Appalachian Environmental Laboratory at the University of Maryland. All other analyses are performed at the Department of Environmental Sciences, University of Virginia.

The North Fork of Dry Run, Paine Run, Piney River, Staunton River, and White Oak Run watersheds are gauged using standard methods of the U.S. Geological Survey (Rantz et al., 1982). Discharge data for all sites having periods of missing gage data has been estimated using linear regression on discharge at other gauged sites within SNP.

4. Data Quality Assurance:

Quality assurance data for analysis of stream-water samples are obtained by charge balance determination and by analysis of reference samples. Percent charge balance error for the samples is defined as $100 \times (\text{sum cations} - \text{sum anions})/(\text{sum cations} + \text{sum anions})$.

The capability of a process to fall within specified limits is often quantified using the C_p or C_{pk} , also known as process capability ratios. The formulas for C_p and C_{pk} are:

$$C_p = \frac{USL - LSL}{6\sigma}$$
$$C_{pk} = \min\left(\frac{USL - \mu}{3\sigma}, \frac{\mu - LSL}{3\sigma}\right)$$

where USL and LSL are the upper specification limit and lower specification limit, respectively. When a process is “on target”, or no target is known, the C_p is appropriate. When the process is off-target, the C_{pk} provides a better metric of the process’s ability to remain within specification limits. For an off-target process, the C_p provides a metric of the process’s ability to operate within limits *if it were on-target*. Generally, a C_p or C_{pk} in excess of 1.3 is desired, in excess of 1.0 is acceptable (Montgomery, 1997). We report the C_{pk} because the average charge balance of our samples is less than zero. Confidence intervals for C_{pk} can be large for small sample size. Figures 1 and 2 graphically illustrate the frequency with which percent charge balance error falls within the target specification limits of $\pm 15\%$ and $\pm 30\%$ respectively, and give a confidence interval for the C_{pk} .

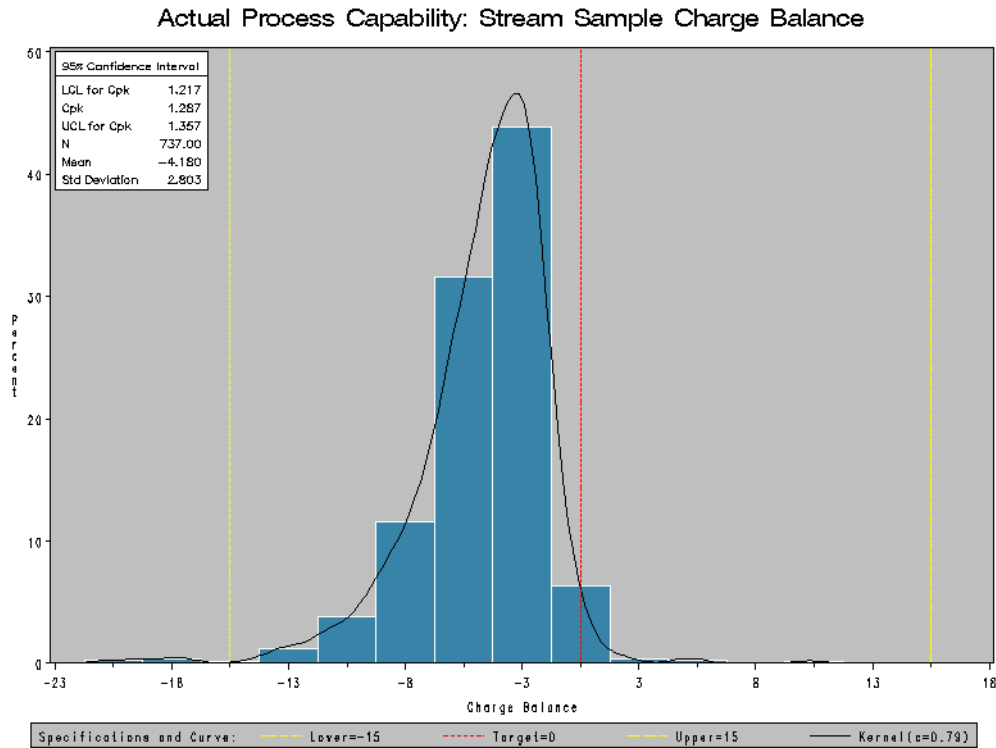


Figure 1

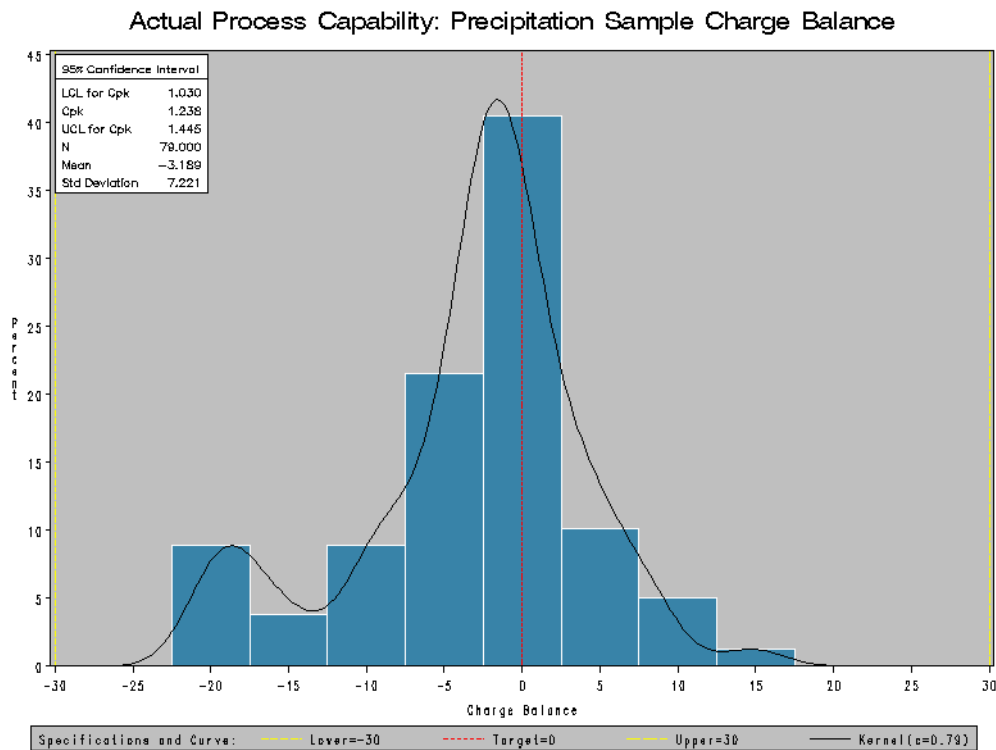


Figure 2

Reference samples were analyzed during all analysis sessions for pH, alkalinity, conductivity, cations, anions, aluminum, DOC, ammonium, and silica. Analysis results for reference samples are summarized in Table 3.

5. Inter-laboratory Quality Assurance:

The project laboratory at the Department of Environmental Sciences at the University of Virginia participates in inter-laboratory quality assurance (QA) studies administered by Environment Canada's National Water Research Institute (NWRI). Environmental programs in both the United States and Canada participate in these studies which are designed for laboratories analyzing acid rain and surface waters. The purpose of these QA studies is to provide a useful means of quantifying laboratory performance and data quality. The QA report for each study includes an assessment of any systematic bias and indicates any results flagged as a result of poor precision. A bias of greater than 5% is considered excessive by NWRI for most parameters in the studies. A result is flagged if its value is beyond that of the median (target) plus or minus the acceptable difference. The acceptable difference is calculated by NWRI using the following formula:

$(\text{Target} - \text{LLBAE}) \times \text{CEI} + \text{BAE}$, where

LLBAE = Lower Limit for use of Basic Acceptable Error

CEI = Concentration Error Increment

BAE = Basic Acceptable Error

(The values for these terms are determined by NWRI.)

Each study consists of ten samples, which are analyzed by the project laboratory by the same means as the project samples and usually included in analysis sessions along with project samples. The analysis results are then reported to the NWRI. We report results for the studies in which the project laboratory has participated to date in Table A.

Table A: Project Laboratory Results for NWRI Inter-laboratory Quality Assurance Studies

Study Date	pH	specific conductance	alkalinity-Gran	chloride	nitrate	sulfate	ammonia	reactive silica	sodium	potassium	calcium	magnesium
10-MAY-94	A	A	N	A	A	A	A	A	A	A	A	A
15-JAN-95	A	1	A	2	A	A	A	3	A	A	A	4
05-SEP-95	A	A	A	A	A	A	N	A	A	A	A	A
01-SEP-96	A	A	A	A	A	A	A	A	5	A	A	A
02-SEP-97	A	A	A	A	A	A	A	A	A	A	A	A
01-SEP-98	A	A	A	A	A	A	6	A	A	A	A	A
01-SEP-99	A	A	A	A	A	A	7	A	A	A	A	A
28-AUG-00	A	A	A	A	A	A	A	8	A	A	A	A
27-AUG-01	A	A	A	A	A	A	9	10	A	A	A	11
03-SEP-02	A	12	A	A	A	A	A	13	A	A	A	A
01-JUN-04	A	A	A	A	A	A	A	A	A	A	A	A

Notes:

A) Acceptable

N) No results

- 1) Although no results are flagged, ranking indicates a slight bias low.
- 2) Although no results are flagged, ranking indicates a slight bias low. After these results were submitted, the ion chromatography column used for chloride analyses was replaced.
- 3) Acceptable, except for high on one out of ten samples.
- 4) Although no results are flagged, ranking indicates a slight bias high.
- 5) Flagged very high on one out of ten samples. This was due to a calculation error made after analysis.
- 6) Two out of 10 samples flagged: one extremely low, one low.
- 7) Two out of 10 samples flagged: both very low.
- 8) Flagged extremely low on one sample out of 10.
- 9) Three out of 10 samples flagged: one extremely low, one very low, and one low.
- 10) Satisfactory, except for low on one out of 10 samples.
- 11) Flagged extremely high on one sample out of 10.
- 12) Four out of 10 samples flagged low. Ranking indicates a low bias: -4.64%, blank – 0.3536.
- 13) Two out of 10 samples flagged: one very low, one low.

6. Data Format:

- a. Analysis results are provided on CD in Excel format. Sample data and discharge, along with data definitions, are provided in spreadsheets
 - i. Stream Chemistry.xls
 - ii. Precipitation Chemistry.xls
 - iii. flow.xls
- b. Printouts of chemical analysis results are provided in Table 4A (stream) and Table 4B (precipitation).
- c. Volatile residue analysis results are listed in Table 5.

7. References

Hirsch, R.M. and Slack, J.R., 1984. A nonparametric trend test for seasonal data with serial dependence. *Water Resources Research*, 20(6), 727-732.

Rantz, S. E., *et al.*, 1982. Measurement and computation of streamflow: Volume 1. Measurement of stage and discharge. *U.S. Geol. Surv. Water-Supply Paper 2175*, U.S. Geological Survey, Washington, DC.

Montgomery, D.C., 1997, *Introduction to Statistical Quality Control, Third Edition*, John Wiley & Sons, Inc., New York.

Table 1: Collection Sites

Table 1A: Precipitation sites

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters-easting)	Universal Transverse Mercator coordinates (meters-northing)	elevation in feet
A01	MADISON RUN	ROCKINGHAM	GROTTOES	694785	4238318	1270
SHW1	NORTH FORK OF DRY RUN	MADISON	OLD RAG MTN	730981	4277666	3330

Table 1B: Stream sites

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
BA09	CUB RUN	BATH	BATH ALUM VA	613435	4218098	2080	1.89
DR01	DEEP RUN	ROCKINGHAM	GROTTOES	695591	4238919	1360	3.12
M002	LAUREL BED CREEK	RUSSELL	SALTVILLE	429939	4091720	3560	4.34
M003	LAUREL BED LAKE	RUSSELL	SALTVILLE	427573	4089919	3520	6.34
M004	RED BRANCH	RUSSELL	SALTVILLE	425196	4086953	2480	4.60
MAD2	MADISON RUN	ROCKINGHAM	MCGAHEYSVILLE	697162	4235896	1460	5.15
NFDR	NF OF THE DRY RUN	PAGE	THORNTON GAP	729933	4279183	1600	2.31
PAIN	PAINE RUN	AUGUSTA	CRIMORA	693243	4229927	1390	12.39
PINE	PINEY RIVER	RAPPAHANNOCK	THORNTON GAP	737523	4287155	1180	12.59
RF01	ROARING FORK	TAZEWELL	HUTCHINSON ROCK	.	.	2420	.
RH31	BLACK RUN (LOWER REACH)	ROCKINGHAM	RAWLEY SPRINGS VA	668830	4263828	1720	29.12
RH33	ROCKY RUN OF BRIERY BRANCH	ROCKINGHAM	BRIERY BRANCH VA	664435	4257544	1730	5.04

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
STAN	STAUNTON RIVER	MADISON	MADISON	729396	4258233	1010	10.50
VT01	HELTON CREEK	GRAYSON	WHITETOP MTN	448925	4055170	4000	3.57
VT02	LEWIS FORK	GRAYSON	WHITETOP MTN	453592	4060345	3620	6.67
VT03	FOX CREEK	GRAYSON	WHITETOP MTN	453518	4060913	3580	2.30
VT04	LITTLE WILSON CR	GRAYSON	TROUT DALE	457848	4054507	3500	5.38
VT05	RACCOON BRANCH	SMYTH	TROUT DALE	461965	4066538	2740	4.37
VT06	ROWLAND CREEK	SMYTH	WHITETOP MTN	449700	4065483	2585	7.63
VT09	ROARING FORK- LOWER	TAZEWELL	HUTCHINSON ROCK	457305	4098662	2180	13.45
VT10	LAUREL RUN	BATH	BURNSVILLE	616516	4224450	2380	3.45
VT11	MARE RUN	BATH	WARM SPRINGS	608742	4208518	2030	6.02
VT12	PANTHER RUN	BATH	WARM SPRINGS	608750	4208463	2030	4.04
VT14	LITTLE WILSON CR	BATH	HEALING SPRINGS	608402	4204360	1860	3.27
VT15	PORTERS CREEK	BATH	HEALING SPRINGS	607872	4203442	1980	2.12
VT16	N BR SIMPSON CR	ALLEGHANY	LONGDALE FURNACE	616905	4186568	1400	7.65
VT18	BEARWALLOW RUN	HIGHLAND	THORNWOOD	618975	4265821	3140	4.11
VT19	LOST RUN	HIGHLAND	THORNWOOD	619016	4266075	3140	2.43
VT22	CORNELIUS CREEK	BOTETOURT	ARNOLD VALLEY	627860	4154336	1460	4.90
VT23	FALLINGWATER CR	BOTETOURT	PEAKS OF OTTER	624227	4147778	1660	4.55
VT24	SHAWVERS RUN	CRAIG	POTTS CREEK	572792	4163370	1860	5.92
VT25	COVE BRANCH	CRAIG	POTTS CREEK	576985	4158727	1840	10.67
VT26	PINE SWAMP BRANCH	GILES	INTERIOR	534934	4141489	2380	1.95
VT28	NF STONY CREEK	GILES	INTERIOR	538618	4143428	2740	20.92
VT29	WAR SPUR BRANCH	GILES	WAITEVILLE	546564	4138819	2320	3.19
VT31	NOBUSINESS CREEK	GILES	MECHANICSBURG	507203	4121194	2410	17.42
VT32	LAUREL CREEK	GILES	INTERIOR	537402	4136979	3090	4.59
VT33	GUYS RUN	ROCKBRIDGE	GOSHEN	632054	4199009	1620	10.05
VT34	LAUREL RUN	ROCKBRIDGE	GOSHEN	635745	4198824	1270	8.43
VT36	MEADOW RUN	AUGUSTA	CRIMORA	691758	4225462	1480	8.86
VT37	NORTH RIVER	AUGUSTA	PALO ALTO	649882	4251522	2660	12.36

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
VT38	RAMSEYS DRAFT	AUGUSTA	WEST AUGUSTA	643961	4241976	2320	23.94
VT39	KENNEDY CREEK	AUGUSTA	BIG LEVELS	674300	4203231	1840	5.98
VT40	MILLS CREEK	AUGUSTA	BIG LEVELS	675131	4200825	1980	6.64
VT41	ST MARYS R-LOWER	AUGUSTA	VESUVIUS	663725	4198876	1740	26.93
VT42	HUNTING CREEK	BEDFORD	SNOWDEN	635627	4154888	1880	5.52
VT43	GREASY SPRING BR	AMHERST	MONTEBELLO	662531	4183685	2460	2.63
VT44	GEORGES CREEK	AMHERST	MONTEBELLO	664723	4180372	1600	3.46
VT45	OTTER CREEK	AMHERST	BUENA VISTA	646478	4166256	1300	3.65
VT46	LITTLE COVE CREEK	AMHERST	FORKS OF BUFFALO	658616	4176700	1660	3.51
VT48	BIG MACK CREEK	PULASKI	HIWASSEE	530259	4089949	2160	19.39
VT49	LITTLE STONY CREEK- LOWER	SHENANDOAH	WOLF GAP	704088	4312384	1530	11.09
VT50	LAUREL RUN	SHENANDOAH	WOLF GAP	696758	4308486	1720	4.60
VT51	JEREMYS RUN	PAGE	LURAY	727652	4288251	930	21.97
VT52	MORGAN RUN	PAGE	TENTH LEGION	703720	4266381	1600	3.29
VT53	TWO MILE RUN	ROCKINGHAM	MCGAHEYSVILLE	703527	4245225	1220	5.56
VT54	GERMAN RIVER- UPPER	ROCKINGHAM	COW KNOB	668399	4283080	2500	4.86
VT56	WOLF RUN	ROCKINGHAM	REDDISH KNOB	662303	4254949	1950	5.79
VT57	BLACK RUN-LOWER	ROCKINGHAM	RAWLEY SPRINGS	668572	4263923	1720	28.65
VT58	BROKENBACK RUN	MADISON	OLD RAG MTN	735102	4272372	1080	9.86
VT61	NF THORNTON RIVER	RAPPAHANNOCK	THORNTON GAP	736982	4286022	1100	19.08
VT62	HAZEL RUN	RAPPAHANNOCK	OLD RAG MTN	738348	4277397	1080	13.24
VT63	SHOE CREEK	NELSON	MASSIES MILL	666996	4184076	1420	12.60
VT64	CRABTREE CREEK	NELSON	MASSIES MILL	669052	4190771	1580	3.53
VT65	MEADOW CREEK	NELSON	MASSIES MILL	668843	4190742	1620	2.74
VT66	ROSE RIVER	MADISON	OLD RAG MTN	729550	4266066	1120	23.73
VT67	EF CHESTNUT CREEK- LOWER	GRAYSON	LAMBSBURG	518771	4047289	2620	3.50
VT75	WHITE OAK CANYON R	MADISON	OLD RAG MTN	730905	4268968	1160	14.08

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
VT76	BELFAST CREEK	ROCKBRIDGE	SNOWDEN	633209	4159337	1040	2.07
VT77	MATTS CREEK	BEDFORD	SNOWDEN	639963	4162295	840	2.77
VT78	LITTLE TUMBLING CREEK	TAZEWELL	BROADFORD	438250	4091591	2620	17.90
VT80	LITTLE STONY CREEK- UPPER	SHENANDOAH	WOLF GAP	.	.	1720	.
VT81	EF CHESTNUT CREEK- UPPER	GRAYSON	LAMBSBURG	.	.	0	.
WOR1	WHITE OAK RUN	ROCKINGHAM	MCGAHEYSVILLE	696960	4235772	1480	5.13

Table 2: Summary Of Laboratory Analytical Methods

<u>Aliquot</u>	<u>Instrumentation</u>	<u>Method</u>
a. pH	Orion model 290A+ pH meter with Orion model 9107 pH electrode with ATC used for analyses 10/30/03 and later.	Potentiometric measurement with open-system samples. Within-aliquot stability (≤ 0.01 units/min.) and sequential-aliquot agreement (≤ 0.03 units difference) obtained for all readings.
b. Alkalinity	Orion model 290A+ pH meter with Orion model 9107 pH electrode with ATC used for analyses 10/30/03 and later.	Two-point Gran titration with 100 ml sample volumes and 0.005 N HCl titrant. Titration endpoints were approx. 4.5 and 4.2. Within-aliquot stability (≤ 0.01 units/min.) was obtained for endpoint determinations.
c. Sulfate, Chloride, Nitrate	Dionex Model 14 Ion Chromatograph; HPIC AS14 Separator Column; HPIC AG14 Guard Column; AMMS Anion Micro-Membrane Suppressor	Simultaneous determination by ion chromatography. Injection volume: 200 μ l. Eluent: 1.5 mL 4.8 mM Na_2CO_3 /0.6mM NaHCO_3 /minute. Regenerant: 3-4 ml 0.035 N H_2SO_4 /minute.
d. Calcium, Magnesium, Potassium, Sodium	Thermo Jarrell Ash AA/AE Spectrophotometer Model Smith-Hieftje 22	Flame atomic absorption spectrophotometry. Li/La added to aliquot.
e. Silica	Technicon Autoanalyzer II	Colorimetric detection by molybdate blue technique.
f. Conductivity	VWR-brand (manufactured by Control Company) NIST Traceable digital conductivity meter with automatic temperature compensation to 25 degrees C.	Digital meter and conductivity probe. Readings obtained at ambient lab temperature (about 23 deg. C).
g. Aluminum, Total and Organic Monomeric	Technicon Autoanalyzer II	Colorimetric detection with open-system samples by pyrocatechol violet technique. Fractionation with ion-exchange resin.
h. Ammonium	Technicon Autoanalyzer II	Colorimetric detection by Indophenol blue technique.
i. Volatile Residue	Thermolyne 48000 Furnace	Filtration through glass fiber filter; volatilization in furnace at 500 degrees C.
i. Dissolved Organic Carbon	Dohrmann Phoenix 8000 TOC Analyzer	Ultra-violet promoted persulfate oxidation technique followed by infrared detection. External sparging is used to remove inorganic carbon.

Table 3: Summary of Reference Sample and Field Duplicate Analyses for Sample Period: July 2003 through June 2004

3.1 Analysis of samples used at University of Virginia

3.1.A Reference Samples

Concentrations in $\mu\text{eq/L}$ (alkalinity and ions), $\mu\text{mol/L}$ (SiO_2), $\mu\text{S/cm}$ (conductivity), $\mu\text{g/L}$ (T_{AL} =total monomeric aluminum, O_{AL} =organic monomeric aluminum), and mg/L (DOC).

Chloroform (1 mL/L) added to bulk streamwater samples (other than aluminum aliquots).

Natural audit samples provided by Environmental Assessment Department, Lockheed Engineering and Sciences. Listed target values are based on data collected from multiple laboratories. Samples are maintained at approximately 4 °C. Chloroform (1 mL/L) added (other than aluminum aliquots).

Synthetic audit samples purchased from High Purity Standards, Charleston, South Carolina. Listed target values are provided by High Purity Standards. Samples are maintained at approximately 4°C. Chloroform (1 mL/L) added (other than aluminum aliquots).

CRM – Certified Reference Materials purchased from Environment Canada National Water Research Institute. Target values for these samples are derived from several performance evaluation studies in which multiple laboratories participated. Samples are maintained at approximately 4°C. Chloroform (1 mL/L) added (other than aluminum aliquots).

C_p is only reported for $n \geq 30$. See text for definition of C_p .

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery high	Std Error	C_p
Bulk	NFDR	10/23/2003	65	ALK	66.59	9.01	52.93	81.89	.	.	.	1.12	0.18
Bulk	NFDR	10/23/2003	1	CA	81.09	.	81.09	81.09	.	.	.	.	.
Bulk	NFDR	10/23/2003	6	CL	31.06	0.35	30.46	31.39	.	.	.	0.14	.
Bulk	NFDR	10/23/2003	67	COND	25.24	0.32	24.40	26.00	.	.	.	0.04	1.03
Bulk	NFDR	10/23/2003	1	K	11.09	.	11.09	11.09	.	.	.	.	.
Bulk	NFDR	10/23/2003	1	MG	46.83	.	46.83	46.83	.	.	.	.	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery high	Std Error	C _p
Bulk	NFDR	10/23/2003	1	NA	75.30	.	75.30	75.30	.	.	.	.	.
Bulk	NFDR	10/23/2003	6	NO3	7.16	0.14	6.94	7.31	.	.	.	0.06	.
Bulk	NFDR	10/23/2003	67	PH	6.08	0.05	5.97	6.16	.	.	.	0.01	1.00
Bulk	NFDR	10/23/2003	2	SIO2	182.18	0.48	181.84	182.52	.	.	.	0.34	.
Bulk	NFDR	10/23/2003	6	SO4	92.97	0.31	92.62	93.52	.	.	.	0.13	.
Bulk	NFDR	03/09/2005	2	CA	71.53	2.93	69.46	73.60	.	.	.	2.07	.
Bulk	NFDR	03/09/2005	6	CL	24.49	0.23	24.28	24.76	.	.	.	0.09	.
Bulk	NFDR	03/09/2005	1	COND	23.70	.	23.70	23.70	.	.	.	.	.
Bulk	NFDR	03/09/2005	2	K	8.26	0.42	7.96	8.55	.	.	.	0.29	.
Bulk	NFDR	03/09/2005	2	MG	43.66	0.06	43.62	43.70	.	.	.	0.04	.
Bulk	NFDR	03/09/2005	2	NA	70.04	0.31	69.82	70.25	.	.	.	0.22	.
Bulk	NFDR	03/09/2005	6	NO3	26.36	0.14	26.11	26.57	.	.	.	0.06	.
Bulk	NFDR	03/09/2005	5	SIO2	156.31	0.23	156.01	156.51	.	.	.	0.10	.
Bulk	NFDR	03/09/2005	6	SO4	97.78	0.30	97.28	98.09	.	.	.	0.12	.
Bulk	PAIN	05/20/2003	14	ALK	-18.04	7.25	-29.56	-7.05	.	.	.	1.94	.
Bulk	PAIN	05/20/2003	26	COND	27.03	1.46	24.70	29.30	.	.	.	0.29	.
Bulk	PAIN	05/20/2003	26	PH	4.81	0.13	4.60	5.02	.	.	.	0.03	.
Bulk	PAIN	05/24/2004	37	ALK	-4.95	8.55	-19.68	7.82	.	.	.	1.40	0.20
Bulk	PAIN	05/24/2004	6	CL	23.99	0.51	23.24	24.51	.	.	.	0.21	.
Bulk	PAIN	05/24/2004	35	COND	22.22	1.75	19.90	26.00	.	.	.	0.30	0.19
Bulk	PAIN	05/24/2004	6	NO3	0.51	0.15	0.32	0.71	.	.	.	0.06	.
Bulk	PAIN	05/24/2004	35	PH	5.16	0.25	4.74	5.71	.	.	.	0.04	0.10
Bulk	PAIN	05/24/2004	6	SO4	107.35	0.98	105.77	108.33	.	.	.	0.40	.
Bulk	PAIN	12/07/2004	4	ALK	-0.93	1.44	-2.18	0.32	.	.	.	0.72	.
Bulk	PAIN	12/07/2004	2	CA	25.30	0.35	25.05	25.55	.	.	.	0.25	.
Bulk	PAIN	12/07/2004	6	CL	32.43	0.52	31.92	33.36	.	.	.	0.21	.
Bulk	PAIN	12/07/2004	4	COND	22.08	2.76	20.40	26.20	.	.	.	1.38	.
Bulk	PAIN	12/07/2004	2	K	39.74	0.31	39.53	39.96	.	.	.	0.22	.
Bulk	PAIN	12/07/2004	2	MG	46.50	0.12	46.42	46.58	.	.	.	0.08	.
Bulk	PAIN	12/07/2004	2	NA	21.10	0.25	20.92	21.27	.	.	.	0.17	.
Bulk	PAIN	12/07/2004	6	NO3	0.03	0.04	-0.03	0.06	.	.	.	0.02	.
Bulk	PAIN	12/07/2004	3	PH	5.31	0.07	5.25	5.38	.	.	.	0.04	.
Bulk	PAIN	12/07/2004	3	SIO2	92.54	0.68	91.93	93.28	.	.	.	0.39	.
Bulk	PAIN	12/07/2004	6	SO4	111.73	0.79	110.66	113.11	.	.	.	0.32	.
Bulk	PAIN	12/06/2005	1	CA	30.39	.	30.39	30.39	.	.	.	.	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery high	Std Error	C _p
Bulk	PAIN	12/06/2005	1	K	40.63	.	40.63	40.63	.	.	.	.	.
Bulk	PAIN	12/06/2005	1	MG	50.70	.	50.70	50.70	.	.	.	.	.
Bulk	PAIN	12/06/2005	1	NA	20.05	.	20.05	20.05	.	.	.	.	.
Bulk	PAIN	12/06/2005	4	SIO2	92.28	0.20	92.01	92.46	.	.	.	0.10	.
CRM	AE02	04/05/2004	6	CA	7.93	0.20	7.64	8.13	8.18	93.29	99.39	0.08	.
CRM	AE02	04/05/2004	9	CL	3.53	0.17	3.36	3.78	3.38	99.17	111.67	0.06	.
CRM	AE02	04/05/2004	6	K	0.75	0.12	0.54	0.85	0.77	70.05	110.03	0.05	.
CRM	AE02	04/05/2004	6	MG	2.62	0.18	2.39	2.80	2.47	96.68	113.33	0.07	.
CRM	AE02	04/05/2004	6	NA	2.93	0.11	2.74	3.05	2.92	94.00	104.46	0.04	.
CRM	AE02	04/05/2004	4	NH4	11.51	0.08	11.41	11.58	11.42	99.96	101.43	0.04	.
CRM	AE02	04/05/2004	9	NO3	17.26	0.10	17.08	17.39	16.75	101.99	103.82	0.03	.
CRM	AE02	04/05/2004	3	SIO2	0.41	0.13	0.28	0.55	0.64	44.13	85.76	0.08	.
CRM	AE02	04/05/2004	9	SO4	38.11	0.34	37.75	38.69	37.44	100.83	103.33	0.11	.
CRM	AE02	07/22/2005	4	CA	8.03	0.37	7.69	8.48	8.18	93.90	103.65	0.18	.
CRM	AE02	07/22/2005	9	CL	3.65	0.12	3.55	3.92	3.38	104.99	115.84	0.04	.
CRM	AE02	07/22/2005	4	K	0.76	0.08	0.64	0.82	0.77	83.33	106.64	0.04	.
CRM	AE02	07/22/2005	4	MG	2.49	0.12	2.39	2.63	2.47	96.68	106.68	0.06	.
CRM	AE02	07/22/2005	4	NA	2.76	0.38	2.39	3.13	2.92	82.06	107.44	0.19	.
CRM	AE02	07/22/2005	12	NH4	11.22	0.10	11.14	11.41	11.42	97.54	99.96	0.03	.
CRM	AE02	07/22/2005	9	NO3	17.19	0.17	16.91	17.42	16.75	100.94	104.01	0.06	.
CRM	AE02	07/22/2005	5	SIO2	0.20	0.13	0.03	0.40	0.64	5.16	62.28	0.06	.
CRM	AE02	07/22/2005	9	SO4	38.03	0.50	37.34	38.81	37.44	99.72	103.67	0.17	.
CRM	RA97	04/05/2004	5	CA	139.13	0.92	137.67	140.22	131.74	104.51	106.44	0.41	.
CRM	RA97	04/05/2004	6	CL	15.84	0.13	15.68	16.02	14.83	105.70	107.99	0.05	.
CRM	RA97	04/05/2004	5	K	4.03	0.20	3.81	4.22	3.92	97.37	107.84	0.09	.
CRM	RA97	04/05/2004	5	MG	81.35	0.74	80.33	82.38	76.87	104.50	107.17	0.33	.
CRM	RA97	04/05/2004	5	NA	12.85	0.33	12.53	13.40	12.01	104.35	111.59	0.15	.
CRM	RA97	04/05/2004	4	NH4	12.48	0.07	12.41	12.58	12.84	96.63	97.92	0.03	.
CRM	RA97	04/05/2004	6	NO3	156.05	0.64	155.20	157.06	148.95	104.20	105.44	0.26	.
CRM	RA97	04/05/2004	3	SIO2	4.78	0.53	4.17	5.10	3.94	105.71	129.27	0.31	.
CRM	RA97	04/05/2004	6	SO4	116.29	0.36	115.86	116.69	109.82	105.49	106.25	0.15	.
CRM	RA97	07/22/2005	2	CA	138.92	0.85	138.32	139.52	142.71	96.92	97.76	0.60	.
CRM	RA97	07/22/2005	7	CL	16.05	0.13	15.88	16.22	16.36	97.07	99.14	0.05	.
CRM	RA97	07/22/2005	2	K	4.13	0.09	4.07	4.20	4.25	95.76	98.78	0.06	.
CRM	RA97	07/22/2005	2	MG	81.44	0.52	81.07	81.81	82.30	98.50	99.40	0.37	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery high	Std Error	C _p
CRM	RA97	07/22/2005	2	NA	12.22	0.43	11.92	12.53	13.05	91.33	96.00	0.30	.
CRM	RA97	07/22/2005	10	NH4	13.17	0.08	13.02	13.30	13.63	95.54	97.57	0.02	.
CRM	RA97	07/22/2005	7	NO3	157.02	0.45	156.35	157.72	158.22	98.82	99.68	0.17	.
CRM	RA97	07/22/2005	5	SIO2	4.19	0.29	3.82	4.48	4.26	89.60	105.19	0.13	.
CRM	RA97	07/22/2005	7	SO4	116.43	0.42	115.79	116.96	118.56	97.67	98.65	0.16	.
De-ionized	DIW	.	65	ALK	-0.79	1.41	-4.55	1.85	.	.	.	0.17	1.18
De-ionized	DIW	.	16	CA	-0.38	0.52	-1.75	0.40	.	.	.	0.13	.
De-ionized	DIW	.	14	CL	0.15	0.09	-0.01	0.25	.	.	.	0.02	.
De-ionized	DIW	.	68	COND	0.15	0.09	0.10	0.50	.	.	.	0.01	3.68
De-ionized	DIW	.	16	K	-0.01	0.10	-0.23	0.10	.	.	.	0.03	.
De-ionized	DIW	.	16	MG	0.12	0.17	-0.17	0.41	.	.	.	0.04	.
De-ionized	DIW	.	16	NA	-0.20	0.44	-0.96	0.13	.	.	.	0.11	.
De-ionized	DIW	.	15	NH4	-0.08	0.08	-0.22	0.06	.	.	.	0.02	.
De-ionized	DIW	.	14	NO3	0.03	0.03	-0.02	0.10	.	.	.	0.01	.
De-ionized	DIW	.	11	SIO2	-0.02	0.20	-0.40	0.23	.	.	.	0.06	.
De-ionized	DIW	.	14	SO4	0.12	0.04	0.08	0.19	.	.	.	0.01	.
De-ionized	DIW	.	10	T_AL	0.59	0.28	0.26	1.26	.	.	.	0.09	.
Natural	FN10	01/01/1990	2	O_AL	45.02	0.10	44.95	45.09	42.00	107.01	107.35	0.07	.
Natural	FN10	01/01/1990	6	T_AL	133.33	10.57	119.37	142.40	158.00	75.55	90.13	4.31	.
Natural	FN13	04/14/1994	8	CA	106.72	1.08	104.99	107.93	99.26	105.78	108.74	0.38	.
Natural	FN13	04/14/1994	16	CL	10.61	0.12	10.35	10.77	11.91	86.90	90.45	0.03	.
Natural	FN13	04/14/1994	8	K	8.52	0.07	8.45	8.65	8.95	94.44	96.74	0.02	.
Natural	FN13	04/14/1994	8	MG	40.24	0.46	39.75	40.90	38.74	102.62	105.59	0.16	.
Natural	FN13	04/14/1994	8	NA	24.75	0.30	24.27	25.23	25.39	95.60	99.37	0.11	.
Natural	FN13	04/14/1994	11	SIO2	18.67	0.35	17.95	19.11	17.75	101.13	107.68	0.10	.
Natural	FN13	04/14/1994	16	SO4	120.29	0.54	119.58	121.29	115.09	103.90	105.38	0.14	.
Natural	FN13	04/14/1994	2	T_AL	37.64	4.65	34.36	40.93	58.00	59.24	70.57	3.29	.
Natural	FN15	04/14/1994	8	CA	118.36	1.24	116.47	120.11	111.80	104.17	107.43	0.44	.
Natural	FN15	04/14/1994	17	CL	14.58	0.11	14.30	14.81	15.75	90.77	94.00	0.03	.
Natural	FN15	04/14/1994	8	K	11.13	0.13	10.93	11.29	11.35	96.31	99.47	0.04	.
Natural	FN15	04/14/1994	8	MG	30.56	0.21	30.29	30.95	29.67	102.09	104.31	0.07	.
Natural	FN15	04/14/1994	8	NA	30.99	0.29	30.58	31.45	31.08	98.38	101.18	0.10	.
Natural	FN15	04/14/1994	17	NO3	23.10	0.21	22.60	23.46	22.00	102.75	106.63	0.05	.
Natural	FN15	04/14/1994	3	O_AL	58.51	0.99	57.80	59.64	35.42	163.19	168.39	0.57	.
Natural	FN15	04/14/1994	11	SIO2	70.64	0.24	70.38	71.18	69.26	101.63	102.78	0.07	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery high	Std Error	C _p
Natural	FN15	04/14/1994	17	SO4	136.03	0.62	134.89	137.55	130.92	103.03	105.07	0.15	.
Natural	FN15	04/14/1994	8	T_AL	98.27	2.55	95.09	102.52	165.08	57.60	62.10	0.90	.
Natural	FN16	04/14/1994	5	CA	293.07	3.26	288.57	296.41	285.96	100.91	103.65	1.46	.
Natural	FN16	04/14/1994	15	CL	27.46	0.36	27.04	28.20	27.67	97.75	101.93	0.09	.
Natural	FN16	04/14/1994	5	K	19.11	0.53	18.18	19.51	19.29	94.23	101.13	0.24	.
Natural	FN16	04/14/1994	5	MG	135.66	1.07	134.40	136.87	131.33	102.33	104.21	0.48	.
Natural	FN16	04/14/1994	5	NA	44.08	0.48	43.33	44.63	44.13	98.17	101.13	0.22	.
Natural	FN16	04/14/1994	15	NO3	3.69	0.49	2.82	4.33	5.93	47.50	73.00	0.13	.
Natural	FN16	04/14/1994	11	SIO2	37.64	0.32	37.22	38.18	37.30	99.78	102.36	0.09	.
Natural	FN16	04/14/1994	15	SO4	178.49	0.84	177.20	180.69	174.33	101.64	103.65	0.22	.
Synthetic	HPS1	03/22/2000	1	CL	27.78	.	27.78	27.78	28.20	98.50	98.50	.	.
Synthetic	HPS1	03/22/2000	1	NO3	32.96	.	32.96	32.96	32.20	102.35	102.35	.	.
Synthetic	HPS1	03/22/2000	1	SO4	105.29	.	105.29	105.29	104.00	101.24	101.24	.	.

Table 3.1.B: Field Blanks Used

Site	Date	Time
NFDR	2004-07-28	1300
NFDR	2004-10-27	1310
PINE	2004-01-28	1230
PINE	2004-04-28	1130

Table 3.1.C: Field Blank Statistics

Analyte	Mean	N	Standard Deviation	Standard Error
ALK	-2.50	4	4.36	2.18
CA	-0.20	4	0.18	0.09
CL	0.27	4	0.16	0.08
COND	0.78	4	0.30	0.15
DOC	0.21	3	0.35	0.20
H	1.33	4	0.11	0.05
K	-0.01	4	0.17	0.08
MG	0.21	4	0.38	0.19
NA	-0.17	4	0.41	0.21
NO3	0.02	4	0.02	0.01
SIO2	0.57	4	0.62	0.31
SO4	0.09	4	0.03	0.01
T_AL	0.67	4	0.30	0.15

Table 3.1.D: Detection Limits

Detection limits are determined from DIW QC samples analyzed during the period. The t column is the value of t for the Student's t distribution with $n-1$ d.f. such that $\text{Prob}(x < t) = 0.99$. The Method Detection Limit $\text{MDL} = t \cdot \sigma$, the Minimum Level of Quantitation $\text{ML} = 3.18 \cdot \text{MDL}$, and the Practical Quantitation Limit $\text{PQL} = 5 \cdot \text{MDL}$.

type	site_id	n	analyte	mean	Standard Deviation σ	t	MDL	ML	PQL
De-ionized	DIW	16	CA	-0.38	0.52	2.6025	1.352	4.299	6.759
De-ionized	DIW	14	CL	0.15	0.09	2.6503	0.226	0.718	1.129
De-ionized	DIW	68	COND	0.15	0.09	2.3833	0.216	0.687	1.080
De-ionized	DIW	16	K	-0.01	0.10	2.6025	0.267	0.849	1.335
De-ionized	DIW	16	MG	0.12	0.17	2.6025	0.448	1.426	2.242
De-ionized	DIW	16	NA	-0.20	0.44	2.6025	1.134	3.607	5.671
De-ionized	DIW	15	NH4	-0.08	0.08	2.6245	0.203	0.647	1.017
De-ionized	DIW	14	NO3	0.03	0.03	2.6503	0.068	0.218	0.342
De-ionized	DIW	11	SIO2	-0.02	0.20	2.7638	0.566	1.799	2.829
De-ionized	DIW	14	SO4	0.12	0.04	2.6503	0.105	0.333	0.524
De-ionized	DIW	10	T_AL	0.59	0.28	2.8214	0.803	2.553	4.014

Table 3.1.E: Duplicates Collected

Site	Date	Time
RF01	2004-11-07	1425
VT09	2004-11-07	1605
VT12	2004-05-04	1313
VT18	2004-04-28	1320
VT19	2004-07-27	0920
VT32	2004-10-26	1100
VT34	2004-01-29	1215
VT36	2004-07-29	1120
VT37	2004-04-26	0815
VT41	2004-07-27	1655
VT46	2004-10-25	0705
VT49	2004-10-26	1005
VT52	2004-04-26	1230
VT54	2004-02-02	0830
VT57	2004-07-27	1315
VT66	2004-01-29	1125
VT66	2004-10-26	1330
VT67	2004-02-05	1030
VT75	2004-04-30	1330
VT78	2004-11-01	1509

Table 3.1.F: Duplicate Statistics

This table gives the mean, standard deviation, and standard deviation of the mean of the differences between duplicates taken during the period, for samples where both values exceeded the MDL listed in Table 3.1.E, for those analytes that had MDLs.

RPD = $200 \cdot (a-b)/(a+b)$, where a and b are the two duplicate values.

Analyte	Mean of Duplicate Differences	N	Standard Deviation	Standard Error	Median RPD	95th Percentile of RPDs
ALK	2.77	18	13.78	3.25	6.54	40.73
CA	-0.12	20	0.42	0.09	0.44	2.01
CL	-0.11	20	0.45	0.10	0.98	8.83
COND	-0.06	20	0.11	0.03	0.51	1.55
H	0.00	20	0.22	0.05	6.82	20.70
MG	0.10	20	0.32	0.07	0.29	1.91
NA	-0.00	20	0.56	0.12	0.73	9.90
NO3	0.56	12	2.12	0.61	9.92	172.92
O_AL	-2.33	1	.	.	9.64	9.64
PH	0.01	20	0.04	0.01	0.45	1.41
SIO2	0.11	20	0.29	0.06	0.23	0.67
SO4	-0.15	20	0.81	0.18	0.46	4.30
T_AL	0.45	3	2.85	1.64	12.63	18.68

Table 3.2 Analysis of reference samples used at University of Maryland for DOC analysis

Samples

10QCCS and 2QCCS ...Separate stocks of standard solutions.

Lab Blank De-ionized water.

Lab Duplicate ...Splits of field samples. Mean is of the percent relative standard deviations between the two split values, for all duplicates.

FNBR002..... Natural field audit sample.

Results

	<u>10QCCS</u>	<u>2QCCS</u>	<u>Lab Blank</u>	<u>Lab Duplicate</u>	<u>FNBR002</u>
Count	121	128	30	74	29
Mean	9.92	2.12	-0.076	3.98	0.61
Std. Dev.	0.31	0.14	0.17	3.38	0.11
Target	10.00	2.00		<10%	
Recovery - Low	92.4	87.5			
Recovery - High	106.0	118.0			
Std. Error	0.028	0.012	0.031	0.393	0.020

Table 4A: Stream Sample Chemistry

Concentrations in µeq/L (alkalinity and ions), µmol/L (SiO₂), µS/cm (conductivity), µg/L (T_AL=total monomeric aluminum, O_AL=organic monomeric aluminum), and mg/L (DOC).

Chloroform (1 mL/L) added to streamwater samples (other than aluminum and DOC aliquots).

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
BA09	01/31/2004	1322	SWAS	GRAB	1	6.86	96	21	128	40	12	11	56	5	14	60	.	.	.	.	.
DR01	01/05/2004	1125	SWAS	GRAB	10	5.32	-5	22	24	44	24	37	106	0	23	94	0	.	.	.	.
DR01	01/12/2004	1215	SWAS	GRAB	3	5.38	-5	20	25	46	24	34	105	1	23	91	-0	.	.	.	.
DR01	01/20/2004	1135	SWAS	GRAB	1	5.40	-3	19	25	47	24	33	102	2	23	92	0	.	.	.	.
DR01	01/27/2004	1030	SWAS	GRAB	1	5.39	-3	19	24	46	24	32	101	2	22	89	0	37	.	.	1
DR01	02/03/2004	1215	SWAS	GRAB	0	5.39	-4	19	24	45	23	31	96	7	22	81	1	.	.	.	.
DR01	02/11/2004	1105	SWAS	GRAB	4	5.37	-3	20	24	47	23	38	110	0	21	88	0	.	.	.	.
DR01	02/18/2004	1145	SWAS	GRAB	2	5.36	-3	20	25	47	23	34	109	1	21	88	0	.	.	.	.
DR01	02/24/2004	1115	SWAS	GRAB	4	5.37	-3	19	24	45	23	35	106	0	22	89	0	.	.	.	.
DR01	03/02/2004	1055	SWAS	GRAB	7	5.34	-2	19	24	43	23	36	104	0	22	89	-0	.	.	.	.
DR01	03/09/2004	1135	SWAS	GRAB	6	5.44	-6	19	22	41	23	38	100	1	21	90	.	.	.	.	.
DR01	03/16/2004	1125	SWAS	GRAB	6	5.28	-4	19	22	42	23	38	99	4	21	85	0	.	.	.	.
DR01	03/23/2004	1045	SWAS	GRAB	4	5.46	-1	19	22	41	24	37	100	1	21	88	0	.	.	.	.
DR01	03/30/2004	1230	SWAS	GRAB	9	5.44	-2	19	21	39	24	39	100	0	22	89	0	.	.	.	.
DR01	04/06/2004	1150	SWAS	GRAB	7	5.43	-2	18	22	40	24	38	100	1	22	87	0	.	.	.	.
DR01	04/13/2004	1100	SWAS	GRAB	8	5.47	1	20	23	43	21	47	102	0	20	80	0	.	.	.	.
DR01	04/20/2004	1115	SWAS	GRAB	14	5.39	-1	19	23	42	23	42	107	0	22	89	0	.	.	.	.
DR01	04/27/2004	1250	SWAS	GRAB	13	5.41	-2	19	23	42	23	41	106	0	22	91	0	34	.	.	1
DR01	05/04/2004	1125	SWAS	GRAB	11	5.43	-2	19	22	40	24	41	102	0	22	92	0	.	.	.	.
DR01	05/11/2004	1400	SWAS	GRAB	17	5.45	-2	19	21	38	25	43	100	0	23	96	0	.	.	.	.
DR01	05/18/2004	1415	SWAS	GRAB	18	5.40	-2	19	21	37	25	44	97	0	24	99	0	.	.	.	.
DR01	05/24/2004	1300	SWAS	GRAB	19	5.49	0	19	21	37	29	46	96	1	26	101	0	.	.	.	.
DR01	06/01/2004	1415	SWAS	GRAB	17	5.20	-3	19	21	37	25	44	97	0	23	102	0	.	.	.	.
DR01	06/08/2004	1445	SWAS	GRAB	.	5.42	0	19	20	36	26	46	98	1	24	101	0	.	.	.	.
DR01	06/15/2004	1205	SWAS	GRAB	18	5.45	0	19	20	39	24	44	99	0	23	102	0	.	.	.	.
DR01	06/22/2004	0905	SWAS	GRAB	16	5.33	-1	19	20	38	24	45	98	0	23	102	0	.	.	.	.
DR01	06/29/2004	1125	SWAS	GRAB	16	5.30	-1	19	20	40	25	42	98	0	23	104	0	.	.	.	.
DR01	07/06/2004	1015	SWAS	GRAB	17	5.40	0	19	23	43	23	45	103	1	21	100	0	.	.	.	.
DR01	07/13/2004	0802	SWAS	GRAB	18	5.41	0	19	22	40	24	42	99	0	22	103	-0	.	.	.	.
DR01	07/20/2004	0850	SWAS	GRAB	17	5.42	-1	19	21	40	25	42	98	0	23	106	0	.	.	.	.
DR01	07/27/2004	0935	SWAS	GRAB	18	5.43	1	18	21	39	25	42	94	0	24	107	0	.	.	.	.
DR01	08/03/2004	1200	SWAS	GRAB	20	5.41	-6	18	19	38	25	42	92	1	25	109	-0	24	.	.	1

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC
					°C																
DR01	08/10/2004	1055	SWAS	GRAB	18	5.43	0	18	20	39	25	40	94	0	25	108	.	.	.	.	
DR01	08/17/2004	1130	SWAS	GRAB	18	5.51	3	18	21	39	28	40	92	1	28	108	.	.	.	.	
DR01	08/24/2004	1205	SWAS	GRAB	19	5.50	3	18	21	38	27	40	91	0	27	110	.	.	.	.	
DR01	08/31/2004	1030	SWAS	GRAB	20	5.52	1	18	21	38	26	40	89	0	27	111	.	.	.	.	
DR01	09/08/2004	1115	SWAS	GRAB	19	5.50	3	16	20	31	22	39	74	0	22	90	.	.	.	.	
DR01	09/14/2004	1140	SWAS	GRAB	17	5.43	-1	19	23	43	22	42	104	0	23	104	.	.	.	.	
DR01	09/21/2004	1210	SWAS	GRAB	15	5.33	-1	20	26	47	21	41	110	0	23	101	.	.	.	.	
DR01	09/28/2004	1125	SWAS	GRAB	16	5.49	-1	18	22	40	21	39	92	0	21	90	.	.	.	.	
DR01	10/05/2004	1110	SWAS	GRAB	14	5.44	-2	19	26	46	23	38	108	-0	23	103	.	.	.	.	
DR01	10/12/2004	1245	SWAS	GRAB	13	5.52	-1	19	25	45	23	36	103	-0	23	102	.	.	.	.	
DR01	10/19/2004	1115	SWAS	GRAB	13	5.49	0	19	23	43	24	37	101	-0	24	102	.	.	.	.	
DR01	10/26/2004	1110	SWAS	GRAB	13	5.49	-1	18	23	43	24	38	99	-0	24	103	.	27	.	.	
DR01	11/02/2004	1050	SWAS	GRAB	15	5.44	1	18	23	42	25	40	99	0	25	105	.	.	.	.	
DR01	11/09/2004	1050	SWAS	GRAB	9	5.44	-1	18	24	42	25	36	99	0	24	102	.	.	.	.	
DR01	11/19/2004	1315	SWAS	GRAB	11	5.50	-1	18	22	41	22	40	98	0	22	98	.	.	.	.	
DR01	11/23/2004	1105	SWAS	GRAB	11	5.51	1	18	23	42	23	40	100	0	23	102	.	.	.	.	
DR01	11/30/2004	1115	SWAS	GRAB	9	5.52	-1	18	22	41	22	42	101	0	22	99	.	.	.	.	
DR01	12/07/2004	1200	SWAS	GRAB	10	5.53	2	18	22	43	23	40	102	0	22	98	.	.	.	.	
DR01	12/14/2004	1055	SWAS	GRAB	7	5.48	-1	19	24	45	22	39	104	0	21	97	.	.	.	.	
DR01	12/22/2004	1150	SWAS	GRAB	5	5.50	2	19	24	46	23	36	104	0	22	95	.	.	.	.	
DR01	12/28/2004	1205	SWAS	GRAB	2	5.50	2	18	24	46	23	35	102	0	21	94	.	.	.	.	
M002	04/27/2004	1145	VTSSS	GRAB	11	4.75	-25	16	19	17	8	5	58	4	11	42	.	94	32	.	
M002	07/29/2004	1100	VTSSS	GRAB	21	4.80	-17	15	20	17	9	6	50	0	12	55	.	125	74	.	
M002	11/01/2004	1224	VTSSS	GRAB	16	4.73	-20	15	17	16	11	7	56	0	15	55	.	97	28	.	
M003	02/05/2004	1430	VTSSS	GRAB	.	6.70	90	21	106	69	10	7	65	3	11	34	.	.	.	.	
M003	04/27/2004	0930	VTSSS	GRAB	11	6.74	160	27	173	63	10	8	55	15	12	33	.	.	.	.	
M003	07/27/2004	1300	VTSSS	GRAB	24	6.84	71	17	82	61	9	5	59	0	10	17	.	.	.	.	
M003	11/01/2004	1301	VTSSS	GRAB	16	6.66	64	17	82	63	8	6	58	0	10	25	.	.	.	.	
M004	07/29/2004	1210	VTSSS	GRAB	16	5.59	33	24	152	33	27	7	98	0	13	84	.	223	206	.	
M004	11/01/2004	1335	VTSSS	GRAB	14	5.29	11	21	101	25	29	8	89	0	15	87	.	72	74	.	
MAD2	01/27/2004	1230	SWAS	GRAB	1	6.76	78	22	55	78	41	21	70	1	24	117	.	.	.	0	
MAD2	04/27/2004	1350	SWAS	GRAB	14	6.63	102	23	58	79	44	28	68	0	25	130	.	.	.	1	
MAD2	08/03/2004	1015	SWAS	GRAB	20	6.48	170	28	75	104	51	35	61	0	24	147	.	.	.	0	
MAD2	10/26/2004	1325	SWAS	GRAB	14	6.79	125	25	66	90	46	29	65	-0	27	136	.	.	.	.	
NFDR	01/07/2004	1250	SWAS	GRAB	3	6.50	23	25	78	45	70	9	103	22	26	154	.	.	.	.	
NFDR	01/14/2004	1115	SWAS	GRAB	2	6.52	26	24	76	44	69	9	97	26	27	157	.	.	.	.	
NFDR	01/21/2004	1100	SWAS	GRAB	0	6.47	29	24	75	44	71	8	95	26	28	162	.	.	.	.	
NFDR	01/28/2004	1430	SWAS	GRAB	0	6.45	33	24	73	42	70	8	91	27	28	162	.	.	.	0	
NFDR	02/04/2004	1110	SWAS	GRAB	1	6.48	28	24	74	43	72	8	89	28	28	164	.	.	.	.	
NFDR	02/10/2004	1350	SWAS	GRAB	4	6.48	35	24	72	42	72	9	93	27	24	166	.	.	.	.	
NFDR	02/17/2004	1355	SWAS	GRAB	2	6.49	30	23	71	40	73	8	93	23	26	167	.	.	.	.	
NFDR	02/25/2004	1100	SWAS	GRAB	2	6.43	41	24	73	42	73	8	93	26	26	163	.	.	.	.	
NFDR	03/03/2004	1045	SWAS	GRAB	6	6.48	45	24	75	42	74	9	93	27	27	159	.	.	.	.	
NFDR	03/10/2004	1040	SWAS	GRAB	4	6.49	25	25	84	47	68	9	105	36	24	145	.	.	.	.	

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
NFDR	03/17/2004	1100	SWAS	GRAB	5	6.32	27	25	79	45	71	9	100	34	25	151	.	.	.	.	.
NFDR	03/24/2004	1100	SWAS	GRAB	5	6.16	26	24	78	43	68	9	102	28	25	148	.	.	.	.	.
NFDR	03/31/2004	1145	SWAS	GRAB	7	6.60	37	24	77	43	72	10	99	25	26	153	.	.	.	.	.
NFDR	04/07/2004	1245	SWAS	GRAB	8	6.48	24	25	81	45	70	10	104	30	24	149	.	.	.	.	.
NFDR	04/14/2004	1355	SWAS	GRAB	7	6.34	29	27	92	51	65	11	105	45	22	136	.	.	.	.	.
NFDR	04/21/2004	1345	SWAS	GRAB	13	6.55	42	24	81	45	72	11	96	22	26	157	.	.	.	.	.
NFDR	04/28/2004	1330	SWAS	GRAB	9	6.01	48	25	82	46	71	10	99	20	25	159	.	.	.	.	0
NFDR	05/05/2004	1325	SWAS	GRAB	10	6.53	39	25	83	46	69	10	104	30	24	151	.	.	.	.	.
NFDR	05/12/2004	1305	SWAS	GRAB	14	6.53	50	25	83	47	73	11	97	13	26	166	.	.	.	.	.
NFDR	05/19/2004	1348	SWAS	GRAB	15	6.35	65	26	86	48	77	11	93	20	28	176	.	.	.	.	.
NFDR	05/27/2004	1130	SWAS	GRAB	15	6.49	70	26	89	49	78	12	91	23	27	180	.	.	.	.	.
NFDR	06/03/2004	0830	SWAS	GRAB	15	6.34	70	27	91	50	79	12	95	25	28	177	.	.	.	.	.
NFDR	06/09/2004	1305	SWAS	GRAB	15	6.10	49	26	88	48	72	11	103	20	25	161	.	.	.	.	.
NFDR	06/16/2004	1315	SWAS	GRAB	16	6.51	63	26	89	49	73	11	101	21	27	167	.	.	.	.	.
NFDR	06/23/2004	1035	SWAS	GRAB	16	6.20	69	27	93	51	77	11	96	20	28	175	.	.	.	.	.
NFDR	06/30/2004	1045	SWAS	GRAB	15	6.31	76	27	94	52	79	11	91	19	30	182	.	.	.	.	.
NFDR	07/07/2004	1030	SWAS	GRAB	19	6.19	78	28	98	53	82	12	91	24	29	184	.	.	.	.	.
NFDR	07/14/2004	1145	SWAS	GRAB	19	6.24	83	28	97	52	80	12	90	25	28	187	.	.	.	.	.
NFDR	07/21/2004	1225	SWAS	GRAB	18	6.25	93	29	99	54	84	12	90	25	30	195	.	.	.	.	.
NFDR	07/28/2004	1300	SWAS	GRAB	19	6.24	97	29	100	54	84	13	89	25	30	203	.	.	.	.	0
NFDR	08/04/2004	1200	SWAS	GRAB	20	6.19	105	29	103	56	86	13	88	27	30	200	.	.	.	.	.
NFDR	08/11/2004	1255	SWAS	GRAB	19	6.21	105	30	104	57	86	13	89	22	32	202	.	.	.	.	.
NFDR	08/18/2004	1230	SWAS	GRAB	18	6.38	88	30	106	58	86	13	88	21	32	203	.	.	.	.	.
NFDR	08/25/2004	1300	SWAS	GRAB	18	6.28	98	30	109	60	88	13	87	17	32	209	.	.	.	.	.
NFDR	09/01/2004	1230	SWAS	GRAB	19	6.35	114	31	112	60	89	13	88	16	33	215	.	.	.	.	.
NFDR	09/10/2004	1500	SWAS	GRAB	15	6.43	34	25	90	48	60	12	114	13	25	147	.	.	.	.	.
NFDR	09/15/2004	1355	SWAS	GRAB	16	6.51	55	25	89	48	70	12	104	0	29	165	.	.	.	.	.
NFDR	09/22/2004	1420	SWAS	GRAB	14	6.56	49	25	83	45	69	11	106	14	27	165	.	.	.	.	.
NFDR	09/29/2004	1115	SWAS	GRAB	14	6.45	31	24	82	45	61	13	113	0	22	149	.	.	.	.	.
NFDR	10/06/2004	1410	SWAS	GRAB	12	6.58	55	24	76	44	72	10	99	-0	27	172	.	.	.	.	.
NFDR	10/13/2004	1350	SWAS	GRAB	12	6.67	66	24	79	45	74	11	95	9	29	179	.	.	.	.	.
NFDR	10/20/2004	1315	SWAS	GRAB	11	6.63	77	25	83	46	75	12	91	5	30	179	.	.	.	.	.
NFDR	10/27/2004	1310	SWAS	GRAB	11	6.60	76	25	80	45	76	12	84	-0	30	182	.	.	.	.	.
NFDR	11/05/2004	1330	SWAS	GRAB	10	6.57	73	25	84	47	75	13	92	8	30	176	.	.	.	.	.
NFDR	11/10/2004	1110	SWAS	GRAB	7	6.55	60	24	79	45	72	10	98	10	28	167	.	.	.	.	.
NFDR	11/17/2004	1325	SWAS	GRAB	9	6.54	50	24	79	44	72	10	105	14	25	164	.	.	.	.	.
NFDR	11/24/2004	1150	SWAS	GRAB	11	6.47	62	25	80	46	74	11	103	10	27	167	.	.	.	.	.
NFDR	12/01/2004	1145	SWAS	GRAB	9	6.53	43	24	77	44	70	10	108	14	25	159	.	.	.	.	.
NFDR	12/08/2004	1245	SWAS	GRAB	9	6.58	52	24	76	43	72	10	101	14	26	166	.	.	.	.	.
NFDR	12/15/2004	1300	SWAS	GRAB	5	6.52	41	24	74	43	70	9	105	17	25	163	.	.	.	.	.
NFDR	12/23/2004	1155	SWAS	GRAB	8	6.45	45	23	74	42	71	9	96	13	27	158	.	.	.	.	.
NFDR	12/29/2004	1235	SWAS	GRAB	4	6.51	39	23	72	41	70	8	104	17	26	159	.	.	.	.	.
PAIN	01/05/2004	0945	SWAS	GRAB	9	5.61	2	21	29	48	22	43	111	0	22	92	.	.	.	.	.
PAIN	01/12/2004	0935	SWAS	GRAB	2	5.68	1	20	30	52	22	39	111	4	22	88	.	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
PAIN	01/20/2004	1400	SWAS	GRAB	1		5.70	3	21	31	52	22	38	110	3	21	88	.	.	.	.
PAIN	01/27/2004	1330	SWAS	GRAB	1		5.73	5	20	31	51	22	37	110	4	21	87	0	14	.	0
PAIN	02/03/2004	1440	SWAS	GRAB	1		5.64	0	20	30	51	21	37	102	9	21	79	.	.	.	.
PAIN	02/06/2004	1600	SWAS	ISCO	.		5.45	0	21	29	52	21	40	108	0	21	80	0	19	.	2
PAIN	02/06/2004	1800	SWAS	ISCO	.		5.48	-2	21	31	56	21	41	114	0	20	79	0	37	.	2
PAIN	02/06/2004	2000	SWAS	ISCO	.		5.47	-1	22	30	58	21	44	118	1	20	79	0	15	.	2
PAIN	02/06/2004	2200	SWAS	ISCO	.		5.47	-1	22	35	61	21	44	120	0	20	79	0	35	.	2
PAIN	02/07/2004	0000	SWAS	ISCO	.		5.47	-1	22	31	57	21	44	121	0	21	80	0	33	.	2
PAIN	02/07/2004	0400	SWAS	ISCO	.		5.48	-6	22	31	55	21	44	121	5	20	81	0	31	.	2
PAIN	02/07/2004	0800	SWAS	ISCO	.		5.46	-3	22	29	54	21	44	120	0	20	81	-0	10	.	1
PAIN	02/07/2004	1600	SWAS	ISCO	.		5.49	-3	22	30	54	21	43	119	0	21	83	-0	29	.	1
PAIN	02/08/2004	0000	SWAS	ISCO	.		5.49	-3	22	30	52	21	42	118	4	20	85	-0	8	.	1
PAIN	02/11/2004	1005	SWAS	GRAB	4		5.56	1	21	29	52	22	41	115	3	21	88	.	.	.	.
PAIN	02/18/2004	1040	SWAS	GRAB	2		5.67	3	20	30	51	22	39	111	2	21	88	.	.	.	.
PAIN	02/24/2004	1340	SWAS	GRAB	5		5.64	1	20	28	49	22	40	110	1	21	87	.	.	.	.
PAIN	03/02/2004	1320	SWAS	GRAB	9		5.65	1	20	29	47	22	42	110	2	21	85	.	.	.	.
PAIN	03/09/2004	1320	SWAS	GRAB	6		5.69	2	20	30	49	22	43	109	5	21	86	.	.	.	.
PAIN	03/16/2004	1410	SWAS	GRAB	6		5.50	2	20	31	49	22	42	109	4	21	78	-0	21	.	1
PAIN	03/23/2004	1445	SWAS	GRAB	8		5.73	3	20	29	47	22	43	110	2	21	78	.	.	.	.
PAIN	03/30/2004	1435	SWAS	GRAB	10		5.82	3	19	28	45	22	43	110	0	22	70	-0	12	.	1
PAIN	04/06/2004	1400	SWAS	GRAB	10		5.77	3	20	28	46	22	43	111	0	22	66	.	.	.	.
PAIN	04/12/2004	2000	SWAS	ISCO	.		5.35	3	21	29	47	21	44	106	3	21	78	3	29	.	3
PAIN	04/12/2004	2200	SWAS	ISCO	.		5.34	5	22	31	50	21	46	109	0	21	83	2	36	.	2
PAIN	04/13/2004	0000	SWAS	ISCO	.		5.44	8	22	33	53	21	46	112	0	22	82	0	30	.	2
PAIN	04/13/2004	0200	SWAS	ISCO	.		5.46	6	22	32	52	21	48	113	0	22	85	0	29	.	2
PAIN	04/13/2004	0400	SWAS	ISCO	.		5.40	8	23	33	52	21	49	114	0	21	84	0	27	.	2
PAIN	04/13/2004	0800	SWAS	ISCO	.		5.44	6	23	32	53	21	48	114	0	21	82	0	10	.	1
PAIN	04/13/2004	1200	SWAS	ISCO	.		5.38	4	22	31	51	21	47	113	0	21	84	1	21	.	1
PAIN	04/13/2004	1315	SWAS	GRAB	9		5.48	1	22	33	53	21	47	114	2	20	81	0	28	.	1
PAIN	04/13/2004	1600	SWAS	ISCO	.		5.59	2	21	31	50	21	46	113	0	21	80	1	23	.	1
PAIN	04/13/2004	2000	SWAS	ISCO	.		5.58	2	21	32	51	21	46	113	5	21	82	2	23	.	1
PAIN	04/14/2004	0400	SWAS	ISCO	.		5.50	0	21	32	51	21	46	114	9	21	83	1	5	.	1
PAIN	04/14/2004	2000	SWAS	ISCO	.		5.53	5	21	32	51	21	46	113	1	21	83	1	18	.	1
PAIN	04/15/2004	1200	SWAS	ISCO	.		5.57	4	21	32	50	21	45	114	0	21	84	0	15	.	1
PAIN	04/20/2004	1445	SWAS	GRAB	17		5.71	-1	19	28	45	22	47	112	1	22	80	.	.	.	.
PAIN	04/27/2004	1500	SWAS	GRAB	14		5.85	3	19	28	44	22	46	111	0	22	76	0	13	.	1
PAIN	05/04/2004	1430	SWAS	GRAB	14		5.83	3	20	28	46	22	47	110	2	21	81	.	.	.	.
PAIN	05/11/2004	1015	SWAS	GRAB	16		5.93	5	19	27	45	23	47	109	0	22	72	0	11	.	1
PAIN	05/18/2004	1020	SWAS	GRAB	17		5.99	5	19	27	45	24	47	107	0	23	69	.	.	.	.
PAIN	05/24/2004	0951	SWAS	GRAB	18		5.94	8	19	27	45	24	49	107	0	22	69	0	10	.	1
PAIN	06/01/2004	1145	SWAS	GRAB	18		5.93	9	20	28	46	24	50	108	4	22	79	.	.	.	.
PAIN	06/05/2004	1600	SWAS	ISCO	.		5.50	8	21	28	45	23	48	107	3	21	97	2	18	.	3
PAIN	06/05/2004	1800	SWAS	ISCO	.		5.69	6	21	35	49	24	51	105	0	21	102	4	15	.	1
PAIN	06/05/2004	2000	SWAS	ISCO	.		5.48	0	21	28	47	23	51	107	7	21	96	1	14	.	1

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
PAIN	06/05/2004	2200	SWAS	ISCO	.	5.44	9	22	33	49	24	51	107	8	21	99	3	14	.	1	
PAIN	06/08/2004	1120	SWAS	GRAB	17	5.57	4	21	29	47	24	50	110	4	21	88	0	9	.	1	
PAIN	06/15/2004	0915	SWAS	GRAB	17	5.67	5	20	29	47	23	50	110	2	21	89	.	.	.	.	
PAIN	06/22/2004	0813	SWAS	GRAB	16	5.65	6	20	28	47	23	49	108	1	22	90	.	.	.	.	
PAIN	06/29/2004	0805	SWAS	GRAB	16	5.98	10	20	28	48	24	50	106	0	22	90	.	.	.	.	
PAIN	07/04/2004	0600	SWAS	ISCO	.	5.58	10	20	27	44	22	48	96	6	19	86	1	8	.	3	
PAIN	07/04/2004	1400	SWAS	ISCO	.	5.54	22	22	49	54	21	49	100	5	20	129	15	29	.	2	
PAIN	07/04/2004	1600	SWAS	ISCO	.	5.58	15	21	45	48	24	53	104	4	20	123	12	9	.	2	
PAIN	07/04/2004	1800	SWAS	ISCO	.	5.72	8	20	32	47	22	49	103	4	18	96	1	4	.	2	
PAIN	07/04/2004	2000	SWAS	ISCO	.	5.70	6	20	28	45	22	50	104	8	19	95	1	15	.	1	
PAIN	07/04/2004	2200	SWAS	ISCO	.	5.80	8	20	27	46	23	51	104	6	19	95	1	14	.	1	
PAIN	07/05/2004	0200	SWAS	ISCO	.	5.85	8	20	29	48	23	51	106	11	20	96	0	13	.	1	
PAIN	07/05/2004	0600	SWAS	ISCO	.	5.84	8	20	29	48	23	51	106	11	20	94	0	13	.	1	
PAIN	07/06/2004	1235	SWAS	GRAB	19	5.76	6	20	28	46	23	50	107	4	20	94	.	.	.	.	
PAIN	07/13/2004	1315	SWAS	GRAB	20	5.82	10	19	27	44	23	50	106	0	21	94	.	.	.	.	
PAIN	07/20/2004	0925	SWAS	GRAB	18	5.98	13	20	27	47	23	49	106	1	21	98	.	.	.	.	
PAIN	07/27/2004	1015	SWAS	GRAB	19	5.98	14	20	28	47	24	51	105	3	22	101	.	.	.	.	
PAIN	07/29/2004	1320	SWAS	GRAB	20	6.10	11	20	26	45	24	51	105	2	23	102	.	.	.	.	
PAIN	08/03/2004	1315	SWAS	GRAB	21	6.08	10	20	27	46	27	52	104	5	24	106	0	.	.	0	
PAIN	08/10/2004	1130	SWAS	GRAB	20	6.05	11	20	28	47	25	51	106	2	24	108	.	.	.	.	
PAIN	08/17/2004	1230	SWAS	GRAB	19	6.07	14	20	27	46	26	50	105	0	24	112	.	.	.	.	
PAIN	08/24/2004	1255	SWAS	GRAB	20	6.07	10	20	27	46	25	51	105	0	23	111	.	.	.	.	
PAIN	08/31/2004	1325	SWAS	GRAB	21	5.86	12	20	26	46	25	51	103	0	23	113	.	.	.	.	
PAIN	09/08/2004	1000	SWAS	ISCO	.	5.64	13	19	33	45	22	48	90	2	24	119	20	29	.	.	
PAIN	09/08/2004	1005	SWAS	GRAB	19	5.69	10	18	26	42	20	47	89	0	20	90	.	.	.	.	
PAIN	09/08/2004	1200	SWAS	ISCO	.	5.52	4	20	31	48	20	51	95	0	20	87	0	42	.	.	
PAIN	09/08/2004	1400	SWAS	ISCO	.	5.42	2	22	33	51	20	52	98	0	20	84	0	58	43	.	
PAIN	09/08/2004	1600	SWAS	ISCO	.	5.36	2	24	40	60	19	54	103	17	21	84	-0	42	.	.	
PAIN	09/08/2004	1800	SWAS	ISCO	.	5.35	2	24	35	52	19	53	104	0	20	89	20	43	.	.	
PAIN	09/08/2004	2200	SWAS	ISCO	.	5.24	-1	24	38	50	17	54	117	0	21	80	5	30	.	.	
PAIN	09/09/2004	0200	SWAS	ISCO	.	5.27	-4	23	38	54	18	50	116	0	20	79	0	37	.	.	
PAIN	09/09/2004	1000	SWAS	ISCO	.	5.28	-7	22	35	53	19	49	115	5	21	83	0	30	.	.	
PAIN	09/09/2004	1800	SWAS	ISCO	.	5.38	-6	22	34	51	19	49	114	5	21	96	-0	20	.	.	
PAIN	09/10/2004	1000	SWAS	ISCO	.	5.52	-1	21	33	51	20	48	113	0	21	91	0	19	.	.	
PAIN	09/11/2004	0800	SWAS	ISCO	.	5.72	4	20	31	50	20	47	111	0	21	95	0	12	.	.	
PAIN	09/14/2004	1445	SWAS	GRAB	18	5.79	2	20	30	48	21	48	112	0	22	100	0	11	.	.	
PAIN	09/17/2004	1600	SWAS	ISCO	.	5.70	5	18	27	41	19	44	93	0	20	86	0	22	.	.	
PAIN	09/17/2004	1800	SWAS	ISCO	.	5.41	2	19	29	46	18	46	96	0	19	83	-0	80	63	.	
PAIN	09/17/2004	2000	SWAS	ISCO	.	5.38	1	21	31	51	19	51	106	0	20	85	-0	48	.	.	
PAIN	09/17/2004	2200	SWAS	ISCO	.	5.38	-4	23	35	56	20	51	112	0	21	87	0	42	.	.	
PAIN	09/18/2004	0000	SWAS	ISCO	.	5.39	-3	23	34	56	19	51	115	3	21	88	0	35	.	.	
PAIN	09/18/2004	0400	SWAS	ISCO	.	5.44	-6	22	34	54	20	50	114	4	23	90	0	35	.	.	
PAIN	09/18/2004	0800	SWAS	ISCO	.	5.41	-2	22	32	52	20	49	114	1	22	91	0	32	.	.	
PAIN	09/18/2004	1600	SWAS	ISCO	.	5.52	-4	21	31	52	20	49	115	5	21	94	0	22	.	.	

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
PAIN	09/19/2004	0000	SWAS	ISCO	.		5.43	-4	21	32	52	20	47	115	4	22	94	-0	7	.	.
PAIN	09/21/2004	1515	SWAS	GRAB	16		5.63	0	20	31	49	21	45	113	0	22	98	.	.	.	.
PAIN	09/28/2004	1000	SWAS	ISCO	.		5.57	4	18	26	41	18	43	91	0	20	81	0	41	.	.
PAIN	09/28/2004	1200	SWAS	ISCO	.		5.53	-1	20	27	47	19	47	100	0	20	81	0	48	41	.
PAIN	09/28/2004	1235	SWAS	GRAB	17		5.41	-5	20	28	47	18	48	100	0	19	78	0	51	47	.
PAIN	09/28/2004	1400	SWAS	ISCO	.		5.39	-1	20	32	47	15	49	96	-0	17	73	0	87	72	.
PAIN	09/28/2004	1600	SWAS	ISCO	.		5.33	-21	23	48	54	14	56	119	-0	20	95	10	73	67	.
PAIN	09/28/2004	1800	SWAS	ISCO	.		5.28	-4	23	55	65	16	55	158	-0	21	85	4	46	.	.
PAIN	09/28/2004	2200	SWAS	ISCO	.		5.30	-3	22	35	49	17	49	119	-0	20	83	0	41	.	.
PAIN	09/29/2004	0200	SWAS	ISCO	.		5.32	-2	22	35	51	18	48	117	-0	20	84	0	40	.	.
PAIN	09/29/2004	1000	SWAS	ISCO	.		5.40	-5	21	33	50	18	46	116	-0	21	89	0	34	.	.
PAIN	09/29/2004	1800	SWAS	ISCO	.		5.44	-1	21	33	49	19	46	116	3	21	91	0	24	.	.
PAIN	09/30/2004	1000	SWAS	ISCO	.		5.46	-1	21	32	49	20	46	115	3	22	94	0	25	.	.
PAIN	10/05/2004	1410	SWAS	GRAB	15		5.75	-2	20	31	47	21	45	112	-0	22	99	.	.	.	.
PAIN	10/12/2004	1450	SWAS	GRAB	14		5.81	-1	19	30	47	21	44	111	-0	22	100	0	2	.	.
PAIN	10/19/2004	1540	SWAS	GRAB	15		5.91	5	19	30	47	21	46	111	-0	22	99	.	.	.	.
PAIN	10/26/2004	1410	SWAS	GRAB	14		5.95	7	20	30	48	21	46	110	-0	22	101	0	2	.	.
PAIN	11/02/2004	1335	SWAS	GRAB	16		5.89	8	20	30	48	22	47	112	0	23	103	.	.	.	.
PAIN	11/09/2004	1310	SWAS	GRAB	9		5.88	5	20	30	49	22	44	112	0	22	101	0	10	.	.
PAIN	11/12/2004	1800	SWAS	ISCO	.		5.57	5	20	30	47	21	46	105	0	23	95	0	23	.	.
PAIN	11/12/2004	2000	SWAS	ISCO	.		5.71	1	20	30	47	21	47	107	0	23	95	0	22	.	.
PAIN	11/12/2004	2200	SWAS	ISCO	.		5.71	3	20	29	48	21	46	108	0	23	95	0	18	.	.
PAIN	11/13/2004	0000	SWAS	ISCO	.		5.73	3	20	30	48	21	46	109	0	23	95	0	20	.	.
PAIN	11/13/2004	0200	SWAS	ISCO	.		5.70	3	20	30	49	21	47	109	0	23	96	0	21	.	.
PAIN	11/13/2004	0400	SWAS	ISCO	.		5.72	3	20	30	49	21	47	109	0	22	96	-0	20	.	.
PAIN	11/13/2004	0600	SWAS	ISCO	.		5.73	2	20	29	49	21	47	109	0	23	96	0	20	.	.
PAIN	11/13/2004	0800	SWAS	ISCO	.		5.73	1	20	30	48	21	47	110	0	22	97	0	19	.	.
PAIN	11/13/2004	1000	SWAS	ISCO	.		5.71	3	20	29	49	21	47	110	0	22	97	0	17	.	.
PAIN	11/13/2004	1800	SWAS	ISCO	.		5.74	3	20	29	48	21	46	110	1	22	97	0	14	.	.
PAIN	11/14/2004	0200	SWAS	ISCO	.		5.72	1	20	29	48	21	45	111	1	22	98	0	16	.	.
PAIN	11/19/2004	1010	SWAS	GRAB	12		5.80	2	19	29	47	21	43	110	0	22	98	.	.	.	.
PAIN	11/23/2004	1315	SWAS	GRAB	12		5.72	3	19	29	46	22	45	111	0	22	98	-0	15	.	.
PAIN	11/30/2004	1500	SWAS	GRAB	10		5.53	-1	20	27	47	22	44	113	0	22	95	.	.	.	.
PAIN	12/07/2004	1400	SWAS	GRAB	11		5.78	4	19	27	46	22	43	110	0	21	92	0	16	.	.
PAIN	12/10/2004	1200	SWAS	ISCO	.		5.59	2	20	28	48	21	45	108	0	22	94	1	21	.	.
PAIN	12/10/2004	1400	SWAS	ISCO	.		5.65	2	20	28	48	21	45	109	3	21	95	0	23	.	.
PAIN	12/10/2004	1600	SWAS	ISCO	.		5.65	2	20	29	50	22	47	110	3	22	97	1	13	.	.
PAIN	12/10/2004	1800	SWAS	ISCO	.		5.64	2	20	29	48	21	46	110	3	22	95	0	22	.	.
PAIN	12/10/2004	2000	SWAS	ISCO	.		5.65	2	20	28	48	22	46	110	3	22	95	0	23	.	.
PAIN	12/11/2004	0000	SWAS	ISCO	.		5.62	2	20	29	50	22	46	112	4	24	95	1	23	.	.
PAIN	12/11/2004	0400	SWAS	ISCO	.		5.64	2	20	28	49	21	45	111	4	22	95	0	23	.	.
PAIN	12/11/2004	1200	SWAS	ISCO	.		5.65	2	20	28	48	22	46	111	4	21	95	1	21	.	.
PAIN	12/11/2004	2000	SWAS	ISCO	.		5.65	2	20	28	49	22	46	112	3	22	95	0	20	.	.
PAIN	12/14/2004	1310	SWAS	GRAB	7		5.67	2	20	29	48	22	42	111	0	21	92	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
PAIN	12/22/2004	1015	SWAS	GRAB	4	5.67	4	20	29	50	22	40	110	1	21	87	.	.	.	.	.
PAIN	12/28/2004	1020	SWAS	GRAB	3	5.72	5	19	29	50	22	40	111	1	21	88	.	.	.	.	.
PINE	01/07/2004	1500	SWAS	GRAB	3	6.99	175	32	123	103	71	6	63	20	29	206	.	.	.	.	.
PINE	01/14/2004	1305	SWAS	GRAB	2	7.11	164	32	117	99	69	5	61	23	29	203	.	.	.	.	.
PINE	01/21/2004	1350	SWAS	GRAB	0	7.08	156	31	116	98	69	5	60	20	29	202	.	.	.	.	.
PINE	01/28/2004	1230	SWAS	GRAB	0	7.07	159	31	116	96	70	5	59	25	29	204	-0	.	.	.	0
PINE	02/04/2004	1310	SWAS	GRAB	2	7.07	150	32	117	99	70	5	62	28	29	198	.	.	.	.	.
PINE	02/10/2004	1200	SWAS	GRAB	4	6.95	149	33	124	105	70	5	77	33	26	200	.	.	.	.	.
PINE	02/17/2004	1200	SWAS	GRAB	2	6.99	154	33	122	103	70	5	73	27	28	202	.	.	.	.	.
PINE	02/25/2004	1410	SWAS	GRAB	4	6.97	156	33	123	104	70	5	70	27	27	197	.	.	.	.	.
PINE	03/03/2004	1330	SWAS	GRAB	8	6.91	170	33	122	101	72	6	65	18	28	200	.	.	.	.	.
PINE	03/10/2004	1250	SWAS	GRAB	6	7.02	154	33	126	106	71	6	71	28	27	196	.	.	.	.	.
PINE	03/17/2004	1315	SWAS	GRAB	5	6.96	171	33	127	105	72	6	68	27	27	200	-0	.	.	.	0
PINE	03/24/2004	1315	SWAS	GRAB	8	6.80	160	33	124	103	71	6	69	20	27	200	.	.	.	.	.
PINE	03/31/2004	1000	SWAS	GRAB	7	7.22	193	34	131	108	76	6	66	19	28	208	-0	.	.	.	0
PINE	04/07/2004	1130	SWAS	GRAB	8	7.01	165	34	127	105	70	6	75	26	27	198	.	.	.	.	.
PINE	04/12/2004	1800	SWAS	ISCO	.	6.46	185	35	119	100	70	9	73	27	26	210	4	.	.	.	6
PINE	04/12/2004	2000	SWAS	ISCO	.	6.81	168	34	130	106	67	8	76	24	24	191	0	.	.	.	2
PINE	04/12/2004	2200	SWAS	ISCO	.	6.75	164	36	140	113	67	9	82	32	23	183	0	.	.	.	2
PINE	04/13/2004	0000	SWAS	ISCO	.	6.81	156	37	142	116	67	8	88	44	23	179	0	.	.	.	2
PINE	04/13/2004	0200	SWAS	ISCO	.	6.88	161	37	144	118	68	8	90	47	24	180	0	.	.	.	2
PINE	04/14/2004	1130	SWAS	GRAB	8	6.85	169	35	136	112	68	7	88	23	24	191	0	.	.	.	1
PINE	04/14/2004	1800	SWAS	ISCO	.	6.98	162	35	132	109	68	7	86	25	25	192	-0	.	.	.	1
PINE	04/15/2004	1000	SWAS	ISCO	.	7.01	158	34	129	107	67	6	84	33	26	194	0	.	.	.	1
PINE	04/21/2004	1120	SWAS	GRAB	13	7.21	208	34	135	109	76	7	67	0	27	214	.	.	.	.	.
PINE	04/28/2004	1130	SWAS	GRAB	10	6.79	214	35	140	115	75	6	72	2	25	212	0	.	.	.	0
PINE	05/03/2004	0000	SWAS	ISCO	.	7.00	207	35	133	108	71	8	68	10	24	208	0	.	.	.	5
PINE	05/03/2004	0200	SWAS	ISCO	.	7.17	198	36	141	113	71	8	71	24	23	198	0	.	.	.	2
PINE	05/03/2004	0400	SWAS	ISCO	.	7.20	194	36	142	116	73	8	73	23	23	199	0	.	.	.	2
PINE	05/03/2004	0600	SWAS	ISCO	.	7.24	200	36	144	117	73	7	75	25	24	202	-0	.	.	.	1
PINE	05/05/2004	1105	SWAS	GRAB	11	7.19	193	35	135	112	72	6	73	17	25	203	.	.	.	.	.
PINE	05/12/2004	1100	SWAS	GRAB	15	7.27	233	36	147	118	79	7	63	10	26	226	-0	.	.	.	0
PINE	05/19/2004	1211	SWAS	GRAB	16	6.87	260	38	152	123	84	7	58	3	26	241	.	.	.	.	.
PINE	05/27/2004	0950	SWAS	GRAB	16	7.08	251	39	157	126	86	7	55	0	26	246	0	.	.	.	0
PINE	06/02/2004	1135	SWAS	GRAB	15	6.79	275	38	157	126	89	7	53	2	27	255	.	.	.	.	.
PINE	06/05/2004	0400	SWAS	ISCO	.	6.77	246	34	134	107	78	9	48	0	23	231	4	.	.	.	6
PINE	06/05/2004	0600	SWAS	ISCO	.	6.75	248	38	134	106	81	6	54	0	23	247	0	.	.	.	3
PINE	06/05/2004	0800	SWAS	ISCO	.	6.86	240	39	153	125	81	8	57	0	23	240	0	.	.	.	2
PINE	06/05/2004	1000	SWAS	ISCO	.	6.88	244	39	159	130	82	8	59	8	23	231	0	.	.	.	2
PINE	06/05/2004	1200	SWAS	ISCO	.	6.98	250	39	156	127	82	8	60	9	23	232	0	.	.	.	2
PINE	06/09/2004	1120	SWAS	GRAB	17	6.65	277	39	156	126	86	7	58	0	25	246	-0	.	.	.	0
PINE	06/16/2004	1450	SWAS	GRAB	18	7.00	280	39	160	129	87	7	58	1	25	248	.	.	.	.	.
PINE	06/23/2004	0830	SWAS	GRAB	18	6.80	292	41	169	133	92	7	53	4	27	259	.	.	.	.	.
PINE	06/30/2004	0845	SWAS	GRAB	16	6.78	300	40	166	132	94	7	49	0	26	265	.	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
PINE	07/07/2004	0840	SWAS	GRAB	18	6.80	314	41	175	137	94	7	50	0	26	266	.	.	.	.	
PINE	07/14/2004	0945	SWAS	GRAB	19	6.81	347	43	181	141	100	7	47	0	26	274	.	.	.	.	
PINE	07/21/2004	0820	SWAS	GRAB	18	6.78	345	43	180	140	99	7	47	0	26	273	.	.	.	.	
PINE	07/28/2004	0930	SWAS	GRAB	18	6.78	350	44	186	145	99	8	48	0	26	273	0	.	.	0	
PINE	08/04/2004	0815	SWAS	GRAB	20	6.84	366	45	190	149	103	8	45	0	26	280	.	.	.	.	
PINE	08/11/2004	0850	SWAS	GRAB	19	6.81	376	45	194	153	106	8	43	0	29	283	.	.	.	.	
PINE	08/18/2004	0845	SWAS	GRAB	18	6.88	369	45	195	154	107	8	45	0	28	283	.	.	.	.	
PINE	08/25/2004	1055	SWAS	GRAB	18	6.91	389	46	198	154	108	9	43	0	28	287	.	.	.	.	
PINE	09/01/2004	1055	SWAS	GRAB	19	6.91	400	47	202	159	113	9	41	0	28	298	.	.	.	.	
PINE	09/08/2004	0400	SWAS	ISCO	.	6.67	256	43	176	130	85	9	64	0	44	300	20	.	.	.	
PINE	09/08/2004	0800	SWAS	ISCO	.	6.91	244	42	174	141	85	10	69	19	42	242	2	.	.	.	
PINE	09/08/2004	1000	SWAS	ISCO	.	6.97	236	42	175	149	84	10	71	5	42	247	7	.	.	.	
PINE	09/08/2004	1200	SWAS	ISCO	.	6.89	214	39	161	123	79	11	72	0	40	259	0	.	.	.	
PINE	09/08/2004	1400	SWAS	ISCO	.	6.74	194	40	161	125	74	14	80	0	40	236	18	.	.	.	
PINE	09/08/2004	1600	SWAS	ISCO	.	6.83	187	39	158	123	73	12	85	19	38	211	10	.	.	.	
PINE	09/08/2004	2000	SWAS	ISCO	.	6.64	174	35	146	108	61	16	75	0	33	209	-0	.	.	.	
PINE	09/09/2004	0000	SWAS	ISCO	.	6.41	144	31	154	104	46	17	92	18	25	174	22	.	.	.	
PINE	09/09/2004	0800	SWAS	ISCO	.	6.70	126	31	131	99	51	10	98	0	25	168	0	.	.	.	
PINE	09/09/2004	1600	SWAS	ISCO	.	6.79	136	31	131	100	54	9	95	0	26	178	1	.	.	.	
PINE	09/10/2004	1235	SWAS	GRAB	18	6.76	169	32	130	102	59	8	86	0	26	192	.	.	.	.	
PINE	09/11/2004	0000	SWAS	ISCO	.	7.16	171	32	132	102	61	8	82	0	27	195	0	.	.	.	
PINE	09/12/2004	0800	SWAS	ISCO	.	7.24	194	33	137	107	64	7	74	0	27	204	-0	.	.	.	
PINE	09/15/2004	1125	SWAS	GRAB	17	7.19	214	34	144	114	69	8	69	0	27	219	0	.	.	.	
PINE	09/17/2004	1400	SWAS	ISCO	.	6.96	229	35	141	112	71	9	63	0	29	236	-0	.	.	.	
PINE	09/17/2004	1600	SWAS	ISCO	.	6.99	210	34	137	110	68	10	62	0	28	212	-0	.	.	.	
PINE	09/17/2004	1800	SWAS	ISCO	.	6.95	214	35	142	113	70	10	64	0	30	220	0	.	.	.	
PINE	09/17/2004	2000	SWAS	ISCO	.	6.72	196	35	142	109	64	13	71	0	27	207	0	.	.	.	
PINE	09/17/2004	2200	SWAS	ISCO	.	6.79	176	35	150	114	61	11	81	0	25	186	-0	.	.	.	
PINE	09/18/2004	0200	SWAS	ISCO	.	6.84	174	35	149	115	62	10	87	0	25	193	0	.	.	.	
PINE	09/18/2004	0600	SWAS	ISCO	.	6.79	169	33	141	110	61	9	88	0	25	189	-0	.	.	.	
PINE	09/18/2004	1400	SWAS	ISCO	.	6.92	158	32	133	105	59	8	91	0	24	193	0	.	.	.	
PINE	09/18/2004	2200	SWAS	ISCO	.	7.16	160	32	130	102	59	7	89	0	25	191	0	.	.	.	
PINE	09/22/2004	1125	SWAS	GRAB	15	6.97	185	32	131	102	65	6	71	0	26	204	.	.	.	.	
PINE	09/22/2004	2200	SWAS	ISCO	.	7.28	189	32	131	105	65	6	70	0	27	207	-0	.	.	.	
PINE	09/28/2004	1000	SWAS	ISCO	.	7.00	203	32	134	107	66	9	56	0	28	211	-0	.	.	.	
PINE	09/28/2004	1200	SWAS	ISCO	.	6.95	208	33	144	107	63	13	59	0	27	199	6	.	.	.	
PINE	09/28/2004	1400	SWAS	ISCO	.	6.83	157	33	140	104	55	14	77	7	24	165	8	.	.	.	
PINE	09/28/2004	1600	SWAS	ISCO	.	6.97	156	32	135	104	54	13	82	5	23	165	2	.	.	.	
PINE	09/28/2004	1800	SWAS	ISCO	.	6.91	126	30	124	95	51	12	85	0	21	158	2	.	.	.	
PINE	09/28/2004	2200	SWAS	ISCO	.	7.07	131	31	126	98	54	10	93	0	22	172	0	.	.	.	
PINE	09/29/2004	0200	SWAS	ISCO	.	7.07	146	31	126	99	56	9	93	0	23	177	0	.	.	.	
PINE	09/29/2004	1340	SWAS	GRAB	16	6.94	146	31	125	98	59	8	91	0	23	184	-0	.	.	.	
PINE	09/29/2004	1800	SWAS	ISCO	.	7.14	156	31	126	99	61	8	89	0	24	188	-0	.	.	.	
PINE	09/30/2004	1000	SWAS	ISCO	.	7.17	164	32	128	101	62	7	83	0	25	198	-0	.	.	.	

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
PINE	10/01/2004	0200	SWAS	ISCO	.	7.18	172	32	129	103	63	7	79	2	26	198	-0	.	.	.
PINE	10/06/2004	1135	SWAS	GRAB	13	7.22	200	33	130	107	68	6	65	3	27	211	.	.	.	.
PINE	10/13/2004	1145	SWAS	GRAB	12	7.28	218	33	135	109	71	6	60	-0	28	218	0	.	.	.
PINE	10/20/2004	1125	SWAS	GRAB	12	7.26	236	35	141	114	74	8	57	-0	31	220	.	.	.	.
PINE	10/27/2004	1130	SWAS	GRAB	11	7.19	221	34	141	112	75	7	57	-0	31	220	-0	.	.	.
PINE	11/04/2004	1600	SWAS	ISCO	.	6.99	256	38	157	120	77	16	58	0	39	262	1	.	.	.
PINE	11/04/2004	1800	SWAS	ISCO	.	6.98	255	39	156	125	76	14	62	0	37	228	0	.	.	.
PINE	11/04/2004	2000	SWAS	ISCO	.	7.10	250	39	158	127	76	12	63	0	36	220	0	.	.	.
PINE	11/05/2004	1055	SWAS	GRAB	11	7.15	235	37	153	124	76	9	65	0	34	217	.	.	.	.
PINE	11/10/2004	1400	SWAS	GRAB	10	7.25	221	34	137	111	74	6	63	0	30	210	-0	.	.	.
PINE	11/17/2004	1055	SWAS	GRAB	9	7.08	197	33	132	109	71	6	70	2	29	201	.	.	.	.
PINE	11/24/2004	1300	SWAS	GRAB	11	6.86	208	35	139	112	75	7	66	0	29	211	-0	.	.	.
PINE	11/28/2004	0200	SWAS	ISCO	.	6.79	200	34	142	108	69	11	67	0	32	278	0	.	.	.
PINE	11/28/2004	0400	SWAS	ISCO	.	6.93	180	35	147	115	68	10	76	0	31	215	11	.	.	.
PINE	11/28/2004	0600	SWAS	ISCO	.	6.96	181	36	143	116	68	8	80	0	31	200	9	.	.	.
PINE	11/28/2004	0800	SWAS	ISCO	.	7.08	180	36	145	121	69	8	83	9	31	197	1	.	.	.
PINE	11/28/2004	1000	SWAS	ISCO	.	7.13	180	36	145	120	69	8	85	6	31	197	3	.	.	.
PINE	11/28/2004	1400	SWAS	ISCO	.	7.15	185	36	144	118	70	7	86	4	31	200	-0	.	.	.
PINE	11/29/2004	0200	SWAS	ISCO	.	7.14	186	36	142	118	69	6	85	14	29	201	0	.	.	.
PINE	11/29/2004	1000	SWAS	ISCO	.	7.15	182	35	139	115	69	6	83	11	29	202	0	.	.	.
PINE	12/01/2004	1350	SWAS	GRAB	9	7.10	175	33	131	107	70	6	77	7	28	198	.	.	.	.
PINE	12/08/2004	1130	SWAS	GRAB	9	7.25	187	33	127	104	71	6	68	4	28	204	0	.	.	.
PINE	12/09/2004	2200	SWAS	ISCO	.	6.92	188	34	153	109	70	6	67	0	27	305	-0	.	.	.
PINE	12/10/2004	0000	SWAS	ISCO	.	7.11	186	34	134	110	69	6	70	5	27	204	0	.	.	.
PINE	12/10/2004	0200	SWAS	ISCO	.	7.13	184	34	133	112	70	6	73	1	28	202	0	.	.	.
PINE	12/10/2004	1400	SWAS	ISCO	.	7.17	189	34	137	111	70	6	76	3	28	209	0	.	.	.
PINE	12/10/2004	1600	SWAS	ISCO	.	7.18	186	35	137	113	71	6	77	6	27	205	0	.	.	.
PINE	12/10/2004	1800	SWAS	ISCO	.	7.17	190	35	138	115	71	6	77	4	27	205	0	.	.	.
PINE	12/10/2004	2000	SWAS	ISCO	.	7.18	190	35	140	114	72	6	79	5	27	206	0	.	.	.
PINE	12/10/2004	2200	SWAS	ISCO	.	7.19	190	35	139	116	71	6	79	0	28	205	0	.	.	.
PINE	12/11/2004	0200	SWAS	ISCO	.	7.20	190	35	142	117	71	6	81	14	28	208	0	.	.	.
PINE	12/15/2004	1140	SWAS	GRAB	5	7.18	170	32	125	105	69	5	74	15	28	198	.	.	.	.
PINE	12/23/2004	1330	SWAS	GRAB	7	6.92	165	31	117	97	67	6	62	5	28	190	.	.	.	.
PINE	12/29/2004	1120	SWAS	GRAB	3	7.15	163	31	118	102	68	5	71	17	29	193	.	.	.	.
RF01	11/07/2004	1425	VTSSS	GRAB	9	5.78	6	14	53	28	16	8	70	0	14	66	.	.	.	.
RH31	05/02/2004	1522	SWAS	GRAB	14	6.28	18	21	53	67	25	22	104	22	15	83	.	.	.	.
RH33	05/02/2004	1320	SWAS	GRAB	13	5.05	-12	17	18	42	15	17	88	1	15	79	.	.	.	.
STAN	01/05/2004	1315	SWAS	GRAB	10	6.79	70	18	61	26	60	10	46	0	22	137	.	.	.	.
STAN	01/13/2004	1005	SWAS	GRAB	4	6.80	75	18	59	25	57	9	45	0	22	134	.	.	.	.
STAN	01/20/2004	0940	SWAS	GRAB	1	6.75	74	18	60	26	58	9	45	0	23	140	.	.	.	.
STAN	01/28/2004	0945	SWAS	GRAB	1	6.72	69	18	60	25	58	9	46	0	23	140	0	.	.	0
STAN	02/03/2004	1020	SWAS	GRAB	2	6.65	74	17	58	25	56	8	45	0	22	125	.	.	.	.
STAN	02/10/2004	0920	SWAS	GRAB	4	6.54	67	20	66	28	65	9	61	1	23	144	.	.	.	.
STAN	02/17/2004	0930	SWAS	GRAB	2	6.73	69	19	65	27	63	9	57	0	23	145	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
STAN	02/24/2004	0920	SWAS	GRAB	4	6.13	75	19	63	26	63	9	53	0	23	143	.	.	.	.	
STAN	03/02/2004	0900	SWAS	GRAB	7	6.20	78	18	62	26	64	9	51	0	23	142	.	.	.	.	
STAN	03/09/2004	1010	SWAS	GRAB	6	6.22	77	19	64	27	63	9	50	0	23	141	.	.	.	.	
STAN	03/16/2004	0935	SWAS	GRAB	6	6.37	73	18	63	27	61	10	51	2	21	130	5	.	.	1	
STAN	03/23/2004	0900	SWAS	GRAB	4	6.24	74	18	62	26	60	9	51	0	23	136	.	.	.	.	
STAN	03/30/2004	0910	SWAS	GRAB	8	6.72	80	18	62	26	61	10	49	0	22	138	1	.	.	0	
STAN	04/06/2004	0940	SWAS	GRAB	6	6.02	74	18	62	26	59	9	51	0	22	135	.	.	.	.	
STAN	04/13/2004	0910	SWAS	GRAB	8	6.10	72	19	68	29	60	10	56	2	21	130	0	.	.	1	
STAN	04/20/2004	0905	SWAS	GRAB	12	6.71	80	17	63	26	60	10	52	0	22	136	.	.	.	.	
STAN	04/27/2004	0920	SWAS	GRAB	11	6.25	85	18	65	27	62	10	49	0	22	140	0	.	.	0	
STAN	05/04/2004	0915	SWAS	GRAB	11	6.32	79	19	68	29	63	11	64	0	21	139	.	.	.	.	
STAN	05/11/2004	1540	SWAS	GRAB	16	6.75	81	19	65	27	61	11	51	0	20	132	-0	.	.	1	
STAN	05/19/2004	1005	SWAS	GRAB	15	6.42	93	19	69	29	63	11	47	0	20	142	.	.	.	.	
STAN	05/24/2004	1455	SWAS	GRAB	19	6.36	86	19	64	27	66	11	48	0	22	148	0	.	.	0	
STAN	06/01/2004	1615	SWAS	GRAB	18	6.29	89	19	65	27	66	11	46	0	21	148	.	.	.	.	
STAN	06/08/2004	1630	SWAS	GRAB	18	6.20	94	19	67	28	66	11	48	0	22	147	0	.	.	0	
STAN	06/16/2004	0958	SWAS	GRAB	17	6.55	90	19	67	28	65	11	48	0	21	148	.	.	.	.	
STAN	06/22/2004	1317	SWAS	GRAB	19	6.26	85	19	64	26	65	11	47	0	22	145	.	.	.	.	
STAN	06/29/2004	1415	SWAS	GRAB	18	6.44	88	18	64	26	65	11	45	0	21	145	.	.	.	.	
STAN	07/06/2004	1505	SWAS	GRAB	.	6.49	93	19	67	27	65	12	47	0	19	146	.	.	.	.	
STAN	07/14/2004	0800	SWAS	GRAB	19	6.39	93	19	69	28	65	11	44	0	20	142	.	.	.	.	
STAN	07/20/2004	1135	SWAS	GRAB	19	6.34	99	19	68	28	68	12	44	0	23	146	.	.	.	.	
STAN	07/27/2004	1330	SWAS	GRAB	19	6.32	103	19	69	28	66	12	43	0	21	148	.	.	.	.	
STAN	08/03/2004	1520	SWAS	GRAB	21	6.37	106	19	70	29	67	12	42	0	21	150	0	.	.	0	
STAN	08/10/2004	1440	SWAS	GRAB	20	6.33	112	21	69	28	79	16	44	0	33	150	.	.	.	.	
STAN	08/17/2004	1455	SWAS	GRAB	20	6.42	99	19	70	28	67	12	41	0	22	148	.	.	.	.	
STAN	08/24/2004	1440	SWAS	GRAB	21	6.50	103	19	70	29	67	12	43	0	21	150	.	.	.	.	
STAN	08/31/2004	0855	SWAS	GRAB	20	6.45	108	20	72	30	69	12	42	0	21	151	.	.	.	.	
STAN	09/08/2004	1200	SWAS	ISCO	.	5.94	77	20	75	31	55	18	42	0	23	119	-0	.	.	.	
STAN	09/08/2004	1240	SWAS	GRAB	19	6.25	84	19	71	29	53	16	46	0	21	118	.	.	.	.	
STAN	09/08/2004	1400	SWAS	ISCO	.	6.14	80	18	68	29	52	16	45	0	21	115	0	.	.	.	
STAN	09/08/2004	1600	SWAS	ISCO	.	6.15	78	18	76	32	50	16	49	0	20	110	1	.	.	.	
STAN	09/08/2004	1800	SWAS	ISCO	.	6.15	79	19	77	32	51	15	55	1	20	114	10	.	.	.	
STAN	09/08/2004	2000	SWAS	ISCO	.	6.14	77	19	75	31	50	17	55	0	20	110	14	.	.	.	
STAN	09/09/2004	0000	SWAS	ISCO	.	6.09	75	21	86	34	43	22	68	0	18	101	11	.	.	.	
STAN	09/09/2004	0400	SWAS	ISCO	.	6.09	64	20	80	34	46	18	75	0	19	109	10	.	.	.	
STAN	09/09/2004	1200	SWAS	ISCO	.	6.22	64	19	77	32	48	15	71	0	20	116	4	.	.	.	
STAN	09/09/2004	2000	SWAS	ISCO	.	6.17	73	19	75	31	50	13	65	0	21	119	2	.	.	.	
STAN	09/14/2004	0915	SWAS	GRAB	16	6.38	79	17	63	26	55	10	43	0	21	135	0	.	.	.	
STAN	09/17/2004	1800	SWAS	ISCO	.	5.99	54	17	56	24	50	13	36	0	21	116	-0	.	.	.	
STAN	09/17/2004	2000	SWAS	ISCO	.	5.79	49	17	68	28	47	15	40	0	18	100	0	.	.	.	
STAN	09/17/2004	2200	SWAS	ISCO	.	6.01	56	18	76	32	51	15	49	0	18	108	0	.	.	.	
STAN	09/18/2004	0000	SWAS	ISCO	.	6.07	75	19	74	31	54	14	54	0	20	118	0	.	.	.	
STAN	09/18/2004	0200	SWAS	ISCO	.	6.15	76	19	73	31	55	13	56	0	20	123	0	.	.	.	

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
STAN	09/18/2004	0400	SWAS	ISCO	.	6.14	71	19	71	30	55	13	58	0	20	128	-0	.	.	.
STAN	09/18/2004	0600	SWAS	ISCO	.	6.17	67	19	71	31	55	13	58	0	21	128	-0	.	.	.
STAN	09/18/2004	0800	SWAS	ISCO	.	6.56	64	19	71	31	56	13	59	0	20	129	-0	.	.	.
STAN	09/18/2004	1000	SWAS	ISCO	.	6.22	62	19	70	30	55	12	59	0	21	130	-0	.	.	.
STAN	09/19/2004	0200	SWAS	ISCO	.	6.20	62	18	66	29	56	11	56	0	21	134	-0	.	.	.
STAN	09/20/2004	1000	SWAS	ISCO	.	6.12	52	17	61	27	56	10	48	0	21	135	0	.	.	.
STAN	09/21/2004	0945	SWAS	GRAB	13	6.64	72	17	63	26	55	10	46	0	21	136	.	.	.	.
STAN	09/28/2004	0930	SWAS	GRAB	16	6.14	82	18	63	27	54	14	40	0	22	121	0	.	.	.
STAN	09/28/2004	1000	SWAS	ISCO	.	6.47	81	18	63	27	54	15	39	-0	22	118	0	.	.	.
STAN	09/28/2004	1200	SWAS	ISCO	.	6.60	80	18	65	28	51	16	42	-0	20	107	-0	.	.	.
STAN	09/28/2004	1400	SWAS	ISCO	.	6.69	78	18	68	29	52	16	45	-0	20	106	0	.	.	.
STAN	09/28/2004	1600	SWAS	ISCO	.	6.65	78	18	70	30	51	16	48	-0	19	106	-0	.	.	.
STAN	09/28/2004	1800	SWAS	ISCO	.	6.69	78	19	74	32	52	17	55	-0	19	110	-0	.	.	.
STAN	09/28/2004	2200	SWAS	ISCO	.	6.75	78	21	77	34	58	15	68	-0	21	126	-0	.	.	.
STAN	09/29/2004	0200	SWAS	ISCO	.	6.76	78	21	77	33	58	14	69	-0	21	130	0	.	.	.
STAN	09/29/2004	1000	SWAS	ISCO	.	6.78	82	20	103	32	58	13	66	-0	21	134	0	.	.	.
STAN	09/29/2004	1800	SWAS	ISCO	.	6.77	78	19	69	31	58	12	60	-0	22	135	-0	.	.	.
STAN	10/05/2004	0900	SWAS	GRAB	13	6.74	75	17	63	27	59	10	43	-0	22	140	.	.	.	.
STAN	10/12/2004	0925	SWAS	GRAB	12	6.67	68	17	62	26	59	10	41	-0	22	142	0	.	.	.
STAN	10/19/2004	0905	SWAS	GRAB	12	6.89	67	18	63	26	60	10	41	-0	23	140	.	.	.	.
STAN	10/26/2004	0915	SWAS	GRAB	12	6.65	61	18	65	27	61	11	42	-0	23	141	0	.	.	.
STAN	11/02/2004	0900	SWAS	GRAB	13	6.83	90	19	67	28	63	11	44	0	23	142	.	.	.	.
STAN	11/09/2004	0900	SWAS	GRAB	9	6.94	84	19	67	29	62	11	43	0	23	141	1	.	.	.
STAN	11/19/2004	1510	SWAS	GRAB	12	6.82	69	18	66	28	61	11	47	0	22	137	.	.	.	.
STAN	11/23/2004	0910	SWAS	GRAB	11	6.30	93	19	68	29	63	11	45	0	23	139	-0	.	.	.
STAN	11/30/2004	0915	SWAS	GRAB	9	6.30	77	19	65	29	61	10	56	0	22	139	.	.	.	.
STAN	12/07/2004	0905	SWAS	GRAB	10	6.77	76	18	65	27	60	10	48	0	22	140	0	.	.	.
STAN	12/14/2004	0915	SWAS	GRAB	6	6.84	77	18	63	28	61	9	51	0	22	143	.	.	.	.
STAN	12/22/2004	1305	SWAS	GRAB	6	6.23	75	18	60	26	60	9	48	0	22	141	.	.	.	.
STAN	12/28/2004	1325	SWAS	GRAB	3	6.72	61	18	62	27	61	9	55	0	22	143	.	.	.	.
VT01	01/27/2004	9999	VTSSS	GRAB	4	6.87	75	20	79	33	55	9	26	43	13	129	.	.	.	.
VT01	04/28/2004	1313	VTSSS	GRAB	8	6.36	78	21	86	34	52	10	29	35	15	126	.	.	.	.
VT01	08/03/2004	1000	VTSSS	GRAB	14	6.60	125	22	95	39	61	10	24	35	13	161	.	.	.	.
VT01	10/27/2004	1040	VTSSS	GRAB	11	6.53	93	22	91	37	56	12	34	30	14	137	.	.	.	.
VT02	01/27/2004	9999	VTSSS	GRAB	3	6.39	21	16	49	25	44	11	46	43	12	117	.	.	.	.
VT02	04/28/2004	1115	VTSSS	GRAB	6	6.36	20	16	49	24	42	12	47	35	12	115	.	.	.	.
VT02	08/03/2004	1130	VTSSS	GRAB	15	6.56	46	15	47	24	50	12	48	15	12	146	.	.	.	.
VT02	10/27/2004	1230	VTSSS	GRAB	12	6.37	36	16	48	24	45	15	51	2	13	126	.	.	.	.
VT03	01/27/2004	9999	VTSSS	GRAB	3	6.63	49	12	33	31	28	13	31	3	11	106	.	.	.	.
VT03	04/28/2004	1140	VTSSS	GRAB	7	6.55	54	12	34	33	25	15	34	0	10	93	.	.	.	.
VT03	08/03/2004	1115	VTSSS	GRAB	15	6.53	91	15	45	42	37	18	26	0	11	135	.	.	.	.
VT03	10/27/2004	1150	VTSSS	GRAB	11	6.57	69	14	43	39	32	20	34	0	12	116	.	.	.	.
VT04	01/27/2004	9999	VTSSS	GRAB	2	6.39	22	13	23	16	53	9	47	9	11	129	.	.	.	.
VT04	04/28/2004	1418	VTSSS	GRAB	9	6.43	30	12	23	16	53	11	50	0	11	131	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
VT04	08/03/2004	0915	VTSSS	GRAB	16	6.56	53	13	27	17	63	11	36	3	11	168	.	.	.	.	
VT04	10/27/2004	0940	VTSSS	GRAB	11	6.55	39	13	26	18	55	12	46	0	14	148	.	.	.	.	
VT05	01/27/2004	9999	VTSSS	GRAB	3	6.60	45	13	24	36	29	17	44	0	11	99	.	.	.	.	
VT05	04/28/2004	9999	VTSSS	GRAB	.	6.61	43	12	22	34	28	22	44	0	13	101	.	.	.	.	
VT05	08/03/2004	1210	VTSSS	GRAB	17	6.82	113	20	53	72	38	26	43	0	12	131	.	.	.	.	
VT05	10/27/2004	0845	VTSSS	GRAB	12	6.75	103	20	53	69	34	30	47	0	14	116	.	.	.	.	
VT06	01/27/2004	9999	VTSSS	GRAB	3	6.53	34	15	39	46	26	13	57	12	11	83	.	.	.	.	
VT06	04/28/2004	1030	VTSSS	GRAB	6	6.36	37	15	37	45	25	14	53	5	11	84	.	.	.	.	
VT06	08/03/2004	1245	VTSSS	GRAB	17	6.38	69	18	49	58	33	18	54	10	11	106	.	.	.	.	
VT06	10/27/2004	1345	VTSSS	GRAB	12	6.51	74	18	52	58	28	21	57	0	12	89	.	.	.	.	
VT09	04/27/2004	1315	VTSSS	GRAB	10	5.39	-2	14	42	28	14	9	65	4	13	58	.	43	.	.	
VT09	10/28/2004	1235	VTSSS	GRAB	14	5.71	8	14	53	32	14	12	71	-0	15	67	.	59	48	.	
VT09	11/07/2004	1605	VTSSS	GRAB	10	5.81	5	13	48	30	15	9	68	0	14	70	.	.	.	.	
VT10	01/31/2004	1522	SWAS	GRAB	0	6.09	15	11	29	31	13	10	50	0	12	64	.	.	.	.	
VT10	02/02/2004	0944	VTSSS	GRAB	0	6.19	18	12	32	30	20	10	48	1	22	65	.	.	.	.	
VT10	04/29/2004	1500	VTSSS	GRAB	.	6.17	13	11	26	27	18	12	48	0	16	62	.	.	.	.	
VT10	07/27/2004	1135	VTSSS	GRAB	17	6.22	31	12	37	39	15	13	45	6	12	89	.	.	.	.	
VT10	10/28/2004	1145	VTSSS	GRAB	11	6.23	16	11	31	31	15	13	51	-0	16	75	.	.	.	.	
VT11	02/02/2004	1100	VTSSS	GRAB	2	6.26	15	11	30	30	13	10	38	6	14	71	.	.	.	.	
VT11	04/29/2004	1215	VTSSS	GRAB	11	6.21	17	11	30	29	12	12	39	4	14	55	.	.	.	.	
VT11	07/27/2004	1245	VTSSS	GRAB	17	6.14	36	11	35	34	13	11	34	2	13	88	.	.	.	.	
VT11	10/27/2004	1500	VTSSS	GRAB	12	5.90	14	11	32	32	12	13	41	0	15	75	.	7	.	.	
VT12	02/02/2004	1100	VTSSS	GRAB	0	6.80	89	19	79	67	13	11	42	12	15	59	.	.	.	.	
VT12	05/04/2004	1313	VTSSS	GRAB	8	6.85	83	18	74	63	14	14	39	12	16	67	.	.	.	.	
VT12	07/27/2004	1255	VTSSS	GRAB	18	6.67	168	27	129	101	15	18	38	14	16	80	.	.	.	.	
VT12	10/27/2004	1502	VTSSS	GRAB	14	6.84	101	18	79	64	13	15	40	0	16	75	.	.	.	.	
VT14	02/02/2004	1050	VTSSS	GRAB	4	6.19	12	10	27	29	14	10	41	6	14	65	.	.	.	.	
VT14	05/04/2004	1340	VTSSS	GRAB	12	6.20	13	11	26	30	14	12	46	2	14	66	.	.	.	.	
VT14	07/27/2004	1225	VTSSS	GRAB	19	6.25	27	11	34	34	15	12	35	5	14	95	.	.	.	.	
VT14	10/27/2004	1402	VTSSS	GRAB	13	6.28	19	11	30	33	14	14	47	0	16	80	.	.	.	.	
VT15	01/31/2004	1135	SWAS	GRAB	0	5.90	13	7	19	15	13	7	22	1	14	86	.	.	.	.	
VT15	02/02/2004	1027	VTSSS	GRAB	4	6.16	16	10	26	25	14	9	35	4	13	76	.	.	.	.	
VT15	05/04/2004	1347	VTSSS	GRAB	12	6.04	10	8	21	18	15	10	26	0	14	80	.	.	.	.	
VT15	07/27/2004	1203	VTSSS	GRAB	19	6.05	26	8	28	19	13	8	15	2	14	108	.	.	.	.	
VT15	10/27/2004	1400	VTSSS	GRAB	14	5.88	13	10	25	24	15	13	40	-0	16	90	.	12	.	.	
VT16	01/28/2004	1100	VTSSS	GRAB	0	6.10	14	16	63	36	15	11	82	2	18	68	.	.	.	.	
VT16	04/26/2004	0930	VTSSS	GRAB	14	6.31	26	16	65	37	16	15	80	0	18	68	.	.	.	.	
VT16	07/26/2004	1330	VTSSS	GRAB	19	6.10	28	15	57	33	15	12	66	0	19	81	.	.	.	.	
VT16	10/27/2004	0720	VTSSS	GRAB	13	6.26	23	15	58	34	13	15	73	0	17	80	.	.	.	.	
VT18	04/28/2004	1320	VTSSS	GRAB	9	6.38	39	20	68	55	25	17	81	9	12	83	.	.	.	.	
VT18	07/27/2004	0910	VTSSS	GRAB	16	6.61	106	24	87	71	41	23	70	14	11	92	.	.	.	.	
VT18	10/26/2004	1100	VTSSS	GRAB	8	6.86	88	22	79	65	33	18	74	1	14	92	.	.	.	.	
VT19	04/28/2004	1340	VTSSS	GRAB	9	6.39	36	20	71	57	23	18	73	22	13	81	.	.	.	.	
VT19	07/27/2004	0920	VTSSS	GRAB	16	6.40	78	23	85	67	29	23	69	30	11	97	.	.	.	.	

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC
					°C																
VT19	10/26/2004	1110	VTSSS	GRAB	9	6.78	77	21	75	62	27	21	49	0	14	93	.	.	.	.	.
VT22	05/03/2004	1212	VTSSS	GRAB	11	6.76	100	21	64	47	69	12	53	3	23	181	.	.	.	.	.
VT22	07/28/2004	1335	VTSSS	GRAB	19	6.64	158	25	82	59	84	16	42	0	23	213	.	.	.	.	.
VT22	10/25/2004	1330	VTSSS	GRAB	12	6.73	115	22	73	53	71	15	51	-0	25	191	.	.	.	.	.
VT23	05/03/2004	1100	VTSSS	GRAB	11	6.68	120	21	65	41	75	15	37	0	27	190	.	.	.	.	.
VT23	07/28/2004	1240	VTSSS	GRAB	18	6.69	185	26	87	55	89	19	29	0	26	226	.	.	.	.	.
VT23	10/25/2004	1243	VTSSS	GRAB	12	6.78	130	23	75	48	77	17	35	-0	28	204	.	.	.	.	.
VT24	02/04/2004	1530	VTSSS	GRAB	2	6.29	20	14	52	28	16	9	64	2	16	78	.	.	.	.	.
VT24	04/26/2004	1100	VTSSS	GRAB	13	6.19	19	13	47	27	15	13	59	0	16	75	.	.	.	.	.
VT24	07/26/2004	1300	VTSSS	GRAB	19	6.45	40	15	72	31	14	10	63	3	13	110	.	.	.	.	.
VT24	10/25/2004	1045	VTSSS	GRAB	10	6.19	18	13	48	25	14	13	60	-0	16	92	.	.	.	.	.
VT25	02/04/2004	1400	VTSSS	GRAB	4	5.76	3	9	21	23	14	7	41	1	14	64	.	10	.	.	.
VT25	04/26/2004	1000	VTSSS	GRAB	14	5.80	5	10	23	24	13	9	43	0	14	59	.	18	.	.	.
VT25	07/26/2004	1207	VTSSS	GRAB	19	5.85	5	9	22	24	13	8	37	3	14	82	.	13	.	.	.
VT25	10/25/2004	1000	VTSSS	GRAB	10	5.71	2	10	22	24	13	10	45	-0	16	76	.	16	.	.	.
VT26	01/30/2004	1440	VTSSS	GRAB	1	5.21	-6	17	47	35	13	11	87	6	18	64	.	50	10	.	.
VT26	04/30/2004	1345	VTSSS	GRAB	.	5.13	-7	18	49	34	13	13	90	8	20	64	.	51	15	.	.
VT26	07/28/2004	1215	VTSSS	GRAB	16	5.09	-9	15	40	30	13	6	79	0	17	76	.	39	.	.	.
VT26	10/26/2004	1315	VTSSS	GRAB	12	5.19	-6	16	48	31	12	10	86	0	20	74	.	35	.	.	.
VT28	01/30/2004	1400	VTSSS	GRAB	1	5.61	1	9	20	23	11	7	41	0	13	70	.	20	.	.	.
VT28	04/30/2004	1300	VTSSS	GRAB	.	5.38	-5	10	20	23	11	8	48	0	14	62	.	27	.	.	.
VT28	07/28/2004	1100	VTSSS	GRAB	15	5.35	-4	10	23	25	11	7	46	0	13	78	.	37	.	.	.
VT28	10/26/2004	1238	VTSSS	GRAB	10	5.53	1	9	22	23	11	8	44	0	14	79	.	26	.	.	.
VT29	01/30/2004	1000	VTSSS	GRAB	1	5.54	2	9	20	23	10	7	38	3	14	50	.	15	.	.	.
VT29	04/30/2004	1030	VTSSS	GRAB	11	5.48	-1	9	20	21	11	8	40	2	14	49	.	5	.	.	.
VT29	07/28/2004	0835	VTSSS	GRAB	17	5.42	1	10	22	24	11	8	39	4	13	62	.	15	.	.	.
VT29	10/26/2004	0937	VTSSS	GRAB	10	5.51	1	9	21	21	10	9	41	0	15	59	.	13	.	.	.
VT31	01/30/2004	1600	VTSSS	GRAB	0	5.15	-8	11	15	22	13	6	46	0	16	64	.	35	.	.	.
VT31	04/30/2004	1450	VTSSS	GRAB	.	5.05	-10	11	14	21	13	8	48	0	15	61	.	43	.	.	.
VT31	07/28/2004	1330	VTSSS	GRAB	17	5.25	-3	9	15	20	13	8	31	0	16	82	.	64	45	.	.
VT31	10/26/2004	1440	VTSSS	GRAB	11	5.07	-10	11	15	22	13	8	46	0	16	75	.	43	.	.	.
VT32	01/30/2004	1220	VTSSS	GRAB	1	5.64	1	16	59	38	11	8	78	16	17	51	.	25	.	.	.
VT32	04/30/2004	1145	VTSSS	GRAB	.	5.40	-1	17	59	36	11	9	76	23	18	49	.	15	.	.	.
VT32	07/28/2004	0915	VTSSS	GRAB	14	5.86	11	17	65	44	12	8	77	17	18	61	.	28	.	.	.
VT32	10/26/2004	1100	VTSSS	GRAB	10	5.85	7	15	58	38	11	9	75	7	19	59	.	16	.	.	.
VT33	01/29/2004	9999	VTSSS	GRAB	0	7.46	359	46	352	67	20	11	60	0	17	87	.	.	.	.	.
VT33	04/25/2004	1430	VTSSS	GRAB	15	7.22	257	35	250	59	20	13	56	0	17	86	.	.	.	.	.
VT33	07/27/2004	1717	VTSSS	GRAB	20	7.31	766	85	723	119	23	16	63	0	15	117	.	.	.	.	.
VT33	10/30/2004	1620	VTSSS	GRAB	15	7.55	409	50	393	73	20	17	59	-0	17	103	.	.	.	.	.
VT34	01/29/2004	1215	VTSSS	GRAB	1	6.46	30	15	58	34	18	9	66	1	17	76	.	.	.	.	.
VT34	04/25/2004	1500	VTSSS	GRAB	15	6.60	34	15	60	35	19	11	67	0	17	78	.	.	.	.	.
VT34	07/27/2004	1815	VTSSS	GRAB	20	6.70	81	19	87	46	25	12	56	5	21	98	.	.	.	.	.
VT34	10/30/2004	1651	VTSSS	GRAB	15	6.76	59	17	76	40	18	15	66	-0	17	90	.	.	.	.	.
VT36	01/28/2004	1055	VTSSS	GRAB	0	5.37	-7	18	28	42	21	25	91	6	21	90	.	37	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
VT36	04/29/2004	1100	VTSSS	GRAB	11	5.31	-3	18	28	42	21	28	97	2	21	85	.	36	.	.	
VT36	07/29/2004	1120	VTSSS	GRAB	18	5.38	-2	16	22	34	22	28	77	4	22	104	.	19	.	.	
VT36	07/29/2004	1430	SWAS	GRAB	20	5.44	-2	16	22	34	22	28	78	5	23	104	.	.	.	.	
VT36	10/25/2004	1425	VTSSS	GRAB	13	5.33	-2	17	25	37	20	30	90	-0	23	97	.	27	.	.	
VT37	02/02/2004	1300	VTSSS	GRAB	2	6.24	17	16	41	50	22	14	75	14	14	69	.	.	.	.	
VT37	04/26/2004	0815	VTSSS	GRAB	10	6.27	23	16	40	50	22	18	72	9	14	74	.	.	.	.	
VT37	07/27/2004	1030	VTSSS	GRAB	15	6.41	43	18	46	58	27	22	68	16	15	85	.	.	.	.	
VT37	10/25/2004	0830	VTSSS	GRAB	9	6.42	29	16	39	49	22	18	71	-0	15	79	.	.	.	.	
VT38	01/28/2004	1600	VTSSS	GRAB	1	6.61	47	26	79	76	35	17	125	7	16	76	.	.	.	.	
VT38	04/28/2004	1200	VTSSS	GRAB	9	6.45	53	25	77	75	34	19	121	6	16	84	.	.	.	.	
VT38	08/01/2004	0752	VTSSS	GRAB	20	6.48	135	34	120	115	45	29	106	28	17	95	.	.	.	.	
VT38	10/29/2004	1050	VTSSS	GRAB	12	6.70	76	25	83	78	35	21	112	-0	17	78	.	.	.	.	
VT39	05/05/2004	1015	VTSSS	GRAB	10	5.05	-10	12	11	18	16	15	55	0	15	69	.	60	13	.	
VT39	07/27/2004	1555	VTSSS	GRAB	18	5.08	-7	11	9	15	16	14	45	0	16	83	.	33	.	.	
VT39	10/25/2004	1120	VTSSS	GRAB	12	5.04	-10	12	12	18	16	16	53	0	16	79	.	48	16	.	
VT40	05/05/2004	1140	VTSSS	GRAB	11	6.01	9	11	15	24	23	22	54	0	16	77	.	.	.	.	
VT40	07/27/2004	1432	VTSSS	GRAB	18	6.20	18	11	15	24	23	24	46	0	17	83	.	.	.	.	
VT40	10/25/2004	1235	VTSSS	GRAB	11	6.02	17	11	16	26	22	23	50	0	17	86	.	.	.	.	
VT41	05/05/2004	0900	VTSSS	GRAB	9	5.91	7	12	29	26	17	18	62	2	16	71	.	12	.	.	
VT41	07/27/2004	1655	VTSSS	GRAB	19	6.08	15	12	29	26	17	18	55	1	16	86	.	.	.	.	
VT41	10/25/2004	0945	VTSSS	GRAB	12	5.96	9	12	30	28	17	18	61	0	17	80	.	4	.	.	
VT42	05/04/2004	1450	VTSSS	GRAB	10	6.69	63	14	48	27	47	9	24	7	20	128	.	.	.	.	
VT42	07/29/2004	0815	VTSSS	GRAB	16	6.67	94	16	54	31	55	11	18	7	20	154	.	.	.	.	
VT42	10/25/2004	1050	VTSSS	GRAB	11	6.58	82	15	48	28	49	11	21	1	20	138	.	.	.	.	
VT43	01/25/2004	1045	VTSSS	GRAB	1	6.67	44	10	32	12	39	5	12	0	18	100	.	.	.	.	
VT43	04/27/2004	1400	VTSSS	GRAB	10	6.63	58	10	35	12	39	6	12	0	18	101	.	.	.	.	
VT43	07/25/2004	1540	VTSSS	GRAB	15	6.49	70	11	41	14	42	5	10	0	18	111	.	.	.	.	
VT43	10/26/2004	1300	VTSSS	GRAB	10	6.51	65	11	39	14	42	7	11	0	18	109	.	.	.	.	
VT44	01/25/2004	1210	VTSSS	GRAB	1	6.59	44	15	49	20	49	6	36	0	20	124	.	.	.	.	
VT44	04/27/2004	1530	VTSSS	GRAB	11	6.68	68	15	54	21	53	8	35	0	20	129	.	.	.	.	
VT44	07/25/2004	1640	VTSSS	GRAB	17	6.27	94	16	61	23	58	8	30	0	19	145	.	.	.	.	
VT44	10/26/2004	1115	VTSSS	GRAB	11	6.16	81	16	57	23	54	9	38	0	19	136	.	.	.	.	
VT45	04/27/2004	1155	VTSSS	GRAB	13	6.49	39	15	23	47	32	27	60	0	21	110	.	.	.	.	
VT45	07/25/2004	1235	VTSSS	GRAB	20	6.54	70	19	32	62	37	30	55	3	21	129	.	.	.	.	
VT45	10/26/2004	0920	VTSSS	GRAB	13	6.65	49	18	31	57	36	31	70	0	23	120	.	.	.	.	
VT46	05/05/2004	1445	VTSSS	GRAB	12	6.64	65	16	61	21	53	5	45	0	21	123	.	.	.	.	
VT46	07/28/2004	0935	VTSSS	GRAB	17	6.73	96	17	71	23	61	5	34	0	21	145	.	.	.	.	
VT46	10/25/2004	0705	VTSSS	GRAB	11	6.50	70	16	66	22	58	6	38	0	23	135	.	.	.	.	
VT48	01/31/2004	1320	VTSSS	GRAB	0	6.58	36	16	25	43	33	29	69	1	17	117	.	.	.	.	
VT48	04/30/2004	2130	VTSSS	GRAB	12	6.31	39	16	22	38	32	35	63	0	18	116	.	.	.	.	
VT48	07/28/2004	1610	VTSSS	GRAB	20	6.69	64	18	31	49	36	42	60	3	18	136	.	.	.	.	
VT48	10/27/2004	1700	VTSSS	GRAB	16	6.72	51	17	29	46	33	39	64	0	19	129	.	.	.	.	
VT49	01/30/2004	1250	VTSSS	GRAB	1	6.47	34	19	69	57	19	13	94	7	15	85	.	.	.	.	
VT49	04/26/2004	1345	VTSSS	GRAB	12	5.49	1	22	59	61	15	24	118	16	16	66	.	81	47	.	

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC
					°C																
VT49	07/26/2004	1135	VTSSS	GRAB	16	6.65	68	20	85	55	22	12	78	5	15	97	.	.	.	.	.
VT49	10/26/2004	1005	VTSSS	GRAB	10	6.89	96	26	133	60	18	16	103	0	18	88	.	.	.	.	.
VT50	01/28/2004	1430	VTSSS	GRAB	0	4.91	-9	24	32	53	14	14	127	8	15	72	.	.	236	20	.
VT50	04/26/2004	1140	VTSSS	GRAB	12	4.84	-19	26	43	60	14	23	115	28	16	66	.	.	165	45	.
VT50	07/26/2004	1215	VTSSS	GRAB	16	4.85	-16	21	25	47	15	12	109	0	16	93	.	.	135	18	.
VT50	10/26/2004	1120	VTSSS	GRAB	11	4.77	-19	23	31	47	13	17	124	0	17	80	.	.	184	27	.
VT51	01/28/2004	1405	VTSSS	GRAB	0	7.07	145	35	123	120	59	15	112	12	31	146	.	.	.	.	.
VT51	04/30/2004	1430	VTSSS	GRAB	11	6.71	153	36	126	119	62	18	133	0	25	168	.	.	.	.	.
VT51	07/30/2004	1030	VTSSS	GRAB	18	6.89	405	55	211	192	115	25	94	0	31	168	.	.	.	.	.
VT51	10/26/2004	0810	VTSSS	GRAB	11	6.55	230	39	145	135	68	18	91	-0	37	177	.	.	.	.	.
VT52	01/28/2004	1300	VTSSS	GRAB	6	6.44	33	21	84	56	18	12	110	2	17	84	.	.	.	.	.
VT52	04/26/2004	1230	VTSSS	GRAB	12	6.18	18	20	84	46	16	15	115	0	17	72	.	.	.	.	.
VT52	07/27/2004	0850	VTSSS	GRAB	16	6.73	99	23	109	69	21	11	81	1	17	97	.	.	.	.	.
VT52	10/26/2004	1335	VTSSS	GRAB	11	6.60	44	21	96	52	17	13	104	0	19	90	.	.	.	.	.
VT53	01/28/2004	1148	VTSSS	GRAB	1	5.92	10	18	30	47	26	32	95	2	21	97	.	.	9	.	.
VT53	04/29/2004	1155	VTSSS	GRAB	12	6.02	12	18	29	44	26	37	97	1	22	92	.	.	.	.	.
VT53	07/29/2004	0920	SWAS	GRAB	17	6.11	25	18	28	45	27	39	83	4	23	115	.	.	.	.	.
VT53	07/29/2004	1222	VTSSS	GRAB	18	5.94	19	18	28	44	27	39	83	2	22	115	.	.	9	.	.
VT53	10/25/2004	1525	VTSSS	GRAB	12	6.05	18	18	29	46	26	39	93	-0	23	106	.	.	.	.	.
VT54	02/02/2004	0830	VTSSS	GRAB	0	6.51	43	29	91	87	37	19	124	29	18	83	.	.	.	.	.
VT54	04/26/2004	1335	VTSSS	GRAB	11	5.83	43	26	83	78	30	24	109	34	17	83	.	.	4	.	.
VT54	07/27/2004	1120	VTSSS	GRAB	15	6.46	79	31	101	96	38	27	109	46	19	99	.	.	.	.	.
VT54	10/25/2004	1245	VTSSS	GRAB	9	6.37	66	27	86	82	35	24	100	-0	19	93	.	.	.	.	.
VT56	02/02/2004	1135	VTSSS	GRAB	1	5.57	-2	15	24	46	15	15	79	6	14	66	.	.	28	.	.
VT56	04/26/2004	0925	VTSSS	GRAB	11	5.54	-1	14	22	41	15	20	78	5	14	71	.	.	8	.	.
VT56	05/02/2004	1236	SWAS	GRAB	13	5.57	0	14	21	40	15	19	76	2	14	71	.	.	.	.	.
VT56	07/27/2004	1130	VTSSS	GRAB	16	5.75	5	14	22	44	16	22	72	9	16	90	.	.	8	.	.
VT56	10/25/2004	1000	VTSSS	GRAB	10	5.65	3	14	22	40	14	20	77	0	14	78	.	.	16	.	.
VT57	02/02/2004	1020	VTSSS	GRAB	1	6.23	20	21	55	70	23	17	106	22	16	74	.	.	.	.	.
VT57	04/26/2004	1020	VTSSS	GRAB	11	6.31	20	21	55	68	24	21	102	23	15	79	.	.	.	.	.
VT57	07/27/2004	1315	VTSSS	GRAB	18	6.55	46	24	63	80	29	27	92	36	17	95	.	.	.	.	.
VT57	10/25/2004	1045	VTSSS	GRAB	10	6.46	31	21	55	69	24	23	105	5	17	86	.	.	.	.	.
VT58	01/29/2004	0955	VTSSS	GRAB	1	6.70	57	17	49	31	55	8	38	0	22	147	.	.	.	.	.
VT58	04/30/2004	1010	VTSSS	GRAB	10	6.41	79	18	58	36	58	11	50	0	21	146	.	.	.	.	.
VT58	07/30/2004	0830	VTSSS	GRAB	18	6.47	139	22	77	46	69	12	34	0	21	170	.	.	.	.	.
VT58	10/26/2004	1100	VTSSS	GRAB	11	6.92	90	18	60	36	59	11	36	-0	24	159	.	.	.	.	.
VT61	01/29/2004	0830	VTSSS	GRAB	0	7.16	191	37	131	123	87	8	70	22	31	231	.	.	.	.	.
VT61	04/30/2004	0900	VTSSS	GRAB	9	6.80	255	43	160	144	94	10	102	9	29	244	.	.	.	.	.
VT61	07/30/2004	0930	VTSSS	GRAB	18	6.88	444	53	212	174	136	13	49	0	29	313	.	.	.	.	.
VT61	10/26/2004	0945	VTSSS	GRAB	11	6.92	308	43	165	147	98	11	67	-0	35	249	.	.	.	.	.
VT62	01/28/2004	1525	VTSSS	GRAB	1	6.75	72	18	50	37	59	9	32	10	25	160	.	.	.	.	.
VT62	04/30/2004	0935	VTSSS	GRAB	9	6.48	84	19	59	43	60	12	50	0	23	155	.	.	.	.	.
VT62	07/30/2004	0900	VTSSS	GRAB	18	6.44	155	23	77	54	75	13	27	0	24	188	.	.	.	.	.
VT62	10/26/2004	1030	VTSSS	GRAB	11	6.90	98	19	59	44	61	13	33	-0	27	169	.	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
VT63	01/25/2004	1120	VTSSS	GRAB	1	6.77	68	15	52	21	53	6	25	0	22	141	.	.	.	.	
VT63	04/27/2004	1450	VTSSS	GRAB	12	6.92	85	15	55	21	55	8	25	0	21	138	.	.	.	.	
VT63	07/25/2004	1505	VTSSS	GRAB	18	6.46	117	18	69	26	62	9	23	0	20	151	.	.	.	.	
VT63	10/26/2004	1220	VTSSS	GRAB	12	6.86	98	16	63	25	58	10	21	0	21	143	.	.	.	.	
VT64	05/05/2004	1340	VTSSS	GRAB	12	6.70	47	10	36	13	37	5	14	0	18	99	.	.	.	.	
VT64	07/28/2004	0830	VTSSS	GRAB	17	6.46	63	12	47	16	39	7	10	0	17	111	.	.	.	.	
VT64	10/25/2004	0830	VTSSS	GRAB	10	6.75	69	11	42	16	39	9	11	0	20	104	.	.	.	.	
VT65	05/05/2004	1335	VTSSS	GRAB	10	6.63	59	12	45	15	44	6	26	0	18	111	.	.	.	.	
VT65	07/28/2004	0820	VTSSS	GRAB	17	6.46	89	14	57	18	49	7	20	0	16	128	.	.	.	.	
VT65	10/25/2004	0835	VTSSS	GRAB	10	6.52	64	13	52	18	47	8	22	0	19	125	.	.	.	.	
VT66	01/29/2004	1125	VTSSS	GRAB	1	6.68	132	25	97	74	52	4	47	22	31	137	.	.	.	.	
VT66	04/29/2004	1330	VTSSS	GRAB	12	6.77	145	27	109	80	58	6	53	5	31	147	.	.	.	.	
VT66	07/30/2004	0730	VTSSS	GRAB	18	6.61	219	33	140	102	69	5	43	11	33	164	.	.	.	.	
VT66	10/26/2004	1330	VTSSS	GRAB	12	6.62	170	28	117	86	57	6	45	-0	35	145	.	.	.	.	
VT67	02/05/2004	1030	VTSSS	GRAB	3	6.46	39	9	19	21	35	5	18	0	20	83	.	.	.	.	
VT67	04/30/2004	1015	VTSSS	GRAB	11	6.56	40	10	22	24	35	6	19	0	19	79	.	.	.	.	
VT67	07/27/2004	1330	VTSSS	GRAB	16	6.50	49	10	25	26	36	6	14	0	19	95	.	.	.	.	
VT67	10/27/2004	1400	VTSSS	GRAB	13	6.36	38	10	22	23	36	10	20	-0	22	91	.	.	.	.	
VT75	01/29/2004	1045	VTSSS	GRAB	1	6.76	95	24	93	70	50	4	50	25	33	127	.	.	.	.	
VT75	04/30/2004	1330	VTSSS	GRAB	13	6.77	128	25	102	75	53	6	51	14	30	134	.	.	.	.	
VT75	07/30/2004	0800	VTSSS	GRAB	18	6.60	208	31	137	100	59	5	40	12	33	144	.	.	.	.	
VT75	10/26/2004	1135	VTSSS	GRAB	12	6.65	140	26	108	79	52	6	46	-0	34	130	.	.	.	.	
VT76	05/04/2004	1530	VTSSS	GRAB	12	5.96	10	12	11	26	22	28	53	0	19	99	.	7	.	.	
VT76	07/28/2004	1431	VTSSS	GRAB	20	5.95	24	13	13	28	24	33	47	0	22	129	.	8	.	.	
VT76	10/25/2004	1420	VTSSS	GRAB	14	5.89	13	12	13	28	22	29	55	0	20	109	.	7	.	.	
VT77	05/03/2004	1435	VTSSS	GRAB	13	6.49	25	15	24	39	34	27	63	0	18	97	.	.	.	.	
VT77	07/29/2004	1024	VTSSS	GRAB	20	6.39	65	18	32	53	42	31	65	0	18	117	.	.	.	.	
VT77	10/25/2004	0905	VTSSS	GRAB	13	6.55	43	16	26	42	35	29	62	0	19	104	.	.	.	.	
VT78	04/30/2004	0950	VTSSS	GRAB	11	5.00	-11	13	25	21	10	7	62	5	10	51	.	38	.	.	
VT78	07/29/2004	1330	VTSSS	GRAB	17	5.16	-8	12	23	21	14	7	54	3	12	64	.	56	28	.	
VT78	11/01/2004	1509	VTSSS	GRAB	14	5.03	-10	13	26	22	11	7	62	0	12	61	.	56	24	.	
VT80	01/30/2004	1140	VTSSS	GRAB	1	5.91	8	16	38	53	18	12	91	7	15	86	.	27	.	.	
VT80	04/26/2004	1300	VTSSS	GRAB	12	5.08	-6	24	52	58	14	24	119	15	16	62	.	166	76	.	
VT80	07/26/2004	1100	VTSSS	GRAB	17	6.26	15	15	35	49	21	11	75	6	14	99	.	.	.	.	
VT80	10/26/2004	0945	VTSSS	GRAB	10	5.87	9	18	43	55	19	16	103	1	19	88	.	29	.	.	
VT81	02/05/2004	1100	VTSSS	GRAB	3	6.48	34	9	18	20	36	5	18	0	19	85	.	.	.	.	
VT81	04/30/2004	1025	VTSSS	GRAB	10	6.52	39	10	21	24	35	6	20	0	19	79	.	.	.	.	
VT81	07/27/2004	1335	VTSSS	GRAB	16	6.42	43	10	25	26	36	6	14	0	19	95	.	.	.	.	
VT81	10/27/2004	1410	VTSSS	GRAB	13	6.48	35	10	20	23	35	8	20	0	20	90	.	.	.	.	
WOR1	01/05/2004	1030	SWAS	GRAB	9	5.88	19	18	30	46	20	38	82	0	20	82	0	.	.	.	
WOR1	01/12/2004	1320	SWAS	GRAB	4	6.12	12	18	31	49	20	35	84	6	19	78	0	.	.	.	
WOR1	01/20/2004	1255	SWAS	GRAB	3	6.11	24	18	32	50	20	34	82	3	19	78	0	.	.	.	
WOR1	01/27/2004	1200	SWAS	GRAB	2	6.08	14	18	33	50	20	33	83	7	18	77	0	.	.	0	
WOR1	02/03/2004	1335	SWAS	GRAB	2	6.07	15	18	33	51	20	34	82	12	19	73	0	.	.	.	

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
WOR1	02/11/2004	1315	SWAS	GRAB	5	6.10	16	17	29	46	20	34	84	3	19	78	0	.	.	.	.
WOR1	02/18/2004	1300	SWAS	GRAB	3	6.07	14	17	30	47	20	33	83	2	19	79	0	.	.	.	.
WOR1	02/24/2004	1225	SWAS	GRAB	4	5.97	16	17	30	46	20	34	82	4	19	79	-0	.	.	.	.
WOR1	03/02/2004	1210	SWAS	GRAB	6	6.16	18	17	31	46	20	35	82	4	19	79	-0	.	.	.	.
WOR1	03/09/2004	1225	SWAS	GRAB	6	5.85	10	18	30	47	20	35	81	6	18	78	.	.	.	.	.
WOR1	03/16/2004	1300	SWAS	GRAB	6	6.04	14	18	32	46	20	36	81	6	18	77	-0	.	.	.	.
WOR1	03/23/2004	1215	SWAS	GRAB	6	5.71	10	18	30	46	20	34	80	7	18	78	-0	.	.	.	.
WOR1	03/30/2004	1335	SWAS	GRAB	10	6.18	10	17	30	45	21	37	82	5	19	79	0	.	.	.	.
WOR1	04/06/2004	1300	SWAS	GRAB	8	6.10	18	17	31	46	20	35	82	6	19	78	-0	.	.	.	.
WOR1	04/13/2004	1215	SWAS	GRAB	9	5.92	15	18	33	49	19	37	87	3	18	70	0	.	.	.	.
WOR1	04/20/2004	1235	SWAS	GRAB	14	6.13	18	17	30	45	20	39	84	5	19	80	0	.	.	.	.
WOR1	04/27/2004	1410	SWAS	GRAB	12	5.39	22	19	30	45	20	40	83	0	19	81	0	6	.	.	0
WOR1	05/04/2004	1255	SWAS	GRAB	12	6.14	16	16	28	43	20	36	78	3	19	79	0	.	.	.	.
WOR1	05/11/2004	1230	SWAS	GRAB	15	6.21	23	18	30	46	21	40	80	5	19	81	0	.	.	.	.
WOR1	05/18/2004	1300	SWAS	GRAB	17	6.17	34	19	33	50	22	45	79	7	19	84	0	.	.	.	.
WOR1	05/24/2004	1059	SWAS	GRAB	17	6.04	31	19	33	49	22	44	79	7	19	86	0	.	.	.	.
WOR1	06/01/2004	1250	SWAS	GRAB	17	5.69	20	19	31	46	22	42	79	7	19	85	.	.	.	.	.
WOR1	06/08/2004	1250	SWAS	GRAB	16	5.71	14	18	30	46	20	39	80	4	19	83	0	.	.	.	.
WOR1	06/15/2004	1030	SWAS	GRAB	16	5.93	21	18	31	46	20	40	79	4	19	85	0	.	.	.	.
WOR1	06/22/2004	1035	SWAS	GRAB	16	5.79	18	18	30	46	21	40	79	1	19	85	0	.	.	.	.
WOR1	06/29/2004	0905	SWAS	GRAB	16	6.01	34	19	33	52	22	43	78	2	19	87	.	.	.	.	.
WOR1	07/06/2004	1135	SWAS	GRAB	17	5.91	26	18	31	47	20	41	78	0	18	86	-0	.	.	.	.
WOR1	07/13/2004	0925	SWAS	GRAB	17	5.77	28	18	31	47	21	42	76	0	18	88	0	.	.	.	.
WOR1	07/20/2004	0738	SWAS	GRAB	16	5.95	38	19	34	52	22	44	77	2	19	91	0	.	.	.	.
WOR1	07/27/2004	0820	SWAS	GRAB	17	5.98	46	20	36	55	22	45	76	7	19	93	-0	.	.	.	.
WOR1	08/03/2004	1025	SWAS	GRAB	18	6.17	55	20	37	57	23	48	76	7	19	97	0	.	.	.	0
WOR1	08/10/2004	0830	SWAS	GRAB	17	6.13	49	21	38	59	23	47	78	5	20	98	.	.	.	.	.
WOR1	08/17/2004	1000	SWAS	GRAB	17	6.22	54	21	39	61	23	48	77	6	20	98	.	.	.	.	.
WOR1	08/24/2004	1045	SWAS	GRAB	19	6.28	56	21	40	63	23	48	77	0	20	100	.	.	.	.	.
WOR1	08/31/2004	1200	SWAS	GRAB	20	6.26	63	21	40	63	24	51	76	0	20	103	.	.	.	.	.
WOR1	09/14/2004	1315	SWAS	GRAB	17	5.93	15	18	32	48	20	41	83	0	19	87	.	.	.	.	.
WOR1	09/21/2004	1415	SWAS	GRAB	15	5.97	6	18	31	47	19	40	85	0	19	85	.	.	.	.	.
WOR1	10/05/2004	1310	SWAS	GRAB	15	6.01	14	17	31	45	19	40	83	-0	19	86	.	.	.	.	.
WOR1	10/12/2004	1355	SWAS	GRAB	14	6.10	8	18	31	47	19	40	84	-0	19	86	.	.	.	.	.
WOR1	10/19/2004	1335	SWAS	GRAB	14	6.08	13	18	33	50	20	40	84	-0	19	84	.	.	.	.	.
WOR1	10/26/2004	1300	SWAS	GRAB	14	5.89	11	19	34	51	20	42	83	-0	20	85	.	6	.	.	.
WOR1	11/02/2004	1230	SWAS	GRAB	16	5.81	30	19	35	53	21	44	83	0	20	87	.	.	.	.	.
WOR1	11/09/2004	1210	SWAS	GRAB	12	6.10	14	18	32	49	20	39	82	0	19	84	.	.	.	.	.
WOR1	11/19/2004	1220	SWAS	GRAB	12	6.05	14	17	30	45	19	37	80	0	19	83	.	.	.	.	.
WOR1	11/23/2004	1210	SWAS	GRAB	12	5.43	17	18	30	45	20	38	82	0	19	84	.	.	.	.	.
WOR1	11/30/2004	1250	SWAS	GRAB	10	6.01	10	17	29	44	19	36	82	0	19	82	.	.	.	.	.
WOR1	12/07/2004	1305	SWAS	GRAB	10	6.17	21	17	28	45	20	36	81	0	19	83	.	.	.	.	.
WOR1	12/14/2004	1205	SWAS	GRAB	8	6.16	16	17	30	46	19	35	82	0	19	82	.	.	.	.	.
WOR1	12/22/2004	1100	SWAS	GRAB	5	6.02	17	17	30	48	20	34	83	5	18	80	.	.	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC
					°C																
WOR1	12/28/2004	1110	SWAS	GRAB	3		6.12	17	17	31	46	19	32	81	3	19	80	.	.	.	.

Table 4B: Precipitation Sample Chemistry

Concentrations in $\mu\text{eq/L}$ (alkalinity and ions), $\mu\text{S/cm}$ (conductivity).
Chloroform (1 mL/L) added to precipitation samples.

Site	Interval Start	Interval End	Project	Method	Volume (mL)	PH	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	NH ₄ ⁺
A01	05JAN04:11:05	12JAN04:12:30	SWAS	BULK	250	4.71	17	29	4	4	1	20	14	7	1
A01	12JAN04:12:30	20JAN04:11:55	SWAS	BULK	150	5.13	19	59	7	6	2	43	37	9	39
A01	27JAN04:11:00	03FEB04:12:35	SWAS	BULK	550	4.75	14	11	2	7	1	27	19	9	1
A01	03FEB04:12:35	11FEB04:12:15	SWAS	BULK	2000	4.43	20	1	1	3	1	35	16	8	18
A01	02MAR04:11:15	09MAR04:11:45	SWAS	BULK	550	4.87	14	13	5	12	2	26	17	12	11
A01	09MAR04:11:45	16MAR04:11:50	SWAS	BULK	950	4.36	28	15	3	2	1	45	40	5	16
A01	16MAR04:11:50	23MAR04:11:00	SWAS	BULK	135	4.24	54	26	5	8	15	122	88	12	144
A01	23MAR04:11:00	30MAR04:12:45	SWAS	BULK	200	4.25	34	32	8	5	5	52	31	10	27
A01	30MAR04:12:45	06APR04:12:05	SWAS	BULK	700	4.14	40	3	2	5	1	53	56	7	15
A01	06APR04:12:05	13APR04:11:20	SWAS	BULK	2000	4.42	24	16	3	2	2	45	30	6	9
A01	13APR04:11:20	20APR04:11:35	SWAS	BULK	1100	4.29	29	2	1	4	1	37	32	6	6
A01	20APR04:11:35	27APR04:13:15	SWAS	BULK	1150	4.64	18	21	10	6	12	44	22	6	37
A01	11MAY04:13:30	18MAY04:13:45	SWAS	BULK	525	4.28	32	22	9	9	10	74	36	11	26
A01	18MAY04:13:45	24MAY04:12:25	SWAS	BULK	2000	4.80	10	3	1	2	1	17	10	3	12
A01	24MAY04:12:25	01JUN04:13:30	SWAS	BULK	2000	4.67	15	8	2	5	1	28	17	5	13
A01	01JUN04:13:30	08JUN04:13:45	SWAS	BULK	1700	4.45	18	2	1	0	1	32	17	3	15
A01	08JUN04:13:45	15JUN04:11:30	SWAS	BULK	2000	4.38	23	4	1	1	1	51	20	4	26
A01	15JUN04:11:30	22JUN04:09:30	SWAS	BULK	1880	4.76	8	2	0	1	0	10	6	2	4
A01	22JUN04:09:30	29JUN04:10:50	SWAS	BULK	1400	4.39	21	6	1	1	1	38	17	2	8
A01	29JUN04:10:50	06JUL04:10:25	SWAS	BULK	2000	4.37	21	3	1	0	0	41	15	3	16
A01	06JUL04:10:25	13JUL04:08:30	SWAS	BULK	2000	4.48	16	5	1	1	1	28	13	3	5
A01	13JUL04:08:30	20JUL04:08:20	SWAS	BULK	750	4.28	27	10	2	1	1	56	24	4	20
A01	20JUL04:08:20	27JUL04:09:20	SWAS	BULK	1250	4.76	12	4	1	0	0	33	11	2	25
A01	27JUL04:09:20	03AUG04:11:15	SWAS	BULK	800	4.43	22	6	2	6	2	34	17	8	18
A01	03AUG04:11:15	10AUG04:10:20	SWAS	BULK	930	4.36	20	3	1	0	1	35	12	2	12
A01	31AUG04:11:00	08SEP04:10:55	SWAS	BULK	2000	4.78	10	1	2	7	1	19	5	9	0
A01	08SEP04:10:55	14SEP04:12:00	SWAS	BULK	2000	4.89	6	1	1	4	1	9	-0	4	0
A01	14SEP04:12:00	21SEP04:12:35	SWAS	BULK	2000	4.95	6	1	1	4	1	9	2	5	2
A01	21SEP04:12:35	28SEP04:11:45	SWAS	BULK	2000	4.77	10	1	2	6	0	17	6	8	1

Site	Interval Start	Interval End	Project	Method	Volume (mL)	PH	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	NH ₄ ⁺
A01	28SEP04:11:45	05OCT04:11:30	SWAS	BULK	2000	5.05	5	1	0	1	0	9	-0	1	0
A01	02NOV04:11:10	09NOV04:11:10	SWAS	BULK	1000	4.59	13	4	1	1	1	19	9	2	8
A01	09NOV04:11:10	19NOV04:12:55	SWAS	BULK	2000	4.65	12	3	1	1	1	18	11	2	0
A01	23NOV04:11:20	30NOV04:11:30	SWAS	BULK	1800	4.68	11	2	1	4	0	19	2	5	9
A01	30NOV04:11:30	07DEC04:12:15	SWAS	BULK	1000	4.49	16	4	1	2	1	22	13	5	3
A01	07DEC04:12:15	14DEC04:11:15	SWAS	BULK	1800	4.69	11	2	1	1	0	17	7	2	0
SHW1	07JAN04:11:50	14JAN04:10:15	SWAS	WET_ONLY	100	4.65	12	4	1	1	0	7	25	4	7
SHW1	14JAN04:10:15	21JAN04:12:00	SWAS	WET_ONLY	200	4.64	14	7	2	1	1	21	20	6	18
SHW1	21JAN04:12:00	17FEB04:15:00	SWAS	WET_ONLY	3500	4.83	7	1	0	1	0	12	4	4	3
SHW1	17FEB04:15:00	25FEB04:12:05	SWAS	WET_ONLY	150	4.31	33	24	4	4	2	61	51	8	42
SHW1	25FEB04:12:05	03MAR04:11:45	SWAS	WET_ONLY	150	4.42	24	11	6	21	2	25	29	33	14
SHW1	03MAR04:11:45	10MAR04:11:25	SWAS	WET_ONLY	1600	4.60	19	5	3	10	1	32	24	11	15
SHW1	10MAR04:11:25	17MAR04:11:40	SWAS	WET_ONLY	1100	4.37	24	2	0	1	0	36	28	3	14
SHW1	17MAR04:11:40	24MAR04:11:40	SWAS	WET_ONLY	600	4.44	25	4	1	2	1	49	35	3	38
SHW1	24MAR04:11:40	31MAR04:12:40	SWAS	WET_ONLY	550	4.32	26	4	3	10	1	35	27	14	13
SHW1	31MAR04:12:40	07APR04:14:00	SWAS	WET_ONLY	1770	4.26	28	1	0	0	0	41	34	2	19
SHW1	07APR04:14:00	14APR04:13:05	SWAS	WET_ONLY	5250	4.53	16	3	1	1	0	26	16	5	11
SHW1	14APR04:13:05	21APR04:12:30	SWAS	WET_ONLY	350	4.20	49	38	10	7	6	112	61	16	67
SHW1	21APR04:12:30	28APR04:12:45	SWAS	WET_ONLY	2070	4.75	13	7	3	5	3	29	16	4	23
SHW1	28APR04:12:45	05MAY04:12:20	SWAS	WET_ONLY	2840	5.03	6	1	1	3	1	10	0	3	3
SHW1	05MAY04:12:20	12MAY04:12:05	SWAS	WET_ONLY	630	4.80	22	23	7	1	12	75	36	4	61
SHW1	12MAY04:12:05	19MAY04:14:44	SWAS	WET_ONLY	700	4.98	12	12	6	9	5	27	22	8	21
SHW1	19MAY04:14:44	27MAY04:13:15	SWAS	WET_ONLY	2900	5.01	9	4	2	4	2	22	14	3	24
SHW1	27MAY04:13:15	02JUN04:13:30	SWAS	WET_ONLY	1950	5.18	8	4	1	2	1	23	12	2	27
SHW1	02JUN04:13:30	09JUN04:14:05	SWAS	WET_ONLY	3000	4.51	16	1	0	0	1	30	13	2	15
SHW1	09JUN04:14:05	16JUN04:11:48	SWAS	WET_ONLY	1600	4.55	14	1	0	1	0	28	12	2	11
SHW1	16JUN04:11:48	23JUN04:12:30	SWAS	WET_ONLY	850	4.83	11	6	1	1	1	29	15	3	26
SHW1	23JUN04:12:30	30JUN04:12:00	SWAS	WET_ONLY	300	4.43	18	1	0	0	0	25	21	3	13
SHW1	30JUN04:12:00	07JUL04:11:50	SWAS	WET_ONLY	2450	4.59	13	1	0	0	0	25	13	2	14
SHW1	07JUL04:11:50	14JUL04:12:35	SWAS	WET_ONLY	2000	4.55	16	3	1	0	1	40	14	2	25
SHW1	14JUL04:12:35	21JUL04:10:35	SWAS	WET_ONLY	500	4.38	31	15	3	1	2	88	28	5	69
SHW1	21JUL04:10:35	28JUL04:10:50	SWAS	WET_ONLY	600	4.36	21	3	0	1	1	39	16	3	12
SHW1	28JUL04:10:50	04AUG04:09:35	SWAS	WET_ONLY	950	4.79	11	1	1	3	0	22	8	4	13
SHW1	04AUG04:09:35	11AUG04:10:55	SWAS	WET_ONLY	850	4.17	37	9	2	0	1	94	22	4	41
SHW1	11AUG04:10:55	18AUG04:10:40	SWAS	WET_ONLY	1200	4.59	13	1	0	0	0	24	7	2	5
SHW1	18AUG04:10:40	25AUG04:12:10	SWAS	WET_ONLY	670	4.68	17	9	1	1	1	51	17	3	31
SHW1	25AUG04:12:10	01SEP04:13:20	SWAS	WET_ONLY	400	4.37	24	3	3	10	1	47	13	15	11
SHW1	01SEP04:13:20	10SEP04:13:55	SWAS	WET_ONLY	10000	4.91	9	4	3	8	4	18	3	10	0
SHW1	10SEP04:13:55	15SEP04:13:00	SWAS	WET_ONLY	350	3.97	55	5	3	8	1	114	42	17	46

Site	Interval Start	Interval End	Project	Method	Volume (mL)	PH	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	NH ₄ ⁺
SHW1	15SEP04:13:00	22SEP04:12:55	SWAS	WET_ONLY	6640	5.07	6	3	2	4	4	10	-0	5	0
SHW1	22SEP04:12:55	29SEP04:12:05	SWAS	WET_ONLY	9700	4.97	6	1	1	2	1	11	2	3	-0
SHW1	29SEP04:12:05	06OCT04:13:05	SWAS	WET_ONLY	150	4.07	51	14	2	1	1	128	46	6	76
SHW1	13OCT04:13:05	20OCT04:13:55	SWAS	WET_ONLY	1260	4.34	24	4	0	1	0	39	25	4	16
SHW1	27OCT04:14:10	05NOV04:12:15	SWAS	WET_ONLY	1940	4.94	7	6	3	0	3	16	8	2	3
SHW1	10NOV04:11:55	17NOV04:12:00	SWAS	WET_ONLY	1750	4.90	6	1	0	0	0	9	3	1	1
SHW1	17NOV04:12:00	24NOV04:11:10	SWAS	WET_ONLY	800	4.50	14	1	0	0	0	24	5	1	-0
SHW1	24NOV04:11:10	01DEC04:12:30	SWAS	WET_ONLY	3500	4.84	7	1	1	4	0	12	4	6	1
SHW1	01DEC04:12:30	08DEC04:13:55	SWAS	WET_ONLY	750	4.81	10	3	1	1	1	17	13	3	10
SHW1	08DEC04:13:55	15DEC04:13:45	SWAS	WET_ONLY	1645	4.71	10	3	1	2	2	20	8	3	10
SHW1	15DEC04:13:45	29DEC04:13:25	SWAS	WET_ONLY	1900	5.42	6	16	2	4	1	12	8	6	0

Table 5: Volatile Residue Determination

Sample ID	Organics/L g/L
January-04	
PAIN 1/27/04 13:30	0.00005
VT36 Meadow Run	0.00005
VT51 Jeremy's Run	0.00005
VT53 Twomile Run	0.00000
VT58 Brokenback Run	0.00015
STAN 1/28/04 09:45	0.00010
PINE 1/28/04 12:30	0.00015
VT61 N Fork Thornton River	0.00020
VT62 Hazel Run	0.00036
VT66-1 Rose River	-0.00005
VT75 White Oak Canyon Run	0.00000
VT66-2 Rose River	0.00005
April-04	
PAIN 4/27/04 15:00	0.00020
VT36 Meadow Run	0.00015
VT51 Jeremy's Run	0.00040
VT53 Twomile Run	0.00015
VT58 Brokenback Run	0.00095
STAN 4/27/04 09:20	0.00075
PINE 4/28/04 11:30	0.00070
VT61 N Fork Thornton River	0.00135
VT62 Hazel Run	0.00180
VT66 Rose River	0.00030
VT75-1 White Oak Canyon Run	0.00045
VT75-2 White Oak Canyon Run	0.00050
July-04	
PAIN 8/3/04 13:15	0.00030
VT36-1 Meadow Run	0.00015
VT51 Jeremy's Run	0.00025
VT53 Twomile Run	0.00005
VT58 Brokenback Run	0.00085
STAN 8/3/04 15:20	0.00060
PINE 7/28/05 09:30	0.00065
VT61 N Fork Thornton River	0.00070
VT62 Hazel Run	0.00125
VT66 Rose River	0.00060
VT75 White Oak Canyon Run	0.00037
VT36-2 Meadow Run	0.00025

Sample ID	Organics/L g/L
October-04	
PAIN 10/26/04 14:10	0.00035
VT36 Meadow Run	0.00020
VT51 Jeremy's Run	-0.00102
VT53 Twomile Run	0.00015
VT58 Brokenback Run	0.00051
STAN 10/26/04 09:15	0.00055
PINE 10/27/06 11:30	0.00030
VT61 N Fork Thornton River	0.00025
VT62 Hazel Run	0.00080
VT66-1 Rose River	0.00025
VT75 White Oak Canyon Run	0.00025
VT66-2 Rose River	0.00020