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TRITIUM SAMPLE ANALYSES IN THE SAVANNAH RIVER AND ASSOCIATED WATERWAYS FOLLOWING THE K-REACTOR RELEASE OF DECEMBER 1991 (U)

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. DE-AC-88SR18035

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by

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CONTENTS

INTRODUCTION

An unplanned release of tritiated water occurred at K reactor on SRS between 22-December and 25-December, 1991. This water moved down through the effluent canal, Pen Branch, Steel Creek and finally to the Savannah River. Samples were collected in the Savannah River and associated waterways over a period of a month. The Environmental Technology Section (ETS) of the Savannah River Laboratory performed liquid scintillation analyses to monitor the passage of the tritiated water from SRS to the Atlantic Ocean.

DISCUSSION

Sample collection

Samples were collected by one of two methods at the locations shown in Table A1. ETS sampling teams collected grab samples by dipping a plastic bottle below the water surface. (Water treatment plant personnel collected many of the raw and finished water samples from the treatment plants for activity determination by ETS.) The second technique used battery-powered automatic samplers to collect grab samples at specific time intervals. All bottles used in these two techniques were rinsed with deionized water prior to use.

Automatic samplers were in place at Steel Creek and in the Savannah River at the Highway 301 bridge (Figure A1) before the December, 1991 K-reactor release. Each sampler was programmed to collect a sample at 6-hour intervals and combine four successive samples to form a 24-hour composite. After the release, the samplers' programs were changed to collect individual grab samples at one to two hour intervals and later, secondary automatic samplers were installed at Steel Creek and Highway 301 as backups. Additional samplers were installed after 28-December at locations further downstream from Highway 301.

Laboratory Analyses

ETS personnel prepared water samples for activity determination by liquid scintillation counting (LSC). Samples received from the various sampling locations were assigned a log number and prepared for counting, usually within 12 hours of collection. Samples were prepared in batches depending on location. Three mL of sample were measured into a plastic liquid scintillation vial along with 19 mL of Packard Opti-Fluor™ liquid scintillation cocktail. Each sample was prepared in duplicate.

At least one blank and one spike were prepared with each batch of samples received. Blanks were prepared using three mL of deionized water and 19 mL of cocktail. Each spike contained three mL of deionized water, 19 mL of cocktail and 0.250 mL of a dilution of a

National Institute of Standards (NIST) calibrated tritiated water standard. The spikes were used to confirm the quench correction for counting efficiency.

Samples, blanks and spikes were shaken to mix and then transferred to the ETS counting room. The samples were placed into a Packard Tri-Carb™ 2050A with automatic quench correction. Counting of the samples was delayed 30 minutes to allow the natural fluorescence to diminish before determining the sample activity. A single 10 minute count was performed on each sample, and as time permitted the duplicates were counted. Due to time and instrument constraints the duplicates were counted a few hours to several days after the original sample count; not all sample duplicates were counted.

Results

The tritium concentration data for all sampling locations are shown in Appendices B through F. The measured tritium concentration is reported in units of pCi/mL. For consistency, all data are reported to two decimal places, however this may overestimate the accuracy in some cases. When both the sample and the duplicate were counted, the average result is reported with its precision (95% confidence level). If the sample only was counted the concentration is reported without an associated uncertainty. Typical counting uncertainties may be estimated from Figure G1.

Quality control charts showing the counting results of blank and spike samples are shown in Figures G2 and G3. The running average dpm in the tritium energy region of the blank is shown as the smoothed line in Figure G3. The photo-multiplier tube (PMT) in the Tri-Carb counter failed on 15-January (after blank number 149 and spike number 121). The PMT was replaced and counting of samples resumed. Variability in the blank count rate increased but the average blank count rate remained the same within counting error. Separate running averages were used before and after the PMT failure. We excluded blank number 191 (196 dpm) from the running average.

If the quench correction had no uncertainty associated with it, the expected spike activity would be 6613 dpm (the solid line in Figure G2). This is based on the NIST certified value of the standard. Prior to the PMT failure spike recovery (dpm measured/dpm expected) averaged 1.04, implying the activity in the water samples may have been overestimated by 4%. After the PMT was replaced the spike recovery was significantly higher. As seen in Figure G2, sample activity may have been overestimated by up to 20% after the PMT replacement. However, counting uncertainties for these samples were greater than 20% (Figure G1). This was due to the low tritium concentrations at that time. The large counting uncertainty masked the bias in the quench correction.

Daily composite samples collected at Steel Creek and Highway 301 prior to the tritium release at K reactor showed typical levels of tritium to be a few pCi/mL (Appendices B and C). The peak tritium concentration in Steel Creek due to the K-reactor release occurred during the morning of 28-December; the peak activity was 1364.5 pCi/mL. The sampler at Steel Creek failed after 16:00 on 28-December. No samples were collected until the following morning. The peak tritium concentration at Highway 301 exceeded 60 pCi/mL on 28-December and declined daily toward prerelease concentrations.

As shown in Figures D1 and E1, the peak tritium concentration of greater than 50 pCi/mL in the Savannah River passed by the intakes for the Beaufort-Jasper and Port Wentworth water treatment plants on 30-December. The tritium concentration in the Savannah River had decreased by approximately 20% water from Highway 301 to Becks Ferry, principally due to dilution by surface water inflow from streams between these locations.

The Beaufort-Jasper water treatment plant stopped pumping water from the Savannah River on 28-December. Beginning 1-January, grab samples were collected in the canal leading to the Beaufort-Jasper lift station. On 1-January, the maximum tritium concentration in the canal was 30 pCi/mL near the Savannah River (Table D2). Concentrations decreased to 15 pCi/mL by the time the Beaufort-Jasper water treatment plant resumed pumping on 6-January. Water with a tritium concentration of approximately 16.5 pCi/mL moved down the canal and through the lift station (Figure D2) on 7-January with the resumption of pumping. Tritium concentrations at the lift station declined to less than 5 pCi/mL by 15-January.

Aqueous grab samples were collected in the canal between the lift station and the water treatment plant beginning 7-January (Table D4). These data show the parcel of tritiated water moving down the canal, reaching the holding pond prior to the treatment plant 14-January. The diluted tritium concentration at the pond entrance was half that measured at the lift station. Analysis of the samples collected at the plant intake (Figure D3) confirms that the tritiated water did not reach the Beaufort-Jasper treatment plant until 14-January. From 14-January to 23-January, tritium concentrations measured at the plant intake were 5-7 pCi/mL. As shown in Table D6, the activity of the finished drinking water increased slightly after 15-January.

Sampling in the Port Wentworth water treatment plant system was not as extensive as in the Beaufort-Jasper system. The fresh water source for the Port Wentworth water treatment plant is Abercorn Creek (Figure A2). Due to its proximity to the coast, Abercorn Creek experiences tidal ranges of 6 feet. The tidal cycle transports a considerable amount of water in and out of Abercorn Creek. At high tide, the tritium concentration at the lift station is similar to the concentration in the Savannah River. At low tide, the tritium concentration represents the water that was stored in

the upper reaches of Abercorn Creek.

Tritiated water was first introduced into Abercorn Creek from the Savannah River with the 28-December afternoon high tide. Tritium concentrations measured at the Port Wentworth lift station increased (Figure E2). As the tide ebbed, the tritiated Savannah River water was replaced by water from the upper reaches of Abercorn Creek. The tritium concentration measured at the lift station decreased. Examination of the data shows that the high tide tritium concentration at the Abercorn Creek lift station is very similar to the Savannah River tritium concentration measured upstream at Becks Ferry (Figures D1 and E1).

Over many tidal cycles, the tritiated water from the Savannah River mixed with the water in the upper reaches of the creek. This caused the low tide tritium concentration measured at the lift station to increase (Figure E2). On 3-January the low and high tide tritium concentration at Abercorn Creek lift station were the same. The Savannah River tritium concentration had decreased to near 20 pCi/mL, as seen at Becks Ferry. The tritium concentration in the upper reaches of the Abercorn Creek was also near 20 pCi/mL.

In the Savannah River tritium concentrations continued to decrease, becoming less than 10 pCi/mL by 7-January (Figure E1). Savannah River water with lower tritium concentrations was now being transported up Abercorn Creek to the lift station at high tide. At low tide the tritiated water in the upper Abercorn Creek passed by the lift station. The data continued to show that the tritium concentration measured at high tide at the Abercorn Creek lift station mimicked the measured concentration in the Savannah River at Becks Ferry. By 10-January tidal fluctuations in tritium concentration at the Abercorn Creek lift station could no longer be observed; the tritium concentration in the upper Creek and the Savannah River had both returned to lower levels. From 16-January to 21-January samples were collected at low and high tide only. After 22-January the automatic sampler was programmed to collect daily composites.

The only other samples collected in the Port Wentworth system were raw and finished water from the treatment plant. The tritium concentrations in both the raw and finished water were greater than 10 pCi/mL from 30-December through 7-January (Table E2). As the river's tritium concentration returned to lower values, so did the tritium concentration in the raw and finished water.

Samples were also collected in the Savannah River estuary (Figure A3). The U.S. Coast Guard (USCG) authorized ETS use of their sampler installed at Fort Pulaski. ETS installed additional samplers at Priest Landing and Skidaway Institute. Grab samples were collected at Thunderbolt Marina and Lazaretto Creek. Tritium concentrations were elevated (8-10 pCi/mL) at the Thunderbolt Marina

and in Lazaretto Creek during the first week in January but returned to lower levels by 15-January (Table F1).

The results for the samples collected at Fort Pulaski are shown in Figure F1. The data show tidal fluctuations in the tritium concentration measured at this location. At Fort Pulaski, water flow is dominated by the Savannah River during low tide. During high tide, water from the Atlantic Ocean enters the river mouth. The Savannah River was the source of tritium and so only at low tide were significant amounts of tritium measured at Fort Pulaski. After 15-January samples were collected at low and high tide only.

Samples collected near Skidaway Institute and Priest Landing typically had tritium concentrations of only a few pCi/mL (Figures F2 and F3). On 10-January a single sample collected at Priest Landing had a tritium concentration of 11.4 pCi/mL. Tritium exiting the mouth of the Savannah River may have been transported into the Wassaw Sound and moved up the Wilmington River during high tide. This mechanism may have introduced elevated tritium to the Priest Landing sampling sight.

On 3-January, a series of grab samples were collected in the Savannah River and in the waterways to the north and south of the river (Figure A3). The results are shown in Table F5. Samples were collected along the Wilmington River from Wassaw Sound to the Savannah River (south sweep). A sweep of the Savannah River was then conducted from Mackey Point down to the river mouth. Finally sampling was performed in the vicinity of New River and Calibogue Sound (north sweep).

Results for the south sweep show that tritium concentrations decreased with increasing distance from the Savannah River. Tritium concentrations in the Wilmington River decreased from 13.5 pCi/mL near the Savannah River to nondetectable amounts in the Wassaw Sound. In the north sweep, no elevated tritium concentrations were detected. Tritium concentrations in the Savannah River near Mackey Point exceeded 25 pCi/mL (Table F5). Samples collected downstream from Mackey Point showed decreasing tritium concentrations. The 26 pCi/mL peak moved down toward Fort Pulaski and was diluted to less than 17 pCi/mL by 4-January (Figure F1).

SUMMARY

Tritiated water released from K reactor in December 1991 was tracked from SRS to the Atlantic Ocean. The peak tritium concentration in Steel Creek was 1364.5 pCi/mL the morning of 28-December. Dilution by the Savannah River resulted in a peak concentration of 66.9 pCi/mL at the Highway 301 bridge, also on 28-December. The peak concentration of tritium reached the Beaufort-Jasper and Port Wentworth water treatment plant intakes on 30-December, with concentrations of greater than 50 pCi/mL. At Fort Pulaski, on the

South Carolina/Georgia coast, the maximum tritium concentration measured was only 16.9 pCi/mL on 4-January. Tritium concentrations measured in all waterways declined through the month of January and sampling at all locations returned to pre-release monitoring conditions.

ACKNOWLEDGEMENTS

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APPENDIX A

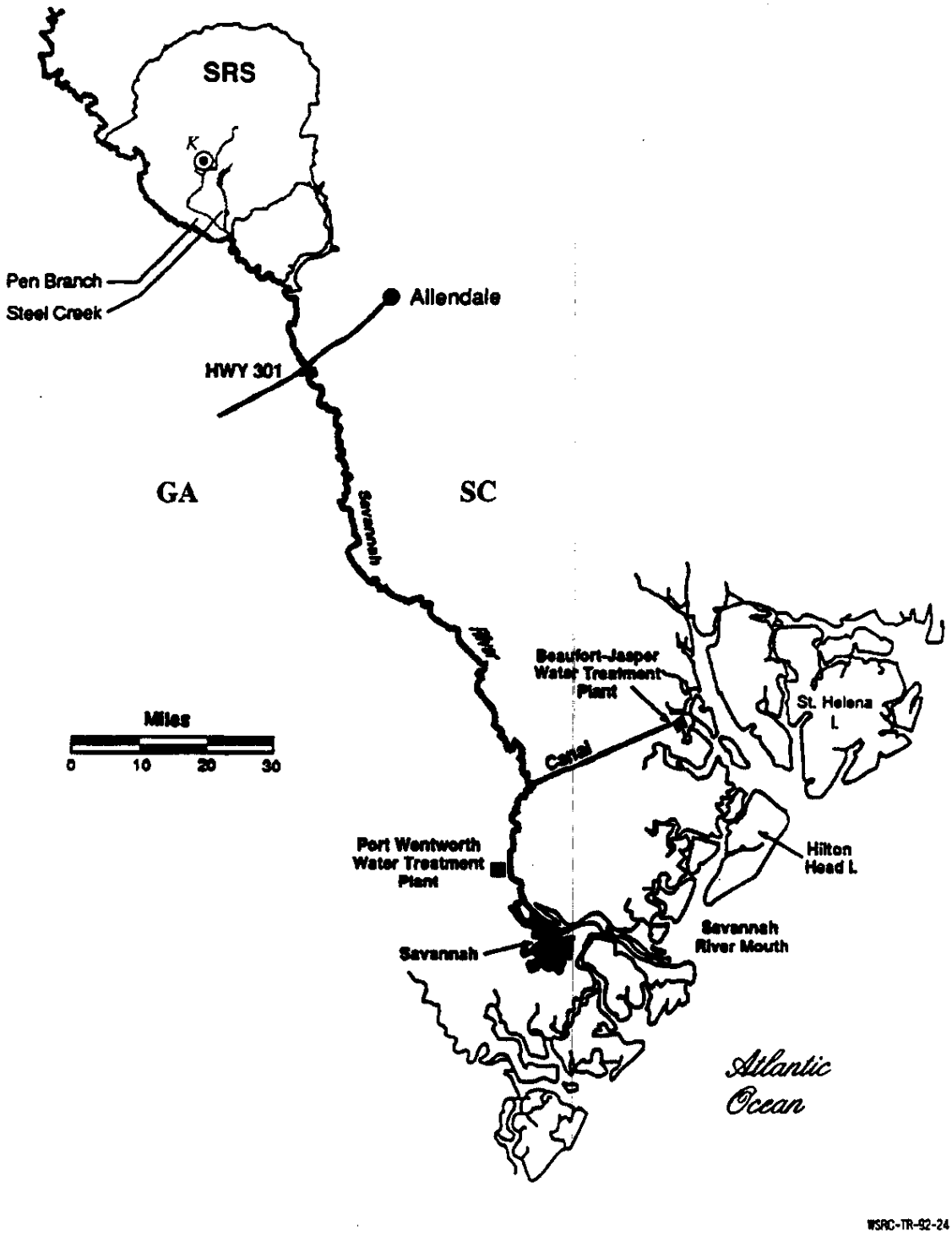


Figure A1. SRS to the Atlantic Ocean

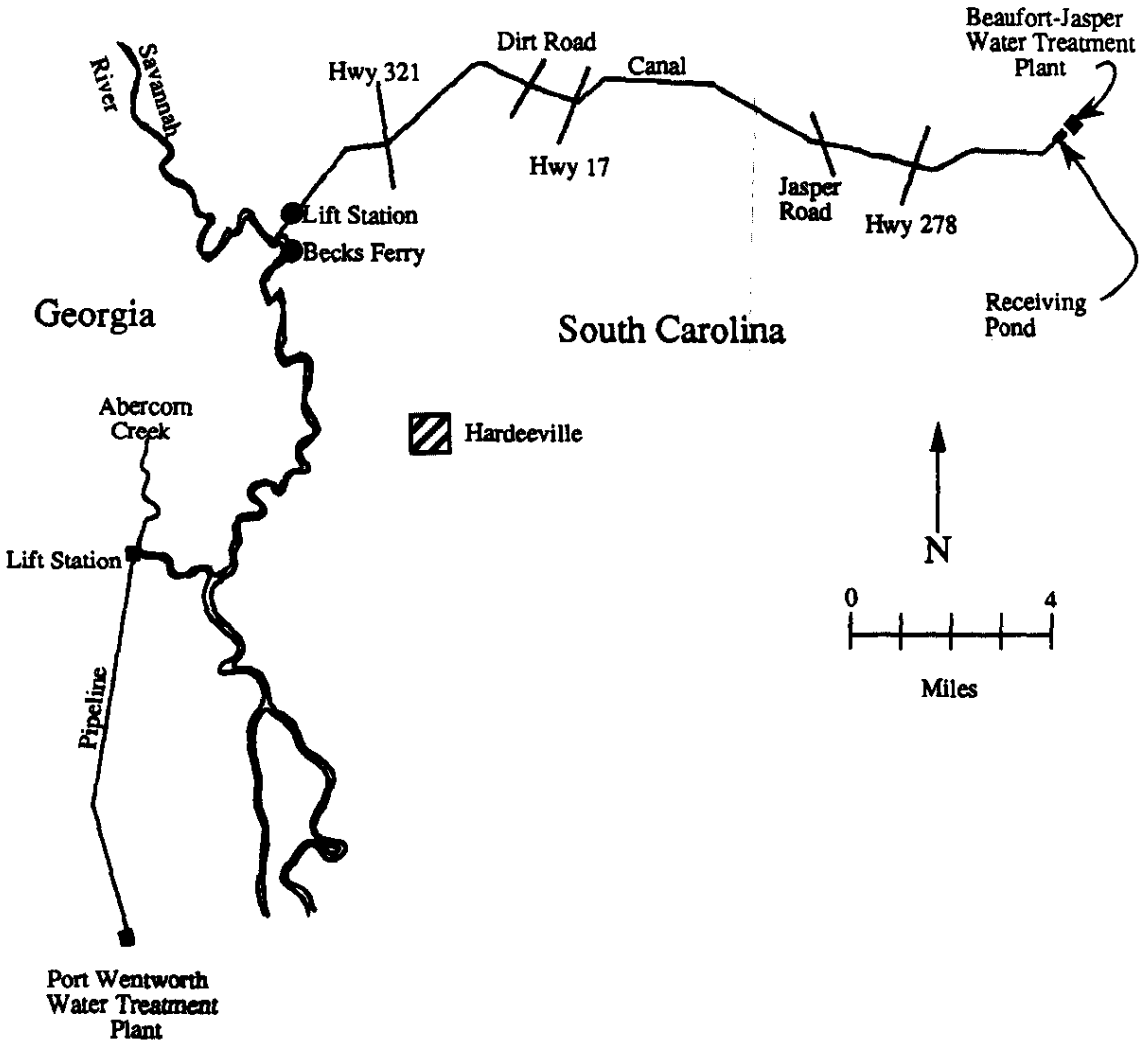


Figure A2. Water Treatment Plant Sampling Locations

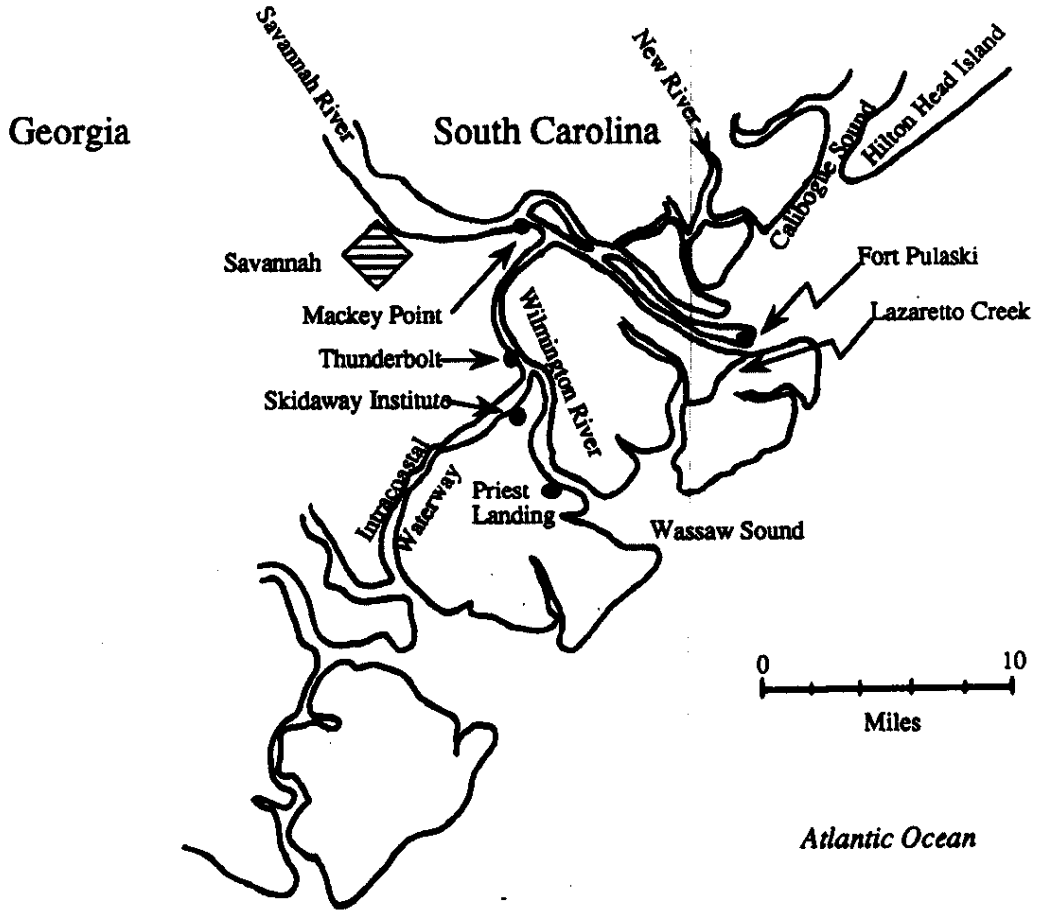


Figure A3. Savannah River Estuary

Water Sampling Locations from SRS to the Savannah River Estuary

Location	Comments
At SRS	
Steel Creek	0.25 miles from its confluence with the Savannah River at river-mile 141.6
On the Savannah River	
Highway 301 Bridge	River-mile 118.7
Becks Ferry Boat Landing	River-mile 38.9
In the Beaufort-Jasper Water Treatment Plant System	
Canal locations	Canal begins at river-mile 39.2
200 yards from river	
400 yards from river	
At Black Creek	0.4 miles from the Savannah River
100 yards before Lift Station	
Lift Station	0.6 miles from the Savannah River
Highway 321	2.9 miles from the Savannah River
Dirt road	5.8 miles from the Savannah River
Highway 17	7.3 miles from the Savannah River
Jasper Road	12.8 miles from the Savannah River
Highway 278	14.7 miles from the Savannah River
End of canal at receiving pond	17.7 miles from the Savannah River
End of receiving pond	
Intake to treatment plant	
Raw water	
Finished water	
In the Port Wentworth Water Treatment Plant System	
Lift Station on Abercorn Creek	2 miles from confluence of Abercorn Creek with the Savannah River at river-mile 29.0
Raw water	
Finished water	
Estuary	
Fort Pulaski	Savannah River mouth
Priest Landing	on the Wilmington River
Skidaway Institute	on the Intracoastal Waterway
Lazaretto Creek	south of Savannah River mouth
Thunderbolt Marina	on the Wilmington River

Table A1. Sample Locations

APPENDIX B

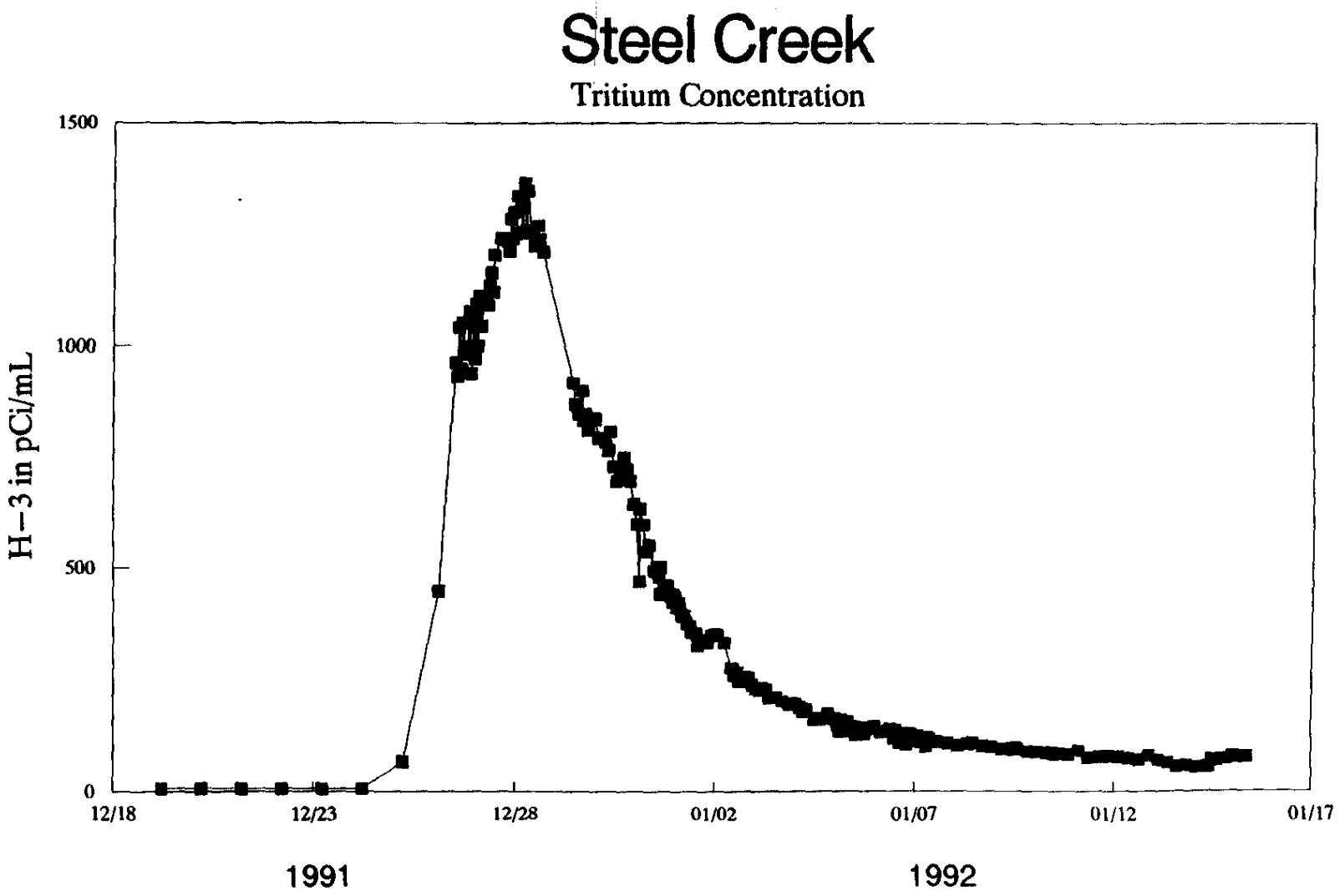


Figure B1. Results from Steel Creek

Tritium Concentrations in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
dec 19		7.50	2.86
dec 20		7.56	2.61
dec 21		7.54	1.18
dec 22		7.69	2.70
dec 23		7.35	2.12
dec 24		7.10	2.37
dec 25		67.13	8.27
dec 26	220	447.97	33.34
dec 26	1230	960.87	8.11
dec 26	1330	930.19	36.89
dec 26	1430	1041.47	3.47
dec 26	1530	947.67	16.05
dec 26	1630	1050.65	6.94
dec 26	1730	982.82	13.01
dec 26	1830	997.95	64.29
dec 26	1930	982.06	15.07
dec 26	2030	1076.90	8.49
dec 26	2130	937.36	52.08
dec 26	2230	1050.01	1.41
dec 26	2330	970.75	86.51
dec 27	30	1094.47	90.81
dec 27	130	1000.02	118.13
dec 27	230	1110.67	15.84
dec 27	330	1044.65	42.81
dec 27	430	1095.66	99.16
dec 27	530	1097.92	71.25
dec 27	630	1102.45	182.01
dec 27	730	1089.67	106.58
dec 27	830	1134.74	91.53

Table B1. Results from Steel Creek

Tritium Concentrations
in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
dec 27	930	1163.83	17.56
dec 27	1030	1120.37	147.20
dec 27	1100	1203.44	119.87
dec 27	1500	1240.95	112.29
dec 27	1900	1235.42	12.23
dec 27	2000	1212.59	–
dec 27	2100	1283.95	142.41
dec 27	2200	1240.04	–
dec 27	2300	1299.03	158.39
			–
dec 28	0	1250.17	–
dec 28	100	1335.55	262.27
dec 28	300	1326.52	159.92
dec 28	400	1253.73	–
dec 28	500	1364.47	18.35
dec 28	600	1259.27	–
dec 28	700	1348.49	36.12
dec 28	900	1255.30	–
dec 28	1100	1224.32	135.79
dec 28	1300	1268.66	–
dec 28	1400	1237.44	38.36
dec 28	1600	1209.87	106.29
			–
dec 29	1000	916.33	88.96
dec 29	1130	867.20	–
dec 29	1330	847.17	–
dec 29	1530	898.53	–
dec 29	1630	834.06	–
dec 29	1730	845.13	72.62
dec 29	1930	810.93	3.57
dec 29	2130	834.04	105.96
dec 29	2330	835.63	83.73
			–
dec 30	130	792.05	20.97
dec 30	330	792.73	7.55
dec 30	530	783.84	23.95
dec 30	730	766.23	5.72
dec 30	830	807.87	–

Table B1. Results from Steel Creek (cont.)

Tritium Concentrations
in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
dec 30	1030	727.54	–
dec 30	1230	695.08	–
dec 30	1430	709.94	–
dec 30	1530	728.11	57.23
dec 30	1630	747.73	–
dec 30	1830	722.67	–
dec 30	2030	696.86	–
dec 30	2230	643.13	52.31
			–
dec 31	30	598.69	–
dec 31	200	468.92	20.89
dec 31	230	633.08	–
dec 31	430	595.65	–
dec 31	430	536.13	–
dec 31	800	551.19	–
dec 31	1100	492.72	7.92
dec 31	1300	501.97	23.13
dec 31	1500	500.66	67.17
dec 31	1600	480.49	–
dec 31	1700	460.01	–
dec 31	1800	460.48	–
dec 31	1900	459.05	–
dec 31	2000	444.00	31.52
dec 31	2100	435.95	40.91
dec 31	2200	422.20	–
dec 31	2300	440.51	9.06
			–
jan 1	0	433.36	–
jan 1	100	410.56	47.86
jan 1	200	420.97	17.76
jan 1	300	407.57	0.04
jan 1	400	395.19	43.08
jan 1	500	392.53	38.71
jan 1	600	392.96	6.27
jan 1	700	376.23	35.99
jan 1	900	368.00	30.56
jan 1	1000	356.57	44.88
jan 1	1300	351.78	–

Table B1. Results from Steel Creek (cont.)

Tritium Concentrations in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
jan 1	1400	326.39	–
jan 1	1800	339.30	–
jan 1	2000	331.81	–
jan 1	2200	348.05	–
			–
jan 2	0	350.47	–
jan 2	200	347.68	–
jan 2	600	332.31	11.47
jan 2	1000	275.03	–
jan 2	1100	273.48	–
jan 2	1200	259.99	–
jan 2	1400	265.70	20.05
jan 2	1500	246.00	–
jan 2	1700	246.15	1.08
jan 2	1900	255.61	–
jan 2	2000	250.58	6.00
jan 2	2100	253.66	–
jan 2	2300	237.32	9.15
			–
jan 3	100	229.04	–
jan 3	300	226.02	–
jan 3	500	231.03	–
jan 3	700	227.55	8.62
jan 3	930	209.67	14.90
jan 3	1330	209.43	15.27
jan 3	1730	200.85	17.52
jan 3	2130	193.89	24.85
jan 3	2330	197.00	–
			–
jan 4	130	193.52	2.90
jan 4	330	187.79	–
jan 4	530	177.49	–
jan 4	730	183.80	19.66
jan 4	1230	163.02	–
jan 4	1630	163.00	–
jan 4	2030	173.53	–
			–

Table B1. Results from Steel Creek (cont.)

Tritium Concentrations in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
jan 5	30	162.62	4.71
jan 5	230	148.37	13.14
jan 5	330	133.74	–
jan 5	430	160.63	–
jan 5	730	134.16	7.80
jan 5	830	155.88	–
jan 5	1030	144.56	–
jan 5	1330	125.44	33.59
jan 5	1630	142.97	–
jan 5	1830	128.16	–
jan 5	1930	137.44	22.09
jan 5	2230	141.16	3.56
			–
jan 6	30	144.79	–
jan 6	430	132.51	6.24
jan 6	830	134.12	–
jan 6	1000	138.25	–
jan 6	1100	132.03	39.32
jan 6	1200	119.64	28.05
jan 6	1300	136.44	15.56
jan 6	1400	127.50	18.75
jan 6	1500	109.82	10.15
jan 6	1600	120.25	–
jan 6	1700	130.57	26.90
jan 6	1800	122.71	–
jan 6	1900	104.25	–
jan 6	2000	124.37	50.35
jan 6	2100	125.15	–
jan 6	2200	129.95	33.82
jan 6	2300	121.54	9.51
			–
jan 7	0	125.29	6.38
jan 7	100	111.58	–
jan 7	200	125.80	23.21
jan 7	300	111.53	21.30
jan 7	500	119.42	51.45
jan 7	600	115.53	30.93
jan 7	700	100.64	45.75

Table B1. Results from Steel Creek (cont.)

Tritium Concentrations in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
jan 7	800	121.49	2.23
jan 7	900	118.19	15.11
jan 7	1400	111.05	1.43
jan 7	2000	108.69	2.43
			–
jan 8	200	102.67	3.34
jan 8	800	105.90	9.55
jan 8	1100	109.14	5.97
jan 8	1700	101.01	15.00
jan 8	2300	98.98	9.59
			–
jan 9	500	94.80	0.24
jan 9	1100	95.74	13.47
jan 9	1200	91.59	18.06
jan 9	1300	96.59	1.54
jan 9	1400	91.84	6.79
jan 9	1430	92.87	–
jan 9	2000	88.74	7.05
			–
jan 10	200	86.78	4.56
jan 10	800	84.95	5.78
jan 10	1000	84.85	8.99
jan 10	1100	85.49	11.30
jan 10	1200	82.78	6.35
jan 10	1500	83.57	9.36
jan 10	2100	81.95	2.84
			–
jan 11	300	89.78	1.25
jan 11	900	75.62	5.29
jan 11	1500	77.00	5.65
jan 11	2100	77.81	0.80
			–
jan 12	300	76.79	7.00
jan 12	900	72.98	–
jan 12	1500	71.19	18.29
jan 12	2100	79.31	4.38
			–

Table B1. Results from Steel Creek (cont.)

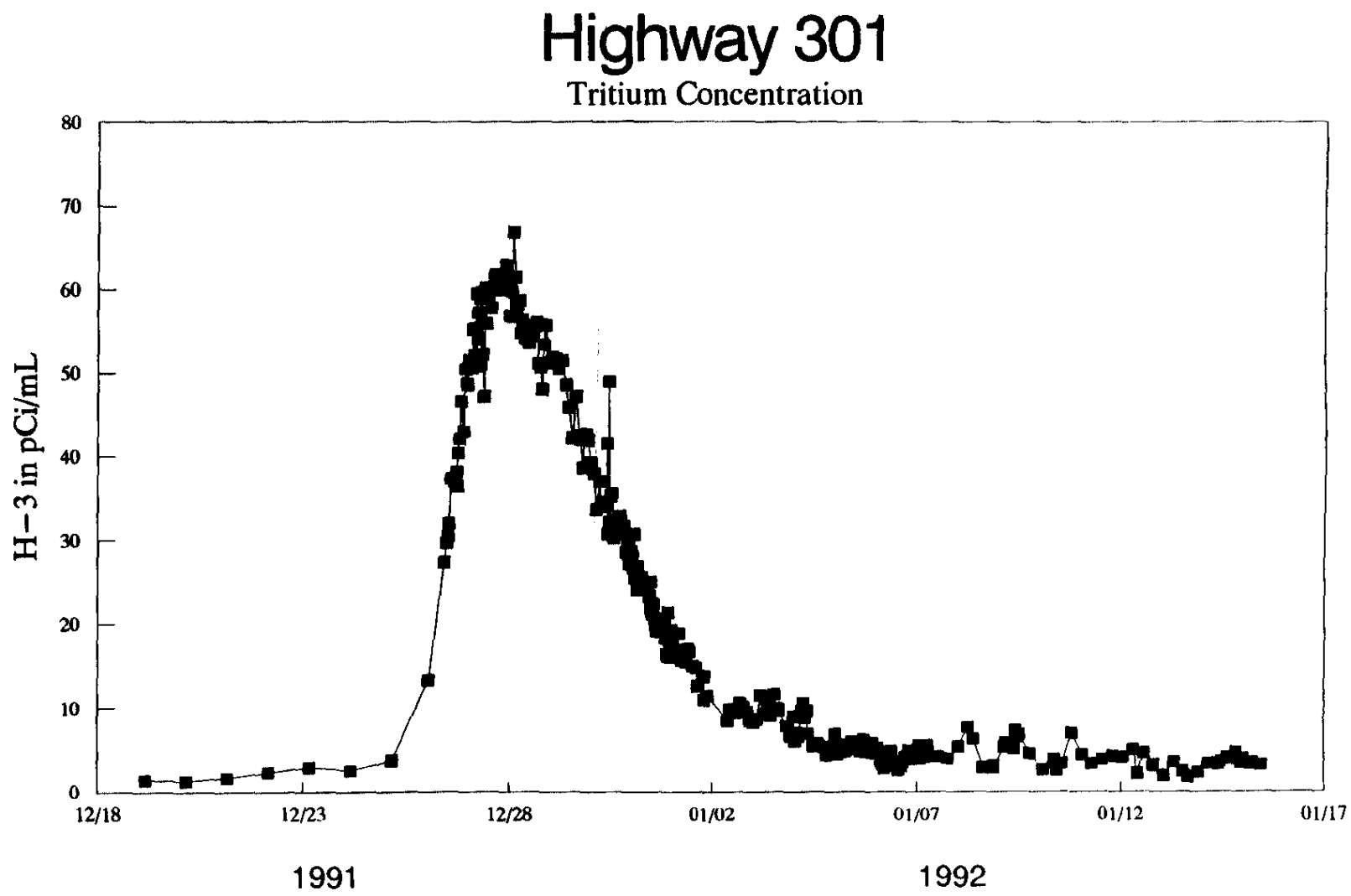
Tritium Concentrations in Steel Creek Mouth

date	time	mean pCi/mL	error 2 sigma
jan 13	300	69.76	6.15
jan 13	900	64.18	4.32
jan 13	1400	56.00	13.36
jan 13	2000	58.32	3.30
			–
jan 14	200	53.74	0.82
jan 14	800	54.78	1.58
jan 14	1000	58.55	5.47
jan 14	1200	71.71	0.39
jan 14	1500	71.21	10.26
jan 14	1800	72.52	2.01
jan 14	2100	73.72	6.14
			–
jan 15	0	78.39	3.99
jan 15	300	74.73	0.30
jan 15	600	78.26	6.24
jan 15	900	76.37	0.50

Table B1. Results from Steel Creek (cont.)

APPENDIX C

Figure C1. Results from Highway 301



Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
dec 19		1.39	1.45
dec 20		1.27	1.20
dec 21		1.61	0.90
dec 22		2.35	0.69
dec 23		2.99	1.69
dec 24		2.56	1.67
dec 25		3.77	3.47
dec 26	110	13.39	2.16
dec 26	1030	27.43	0.55
dec 26	1130	29.71	0.96
dec 26	1230	30.56	3.76
dec 26	1330	32.04	1.82
dec 26	1430	37.44	1.78
dec 26	1530	36.50	3.57
dec 26	1630	36.98	1.27
dec 26	1730	38.11	3.49
dec 26	1830	40.36	6.04
dec 26	1930	42.17	3.06
dec 26	2030	46.61	5.25
dec 26	2130	43.00	2.63
dec 26	2230	50.42	2.76
dec 26	2330	48.70	7.88
dec 27	30	50.68	3.25
dec 27	100	51.58	–
dec 27	130	51.07	0.78
dec 27	200	50.79	–
dec 27	230	50.62	2.86
dec 27	300	55.27	–
dec 27	330	52.12	3.39
dec 27	400	55.38	–

Table C1. Results from Highway 301

Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
dec 27	430	50.91	2.33
dec 27	500	59.51	–
dec 27	530	54.16	5.27
dec 27	600	57.25	–
dec 27	630	54.07	2.86
dec 27	700	58.94	–
dec 27	730	51.07	8.27
dec 27	800	59.71	–
dec 27	830	52.26	3.45
dec 27	930	47.22	6.02
dec 27	1000	60.28	–
dec 27	1030	55.93	8.45
dec 27	1100	59.07	–
dec 27	1130	59.16	0.45
dec 27	1330	57.84	7.17
dec 27	1530	61.79	1.72
dec 27	1730	60.47	10.86
dec 27	1830	59.99	0.31
dec 27	1930	60.73	10.37
dec 27	2030	61.49	5.66
dec 27	2130	62.89	5.68
dec 27	2230	60.74	8.45
dec 27	2330	61.32	7.31
			–
dec 28	30	56.81	–
dec 28	130	59.77	2.53
dec 28	230	66.85	–
dec 28	330	61.51	4.19
dec 28	430	57.80	–
dec 28	530	58.71	11.23
dec 28	630	54.84	–
dec 28	730	56.46	6.17
dec 28	830	55.75	–
dec 28	900	54.19	1.47
dec 28	1000	54.12	0.22
dec 28	1100	53.69	9.04
dec 28	1200	54.37	6.61
dec 28	1300	55.49	6.27
dec 28	1400	55.02	4.43

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
dec 28	1500	55.62	0.88
dec 28	1600	56.13	8.80
dec 28	1700	51.18	4.08
dec 28	1800	50.67	–
dec 28	1900	48.13	–
dec 28	2000	53.40	–
dec 28	2100	55.73	3.88
dec 28	2300	51.21	2.86
			–
dec 29	100	51.90	7.55
dec 29	300	51.71	6.41
dec 29	500	50.55	2.41
dec 29	700	51.52	3.57
dec 29	900	48.58	4.27
dec 29	1100	45.94	1.71
dec 29	1300	42.31	–
dec 29	1500	47.18	–
dec 29	1700	42.48	–
dec 29	1800	42.06	–
dec 29	1900	38.62	3.86
dec 29	2000	42.23	–
dec 29	2100	42.65	–
dec 29	2200	42.02	–
			–
dec 30	0	39.37	–
dec 30	200	38.01	–
dec 30	300	33.77	–
dec 30	500	37.09	5.25
dec 30	600	34.04	0.04
dec 30	730	34.65	–
dec 30	830	34.15	–
dec 30	900	34.43	–
dec 30	930	41.57	5.39
dec 30	1000	30.83	1.61
dec 30	1030	48.95	3.08
dec 30	1100	32.25	–
dec 30	1130	35.26	4.04
dec 30	1230	35.63	–
dec 30	1330	30.33	–

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations
at Hwy 301

date	time	mean pCi/mL	error 2 sigma
dec 30	1430	32.48	–
dec 30	1500	30.82	–
dec 30	1700	32.86	7.17
dec 30	1800	32.44	–
dec 30	1900	31.69	–
dec 30	1930	31.73	–
dec 30	2000	30.87	5.53
dec 30	2030	30.76	–
dec 30	2100	28.52	–
dec 30	2130	29.70	–
dec 30	2200	29.31	0.74
dec 30	2230	27.19	–
dec 30	2300	28.35	–
dec 30	2330	27.78	–
			–
dec 31	0	28.65	0.22
dec 31	30	28.01	–
dec 31	100	26.73	–
dec 31	130	30.73	–
dec 31	200	25.47	1.47
dec 31	230	25.80	–
dec 31	300	24.10	–
dec 31	330	26.81	–
dec 31	400	25.62	1.78
dec 31	600	25.62	0.76
dec 31	730	24.81	–
dec 31	930	24.30	–
dec 31	1030	23.26	–
dec 31	1100	25.02	–
dec 31	1130	21.81	–
dec 31	1200	22.45	–
dec 31	1230	21.23	–
dec 31	1300	22.33	–
dec 31	1330	20.69	–
dec 31	1400	19.87	–
dec 31	1430	19.17	1.72
dec 31	1500	19.89	–
dec 31	1530	20.58	0.94
dec 31	1600	19.56	–

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations
at Hwy 301

date	time	mean pCi/mL	error 2 sigma
dec 31	1630	19.75	–
dec 31	1700	19.03	–
dec 31	1730	20.55	0.59
dec 31	1800	19.26	–
dec 31	1830	20.00	–
dec 31	1900	20.29	–
dec 31	1930	20.09	0.27
dec 31	2000	18.30	–
dec 31	2030	16.40	–
dec 31	2100	16.07	–
dec 31	2130	21.37	5.27
dec 31	2230	17.98	1.35
dec 31	2330	19.30	1.45
			–
jan 1	30	17.34	5.57
jan 1	130	16.36	0.65
jan 1	230	16.96	1.49
jan 1	330	18.87	3.59
jan 1	430	16.16	5.31
jan 1	500	16.03	1.80
jan 1	530	15.70	2.88
jan 1	600	16.68	2.08
jan 1	800	15.49	–
jan 1	900	16.97	–
jan 1	1000	16.75	–
jan 1	1200	15.02	–
jan 1	1400	14.73	–
jan 1	1500	12.59	–
jan 1	1700	13.84	2.02
jan 1	1900	10.92	–
jan 1	2100	11.44	–
			–
jan 2	900	8.49	–
jan 2	1000	9.81	–
jan 2	1200	9.47	–
jan 2	1400	9.45	–
jan 2	1600	10.55	–
jan 2	1800	10.12	2.10
jan 2	2000	9.51	–

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations
at Hwy 301

date	time	mean pCi/mL	error 2 sigma
jan 2	2200	8.55	–
			–
jan 3	0	8.27	–
jan 3	200	8.66	–
jan 3	400	11.49	–
jan 3	600	9.23	0.41
jan 3	700	11.23	–
jan 3	800	10.41	0.92
jan 3	900	11.19	–
jan 3	1000	9.08	–
jan 3	1100	9.87	–
jan 3	1200	11.61	–
jan 3	1300	9.90	–
jan 3	1400	9.80	–
jan 3	1430	9.73	–
jan 3	1930	7.86	4.92
jan 3	2130	6.64	3.49
jan 3	2330	9.01	–
			–
jan 4	30	6.08	2.08
jan 4	130	7.05	–
jan 4	230	6.57	4.56
jan 4	430	9.63	–
jan 4	530	10.54	–
jan 4	630	8.84	3.28
jan 4	730	9.60	–
jan 4	800	6.88	–
jan 4	1100	5.49	0.75
jan 4	1400	5.82	0.60
jan 4	1700	5.34	0.73
jan 4	1800	5.41	1.70
jan 4	1900	4.37	3.04
jan 4	2000	4.53	0.85
jan 4	2100	5.20	0.71
jan 4	2200	5.24	0.07
jan 4	2300	5.43	–
		5.43	–
jan 5	0	6.95	5.07
jan 5	100	4.47	–

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
jan 5	200	5.22	2.61
jan 5	300	4.77	–
jan 5	400	5.05	0.36
jan 5	500	5.67	–
jan 5	600	4.85	1.43
jan 5	700	5.57	0.49
jan 5	800	5.53	4.43
jan 5	900	5.40	2.16
jan 5	1000	5.96	1.26
jan 5	1100	5.93	–
jan 5	1200	5.11	0.91
jan 5	1300	5.64	–
jan 5	1400	5.69	2.36
jan 5	1500	4.77	–
jan 5	1600	5.06	1.05
jan 5	1700	6.22	–
jan 5	1800	4.74	0.54
jan 5	1900	5.15	1.34
jan 5	2000	5.36	0.11
jan 5	2100	5.10	–
jan 5	2200	5.83	1.70
jan 5	2300	4.76	–
			–
jan 6	0	4.56	0.18
jan 6	100	5.25	–
jan 6	200	4.73	1.34
jan 6	300	3.78	–
jan 6	400	3.31	1.58
jan 6	500	2.92	–
jan 6	600	3.77	–
jan 6	800	3.85	1.43
jan 6	900	4.85	1.33
jan 6	1000	3.57	–
jan 6	1100	3.23	1.32
jan 6	1200	3.17	2.49
jan 6	1300	2.68	0.60
jan 6	1400	3.47	0.65
jan 6	1500	3.12	1.87
jan 6	1600	3.57	2.00

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
jan 6	1700	4.03	0.85
jan 6	1800	4.20	1.30
jan 6	1900	4.94	1.18
jan 6	2000	4.56	2.38
jan 6	2100	4.51	0.86
jan 6	2200	4.81	1.91
jan 6	2300	3.93	1.95
			–
jan 7	0	4.79	0.17
jan 7	100	5.55	1.18
jan 7	200	3.92	1.80
jan 7	300	5.46	0.75
jan 7	400	4.98	0.85
jan 7	500	4.18	1.37
jan 7	600	5.55	1.34
jan 7	630	4.92	1.66
jan 7	1230	4.23	1.34
jan 7	1830	3.98	0.55
			–
jan 8	30	5.40	1.58
jan 8	630	7.74	1.61
jan 8	930	6.29	1.04
jan 8	1530	2.90	0.06
jan 8	2130	3.15	0.72
			–
jan 9	330	5.36	0.51
jan 9	430	5.87	–
jan 9	930	5.12	–
jan 9	1030	7.34	3.78
jan 9	1130	6.53	1.80
jan 9	1230	6.81	2.67
jan 9	1830	4.54	1.05
			–
jan 10	230	2.67	1.16
jan 10	830	3.86	1.61
jan 10	930	3.37	1.94
jan 10	1030	2.59	0.55
jan 10	1300	3.40	2.69
jan 10	1900	6.98	0.24

Table C1. Results from Highway 301 (cont.)

Tritium Concentrations at Hwy 301

date	time	mean pCi/mL	error 2 sigma
jan 11	100	4.42	0.72
jan 11	700	3.31	4.41
jan 11	1300	3.84	3.20
jan 11	1900	4.24	0.72
jan 12	100	4.09	0.18
jan 12	700	5.03	1.14
jan 12	1000	2.20	–
jan 12	1300	4.57	–
jan 12	1900	3.29	0.51
jan 13	100	1.99	1.82
jan 13	700	3.53	0.62
jan 13	1230	2.46	0.71
jan 13	1530	1.84	0.72
jan 13	2130	2.35	2.09
jan 14	330	3.42	0.82
jan 14	930	3.25	1.94
jan 14	1100	3.60	1.32
jan 14	1400	4.00	0.60
jan 14	1700	3.87	0.26
jan 14	2000	4.65	0.86
jan 14	2300	3.49	1.07
jan 15	0	3.89	1.33
jan 15	500	3.32	1.79
jan 15	600	3.48	2.84
jan 15	1100	4.01	0.97

Table C1. Results from Highway 301 (cont.)

APPENDIX D

Savannah River At Becks Ferry

Beaufort – Jasper WTP Intake

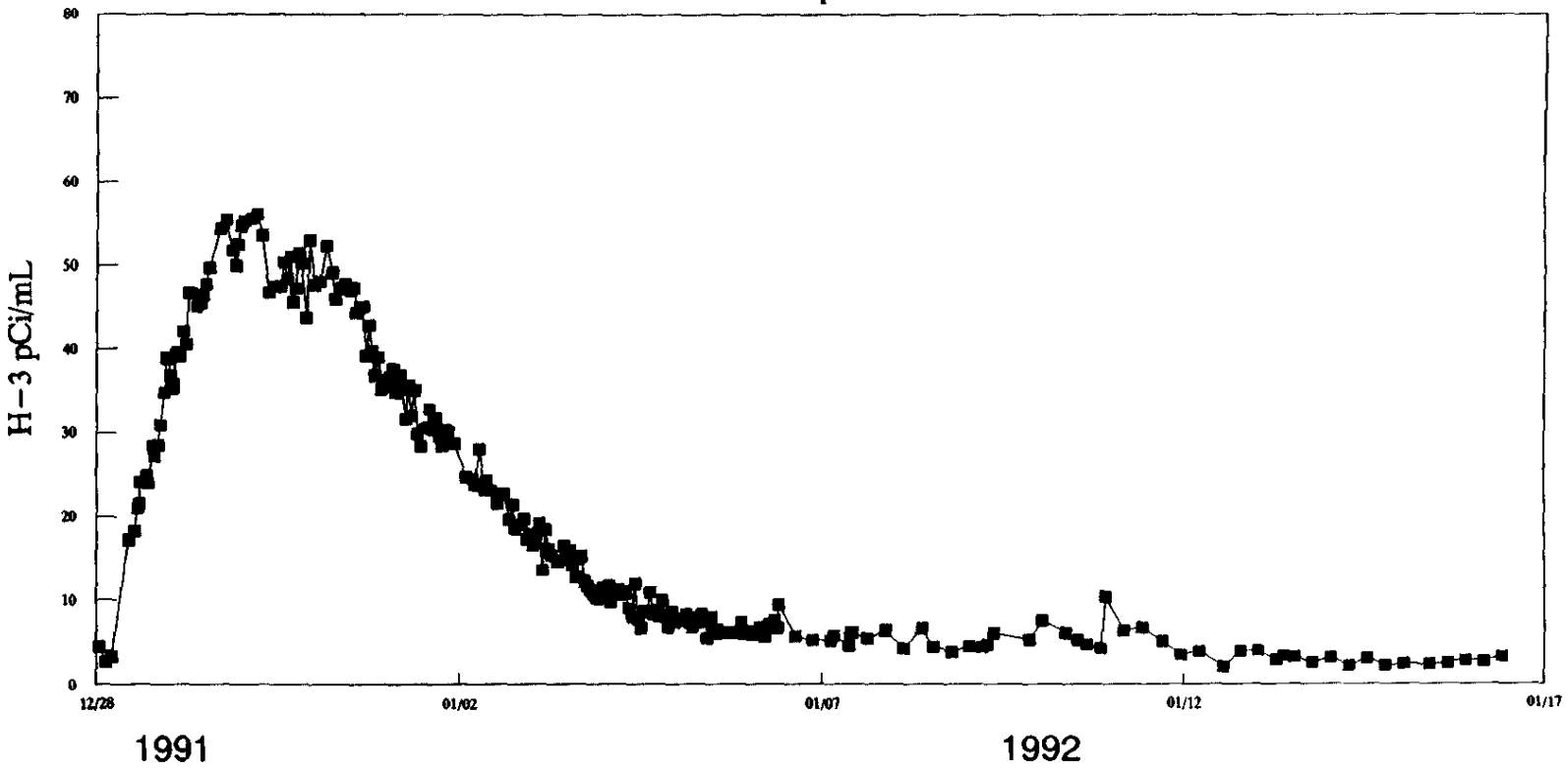


Figure D1. Results from Becks Ferry

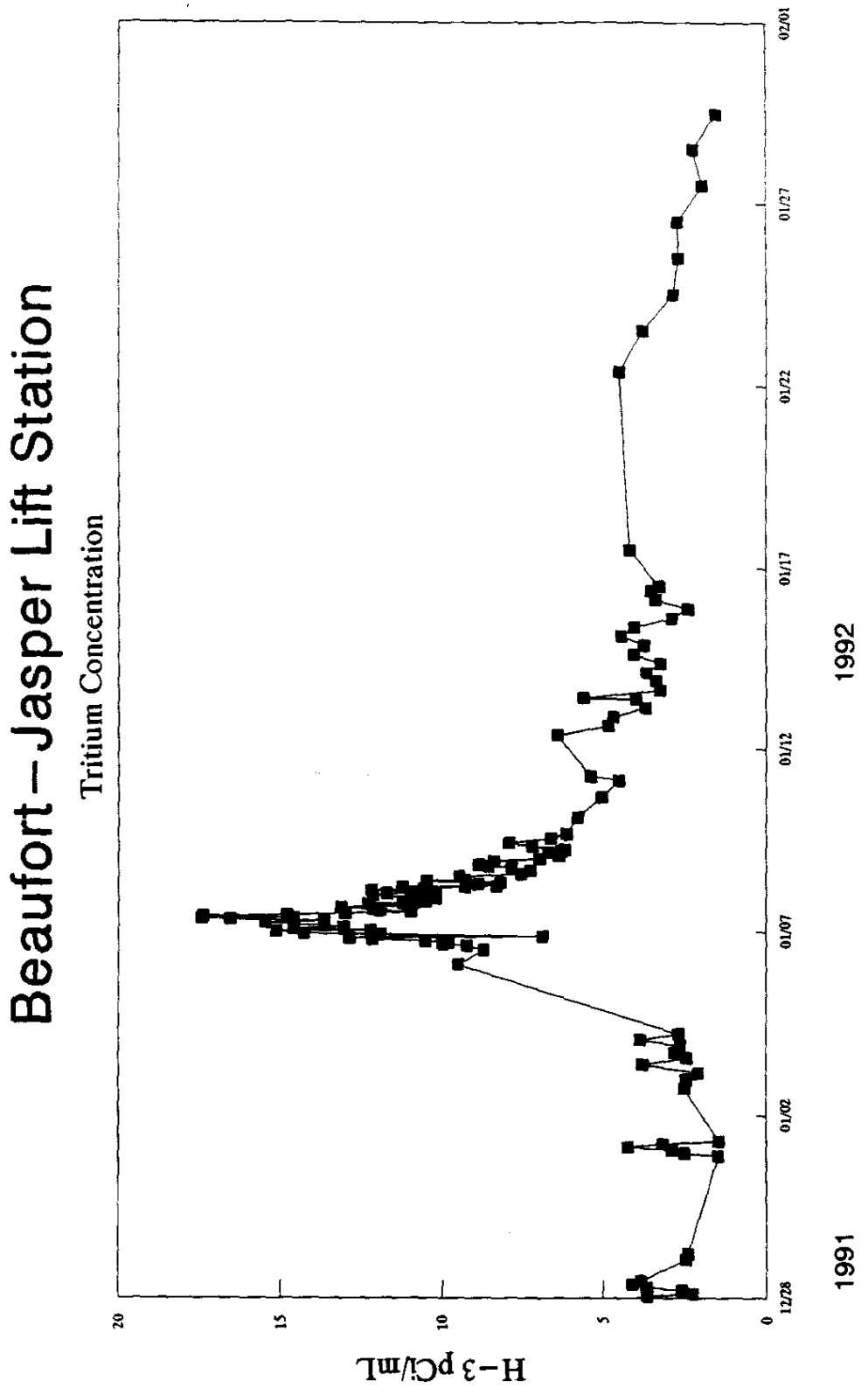


Figure D2. Results from Beaufort-Jasper Lift Station

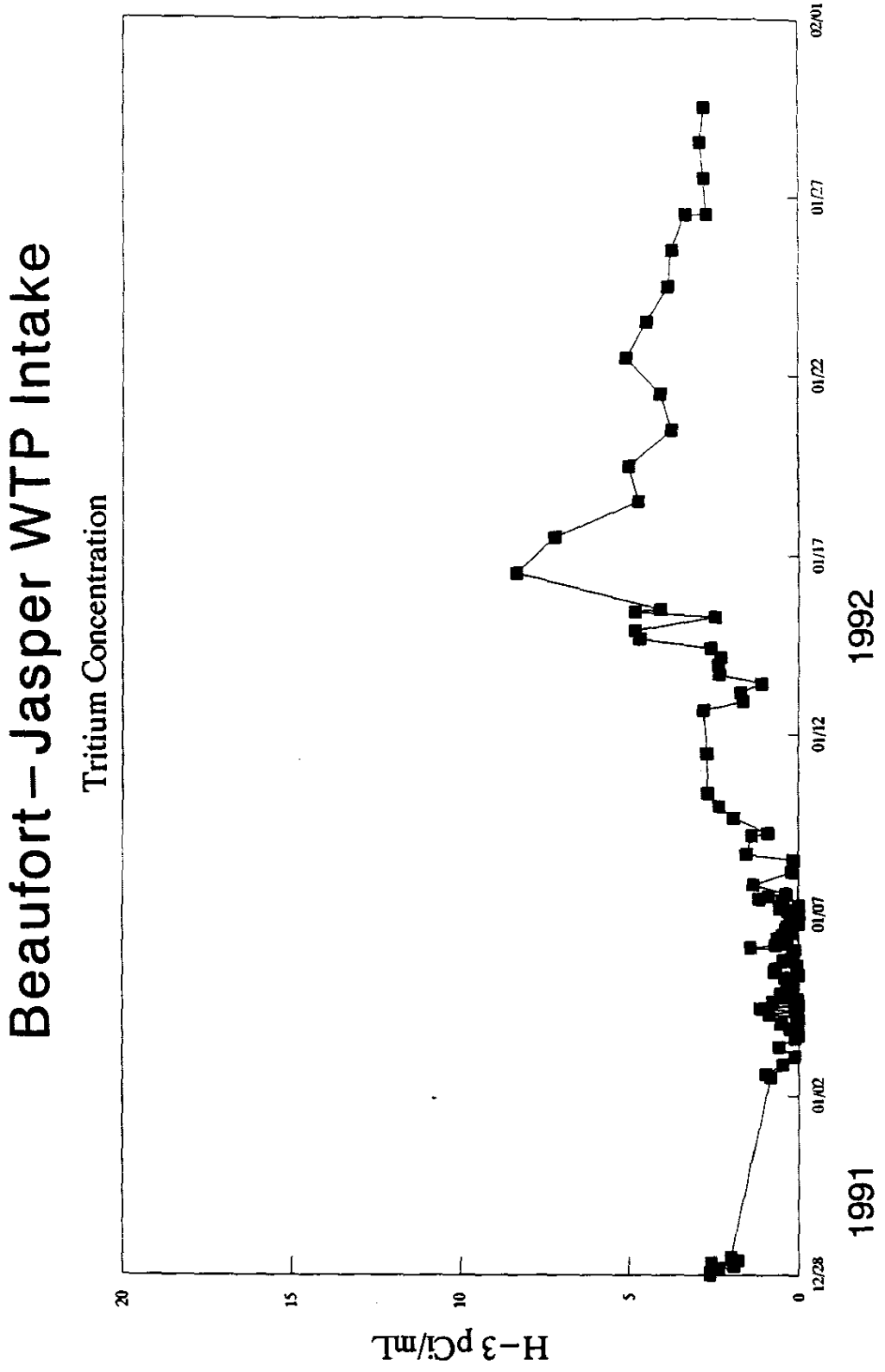


Figure D3. Results from Beaufort-Jasper WTP Intake

Tritium Concentration
at Becks Ferry
Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 28	100	4.41	–
dec 28	300	2.57	–
dec 28	500	3.30	–
dec 28	1030	17.15	1.65
dec 28	1230	18.18	1.55
dec 28	1345	21.01	0.63
dec 28	1400	21.54	2.20
dec 28	1430	24.08	7.59
dec 28	1600	24.10	–
dec 28	1630	24.82	1.06
dec 28	1700	23.84	2.12
dec 28	1830	28.32	8.64
dec 28	1900	27.10	1.04
dec 28	2030	28.51	1.53
dec 28	2100	30.82	5.78
dec 28	2230	34.83	2.57
dec 28	2300	38.98	2.06
			–
dec 29	0	38.81	–
dec 29	30	36.89	–
dec 29	100	35.16	–
dec 29	130	35.82	–
dec 29	230	39.67	3.39
dec 29	330	39.07	–
dec 29	430	42.12	7.06
dec 29	530	40.51	–
dec 29	630	46.69	0.76
dec 29	730	46.63	–
dec 29	900	45.14	2.63
dec 29	1030	45.49	–
dec 29	1130	46.48	2.88
dec 29	1230	47.79	–
dec 29	1330	49.78	0.49
dec 29	1700	54.35	9.62
dec 29	1900	55.49	3.33
dec 29	2100	51.71	–
dec 29	2200	49.99	–

Table D1. Results from Becks Ferry

Tritium Concentration
at Becks Ferry
Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 29	2300	52.54	7.55
			–
dec 30	0	54.67	–
dec 30	100	55.37	–
dec 30	300	55.62	9.92
dec 30	500	56.17	–
dec 30	700	53.65	–
dec 30	900	46.76	–
dec 30	1100	47.36	6.00
dec 30	1300	47.51	–
dec 30	1400	50.36	–
dec 30	1500	48.43	–
dec 30	1600	51.06	7.68
dec 30	1700	45.57	–
dec 30	1800	47.15	–
dec 30	1900	51.50	–
dec 30	2000	50.21	7.51
dec 30	2130	43.75	–
dec 30	2200	52.99	3.78
			–
dec 31	0	47.62	6.37
dec 31	200	48.11	–
dec 31	400	52.41	3.67
dec 31	600	49.19	–
dec 31	700	46.02	1.41
dec 31	900	47.29	5.84
dec 31	1000	47.83	–
dec 31	1100	47.07	–
dec 31	1200	46.84	0.63
dec 31	1300	47.28	–
dec 31	1400	44.32	5.33
dec 31	1500	44.99	1.45
dec 31	1600	45.00	3.39
dec 31	1700	39.22	–
dec 31	1800	42.88	–
dec 31	1900	39.77	3.53
dec 31	2000	36.78	–
dec 31	2100	39.05	–

Table D1. Results from Becks Ferry (cont.)

Tritium Concentration
at Becks Ferry
Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 31	2200	35.21	–
dec 31	2300	36.27	–
			–
jan 1	0	35.51	–
jan 1	100	36.62	–
jan 1	200	37.58	–
jan 1	300	34.67	–
jan 1	400	36.82	–
jan 1	500	35.21	–
jan 1	600	31.57	–
jan 1	700	35.63	–
jan 1	800	32.06	–
jan 1	900	35.01	–
jan 1	1000	29.84	–
jan 1	1100	28.35	–
jan 1	1200	30.43	–
jan 1	1300	30.65	–
jan 1	1400	32.65	–
jan 1	1500	30.18	4.84
jan 1	1600	31.75	–
jan 1	1700	29.60	–
jan 1	1800	28.42	–
jan 1	1900	30.44	–
jan 1	2000	30.04	–
jan 1	2200	28.64	–
			–
jan 2	100	24.67	–
jan 2	400	24.43	3.10
jan 2	445	23.67	–
jan 2	600	28.07	–
jan 2	800	23.17	–
jan 2	845	24.21	–
jan 2	1000	23.07	2.25
jan 2	1200	21.52	–
jan 2	1400	22.68	–
jan 2	1600	19.64	–
jan 2	1700	21.40	1.53
jan 2	1800	18.52	–

Table D1. Results from Becks Ferry (cont.)

Tritium Concentration
at Becks Ferry
Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 2	2000	19.09	–
jan 2	2100	19.74	–
jan 2	2200	17.22	–
jan 2	2300	17.89	–
			–
jan 3	0	16.61	4.57
jan 3	100	17.87	–
jan 3	200	19.27	–
jan 3	300	13.54	–
jan 3	400	18.42	–
jan 3	445	16.04	–
jan 3	600	15.35	1.10
jan 3	800	14.60	–
jan 3	900	14.85	–
jan 3	1000	16.51	–
jan 3	1100	15.13	2.21
jan 3	1200	15.94	–
jan 3	1300	14.25	–
jan 3	1400	12.77	–
jan 3	1500	14.97	–
jan 3	1600	15.24	–
jan 3	1700	12.26	1.02
jan 3	1800	11.70	0.35
jan 3	1900	11.24	0.41
jan 3	2000	10.68	0.08
jan 3	2100	10.31	4.82
jan 3	2200	10.19	–
jan 3	2300	11.48	0.31
			–
jan 4	0	11.29	1.82
jan 4	100	11.70	–
jan 4	200	9.78	1.16
jan 4	300	10.72	–
jan 4	400	11.27	1.35
jan 4	500	10.68	1.45
jan 4	600	11.07	–
jan 4	700	10.93	0.47
jan 4	800	9.02	–

Table D1. Results from Becks Ferry (cont.)

Tritium Concentration at Becks Ferry Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 4	900	8.05	–
jan 4	1000	11.98	–
jan 4	1100	7.75	–
jan 4	1200	6.73	–
jan 4	1300	8.71	0.10
jan 4	1400	8.62	–
jan 4	1500	11.03	9.91
jan 4	1600	8.32	–
jan 4	1700	8.78	1.29
jan 4	1800	8.12	–
jan 4	1900	10.02	–
jan 4	2000	8.07	1.62
jan 4	2100	6.89	2.02
jan 4	2200	8.63	–
jan 4	2300	7.45	–
			–
jan 5	0	7.79	–
jan 5	100	7.62	4.09
jan 5	300	8.36	–
jan 5	400	7.38	–
jan 5	500	6.85	2.18
jan 5	600	7.90	3.38
jan 5	700	7.38	–
jan 5	800	8.32	–
jan 5	900	7.65	0.32
jan 5	1000	5.45	–
jan 5	1100	8.04	–
jan 5	1200	6.42	–
jan 5	1300	6.54	0.78
jan 5	1400	6.05	–
jan 5	1700	6.18	–
jan 5	1800	6.08	1.65
jan 5	1900	6.24	3.34
jan 5	2000	6.06	0.64
jan 5	2100	7.31	–
jan 5	2200	5.89	0.69
jan 5	2300	6.35	2.92
			–

Table D1. Results from Becks Ferry (cont.)

Tritium Concentration at Becks Ferry Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 6	0	6.01	1.15
jan 6	100	5.89	1.79
jan 6	200	6.04	2.54
jan 6	300	6.82	2.95
jan 6	400	6.26	0.04
jan 6	500	5.65	2.00
jan 6	600	7.14	1.46
jan 6	700	7.03	2.59
jan 6	800	7.64	0.60
jan 6	900	6.74	0.14
jan 6	935	9.45	–
jan 6	1500	5.67	0.55
jan 6	2100	5.26	1.58
			–
jan 7	300	5.14	0.19
jan 7	400	5.77	1.18
jan 7	900	4.62	0.03
jan 7	945	6.16	0.40
jan 7	1000	6.14	2.41
jan 7	1500	5.41	1.00
jan 7	2100	6.40	2.47
			–
jan 8	300	4.21	2.16
jan 8	900	6.62	8.44
jan 8	1300	4.44	2.02
jan 8	1900	3.76	1.21
			–
jan 9	100	4.51	1.25
jan 9	515	4.45	0.97
jan 9	700	4.67	0.44
jan 9	900	6.03	2.09
jan 9	2100	5.27	1.19
			–
jan 10	100	7.52	–
jan 10	900	6.02	3.33
jan 10	1300	5.22	–
jan 10	1600	4.67	–
jan 10	2045	4.27	–

Table D1. Results from Becks Ferry (cont.)

Tritium Concentration at Becks Ferry Beaufort–Jasper WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 10	2200	10.36	–
			–
jan 11	400	6.36	1.87
jan 11	1000	6.70	–
jan 11	1700	5.10	0.53
jan 11	2300	3.49	0.79
			–
jan 12	500	3.96	1.51
jan 12	1300	2.12	1.15
jan 12	1900	3.93	0.30
			–
jan 13	100	4.02	1.41
jan 13	700	2.79	0.67
jan 13	935	3.41	0.51
jan 13	1300	3.23	1.32
jan 13	1900	2.54	–
			–
jan 14	100	3.20	1.83
jan 14	700	2.14	0.87
jan 14	1300	3.1	–
jan 14	1900	2.1	1.43
			–
jan 15	100	2.4	0.24
jan 15	1000	2.3	–
jan 15	1600	2.4	0.54
jan 15	2200	2.8	1.97
			–
jan 16	400	2.6	–
jan 16	1000	3.2	1.26

Table D1. Results from Becks Ferry (cont.)

Beaufort–Jasper
Raw Water Canal Survey
Before Lift Station

location	date	time	mean pCi/mL	error 2 sigma
200 yds from river	jan 1	1253	29.32	
	jan 2	1300	24.70	
	jan 3	1230	20.07	
	jan 4	1335	16.19	2.55
	jan 5	1235	15.69	
	jan 6	1245	10.52	0.20
	jan 7	1015	5.19	0.63
	jan 8	1000	4.73	
	jan 8	1010	3.90	
400 yds from river	jan 1	1302	30.33	
	jan 2	1305	22.64	2.37
	jan 3	1235	20.70	1.39
	jan 4	1330	16.59	
	jan 5	1240	16.61	
	jan 6	645	14.07	
	jan 6	1250	13.71	
	jan 7	1020	9.16	2.00
	jan 8	1010	5.29	3.53
end of canal at Black Ck.	jan 1	1315	6.87	
	jan 2	1315	16.86	0.59
	jan 3	1240	18.86	
	jan 4	1340	14.56	
	jan 5	1245	16.54	1.84
	jan 6	1250	15.40	1.31
	jan 7	1025	13.16	2.16
	jan 8	1015	6.83	5.19
100 yds before B–J Lift	jan 1	1320	4.86	0.88
	jan 2	1335	8.49	
	jan 3	1215	6.55	0.55
	jan 4	1310	8.03	2.39
	jan 5	1215	8.66	
	jan 6	1225	9.56	0.04
	jan 7	700	8.10	3.14
	jan 7	1050	14.62	1.57
	jan 8	640	8.27	
	jan 8	1035	7.56	2.72

Table D2. Results from Beaufort-Jasper canal

Tritium Concentration at Beaufort Jasper Lift Station

date	time	mean pCi/mL	error 2 sigma
dec 28	100	3.66	2.10
dec 28	300	2.27	0.82
dec 28	500	2.62	1.88
dec 28	700	3.70	1.96
dec 28	900	4.12	1.22
dec 28	1100	3.86	0.29
			–
dec 29	100	2.48	–
dec 29	500	2.39	–
			–
dec 31	2130	1.48	–
dec 31	2330	2.54	–
			–
jan 1	130	2.90	–
jan 1	330	4.26	3.86
jan 1	530	3.21	–
jan 1	730	1.47	–
			–
jan 2	1730	2.53	1.78
jan 2	2330	2.49	–
			–
jan 3	330	2.11	–
jan 3	930	3.82	–
jan 3	1330	2.47	–
jan 3	1730	2.82	0.37
jan 3	2130	2.67	–
			–
jan 4	130	3.89	–
jan 4	530	2.72	3.43
			–
jan 6	300	9.51	–
jan 6	1225	8.72	–
jan 6	1500	9.22	–
jan 6	1600	9.99	3.01
jan 6	1700	9.82	0.46
jan 6	1800	10.50	–
jan 6	1900	12.17	4.14

Table D3. Results from Beaufort-Jasper Lift Station

Tritium Concentration at Beaufort Jasper Lift Station

date	time	mean pCi/mL	error 2 sigma
jan 6	2000	12.87	–
jan 6	2100	6.88	0.04
jan 6	2200	11.91	9.26
jan 6	2300	14.27	1.57
			–
jan 7	0	15.13	5.85
jan 7	100	12.23	–
jan 7	200	14.61	4.71
jan 7	300	13.20	0.40
jan 7	600	15.48	0.46
jan 7	700	13.66	1.79
jan 7	800	16.56	5.25
jan 7	900	17.43	1.16
jan 7	930	14.60	0.47
jan 7	1000	17.38	0.58
jan 7	1100	14.79	0.25
jan 7	1200	13.00	–
jan 7	1300	10.96	7.93
jan 7	1400	11.91	–
jan 7	1500	12.11	3.15
jan 7	1600	13.13	3.60
jan 7	1700	11.03	3.76
jan 7	1800	12.31	–
jan 7	1900	11.22	6.00
jan 7	1955	10.84	4.27
jan 7	2000	10.51	1.34
jan 7	2100	10.97	0.44
jan 7	2200	10.21	–
			–
jan 8	0	12.14	–
jan 8	100	11.71	–
jan 8	200	10.21	1.62
jan 8	300	12.19	1.48
jan 8	400	10.59	2.84
jan 8	500	10.47	–
jan 8	525	9.28	0.72

Table D3. Results from Beaufort-Jasper Lift Station (cont.)

Tritium Concentration at Beaufort Jasper Lift Station

date	time	mean pCi/mL	error 2 sigma
jan 8	525	11.24	–
jan 8	600	8.31	1.34
jan 8	700	8.88	–
jan 8	800	8.18	–
jan 8	900	10.48	1.61
jan 8	1000	9.28	1.77
jan 8	1200	9.46	5.16
jan 8	1400	7.55	3.96
jan 8	1600	7.26	2.63
jan 8	1800	7.84	0.04
jan 8	1900	8.56	1.90
jan 8	2000	8.87	–
jan 8	2200	8.39	5.14
			–
jan 9	0	6.99	0.22
jan 9	200	6.40	0.39
jan 9	400	6.71	1.52
jan 9	530	6.31	0.90
jan 9	600	6.19	0.53
jan 9	800	7.20	2.36
jan 9	1030	7.93	1.34
jan 9	1330	6.63	2.33
jan 9	1630	6.14	1.95
			–
jan 10	300	5.80	0.55
			–
jan 11	300	4.54	2.01
			–
jan 12	900	6.43	5.42
jan 12	1500	4.85	1.39
jan 12	2100	4.71	–
			–
jan 13	300	3.73	2.31
jan 13	900	4.00	1.55
jan 13	950	5.61	–
jan 13	1500	3.27	–
jan 13	2100	3.40	1.21

Table D3. Results from Beaufort-Jasper Lift Station (cont.)

Tritium Concentration
at Beaufort Jasper Lift Station

date	time	mean pCi/mL	error 2 sigma
			–
jan 14	300	3.69	0.40
jan 14	900	3.26	1.22
jan 14	1500	4.08	–
jan 14	2100	3.76	1.15
			–
jan 15	300	4.47	1.59
jan 15	900	4.05	–
jan 15	1500	2.91	0.91
jan 15	2100	2.40	–
			–
jan 16	300	3.39	0.55
jan 16	900	3.55	–
jan 16		3.30	1.22
			–
jan 17		4.19	1.88
			–
jan 22	930	4.51	1.16
			–
jan 23		3.79	1.39
			–
jan 24		2.86	1.22
			–
jan 25		2.70	1.14
			–
jan 26		2.72	0.35
			–
jan 27		1.95	0.96
			–
jan 28		2.24	1.10
			–
jan 29		1.53	0.76

Table D3. Results from Beaufort-Jasper Lift Station (cont.)

Beaufort–Jasper
Raw Water Canal Survey
After Lift Station

location	date	time	mean pCi/mL	error 2 sigma
Highway 321 crossing	jan 7	815	3.14	1.65
	jan 8	710	14.46	4.38
	jan 9	800	11.60	3.49
	jan 9	1530	12.43	0.15
	jan 10	745	8.06	1.06
	jan 10	1645	6.56	3.00
	jan 11	810	6.73	2.08
	jan 11	1320	5.36	0.26
	jan 11	1340	6.69	1.07
	jan 12	1200	7.69	8.34
between Hwy 321 and 17	jan 9	745	13.49	1.96
Highway 17 crossing	jan 7	745	1.92	0.67
	jan 8	640	1.97	0.90
	jan 9	735	12.57	5.37
	jan 9	1500	13.52	1.11
	jan 10	800	2.20	3.74
	jan 10	1700	11.18	2.34
	jan 11	840	7.34	3.49
	jan 11	1348	8.56	4.57
	jan 12	1215	6.09	1.15
	jan 12	1225	5.96	1.04
	jan 14	1320	3.77	1.34

Table D4. Results from Beaufort-Jasper canal

Beaufort–Jasper
Raw Water Canal Survey
After Lift Station

location	date	time	mean pCi/mL	error 2 sigma
2 miles before Hwy 278 (Jasper Rd.)	jan 12	1245	13.44	0.36
	jan 14	1400	6.12	
Highway 278 crossing	jan 7	730	2.28	2.25
	jan 8	615	1.42	
	jan 9	625	2.27	1.80
	jan 9	1425	2.79	2.72
	jan 10	830	13.68	0.73
	jan 10	1130	2.69	2.69
	jan 10	1300	2.74	3.46
	jan 10	1730	3.55	0.49
	jan 11	915	1.71	0.20
	jan 11	1445	2.30	3.64
	jan 11	1735	1.95	1.90
	jan 12	600	9.83	2.25
	jan 12	740	2.81	0.24
	jan 12	1100	4.93	3.39
	jan 12	1300	5.69	4.49
	jan 13	730	13.49	1.67
	jan 13	1328	10.70	0.16
	jan 13	1730	12.58	
	jan 14	705	8.55	0.07
	jan 14	1145	7.34	0.80
	jan 14	1700	7.21	0.26
	jan 15	700	5.69	0.01
	jan 15	1000	5.54	2.51

Table D4. . Results from Beaufort-Jasper canal (cont.)

Beaufort–Jasper
Raw Water Canal Survey
After Lift Station

location	date	time	mean pCi/mL	error 2 sigma
Pond Entrance	jan 13	825	2.08	1.80
	jan 13	830	3.48	
	jan 13	1340	3.07	0.35
	jan 13	1745	2.05	1.37
	jan 14	715	9.47	2.55
	jan 14	1200	9.88	0.15
	jan 14	1715	5.43	0.71
	jan 15	710	8.86	
	jan 15	1015	6.93	
	jan 15	1150	9.91	6.75
Pond Exit	jan 13	1345	4.02	
	jan 13	1750	1.06	0.01
	jan 14	720	2.08	0.98
	jan 14	1200	5.28	0.49
	jan 14	1720	4.56	
	jan 15	710	5.69	1.64
	jan 15	1019	5.81	1.09
	jan 15	1155	6.64	

Table D4. Results from Beaufort-Jasper canal (cont.)

Tritium Concentration at the plant intake of the Beaufort–Jasper WTP

date	time	mean pCi/mL	error 2 sigma
dec 28	0	2.61	0.45
dec 28	200	2.61	1.84
dec 28	400	2.35	1.59
dec 28	600	1.90	0.25
dec 28	800	2.58	2.88
dec 28	1000	1.81	0.35
dec 28	1200	2.00	2.04
			–
jan 2	1200	0.83	–
jan 2	1400	0.98	–
jan 2	2000	0.46	–
			–
jan 3	200	0.13	–
jan 3	800	0.59	1.51
jan 3	1400	0.11	–
jan 3	1600	nd	–
jan 3	1800	nd	–
jan 3	2000	0.23	0.78
jan 3	2200	0.05	–
			–
jan 4	0	0.52	–
jan 4	200	nd	–
jan 4	400	0.04	–
jan 4	600	0.90	–
jan 4	800	0.13	0.43
jan 4	1000	1.13	–
jan 4	1200	nd	–
jan 4	1400	0.76	–
jan 4	1600	0.02	–
jan 4	1800	0.30	–
jan 4	2000	0.54	0.04
jan 4	2200	0.21	–
			–
jan 5	0	0.25	–
jan 5	200	0.21	–
jan 5	400	0.34	–
jan 5	600	0.42	0.82

Table D5. Results from Beaufort-Jasper WTP Intake

Tritium Concentration at the plant intake of the Beaufort–Jasper WTP

date	time	mean pCi/mL	error 2 sigma
jan 5	800	nd	–
jan 5	1000	0.73	–
jan 5	1200	0.69	–
jan 5	1400	0.04	–
jan 5	1800	0.45	0.78
jan 5	2000	0.17	0.33
jan 5	2200	0.15	0.22
			–
jan 6	0	0.13	0.25
jan 6	200	1.43	1.55
jan 6	400	0.70	0.94
jan 6	600	0.33	1.12
jan 6	800	0.64	0.54
jan 6	1000	0.47	0.92
jan 6	1200	0.17	0.33
jan 6	1400	0.38	0.73
jan 6	1600	0.33	0.84
jan 6	1800	nd	–
jan 6	2000	0.25	0.82
jan 6	2200	nd	–
			–
jan 7	0	nd	–
jan 7	200	0.34	0.90
jan 7	400	0.57	1.53
jan 7	600	nd	–
jan 7	800	0.48	0.47
jan 7	1000	1.18	3.21
jan 7	1200	0.89	2.00
jan 7	1400	0.37	0.76
jan 7	2000	1.35	4.41
			–
jan 8	400	0.20	0.55
jan 8	1200	0.14	0.47
jan 8	1600	1.55	2.56
			–
jan 9	400	1.39	0.14
jan 9	600	0.91	0.20

Table D5. Results from Beaufort-Jasper WTP Intake (cont.)

Tritium Concentration at the plant intake of the Beaufort–Jasper WTP

date	time	mean pCi/mL	error 2 sigma
jan 9	1600	1.93	1.59
jan 10	0	2.37	1.55
jan 10	845	2.69	0.89
jan 11	1115	2.71	1.95
jan 12	1600	2.81	2.36
jan 12	2200	1.64	0.14
jan 13	400	1.71	0.67
jan 13	1000	1.09	0.57
jan 13	1600	2.34	0.50
jan 13	2200	2.38	1.82
jan 14	400	2.30	1.15
jan 14	1000	2.57	0.03
jan 14	1600	4.67	0.71
jan 14	2200	4.82	1.55
jan 15	720	2.45	1.72
jan 15	1030	4.81	3.89
jan 15	1200	4.08	0.93
jan 16		8.31	1.84
jan 17		7.18	0.82
jan 18		4.71	1.57
jan 19		5.00	1.45
jan 20		3.72	1.59
jan 21		4.06	1.41
jan 22		5.08	4.84

Table D5. Results from Beaufort-Jasper WTP Intake (cont.)

Tritium Concentration at the plant intake of the Beaufort–Jasper WTP

date	time	mean pCi/mL	error 2 sigma
jan 23		4.46	0.90
jan 24		3.84	1.04
jan 25		3.74	1.67
jan 26		3.35	0.78
jan 27		2.81	1.12
jan 28		2.93	1.41
jan 29		2.80	1.86

Table D5. Results from Beaufort-Jasper WTP Intake (cont.)

Tritium Concentration at Beaufort – Jasper Water Treatment Plant

		Raw Water		Finished Water	
date	time	mean pCi/mL	error 2 sigma	mean pCi/mL	error 2 sigma
26–Dec		2.39	0.43	3.58	4.01
27–Dec		1.14	0.82	1.32	0.36
28–Dec		0.54	0.51	2.15	0.47
29–Dec		0.65	1.79	1.37	0.32
30–Dec		1.54	0.57	1.34	0.98
31–Dec		1.32	0.46	0.97	0.39
01–Jan		1.98		1.55	0.89
02–Jan		0.50	1.00	1.52	0.30
03–Jan		0.92		1.88	5.21
04–Jan		0.28	0.58	0.25	0.69
05–Jan		nd		nd	
06–Jan		0.32	0.89	2.66	6.07
07–Jan		nd		0.59	1.64
16–Jan		7.80	0.33	7.08	
17–Jan	07:50	7.75	0.80	7.20	0.51
17–Jan	14:45	7.13	0.06	7.79	3.51
18–Jan	00:30	7.46	0.16	5.57	0.72

Table D6. Results from Beaufort-Jasper WTP

Tritium Concentration at Beaufort – Jasper Water Treatment Plant

		Raw Water		Finished Water	
date	time	mean pCi/mL	error 2 sigma	mean pCi/mL	error 2 sigma
18–Jan	08:30	6.10	1.00	6.46	1.66
19–Jan	00:01	5.72	0.82	5.02	1.40
19–Jan	08:30	4.23		5.06	1.37
20–Jan	07:30	3.45		3.95	0.78
21–Jan	07:40	4.28	1.37	4.93	0.82
22–Jan	07:45	4.87	0.76	4.59	0.74
22–Jan	21:00	4.68	0.53	4.63	0.96
23–Jan	08:00	3.99	2.47	5.03	1.47
24–Jan	08:10	3.91	2.02	4.17	0.43
25–Jan	07:25	4.13	0.41	3.82	0.51
26–Jan	07:45	3.91	0.80	3.69	1.25
27–Jan	07:30	3.34	0.27	3.45	1.61

Table D6. . Results from Beaufort-Jasper WTP (cont.)

APPENDIX E

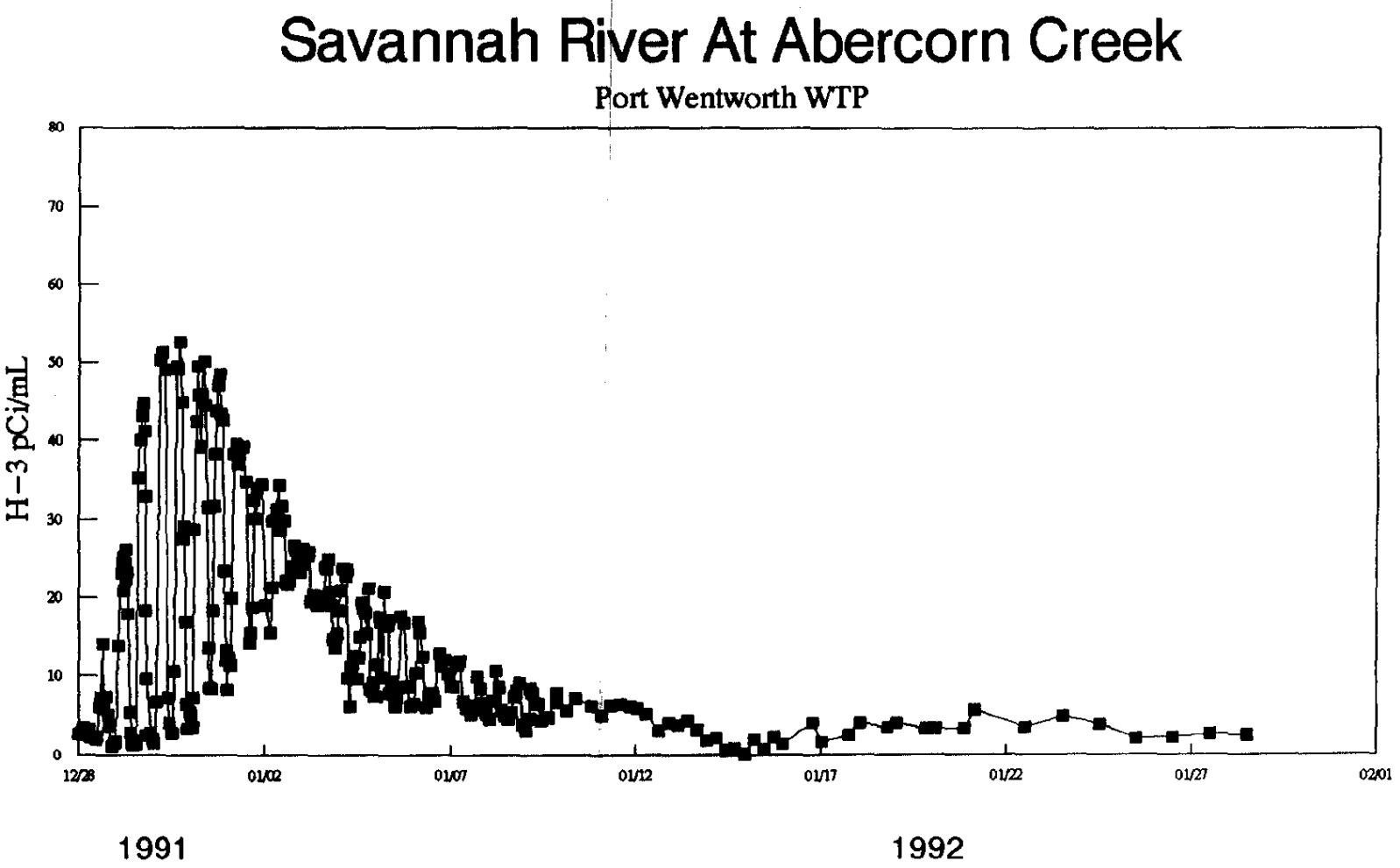


Figure E1. Results from Abercorn Creek

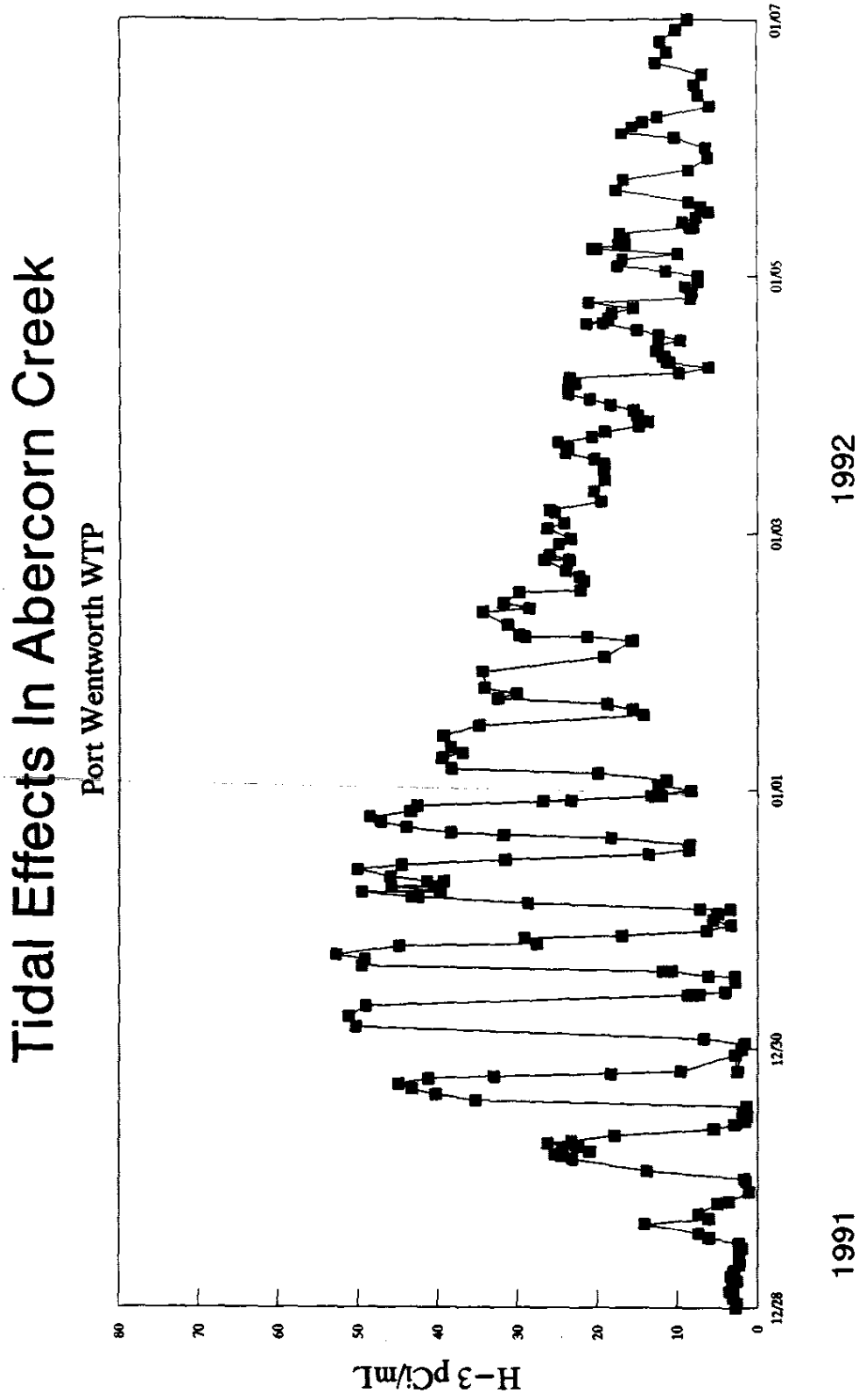


Figure E2. Partial Results from Abercorn Creek

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 28	0	2.68	1.47
dec 28	100	2.61	0.02
dec 28	200	3.05	0.02
dec 28	300	3.50	1.63
dec 28	400	3.07	2.35
dec 28	500	2.50	0.67
dec 28	600	3.25	0.49
dec 28	700	2.95	2.10
dec 28	800	2.25	0.78
dec 28	900	2.36	0.55
dec 28	1000	2.32	0.41
dec 28	1100	1.95	0.43
dec 28	1200	2.30	0.49
dec 28	1300	6.06	0.08
dec 28	1400	7.32	3.37
dec 28	1530	14.09	–
dec 28	1630	6.13	–
dec 28	1730	7.41	–
dec 28	1930	5.00	1.37
dec 28	2000	3.58	1.49
dec 28	2130	1.09	1.96
dec 28	2330	1.46	0.94
			–
dec 29	0	1.71	0.22
dec 29	130	13.84	0.92
dec 29	330	23.13	2.96
dec 29	400	24.55	1.31
dec 29	430	25.27	–
dec 29	500	20.92	–
dec 29	530	24.39	–
dec 29	600	22.41	1.59
dec 29	630	26.26	–
dec 29	700	23.30	0.12
dec 29	800	17.86	0.12
dec 29	900	5.50	–
dec 29	1000	2.84	0.14
dec 29	1030	1.59	–

Table E1. Results from Abercorn Creek

Tritium Concentration at Abercorn Creek Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 29	1130	1.26	–
dec 29	1230	1.80	–
dec 29	1330	1.42	–
dec 29	1430	35.30	–
dec 29	1530	40.26	–
dec 29	1630	43.25	–
dec 29	1730	44.92	–
dec 29	1830	41.15	–
dec 29	1900	32.90	–
dec 29	1930	18.28	–
dec 29	2000	9.58	–
dec 29	2300	2.77	0.76
			–
dec 30	0	1.98	–
dec 30	100	1.56	–
dec 30	200	6.74	–
dec 30	400	50.34	–
dec 30	600	51.25	4.98
dec 30	800	49.04	–
dec 30	1000	7.20	–
dec 30	1030	4.03	–
dec 30	1230	2.81	–
dec 30	1330	2.81	4.72
dec 30	1430	10.68	–
dec 30	1530	49.59	–
dec 30	1630	49.14	–
dec 30	1730	52.73	–
dec 30	1900	44.94	–
dec 30	1930	27.60	–
dec 30	2030	29.16	–
dec 30	2100	16.89	–
dec 30	2200	6.40	4.16
dec 30	2300	3.28	–
			–
dec 31	000	5.47	–
dec 31	100	5.01	–
dec 31	200	3.44	1.00
dec 31	230	7.22	–

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
dec 31	300	28.77	5.74
dec 31	400	42.50	–
dec 31	500	49.56	0.73
dec 31	600	45.79	3.43
dec 31	700	39.19	16.99
dec 31	800	45.97	–
dec 31	900	50.12	8.21
dec 31	1000	44.59	–
dec 31	1100	31.55	–
dec 31	1200	13.59	1.72
dec 31	1300	8.51	–
dec 31	1400	8.42	–
dec 31	1500	18.31	–
dec 31	1530	31.74	2.59
dec 31	1600	38.40	–
dec 31	1700	43.93	–
dec 31	1800	47.15	0.35
dec 31	1900	48.55	–
dec 31	2000	43.46	–
dec 31	2100	42.56	–
dec 31	2200	23.33	–
dec 31	2300	12.02	–
			–
jan 1	0	8.30	–
jan 1	100	12.33	–
jan 1	200	11.36	–
jan 1	300	19.90	–
jan 1	400	38.34	–
jan 1	600	39.49	–
jan 1	700	36.93	–
jan 1	800	38.46	–
jan 1	1000	39.24	–
jan 1	1200	34.88	3.67
jan 1	1400	14.29	0.12
jan 1	1500	15.60	–
jan 1	1600	18.79	–
jan 1	1700	32.46	0.02

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 1	1800	30.11	–
jan 1	1900	34.10	–
jan 1	2200	34.44	–
			–
jan 2	100	19.09	–
jan 2	400	15.61	3.86
jan 2	445	21.31	–
jan 2	500	29.85	–
jan 2	700	31.25	4.80
jan 2	900	34.38	–
jan 2	1000	28.55	–
jan 2	1100	31.74	–
jan 2	1300	29.87	2.57
jan 2	1330	22.11	–
jan 2	1500	21.67	–
jan 2	1600	22.18	–
jan 2	1700	23.90	–
jan 2	1900	26.64	–
jan 2	1900	23.54	2.63
jan 2	2000	26.02	–
jan 2	2200	24.82	–
jan 2	2300	23.29	–
			–
jan 3	100	26.22	–
jan 3	200	24.20	–
jan 3	400	25.35	–
jan 3	445	25.96	–
jan 3	600	19.53	–
jan 3	800	20.45	–
jan 3	1000	19.11	1.66
jan 3	1200	19.17	6.76
jan 3	1300	19.13	–
jan 3	1400	20.32	–
jan 3	1500	24.01	–
jan 3	1600	23.64	6.79
jan 3	1700	24.99	–
jan 3	1800	20.70	–

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 3	1900	19.06	–
jan 3	2000	14.76	4.13
jan 3	2100	13.59	–
jan 3	2200	15.00	–
jan 3	2300	15.44	–
			–
jan 4	0	18.35	–
jan 4	100	20.94	–
jan 4	200	23.62	–
jan 4	300	23.65	–
jan 4	400	22.73	–
jan 4	500	23.53	–
jan 4	600	9.84	10.56
jan 4	700	6.09	1.80
jan 4	800	11.26	2.40
jan 4	900	11.55	–
jan 4	1000	12.67	–
jan 4	1100	12.40	–
jan 4	1200	9.58	0.78
jan 4	1300	12.36	–
jan 4	1400	15.04	–
jan 4	1500	19.30	1.68
jan 4	1600	18.61	7.19
jan 4	1700	18.14	–
jan 4	1800	15.42	10.34
jan 4	1900	21.12	–
jan 4	2000	8.34	–
jan 4	2100	8.16	0.50
jan 4	2200	9.05	–
jan 4	2300	7.39	–
			–
jan 5	0	7.41	–
jan 5	100	11.44	–
jan 5	200	17.47	1.52
jan 5	300	16.87	–
jan 5	400	10.00	1.07
jan 5	500	20.69	–
jan 5	600	16.43	1.29

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 5	700	16.50	–
jan 5	800	17.21	–
jan 5	900	7.88	–
jan 5	1000	9.31	–
jan 5	1100	7.69	1.00
jan 5	1200	6.14	–
jan 5	1300	7.09	–
jan 5	1400	8.58	–
jan 5	1600	17.58	–
jan 5	1800	16.79	–
jan 5	2000	8.66	0.67
jan 5	2200	6.17	–
			–
jan 6	0	6.48	–
jan 6	200	10.40	0.46
jan 6	300	17.00	4.63
jan 6	400	15.59	–
jan 6	600	12.42	–
jan 6	800	5.98	1.66
jan 6	1000	7.43	1.59
jan 6	1200	7.86	2.80
jan 6	1400	6.86	0.29
jan 6	1600	12.81	2.76
jan 6	1800	11.37	1.46
jan 6	2000	12.10	1.70
jan 6	2200	10.15	–
			–
jan 7	0	8.73	–
jan 7	200	8.66	2.13
jan 7	400	11.80	2.29
jan 7	430	11.49	3.24
jan 7	600	11.83	6.90
jan 7	800	6.81	0.58
jan 7	1000	5.81	4.13
jan 7	1200	6.34	2.08
jan 7	1300	5.10	0.44
jan 7	1500	5.76	1.65
jan 7	1700	9.91	1.23

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration at Abercorn Creek Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 7	1900	8.43	2.83
jan 7	2100	6.58	2.23
jan 7	2300	5.23	–
			–
jan 8	100	4.53	2.36
jan 8	300	6.83	3.71
jan 8	500	10.65	5.28
jan 8	700	8.49	3.05
jan 8	900	5.56	0.21
jan 8	1100	5.00	1.70
jan 8	1300	4.41	0.50
jan 8	1500	5.35	2.05
jan 8	1700	7.28	–
jan 8	1900	8.09	4.57
jan 8	2100	9.11	1.86
jan 8	2300	3.72	3.60
			–
jan 9	100	3.03	1.11
jan 9	300	4.59	2.81
jan 9	400	8.36	–
jan 9	435	7.99	2.72
jan 9	500	7.84	1.07
jan 9	700	6.57	0.42
jan 9	900	6.37	1.55
jan 9	1100	4.27	2.49
jan 9	1500	4.69	2.34
jan 9	2100	7.87	3.17
			–
jan 10	300	5.53	0.42
jan 10	900	7.14	5.22
jan 10	1927	6.09	5.25
			–
jan 11	139	5.09	0.54
jan 11	751	6.25	1.37
jan 11	1404	6.49	0.89
jan 11	2016	6.17	0.55
			–

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 12	18	5.83	0.83
jan 12	630	5.10	0.17
jan 12	1453	3.08	0.37
jan 12	2105	4.04	0.71
			–
jan 13	317	3.72	1.80
jan 13	929	4.25	1.26
jan 13	1541	3.15	1.16
jan 13	2135	1.84	1.11
			–
jan 14	405	2.04	0.87
jan 14	1017	0.47	1.00
jan 14	1630	0.85	0.75
jan 14	2242	0.11	0.28
			–
jan 15	454	1.97	0.82
jan 15	1106	0.67	0.75
jan 15	1719	2.28	1.25
jan 15	2331	1.40	1.41
			–
jan 16	1807	4.10	2.06
			–
jan 17	19	1.67	1.16
jan 17	1855	2.43	1.20
			–
jan 18	107	4.07	3.08
jan 18	1943	3.44	2.45
			–
jan 19	155	3.97	2.69
jan 19	2031	3.27	2.06
			–
jan 20	243	3.32	0.78
jan 20	2119	3.38	3.00
			–
jan 21	331	5.68	0.86
			–
jan 22		3.47	2.10
			–

Table E1. Results from Abercorn Creek (cont.)

Tritium Concentration
at Abercorn Creek
Port Wentworth WTP Intake

date	time	mean pCi/mL	error 2 sigma
jan 23		4.82	3.27
jan 24		3.96	2.98
jan 25		2.06	1.39
jan 26		2.25	1.02
jan 27		2.58	1.86
jan 28		2.52	2.29

Table E1: Results from Abercorn Creek (cont.)

Tritium Concentration at Port Wentworth Water Treatment Plant

		Raw Water		Finished Water	
date	time	mean pCi/mL	error 2 sigma	mean pCi/mL	error 2 sigma
dec 30	1515	2.45		38.31	
dec 30	2010	46.34		15.11	
dec 31	0915	44.94	6.80	14.25	3.37
dec 31	1600	6.86		34.45	
dec 31	2115	8.75		22.00	
jan 1	1450	23.70		26.76	
jan 2	945	18.97		21.02	
jan 2	1415	29.70		25.55	
jan 3	730	24.29		24.79	
jan 3	1400	18.70		23.23	
jan 3	1930	22.86	0.88	20.26	1.53
jan 4	800	23.74	1.82	20.16	0.88
jan 4	1420	11.90	1.71	21.93	0.27
jan 4	2015	18.68	0.92	16.68	2.43
jan 5	745	17.31	4.06	15.30	
jan 5	1330	18.79	7.64	17.62	0.22
jan 6	645	7.30		11.00	
jan 7	1225	4.80	2.06	10.57	2.84
jan 7	1900	3.91			
jan 7	1930	10.87	0.35		
jan 8	1225	5.53	0.29	7.81	2.37
jan 9	1150	6.47	0.49	4.29	0.27
jan 9	1900	6.13		6.36	0.96

Table E2. Results from Port Wentworth WTP

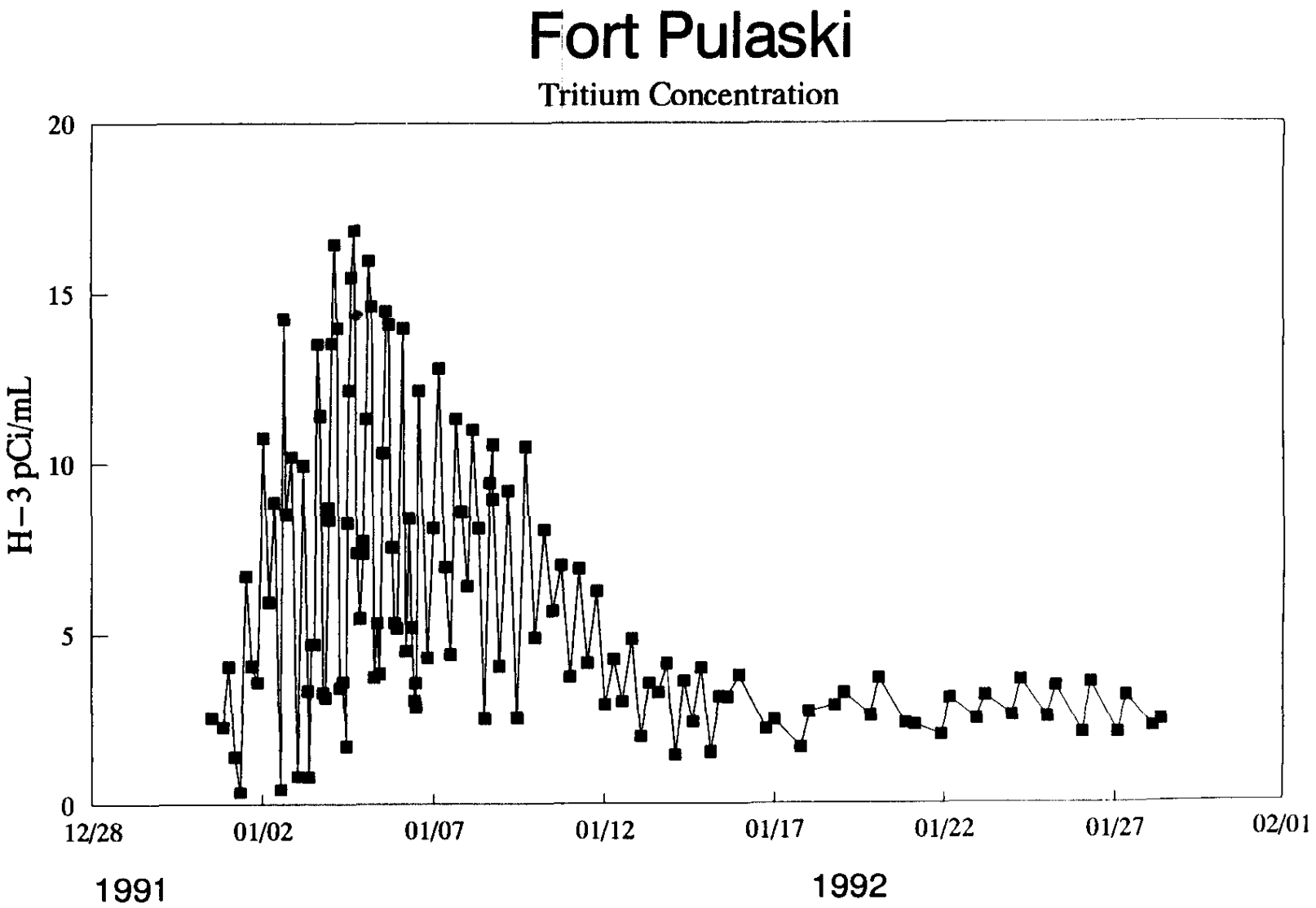
Tritium Concentration at Port Wentworth Water Treatment Plant

		Raw Water		Finished Water	
date	time	mean pCi/mL	error 2 sigma	mean pCi/mL	error 2 sigma
jan 10	1045	6.05	2.63	6.41	2.10
jan 10	1515	6.85	1.86	6.95	1.69
jan 10	2015	5.68	0.46	5.66	3.23
jan 11		6.17	1.06	6.21	1.82
jan 12		5.25	2.20	6.21	1.82
jan 13	1540	3.93	0.36	5.28	2.58
jan 14	1615	1.28	3.33	1.77	1.70
jan 14	2125	3.35	0.65	3.11	1.14

Table E2. Results from Port Wentworth WTP (cont.)

APPENDIX F

Figure FL. Results from Fort Pulaski



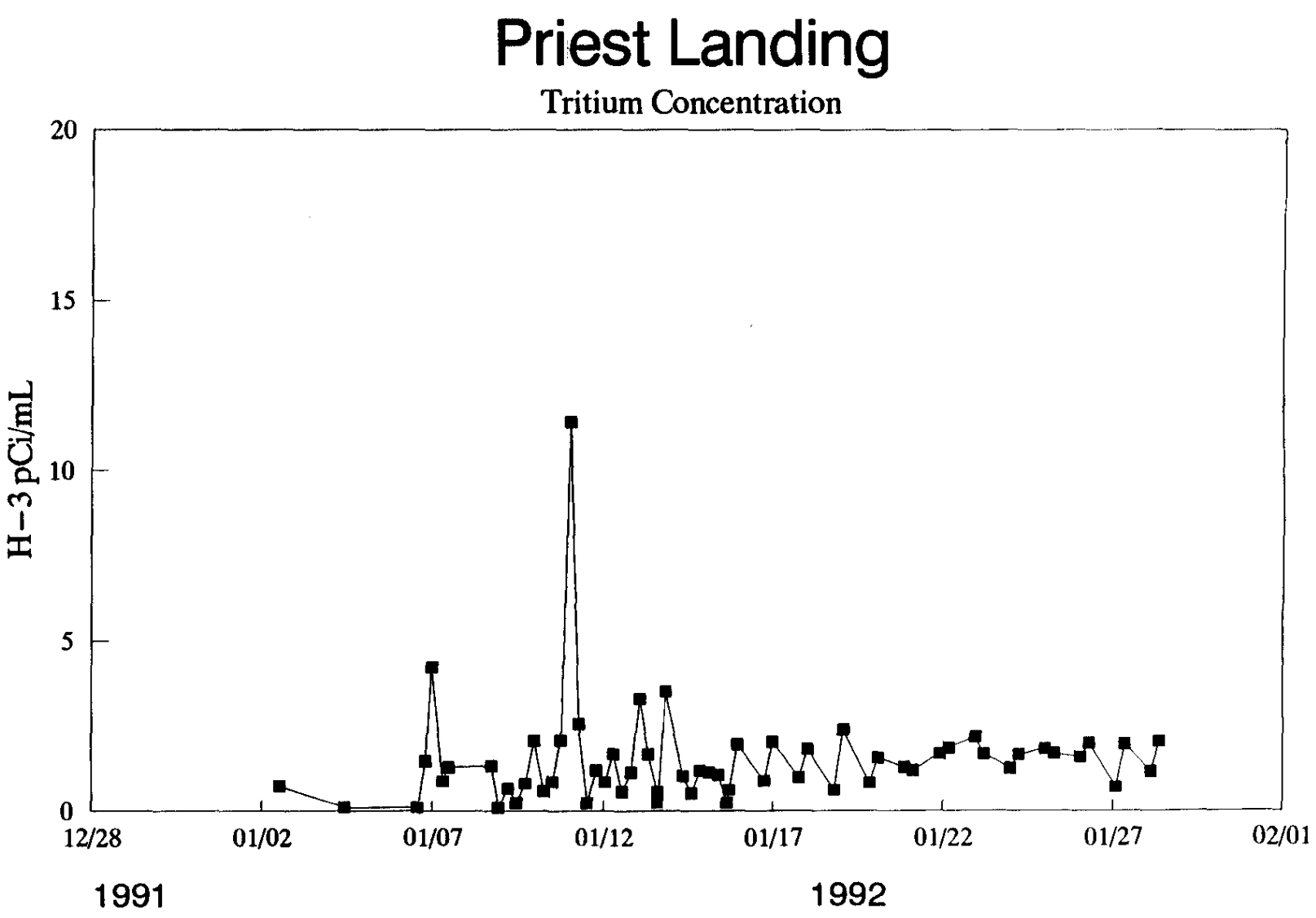


Figure F2. Results from Priest Landing

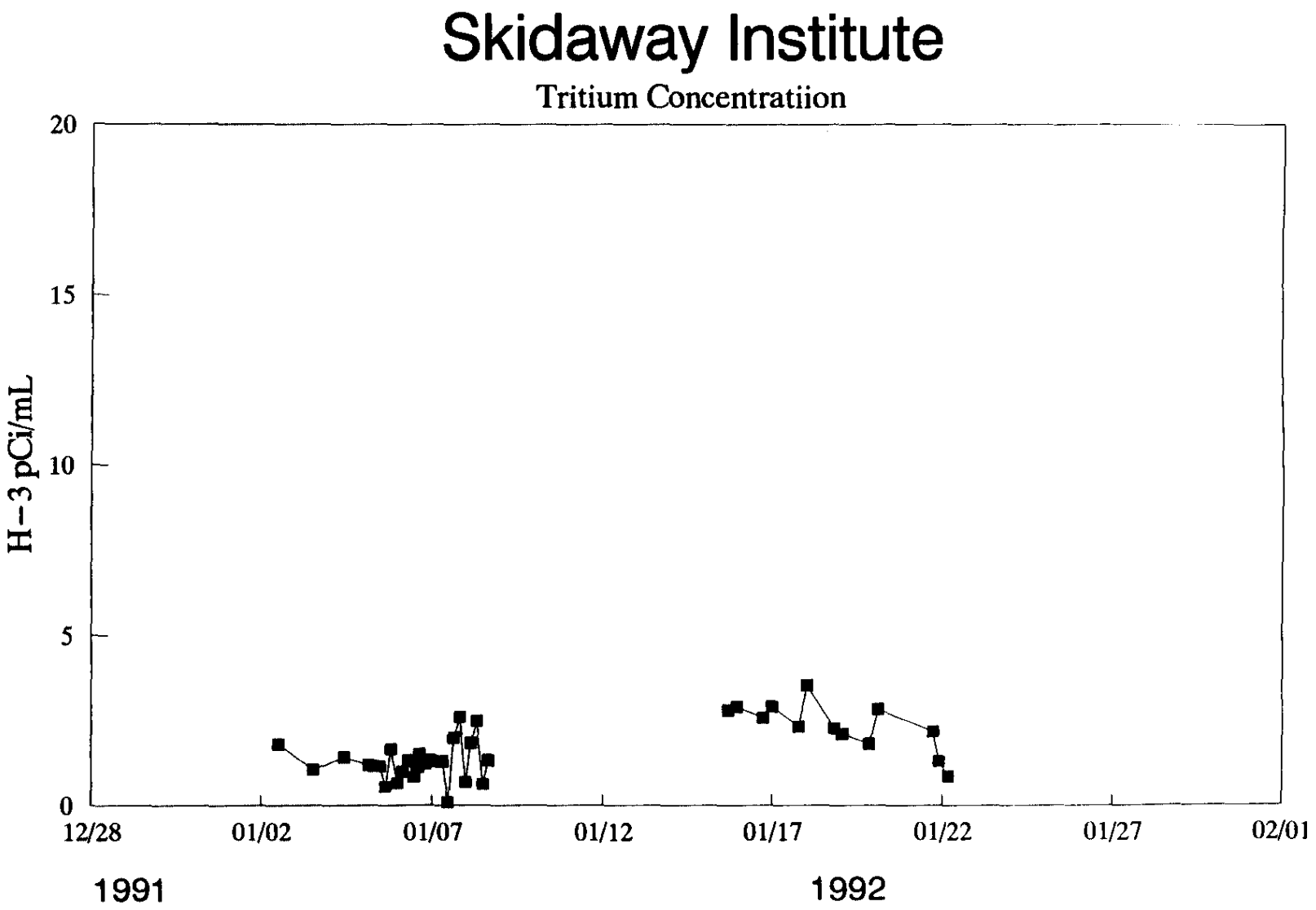


Figure F3. Results from Skidaway Institute

Estuarine Study
Savannah River Mouth
Grab Samples

location	date	time	mean pCi/mL	error 2 sigma
Lazaretto Creek	jan 3	710	3.97	
	jan 6	1600	6.81	3.03
	jan 8	1750	9.47	1.26
	jan 15	1750	3.53	2.05
	jan 21	1510	2.87	3.35
	jan 28	1530	2.34	1.90
Thunderbolt	jan 2	1525	7.67	1.92
	jan 4	1230	8.44	0.04
	jan 6	1200	8.77	0.67
	jan 15	1645	2.89	0.29
	jan 21	1605	3.14	1.94
	jan 28	1445	2.80	2.69

Table F1. Results from Lazaretto Creek and Thunderbolt Marina

Estuarine Study
Savannah River Mouth
Fort Pulaski

date	time	mean pCi/mL	error 2 sigma
dec 31	12:30	2.57	0.53
dec 31	20:30	2.29	
jan 1	00:30	4.06	
jan 1	04:30	1.43	
jan 1	08:30	0.37	
jan 1	12:30	6.71	
jan 1	16:30	4.07	
jan 1	20:30	3.60	0.92
jan 2	00:30	10.77	
jan 2	04:30	5.96	
jan 2	08:30	8.85	
jan 2	12:30	0.45	0.18
jan 2	14:45	14.27	3.76
jan 2	16:30	8.53	
jan 2	20:30	10.20	
jan 3	00:30	0.84	0.14
jan 3	04:30	9.96	
jan 3	08:07	3.36	
jan 3	08:30	0.82	0.94
jan 3	10:30	4.72	0.39
jan 3	12:30	4.73	
jan 3	14:30	13.54	1.12
jan 3	16:30	11.43	
jan 3	18:30	3.30	0.26
jan 3	20:30	3.15	
jan 3	22:30	8.72	0.96
jan 4	00:30	13.55	7.15
jan 4	02:30	16.46	
jan 4	04:30	14.01	
jan 4	06:30	3.45	2.38
jan 4	08:30	3.61	
jan 4	10:30	1.73	1.00
jan 4	11:25	8.28	0.25

Table F2. Results from Fort Pulaski

Estuarine Study
Savannah River Mouth
Fort Pulaski

date	time	mean pCi/mL	error 2 sigma
jan 4	12:30	12.18	0.25
jan 4	14:30	15.50	2.45
jan 4	16:30	16.87	2.11
jan 4	18:30	7.40	0.30
jan 4	20:30	5.48	3.95
jan 4	22:30	7.38	1.00
jan 5	00:30	11.34	2.12
jan 5	02:30	15.98	0.35
jan 5	04:30	14.63	1.36
jan 5	06:30	3.74	2.41
jan 5	08:30	5.35	0.76
jan 5	10:30	3.85	1.55
jan 5	12:30	10.32	2.71
jan 5	14:30	14.51	0.49
jan 5	16:30	14.11	3.49
jan 5	18:30	7.55	0.83
jan 5	20:30	5.33	1.19
jan 5	22:30	5.17	0.22
jan 6	02:30	13.99	0.47
jan 6	04:30	4.50	1.90
jan 6	06:30	8.41	4.84
jan 6	08:30	5.21	3.48
jan 6	10:30	3.06	0.33
jan 6	11:30	3.57	0.44
jan 6	11:40	2.86	0.57
jan 6	13:30	12.16	1.11
jan 6	19:30	4.32	0.94
jan 6	23:30	8.13	0.14
jan 7	03:30	12.83	2.56
jan 7	07:30	6.98	2.18
jan 7	11:30	4.41	0.47
jan 7	15:30	11.34	1.44
jan 7	19:30	8.59	
jan 7	23:30	6.42	0.26

Table F2. Results from Fort Pulaski (cont.)

Estuarine Study
Savannah River Mouth
Fort Pulaski

date	time	mean pCi/mL	error 2 sigma
jan 8	03:30	11.00	0.25
jan 8	07:30	8.11	4.93
jan 8	11:30	2.54	1.84
jan 8	15:30	9.43	3.37
jan 8	17:30	10.55	
jan 8	17:35	8.96	1.46
jan 8	22:09	4.07	0.15
jan 9	04:21	9.19	0.75
jan 9	10:28	3.08	1.46
jan 9	16:45	10.49	3.44
jan 9	22:57	4.54	0.98
jan 10	05:09	8.04	0.02
jan 10	11:21	5.69	1.18
jan 10	17:33	7.02	0.68
jan 10	23:45	3.75	1.25
jan 11	05:57	6.91	0.18
jan 11	12:09	4.14	1.19
jan 11	18:21	6.27	0.79
jan 12	00:33	2.92	0.47
jan 12	06:45	4.46	0.55
jan 12	12:57	3.01	2.69
jan 12	19:09	4.84	1.91
jan 13	01:21	2.13	0.35
jan 13	07:33	3.79	0.62
jan 13	13:45	3.28	1.25
jan 13	19:57	4.12	1.30
jan 14	02:09	1.45	0.12
jan 14	08:21	3.62	2.19
jan 14	14:33	2.44	1.59
jan 14	20:45	4.01	0.07

Table F2. Results from Fort Pulaski (cont.)

Estuarine Study
Savannah River Mouth
Fort Pulaski

date	time	mean pCi/mL	error 2 sigma
jan 15	02:57	1.83	0.80
jan 15	09:09	3.15	0.71
jan 15	15:00	3.14	1.51
jan 15	23:12	3.78	3.19
jan 16	17:48	2.22	0.90
jan 17	00:00	2.48	1.41
jan 17	18:36	1.67	1.08
jan 18	00:48	2.69	1.67
jan 18	19:24	2.88	5.74
jan 19	01:36	3.25	0.74
jan 19	20:12	2.59	2.35
jan 20	02:24	3.68	3.21
jan 20	21:00	2.38	4.55
jan 21	03:12	2.33	3.72
jan 21	22:04	2.03	2.61
jan 22	04:16	3.09	3.49
jan 22	22:52	2.48	3.51
jan 23	05:04	3.16	1.98
jan 23	23:40	2.58	3.61
jan 24	05:52	3.63	2.90
jan 25	00:28	2.54	2.86
jan 25	06:37	3.45	1.84
jan 26	01:13	2.09	1.90
jan 26	07:25	3.56	2.51

Table F2. Results from Fort Pulaski (cont.)

Estuarine Study
Savannah River Mouth
Fort Pulaski

date	time	mean pCi/mL	error 2 sigma
jan 27	02:01	2.09	3.06
jan 27	08:13	3.16	2.92
jan 28	02:49	2.25	2.31
jan 28	09:01	2.44	2.21

Table F2. Results from Fort Pulaski (cont.)

Estuarine Study
Savannah River Mouth
Priest Landing

date	time	mean pCi/mL	error 2 sigma
jan 2	12:15	0.73	
jan 4	10:25	nd	nd
jan 6	13:30	nd	nd
jan 6	19:00	1.48	
jan 6	23:00	4.24	
jan 7	07:00	0.89	
jan 7	11:00	1.30	
jan 8	16:53	1.35	0.57
jan 8	22:09	nd	
jan 9	04:21	0.68	0.68
jan 9	10:33	0.24	
jan 9	16:45	0.81	
jan 9	22:57	2.08	
jan 10	05:09	0.58	
jan 10	11:21	0.87	2.41
jan 10	17:33	2.10	
jan 10	23:45	11.43	
jan 11	05:57	2.56	
jan 11	12:09	0.24	0.11
jan 11	18:21	1.21	
jan 12	00:33	0.86	
jan 12	06:45	1.69	0.86
jan 12	12:57	0.57	
jan 12	19:09	1.15	1.58
jan 13	01:21	3.32	
jan 13	07:33	1.69	
jan 13	13:45	0.55	
jan 13	14:09	0.26	0.12
jan 13	19:57	3.52	

Table F3. Results from Priest Landing

Estuarine Study
Savannah River Mouth
Priest Landing

date	time	mean pCi/mL	error 2 sigma
jan 14	08:21	1.05	
jan 14	14:33	0.53	0.43
jan 14	20:45	1.22	
jan 15	02:57	1.16	
jan 15	09:09	1.07	
jan 15	15:21	0.25	0.68
jan 15	16:50	0.63	1.41
jan 15	23:02	1.98	1.04
jan 16	17:38	0.90	0.84
jan 16	23:50	2.05	1.20
jan 17	18:26	1.00	1.06
jan 18	00:38	1.83	0.90
jan 18	19:14	0.63	0.35
jan 19	01:26	2.40	1.25
jan 19	20:02	0.83	1.47
jan 20	02:14	1.58	0.98
jan 20	20:50	1.30	1.00
jan 21	03:02	1.22	0.51
jan 21	21:56	1.69	2.27
jan 22	04:07	1.87	1.23
jan 22	22:43	2.18	2.72
jan 23	04:55	1.68	1.53
jan 23	23:31	1.26	2.21
jan 24	05:43	1.67	1.90
jan 25	00:19	1.84	3.37
jan 25	06:31	1.70	2.47

Table F3. Results from Priest Landing (cont.)

Estuarine Study
Savannah River Mouth
Priest Landing

date	time	mean pCi/mL	error 2 sigma
jan 26	01:07	1.58	2.33
jan 26	07:19	1.99	1.76
jan 27	01:55	0.70	1.22
jan 27	08:07	1.97	3.35
jan 28	02:43	1.17	1.59
jan 28	08:55	2.05	2.00

Table F3. Results from Priest Landing (cont.)

Estuarine Study
Savannah River Mouth
Skidaway Institute

date	time	mean pCi/mL	error 2 sigma
jan 2	12:00	1.82	
jan 3	12:06	1.07	
jan 4	10:07	1.44	1.25
jan 5	03:00	1.21	0.78
jan 5	07:00	1.19	
jan 5	11:00	1.19	0.53
jan 5	15:00	0.58	1.59
jan 5	19:00	1.68	
jan 5	23:00	0.67	1.09
jan 6	03:00	1.02	0.60
jan 6	07:00	1.34	
jan 6	11:00	0.86	2.29
jan 6	14:00	1.15	
jan 6	15:00	1.54	0.22
jan 6	19:00	1.26	
jan 6	23:00	1.35	
jan 7	03:00	1.32	0.24
jan 7	07:00	1.32	
jan 7	11:00	nd	
jan 7	15:00	2.01	0.07
jan 7	19:00	2.62	1.94
jan 7	23:00	0.70	0.26
jan 8	03:00	1.86	
jan 8	07:00	2.50	0.37
jan 8	11:00	0.64	
jan 8	15:00	1.36	0.15
jan 15	1650	2.81	1.35
jan 15	2302	2.91	2.00
jan 16	1738	2.60	2.25
jan 16	2350	2.92	1.55

Table F4. Results from Skidaway Institute

Estuarine Study
Savannah River Mouth
Skidaway Institute

date	time	mean pCi/mL	error 2 sigma
jan 17	1826	2.32	1.20
jan 18	38	3.54	1.49
jan 18	1914	2.28	1.27
jan 19	126	2.11	0.43
jan 19	2002	1.83	0.61
jan 20	214	2.84	2.02
jan 21	1715	2.17	1.61
jan 21	2156	1.32	1.84
jan 22	407	0.87	0.69

Table F4. Results from Skidaway Institute (cont.)

Estuarine Survey
Savannah River Mouth

location	date	time	mean pCi/mL	error 2 sigma
Intracoastal WAterway South (sweep)	jan 3	1125	nd	
	jan 3	1140	nd	
	jan 3	1146	0.53	0.76
	jan 3	1206	nd	
	jan 3	1212	1.38	
	jan 3	1230	7.48	1.16
	jan 3	1247	11.52	0.71
	jan 3	1253	11.76	3.92
	jan 3	1259	12.85	0.53
	jan 3	1620	13.53	1.84
Intracoastal Waterway North (sweep)	jan 3	1500	0.87	0.29
	jan 3	1503	0.85	
	jan 3	1518	0.82	1.53
	jan 3	1525	nd	
Savannah River (sweep)	jan 3	1335	25.69	1.69
	jan 3	1345	26.72	1.16
	jan 3	1357	25.19	1.29
	jan 3	1403	23.00	
	jan 3	1418	14.57	0.69
	jan 3	1423	11.85	
	jan 3	1430	13.12	
	jan 3	1440	8.96	

Table F5. Results from Estuarine Survey

APPENDIX G

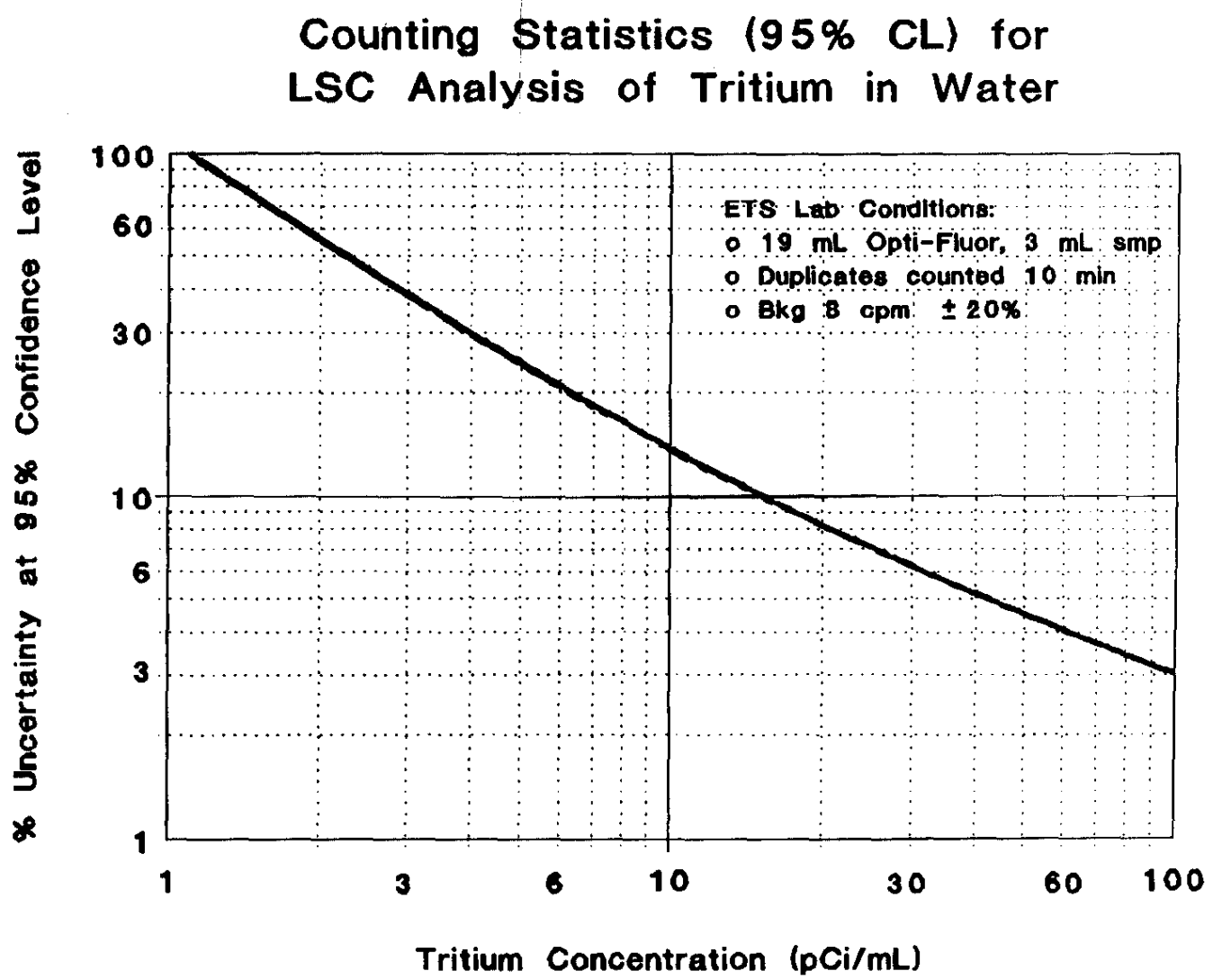


Figure G1. Counting Uncertainty vs Concentration

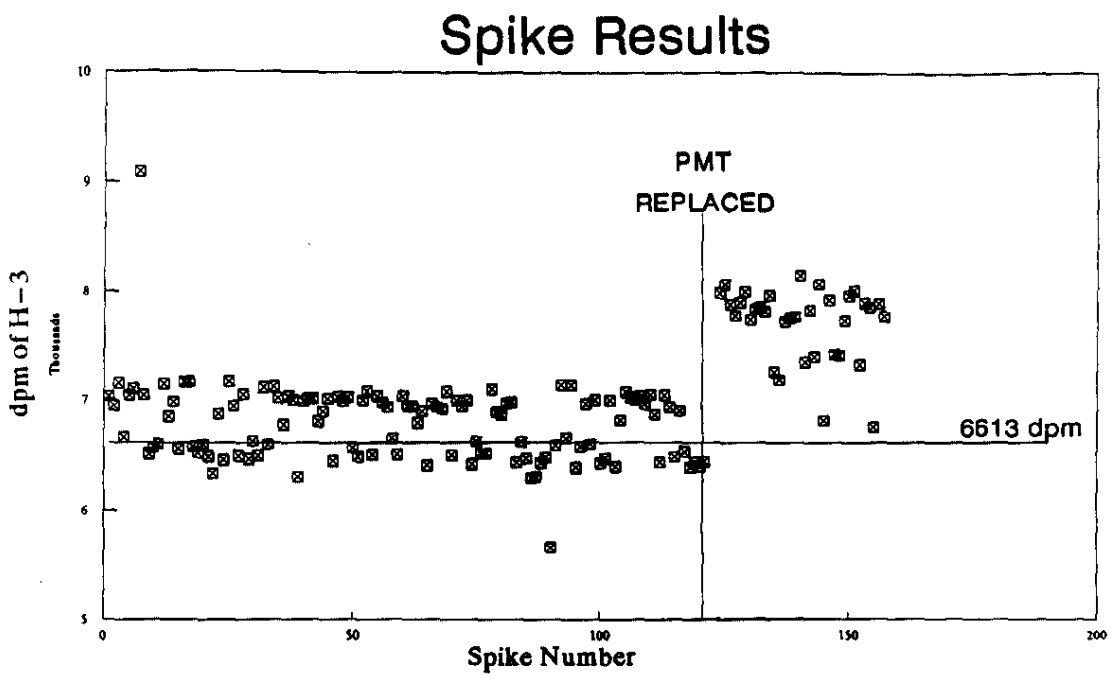


Figure G2. Spike Results

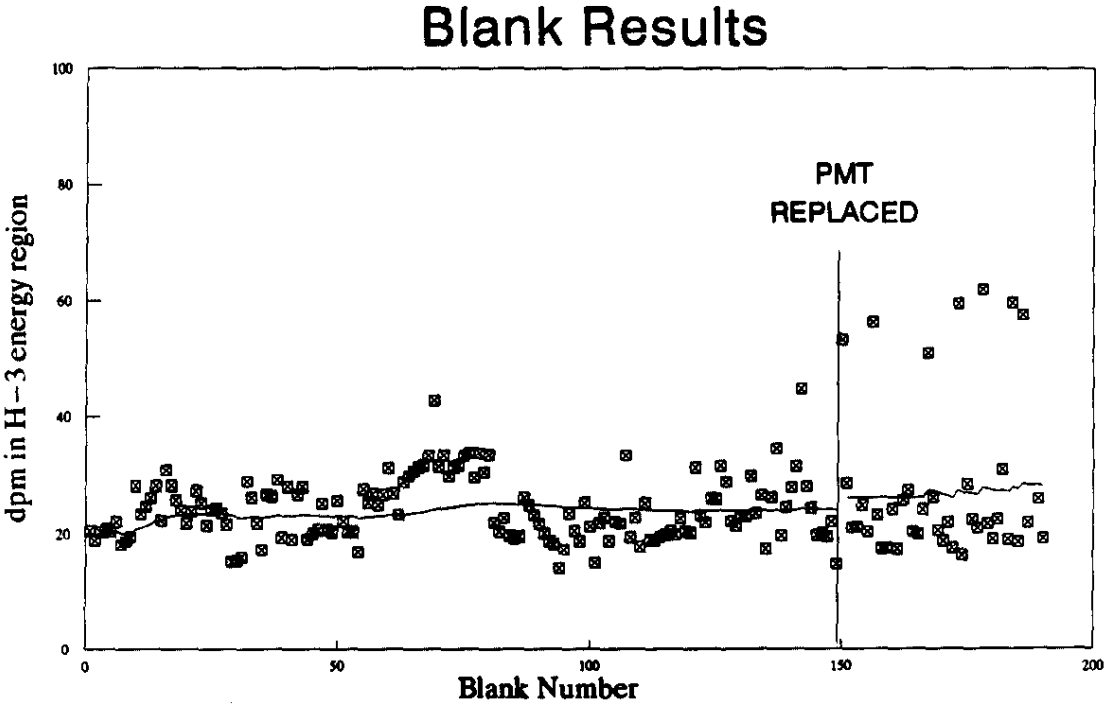


Figure G3. Blank Results

TRITIUM SAMPLE ANALYSES IN THE SAVANNAH RIVER AND ASSOCIATED WATERWAYS FOLLOWING THE K-REACTOR RELEASE OF DECEMBER 1991 (U)

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