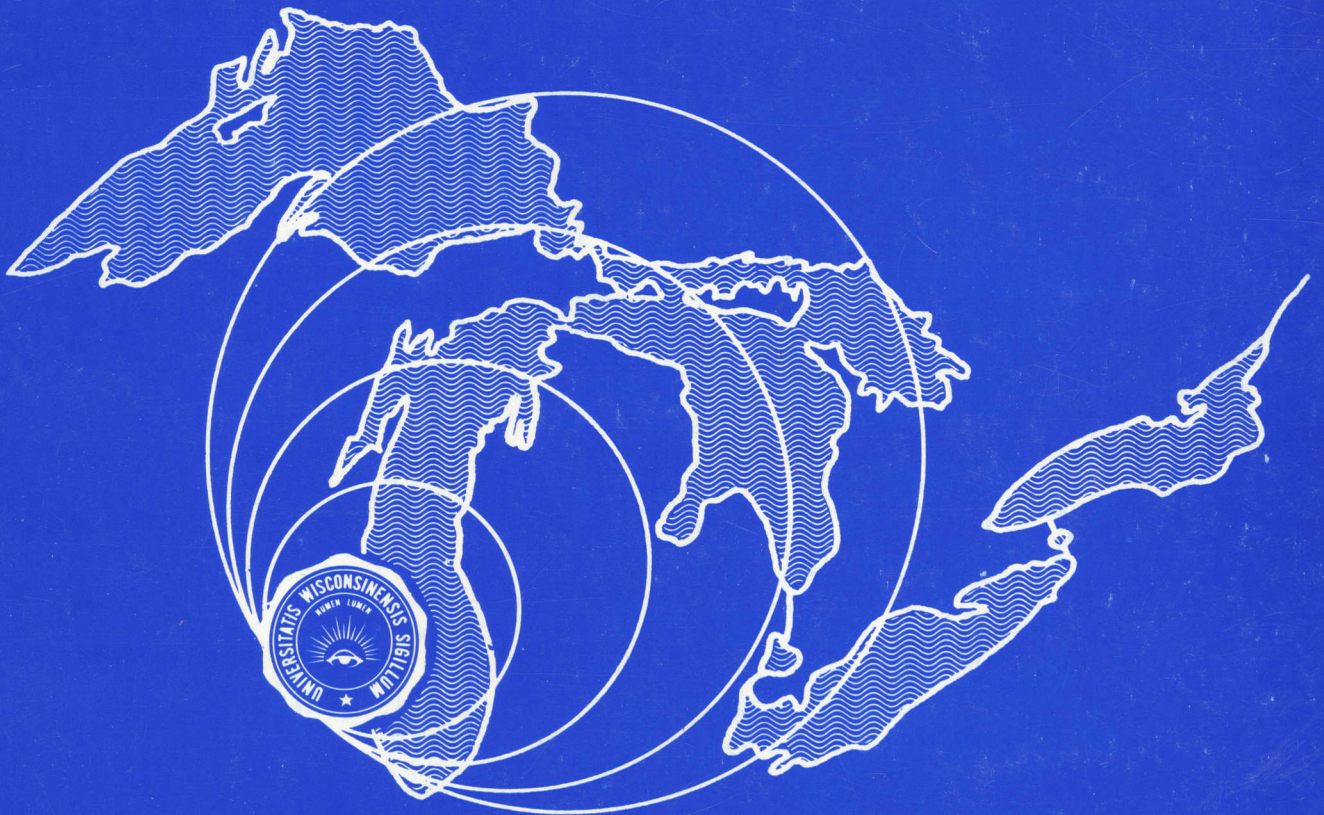
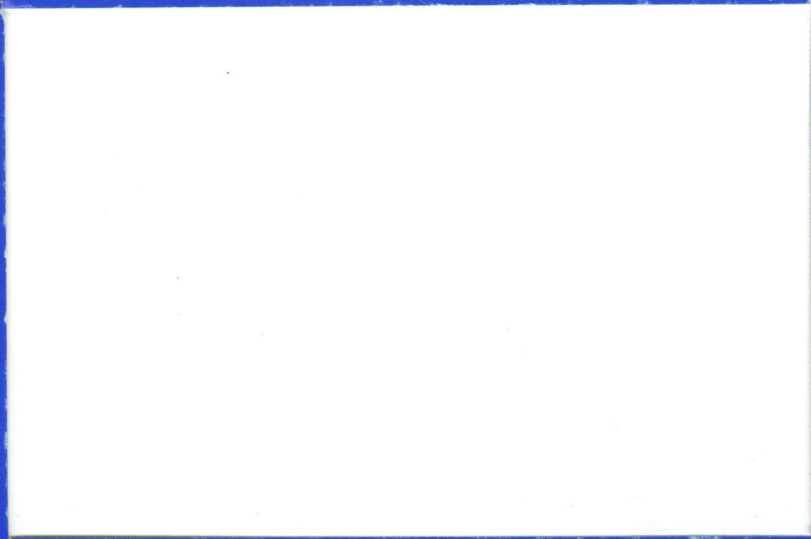


THE UNIVERSITY OF WISCONSIN—MILWAUKEE

CENTER
FOR
GREAT LAKES STUDIES



MILWAUKEE, WISCONSIN 53201 U.S.A.



SPECIAL REPORT NO. 39

Section 7

APPENDIX

A COMPARISON OF CONTINUOUS AND
INTERMITTENT EXPOSURES OF FOUR SPECIES
OF AQUATIC ORGANISMS TO CHLORINE

March 1989

Final Research Report
Submitted to Hunton and Williams on behalf of
the Utility Water Act Group

by

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Section 7.1 Common Shiner Acute Tests

TOTAL LENGTHS (MM) AND NET WEIGHTS (G)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

Table 7.1-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
	A		A		A		A		A		A	
	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.
FISH NO.												
1	95 5.77	81 3.80	91 5.26	87 4.26	87 4.02	92 5.46	88 5.06	87 4.86	97 5.58	90 4.80	97 6.10	91 4.96
2	81 3.99	94 5.61	97 7.00	91 4.58	95 6.17	77 2.95	94 5.84	94 5.76	92 4.93	93 5.79	89 4.96	88 5.14
3	87 6.78	87 4.43	90 5.67	89 5.31	85 4.45	87 4.65	92 5.53	85 4.12	84 4.10	89 4.76	89 4.34	90 5.25
4	93 5.28	95 7.13	83 4.22	98 7.58	90 5.11	86 3.97	87 4.23	87 4.54	89 4.52	91 5.58	97 6.46	93 5.53
5	91 5.31	95 6.74	85 3.78	87 4.31	85 4.24	90 4.94	87 3.68	82 3.43	90 4.98	90 5.21	85 6.43	105 7.15
6	89 5.22	89 5.09	87 4.42	85 4.39	88 4.68	93 5.07	90 4.16	90 4.77	90 5.28	83 3.81	80 3.25	90 4.10
7	89 5.25	98 6.73	90 6.39	95 7.06	92 5.32	93 5.55	89 4.59	97 6.17	85 3.88	92 5.89	90 4.31	93 5.64
8	95 5.32	91 5.62	85 5.15	85 4.60	88 4.39	83 3.91	99 7.12	84 3.94	87 4.61	97 6.37	96 6.14	90 5.23
9	86 5.39	89 5.69	89 4.88	86 5.11	91 4.65	92 4.42	100 5.89	90 4.98	85 4.45	90 4.28	87 4.46	91 4.38
10	97 7.38	92 6.03	95 6.13	84 4.35	95 5.65	80 3.36	86 4.55	90 5.03	89 4.48	100 6.55	86 4.25	95 6.08

TOTAL LENGTHS (MM) AND NET WEIGHTS (G)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
	A		A		A		A		A		A	
	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.	F.L. W.WT.
FISH NO.												
1	85 4.58	89 4.86	88 4.46	94 6.25	99 5.74	88 4.52	89 5.27	87 4.14	91 5.17	90 5.09	89 4.87	94 5.60
2	97 6.73	91 5.88	85 4.21	89 5.27	89 4.49	90 4.74	82 3.78	89 4.83	93 5.75	90 5.50	87 4.40	99 6.56
3	98 6.80	97 6.83	85 4.43	87 4.87	95 6.04	86 4.46	88 4.76	88 4.50	93 6.25	93 5.67	80 3.90	90 4.59
4	98 6.33	95 5.79	98 6.37	87 4.38	97 6.88	93 6.07	98 6.38	89 3.97	99 7.11	87 5.15	95 6.12	89 4.57
5	95 5.54	93 5.52	90 5.17	92 4.96	87 4.48	86 4.93	94 5.74	84 3.80	87 4.32	105 6.83	88 4.47	92 5.72
6	95 6.04	87 4.60	99 5.67	101 6.44	90 5.16	87 4.33	101 7.18	87 4.65	91 5.34	94 4.94	97 6.69	92 4.15
7	93 5.35	86 4.11	87 3.68	92 6.18	96 5.75	96 6.60	90 5.08	87 4.51	90 4.09	83 3.34	94 6.69	89 4.70
8	92 5.38	86 4.75	90 4.98	101 6.81	93 5.40	92 5.55	90 5.30	86 4.41	92 5.40	89 5.80	81 3.86	94 5.59
9	93 6.13	98 6.23	99 5.85	86 4.08	91 5.90	87 4.63	94 5.33	94 5.67	94 6.15	100 6.61	82 3.94	95 5.56
10	88 4.68	85 3.94	88 4.20	84 4.03	87 4.96	101 6.93		88 5.19	86 3.70	85 3.88		84 3.50

Table 7.1-2

TEMPERATURE (CELCIUS)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	25.2	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.7	25.5	25.5	25.5
	26.1	25.8	26.5	26.2	26.3	26.2	26.0	25.8	26.1	26.2	25.9	25.9
3/01			25.2	25.2	25.2	25.2	25.2	25.5	25.5	25.2	25.0	25.5
			26.5	26.5	26.1	26.3	26.5	26.7	26.5	26.2	26.5	26.0
3/02			25.5	25.5	25.5	25.5	25.5	25.5	25.2	25.2	25.5	25.2
			26.1	26.0	26.1	26.0	25.9	26.2	25.9	26.2	25.1	25.9
3/03					26.0	25.7	25.7	26.0	26.0	26.0	25.5	25.0
					26.3	25.7	25.9	26.0	25.7	25.8	25.2	25.5
3/04					25.2	26.0	25.5	26.0	25.5	25.7	25.0	26.0
					25.9	25.5	25.6	26.2	25.6	25.6	25.1	25.5
3/05					26.0	25.7	26.0	26.0	25.7	26.0	26.0	26.0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	25.7	25.7	25.9	25.6	25.8	25.8	25.8	25.9	25.8	25.8	25.5	25.6
S.D. =	0.6	0.2	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.3
MAX =	26.1	25.8	26.5	26.5	26.3	26.3	26.5	26.7	26.5	26.2	26.5	26.0
MIN =	25.2	25.5	25.2	25.2	25.2	25.2	25.2	25.5	25.2	25.2	25.0	25.0
N =	2	2	6	5	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	25.7	25.9	25.8	25.9	25.8	25.6
S.D. =	0.4	0.5	0.4	0.4	0.4	0.4
MAX =	26.1	26.5	26.3	26.7	26.5	26.5
MIN =	25.2	25.2	25.2	25.2	25.2	25.0
N =	4	12	22	22	22	22

GRAND (OVERALL) STATISTICS

MEAN =	25.8
S.D. =	0.4
MAX =	26.7
MIN =	25.0
N =	104

Table 7.1-2 (continued)

TEMPERATURE (CELCIUS)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	25.5	25.5	25.2	25.5	25.5	25.5	25.5	25.2	25.2	25.5	25.5	
	26.0	25.3	26.0	25.2	25.4	25.3	25.5	25.3	25.0	25.7	25.0	25.8
3/01			25.5	25.2	25.2	25.5	25.5	25.2	25.2	25.5	25.2	25.5
			25.9	25.9	25.8	25.7	25.8	25.7	25.2	25.8	25.3	25.8
3/02			25.5	25.5	25.5	25.5	25.5	25.5	25.2	25.5	25.5	25.5
			25.5	25.2	25.2	25.2	25.1	25.4	25.0	25.5	25.0	25.5
3/03			25.5	25.0	25.2	25.0	25.0	25.0	25.0	25.2	25.0	25.2
			25.6	25.4	25.5	25.4	25.4	25.5	25.4	25.5	25.5	25.5
3/04			26.0	25.2	25.5	25.5	26.0	25.7	26.0	26.0	25.5	25.5
			25.5	25.3	25.1	25.3	25.4	25.4	24.9	25.4	24.7	25.5
3/05			25.2	25.2	25.0	25.0	25.2	25.2	25.0	25.2	25.0	25.0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	25.8	25.4	25.6	25.3	25.4	25.4	25.4	25.4	25.2	25.5	25.2	25.5
S.D. =	0.4	0.1	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2
MAX =	26.0	25.5	26.0	25.9	25.8	25.7	26.0	25.7	26.0	26.0	25.5	25.8
MIN =	25.5	25.3	25.2	25.0	25.0	25.0	25.0	25.0	24.9	25.2	24.7	25.0
N =	2	2	11	11	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	25.6	25.5	25.4	25.4	25.4	25.3
S.D. =	0.3	0.3	0.2	0.3	0.3	0.3
MAX =	26.0	26.0	25.8	26.0	26.0	25.8
MIN =	25.3	25.0	25.0	25.0	24.9	24.7
N =	4	22	22	22	22	22

GRAND (OVERALL) STATISTICS

MEAN =	25.4
S.D. =	0.3
MAX =	26.0
MIN =	24.7
N =	114

DISSOLVED OXYGEN (MG/L)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

Table 7.1-3

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	7.00	6.45	6.60	6.45	6.40	6.50	6.50	6.00	6.50	6.40	6.65	6.15
3/01			7.55	7.90	7.50	7.60	7.50	7.45	7.35	7.75	7.60	7.50
3/02			8.00	8.00	7.85	7.90	7.75	7.75	7.90	7.85	7.80	7.83
3/03					7.90	7.80	7.80	7.75	7.75	7.90	7.80	7.90
3/04					7.80	7.80	7.75	7.75	7.80	7.90	7.90	7.87
3/05					7.80	7.85	7.70	7.75	7.65	7.80	7.80	7.65

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	7.00	6.45	7.38	7.45	7.54	7.58	7.50	7.41	7.49	7.60	7.59	7.48
S.D. =			0.71	0.87	0.58	0.54	0.50	0.70	0.52	0.59	0.47	0.67
MAX =	7.00	6.45	8.00	8.00	7.90	7.90	7.80	7.75	7.90	7.90	7.90	7.90
MIN =	7.00	6.45	6.60	6.45	6.40	6.50	6.50	6.00	6.50	6.40	6.65	6.15
N =	1	1	3	3	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	6.73	7.42	7.56	7.45	7.55	7.54
S.D. =	0.39	0.71	0.53	0.58	0.53	0.56
MAX =	7.00	8.00	7.90	7.80	7.90	7.90
MIN =	6.45	6.45	6.40	6.00	6.40	6.15
N =	2	6	12	12	12	12

GRAND (OVERALL) STATISTICS

MEAN =	7.48
S.D. =	0.56
MAX =	8.00
MIN =	6.00
N =	56

DISSOLVED OXYGEN (MG/L)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

Table 7.1-3 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	7.00	7.05	7.20	6.85	7.00	6.60	6.85	7.15	7.15	6.85	7.00	6.90
3/01			7.30	7.40	7.40	7.35	7.25	7.40	7.45	7.40	7.50	7.15
3/02			7.70	7.60	7.95	7.90	7.90	7.85	7.90	7.80	7.85	7.55
3/03			7.90	8.05	7.85	7.90	7.90	7.95	7.95	7.90	7.95	7.80
3/04			8.00	8.00	7.70	7.85	7.80	7.90	7.75	7.80	7.90	7.75
3/05			8.00	8.05	7.85	7.75	7.75	7.95	7.85	7.80	7.95	7.90

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	7.00	7.05	7.68	7.66	7.63	7.56	7.58	7.70	7.68	7.59	7.69	7.51
S.D. =			0.35	0.48	0.36	0.51	0.43	0.34	0.31	0.40	0.38	0.40
MAX =	7.00	7.05	8.00	8.05	7.95	7.90	7.90	7.95	7.95	7.90	7.95	7.90
MIN =	7.00	7.05	7.20	6.85	7.00	6.60	6.85	7.15	7.15	6.85	7.00	6.90
N =	1	1	6	6	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	7.03	7.67	7.59	7.64	7.63	7.60
S.D. =	0.04	0.40	0.42	0.38	0.35	0.38
MAX =	7.05	8.05	7.95	7.95	7.95	7.95
MIN =	7.00	6.85	6.60	6.85	6.85	6.90
N =	2	12	12	12	12	12

GRAND (OVERALL) STATISTICS

MEAN = 7.61
S.D. = 0.38
MAX = 8.05
MIN = 6.60
N = 62

FILE: CS-UNION

UN-IONIZED AMMONIA-NITROGEN (ug/L)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

Table 7.1-4

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	35	40	28	31	26	31	29	29	29	28	25	27
3/02			25	28	21	30	25	25	24	29	26	24
3/04					11	11	12	11	11	10	1	10

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	35	40	26	29	20	24	22	22	21	22	17	20
S.D. =			1	2	7	11	9	10	9	11	14	9
MAX =			28	31	26	31	29	29	29	29	26	27
MIN =			25	28	11	11	12	11	11	10	1	10
N =	1	1	2	2	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	37	28	22	22	22	19
S.D. =	2	2	9	8	9	11
MAX =	40	31	31	29	29	27
MIN =	35	25	11	11	10	1
N =	2	4	6	6	6	6

GRAND (OVERALL) STATISTICS

MEAN = 23
S.D. = 9
MAX = 40
MIN = 1
N = 30

UN-IONIZED AMMONIA-NITROGEN (ug/L)
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

Table 7.1-4 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	31	30	28	31	30	25	26	28	30	31	28	25
3/02			29	33	32	27	29	30	32	31	31	28
3/04			23	21	21	13	18	16	15	11	12	11

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	31	30	27	28	28	22	24	24	26	24	24	21
S.D. =			3	6	6	7	6	8	9	11	10	9
MAX =			29	33	32	27	29	30	32	31	31	28
MIN =			23	21	21	13	18	16	15	11	12	11
N =	1	1	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	31	27	25	24	25	23
S.D. =	0	5	7	6	9	9
MAX =	31	33	32	30	32	31
MIN =	30	21	13	16	11	11
N =	2	6	6	6	6	6

GRAND (OVERALL) STATISTICS

MEAN = 25
S.D. = 7
MAX = 33
MIN = 11
N = 32

FILE: CS-PH

pH
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

Table 7.1-5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	8.22	8.30	8.16	8.22	8.12	8.21	8.17	8.18	8.14	8.13	8.09	8.12
3/02			8.12	8.17	8.04	8.19	8.11	8.13	8.11	8.17	8.11	8.08
3/04					7.85	7.80	7.85	7.80	7.85	7.75	7.70	7.75

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.22	8.30	8.16	8.22	8.12	8.21	8.17	8.18	8.14	8.17	8.11	8.12
MIN =	8.22	8.30	8.12	8.17	7.85	7.80	7.85	7.80	7.85	7.75	7.70	7.75
N =	1	1	2	2	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MAX =	8.30	8.22	8.21	8.18	8.17	8.12
MIN =	8.22	8.12	7.80	7.80	7.75	7.70
N =	2	4	6	6	6	6

GRAND (OVERALL) STATISTICS

MAX = 8.30
MIN = 7.70
N = 30

FILE: CS-PH

pH
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

Table 7.1-5 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
2/29	8.20	8.21	8.19	8.22	8.20	8.12	8.13	8.18	8.21	8.21	8.18	8.12
3/02			8.15	8.21	8.21	8.15	8.16	8.17	8.23	8.19	8.21	8.17
3/04			8.10	8.02	8.10	7.90	8.00	7.95	7.95	7.80	7.87	7.80

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.20	8.21	8.19	8.22	8.21	8.15	8.16	8.18	8.23	8.21	8.21	8.17
MIN =	8.20	8.21	8.10	8.02	8.10	7.90	8.00	7.95	7.95	7.80	7.87	7.80
N =	1	1	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MAX =	8.21	8.22	8.21	8.18	8.23	8.21
MIN =	8.20	8.02	7.90	7.95	7.80	7.80
N =	2	6	6	6	6	6

GRAND (OVERALL) STATISTICS

MAX = 8.23
MIN = 7.80
N = 32

Table 7.1-6

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

COMMON SHINER ACUTE TEST

FEBRUARY 29 - MARCH 5, 1988

CONTINUOUS EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
2/29 AM	263	171	133	116	62	66	32	28	14	13	1	1
PM	241	248	91	93	41	40	16	20	10	9	-1	3
3/01 AM		298	92	106	32	34	19	18	7	8		
PM			124	129	51	52	15	16	6	8	-2	-1
3/02 AM			112	105	57	61	15	17	7	5	1	0
PM			123	121	49	48	13	15	8	6	-2	-1
3/03 AM			135	143	55	59	15	22	11	8	4	0
PM					54	54	14	20	9	7		4
3/04 AM					59	58	18	22	11	10	2	1
TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DAILY MEANS												
2/29 =	252	210	112	104	52	53	24	24	12	11	0	2
3/01 =		298	108	117	41	43	17	17	6	8	-2	-1
3/02 =			118	113	53	54	14	16	8	6	-1	-0
3/03 =			135	143	55	57	14	21	10	7	4	2
3/04 =					59	58	18	22	11	10	2	1
MEAN =	252	239	116	116	51	52	17	20	9	8	0	1
S.D. =	15	64	18	17	10	10	6	4	2	2	2	2
MAX =	263	298	135	143	62	66	32	28	14	13	4	4
MIN =	241	171	91	93	32	34	13	15	6	5	-2	-1
N =	2	3	7	7	9	9	9	9	9	9	7	8
TREATMENT	1		2		3		4		5		CONTROL	
DAILY MEANS												
2/29 =	231		108		53		24		11		1	
3/01 =	298		112		42		17		7		-2	
3/02 =			115		54		15		7		-0	
3/03 =			139		56		18		9		3	
3/04 =					58		20		10		1	
MEAN =	244		116		52		19		9		1	
S.D. =	47		17		10		5		2		2	
MAX =	298		143		66		32		14		4	
MIN =	171		91		32		13		5		-2	
N =	5		14		18		18		18		15	

Table 7.1-6 (continued)

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

COMMON SHINER ACUTE TEST

FEBRUARY 29 - MARCH 5, 1988

INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
2/29 ONSET	475	506	387	375	293	280	220	239	114	108	-4	-0
MIDPOINT	479	478	367	360	277	269	189	220	91	92	2	2
FINAL	465	466	361	357	268	263	191	211	87	88	3	3
3/01 ONSET			355	350	254	244	168	155	89	84		
MIDPOINT			337	336	243	252	160	160	79	72		
FINAL				363	276	268	193	186	91		0	
3/02 ONSET			356	356	276	278	182	197	93	73		
MIDPOINT			343	338	258	257	173	171	65	66		
FINAL			333	339	262	256	167	161	89	59	0	-1
3/03 ONSET			362	362	279	275	167	183	102	82		
MIDPOINT			342	346	268	261	173	174	71	75		
FINAL			339	341	266	250	172	164	66	64		

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DAILY MEANS												
2/29 =	473	484	372	364	279	270	200	223	97	96	0	2
3/01 =			346	350	258	254	173	167	86	78	0	
3/02 =			344	344	265	264	174	176	82	66	0	-1
3/03 =			348	350	271	262	171	174	80	73		
MEAN =	473	484	353	352	268	263	179	185	86	78	0	1
S.D. =	7	21	16	12	13	12	17	27	14	14	2	2
MAX =	479	506	387	375	293	280	220	239	114	108	3	3
MIN =	465	466	333	336	243	244	160	155	65	59	-4	-1
N =	3	3	11	12	12	12	12	12	12	11	5	4

TREATMENT DAILY MEANS	1	2	3	4	5	CONTROL
2/29 =	478	368	275	212	97	1
3/01 =		348	256	170	83	0
3/02 =		344	264	175	74	-0
3/03 =		349	266	172	77	
MEAN =	478	352	265	182	83	1
S.D. =	15	14	12	22	15	2
MAX =	506	387	293	239	114	3
MIN =	465	333	243	155	59	-4
N =	6	23	24	24	23	9

FILE: CS-DPD

PERCENT MONOCHLORAMINE
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
CONTINUOUS EXPOSURE

Table 7.1-7

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
2/29	91		99		69		59		57			0
	95		88		82		74		65			0
3/01			88			72	52			19	0	
			93			82	77			59	0	
3/02				83	80			83	94			0
				86	90			100	83			0
3/03						77	92			63	0	
						89	100			100	0	
3/04					88		100		74			0
					100		100		24			0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	93		90	89	85	80	80	86	66	60	0	0
S.D. =	3		4	7	10	7	21	17	24	33	0	0
MAX =	95		93	99	100	89	100	100	94	100	0	0
MIN =	91		88	83	69	72	52	59	24	19	0	0
N =	2		2	4	6	4	4	6	6	4	4	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	93	90	83	84	64	0
S.D. =	3	6	9	18	26	0
MAX =	95	99	100	100	100	0
MIN =	91	83	69	52	19	0
N =	2	6	10	10	10	10

GRAND (OVERALL) STATISTICS (EXCLUDING CONTROL)

MEAN = 80
S.D. = 19
MAX = 100
MIN = 19
N = 38

FILE: CS-DPD

Table 7.1-7 (continued)

PERCENT MONOCHLORAMINE
COMMON SHINER ACUTE TEST
FEBRUARY 29 - MARCH 5, 1988
INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
2/29	100		100		100		100		100			0
	100		100		100		100		100			0
3/01			97			94	95			100	0	
			97			96	99			96	0	
3/02				95	96			97	87			0
				95	97			98	92			0
3/03			97			95	97			100	0	
			98			97	98			99	0	

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	100		97	98	98	96	97	99	95	99	0	0
S.D. =	0		1	3	2	1	2	1	6	2	0	0
MAX =	100		98	100	100	97	99	100	100	100	0	0
MIN =	100		97	95	96	94	95	97	87	96	0	0
N =	2		4	4	4	4	4	4	4	4	4	4

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	100	98	97	98	97	0
S.D. =	0	2	2	2	5	0
MAX =	100	100	100	100	100	0
MIN =	100	95	94	95	87	0
N =	2	8	8	8	8	8

GRAND (OVERALL) STATISTICS (EXCLUDING CONTROL)

MEAN = 97
S.D. = 3
MAX = 100
MIN = 87
N = 34

FILE: CMORT-TABLE

Table 7.1-8

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period through 96 hrs of continuous exposure of monochloramine to common shiner.

Treatment Level	No. of Fish at Start		Observation Time (hours of exposure)							
			3	6	8	24	48	72	96	120
1	20	TRC (ug/L)	231	231	231	244	244	244	244	244
		Cum. Mort.	0	5	12	20	20	20	20	20
		Cum. % Mort.	0	25	60	100	100	100	100	100
2	20	TRC (ug/L)	108	108	108	110	112	116	116	116
		Cum. Mort.	0	0	0	3	17	20	20	20
		Cum. % Mort.	0	0	0	15	85	100	100	100
3	20	TRC (ug/L)	53	53	53	47	49	51	52	52
		Cum. Mort.	0	0	0	0	0	1	2	2
		Cum. % Mort.	0	0	0	0	0	5	10	10
4	20	TRC (ug/L)	24	24	24	20	19	18	19	19
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
5	20	TRC (ug/L)	11	11	11	9	8	9	9	9
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Control	20	TRC (ug/L)	1	1	1	0	0	1	1	1
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)					204	145	84	73	71	71

FILE: CMORT-TABLE

Table 7.1-9

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period through 96 hrs of intermittent exposure of monochloramine to common shiner.

Treatment Level	No. of Fish at Start		Observation Time (hours of exposure)							
			3	6	8	24	48	72	96	120
1	20	TRC (ug/L)	478	478	478	478	478	478	478	478
		Cum. Mort.	14	18	19	19	20	20	20	20
		Cum. % Mort.	70	90	95	95	100	100	100	100
2	20	TRC (ug/L)	368	368	368	359	354	352	352	352
		Cum. Mort.	0	3	3	3	3	3	5	5
		Cum. % Mort.	0	15	15	15	15	15	25	25
3	20	TRC (ug/L)	275	275	275	265	265	265	265	265
		Cum. Mort.	4	6	6	6	6	6	6	6
		Cum. % Mort.	20	30	30	30	30	30	30	30
4	19	TRC (ug/L)	212	212	212	191	186	182	182	182
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
5	20	TRC (ug/L)	97	97	97	90	85	83	83	83
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Control	19	TRC (ug/L)	1	1	1	1	1	1	1	1
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)			438	388	379	371	358	356	345	345

Section 7.2 Rainbow Trout Acute Tests

TOTAL LENGTH (MM)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 CONTINUOUS EXPOSURE

Table 7.2-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE FISH NO.	A	B	A	B	A	B	A	B	A	B	A	B
1	74	73	70	72	75	77	80	76	76	68	68	69
2	72	74	74	72	76	72	78	76	74	85	70	70
3	75	78	74	79	75	69	79	79	76	72	75	79
4	76	73	72	77	77	75	77	74	78	77	79	79
5	76	72	73	73	76	76	73	83	75	73	71	74
6	78	72	73	75	75	69	73	75	82	71	77	73
7	75	79	67	74	75	72	78	73	75	74	72	73
8	77	72	80	67	76	78	77	73	68	72	71	76
9	76	76	74	72	82	79	78	78	71	76	75	70
10	78	71	71	73	69	73	71	76	70	73	72	72

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	76	74	73	73	76	74	76	76	75	74	73	74
S.D. =	2	3	3	3	3	4	3	3	4	5	3	4
MAX =	78	79	80	79	82	79	80	83	82	85	79	79
MIN =	72	71	67	67	69	69	71	73	68	68	68	69
N =	10	10	10	10	10	10	10	10	10	10	10	10

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	75	73	75	76	74	73
S.D. =	2	3	3	3	4	3
MAX =	79	80	82	83	85	79
MIN =	71	67	69	71	68	68
N =	20	20	20	20	20	20

OVERALL (GRAND) STATISTICS:

MEAN =	74
S.D. =	3
MAX =	85
MIN =	67
N =	120

FILE: RI-LENGTH

TOTAL LENGTH (MM)
RAINBOW TROUT ACUTE TEST
APRIL 18 - APRIL 23, 1988
INTERMITTENT EXPOSURE

Table 7.2-1 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE FISH NO.	A	B	A	B	A	B	A	B	A	B	A	B
1	75	77	72	78	75	78	75	76	77	73	75	78
2	75	73	72	73	71	72	73	73	81	73	81	71
3	74	67	70	72	73	77	81	71	76	77	79	80
4	75	74	76	73	76	77	79	77	78	75	78	77
5	76	84	67	75	79	77	74	77	76	74	83	79
6	71	70	76	76	76	73	79	80	75	78	79	66
7	68	78	76	72	75	70	78	74	71	74	76	69
8	77	79	73	78	75	72	79	72	79	75	74	75
9	76	78	74	79	75	78	77	77	82	76	74	82
10	77	74	73	76	75	80	75	76	79	76	75	79

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	74	75	73	75	75	75	77	75	77	75	77	76
S.D. =	3	5	3	3	2	3	3	3	3	2	3	5
MAX =	77	84	76	79	79	80	81	80	82	78	83	82
MIN =	68	67	67	72	71	70	73	71	71	73	74	66
N =	10	10	10	10	10	10	10	10	10	10	10	10

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	75	74	75	76	76	77
S.D. =	4	3	3	3	3	4
MAX =	84	79	80	81	82	83
MIN =	67	67	70	71	71	66
N =	20	20	20	20	20	20

OVERALL (GRAND) STATISTICS:

MEAN =	76
S.D. =	3
MAX =	84
MIN =	66
N =	120

FILE: RI-WEIGHT

WEI WEIGHT (6)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 CONTINUOUS EXPOSURE

Table 7.2-2

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE FISH NO.	A	B	A	B	A	B	A	B	A	B	A	B
1	4.40	3.24	4.21	3.76	4.55	4.62	4.44	3.57	3.85	2.83	2.98	2.52
2	3.72	4.44	4.15	4.44	4.82	3.60	3.94	3.59	3.56	4.95	3.13	3.15
3	4.27	5.15	4.95	5.07	4.52	3.24	4.22	4.04	3.49	3.26	3.67	3.95
4	4.49	3.85	3.79	4.70	3.97	4.48	3.77	3.28	4.04	3.86	4.16	4.58
5	3.67	3.84	4.49	4.03	3.70	4.05	3.23	5.09	3.56	3.53	3.24	3.55
6	5.43	3.88	4.33	4.13	3.43	3.50	2.27	3.75	4.62	3.11	3.90	3.42
7	4.35	4.78	3.71	3.69	3.58	3.83	3.79	3.47	3.49	3.49	3.65	3.15
8	4.86	4.29	4.56	3.81	3.87	3.82	3.66	3.20	2.61	3.25	3.25	3.85
9	4.45	4.36	3.79	3.95	4.66	4.07	3.83	4.18	3.10	4.29	3.77	2.97
10	4.90	3.50	3.76	4.88	2.82	3.35	3.11	3.62	2.94	3.44	2.98	3.06

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	4.45	4.13	4.17	4.25	3.99	3.86	3.63	3.78	3.53	3.60	3.47	3.42
S.D. =	0.53	0.58	0.42	0.50	0.64	0.46	0.62	0.55	0.57	0.62	0.41	0.59
MAX =	5.43	5.15	4.95	5.07	4.82	4.62	4.44	5.09	4.62	4.95	4.16	4.58
MIN =	3.67	3.24	3.71	3.69	2.82	3.24	2.27	3.20	2.61	2.83	2.98	2.52
N =	10	10	10	10	10	10	10	10	10	10	10	10

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	4.29	4.21	3.92	3.70	3.56	3.45
S.D. =	0.57	0.45	0.55	0.58	0.58	0.49
MAX =	5.43	5.07	4.82	5.09	4.95	4.58
MIN =	3.24	3.69	2.82	2.27	2.61	2.52
N =	20	20	20	20	20	20

OVERALL (GRAND) STATISTICS:

MEAN = 3.86
 S.D. = 0.61
 MAX = 5.43
 MIN = 2.27
 N = 120

FILE: KI-WEIGH1

WEI WEIGHT (G)
RAINBOW TROUT ACUTE TEST
APRIL 18 - APRIL 23, 1988
INTERMITTENT EXPOSURE

Table 7.2-2 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE FISH NO.	A	B	A	B	A	B	A	B	A	B	A	B
1	3.90	4.37	3.75	4.33	4.12	5.23	4.33	3.79	4.20	3.24	3.59	3.99
2	3.70	3.76	3.91	3.67	3.83	3.04	3.38	3.26	4.53	3.35	4.40	2.81
3	3.70	3.84	3.81	3.95	4.48	4.04	4.26	2.97	4.24	3.79	4.22	4.45
4	3.68	4.17	4.36	3.99	3.69	3.69	3.84	4.06	3.81	3.24	3.91	3.88
5	3.91	6.02	2.70	3.80	4.37	3.37	3.25	4.03	3.53	3.67	5.13	3.73
6	3.46	3.41	3.97	4.00	3.78	3.20	3.78	3.97	3.18	3.88	3.65	2.71
7	3.21	4.84	3.60	3.51	3.46	2.80	3.95	3.71	3.09	3.32	3.56	2.73
8	4.25	4.00	3.53	4.45	3.75	3.09	3.93	3.28	4.15	3.52	3.25	3.45
9	3.95	4.26	3.54	4.14	3.43	4.18	3.65	4.10	4.23	3.51	3.44	4.35
10	4.88	4.30	3.64	3.74	3.75	4.18	3.47	3.65	3.64	3.72	3.86	4.05

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	3.86	4.30	3.68	3.96	3.87	3.68	3.78	3.68	3.86	3.52	3.90	3.62
S.D. =	0.46	0.72	0.43	0.29	0.35	0.74	0.36	0.39	0.49	0.23	0.56	0.66
MAX =	4.88	6.02	4.36	4.45	4.48	5.23	4.33	4.10	4.53	3.88	5.13	4.45
MIN =	3.21	3.41	2.70	3.51	3.43	2.80	3.25	2.97	3.09	3.24	3.25	2.71
N =	10	10	10	10	10	10	10	10	10	10	10	10

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	4.08	3.82	3.77	3.73	3.69	3.76
S.D. =	0.63	0.38	0.57	0.37	0.41	0.61
MAX =	6.02	4.45	5.23	4.33	4.53	5.13
MIN =	3.21	2.70	2.80	2.97	3.09	2.71
N =	20	20	20	20	20	20

OVERALL (GRAND) STATISTICS:

MEAN = 3.81
S.D. = 0.51
MAX = 6.02
MIN = 2.70
N = 120

TEMPERATURES (CELCIUS)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 CONTINUOUS EXPOSURE

Table 7.2-3

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	11.9	12.0	12.0	12.0	12.0	11.9	11.9	12.0	12.0	11.9	12.2	12.0
	12.0	12.0	12.0	12.0	12.0	11.9	12.0	12.0	12.0	11.9	12.4	12.1
4/19			12.0	12.2	12.0	11.9	12.2	12.0	12.0	12.0	12.5	11.9
			11.3	11.9	11.3	11.8	11.7	11.8	11.8	11.4	12.0	12.0
4/20			11.8		11.5	11.5	11.9	11.5	11.9	11.7	11.5	11.5
			12.5		12.5	12.5	12.6	12.5	12.5	12.5	13.1	12.9
4/21					12.0	11.8	12.0	12.0	11.9	12.0	12.0	12.0
					11.8	12.2	11.8	12.3	11.8	11.8	12.3	12.5
4/22					11.9	12.0	12.0	12.2	12.0	12.0	12.0	12.0
					11.6	11.5	11.5	11.5	11.5	11.5	11.7	11.7
4/23					11.0	11.0	11.0	11.0	11.1	11.0	11.5	10.9

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	12.0	12.0	11.9	12.0	11.8	11.8	11.9	11.9	11.9	11.8	12.1	12.0
S.D. =	0.1	0.0	0.4	0.1	0.4	0.4	0.4	0.4	0.3	0.4	0.5	0.5
MAX =	12.0	12.0	12.5	12.2	12.5	12.5	12.6	12.5	12.5	12.5	13.1	12.9
MIN =	11.9	12.0	11.3	11.9	11.0	11.0	11.0	11.0	11.1	11.0	11.5	10.9
N =	2	2	6	4	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	12.0	12.0	11.8	11.9	11.8	12.0
S.D. =	0.1	0.3	0.4	0.4	0.4	0.5
MAX =	12.0	12.5	12.5	12.6	12.5	13.1
MIN =	11.9	11.3	11.0	11.0	11.0	10.9
N =	4	10	22	22	22	22

OVERALL (GRAND) STATISTICS:

MEAN = 11.9
 S.D. = 0.4
 MAX = 13.1
 MIN = 10.9
 N = 102

TEMPERATURES (CELCIUS)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 INTERMITTENT EXPOSURE

Table 7.2-3 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	11.9	12.0	12.0	11.9	11.7	12.2	12.0	12.0	12.0	12.0	12.0	11.9
	12.0	12.0	12.0	11.9	11.9	12.3	12.0	12.0	12.0	12.0	12.1	12.0
4/19	11.9	12.0	12.0	11.8	12.0	11.5	11.9	11.8	12.0	12.0	12.0	11.9
	11.9	11.9	11.9	11.9	11.5	11.9	11.9	11.9	11.9	11.8	11.9	11.9
4/20	11.5	11.7	11.9	11.5	11.7	11.5	11.7	11.7	11.7	11.7	11.5	11.5
	13.0	12.7	13.1	12.7	12.8	13.2	12.6	13.2	12.5	13.3	12.7	12.7
4/21		12.1	12.0	12.1	12.2	12.0	12.2	12.2	12.0	12.0	12.1	12.0
		12.4	11.7	12.7	12.0	12.2	12.4	11.7	12.4	11.8	12.4	12.1
4/22			12.1	12.0	12.0	11.9	11.9	11.9	11.9	11.8	12.0	12.0
			11.8	12.3	12.0	12.3	12.4	12.0	12.5	11.9	12.5	12.0
4/23			11.3	11.8	11.3	11.8	11.4	11.6	11.5	11.6	12.0	11.5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	12.0	12.1	12.0	12.1	11.9	12.1	12.0	12.0	12.0	12.0	12.1	12.0
S.D. =	0.5	0.3	0.4	0.4	0.4	0.5	0.3	0.4	0.3	0.5	0.3	0.3
MAX =	13.0	12.7	13.1	12.7	12.8	13.2	12.6	13.2	12.5	13.3	12.7	12.7
MIN =	11.5	11.7	11.3	11.5	11.3	11.5	11.4	11.6	11.5	11.6	11.5	11.5
N =	6	8	11	11	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	12.1	12.0	12.0	12.0	12.0	12.0
S.D. =	0.4	0.4	0.4	0.4	0.4	0.3
MAX =	13.0	13.1	13.2	13.2	13.3	12.7
MIN =	11.5	11.3	11.3	11.4	11.5	11.5
N =	14	22	22	22	22	22

OVERALL (GRAND) STATISTICS:

MEAN =	12.0
S.D. =	0.4
MAX =	13.3
MIN =	11.3
N =	124

FILE: RI-00

DISSOLVED OXYGEN (MG/L)
RAINBOW TROUT ACUTE TEST
APRIL 18 - APRIL 23, 1988
CONTINUOUS EXPOSURE

Table 7.2-4

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	10.2	10.2	10.2	10.0	10.4	10.3	10.2	10.2	10.0	10.0	10.0	10.2
4/19			10.2	10.0	10.0	10.1	10.1	10.0	10.1	10.0	9.8	10.2
4/20			10.6		10.5	10.4	10.2	10.1	10.2	10.0	10.4	10.3
4/21					10.0	10.3	10.1	10.0	10.0	10.1	10.1	9.9
4/22					10.0	10.2	10.0	10.0	10.1	10.1	10.0	10.1
4/23					10.8	10.8	10.8	10.8	10.8	10.8	10.6	11.0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	10.2	10.2	10.3	10.0	10.3	10.4	10.2	10.2	10.2	10.2	10.2	10.3
S.D. =			0.2	0.0	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4
MAX =	10.2	10.2	10.6	10.0	10.8	10.8	10.8	10.8	10.8	10.8	10.6	11.0
MIN =	10.2	10.2	10.2	10.0	10.0	10.1	10.0	10.0	10.0	10.0	9.8	9.9
N =	1	1	3	2	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	10.2	10.2	10.3	10.2	10.2	10.2
S.D. =	0.0	0.2	0.3	0.3	0.3	0.3
MAX =	10.2	10.6	10.8	10.8	10.8	11.0
MIN =	10.2	10.0	10.0	10.0	10.0	9.8
N =	2	5	12	12	12	12

OVERALL (GRAND) STATISTICS:

MEAN = 10.2
S.D. = 0.3
MAX = 11.0
MIN = 9.8
N = 55

DISSOLVED OXYGEN (MG/L)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 INTERMITTENT EXPOSURE

Table 7.2-4 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	10.2	10.2	10.0	10.2	10.2	10.0	10.2	10.2	10.0	10.2	10.2	10.4
4/19	10.2	10.1	10.1	10.2	10.2	10.5	10.1	10.1	10.2	10.2	10.0	10.1
4/20	10.6	10.6	10.4	10.6	10.5	10.4	10.3	10.4	10.4	10.0	10.4	10.3
4/21		10.3	10.0	10.0	10.0	9.8	9.8	10.0	10.1	10.1	10.0	10.1
4/22			10.1	10.2	10.1	10.2	10.2	10.2	10.3	10.1	10.0	10.2
4/23			10.8	10.8	10.8	10.4	10.8	10.4	10.9	10.4	10.6	10.4

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	10.3	10.3	10.2	10.3	10.3	10.2	10.2	10.2	10.3	10.2	10.2	10.3
S.D. =	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.1	0.3	0.1
MAX =	10.6	10.6	10.8	10.8	10.8	10.5	10.8	10.4	10.9	10.4	10.6	10.4
MIN =	10.2	10.1	10.0	10.0	10.0	9.8	9.8	10.0	10.0	10.0	10.0	10.1
N =	3	4	6	6	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	10.3	10.3	10.3	10.2	10.2	10.2
S.D. =	0.2	0.3	0.3	0.2	0.2	0.2
MAX =	10.6	10.8	10.8	10.8	10.9	10.6
MIN =	10.1	10.0	9.8	9.8	10.0	10.0
N =	7	12	12	12	12	12

OVERALL (GRAND) STATISTICS:

MEAN =	10.3
S.D. =	0.2
MAX =	10.9
MIN =	9.8
N =	67

UN-IONIZED AMMONIA-NITROGEN (ug/L)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 CONTINUOUS EXPOSURE

Table 7.2-5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	9	10	6	10	4	5	4	3	4	3	4	5
4/20			8		7	10	9	9	8	8	9	9
4/22					8	10	9	9	8	8	8	8
TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	9	10	7	10	6	8	7	7	6	6	7	7
S.D. =			2		2	3	3	3	2	2	2	2
MAX =	9	10	8	10	8	10	9	9	8	8	9	9
MIN =	9	10	6	10	4	5	4	3	4	3	4	5
N =	1	1	2	1	3	3	3	3	3	3	3	3
TREATMENT	1		2		3		4		5		CONTROL	
MEAN =	10		8		7		7		6		7	
S.D. =	0		2		3		3		2		2	
MAX =	10		10		10		9		8		9	
MIN =	9		6		4		3		3		4	
N =	2		3		6		6		6		6	

OVERALL (GRAND) STATISTICS:

MEAN = 7
 S.D. = 2
 MAX = 10
 MIN = 3
 N = 29

FILE: R1-UNION

UN-IONIZED AMMONIA-NITROGEN (ug/L)
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 INTERMITTENT EXPOSURE

Table 7.2-5 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	11	12	11	11	11	11	11	11	11	11	10	11
4/20	9	9	9	9	10	8	9	9	10	9	9	8
4/22		8	9	8	10	8	9	9	9	9	9	8

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	10	10	10	9	10	9	9	10	10	10	9	9
S.D. =	1	2	1	1	1	2	1	1	1	1	1	1
MAX =	11	12	11	11	11	11	11	11	11	11	10	11
MIN =	9	8	9	8	10	8	9	9	9	9	9	8
N =	2	3	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	10	9	10	10	10	9
S.D. =	1	1	1	1	1	1
MAX =	12	11	11	11	11	11
MIN =	8	8	8	9	9	8
N =	5	6	6	6	6	6

OVERALL (GRAND) STATISTICS:

MEAN = 10
 S.D. = 1
 MAX = 12
 MIN = 8
 N = 35

Table 7.2-6

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE DATE:	A	B	A	B	A	B	A	B	A	B	A	B
4/18	8.16	8.17	7.94	8.18	7.72	7.86	7.76	7.68	7.79	7.72	7.79	7.91
4/20			8.13		8.06	8.17	8.13	8.15	8.08	8.09	8.15	8.15
4/22					8.10	8.18	8.11	8.14	8.07	8.07	8.10	8.10

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.16	8.17	8.13	8.18	8.10	8.18	8.13	8.15	8.08	8.09	8.15	8.15
MIN =	8.16	8.17	7.94	8.18	7.72	7.86	7.76	7.68	7.79	7.72	7.79	7.91
N =	1	1	2	1	3	3	3	3	3	3	3	3
TREATMENT	1		2		3		4		5		CONTROL	
MAX =	8.17		8.18		8.18		8.15		8.09		8.15	
MIN =	8.16		7.94		7.72		7.68		7.72		7.79	
N =	2		3		6		6		6		6	

GRAND (OVERALL) STATISTICS

```

MAX =      8.18
MIN =      7.68
N =      29

```

pH
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 INTERMITTENT EXPOSURE

Table 7.2-6 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18	8.23	8.25	8.20	8.21	8.22	8.21	8.21	8.22	8.22	8.22	8.19	8.20
4/20	8.18	8.16	8.15	8.12	8.18	8.10	8.13	8.15	8.18	8.17	8.16	8.15
4/22	8.15	8.14	8.12	8.11	8.16	8.10	8.12	8.14	8.15	8.14	8.13	8.13

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.23	8.25	8.20	8.21	8.22	8.21	8.21	8.22	8.22	8.22	8.19	8.20
MIN =	8.15	8.14	8.12	8.11	8.16	8.10	8.12	8.14	8.15	8.14	8.13	8.13
N =	3	3	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MAX =	8.25	8.21	8.22	8.22	8.22	8.20
MIN =	8.14	8.11	8.10	8.12	8.14	8.13
N =	6	6	6	6	6	6

GRAND (OVERALL) STATISTICS

MAX = 8.25
 MIN = 8.10
 N = 36

Table 7.2-7

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

RAINBOW TROUT ACUTE TEST

APRIL 18 - APRIL 23, 1988

CONTINUOUS EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
4/18 AM	478	483	228	239	113	114	56	54	26	24		1
PM	500	478	223	230	113	111	47	51	24	24	-4	-1
	480	469	220	226	112	113	47	50	23	24	-1	0
4/19 AM			218	230	108	115	46	46	22	21	2	0
PM			220	228	113	116	49	50	23	23	-2	0
			218	226	119	118	49	51	24	22	1	-2
4/20 AM			216		109	107	47	50	20	22	-1	-1
PM			222		109	113	48	50	24	24	3	1
			220		109	112	46	48	23	23	-1	1
4/21 AM					112	112	50	51	26	22	2	-2
PM					104	110	43	50	28	21	-2	-1
					104	112	43	49	19	21	-2	-2
4/22 AM					104	102	46	49	21	20	-1	-2
					103	103	45	48	20	21	-3	-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	486	477	221	230	109	111	47	50	23	22	-1	-1
S.D. =	13	7	4	5	5	5	3	2	3	1	2	1
MAX =	500	483	228	239	119	118	56	54	28	24	3	1
MIN =	478	469	216	226	103	102	43	46	19	20	-4	-2
N =	3	3	9	6	14	14	14	14	14	14	13	14

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	481	224	110	48	23	-1
S.D. =	10	6	5	3	2	2
MAX =	500	239	119	56	28	3
MIN =	469	216	102	43	19	-4
N =	6	15	28	28	28	27

DAILY MEANS

TREATMENT	1	2	3	4	5	CONTROL
APR 18	481	228	113	51	24	-1
APR 19		223	115	48	22	-0
APR 20		219	110	48	23	0
APR 21			109	48	23	-1
APR 22			103	47	20	-2

Table 7.2-7 (continued)

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

RAINBOW TROUT ACUTE TEST

APRIL 18 - APRIL 23, 1988

INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
4/18	883	902	772	769	671	667	569	564	470	466	-0	-2
	882	900	767	762	671	669	547	555	434	425	-1	1
	844		770	752	660	667	548	537	414	412	1	-1
4/19	890	891	802	803	682	685	574	568	472	466	2	-2
	892	893	799	782	669	675	555	555	434	442	-2	-1
	900	887	787	768	670	680	548	547	423	424	-1	1
4/20	879	889	767	768	675	677	570	567	472	458	-4	-0
	887	892	769	759	672		553	553	431	422	-0	-1
	898	898	770	759	667	676	545	545	409	418	1	1
4/21		900	782	768	673	674	568	559	479	458	-2	-2
		915	778	771	661	664	544	551	430	435	-2	-2
		924	783	760	658	658	541	541	424	433	-2	-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	884	899	779	768	669	672	555	553	441	438	-1	-1
S.D. =	17	11	12	13	7	8	12	10	25	19	2	1
MAX =	900	924	802	803	682	685	574	568	479	466	2	1
MIN =	844	887	767	752	658	658	541	537	409	412	-4	-2
N =	9	11	12	12	12	11	12	12	12	12	12	12

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	892	774	670	554	439	-1
S.D. =	16	13	7	11	22	1
MAX =	924	803	685	574	479	2
MIN =	844	752	658	537	409	-4
N =	20	24	23	24	24	24

DAILY MEANS:

TREATMENT	1	2	3	4	5	CONTROL
4/18	882	765	667	553	437	-0
4/19	892	790	677	558	443	-0
4/20	890	765	673	555	435	-1
4/21	913	774	665	550	443	-2

FILE: RT-DPD

PERCENT MONOCHLORAMINE - DPD METHOD
 RAINBOW TROUT ACUTE TEST
 APRIL 18 - APRIL 23, 1988
 CONTINUOUS EXPOSURE

Table 7.2-8

TREATMENT LEVEL	1		3		5	
	-----		-----		-----	
REPLICATE	A	B	A	B	A	B
DATE:						
4/18		97			100	
4/19	97					100
4/20	99				91	
4/21				98		99
4/22			100		100	

TREATMENT LEVEL	1		3		5	
	-----		-----		-----	
REPLICATE	A	B	A	B	A	B
MEAN =	98	97	100	98	97	99
S.D. =	1				5	1
MAX =	99	97	100	98	100	100
MIN =	97	97	100	98	91	99
N =	2	1	1	1	3	2

TREATMENT	1	3	5
MEAN =	97	99	98
S.D. =	1	1	4
MAX =	99	100	100
MIN =	97	98	91
N =	3	2	5

OVERALL (GRAND) STATISTICS:

MEAN =	98
S.D. =	3
MAX =	100
MIN =	91
N =	10

FILE: RT-DPD

PERCENT MONOCHLORAMINE - DPD METHOD
RAINBOW TROUT ACUTE TEST
APRIL 18 - APRIL 23, 1988
INTERMITTENT EXPOSURE

Table 7.2-8 (continued)

TREATMENT LEVEL	1		3		5	
REPLICATE	A	B	A	B	A	B
DATE:						
4/18	98					98
4/19		97			100	
4/20		97				100
4/21		99			100	

TREATMENT LEVEL	1		3		5	
REPLICATE	A	B	A	B	A	B
MEAN =	98	98			100	99
S.D. =		1			0	1
MAX =	98	99			100	100
MIN =	98	97			100	98
N =	1	3	0	0	2	2

TREATMENT	1	3	5
MEAN =	98		99
S.D. =	1		1
MAX =	99		100
MIN =	97		98
N =	4	0	4

OVERALL (GRAND) STATS:

MEAN= 98
ST DEV= 1
MAX= 100
MIN= 97
N= 8

FILE: MORT-TABL

Table 7.2-9

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period through 96 hrs of continuous exposure of monochloramine to rainbow trout.

Treatment Level	No. of Fish at Start		Observation Time (hours of exposure)							
			3	6	8	24	48	72	96	120
1	20	TRC (ug/L)	481	481	481	481	481	481	481	481
		Cum. Mort.	0	0	1	20	20	20	20	20
		Cum. % Mort.	0	0	5	100	100	100	100	100
2	20	TRC (ug/L)	228	228	228	225	225	225	225	225
		Cum. Mort.	0	0	0	0	17	20	20	20
		Cum. % Mort.	0	0	0	0	85	100	100	100
3	20	TRC (ug/L)	113	113	113	114	112	112	110	110
		Cum. Mort.	0	0	0	0	0	0	9	10
		Cum. % Mort.	0	0	0	0	0	0	45	50
4	20	TRC (ug/L)	51	51	51	49	49	49	48	48
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
5	20	TRC (ug/L)	24	24	24	23	23	23	23	23
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Control	20	TRC (ug/L)	-1	-1	-1	-1	0	0	-1	-1
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)						329	177	159	111	107

FILE: RMORT-TABL

Table 7.2-10

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period through 96 hrs of intermittent exposure of monochloramine to rainbow trout.

Treatment Level	No. of Fish at Start		Observation Time (hours of exposure)							
			3	6	8	24	48	72	96	120
1	20	TRC (ug/L)	885	885	885	888	889	892	892	892
		Cum. Mort.	6	6	6	6	11	19	20	20
		Cum. % Mort.	30	30	30	30	55	95	100	100
2	20	TRC (ug/L)	765	765	765	778	774	774	774	774
		Cum. Mort.	0	0	0	0	2	5	9	10
		Cum. % Mort.	0	0	0	0	10	25	45	50
3	20	TRC (ug/L)	667	667	667	672	673	670	670	670
		Cum. Mort.	0	0	0	0	0	0	3	4
		Cum. % Mort.	0	0	0	0	0	0	15	20
4	20	TRC (ug/L)	553	553	553	555	555	554	554	554
		Cum. Mort.	0	0	0	0	0	0	0	1
		Cum. % Mort.	0	0	0	0	0	0	0	5
5	20	TRC (ug/L)	437	437	437	440	438	439	439	439
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Control	20	TRC (ug/L)	0	0	0	0	0	-1	-1	-1
		Cum. Mort.	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)							875	808	760	740

Table 7.2-11

Probit Analysis

Rainbow Trout Acute Test

Intermittent Exposure - 96 hr

 $y=14.53x-37.11$ $y=20.20x-53.19$

Expected

Corrected

Corrected Expected

10 ^x	(x)		y		y		y		y	g
TRC	log TRC	% Mort	Probit	% Mort	Probit	% Mort	Probit	% Mort	Probit	
892	2.9504	100		78	5.7699	93.5	6.5548	92	6.3937	0.0031
774	2.8887	45	4.8743	45	4.8743	45	4.8743	56	5.1492	0.0491
670	2.8261	15	3.9636	15	3.9636	15	3.9636	13	3.8836	0.0035
554	2.7435	0		1	2.7637	0.3	2.2500	0.3	2.2162	0.0000
439	2.6425	0		0.01	1.2953					
0		0								0.0557

Regression Output:

Constant -37.1065
 Std Err of Y Est
 R Squared
 No. of Observations 2
 Degrees of Freedom

Second Regression

Regression Output:

Constant -53.1906
 Std Err of Y Est 0.233510
 R Squared 0.988734
 No. of Observations 4
 Degrees of Freedom 2

X Coefficient(s) 14.53256
 Std Err of Coef.

X Coefficient(s) 20.19557
 Std Err of Coef. 1.524304

Chi-Square= 1.11
 tabled chi-square=5.991 df=4-2=2

Expected $x=(y+53.19)/20.20$

10 ^x	(x)		y
TRC (ED)	log TRC	% Mort	Probit
852	2.9306	84	5.9945
761	2.8814	50	5.0000
679	2.8321	16	4.0055
584	2.7662	1	2.6737

S= 1.12
 fE050= 1.07

```

* * * * *
*      LC50=      761      *
*      LCI=      584      *
*      LC50 confidence limits *
*      upper=      816      *
*      lower=      709      *
*      slope=      20.20     *
* * * * *

```

Table 7.2-12

Probit Analysis

Rainbow Trout Acute Test

Intermittent Exposure - 120 hr

$y = 11.24x - 27.53$

$y = 13.04x - 32.39$

10 ^x	(x)	y	Expected	Corrected	Corrected	Expected	g
TRC	log TRC	% Mort	Probit	% Mort	Probit	% Mort	Probit
892	2.9504	100	74	5.6432	92.6	6.4758	0.0362
774	2.8887	50	48	4.9503	50	5.0000	0.0509
670	2.8261	20	23	4.2457	20	4.1584	0.0393
554	2.7435	5	5	3.3174	5	3.3551	0.0000
439	2.6425	0	0.24	2.1813	0.3	2.2500	0.0012
0		0			0.16	2.0608	0.1276

Second Regression

Regression Output:

Constant	-27.5297
Std Err of Y Est	0.107310
R Squared	0.991489
No. of Observations	3
Degrees of Freedom	1

Regression Output:

Constant	-32.3875
Std Err of Y Est	0.345667
R Squared	0.965285
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s) 11.24367
Std Err of Coef. 1.041696

X Coefficient(s) 13.03644
Std Err of Coef. 1.427332

Chi-Square= 2.55
tabled chi-square=7.815 df=5-2=3

Expected $x = (y + 32.39) / 13.04$

10 ^x	(x)	y
TRC (ED)	log TRC	% Mort
879	2.9442	84
738	2.8679	50
619	2.7916	16
489	2.6895	1

S= 1.19
fED50= 1.06

```

* * * * *
*      LC50= 738      *
*      LC1= 489      *
*      LC50 confidence limits *
*      upper= 786      *
*      lower= 693      *
*      slope= 13.04     *
* * * * *

```

Section 7.3 Rainbow Trout - ELS Tests

FILE: IMP-01

TEMPERATURES
NATURAL TROUT - EARLY LIFE STAGE
CONTINUOUS EXPOSURE
MAY 26 - JUNE 17, 1988 (-2 TO 20 DAYS POST-HATCH)

Table 7.3-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DPH												
-2	10.3	9.9	10.6	9.7	10.4	10.0	10.5	9.9	9.8	9.9	10.4	10.7
-1	9.7	10.0	9.9	9.8	9.6	9.7	9.8	9.6	9.7	9.6	9.7	9.8
0	9.9	10.5	9.9	10.4	10.0	10.4	10.1	10.1	10.0	9.9	10.6	10.6
0	10.8	10.8	10.9	10.5	10.6	10.8	10.8	10.7	10.7	10.8	10.8	10.6
0	11.0	11.0	10.8	10.9	10.7	10.7	10.8	10.7	10.7	10.6	11.1	10.7
1	9.6	9.9	9.7	10.0	9.6	9.6	9.8	9.6	9.5	9.7	9.6	9.8
1	9.6	10.0	9.6	10.1	10.0	10.0	10.0	9.8	10.0	9.7	10.6	10.0
2	10.9	11.1	10.9	11.1	11.0	11.1	11.0	10.9	11.0	11.0	11.8	11.7
2	9.7	10.3	9.5	10.3	9.5	9.9	9.7	9.6	9.7	9.6	10.5	10.9
3	9.5	9.5	9.5	9.7	9.5	9.7	9.7	9.5	9.5	9.6	10.1	10.0
3	10.5	10.5	10.3	10.5	10.3	10.5	10.3	10.5	10.3	9.7	10.7	10.5
4	9.5	9.6	9.6	9.8	9.5	9.7	9.5	9.9	9.6	9.6	10.0	10.1
4	9.5		9.5	9.5	9.9	9.5	10.3	9.5	10.3	9.7	10.5	10.5
5	9.8	10.0	9.8	9.6	9.7	9.8	9.6	9.6	9.5	9.6	10.2	10.0
5	9.6	10.4	9.5	9.7	9.7	9.7	9.7	9.5	9.7	9.5	10.3	9.7
6	9.9	9.5	9.9	9.5	9.9	9.5	9.4	9.4	9.8	9.1	10.0	9.8
6	9.0	9.5	9.0	9.4	9.3	9.3	9.5	9.4	9.6	9.4	9.7	9.5
7	10.1	10.1	10.2	9.8	9.9	9.8	10.1	9.8	9.8	9.9	10.5	10.3
8	11.1		11.1	11.1	11.0	11.1	11.0	11.1	11.1	11.1	11.2	11.2
8	10.5				10.5	10.4			10.4	10.4		
9			9.2	9.2	9.2	9.2	9.5	9.5	9.5	9.2	10.2	10.0
9			10.4	10.5	10.3	10.4	10.5	10.5	10.3	9.7	10.5	10.5
10			9.2	9.5	9.2	9.3	9.0	9.0	9.2	9.3	9.8	9.8
10			9.6	10.3	9.6	10.0	9.9	9.7	9.6	9.8	10.5	10.5
11			10.0	9.9	9.9	9.6	9.6	9.6	9.6	9.6	10.0	10.2
11			9.4	9.4	9.4	9.4	9.5	9.4	9.5	9.4	10.2	10.2
12			9.2	9.2	9.0	9.2	9.2	9.0	9.2	9.0	9.8	9.6
12			9.7	9.7	9.6	9.7	9.5	9.6	9.5	9.5	10.0	10.0
13			9.0	8.5	8.9	8.7	8.7	8.5	8.7	9.1	9.1	9.0
13			9.5	9.5	9.5	9.5	9.6	9.4	9.6	9.1	9.9	9.7
14			9.2	9.2	9.0	9.2	9.2	9.5	9.2	9.2	9.5	9.7
15			9.3	9.5	9.5	9.5	9.5	9.7	9.6	9.4	9.8	9.8
16			9.5	9.5	9.5	9.5	9.3	9.3	9.5	9.3	9.9	10.2
16			9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	10.3	10.3
17			9.7	9.7	9.5	9.7	9.7	9.7	9.7	9.5	10.2	10.1
17			9.6	10.0	9.6	9.6	9.6	9.6	9.6	9.6	10.1	10.1
18			9.7	10.0	9.7	9.7	10.0	9.7	9.7	9.7	10.2	10.5
18			9.6	10.3	9.7	10.4	10.0	10.3	9.7	9.9	10.5	10.5
19			9.7	9.5	9.5	9.5	9.5	9.3	9.3	9.3	10.0	9.9
19			9.3	9.3	9.3	9.3	9.4	9.3	8.9	9.0	9.7	9.8
20			9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.5	9.3
20			9.7	9.3	9.7	9.4	9.6	9.6	9.6	9.5	10.5	10.0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	10.0	10.2	9.7	9.8	9.7	9.8	9.8	9.7	9.7	9.7	10.2	10.1
S.D. =	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
MAX =	11.1	11.1	11.1	11.1	11.0	11.1	11.0	11.1	11.1	11.1	11.8	11.7
MIN =	9.0	9.5	9.0	8.5	8.9	8.7	8.7	8.5	8.7	9.0	9.1	9.0
N =	20	17	41	41	42	42	41	41	42	42	41	41

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	10.1	9.8	9.8	9.7	9.7	10.2
S.D. =	0.6	0.5	0.5	0.5	0.5	0.5
MAX =	11.1	11.1	11.1	11.1	11.1	11.8
MIN =	9.0	8.5	8.7	8.5	8.7	9.0
N =	37	82	84	82	84	82

GRAND (OVERALL) STATISTICS

MEAN = 9.9
S.D. = 0.5
MAX = 11.8
MIN = 8.5
N = 451

FILE: TEMP-11

TEMPERATURES
RAINBOW TROUT - EARLY LIFE STAGE
INTERMITTENT EXPOSURE
MAY 23 - JUNE 18 (-4 TO 20 DAYS POST-HATCH)

Table 7.3-1 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DPH												
-4	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
-4	10.5	10.7	10.4	10.6	10.6	10.5	10.4	10.5	10.6	10.6	10.7	10.9
-3	10.7	10.4	10.4	10.7	10.4	10.7	10.4	10.4	10.5	10.4	10.5	10.5
-2	9.4	9.4	9.5	9.6	9.6	9.4	9.5	9.5	9.5	9.5	9.6	9.5
-2	10.3	10.5	10.0	10.4	10.0	10.4	10.0	10.0	10.0	10.1	10.1	10.6
-1	10.0	10.0	10.7	10.9	10.9	10.9	11.0	10.6	10.0	10.7	10.0	10.7
-1	10.7	10.5	10.0	10.5	10.6	10.5	10.5	10.6	10.5	10.5	10.6	10.6
0	10.0	9.0	9.0	10.0	9.0	9.0	10.0	9.7	9.0	10.0	9.7	9.0
0	10.2	10.3	9.0	10.3	9.0	10.1	9.9	10.0	10.0	9.9	10.4	10.0
1	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.0	11.2
1	10.2	10.2	10.0	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.5	10.2
2	9.5	9.6	9.9	9.6	9.5	9.7	9.6	9.5	9.6	9.6	9.9	9.0
2	10.4	10.4	10.0	10.0	9.0	10.0	10.0	10.0	9.9	9.0	10.0	10.0
3	9.0	9.7	9.7	9.7	9.6	10.0	10.0	9.6	9.0	9.7	9.7	9.6
3	9.6	9.7	9.6	9.7	9.6	9.6	9.7	9.0	10.0	10.0	9.7	10.3
4	9.6	9.0	9.0	9.6	9.6	9.6	9.6	9.0	9.6	9.0	10.2	10.2
4	9.7	9.6	9.7	9.5	9.7	9.5	9.7	9.5	9.7	9.5	10.1	9.0
5	9.5	9.5	9.5	9.6	9.6	9.6	9.0	9.0	9.0	9.0	10.4	10.3
5	9.5	9.5	9.5	9.5	9.5	9.5	9.4	9.6	9.5	9.5	9.9	10.0
6	10.3	10.7	10.3	10.3	10.3	10.3	10.3	10.2	10.4	10.2	10.5	10.4
7	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.6	11.6
7	10.5	10.5			10.5	10.5			10.5	10.5		
8	9.2	10.0	9.2	9.5	9.5	9.2	9.5	9.2	9.2	9.5	10.0	10.2
8	10.6	11.2	10.3	11.1	10.4	10.5	10.6	11.0	11.2	11.1	11.2	11.0
9	9.0	9.0	9.0	9.2	9.2	9.2	9.0	9.0	9.0	9.0	9.6	9.5
9	10.1	10.1	10.0	10.0	10.0	10.2	10.0	10.3	10.3	10.3	10.4	10.4
10	10.0	9.6	10.0	9.6	9.6	9.6	9.4	10.0	9.6	9.0	9.0	10.0
10	9.6	10.4	9.5	10.1	9.5	9.0	9.6	9.7	9.7	9.7	10.1	9.9
11	9.0	9.0	9.2	9.0	9.2	9.2	9.0	9.0	9.2	9.3	9.5	9.6
11	9.6	9.6	9.5	9.5	9.5	9.5	9.5	9.5	9.6	9.5	9.9	9.9
12	0.9	0.7	0.9	0.9	0.7	0.9	0.7	0.9	0.9	0.9	9.0	9.2
12	9.5	9.7	9.5	9.6	9.5	9.5	9.5	9.5	9.6	9.5	9.9	9.0
13	9.3	9.2	9.0	9.3	9.3	9.2	9.3	9.2	9.3	9.3	9.6	9.6
14	9.4	9.3	9.0	9.6	9.5	9.6	9.6	9.6	9.5	9.5	9.5	9.0
15	9.5	9.3	9.3	9.3	9.5	9.5	9.5	9.3	9.5	9.3	10.0	10.2
15	9.0	9.0	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.0	10.0
16	9.5	9.3	9.5	9.5	9.3	9.5	9.5	9.3	9.5	9.3	9.0	9.5
16	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.1	10.1
17	10.0	9.7	9.5	9.7	9.7	9.5	9.7	9.7	9.5	9.7	10.2	10.0
17	10.0	9.7	10.0	9.7	9.0	9.0	9.6	9.7	9.6	10.0	10.2	10.4
18	9.3	9.5	9.5	9.3	9.5	9.3	9.5	9.5	9.5	9.3	10.0	10.0
18	0.9	0.0	0.7	0.7	9.0	0.7	9.0	0.0	9.0	0.7	9.2	0.9
19	9.4	9.4	9.5	9.3	9.5	9.4	9.5	9.5	9.5	9.5	10.0	9.0
19	9.6	9.6	9.5	9.6	9.6	9.6	9.6	9.6	9.6	9.5	9.7	
20	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.0	10.5	10.5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	9.9	9.9	9.0	9.9	9.0	9.9	9.0	9.0	9.9	9.9	10.1	10.1
S.D. =	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
MAI =	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.0	11.6
RIN =	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.9	0.7	9.0	0.9
N =	45	45	44	44	45	45	44	44	45	45	43	44

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	9.9	9.0	9.0	9.0	9.9	10.1
S.D. =	0.6	0.6	0.6	0.6	0.6	0.5
MAI =	11.5	11.5	11.5	11.5	11.5	11.0
RIN =	0.7	0.7	0.7	0.7	0.7	0.9
N =	90	88	90	88	90	87

GRAND (OVERALL) STATISTICS

MEAN = 9.9
S.D. = 0.6
MAI = 11.0
RIN = 0.7
N = 533

TEMPERATURES (CELSIUS)
 KATHRUM (KOUT) - EARLY LIFE STAGE
 CONTINUOUS EXPOSURE
 JUNE 18 - JULY 28 (21 TO 61 DAYS POST-HATCH)

Table 7.3-2

TREATMENT LEVEL	1		2		3				4				5				CONTROL			
REPLICATE	A		B		A		B		A		B		A		B		A		B	
LARVAL TANK	1	1	1	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
DPH																				
21	10.4	10.3			10.3		10.3		10.3		10.3		10.3	10.3	10.3		10.9	11.0	11.0	
22	12.0	12.2			12.1	12.3	12.2	12.1	12.1	12.1	12.5	12.5	12.2	12.0	12.3	12.3	12.5	12.5	12.5	12.5
23	12.0	11.6			11.7	11.7	11.6	12.0	12.0	12.0	11.5	11.5	12.0	11.7	12.0	12.0	11.5	11.5	11.9	11.9
24	11.5	11.2			11.2	11.5	11.5	11.2	11.2	11.2	11.7	11.5	11.2	11.2	11.2	11.2	11.5	11.5	11.5	11.2
25	11.2	11.5			11.5	11.5	11.0	11.0	11.0	11.2	11.2	11.2	11.0	11.2	10.7	11.0	11.5	11.7	11.5	11.5
26	10.2	10.2			10.0	9.7	10.0	10.0	9.7	10.0	10.2	10.0	10.0	10.0	10.0	10.2	10.0	10.0	10.2	10.2
27	11.2	11.2			11.2	11.2	11.5	11.5	11.0	11.2	11.2	11.2	11.5	11.5	11.5	11.2	11.2	11.5	11.5	11.5
28	11.5	12.5			11.5	11.5	12.5	12.3	12.5	12.5	10.6	10.5	11.7	11.0	10.6	10.7	13.7	13.6	12.0	12.3
29	10.5	11.0			10.5	10.5	11.0	11.0	10.0	10.0	10.5	10.5	9.5	10.0	10.5	10.5	11.0	11.0	11.5	11.5
30	11.7	11.2			11.5	11.2	11.5	11.7	11.2	11.2	11.7	11.7	11.5	11.5	11.5	11.5	11.7	11.5	11.7	11.5
31	11.5	11.5			11.5	11.7	11.0	11.2	11.5	11.5	11.5	11.7	11.5	11.2	11.7	11.9	11.5	11.5	11.5	11.7
32	11.5	11.7			11.5	11.5	11.2	11.5	11.2	11.2	11.5	11.5	11.5	11.2	11.2	11.5	11.5	11.7	11.5	11.5
33	11.5	11.5			11.5	11.5	11.5	11.2	11.2	11.5	11.2	11.5	11.2	11.2	11.2	11.2	11.7	11.7	11.5	11.5
34	11.0	11.2			10.7	11.2	11.5	11.5	11.0	11.0	11.5	11.5	11.2	11.0	11.2	11.5	11.0	10.7	11.5	11.5
35	10.7	10.5			10.5	10.5	10.5	10.5	10.5	10.5	10.7	10.2	10.7	10.7	10.5	10.5	10.5	10.7	10.7	10.7
36	11.0	11.5			11.5	11.5	11.5	11.5	11.2	11.5	11.2	11.5	11.5	11.5	11.5	11.5	11.2	11.5	11.5	11.5
37	12.5	12.5			12.7	12.5	12.5	12.5	12.2	12.2	12.5	12.2	12.5	12.2	12.2	12.2	12.7	12.0	12.5	12.5
38	11.5	11.2			11.5	11.7	11.5	11.7	11.7	11.5	11.2	11.2	11.2	11.5	11.5	11.5	11.5	11.5	11.7	11.5
39	11.5	11.5			11.7	11.9	11.7	11.5	11.5	11.5	11.5	11.5	11.5	11.2	11.7	11.7	11.5	11.7	11.7	11.7
40	10.2	10.2			10.2	10.2	10.5	10.5	10.5	10.2	10.5	10.2	10.5	10.5	10.5	10.5	10.2	10.2	10.2	10.2
41	10.3	11.1			10.3	10.2	11.1	11.0	10.0	10.0	11.0	11.0	10.0	10.9	10.0	10.0	12.1	12.2	11.5	11.9
42	10.0	11.2			10.0	11.3	10.9	11.0	11.0	11.0	10.6	10.5	11.5	11.3	10.5	10.7	11.9	11.7	11.7	11.7
43	11.5	12.3			11.3	11.4	11.9	11.0	11.4	11.5	10.7	10.6	11.4	11.4	10.9	11.0	12.5	12.5	12.5	12.5
44	10.4	11.1			10.6	10.6	11.0	11.0	11.4	11.4	10.1	10.2	11.1	11.1	10.3	10.3	12.5	12.5	11.6	11.7
45	10.5	10.0			10.0	10.2	10.0	11.0	10.9	11.1	10.9	10.2	10.0	11.0	10.4	10.4	12.2	12.2	11.2	11.3
46					10.7	10.6	11.5	11.6	11.6	11.5	10.7	10.6	11.5	11.6	11.4	11.4	11.0	11.9	11.5	11.5
47					10.1	10.1	10.0	10.0	11.0	11.0	9.5	9.5	11.1	11.3	10.1	10.1	12.5	12.5	11.3	11.3
48					11.0	11.0	11.2	11.2	11.0	11.7	10.9	10.0	10.5	10.5	11.0	11.0	13.0	13.0	12.0	12.0
49					11.5	11.3	12.0	12.0	12.0	12.0	11.0	11.0	12.1	12.1	11.9	11.9	13.9	14.0	12.2	12.2
50					11.4	11.4	12.1	11.9	11.9	11.9	11.0	11.0	12.0	12.0	11.4	11.4	13.0	13.0	12.0	12.0
51					11.0	11.9	12.4	12.4	12.7	12.7	11.4	11.4	12.9	12.9	11.5	11.5	13.6	13.6	12.4	12.4
52					11.0	11.0	11.1	11.1	12.0	12.1	10.3	10.3	12.1	12.1	11.0	11.0	13.0	13.1	11.9	11.9
53					10.5	10.5	10.0	10.0	11.0	11.0	10.0	10.1	11.0	11.0	10.0	10.3	12.1	12.2	11.1	11.2
54					10.1	10.2	10.5	10.6	10.0	10.9	10.0	10.0	10.0	10.0	10.0	10.5	12.2	12.2	11.1	11.1
55					11.0	11.0	11.2	11.3	11.2	11.2	11.1	11.0	11.0	11.0	11.4	11.3	12.5	12.5	11.9	11.0
56					11.6	11.6	11.0	11.0	11.7	11.6	11.2	11.1	11.0	11.0	11.0	11.0	12.3	12.3	12.0	12.0
57					11.3	11.3	12.0	12.0	11.3	11.3	11.0	11.0	11.0	11.0	12.0	12.0	13.1	13.0	12.0	12.7
58					12.5	12.5	12.5	12.2	12.5	12.2	12.5	12.5	12.0	12.2	12.2	12.2	12.5	12.5	12.5	12.2
59					10.9	11.2	10.9	11.0	11.0	11.0	11.2	11.0	11.2	11.2	11.0	11.0	11.0	11.0	11.0	11.2
60					12.0	11.7	11.5	12.0	11.7	11.7	11.5	11.5	11.5	11.5	11.7	11.5	12.0	12.0	12.0	12.0
61					12.7	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.7	12.5	12.5	12.7	12.2	12.5

TREATMENT LEVEL	1		2		3				4				5				CONTROL			
REPLICATE	A		B		A		B		A		B		A		B		A		B	
LARVAL TANK	1	1	1	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MEAN =	11.1	11.3			11.2	11.2	11.4	11.4	11.4	11.4	11.1	11.1	11.4	11.4	11.2	11.2	12.0	12.0	11.7	11.7
S.D. =	0.6	0.6			0.7	0.7	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.9	0.9	0.6	0.6
RAI =	12.5	12.5			12.7	12.5	12.5	12.5	12.7	12.7	12.5	12.5	12.9	12.9	12.7	12.5	13.9	14.0	12.0	12.7
RIN =	10.2	10.2			10.0	9.7	10.0	10.0	9.7	10.0	9.5	9.5	9.5	10.0	10.0	10.0	10.0	10.0	10.2	10.2
N =	25	25			41	40	41	40	41	40	41	40	41	41	41	40	41	40	41	41

TREATMENT LEVEL	2		3				4				5				CONTROL			
MEAN =	11.2		11.3				11.2				11.3				11.0			
S.D. =	0.6		0.7				0.7				0.7				0.0			
RAI =	12.5		12.7				12.7				12.9				14.0			
RIN =	10.2		9.7				9.5				9.5				10.0			
N =	50		162				162				163				163			

GRAND (OVERALL) STATISTICS

MEAN =	11.4
S.D. =	0.7
RAI =	14.0
RIN =	9.5
N =	700

FILE: IMP-12

TEMPERATURES (CELSIUS)
RAINBOW TROUT-EARLY LIFE STAGE
INTERMITTENT EXPOSURE
JUNE 19 - JULY 28 (21 TO 60 DAYS POST-HATCH)

Table 7.3-2 (continued)

TREATMENT LEVEL	1				2				3				4				5			
	A		B		A		B		A		B		A		B		A		B	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
REPLICATE LARVAL TANK UPH																				
21	12.2	12.3	12.0	12.3	12.0	12.0	12.2	12.2	12.3	12.3	12.3	12.3	12.5	12.5	11.9	12.0	12.6	12.6	12.3	12.3
22	11.2	11.2	11.2	11.5	11.7	11.5	11.7	11.7	11.0	11.2	11.5	11.5	11.0	11.0	11.7	11.2	11.7	11.5	11.2	11.5
23	11.3	11.2	11.0	11.0	11.0	11.0	11.2	11.0	10.9	11.2	10.7	10.7	11.2	11.2	10.5	10.5	10.9	10.9	11.0	11.0
24	11.2	11.0	11.0	11.0	11.0	11.0	10.9	11.0	10.7	11.1	11.2	11.0	11.0	11.0	11.0	11.0	11.7	11.2	11.2	11.2
25	10.0	10.0	9.7	9.7	10.2	10.0	10.0	10.0	10.0	10.0	10.0	10.2	10.2	10.2	10.0	10.0	10.0	9.7	10.0	10.0
26	11.2	11.2	11.0	11.2	11.5	11.2	11.5	11.2	11.7	11.5	11.5	11.2	11.5	11.5	11.0	11.0	11.2	11.2	11.2	11.2
27	11.4	11.4	12.5	12.6	11.5	11.4	12.4	12.4	11.5	11.5	12.4	12.4	12.4	12.5	11.5	11.5	12.5	12.4	11.5	11.6
28	10.7	10.7	11.1	11.1	10.5	10.5	10.9	10.9	10.7	10.7	10.0	10.0	10.0	10.7	10.7	10.7	10.7	10.0	10.5	10.5
29	11.7	11.7	11.5	11.7	11.7	11.5	11.7	11.7	11.5	11.5	11.5	11.7	11.7	11.5	11.2	11.5	11.5	11.2	11.7	11.7
30	11.5	11.7	11.5	11.7	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.2	11.2	11.5	11.5	11.5	11.5	11.5
31	11.7	11.5	11.5	11.5	11.7	11.7	11.2	11.2	11.5	11.5	11.5	11.2	11.5	11.7	11.5	11.2	11.2	11.5	11.2	11.0
32	11.2	11.0	11.2	11.0	11.2	11.2	11.2	11.2	11.0	11.0	11.5	11.5	11.2	11.2	11.2	11.5	11.2	11.0	11.7	11.2
33	11.5	11.5	11.2	11.2	11.2	11.5	11.7	11.5	11.5	11.5	11.5	11.2	11.2	11.2	11.5	11.5	11.2	11.5	11.5	11.5
34	10.7	11.0	11.0	11.0	11.0	11.0	10.5	11.0	10.7	10.5	11.0	11.0	10.7	10.5	11.0	11.0	10.7	10.7	10.9	11.0
35	11.5	11.5	11.5	11.5	11.5	11.5	11.2	11.2	11.7	11.5	11.5	11.2	11.7	11.7	11.7	11.5	11.5	11.2	11.5	11.5
36	11.5	11.7	11.2	11.2	11.5	11.5	11.5	11.2	11.7	11.5	11.0	11.2	11.2	11.5	11.5	11.7	11.5	11.5	12.0	11.7
37	11.7	11.5	11.7	11.9	11.7	11.7	11.7	11.7	11.5	11.5	11.5	11.5	11.5	11.7	11.7	11.5	11.2	11.5	11.7	11.7
38	12.0	12.2	12.5	12.2	12.0	12.0	12.2	12.0	12.5	12.2	12.2	12.2	12.2	12.0	12.0	12.2	12.2	12.2	12.0	12.0
39	11.5	11.2	11.5	11.2	11.2	11.2	11.5	11.5	11.5	11.5	11.2	11.2	11.7	11.5	11.5	11.2	11.2	11.5	11.2	11.2
40	11.1	11.1	10.5	10.0	10.1	10.1	10.5	10.5	10.3	10.3	10.4	10.4	10.2	10.2	10.2	10.2	10.2	10.2	10.5	10.5
41	11.0	11.1	11.0	11.0	10.9	10.0	10.6	10.6	10.7	10.7	10.5	10.5	10.7	10.6	10.5	10.5	11.0	11.1	10.5	10.5
42	12.5	12.4	11.0	11.0	11.6	11.7	11.7	11.7	11.7	12.0	11.5	11.6	11.7	11.7	11.6	11.6	11.7	11.7	11.5	11.5
43	11.0	10.9	10.9		11.0	11.0	10.6	10.7	10.6	10.7	10.0	10.0	10.6	10.6	10.7	10.0	10.7	10.7	10.7	10.7
44	11.0	11.3	11.3		11.1	10.9	11.5	11.5	11.2	11.2	11.3	11.2	11.5	11.3	11.2	11.2	11.5	11.5	11.2	11.1
45	11.6	11.6	11.6		11.7	11.7	12.3	12.3	12.3	12.2	11.7	11.0	12.5	12.4	11.0	11.0	12.4	12.4	11.7	11.6
46	10.1	10.2	10.2		10.1	10.1	10.2	10.0	10.1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
47	11.3	11.3	11.3		10.9	10.9	11.2	11.3	10.9	10.9	11.1	11.1	11.1	11.1	11.1	11.1	11.0	11.0	11.0	11.0
48	11.9	11.9	12.0		11.0	11.2	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.6	11.6	11.0	11.0	11.6	11.6
49	11.1	11.6	11.7		11.1	11.1	11.3	11.2	11.1	11.1	11.1	11.1	11.1	11.1	11.2	11.2	11.3	11.3	11.0	11.0
50	11.6	11.9	11.9		11.5	11.5	11.9	11.9	11.6	11.6	11.5	11.5	11.5	11.5	11.6	11.6	12.0	12.0	11.4	11.5
51	10.2	10.6	10.6		10.2	10.2	10.6	10.6	10.5	10.5	10.3	10.3	10.0	10.0	10.2	10.2	10.3	10.7	10.3	10.3
52	10.9	11.1	11.1		11.0	11.0	11.0	11.0	11.2	11.2	11.1	11.1	11.2	11.1	11.0	11.1	11.5	11.5	10.0	10.0
53	10.1	11.1	11.1		10.2	10.2	11.1	11.2	10.5	10.5	11.1	11.2	11.1	11.1	11.1	11.2	11.1	11.1	10.5	10.5
54	11.3	11.3	11.3		11.5	11.5	11.7	11.7	12.0	12.0	11.9	11.0	12.0	12.0	12.0	12.0	12.0	12.1	12.1	12.2
55	11.1	11.2	11.2		11.1	11.1	11.2	11.1	12.1	12.0	11.1	11.1	11.0	11.0	11.1	11.1	12.2	12.2	11.1	11.0
56	11.0	12.3			11.5	11.5	12.3	12.2	11.5	11.5	12.0	12.0	11.7	11.0	12.0	12.1	11.0	11.0	11.6	11.6
57	12.2	12.5			12.2	12.0	12.2	12.2	12.2	12.5	12.5	12.5	12.5	12.2	12.5	12.2	12.2	12.2	12.2	12.2
58	11.0				11.2	11.2	11.2	11.2	11.0	11.2	11.0	11.0	10.9	11.0	10.9	11.0	11.2	11.0	11.0	11.2
59	11.7				11.5	11.7	11.5	11.5	11.7	11.7	11.5	11.7	11.7	11.5	11.5	11.5	11.5	11.5	11.7	11.7
60	12.5				12.7	12.7	12.7	12.5	12.7	12.5	12.5	12.7	12.5	12.7	12.7	13.0	12.7	12.7	12.5	12.5

TREATMENT LEVEL	1				2				3				4				5			
	A		B		A		B		A		B		A		B		A		B	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
REPLICATE LARVAL TANK																				
MEAN =	11.3	11.4	11.3	11.4	11.2	11.2	11.4	11.4	11.3	11.3	11.3	11.3	11.4	11.4	11.3	11.3	11.4	11.4	11.3	11.3
S.D. =	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6
RAI =	12.5	12.4	12.5	12.6	12.7	12.7	12.7	12.5	12.7	12.5	12.5	12.7	12.5	12.7	12.7	13.0	12.7	12.7	12.5	12.5
RIN =	10.0	10.0	9.7	9.7	10.1	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.7	10.0	10.0
N =	40	22	35	37	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

TREATMENT LEVEL	1				2				3				4				5			
	A		B		A		B		A		B		A		B		A		B	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MEAN =	11.3				11.3				11.3				11.3				11.3			
S.D. =	0.6				0.6				0.6				0.6				0.6			
RAI =	12.6				12.7				12.7				13.0				12.7			
RIN =	9.7				10.0				10.0				10.0				9.7			
N =	134				160				160				160				160			

GRAND (OVERALL) STATISTICS

MEAN = 11.4
S.D. = 0.6
RAI = 13.7
RIN = 9.7
N = 934

PERCENT OXYGEN SATURATION
 RAINBOW TROUT - EARLY LIFE STAGE
 CONTINUOUS EXPOSURE
 MAY 26 - JUNE 17 (-2 TO 20 DAYS POST-HATCH)

Table 7.3-3

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
UPH												
-2												
-1	95.6	94.3	94.3	95.9	96.3	94.7	93.1	94.5	92.0	94.5	94.7	95.9
0	98.9	98.9	98.2	96.4	100.0	96.2	97.1	96.9	99.6	98.0	98.0	95.7
1	99.0	97.9	98.4	97.2	99.0	98.1	99.5	98.1	96.1	97.5	97.2	99.5
2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
3	98.8	97.9	100.0	95.6	97.9	98.4	100.0	99.7	98.8	99.0	97.4	99.0
4	98.8	100.0	97.2	98.6	99.7	99.3	100.0	100.0	99.0	99.9	99.0	95.6
5	99.5	98.1	99.5	99.9	98.4	99.5	99.0	99.0	98.8	98.1	96.7	99.0
6	98.8	100.0	100.0	98.4	99.7	99.3	99.5	100.0	98.6	100.0	99.9	99.5
7	100.0	100.0	99.4	98.6	98.8	98.6	99.2	97.7	98.6	97.9	97.4	96.9
8	95.9		95.9	95.9	95.7	95.9	95.7	95.9	95.9	95.9	95.2	95.2
9			100.0	98.2	98.2	98.2	97.9	100.0	99.7	98.2	97.6	99.0
10			99.1	100.0	100.0	100.0	96.9	97.8	99.1	99.3	99.5	97.7
11			96.3	97.0	95.2	98.1	99.0	99.9	98.1	98.1	97.2	94.9
12			100.0	100.0	99.5	99.1	100.0	98.6	99.1	100.0	97.7	99.0
13			99.5	100.0	100.0	100.0	100.0	100.0	100.0	98.9	100.0	100.0
14			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15			100.0	99.7	100.0	99.7	100.0	99.3	99.0	98.6	97.7	98.6
16			100.0	100.0	97.9	99.7	98.4	96.6	98.8	96.6	97.0	97.6
17			96.6	99.3	98.8	99.3	98.4	100.0	98.4	97.0	96.7	98.3
18			98.4	99.0	98.4	98.4	99.0	96.6	98.4	97.5	96.7	94.6
19			96.6	98.8	99.7	98.8	98.8	98.4	98.4	98.4	94.5	96.1
20			96.6	98.4	96.6	98.4	98.4	96.6	98.4	97.5	93.4	97.5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	98.5	98.6	98.4	98.5	98.6	98.6	98.6	98.4	98.4	98.2	97.4	97.7
S.D. =	1.5	1.9	1.7	1.5	1.5	1.4	1.7	1.7	1.8	1.4	1.9	1.8
MAX =	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MIN =	95.6	94.3	94.3	95.6	95.2	94.7	93.1	94.5	92.0	94.5	93.4	94.6
N =	10	9	22	22	22	22	22	22	22	22	22	22

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	98.6	98.5	98.6	98.5	98.3	97.6
S.D. =	1.6	1.6	1.4	1.7	1.6	1.8
MAX =	100.0	100.0	100.0	100.0	100.0	100.0
MIN =	94.3	94.3	94.7	93.1	92.0	93.4
N =	19	44	44	44	44	44

GRAND (OVERALL) STATISTICS

MEAN = 98.3
 S.D. = 1.7
 MAX = 100.0
 MIN = 92.0
 N = 239

FILE: 11-00

PERCENT OXYGEN SATURATION
 RAINBOW TROUT - EARLY LIFE STAGE
 INTERMITTENT EXPOSURE
 MAY 25 - JUNE 18 (-4 TO 20 DAYS POST-HATCH)

Table 7.3-3 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
-4	100.0	100.0	99.9	100.0	99.4	100.0	99.0	100.0	99.4	100.0	98.7	100.0
-3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
-2	96.8	95.0	98.8	95.4	96.3	91.4	94.3	97.0	97.0	96.1	96.3	95.2
-1	95.2	98.0	98.7	97.3	98.2	96.4	97.5	97.6	98.9	96.9	98.0	96.9
0	99.0	97.7	99.5	98.1	100.0	96.8	99.9	99.3	98.6	99.0	97.5	99.5
1	100.0	100.0	100.0	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2	98.8	99.0	97.9	100.0	99.7	98.4	99.0	99.7	99.0	100.0	98.8	97.7
3	100.0	99.3	98.4	100.0	98.1	98.1	96.3	98.1	100.0	99.3	99.3	99.0
4	97.2	99.5	99.5	99.9	99.0	98.1	100.0	99.5	99.0	100.0	96.7	98.5
5	97.9	97.9	98.8	99.0	99.0	99.0	98.6	98.6	99.5	99.5	100.0	99.7
6	99.7	100.0	98.7	99.7	98.7	98.7	98.7	98.5	98.1	98.5	98.3	98.1
7	95.8	95.8	95.8	95.8	95.8	95.8	95.8	97.7	95.8	96.8	96.0	96.0
8	100.0	100.0	97.3	97.9	100.0	98.2	99.7	98.2	96.4	97.9	99.9	97.6
9	100.0	98.6	97.8	99.1	100.0	98.2	98.6	100.0	98.6	100.0	97.2	99.7
10	96.3	97.2	96.3	98.1	98.1	98.1	93.2	95.4	99.0	99.5	99.5	96.3
11	100.0	100.0	98.2	100.0	100.0	99.1	99.5	98.6	100.0	100.0	98.8	98.1
12	100.0	100.0	100.0	100.0	99.8	100.0	98.0	100.0	100.0	99.3	97.8	97.3
13	99.3	100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	99.0
14	100.0	100.0	100.0	99.0	99.7	100.0	100.0	99.0	98.8	98.8	100.0	98.6
15	99.7	98.4	97.5	98.4	97.9	100.0	98.8	98.4	98.8	98.4	94.5	96.7
16	100.0	100.0	97.0	97.9	99.3	98.8	98.8	97.5	98.8	98.4	99.5	97.9
17	99.0	100.0	99.7	100.0	98.4	96.1	100.0	100.0	98.8	100.0	96.7	94.5
18	100.0	98.8	100.0	100.0	98.8	100.0	96.1	97.9	99.7	97.5	97.2	97.2
19	96.8	96.8	97.0	98.4	95.2	96.8	97.0	98.8	97.0	98.8	99.9	99.5
20	100.0	100.0	91.9	100.0	100.0	100.0	100.0	100.0	100.0	99.0	99.2	99.2

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	98.9	98.9	98.3	99.0	98.9	98.3	98.4	98.8	98.9	98.9	98.3	98.1
S.D. =	1.6	1.4	1.8	1.3	1.4	2.0	1.9	1.2	1.2	1.2	1.5	1.5
MAI =	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MIN =	95.2	95.0	91.9	95.4	95.2	91.4	93.2	95.4	95.8	96.1	94.5	94.5
N =	25	25	25	25	25	25	25	25	25	25	25	25

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	98.6	98.6	98.6	98.6	98.9	98.2
S.D. =	1.6	1.6	1.7	1.6	1.2	1.5
MAI =	100.0	100.0	100.0	100.0	100.0	100.0
MIN =	91.9	91.9	91.4	93.2	95.8	94.5
N =	50	50	50	50	50	50

GRAND (OVERALL) STATISTICS

MEAN =	98.6
S.D. =	1.5
MAI =	100.0
MIN =	91.4
N =	300

PERCENT OXYGEN SATURATION
RAINBOW TROUT - EARLY LIFE STAGE
CONTINUOUS EXPOSURE
JUNE 19 - JULY 20 (21 TO 61 DAYS POST-HATCH)

Table 7.3-4

TREATMENT LEVEL	1				2				3				4				5				CONTROL			
REPLICATE LARVAL TANK	A		B		A		B		A		B		A		B		A		B		A		B	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
DPH																								
21									100.0								100.0							
22		99.8	100.0			99.0	98.3	100.0	100.0		100.0	100.0	100.0	100.0		100.0	99.8	100.0	100.0		99.0	99.0	100.0	100.0
23		97.9	100.0			99.1	99.1	97.9	98.0		93.0	97.9	100.0	100.0		97.9	97.2	97.9	95.0		100.0	100.0	97.6	97.6
24		100.0	100.0			100.0	100.0	98.6	96.0		98.0	98.0	99.1	98.6		100.0	100.0	93.2	98.0		98.6	98.6	98.6	98.0
25		98.0	98.6			98.6	98.6	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		98.6	95.3	98.6	100.0
26		100.0	100.0			100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0
27		100.0	98.0			98.0	98.0	98.6	97.7		100.0	98.0	98.9	98.9		97.7	98.6	98.6	100.0		99.0	98.6	95.0	96.0
28		98.6	98.0			99.6	98.6	98.0	97.6		100.0	99.0	99.4	99.2		98.1	98.4	99.4	99.6		97.9	97.7	98.7	98.5
29		100.0	98.4			96.4	96.4	100.0	100.0		99.9	99.9	99.2	99.2		100.0	99.9	100.0	100.0		100.0	100.0	100.0	97.7
30		99.1	100.0			100.0	99.8	100.0	99.1		100.0	100.0	99.1	99.1		100.0	100.0	100.0	100.0		97.2	98.6	98.1	100.0
31		100.0	100.0			98.6	97.2	100.0	100.0		100.0	100.0	100.0	99.1		98.6	99.0	96.3	96.7		98.6	98.6	99.5	98.1
32		100.0	99.1			98.6	98.6	98.0	98.6		98.0	99.0	98.6	98.6		100.0	100.0	100.0	100.0		98.6	96.3	100.0	98.6
33		100.0	97.7			96.8	98.6	98.6	99.0		100.0	100.0	100.0	100.0		99.0	100.0	100.0	100.0		97.2	97.2	100.0	100.0
34		100.0	100.0			100.0	100.0	98.6	96.0		100.0	100.0	100.0	98.6		100.0	100.0	99.0	98.6		99.4	100.0	96.0	98.6
35		100.0	100.0			100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0
36		100.0	100.0			98.6	100.0	98.6	100.0		100.0	98.6	100.0	100.0		98.6	98.6	100.0	98.6		99.0	100.0	98.6	100.0
37		96.1	96.1			95.6	97.1	96.1	95.2		100.0	98.3	97.1	97.3		96.1	98.3	95.3	97.4		97.7	97.9	96.1	95.2
38		100.0	98.0			98.6	96.3	98.6	99.1		97.2	100.0	100.0	99.0		100.0	96.0	95.0	94.9		96.0	98.6	97.2	98.6
39		100.0	100.0			99.1	96.7	97.2	98.6		100.0	98.6	98.6	100.0		100.0	100.0	97.2	98.6		96.0	94.4	97.5	98.6
40		100.0	100.0			100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0
41		100.0	96.0			100.0	100.0	96.0	97.5		100.0	100.0	96.0	100.0		100.0	100.0	94.5	94.5		100.0	100.0	98.6	99.5
42		87.0	87.7			87.0	88.0	87.1	87.3		89.2	90.1	87.4	87.3		89.2	88.0	88.2	88.6		89.1	88.7	88.7	88.7
43		87.4	89.9			87.9	88.1	86.3	88.0		88.1	88.3	91.3	92.0		88.1	88.1	92.7	91.0		88.4	89.4	89.4	90.4
44		89.8	87.5			91.1	91.1	89.2	87.3		87.2	88.1	90.1	93.1		86.6	87.5	89.6	89.6		86.5	86.5	89.4	88.7
45		97.4	100.0			94.5	95.0	98.0	99.4		95.4	94.9	97.3	97.6		100.0	100.0	99.0	98.1		100.0	100.0	96.1	96.3
46						97.0	97.6	98.6	97.9		98.9	97.7	97.0	97.6		97.6	100.0	96.3	97.5		94.3	99.5	96.0	95.0
47						98.1	90.1	89.7	88.8		92.9	91.9	91.6	92.5		92.2	93.5	92.9	91.9		94.2	93.2	93.5	92.6
48						100.0	100.0	100.0	100.0		100.0	100.0	100.0	99.9		97.2	99.2	100.0	100.0		99.2	99.2	98.0	98.0
49						92.1	91.6	93.1	93.1		93.1	93.1	91.0	91.0		92.4	92.4	91.0	90.1		99.5	99.7	96.4	98.3
50						90.0	89.0	91.4	90.1		93.0	93.0	91.9	91.9		91.2	93.1	90.0	90.9		87.5	87.5	90.3	90.3
51						92.7	92.0	94.9	94.0		90.0	95.6	90.9	91.0		92.2	90.2	91.1	91.1		90.0	91.7	88.2	87.3
52						94.7	94.7	94.9	94.9		93.1	93.3	96.9	96.9		93.3	93.3	96.6	96.6		93.4	93.6	92.9	92.9
53						93.7	93.7	92.5	92.5		94.7	92.9	95.4	96.5		92.9	92.9	94.3	94.2		93.3	93.5	93.1	92.4
54						96.5	96.7	96.4	96.6		97.1	95.4	96.3	96.3		96.2	95.2	98.0	96.4		97.4	97.4	97.7	97.7
55						94.7	96.6	93.3	93.5		96.1	95.2	93.1	92.9		92.7	93.6	93.7	94.4		95.2	95.7	92.9	92.7
56						92.3	92.3	92.7	92.7		90.6	92.3	92.3	93.1		91.7	92.7	94.7	94.7		93.0	91.9	93.1	92.7
57						91.6	91.6	91.2	91.2		91.6	91.6	98.0	91.7		92.7	92.7	89.3	89.3		89.7	89.5	91.0	89.0
58						91.3	91.3	90.4	90.7		91.3	93.5	87.5	89.4		95.0	95.5	93.5	95.5		92.3	92.3	89.4	92.6
59						100.0	99.0	100.0	100.0		100.0	100.0	99.0	100.0		99.0	98.0	100.0	99.4		100.0	100.0	100.0	98.0
60						95.0	99.1	98.6	92.2		96.3	94.4	96.0	100.0		100.0	98.6	94.4	96.0		91.2	95.0	95.0	95.0
61						94.6	97.1	96.1	96.1		96.1	98.0	98.0	96.1		98.0	95.2	95.6	96.1		96.1	96.6	98.3	97.1

TREATMENT LEVEL	1				2				3				4				5				CONTROL			
REPLICATE LARVAL TANK	A		B		A		B		A		B		A		B		A		B		A		B	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MEAN *		98.0		97.7		96.2	96.2	96.3	96.1		95.6	95.0	96.6	97.0		96.0	96.7	96.3	96.4		95.7	95.0	95.6	95.6
S.D. *		3.9		3.0		3.0	3.7	3.9	4.1		4.0	3.6	3.9	3.7		4.0	3.8	3.6	3.6		4.0	4.7	4.9	4.0
RAI *		100.0		100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0
RIR *		87.4		87.5		87.0	88.1	86.3	87.3		87.2	88.1	87.4	87.3		86.6	87.5	88.2	88.6		79.5	79.7	76.4	76.3
N =	0	0	0	0	0	24	0	24	0	41	40	40	40	40	40	41	40	40	40	40	40	40	42	40

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN *		97.9		96.2		96.7
S.D. *		3.0		3.0		3.7
RAI *		100.0		100.0		100.0
RIR *		87.4		86.3		87.2
N =	0	40		161		160

GRAND (OVERALL) STATISTICS

MEAN = 96.4
S.D. = 4.1
RAI = 100.0
RIR = 76.4
N = 690

PERCENT OXYGEN SATURATION
 RAINBOW TROUT - EARLY LIFE STAGE
 INTERMITTENT EXPOSURE
 JUNE 10 - JULY 26, 1978 (20 TO 60 DAYS POST-HATCH)

Table 7.3-4 (continued)

TREATMENT LEVEL	1				2				3				4				5				CONTROL			
REPLICATE	A		B		A		B		A		B		A		B		A		B		A		B	
LARVAL TANK	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
DPH																								
20																								
21	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	100.0	100.0	100.0	100.0	100.0	100.0
22	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
23	98.2	98.0	95.7	95.7	95.7	95.7	98.0	94.7	99.2	99.0	96.9	96.9	98.0	98.0	100.0	100.0	99.7	97.3	95.7	97.3	97.3	95.2	96.1	96.1
24	99.8	99.4	100.0	99.4	100.0	100.0	100.0	100.0	98.7	97.7	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	98.0	99.8	97.8	96.1	96.6	96.6
25	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
26	98.0	99.0	100.0	100.0	98.6	98.0	100.0	99.0	96.3	100.0	98.6	99.0	95.8	95.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
27	100.0	100.0	98.0	96.3	99.6	99.3	97.0	97.0	93.6	99.6	98.0	97.0	97.8	98.0	99.6	99.6	100.0	100.0	100.0	100.0	98.6	97.7	99.0	98.6
28	100.0	100.0	100.0	100.0	97.2	97.2	100.0	100.0	100.0	99.6	98.9	99.9	97.9	99.6	100.0	99.6	100.0	100.0	100.0	100.0	98.6	97.7	99.0	98.6
29	98.1	98.1	98.6	99.1	99.1	98.6	97.2	99.1	98.6	98.6	98.6	99.1	96.3	98.6	100.0	100.0	100.0	99.8	97.2	97.2	96.3	94.8	94.1	96.3
30	100.0	97.2	98.6	99.1	100.0	100.0	100.0	100.0	100.0	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	97.6	97.2	98.6
31	98.1	98.6	98.6	100.0	97.2	97.2	99.0	100.0	100.0	100.0	100.0	100.0	98.6	97.2	100.0	99.0	100.0	100.0	100.0	100.0	100.0	98.6	98.6	100.0
32	100.0	100.0	100.0	100.0	100.0	99.0	100.0	100.0	100.0	100.0	98.6	100.0	99.0	100.0	100.0	99.0	100.0	100.0	100.0	100.0	100.0	98.6	98.6	100.0
33	97.7	100.0	99.0	100.0	99.0	98.6	96.3	98.6	98.6	98.6	100.0	100.0	100.0	100.0	99.0	100.0	100.0	100.0	100.0	100.0	98.6	97.2	97.2	98.6
34	100.0	100.0	100.0	100.0	100.0	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.6	97.2	97.2
35	100.0	100.0	100.0	100.0	98.6	98.6	100.0	100.0	97.2	100.0	100.0	100.0	97.2	97.2	97.2	98.6	98.6	100.0	100.0	100.0	100.0	98.6	98.6	100.0
36	100.0	96.3	99.0	99.0	98.6	98.6	98.6	99.0	99.1	100.0	100.0	100.0	100.0	100.0	98.6	96.3	98.6	96.3	97.2	97.2	100.0	98.6	98.6	100.0
37	97.2	98.6	95.3	94.8	95.3	95.3	99.1	97.2	98.6	100.0	98.6	98.6	97.7	96.3	95.3	97.7	99.0	98.6	95.3	97.2	98.6	97.2	98.6	98.6
38	95.0	92.6	91.3	92.6	94.1	94.1	95.3	95.0	91.3	92.6	94.5	94.5	92.6	93.0	92.6	92.6	95.3	94.5	95.0	92.6	98.6	97.2	98.6	98.6
39	98.6	99.0	100.0	100.0	100.0	100.0	98.6	98.6	100.0	98.6	99.0	100.0	100.0	100.0	96.7	96.7	98.6	98.6	98.6	98.6	98.6	97.2	98.6	98.6
40	96.0	96.0	99.2	99.9	96.3	96.3	96.4	97.4	100.0	98.7	99.0	97.1	100.0	100.0	96.7	96.7	98.6	98.6	98.6	98.6	98.6	97.2	98.6	98.6
41	88.2	87.3	87.3	87.3	88.0	87.0	87.4	87.4	86.7	87.6	87.3	88.2	87.6	87.4	89.1	88.2	88.2	88.4	88.2	89.1	87.7	88.1	100.0	100.0
42	88.4	88.2	88.9	88.9	88.5	88.7	88.7	87.0	88.7	87.3	88.3	88.5	87.0	88.7	87.6	88.5	87.0	88.7	87.2	88.3	88.0	88.2	87.6	87.6
43	87.3	89.9			87.3	87.3	89.3	88.6	88.4	88.6	89.7	89.7	88.4	88.3	87.3	88.8	87.0	88.6	89.3	90.4	88.0	88.0	87.0	87.2
44		96.3	96.3		94.0	93.6	96.0	96.0	95.2	95.2	96.3	97.0	95.0	95.4	95.2	94.2	94.9	94.9	96.1	95.9	93.8	95.7	93.8	93.8
45	100.0				99.1	100.0	97.6	100.0	97.6	97.6	97.4	98.1	98.4	98.0	98.0	99.3	100.0	98.0	98.0	99.0	98.0	100.0	97.7	97.7
46	97.9				91.9	91.9	89.4	90.8	91.0	91.7	90.8	91.7	89.9	89.0	91.7	91.7	89.0	89.0	92.6	92.6	89.4	91.2	93.1	93.1
47	100.0				100.0	100.0	100.0	97.2	99.2	99.2	96.0	98.7	100.0	100.0	98.7	97.7	100.0	100.0	97.3	97.3	100.0	100.0	98.0	98.9
48	94.0				91.0	91.4	91.7	88.9	91.0	91.0	88.9	89.9	88.9	89.9	89.4	88.3	89.9	89.9	89.4	89.4	90.3	89.3	88.0	89.9
49	91.2				91.2	91.2	88.8	87.7	89.4	91.2	89.4	89.4	91.2	91.2	87.7	89.6	91.2	91.2	90.0	90.2	89.8	87.9	90.6	90.8
50	95.1				92.1	92.9	97.6	97.6	92.3	92.3	97.1	92.1	94.9	94.3	91.3	91.3	91.2	92.2	90.0	90.2	91.2	91.0	92.0	92.0
51	93.1				93.1	93.1	93.9	92.0	91.8	91.8	93.3	94.2	90.6	90.6	93.1	94.9	89.6	90.4	93.3	91.4	91.2	91.0	92.0	92.0
52	90.8				91.9	92.9	94.7	94.7	93.3	93.3	94.9	94.9	93.3	93.1	94.7	94.9	92.1	92.1	94.3	94.3	94.1	94.3	92.3	94.3
53	95.6				93.1	94.9	95.9	96.1	95.5	97.4	94.9	96.1	94.0	94.9	95.9	94.2	92.2	94.0	94.6	94.6	95.7	95.9	95.3	95.3
54	93.5				93.0	93.9	93.4	92.5	91.2	91.2	92.9	92.7	91.2	92.2	93.1	93.1	93.1	93.3	92.4	91.6	92.2	92.2	92.2	92.2
55	93.1				94.9	93.1	93.3	93.1	93.3	93.1	91.2	93.1	94.6	92.7	93.1	91.2	91.6	93.5	93.1	92.9	91.0	89.1	93.1	93.1
56	90.0				92.1	93.0	90.9	89.7	92.1	91.1	91.2	91.2	90.6	90.8	91.2	91.4	90.8	90.8	92.3	92.3	91.9	91.6	91.2	91.2
57	95.5				92.6	95.0	93.5	93.5	95.5	94.2	89.4	91.3	92.3	92.6	91.3	92.6	93.5	91.6	92.6	94.5	95.0	93.2	92.3	92.3
58	100.0				100.0	100.0	100.0	100.0	100.0	98.0	100.0	100.0	100.0	99.4	100.0	100.0	99.8	100.0	100.0	99.8	100.0	100.0	99.8	99.8
59	97.2				96.0	94.4	100.0	100.0	96.3	96.3	98.6	99.1	99.1	100.0	100.0	98.6	98.6	98.6	96.3	96.3	96.9	99.1	98.6	96.3
60	97.1				94.6	91.7	92.7	96.1	92.7	96.1	98.0	96.6	97.1	96.6	92.7	92.4	96.6	96.6	96.1	96.1	98.5	92.4	94.6	92.7

TREATMENT LEVEL	1				2				3				4				5				CONTROL			
REPLICATE	A		B		A		B		A		B		A		B		A		B		A		B	
LARVAL TANK	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
MEAN	96.5	97.8	96.2	96.1	95.9	95.9	96.3	96.2	96.0	96.2	96.1	96.4	95.9	96.0	96.0	95.9	96.2	96.2	95.9	96.1	95.0	95.3	95.7	96.0
S.D.	3.8	3.7	4.3	4.3	3.9	3.8	3.9	4.2	4.1	3.9	4.2	4.0	4.1	4.0	4.2	4.1	4.3	4.2	3.8	3.9	4.1	4.1	3.9	3.9
RAI	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
RIW	87.3	87.3	87.3	87.3	87.3	87.3	87.4	87.4	86.7	87.6	87.3	88.2	87.6	87.4	87.6	88.2	87.8	88.4	88.2	88.3	87.7	87.9	87.0	87.2
N	29	22	35	36	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN	96.5	96.1	96.2	96.0	96.1	95.7
S.D.	4.1	3.9	4.0	4.1	4.0	4.0
RAI	100.0	100.0	100.0	100.0	100.0	100.0
RII	87.3	87.3	86.7	87.4	87.0	87.0
N	132	160	160	160	160	160

FILE: ELS-TWIN

TOTAL AMMONIA-NITROGEN (ug/L)
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 25 - JULY 28, 1988 (-3 TO 61 DAYS POST-HATCH)
 CONTINUOUS EXPOSURE

Table 7.3-5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-3	364	365	363	368	360	364	356	363	359	363	343	335
-1	274	276	271	275	272	279	273	276	282	273	253	250
5	208	218	210	231	209	241	209	211	206	207	192	192
11			182	190	186	192	184	188	187	187	171	169
17			138	135	142	137	145	132	136	143	116	119
24			112	117	123	126	129	129	127	115	116	115
31			222	217	235	232	237	238	228	229	206	203
38			138	143	140	147	139	158	124	148	97	117
44			201	197	206	209	210	215	198	211	171	200
51					191	197	193	196	171	212	158	187
58					137	139	119	149	128	150	104	141

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	282	286	204	208	200	206	199	205	195	203	175	184
S.D. =	78	74	77	78	70	72	71	70	73	70	74	66
MAX =	364	365	363	368	360	364	356	363	359	363	343	335
MIN =	208	218	112	117	123	126	119	129	124	115	97	115
N =	3	3	9	9	11	11	11	11	11	11	11	11

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	284	206	203	202	199	180
S.D. =	68	75	69	69	70	68
MAX =	365	368	364	363	363	343
MIN =	208	112	123	119	115	97
N =	6	18	22	22	22	22

OVERALL (GRAND) STATISTICS

MEAN =	202
S.D. =	72
MAX =	368
MIN =	97
N =	112

FILE: ELS-TUIN

TOTAL AMMONIA-NITROGEN (ug/L)
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 25 - JULY 28, 1988 (-4 TO 60 DAYS POST-HATCH)
 INTERMITTENT EXPOSURE

Table 7.3-5 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.	RE	RW	UE	UR	YE	YW	GE	GW	BE	BW	WE	WR
-4	359	360	360	360	363	361	359	359	359	358	348	353
-2	279	277	267	269	280	265	268	269	267	268	262	263
4	209	199	209	204	216	207	210	203	204	206	200	203
10	185	189	183	183	188	183	186	182	188	179	184	177
16	326	337	286	289	253	255	204	205	163	165	122	125
23	318	329	296	292	249	250	199	196	148	146	101	
30	415	391	405	366	376	355	315	320	304	289	225	218
37	355	358	307	320	274	271	225	224	178	181	129	131
43	435	416	396	381	349	346	308	310	259	270	236	209
50	443	408	374	376	335	335	300	290	246	241	182	182
57			341	344	297	306	266	251	223	223	146	147

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	333	325	311	308	289	285	258	255	231	230	194	201
S.D. =	89	82	73	68	61	60	57	59	64	63	72	68
MAX =	443	416	405	381	376	361	359	359	359	358	348	353
MIN =	185	180	183	183	188	183	186	182	148	146	101	125
N =	10	10	11	11	11	11	11	11	11	11	11	10

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	329	309	287	257	230	197
S.D. =	83	69	59	57	62	69
MAX =	443	405	376	359	359	353
MIN =	180	183	183	182	146	101
N =	20	22	22	22	22	21

OVERALL (GRAND) STATISTICS

MEAN = 268
 S.D. = 79
 MAX = 443
 MIN = 101
 N = 129

FILE: ELS-UNION

UNIONIZED AMMONIA-NITROGEN (ug/L)
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 25 - JULY 28, 1988 (-3 TO 61 DAYS POST-HATCH)
 CONTINUOUS EXPOSURE

Table 7.3-6

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-3	14	15	15	14	14	15	14	15	14	14	13	13
-1	9	10	9	9	9	9	9	9	8	8	7	7
5	7	8	7	8	7	8	7	7	7	7	7	6
11			7	8	7	8	7	7	7	7	6	7
17			4	4	4	4	4	4	4	4	3	3
24			3	3	3	3	3	3	3	3	3	3
31			8	8	8	8	8	8	8	8	7	7
38			5	5	5	5	5	5	4	5	3	4
44			5	5	5	5	5	5	4	5	4	5
51					6	6	6	6	6	6	5	6
58					4	4	3	4	3	4	2	4

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN=	10	11	7	7	6	7	7	7	6	6	5	6
ST DEV=	4	3	4	3	3	3	3	3	3	3	3	3
MAX=	14	15	15	14	14	15	14	15	14	14	13	13
MIN=	7	8	3	3	3	3	3	3	3	3	2	3
N=	3	3	9	9	11	11	11	11	11	11	11	11

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN=	11	7	7	7	6	6
ST DEV=	3	3	3	3	3	3
MAX=	15	15	15	15	14	13
MIN=	7	3	3	3	3	2
N=	6	18	22	22	22	22

OVERALL (GRAND) STATISTICS

MEAN= 7
 ST DEV= 3
 MAX= 15
 MIN= 2
 N= 112

FILE: ELS-URION

UNIONIZED AMMONIA-NITROGEN (ug/L)

RAINBOW TROUT - EARLY LIFE STAGE

MAY 25 - JULY 28, 1988 (-4 TO 60 DAYS POST-HATCH)

INTERMITTENT EXPOSURE

Table 7.3-6 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-4	14	14	14	14	14	14	14	14	14	14	13	13
-2	11	10	10	10	11	10	10	10	9	10	9	9
4	8	7	8	8	8	7	7	8	7	8	7	7
10	8	8	8	8	8	8	8	8	8	7	8	8
16	10	10	9	9	8	8	6	6	5	5	4	4
23	9	9	8	8	7	7	6	5	4	4	3	
30	17	16	15	15	15	14	12	13	11	11	9	8
37	13	15	11	12	10	10	8	8	6	6	5	4
43	15	16	14	13	13	12	11	11	9	10	9	8
50	16	16	14	14	12	12	11	11	9	9	6	6
57			12	12	10	11	8	8	7	7	5	5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN=	12	12	11	11	10	10	9	9	8	8	7	7
ST DEV=	3	4	3	3	3	3	3	3	3	3	3	3
MAX=	17	16	15	15	15	14	14	14	14	14	13	13
MIN=	8	7	8	8	7	7	6	5	4	4	3	4
N=	10	10	11	11	11	11	11	11	11	11	11	10

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN=	12	11	10	9	8	7
ST DEV=	3	3	3	3	3	3
MAX=	17	15	15	14	14	13
MIN=	7	8	7	5	4	3
N=	20	22	22	22	22	21

OVERALL (GRAND) STATS:

MEAN= 10
ST DEV= 3
MAX= 17
MIN= 3
N= 129

Table 7.3-7

FILE: ELS-PH

PH

RAINBOW TROUT - EARLY LIFE STAGE

MAY 25 - JULY 28, 1988 (-3 TO 61 DAYS POST-HATCH)

CONTINUOUS EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-3	8.34	8.35	8.33	8.35	8.34	8.34	8.35	8.34	8.34	8.34	8.33	8.32
-1	8.29	8.30	8.29	8.29	8.27	8.28	8.28	8.28	8.22	8.25	8.19	8.20
5	8.31	8.32	8.31	8.31	8.29	8.30	8.28	8.30	8.28	8.29	8.28	8.27
11			8.38	8.38	8.35	8.38	8.35	8.35	8.34	8.36	8.31	8.33
17			8.22	8.24	8.20	8.21	8.19	8.20	8.18	8.20	8.14	8.16
24			8.15	8.15	8.12	8.12	8.09	8.12	8.09	8.12	8.03	8.10
31			8.26	8.28	8.22	8.24	8.24	8.25	8.26	8.24	8.25	8.22
38			8.24	8.21	8.22	8.24	8.23	8.23	8.23	8.19	8.18	8.21
44			8.08	8.08	8.07	8.06	8.06	8.07	8.05	8.07	8.01	8.05
51					8.17	8.17	8.18	8.18	8.18	8.18	8.12	8.15
58					8.07	8.10	8.07	8.08	8.08	8.09	8.02	8.08

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	8.31	8.32	8.25	8.25	8.21	8.22	8.21	8.22	8.20	8.21	8.17	8.19
S.D. =	0.03	0.03	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.12	0.09
MAX =	8.34	8.35	8.38	8.38	8.35	8.38	8.35	8.35	8.34	8.36	8.33	8.33
MIN =	8.29	8.30	8.08	8.08	8.07	8.06	8.06	8.07	8.05	8.07	8.01	8.05
N =	3	3	9	9	11	11	11	11	11	11	11	11

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	8.32	8.25	8.22	8.21	8.21	8.18
S.D. =	0.02	0.09	0.10	0.10	0.10	0.10
MAX =	8.35	8.38	8.38	8.35	8.36	8.33
MIN =	8.29	8.08	8.06	8.06	8.05	8.01
N =	6	18	22	22	22	22

OVERALL (GRAND) STATISTICS

MEAN =	8.22
S.D. =	0.10
MAX =	8.38
MIN =	8.01
N =	112

FILE: ELS-PH

PH

RAINBOW TROUT - EARLY LIFE STAGE

Table 7.3-7 (continued)

MAY 25 - JULY 28, 1988 (-4 TO 60 DAYS POST-HATCH)

INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-4	8.34	8.34	8.33	8.33	8.32	8.32	8.32	8.33	8.31	8.32	8.29	8.30
-2	8.35	8.34	8.34	8.35	8.34	8.34	8.33	8.34	8.31	8.33	8.31	8.32
4	8.33	8.32	8.32	8.33	8.32	8.32	8.31	8.33	8.29	8.32	8.30	8.30
10	8.40	8.40	8.40	8.40	8.39	8.40	8.38	8.39	8.38	8.38	8.38	8.39
16	8.24	8.24	8.24	8.24	8.23	8.23	8.23	8.23	8.22	8.23	8.23	8.22
23	8.16	8.17	8.17	8.17	8.16	8.17	8.15	8.14	8.13	8.14	8.14	8.11
30	8.30	8.32	8.28	8.30	8.31	8.30	8.28	8.30	8.25	8.28	8.27	8.24
37	8.26	8.31	8.25	8.26	8.27	8.26	8.22	8.26	8.25	8.24	8.24	8.22
43	8.26	8.30	8.28	8.25	8.29	8.28	8.28	8.29	8.27	8.29	8.25	8.27
50	8.26	8.29	8.27	8.26	8.26	8.27	8.25	8.26	8.26	8.26	8.20	8.23
57	8.21	8.23	8.22	8.20	8.20	8.21	8.17	8.19	8.14	8.17	8.16	8.16

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	8.28	8.30	8.28	8.28	8.28	8.28	8.27	8.28	8.26	8.27	8.25	8.25
S.D. =	0.07	0.06	0.06	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.08
MAX =	8.40	8.40	8.40	8.40	8.39	8.40	8.38	8.39	8.38	8.38	8.38	8.39
MIN =	8.16	8.17	8.17	8.17	8.16	8.17	8.15	8.14	8.13	8.14	8.14	8.11
N =	11	11	11	11	11	11	11	11	11	11	11	11

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	8.29	8.28	8.28	8.27	8.26	8.25
S.D. =	0.06	0.06	0.06	0.07	0.07	0.07
MAX =	8.40	8.40	8.40	8.39	8.38	8.39
MIN =	8.16	8.17	8.16	8.14	8.13	8.11
N =	22	22	22	22	22	22

OVERALL (GRAND) STATISTICS

MEAN =	8.27
S.D. =	0.07
MAX =	8.40
MIN =	8.11
N =	132

FILE: ELS-DPD

PERCENT MONOCHLORAMINE - DPD METHOD
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 23 - JULY 28, 1988 (-3 TO 61 DAYS POST-HATCH)
 CONTINUOUS EXPOSURE

Table 7.3-8

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-3	95	94	100	100	98	100	87	100	90	100	0	0
-2	96									100		
-1		96					100					
3	97	100	100			100						
4	100								100			
6		100						97				
9	100				100							
10		100		100								
13	100	100					100			100		
16	100	100	100			100						
19		100							100			
20	95							100				
23	98	100		100	100							
26	100	99					100			100		
30	100	100	100			100						
33								100	100			
40							100			100		
41	100	97		100	100							
48						100		100	100			
55	96			100	98		92			100		
61			100			100		100	100			

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	98	99	100	100	99	100	96	99	98	100	0	0
S.D. =	2	2	0	0	1	0	6	1	4	0	0	0
MAX =	100	100	100	100	100	100	100	100	100	100	0	0
MIN =	95	94	100	100	98	100	87	97	90	100	0	0
N =	13	12	5	5	5	6	6	6	6	6	1	1

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	99	100	100	98	99	0
S.D. =	2	0	1	4	3	0
MAX =	100	100	100	100	100	0
MIN =	94	100	98	87	90	0
N =	25	10	11	12	12	2

OVERALL (GRAND) STATISTICS

MEAN = 99
 S.D. = 3
 MAX = 100
 MIN = 87
 N = 70

FILE: ELS-DPD

PERCENT MONOCHLORAMINE - DPD METHOD

RAINBOW TROUT - EARLY LIFE STAGE

MAY 25 - JULY 28, 1988 (-4 TO 60 DAYS POST-HATCH)

INTERMITTENT EXPOSURE

Table 7.3-8 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
D.P.H.												
-4	98	99	99	99	98	100	98	98	100	100	0	0
-3	96									95		
-2		96					100					
2	96	96	97			93						
3	98								100			
5		99						99				
8	100				100							
9	100			95								
12	100	98					96			93		
15	100	99	100			100						
18		99							100			
19	99							97				
22	100	95		99	98							
25	99	100					99			98		
29	99	100	100			98						
32	98	96						93		94		
39							100			98		
40	100	98		59	88							
47	95	100	98			99		99		100		
54	97	95		98	94		98			92		
60	100		100			100		99		100		

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	98	98	99	90	96	98	99	98	99	96	0	0
S.D. =	2	2	1	18	5	3	2	3	3	3		
MAX =	100	100	100	99	100	100	100	99	100	100	0	0
MIN =	95	95	97	59	88	93	96	93	94	92	0	0
N =	17	14	6	5	5	6	6	6	6	6	1	1

TREATMENT LEVEL	1	2	3	4	5	CONTROL
MEAN =	98	95	97	98	97	0
S.D. =	2	12	4	2	3	0
MAX =	100	100	100	100	100	0
MIN =	95	59	88	93	92	0
N =	31	11	11	12	12	2

OVERALL (GRAND) STATISTICS

MEAN =	97
S.D. =	5
MAX =	100
MIN =	59
N =	77

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 26 - JULY 20, 1968
 CONTINUOUS EXPOSURE

Table 7.3-9

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED
1	191	191	95	95	46	46	23	23	12	12	-1	-1
2	197	193	97	98	47	51	18	18	10	7	0	-3
3	192	197	92	95	44	46	19	19	9	10	2	1
4	195	194	94	97	45	47	19	22	11	8	1	0
5	195	196	96	95	48	52	18	22	12	8	-2	-6
6	207	191	99	94	42	47	20	20	10	9	0	1
7	194	200	92	98	47	49	23	22	10	15	2	2
8	195	197	93	92	47	44	19	19	10	8	-6	-1
9	187	190	90	90	44	46	20	20	10	12	1	2
10	183	183	87	88	45	44	20	20	10	7	2	3
11	183	183	83	84	39	41	20	19	6	8	1	1
12			86	87	42	44	19	21	10	11	-6	2
13			80	87	40	42	19	16	8	11	0	-1
14			80	79	38	38	17	16	5	9	-1	-2
15			81	86	41	45	20	20	12	13	3	3
16			83	89	43	46	22	21	12	11	1	2
17			74	78	36	40	19	14	7	6	0	-2
18			76	84	39	43	19	19	8	11	1	0
19			79	86	41	41	20	20	10	11	2	2
20			82	84	43	39	19	19	10	9	1	1
21			83	83	43	41	19	19	10	8	2	2
22			76	80	38	39	17	17	8	9	-1	-2
23			84	84	42	43	20	21	8	10	-1	-2
24			81	84	3	37	14	12	5	2	-2	1
25			79	84	42	41	18	12	8	8	-1	0
26			76	82	37	36	18	15	7	7	-3	-3
27			79	87	40	43	18	19	12	10	-2	-1
28			79	83	35	37	12	16	6	7	-2	-1
29			70	77	35	34	12	14	6	8	-2	-6
30			74	78	37	36	9	16	11	8	-2	-1
31			76	83	29	32	10	16	8	9	-1	0
32			90	90	42	38	9	23	6	14	-6	0
33			77	83	38	36	10	15	5	9	-1	0
34			77	79	37	36	12	15	5	8	-4	-1
35			110	98	49	45	11	20	7	9	-3	-3
36			99	111	53	46	4	23	7	9	-1	-2
37			89	106	48	48	7	18	7	11	-2	0
38			109	118	54	53	19	21	10	10	0	1
39			98	98	49	49	6	6	5	5	-2	-2
40			114	114	51	51	18	18	10	10	1	1
41			107	113	49	53	19	20	8	9	-1	0
42			88	106	43	44	13	13	7	6	-3	-5
43			95	102	39	39	18	17	8	9	-1	-4
44			103	108	42	40	17	17	8	12	0	-1
45			90	96	39	38	13	17	9	5	0	-1
46			88	104	40	40	13	18	7	10	-1	-3
47			85	97	42	43	11	18	9	10	1	-1
48			102	96	41	40	12	14	8	7	-1	-2
49					45	34	15	16	8	10	3	1
50					36	34	11	13	2	5	-3	-1
51					37	38	9	17	5	11	-2	-4
52					26	34	15	7	2	-2	-4	1
53					39	33	18	14	9	10	7	3
54					39	39	18	16	5	6	-6	-1
55					41	35	14	18	7	9	2	-1
56					37	38	13	18	9	11	-9	-4
57					39	36	13	16	8	7	1	0
58					43	39	21	21	11	12	-1	-1
59					34	32	14	15	8	5	0	-3
60					25	25	10	11	4	3	-3	-4
61					36	29	13	12	4	6	-2	-3
					37	44	18	15	6	9	0	-3
					47	39	17	16	8	14	1	-1
					48	40	16	16	6	8	1	-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN	192	193	87	92	48	41	16	17	8	9	-9	-1
S. D.	7	5	10	11	7	6	4	3	2	3	2	2
MAX	207	200	110	118	54	53	23	23	13	15	8	3
MIN	183	183	70	77	3	25	4	7	2	-2	-6	-6
N	11	9	47	46	63	62	63	62	63	62	63	61

TREATMENT	1	2	3	4	5	CONTROL
MEAN	193	89	41	16	8	-9
S. D.	6	10	6	4	3	2
MAX	207	118	54	23	15	8
MIN	183	70	3	4	-2	-6
N	20	93	125	125	125	124

TOTAL RESIDUAL UNKOWN - AMPEROMETRIC METHOD (ug/L)
 RAINBOW TROUT - EARLY LIFE STAGE
 MAY 25 - JULY 27, 1988 (-4 TO 59 DAYS POST-HATCH)
 INTERMITTENT EXPOSURE

Table 7.3-9 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED	A	B COMBINED
DPH												
-4	619	650 635	547	548 547	394	395 394	233	250 242	119	132 125	-4	-2 -3
-3	725	726 730	628	632 630	458	462 460	281	283 282	146	148 147	2	0 1
-2	697	711 704	628	629 628	452	464 455	278	281 279	145	149 147	1	3 2
-1	683	689 686	616	624 620	468	469 465	285	278 281	163	158 160	-4	-2 -3
0	684	683 684	616	623 619	467	465 464	281	281 281	157	159 158	-1	-1 -1
1	666	654 648	604	614 609	457	454 455	277	276 276	154	147 151	1	1 1
2	708	693 700	602	607 604	438	440 439	265	267 266	123	123 123	1	5 3
3	764	771 771	603	597 600	425	436 436	266	262 264	121	123 122	1	-2 -9
4	720	723 721	569	564 567	418	418 414	259	252 251	116	120 118	3	2 2
5	690	625 663	531	529 530	389	394 386	238	226 232	111	114 113	-2	4 1
6	706	711 711	567	569 568	415	424 420	258	262 260	132	132 132	-5	-1 -3
7	616	582 599	538	527 534	388	389 388	243	242 243	124	123 124	7	1 4
8	634	652 643	538	527 532	404	409 406	273	242 257	125	132 128	1	2 2
9	529	521 525	488	468 474	356	348 352	212	219 216	105	104 104	-9	0 -6
10	594	589 591	345	347 346	434	446 440	199	192 191	84	87 86	-5	0 -9
11	656	662 659	494	471 482	489	457 493	218	212 215	105	106 105	1	-6 0
12	734	722 728	569	533 551	424	427 425	263	236 259	142	136 139		
13	740	736 738	569	585 577	454	445 449	277	268 273	143	137 140		
14	745		571		436		267		139		2	
15	746	746 746	587	590 589	450	445 448	278	264 271	132	131 131	3	1 2
16	645	657 651	504	516 510	408	374 391	376	227 301	82	86 84		
17		386 386	549	558 554	425	430 428	266	265 265	131	137 134	6	5 5
18	754	742 748	569	600 585	447	449 448	285	284 284	150	153 151	2	2 2
19	718	728 723	565	564 566	433	446 440	276	279 277	146	148 147	0	-9 -9
20	695	692 694	558	546 552	418	420 419	259	254 257	128	133 131	7	-3 2
21	650	645 647	515	529 522	402	404 403	241	251 246	121	126 123	3	0 1
22	767	771 769	599	608 604	455	457 456	280	274 277	123	129 126		-2 -2
23	727	744 736	611	602 606	458	415 452	287	282 284	125	131 128	-9	-4 -2
24	757	752 752	599	602 600	438	434 436	311	312 312	142	144 143	2	1 1
25	699	719 709	565	557 561	424	361 392	299	291 295	134	144 139	-9	1 0
26	684	680 682	543	553 548	406		406		287	286 286	134	131 133
27	708	734 721	567	568 568	392	427 409	275	252 264	109	130 119	2	0 1
28	664	709 687	541	532 536	416	419 413	265	246 255	117	116 116	7	-1 3
29	797	822 810	629	627 643	454	471 463	302	300 301	139	141 140	4	1 2
30	775	802 788	602	613 607	427	436 432	293	276 295	130	124 127	-8	-1 -1
31	739	794 766	604	607 606	451	430 441	278	293 285	124	125 124	-3	-6 -5
32	725	783 754	581	605 593	426	437 431	265	276 270	117	119 118	-1	-3 -1
33	794	773 784	569	579 574	405	416 411	260	264 262	88	119 104	0	1 1
34	822	823 822	576	607 592	432	442 437	281	269 275	108	118 113	1	2 1
35	814	805 809	590	603 637	446	447 446	276	275 276	118	125 118	-2	-4 -3
36	809	798 804	736	676 706	421	430 425	266	267 267	112	113 112	-2	0 -1
37	746	755 750	544	543 543	418	388 399	237	242 239	93	105 99	-4	-1 -2
38	779	742 768	554	544 549	400	392 396	241	238 239	78	94 86	-3	-6 -5
39	701	698 699	518	534 526	385	378 381	238	231 235	87	86 86	-2	-2 -2
40	708	652 680	311	263 287	198	188 193	137	124 130	63	64 63	2	-1 0
41	768	758 763	556	555 555	416	423 420	257	252 255	119	105 107	-2	-4 -3
42	737	729 733	540	597 568	378	381 380	256	244 250	69	71 70	-1	1 -6
43					401		238		92		-9	
44	718	712 715	534	578 531	375	382 379	237	238 237	98	92 95	-1	-1 -1
45	753	744 748	520	550 535	376	406 391	244	249 247	85	107 96	-1	-5 -3
46	749	756 752	556	555 556	381	400 391	218	243 226	100	102 101	-2	-4 -3
47	748	746 747	586	580 583	382	391 387	243	238 241	99	89 94	-5	-8 -7
48	762	734 748	531	548 539	386	406 396	272	248 260	115	101 108	-4	4 -9
49	739	725 732	556	560 558	387	407 397	275	263 269	136	137 136	2	-3 -9
50	752	725 739	550	536 543	393	393 393	269	278 273	125	142 133	-1	1 0
51	718	748 763	600	595 597	430	440 435	308	307 307	193	116 110	-1	1 0
52	782	750 766	593	601 597	414	423 423	306	294 300	107	113 110	-1	0 -9
53	759	731 745	576	565 571	422	423 423	289	276 283	107	110 109	-1	-1 -1
54	783	783 783	558	565 562	426	446 436	279	288 284	116	116 116	2	0 1
55	764	737 750	580	578 579	421	429 425	271	276 273	113	129 121	0	-1 -1
56	738	733 736	574	574 574	425	439 437	273	286 280	127	127 127	-2	0 -1
57	703	744 724	559	562 568	416	426 421	272	268 270	80	121 100	-2	-1 -1
58	724		572	573 572	430	420 425	264	274 269	117	133 125	-3	-1 -2
59	728	728	544	585 565	408	431 420	256	277 267	116	133 124	-2	0 -1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN	722	714	562	565	416	420	265	268	117	122	-8	-8
S.D.	55	72	58	64	39	42	32	29	22	20	3	3
RAI	822	823	736	683	489	497	376	312	163	159	7	5
RIN	529	386	311	263	198	188	137	124	63	64	-9	-8
N	62	60	63	62	64	61	64	62	64	62	60	58

TREATMENT	1	2	3	4	5	CONTROL
MEAN	718	563	418	263	119	-8
S.D.	63	60	40	31	21	3
RAI	823	736	497	376	163	7
RIN	386	263	188	124	63	-9
N	122	125	125	126	126	110

Table 7.3-10.

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from embryo through swim-up for continuous exposure to monochloramine during rainbow trout ELS test.

No. of Treatment Fish at Level Start			Observation Time (days posthatch)																								
			-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	200	TRC (ug/L)	131	134	134	134	134	135	135	135	135	133	133	133	133	133	133	133	133	133	133	133	133	133	133		
		Cum. Mort.	0	0	0	0	4	16	64	85	133	135	139	200	200	200	200	200	200	200	200	200	200	200	200		
		Cum. % Mort.	0	0	0	0	2.0	8.0	32.0	42.5	91.5	97.5	100	100	100	100	100	100	100	100	100	100	100	100	100		
2	139	TRC (ug/L)	95	97	95	95	94	94	94	94	93	93	92	91	91	90	89	89	88	88	88	87	87	87	87		
		Cum. Mort.	0	0	0	0	0	0	0	0	1	1	1	1	1	1	6	14	42	84	113	126	146	149			
		Cum. % Mort.	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.0	7.0	21.1	42.2	56.8	63.3	73.4	74.9		
3	200	TRC (ug/L)	46	48	47	47	47	47	47	47	46	46	46	45	45	45	45	45	44	44	44	44	44	43	43		
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4	200	TRC (ug/L)	23	20	19	19	20	20	20	20	20	20	20	20	20	19	19	20	19	19	19	19	19	19	19		
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	3	3	3	3	3		
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	1.0	1.0	1.5	1.5	1.5	1.5		
5	201	TRC (ug/L)	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	3		
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.5		
Control	197	TRC (ug/L)	-1	-1	-0	0	-0	-0	0	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0		
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1		
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)													139	135	133	132	133	132	131	129	124	112	96	85	81	75	74

Table 7.3-10 (continued)

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from embryo through swim-up for intermittent exposure to monochloroamine during rainbow trout ELS test.

Treatment	Fish at Level	No. of Fish at Start	Observation Time (days posthatch)																										
			-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	197	TRC (ug/L)	635	683	630	689	688	683	686	696	699	695	697	689	685	674	668	668	671	673	677	680	679	672	673	677	678	677	
		Cum. Mort.	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	6	8	9	17	17	18
		Cum. % Mort.	0	0	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	1.02	1.02	1.02	1.52	1.52	1.52	2.03	3.03	4.06	4.57	8.53	8.63	9.14
2	201	TRC (ug/L)	547	589	602	606	609	609	608	607	603	595	593	588	584	576	561	556	553	557	557	559	556	556	557	558	557	556	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	3	3	3	3	3	7	
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	0.50	0.50	0.50	1.00	1.00	1.00	1.49	1.49	1.49	1.49	1.49	3.48
3	201	TRC (ug/L)	334	427	437	445	449	450	448	447	443	437	435	432	430	424	425	430	429	430	431	431	429	429	430	431	430	429	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.98
4	196	TRC (ug/L)	242	262	268	271	273	274	272	271	269	265	265	263	263	259	255	252	252	253	254	254	257	257	258	259	259	259	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5
5	192	TRC (ug/L)	125	136	140	145	147	148	144	142	139	136	136	135	134	132	129	128	128	129	129	129	127	127	128	129	129	129	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5
Control	202	TRC (ug/L)	-3	-1	-0	-1	-1	-0	0	-0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	1.0

Estimated LC-50 in ug/L
(Trimmed Spearman-Kärber method)

Notes: After 9 days posthatch, cumulative percent mortality for Treatment 3 is based on 101 fish instead of 201, because of a mechanical failure of one of the replicates.

Table 7.3-11A

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from swim-up through 60 days posthatch for continuous exposure to monochloramine during rainbow trout ELS test.

No. of Treatment Fish at Level Start			Observation Time (days posthatch)																			
			21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	0	TRC (ug/L)	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193
		Cum. Mort.																				
		Cum. % Mort.																				
2	50	TRC (ug/L)	86	86	86	86	86	85	85	85	85	85	85	86	86	87	87	87	88	88	88	88
		Cum. Mort.	8	12	14	18	21	22	23	25	28	28	29	30	32	33	35	37	42	44	49	50
		Cum. % Mort.	16	24	28	36	42	44	46	50	56	56	58	60	64	66	70	74	84	88	98	100
3	99	TRC (ug/L)	42	42	42	42	42	41	41	41	41	41	41	41	41	42	42	42	42	42	42	42
		Cum. Mort.	0	0	0	0	0	1	1	1	2	2	2	3	3	3	3	4	4	6	8	8
		Cum. % Mort.	0	0	0	0	0	1.01	1.01	1.01	2.02	2.02	2.02	3.03	3.03	3.03	3.03	4.04	4.04	6.06	8.08	8.08
4	99	TRC (ug/L)	19	19	19	19	19	18	18	18	18	18	18	17	17	17	17	17	17	17	17	17
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	99	TRC (ug/L)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Control	98	TRC (ug/L)	0	0	0	0	0	0	0	0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0
		Cum. Mort.	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
		Cum. % Mort.	0	0	0	0	0	0	0	0	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)											85	78	79	77	75	73	72	70	68	64	63	59
																						57

Table 7.3-11A (continued)

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from swim-up through 60 days posthatch for continuous exposure to monochloramine during rainbow trout ELS test.

Treatment	Fish at Level	No. of Fish at Start	Observation Time (days posthatch)																			
			42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
1	0	TRC (ug/L)	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193
		Cum. Mort.																				
		Cum. % Mort.																				
2	50	TRC (ug/L)	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
		Cum. Mort.	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
		Cum. % Mort.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
3	99	TRC (ug/L)	42	42	42	42	42	42	41	41	41	41	41	41	41	41	41	41	41	41	41	
		Cum. Mort.	8	8	8	10	11	11	12	15	16	18	18	18	19	20	20	21	24	24	25	26
		Cum. % Mort.	8.08	8.08	8.08	10.10	11.11	11.11	12.12	15.15	16.16	18.18	18.18	18.18	19.19	20.20	20.20	21.21	24.24	24.24	25.25	26.26
4	99	TRC (ug/L)	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	16	16	16	16	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
5	99	TRC (ug/L)	9	9	9	9	9	9	8	9	8	8	8	8	9	8	8	8	8	8	8	
		Cum. Mort.	0	0	0	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	
		Cum. % Mort.	0	0	0	1.01	1.01	1.01	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	
Control	98	TRC (ug/L)	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	
		Cum. Mort.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
		Cum. % Mort.	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)			57	57	57	56	56	56	56	54	53	52	52	52	52	51	51	51	49	49	49	48

3.

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from swim-up through 60 days posthatch for intermittent exposure to monochloramine during rainbow trout ELS test.

No. of Treatment Fish at Level Start			Observation Time (days posthatch)																			
			22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
1	99	TRC (ug/L)	680	682	685	686	686	687	687	690	693	695	697	699	703	705	708	709	710	710	709	710
		Cum. Mort.	5	8	13	14	25	32	35	38	42	46	50	53	54	65	66	73	75	78	81	82
		Cum. % Mort.	5.05	8.08	13.13	14.14	25.25	32.32	35.35	38.38	42.42	46.46	50.51	53.54	54.55	65.66	66.67	73.74	75.76	78.79	81.82	82.83
2	100	TRC (ug/L)	558	560	561	561	561	561	560	563	564	565	566	566	567	568	572	571	571	570	563	563
		Cum. Mort.	0	0	0	1	6	9	13	18	20	27	28	29	29	32	32	35	35	38	40	40
		Cum. % Mort.	0	0	0	1	6	9	13	18	20	27	28	29	29	32	32	35	35	38	40	40
3	98	TRC (ug/L)	430	431	431	430	429	429	428	429	429	430	430	429	429	430	430	429	428	427	422	422
		Cum. Mort.	0	0	0	0	1	2	2	3	3	3	3	3	5	5	5	7	7	7	8	8
		Cum. % Mort.	0	0	0	0	1.02	2.04	2.04	3.06	3.06	3.06	3.06	3.06	5.10	5.10	5.10	7.14	7.14	7.14	8.16	8.16
4	100	TRC (ug/L)	259	260	262	263	264	264	264	265	265	266	266	266	266	266	266	266	265	264	261	261
		Cum. Mort.	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2
		Cum. % Mort.	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2
5	98	TRC (ug/L)	129	129	129	130	130	130	129	129	129	129	129	128	128	128	127	127	126	125	123	123
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.02	1.02
Control	98	TRC (ug/L)	1	0	0	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)			694 678 677 638 639 619 615 602 587 586																			

Table 7.3-11B (continued)

Summary of TRC concentrations (ug/L), observed embryo-larval mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during each 24-hr interval from swim-up through 60 days posthatch for intermittent exposure to monochloramine during rainbow trout ELS test.

No. of Treatment Fish at Level Start			Observation Time (days posthatch)																		
			42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	99	TRC (ug/L)	711	711	711	712	713	713	714	714	715	716	717	717	717	717	718	718	718	718	
		Cum. Mort.	83	85	86	87	90	91	92	92	93	93	93	93	93	94	97	97	98	98	98
		Cum. % Mort.	83.34	85.86	86.87	87.88	90.91	91.92	92.93	92.93	93.94	93.94	93.94	93.94	93.94	94.95	97.98	97.98	98.99	98.99	98.99
2	100	TRC (ug/L)	563	563	563	562	562	562	562	562	561	562	563	563	563	563	563	563	563	563	
		Cum. Mort.	44	45	47	47	49	50	50	50	51	55	58	65	70	72	74	77	79	80	81
		Cum. % Mort.	44	45	47	47	49	50	50	50	51	55	58	65	70	72	74	77	79	80	81
3	98	TRC (ug/L)	421	421	420	419	419	418	417	417	417	417	417	417	418	418	418	418	418	418	
		Cum. Mort.	8	8	8	9	10	11	12	12	13	13	14	16	16	18	19	23	23	25	25
		Cum. % Mort.	8.16	8.16	8.16	9.18	10.20	11.22	12.24	12.24	13.27	13.27	14.29	16.33	16.33	18.37	19.39	23.47	23.47	25.51	25.51
4	100	TRC (ug/L)	261	261	260	260	259	259	259	259	259	260	261	261	262	262	262	262	262	263	
		Cum. Mort.	2	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	5	5
		Cum. % Mort.	2	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	5	5
5	98	TRC (ug/L)	122	121	121	120	120	120	119	120	120	120	120	119	119	119	119	119	119	119	
		Cum. Mort.	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Cum. % Mort.	1.02	1.02	1.02	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Control	98	TRC (ug/L)	0	0	0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	
		Cum. Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimated LC-50 in ug/L (Trimmed Spearman-Kärber method)			576	571	566	563	555	549	545	544	538	532	525	509	502	492	478	466	458	451	449

Table 7.3-12A

				1 DAY 0		1 DAY 1		1 DAY 2		1 DAY 3		1 DAY 4		1 DAY 5		1 DAY 6		
		1 MAY 26		1 MAY 27		1 MAY 28		1 MAY 29		1 MAY 30		1 MAY 31		1 JUNE 1		1 JUNE 1		
		-2 D. P. H.		-1 D. P. H.		0 D. P. H.		1 D. P. H.		2 D. P. H.		3 D. P. H.		4 D. P. H.		5 D. P. H.		
TREATMENT	EGG	LEVEL	REPLICATE	CUP	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	A	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
1	B	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
TREATMENT 1 COMBINED				200	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	A	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
2	B	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
TREATMENT 2 COMBINED				200	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	A	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
3	B	1	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		3	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
		4	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
REPLICATE COMBINED				100	1	0	0	0	0	0	0	0	0	0	0	0	0	
TREATMENT 3 COMBINED				200	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 7.3-12A (continued)

				1 DAY 0		1 DAY 1		1 DAY 2		1 DAY 3		1 DAY 4		1 DAY 5		1 DAY 6	
				1 MAY 26		1 MAY 27		1 MAY 28		1 MAY 29		1 MAY 30		1 MAY 31		1 JUNE 1	
				-2 D. P. H.		-1 D. P. H.		0 D. P. H.		1 D. P. H.		2 D. P. H.		3 D. P. H.		4 D. P. H.	
TREATMENT	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP
LEVEL	REPLICATE	CUP	N	EN	LN	UN	CM	UN	CM	UN	CM	UN	CM	UN	CM	UN	CM
4	A	1	25	1	0	0	0	0	0	1	0	0	19	76	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	22	88	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	81	81	0	0	1
4	B	1	25	1	0	0	0	0	0	1	0	0	18	72	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	21	84	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	23	92	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	21	84	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	83	83	0	0	1
TREATMENT 4 COMBINED		200	1	0	0	0	0	0	0	1	0	0	164	82	0	0	1
5	A	1	25	1	0	0	0	0	0	1	0	0	23	92	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	22	88	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	85	85	0	0	1
5	B	1	25	1	0	0	0	0	0	1	0	0	22	88	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	21	84	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	21	84	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	23	92	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	87	87	0	0	1
TREATMENT 5 COMBINED		200	1	0	0	0	0	0	0	1	0	0	172	86	0	0	1
CONTROL	A	1	25	1	0	0	0	0	0	1	0	0	21	84	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	19	76	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	80	80	0	0	1
CONTROL	B	1	25	1	0	0	0	0	0	1	0	0	20	80	0	0	1
	2	25	1	0	0	0	0	0	0	1	0	0	18	72	0	0	1
	3	25	1	0	0	0	0	0	0	1	0	0	17	68	0	0	1
	4	25	1	0	0	0	0	0	0	1	0	0	20	80	0	0	1
REPLICATE COMBINED		100	1	0	0	0	0	0	0	1	0	0	75	75	0	0	1
CONTROL COMBINED		200	1	0	0	0	0	0	0	1	0	0	153	77.5	0	0	1

Table 7.3-12B

[illegible]

Table 7.3-12B (continued)

[illegible]

MORTALITY DATA
CONTINUOUS EXPOSURE
SAC FRY CHAMBERS
ROOT RIVER GROUP 11

Table 7.3-13A

		1 DAYS (0 - 8)				DAY: 7				DAY: 8				DAY: 9				DAY: 10				DAY: 11				DAY: 12					
		1 5/26 TO 6/01				1 JUNE 2				1 JUNE 3				1 JUNE 4				1 JUNE 5				1 JUNE 6				1 JUNE 7					
TREATMENT		1 -2 TO 4 DPH				1 5 DPH				1 6 DPH				1 7 DPH				1 8 DPH				1 9 DPH				1 10 DPH					
LEVEL	REPLICATE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
		N	1	LM	CM	CZM	1	LM	CM	CZM	1	LM	CM	CZM	1	LM	CM	CZM	1	LM	CM	CZM	1	LM	CM	CZM	1	LM	CM	CZM	
=====																															
1	A	100	1	22	22	22	1	5	27	27.0	1	62	89	89.0	1	8	97	97.0	1	2	99	99.0	1	1	100	****	1				1
	B	100	1	42	42	42	1	16	58	58.0	1	36	94	94.0	1	4	98	98.0	1	2	100	100.0	1	0	100	****	1				1
	COMBINED	200	1	64	64	32	1	21	85	42.5	1	98	183	91.5	1	12	195	97.5	1	4	199	99.5	1	1	200	****	1				1
=====																															
2	A	99	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	B	100	1	0	0	0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1
	COMBINED	199	1	0	0	0	1	0	0	0.0	1	1	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1
=====																															
3	A	101	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	B	99	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	COMBINED	200	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
=====																															
4	A	100	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	B	100	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	COMBINED	200	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
=====																															
5	A	100	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	B	101	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	COMBINED	201	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
=====																															
CONTROL	A	97	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1
	B	100	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
	COMBINED	197	1	0	0	0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	1	1	0.5	1
=====																															

MORTALITY DATA
CONTINUOUS EXPOSURE
SAC FRY CHANGERS
KOUF RIVER GROUP 11

Table 7.3-13A (continued)

		DAY: 13				DAY: 14				DAY: 15				DAY: 16				DAY: 17				DAY: 18				DAY: 19				DAY: 20				DAY: 21				DAY: 22					
		JUNE 8				JUNE 9				JUNE 10				JUNE 11				JUNE 12				JUNE 13				JUNE 14				JUNE 15				JUNE 16				JUNE 17					
TREATMENT		11 DPH				12 DPH				13 DPH				14 DPH				15 DPH				16 DPH				17 DPH				18 DPH				19 DPH				20 DPH					
LEVEL	REPLICATE	1				1				1				1				1				1				1				1				1				1					
		N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM	N	LN	CM	CM						
1	A	100	1			1				1				1				1				1				1				1				1									
	B	100	1			1				1				1				1				1				1				1				1									
COMBINED		200	1			1				1				1				1				1				1				1				1									
2	A	99	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	3	3	3.0	1	11	14	14.1	1	10	24	24.2	1	23	47	47.5	1	10	57	57.6	1	14	71	71.7	1	0	71	71.72	1
	B	100	1	0	1	1.0	1	0	1	1.0	1	5	6	6.0	1	5	11	11.0	1	17	29	28.0	1	32	60	60.0	1	6	66	66.0	1	3	69	69.0	1	6	75	75.0	1	3	79	79.00	1
COMBINED		199	1	0	1	0.5	1	0	1	0.5	1	5	6	3.0	1	8	14	7.0	1	28	42	21.1	1	42	84	42.2	1	29	113	56.3	1	13	126	53.3	1	20	146	73.4	1	3	149	74.37	1
3	A	101	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00	1
	B	99	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00	1
COMBINED		200	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00	1
4	A	100	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.00	1
	B	109	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	1	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.00	1
COMBINED		200	1	0	0	0.0	1	1	1	0.5	1	1	2	1.0	1	1	2	1.0	1	0	2	1.0	1	1	3	1.5	1	0	3	1.5	1	0	3	1.5	1	0	3	1.5	1	0	3	1.50	1
5	A	100	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	1	2	2.00	1
	B	101	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	0.99	1
COMBINED		201	1	0	0	0.0	1	0	0	0.0	1	1	1	0.5	1	1	2	1.0	1	0	2	1.0	1	0	2	1.0	1	0	2	1.0	1	0	2	1.0	1	0	2	1.0	1	1	3	1.49	1
CONTROL	A	97	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.03	1
	B	100	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00	1
COMBINED		197	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.51	1

Table 7.3-13B

[illegible]

MORTALITY DATA
INTERMITTENT EXPOSURE
SAC FRY CHAMBERS
KOOTENAI RIVER GROUP 1

Table 7.3-13B (continued)

		DAY: 19				DAY: 20				DAY: 21				DAY: 22				DAY: 23				DAY: 24				DAY: 25				
TREATMENT		JUNE 13				JUNE 14				JUNE 15				JUNE 16				JUNE 17				JUNE 18				JUNE 19				
LEVEL	REPLICATE	15 D.P.H				16 D.P.H				17 D.P.H				18 D.P.H				19 D.P.H				20 D.P.H				21 D.P.H				
		N	LN	CN	CZN	N	LN	CN	CZN	N	LN	CN	CZN	N	LN	CN	CZN	N	LN	CN	CZN	N	LN	CN	CZN	N	LN	CN	CZN	
1	A	97	1	0	3	3.1	1	0	3	3.1	1	1	4	4.1	1	1	5	5.2	1	5	10	10.3	1	0	10	10.3	1	0	10	10.31
	B	100	1	1	1	1.0	1	2	3	3.0	1	1	4	4.0	1	0	4	4.0	1	3	7	7.0	1	0	7	7.0	1	1	8	8.00
	COMBINED	197	1	1	4	2.0	1	2	6	3.0	1	2	8	4.1	1	1	9	4.6	1	8	17	8.6	1	0	17	8.6	1	1	18	9.14
2	A	100	1	0	1	1.0	1	1	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	1	3	5	5.00
	B	101	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	1	2	1.98
	COMBINED	201	1	0	2	1.0	1	1	3	1.5	1	0	3	1.5	1	0	3	1.5	1	0	3	1.5	1	0	3	1.5	1	4	7	3.48
3	A	101	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	1	2	2.0
	B	100	1	#	#	#	1	#	#	#	1	#	#	#	1	#	#	#	1	#	#	#	1	#	#	#	1	#	#	#
	COMBINED	201	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	1	2	2.0
4	A	98	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00
	B	98	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.02
	COMBINED	196	1	0	0	0.0	1	0	0	0.0	1	1	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.51
5	A	98	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00
	B	94	1	0	0	0.0	1	0	0	0.0	1	1	1	1.1	1	0	1	1.1	1	0	1	1.1	1	0	1	1.1	1	0	1	1.06
	COMBINED	192	1	0	0	0.0	1	0	0	0.0	1	1	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.52
CONTROL	A	101	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.00
	B	101	1	0	0	0.0	1	0	0	0.0	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	1	2	1.98
	COMBINED	202	1	0	0	0.0	1	0	0	0.0	1	1	1	0.5	1	0	1	0.5	1	0	1	0.5	1	0	1	0.5	1	1	2	0.99

Table 7.3-14A

TREATMENT		LARKAL		DATE 23		DATE 24		DATE 25		DATE 26		DATE 27		DATE 28		DATE 29		DATE 30		DATE 31		DATE 32			
LEVEL	REPLICATE	TANK																							
1	A	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	REPLICATE	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1	B	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	REPLICATE	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
TREATMENT 1 CONTINUED		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	A	1	20	1	1	1	25.0	1	3	10	25.1	1	2	12	42.9	1	0	12	42.9	1	0	12	42.9	1	0
		2	3	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	REPLICATE	20	1	1	1	1	25.0	1	3	10	25.1	1	2	12	42.9	1	0	12	42.9	1	0	12	42.9	1	0
2	B	1	22	1	1	1	4.5	1	1	2	9.1	1	4	6	27.3	1	3	9	40.9	1	0	9	40.9	1	0
		2	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	REPLICATE	22	1	1	1	1	4.5	1	1	2	9.1	1	4	6	27.3	1	3	9	40.9	1	0	9	40.9	1	0
TREATMENT 2 CONTINUED		20	1	0	0	0	15.0	1	4	12	24.0	1	2	14	28.0	1	4	10	20.0	1	3	21	42.0	1	1
3	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	48	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
3	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	26	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	51	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
TREATMENT 3 CONTINUED		59	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
4	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	49	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
4	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
TREATMENT 4 CONTINUED		59	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
5	A	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
TREATMENT 5 CONTINUED		59	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
LUNING	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	46	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
LUNING	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0
	REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	
LUNING CONTINUED		54	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	

Table 7.3-14A (continued)

XGSI KIVEN GROUP 11			DATE 32			DATE 34			DATE 35			DATE 36			DATE 37			DATE 38			DATE 39			DATE 40			DATE 41			DATE 42														
TREATMENT	LARVAL		JUNE 28			JUNE 29			JUNE 30			JULY 1			JULY 2			JULY 3			JULY 4			JULY 5			JULY 6			JULY 7														
LEVEL	REPLICATE	NAME	31 D.P.N			32 D.P.N			33 D.P.N			34 D.P.N			35 D.P.N			36 D.P.N			37 D.P.N			38 D.P.N			39 D.P.N			40 D.P.N														
			N	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN														
1	A	1	0	1																																								
		2	0	1																																								
		RELICATE	0	1																																								
1	B	1	0	1																																								
		2	0	1																																								
		RELICATE	0	1																																								
TREATMENT 1 COMBINED			0	1																																								
2	A	1	28	1	0	17	50.7	1	0	17	50.7	1	2	19	67.9	1	0	19	67.9	1	0	19	67.9	1	2	21	73.0	1	3	24	93.7	1	1	23	89.3	1	2	27	96.0	1	0	27	96.0	
		2	0	1																																								
		RELICATE	28	1	0	17	50.7	1	0	17	50.7	1	2	19	67.9	1	0	19	67.9	1	0	19	67.9	1	2	21	73.0	1	3	24	93.7	1	1	23	89.3	1	2	27	96.0	1	0	27	96.0	
2	B	1	22	1	1	12	54.3	1	1	13	59.1	1	0	13	59.1	1	1	14	62.6	1	2	16	72.7	1	0	16	72.7	1	2	18	81.0	1	1	19	86.4	1	3	22	93.0	1	0	22	93.0	
		2	0	1																																								
		RELICATE	22	1	1	12	54.3	1	1	13	59.1	1	0	13	59.1	1	1	14	62.6	1	2	16	72.7	1	0	16	72.7	1	2	18	81.0	1	1	19	86.4	1	3	22	93.0	1	0	22	93.0	
TREATMENT 2 COMBINED			50	1	1	29	58.0	1	1	30	60.0	1	2	32	64.0	1	1	33	66.0	1	2	35	70.0	1	2	37	74.0	1	3	42	94.0	1	2	44	98.0	1	3	49	98.0	1	0	49	98.0	
3	A	1	24	1	0	0	0.0	1	1	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	
		2	24	1	0	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	1	2	8.3	1	0	2	8.3	1	0	2	8.3
		RELICATE	48	1	0	1	2.1	1	1	2	4.2	1	0	2	4.2	1	0	2	4.2	1	0	2	4.2	1	0	2	4.2	1	1	3	6.3	1	0	3	6.3	1	0	3	6.3	1	0	3	6.3	
3	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	1	2	8.0	1	0	2	8.0	1	0	2	8.0	
		2	25	1	0	0	1	3.8	1	0	1	3.8	1	0	1	3.8	1	0	1	3.8	1	0	1	3.8	1	0	1	3.8	1	1	2	7.7	1	3	11.5	1	0	3	11.5	1	0	3	11.5	
		RELICATE	51	1	0	1	2.0	1	0	1	2.0	1	0	1	2.0	1	0	1	2.0	1	1	2	3.9	1	0	2	3.9	1	1	3	5.9	1	2	5	9.8	1	0	5	9.8	1	0	5	9.8	
TREATMENT 3 COMBINED			99	1	0	2	2.0	1	1	3	3.0	1	0	3	3.0	1	0	3	3.0	1	0	3	3.0	1	1	4	4.0	1	0	4	4.0	1	2	6	6.1	1	2	8	8.1	1	0	8	8.1	
3	A	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		RELICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
3	B	1	26	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		RELICATE	49	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
TREATMENT 3 COMBINED			99	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
CONTROL	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		2	24	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	1	1	4.2	1	0	1	4.2	1	0	1	4.2	
		RELICATE	48	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	1	1	2.1	1	0	1	2.1	1	0	1	2.1	
CONTROL	B	1	23	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		2	23	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
		RELICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
CONTROL COMBINED			98	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	

MORTALITY DATA
CONTINUOUS EXPOSURE
LARVAL GROWTH TANKS
KOOTENAI BASIN 11

Table 7.3-14A (continued)

LARVAL GROWTH TANKS		DATE: 33		DATE: 34		DATE: 35		DATE: 36		DATE: 37		DATE: 38		DATE: 39		DATE: 40		DATE: 41		DATE: 42		DATE: 43	
MUST RIVER GROUP 11		JULY 18		JULY 19		JULY 20		JULY 21		JULY 22		JULY 23		JULY 24		JULY 25		JULY 26		JULY 27		JULY 28	
		01 P.M.		02 P.M.		03 P.M.		04 P.M.		05 P.M.		06 P.M.		07 P.M.		08 P.M.		09 P.M.		10 P.M.		11 P.M.	
TREATMENT	LARVAL	REPLICATE		TANK																			
LEVEL		N	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	
1	A	1	0	1																			
		2	0	1																			
	RELICATE	0	1																				
1	B	1	0	1																			
		2	0	1																			
	RELICATE	0	1																				
TREATMENT 1 COMBINED		0	1																				
2	A	1	28	1																			
		2	0	1																			
	RELICATE	28	1																				
2	B	1	22	1																			
		2	0	1																			
	RELICATE	22	1																				
TREATMENT 2 COMBINED		50	1																				
3	A	1	24	1	1	4	16.7	1	0	4	16.7	1	0	4	16.7	1	0	4	16.7	1	0	4	16.7
		2	24	1	1	4	16.7	1	0	4	16.7	1	0	4	16.7	1	0	4	16.7	1	0	4	16.7
	RELICATE	48	1	2	8	16.7	1	0	8	16.7	1	0	8	16.7	1	0	8	16.7	1	0	8	16.7	
3	B	1	25	1	0	3	12.0	1	0	3	12.0	1	0	3	12.0	1	0	3	12.0	1	0	3	12.0
		2	26	1	0	7	26.9	1	0	7	26.9	1	0	7	26.9	1	0	7	26.9	1	0	7	26.9
	RELICATE	51	1	0	10	19.6	1	0	10	19.6	1	0	10	19.6	1	0	10	19.6	1	0	10	19.6	
TREATMENT 3 COMBINED		99	1	2	18	14.2	1	0	18	14.2	1	0	18	14.2	1	0	18	14.2	1	0	18	14.2	
4	A	1	24	1	1	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
	RELICATE	49	1	1	1	2.0	1	0	1	2.0	1	0	1	2.0	1	0	1	2.0	1	0	1	2.0	
4	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
		2	26	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
	RELICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
TREATMENT 4 COMBINED		99	1	1	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	
5	A	1	23	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0
		2	23	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0	1	0	1	4.0
	RELICATE	50	1	0	2	4.0	1	0	2	4.0	1	0	2	4.0	1	0	2	4.0	1	0	2	4.0	
5	B	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
	RELICATE	49	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
TREATMENT 5 COMBINED		99	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	1	0	2	2.0	
CONTINUAL	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
		2	24	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2
	RELICATE	48	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	
CONTINUAL	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0
	RELICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	
CONTINUAL COMBINED		98	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	

MORTALITY DATA
CONTINUOUS EXPOSURE
LARVAL MORTALITY RANKS
MUDT RIVER DRUM 11

Table 7.3-14A (continued)

TREATMENT LEVEL		LARVAL REPLICATE	TANK	DATE 43		DATE 44		DATE 45		DATE 46		DATE 47		DATE 48		DATE 49		DATE 50		DATE 51		DATE 52							
				JULY 8		JULY 9		JULY 10		JULY 11		JULY 12		JULY 13		JULY 14		JULY 15		JULY 16		JULY 17							
				41 D.P.M		42 D.P.M		43 D.P.M		44 D.P.M		45 D.P.M		46 D.P.M		47 D.P.M		48 D.P.M		49 D.P.M		50 D.P.M							
				LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN							
				LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN							
1	A	1	0																										
		2	0																										
		REPLICATE	0																										
1	B	1	0																										
		2	0																										
		REPLICATE	0																										
TREATMENT 1 CUMULATED				0																									
2	A	1	26	1	26 0000																								
		2	0																										
		REPLICATE	26	1	26 0000																								
2	B	1	22	1	22 0000																								
		2	0																										
		REPLICATE	22	1	22 0000																								
TREATMENT 2 CUMULATED				50	1	50 0000																							
3	A	1	24	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	2	0.3	1	1	3 12.5	1						
		2	24	1	0	2	0.3	1	0	2	0.3	1	0	2	0.3	1	0	2	0.3	1	1	3 12.5	1						
		REPLICATE	48	1	0	2	0.3	1	0	2	0.3	1	0	2	0.3	1	1	5 10.9	1	1	6 12.5	1							
3	B	1	25	1	0	2	0.0	1	0	2	0.0	1	0	2	0.0	1	0	2	0.0	1	1	3 12.0	1						
		2	26	1	0	3	11.5	1	0	3	11.5	1	2	5 19.2	1	0	5 19.2	1	1	6 23.1	1	1	7 26.9	1					
		REPLICATE	51	1	0	5	9.0	1	0	5	9.0	1	2	7 13.7	1	0	7 13.7	1	0	7 13.7	1	2	9 17.6	1	1	10 19.6	1		
TREATMENT 3 CUMULATED				79	1	0	8	0.1	1	0	8	0.1	1	2	10 10.1	1	1	11 11.1	1	0	11 11.1	1	3	15 15.2	1	1	16 16.2	1	
4	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	
		REPLICATE	49	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
4	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	
		REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
TREATMENT 4 CUMULATED				79	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1
5	A	1	25	1	0	0	0.0	1	0	0	0.0	1	1	1 4.0	1	0	1 4.0	1	0	1 4.0	1	0	1 4.0	1					
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	1	1 4.0	1	0	1 4.0	1	1	1 4.0	1
		REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	1	1 2.0	1	0	1 2.0	1	1	2 4.0	1	0	2 4.0	1					
5	B	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	
		REPLICATE	49	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
TREATMENT 5 CUMULATED				79	1	0	0	0.0	1	0	0	0.0	1	1	1 1.0	1	0	1 1.0	1	1	2 2.0	1	0	2 2.0	1	0	2 2.0	1	
CONTROL	A	1	24	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
		2	24	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	0	1	4.2	1	
		REPLICATE	48	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1	0	1	2.1	1					
CONTROL	B	1	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
		2	25	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	
		REPLICATE	50	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1	0	0	0.0	1					
CONTROL CUMULATED				78	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1	0	1	1.0	1

MORTALITY DATA
INTERMITTENT EXPOSURE
LARVAL GROWTH TANKS
RUGBY RIVER GROUP 1

Table 7.3-14B

		DATE: 26		DATE: 27		DATE: 28		DATE: 29		DATE: 30		DATE: 31		DATE: 32		DATE: 33		DATE: 34		DATE: 35		
		JUNE 26		JUNE 27		JUNE 28		JUNE 29		JUNE 30		JUNE 31		JUNE 32		JUNE 33		JUNE 34		JUNE 35		
		22 D.P.M		23 D.P.M		24 D.P.M		25 D.P.M		26 D.P.M		27 D.P.M		28 D.P.M		29 D.P.M		30 D.P.M		31 D.P.M		
TREATMENT	LARVAL																					
LEVEL	REPLICATE	TANK																				
			N	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN		
1	A	1	25	1	2	2	0.0	1	1	3 12.0	1	0	3 12.0	1	1	4 16.0	1	1	5 20.0	1	1	6 24.0
		2	25	1	2	2	0.0	1	2	4 16.0	1	2	6 24.0	1	0	6 24.0	1	3	9 36.0	1	0	9 36.0
	RELICATE	50	1	4	4	0.0	1	3	7 14.0	1	2	9 18.0	1	1	10 20.0	1	4	14 28.0	1	1	15 30.0	
1	B	1	25	1	1	1	4.0	1	0	1 4.0	1	1	2 8.0	1	3	5 20.0	1	1	6 24.0	1	0	6 24.0
		2	24	1	0	0	0.0	1	0	0 0.0	1	2	2 8.3	1	0	2 8.3	1	5	11 45.0	1	1	12 56.0
	RELICATE	49	1	1	1	2.0	1	0	1 2.0	1	3	4 8.2	1	0	4 8.2	1	7	11 22.4	1	6	17 34.7	
TREATMENT 1 COMBINED		99	1	5	5	5.1	1	3	8 8.1	1	5	13 13.1	1	1	14 14.1	1	11	25 25.3	1	7	32 32.3	
2	A	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	2	2 8.0	1	0	2 8.0	1	1	3 12.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 4.0	1	1	2 8.0	1	2	4 16.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 2.0	1	2	3 6.0	1	1	4 8.0	
2	B	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 4.0	1	0	1 4.0	1	4	5 20.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	3	3 12.0	1	1	4 16.0	1	0	5 20.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	3	3 6.0	1	2	5 10.0	1	1	6 12.0	
TREATMENT 2 COMBINED		100	1	0	0	0.0	1	0	0 0.0	1	1	1 1.0	1	5	6 6.0	1	5	13 13.0	1	5	18 18.0	
3	A	1	24	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 4.2
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 4.0	1	1	2 8.0	1	0	2 8.0
	RELICATE	49	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 2.0	1	2	4 1.0	1	0	3 6.1	
3	B	1	24	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	49	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
TREATMENT 3 COMBINED		98	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 1.0	1	1	2 2.0	1	0	3 3.1	
4	A	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
4	B	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 4.0	1	0	1 4.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 2.0	1	0	1 2.0	
TREATMENT 4 COMBINED		100	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	1	1 1.0	1	0	1 1.0	
5	A	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
5	B	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	50	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
TREATMENT 5 COMBINED		100	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
LUNIKUL	A	1	24	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	49	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
LUNIKUL	B	1	25	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
		2	24	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0
	RELICATE	49	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	
LUNIKUL COMBINED		98	1	0	0	0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	1	0	0 0.0	

Table 7.3-14B (continued)

ANIMALITY DATA
INHERITANCE RESPONSE
LAKYAL BROWN TALKS
KODI RIVER GROUP 1

		DATE 26 1			DATE 27 1			DATE 28 1			DATE 29 1			DATE 30 1			DATE 31 1			DATE 02 1			DATE 03 1			DATE 04 1			DATE 05 1		
		JUNE 26 1			JULY 1 1			JULY 2 1			JULY 3 1			JULY 4 1			JULY 5 1			JULY 6 1			JULY 7 1			JULY 8 1			JULY 9 1		
		26 P.M.			27 P.M.			28 P.M.			29 P.M.			30 P.M.			31 P.M.			02 P.M.			03 P.M.			04 P.M.			05 P.M.		
TREATMENT	LEVEL	REPLICATE	TIME	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN	LN		
1	A	1	25	1	11 44.9	1	0 11 44.0	1	0 11 44.0	1	2 13 26.0	1	0 13 26.0	1	4 17 58.0	1	0 17 58.0	1	2 19 76.0	1	1 24 00.0	1	1 21 54.0								
		2	28	1	1 16 58.0	1	1 17 58.0	1	1 18 72.0	1	3 21 58.0	1	0 21 58.0	1	0 21 58.0	1	0 21 58.0	1	1 22 58.0	1	1 23 76.0	1	1 23 76.0	1	1 23 76.0	1	1 23 76.0	1	1 23 76.0		
		30	1	2 17 24.0	1	1 28 28.0	1	1 29 28.0	1	3 28 88.0	1	0 28 88.0	1	0 28 76.0	1	0 28 76.0	1	1 41 52.0	1	2 43 80.0	1	1 44 08.0									
1	B	1	25	1	9 26.0	1	1 10 49.0	1	0 10 49.0	1	4 16 25.0	1	1 15 87.0	1	2 17 58.0	1	2 19 76.0	1	0 19 76.0	1	0 19 76.0	1	0 19 76.0								
		2	28	1	1 16 28.1	1	1 15 82.1	1	0 15 82.1	1	2 17 79.0	1	0 17 79.0	1	1 18 73.0	1	0 18 73.0	1	0 18 73.0	1	1 19 77.1	1	0 19 75.2	1	0 19 75.2	1	0 19 75.2	1	0 19 75.2		
		49	1	2 23 46.1	1	2 25 51.0	1	0 25 51.0	1	6 21 83.1	1	1 22 85.1	1	2 25 71.4	1	2 27 73.3	1	0 27 73.3	1	0 27 73.3	1	0 27 73.3	1	0 27 73.3	1	0 27 73.3	1	0 27 73.3	1	0 27 73.3	
TREATMENT 1 COMBINED		99	1	0 30 20.3	1	3 52 32.3	1	1 34 30.3	1	11 63 85.7	1	1 56 86.7	1	7 73 73.7	1	2 75 73.0	1	3 78 75.0	1	3 81 71.0	1	1 82 72.0	1	1 82 72.0	1	1 82 72.0	1	1 82 72.0	1	1 82 72.0	
2	A	1	25	0	6 24.0	1	0 6 24.0	1	0 6 24.0	1	1 7 28.0	1	0 7 28.0	1	1 8 32.0	1	0 8 32.0	1	0 8 32.0	1	1 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0		
		2	28	0	6 24.0	1	0 6 24.0	1	0 6 24.0	1	0 6 24.0	1	0 6 24.0	1	1 7 28.0	1	0 7 28.0	1	2 7 28.0	1	1 19 49.0	1	0 19 49.0	1	0 19 49.0	1	0 19 49.0	1	0 19 49.0		
		30	1	0 12 24.0	1	0 12 24.0	1	0 12 24.0	1	1 13 26.0	1	0 13 26.0	1	2 13 30.0	1	0 13 30.0	1	0 13 30.0	1	2 17 34.0	1	2 19 28.0	1	0 19 28.0	1	0 19 28.0	1	0 19 28.0	1	0 19 28.0	
2	B	1	25	0	0 32.0	1	0 0 32.0	1	0 0 32.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0	1	0 9 36.0		
		2	28	1	0 32.0	1	0 9 36.0	1	0 9 36.0	1	1 19 40.0	1	0 19 40.0	1	1 11 44.0	1	0 11 44.0	1	1 12 48.0	1	0 12 48.0	1	0 12 48.0	1	0 12 48.0	1	0 12 48.0	1	0 12 48.0		
		30	1	1 16 32.0	1	1 17 34.0	1	0 17 34.0	1	2 19 28.0	1	0 19 28.0	1	1 20 40.0	1	0 20 40.0	1	1 21 42.0	1	0 21 42.0	1	0 21 42.0	1	0 21 42.0	1	0 21 42.0	1	0 21 42.0	1	0 21 42.0	
TREATMENT 2 COMBINED		105	1	0 28 29.0	1	1 29 29.0	1	0 29 29.0	1	3 32 32.0	1	0 32 32.0	1	3 35 33.0	1	0 35 35.0	1	3 38 38.0	1	2 40 40.0	1	0 40 40.0	1	0 40 40.0	1	0 40 40.0	1	0 40 40.0	1	0 40 40.0	
3	A	1	24	1	1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2	1	0 1 4.2		
		2	25	0	2 8.0	1	0 2 8.0	1	2 4 16.0	1	0 4 16.0	1	0 4 16.0	1	0 4 16.0	1	0 4 16.0	1	3 4 16.0	1	0 4 16.0	1	0 4 16.0	1	0 4 16.0	1	0 4 16.0	1	0 4 16.0		
		49	1	0 3 6.1	1	0 3 6.1	1	2 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	1	0 3 19.2	
3	B	1	24	1	0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	2 2 4.3	1	0 2 4.3	1	0 2 4.3	1	1 2 4.3	1	0 1 2.3	1	0 1 2.3	1	0 1 2.3	1	0 1 2.3		
		2	25	0	0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0	1	0 0 4.0		
		49	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	2 2 4.1	1	0 2 4.1	1	0 2 4.1	1	1 2 4.1	1	0 2 4.1	1	0 2 4.1	1	0 2 4.1	1	0 2 4.1	1	0 2 4.1	
TREATMENT 3 COMBINED		98	1	0 3 2.1	1	0 3 2.1	1	2 3 3.1	1	0 3 3.1	1	0 3 3.1	1	2 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	1	0 3 3.1	
4	A	1	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	1 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0		
		2	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		30	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	1 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	
4	B	1	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		2	25	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0		
		30	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	
TREATMENT 4 COMBINED		105	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	1	2 2.0	1	0 2 2.0	1	0 2 2.0	1	0 2 2.0	1	0 2 2.0	1	0 2 2.0	1	0 2 2.0	1	0 2 2.0	
5	A	1	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0	1	0 1 4.0		
		2	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		50	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	1	0 1 2.0	
5	B	1	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		2	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		50	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	
TREATMENT 5 COMBINED		100	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	1 1.0	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	1	0 1 1.0	
CONTROL	A	1	24	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		2	24	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		49	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	
CONTROL	B	1	25	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		2	24	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0		
		49	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	
CONTROL COMBINED		98	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	1	0 0 0.0	

INITIALITY DATA
DIFFERENTIAL EXPOSURE
ANAL. GEMININ LINES
MIL. KIVLE GROUP 1

[illegible]

Table 7.3-14B (continued)

MORTALITY DATA
INTERMITTENT EXPOSURE
LARVAL GROWTH TANKS
MUSKIE RIVER GROUP 1

[illegible]

Table 7.3-15

Using only the first 4 concentrations (not 119)

Probit Analysis

Rainbow Trout ELS Test

Intermittent Exposure - 60 dph

10 ^x	(x)		Y
TRC	log TRC	% Mort	Probit
718	2.8561	99	7.3263
563	2.7505	81	5.8779
418	2.6212	26	4.3567
263	2.4200	5	3.3551
119	2.0755	2	2.9463
0		0	

Regression Output:

Constant	-18.7742
Std Err of Y Est	0.495999
R Squared	0.945883
No. of Observations	4
Degrees of Freedom	2

X Coefficient(s) 9.017182

Std Err of Coef. 1.525106

y=9.02x-18.77

Expected

10 ^x	(x)		Y	g
TRC	log TRC	% Mort	Probit	
718	2.8561	98	6.9800	0.0051
563	2.7505	85	6.0276	0.0125
418	2.6212	45	4.8614	0.1459
263	2.4200	2	3.0470	0.0459
119	2.0755		-0.0586	
				0.2094

Chi-Square= 20.79

Students t, 2 d.f.= 2.920(90%), 4.303(95%), 9.925(99%)

Expected x=(y+18.77)/9.02

10 ^x	(x)		Y	
TRC (ED)	log TRC	% Mort	Probit	
558	2.7468	84	5.9945	S= 1.29
433	2.6365	50	5.0000	fED50= 1.26
336	2.5263	16	4.0055	upper= 546
239	2.3786	1	2.6737	lower= 343

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* * * * *
*      LC50=      433      *
*      LC1=       239      *
*      LC50 confidence limits *
*      upper=     546      *
*      lower=     343      *
*      slope=     9.02     *
* * * * *

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WETDRY THROT - EARLY LIFE STAGE
 LENGTH AND WEIGHT DATA
 GROUPS PILOT RIVER WATER 11 AT WASH-UP - CONTINUOUS EXPOSURE
 DATE: JUNE 17, 1980

Table 7.3-16A

TREATMENT LEVEL		CONTROL		3		4		1		2		1	
DUPLICATE		A		A		A		A		A		A	
FISH NO.		T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L.
1		29 0.14	29 0.16	29 0.14	27 0.12	29 0.12	27 0.16	26 0.11	26 0.12				
2		29 0.14	29 0.14	29 0.14	27 0.12	29 0.14	26 0.12	26 0.12	25 0.11				
3		29 0.13	27 0.10	29 0.12	29 0.13	29 0.13	26 0.12	25 0.12	27 0.12				
4		27 0.12	29 0.14	29 0.12	29 0.13	27 0.12	27 0.12	25 0.11	26 0.12				
5		29 0.16	29 0.13	29 0.13	29 0.13	29 0.14	27 0.12	24 0.11	29 0.14				
6		27 0.17	29 0.16	29 0.22	29 0.16	29 0.14	27 0.12	24 0.11	26 0.12				
7		27 0.15	29 0.12	29 0.14	26 0.11	29 0.14	27 0.12	25 0.10	29 0.10				
8		29 0.19	27 0.14	27 0.12	26 0.11	27 0.12	26 0.12	25 0.10	29 0.10				
9		29 0.15	29 0.16	29 0.13	29 0.13	29 0.14	29 0.13	25 0.10	29 0.12				
10		29 0.19	27 0.14	29 0.14	26 0.12	29 0.19	27 0.12	27 0.12	29 0.10				
11		29 0.15	29 0.16	27 0.12	27 0.13	29 0.14	27 0.12	26 0.11	29 0.11				
12		29 0.15	29 0.16	26 0.14	29 0.16	29 0.12	27 0.15	27 0.11	27 0.14				
13		27 0.12	29 0.12	29 0.14	27 0.14	29 0.13	27 0.12	25 0.09	26 0.10				
14		29 0.16	27 0.17	27 0.16	29 0.14	29 0.15	26 0.12	26 0.12	26 0.14				
15		29 0.16	29 0.13	29 0.13	29 0.13	29 0.15	29 0.13	25 0.12	27 0.12				
16		29 0.12	29 0.15	29 0.13	27 0.15	29 0.16	29 0.15	27 0.14	27 0.13				
17		29 0.12	29 0.14	29 0.14	27 0.12	29 0.13	26 0.12	24 0.10	27 0.13				
18		29 0.13	29 0.16	29 0.14	29 0.14	29 0.16	27 0.12	25 0.11	25 0.09				
19		29 0.16	29 0.16	29 0.14	29 0.13	26 0.11	26 0.12	27 0.16	26 0.13				
20		27 0.12	29 0.14	29 0.13	26 0.11	29 0.14	27 0.12	26 0.13	27 0.13				
21		30 0.15	29 0.12	29 0.11	29 0.14	29 0.13	29 0.14	26 0.11	25 0.11				
22		33 0.19	29 0.15	27 0.15	26 0.12	29 0.14	29 0.14	26 0.12	25 0.12				
23		29 0.16	29 0.15	27 0.12	27 0.13	29 0.14	29 0.13	29 0.14	25 0.13				
24		29 0.14	29 0.13	29 0.12	29 0.13	29 0.13	27 0.12	26 0.11	27 0.13				
25		29 0.14	29 0.14	29 0.12	29 0.12	29 0.13	26 0.12	25 0.09	27 0.10				
26		29 0.12	29 0.15	27 0.13	27 0.13	29 0.14	29 0.14	25 0.12	27 0.13				
27		27 0.12	27 0.11	25 0.11	25 0.11	26 0.12	24 0.13	24 0.11	27 0.12				
28		27 0.12	29 0.16	27 0.12	27 0.12	29 0.12	26 0.11	27 0.12	26 0.11				
29		29 0.12	29 0.15	26 0.12	26 0.12	29 0.13	26 0.11	26 0.10	27 0.13				
30		27 0.13	29 0.15	29 0.15	29 0.15	29 0.17	29 0.14	25 0.10	26 0.10				
31		29 0.12	29 0.16	25 0.11	25 0.11	29 0.16	29 0.15	27 0.17	24 0.10				
32		27 0.11	29 0.15	25 0.12	25 0.12	27 0.13	26 0.12	24 0.11	26 0.12				
33		29 0.12	29 0.17	26 0.11	26 0.11	29 0.14	29 0.13	25 0.10	25 0.11				
34		29 0.12	27 0.11	26 0.12	26 0.12	29 0.14	27 0.14	25 0.12	25 0.12				
35		29 0.12	29 0.16	26 0.15	26 0.15	27 0.10	29 0.14	26 0.12	26 0.14				
36		29 0.14	29 0.13	29 0.14	29 0.14	29 0.13	26 0.12	27 0.15	29 0.16				
37		29 0.17	29 0.16	26 0.14	26 0.14	29 0.15	26 0.11	29 0.09	26 0.11				
38		29 0.15	29 0.13	26 0.12	26 0.12	29 0.14	27 0.14	25 0.10	27 0.10				
39		27 0.12	29 0.12	26 0.16	26 0.16	27 0.13	27 0.13	25 0.12	26 0.11				
40		29 0.12	29 0.16	25 0.12	25 0.12	26 0.13	26 0.13	26 0.13	25 0.10				
41		27 0.12	29 0.12	29 0.16	29 0.16	27 0.12	27 0.12	27 0.12	26 0.12				
42		27 0.12	29 0.14	29 0.15	29 0.15	26 0.11	25 0.10	25 0.09	25 0.09				
43		29 0.16	29 0.16	29 0.14	29 0.14	29 0.15	26 0.11	24 0.11	27 0.13				
44		29 0.12	27 0.15	27 0.12	27 0.12	29 0.13	26 0.13	26 0.14	25 0.10				
45		29 0.17	29 0.13	27 0.13	27 0.13	29 0.15	25 0.11	25 0.10	25 0.10				
46		27 0.11	29 0.16	26 0.14	26 0.14	25 0.12	25 0.12	25 0.11	27 0.12				
47			29 0.13	26 0.12	26 0.12	27 0.14	24 0.10	24 0.10	26 0.11				
48			29 0.13	27 0.13	27 0.13	26 0.12	25 0.12	25 0.12	26 0.13				
49			29 0.14	27 0.12	27 0.12		25 0.12	26 0.12					
50				27 0.14	27 0.14		25 0.11	25 0.11					
51							26 0.14	26 0.14					
TREATMENT LEVEL		CONTROL		3		4		1		2		1	
DUPLICATE		A		A		A		A		A		A	
FISH NO.		T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L. W.G.	T.L.
MEAN		29 0.14	29 0.15	29 0.14	27 0.14	29 0.12	27 0.17	25 0.12	26 0.12				
ST. DEV.		2 0.02	1 0.02	2 0.02	1 0.02	1 0.01	1 0.02	1 0.02	1 0.02				
RAT		29 0.19	29 0.10	25 0.22	29 0.19	29 0.16	27 0.19	29 0.16	29 0.15				
RIN		25 0.11	27 0.11	26 0.11	25 0.11	24 0.10	24 0.11	24 0.09	24 0.09				
S		46 46	49 49	25 25	50 50	30 30	48 48	31 31	49 49	0 0	0 0	0 0	0

WISCONSIN TOBACCO - EARLY LIFE STAGE
LENGTH AND WEIGHT DATA
BROWN'S POINT RIVER GROUP 1 AT SWIR-UP - INTERMITTENT EXPOSURE
DATE: JUNE 17, 1990

Table 7.3-16B

TREATMENT LEVEL		CONTROL		3		4		3		2		1	
DUPLICATE		A	B	A	B	A	B	A	B	A	B	A	B
FISH NO.		T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.
1		29 0.13	29 0.17	29 0.13	18 0.11	27 0.10	27 0.11	27 0.12	24 0.11	27 0.10	26 0.12	26 0.10	25 0.11
2		29 0.13	29 0.12	29 0.13	22 0.16	29 0.13	26 0.12	26 0.12	26 0.12	26 0.12	26 0.12	24 0.11	24 0.10
3		27 0.12	29 0.15	29 0.16	29 0.12	27 0.10	25 0.12	25 0.11	26 0.11	25 0.12	25 0.13	27 0.12	29 0.11
4		27 0.12	29 0.16	29 0.16	26 0.11	29 0.17	26 0.12	24 0.11	26 0.10	24 0.11	24 0.09	23 0.10	24 0.10
5		29 0.13	29 0.14	29 0.15	25 0.12	29 0.17	27 0.13	23 0.10	22 0.10	25 0.12	25 0.09	27 0.10	29 0.10
6		27 0.13	29 0.15	26 0.13	27 0.16	26 0.12	26 0.12	23 0.10	27 0.12	25 0.11	24 0.12	25 0.11	24 0.12
7		29 0.16	26 0.11	29 0.16	27 0.14	27 0.16	29 0.14	26 0.12	26 0.11	22 0.09	23 0.10	24 0.10	25 0.12
8		29 0.13	29 0.15	29 0.15	24 0.11	29 0.15	27 0.15	25 0.11	27 0.11	24 0.11	23 0.10	27 0.11	27 0.10
9		29 0.16	29 0.15	29 0.16	25 0.13	27 0.12	29 0.15	26 0.12	26 0.12	26 0.11	25 0.12	24 0.10	26 0.12
10		29 0.14	27 0.12	27 0.13	29 0.14	26 0.12	26 0.13	27 0.13	24 0.10	27 0.10	21 0.08	24 0.10	26 0.12
11		29 0.13	29 0.16	26 0.12	26 0.15	29 0.16	27 0.16	29 0.15	27 0.15	25 0.10	21 0.07	27 0.09	27 0.10
12		27 0.12	26 0.13	29 0.15	27 0.16	29 0.15	27 0.15	29 0.15	27 0.13	27 0.10	21 0.09	25 0.12	24 0.12
13		29 0.16	29 0.15	29 0.16	25 0.15	26 0.11	27 0.13	29 0.11	25 0.10	27 0.12	27 0.10	27 0.11	24 0.10
14		29 0.17	29 0.16	29 0.16	29 0.16	29 0.15	27 0.13	29 0.15	27 0.13	27 0.10	21 0.09	25 0.12	24 0.12
15		29 0.17	29 0.16	27 0.13	27 0.14	29 0.16	25 0.12	27 0.13	24 0.11	24 0.12	21 0.10	24 0.12	27 0.10
16		27 0.12	27 0.15	29 0.16	27 0.13	29 0.16	24 0.10	24 0.11	27 0.13	25 0.13	25 0.12	27 0.11	24 0.09
17		29 0.15	26 0.12	29 0.16	29 0.15	27 0.12	27 0.15	25 0.12	24 0.10	24 0.10	26 0.12	27 0.11	25 0.12
18		29 0.17	25 0.11	26 0.13	27 0.14	29 0.16	29 0.15	25 0.11	24 0.10	27 0.12	26 0.12	24 0.10	27 0.10
19		29 0.15	27 0.13	29 0.17	29 0.15	27 0.13	29 0.14	24 0.11	26 0.10	24 0.10	27 0.09	25 0.12	27 0.10
20		29 0.16	27 0.11	27 0.12	29 0.12	27 0.11	29 0.10	27 0.12	25 0.11	24 0.10	24 0.10	27 0.10	27 0.11
21		27 0.12	29 0.15	29 0.14	27 0.13	25 0.11	29 0.10	27 0.13	25 0.12	24 0.11	24 0.11	24 0.12	24 0.11
22		29 0.15	29 0.15	29 0.15	27 0.12	29 0.13	27 0.15	25 0.11	27 0.13	25 0.14	26 0.12	27 0.09	25 0.09
23		29 0.15	27 0.14	29 0.15	26 0.11	29 0.15	29 0.10	27 0.12	25 0.10	26 0.12	26 0.12	24 0.11	25 0.10
24		29 0.13	29 0.16	29 0.12	29 0.15	27 0.13	29 0.10	25 0.10	24 0.11	24 0.11	24 0.11	24 0.11	25 0.10
25		26 0.12	27 0.13	29 0.13	27 0.14	26 0.12	27 0.10	27 0.13	25 0.10	27 0.10	25 0.10	24 0.10	25 0.10
26		29 0.15	29 0.12	29 0.15	29 0.14	29 0.13	27 0.10	26 0.10	27 0.10	26 0.12	23 0.10	24 0.13	27 0.10
27		29 0.15	29 0.14	29 0.14	29 0.16	26 0.12	27 0.10	25 0.12	27 0.10	25 0.11	23 0.10	24 0.13	27 0.10
28		29 0.17	29 0.15	29 0.16	29 0.15	26 0.12	29 0.10	27 0.13	25 0.11	25 0.11	23 0.10	25 0.11	27 0.10
29		27 0.12	29 0.14	29 0.16	27 0.15	29 0.13	29 0.10	26 0.12	26 0.10	26 0.12	23 0.10	24 0.13	24 0.11
30		29 0.15	29 0.15	29 0.16	27 0.12	29 0.13	29 0.10	26 0.12	26 0.10	25 0.12	23 0.10	24 0.13	24 0.11
31		26 0.14	29 0.12	29 0.14	27 0.12	29 0.15	26 0.12	26 0.12	26 0.12	24 0.11	25 0.12	24 0.12	25 0.12
32		27 0.14	29 0.15	29 0.15	26 0.11	29 0.12	26 0.12	27 0.12	25 0.11	24 0.12	25 0.12	24 0.12	25 0.12
33		27 0.13	29 0.15	29 0.15	29 0.16	27 0.12	26 0.12	27 0.12	24 0.11	24 0.12	25 0.12	24 0.12	25 0.12
34		27 0.13	29 0.16	27 0.15	29 0.15	26 0.11	29 0.15	24 0.10	24 0.10	24 0.12	25 0.12	24 0.12	25 0.12
35		26 0.14	29 0.17	29 0.14	26 0.12	29 0.10	26 0.12	27 0.10	24 0.10	24 0.12	24 0.12	24 0.12	25 0.10
36		29 0.15	27 0.16	26 0.10	29 0.12	29 0.10	25 0.12	24 0.11	24 0.10	24 0.12	24 0.12	24 0.12	25 0.10
37		29 0.16	26 0.12	29 0.15	29 0.15	26 0.11	26 0.12	27 0.12	25 0.11	25 0.11	27 0.11	27 0.10	25 0.12
38		29 0.17	26 0.12	29 0.17	29 0.12	29 0.10	27 0.12	25 0.11	24 0.10	24 0.10	24 0.12	24 0.12	25 0.12
39		27 0.12	26 0.11	29 0.17	27 0.12	26 0.10	29 0.15	27 0.12	27 0.12	23 0.09	26 0.10	24 0.11	25 0.12
40		27 0.15	29 0.16	26 0.14	27 0.13	29 0.14	27 0.14	27 0.10	24 0.10	24 0.10	24 0.10	24 0.10	25 0.10
41		29 0.16	29 0.14	29 0.14	29 0.14	29 0.16	25 0.12	27 0.12	24 0.11	24 0.11	24 0.11	24 0.11	25 0.11
42		27 0.14	29 0.15	27 0.15	26 0.12	29 0.14	29 0.12	26 0.12	26 0.12	26 0.12	24 0.10	24 0.10	24 0.11
43		25 0.12	29 0.16	29 0.16	29 0.14	26 0.16	26 0.12	26 0.11	26 0.11	23 0.09	24 0.10	24 0.10	24 0.11
44		27 0.14	29 0.15	29 0.16	29 0.14	26 0.12	26 0.12	26 0.12	26 0.12	24 0.10	24 0.10	24 0.10	24 0.11
45		25 0.12	29 0.15	29 0.17	29 0.15	29 0.15	26 0.12	27 0.12	26 0.12	24 0.10	24 0.10	24 0.10	24 0.11
46		27 0.14	29 0.15	29 0.14	29 0.15	27 0.12	26 0.12	26 0.12	26 0.12	23 0.09	24 0.10	24 0.10	24 0.11
47		29 0.15	29 0.16	29 0.14	29 0.15	26 0.11	27 0.15	26 0.12	26 0.12	24 0.10	24 0.10	24 0.10	24 0.11
48		29 0.16	29 0.13	29 0.15				25 0.12	25 0.12	24 0.10	24 0.10	24 0.10	24 0.11
49		29 0.16	26 0.10					25 0.12	25 0.12	24 0.10	24 0.10	24 0.10	24 0.11
50		29 0.17						25 0.12					
51		27 0.12											
TREATMENT LEVEL		CONTROL		3		4		3		2		1	
DUPLICATE		A	B	A	B	A	B	A	B	A	B	A	B
FISH NO.		T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.	T.L. W.W.
Mean		29 0.14	29 0.14	29 0.13	27 0.14	29 0.14	27 0.13	26 0.12	25 0.12	24 0.11	24 0.11	24 0.11	24 0.11
St. Dev.		1 0.02	1 0.02	1 0.02	2 0.02	1 0.02	1 0.01	1 0.01	1 0.01	1 0.01	1 0.01	1 0.01	1.06 0.01
Min		29 0.12	29 0.12	29 0.12	29 0.10	29 0.12	25 0.10	29 0.12	27 0.10	27 0.10	25 0.10	26 0.10	26.00 0.01
Max		29 0.17	29 0.17	29 0.17	29 0.16	29 0.17	29 0.16	29 0.17	29 0.16	27 0.12	27 0.12	27 0.12	27.00 0.01
N		51	51	49	49	48	48	47	47	49	49	43	43

RAINBOW TROUT - EARLY LIFE STAGE
 LENGTH (MM) AND WEIGHT (GRAMS) DATA
 GROUPS FROM RIVER GROUP 11 AT FERTILIZATION - CONTINUOUS EXPOSURE
 DATE: JULY 29, 1988 (61 DAYS POSTHATCH)

Table 7.3-17A

TREATMENT LEVEL		CONTROL								3								4							
		A		B		A		B		A		B		A		B		A		B		A		B	
REPLICATE		1		1		2		2		1		1		2		2		1		1		2		2	
LARVAL TAKE																									
FISH NO.		T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.
1	41.2	0.517	42.5	1.122	50.0	1.197	42.5	0.560		40.5	0.569	40.5	0.574	39.2	0.449	38.0	0.424	40.2	0.550	29.5	0.154	39.2	0.427	41.0	0.520
2	40.9	0.600	40.2	0.712	14.5	0.156	40.2	0.587		39.9	0.521	41.0	0.532	39.0	0.483	41.0	0.556	38.2	0.468	39.9	0.515	38.0	0.452	36.5	0.392
3	40.5	0.544	41.9	0.672	40.1	0.539	41.9	0.702		40.2	0.576	37.5	0.418	40.5	0.519	39.5	0.482	39.0	0.505	35.0	0.340	37.0	0.426	37.2	0.445
4	42.2	0.544	41.0	0.552	41.0	0.526	41.0	0.558		38.9	0.509	39.0	0.520	35.5	0.450	39.0	0.478	39.5	0.475	37.9	0.432	36.2	0.406	42.5	0.559
5	39.0	0.475	40.5	0.568	29.5	0.475	40.5	0.599		38.0	0.427	40.0	0.495	41.2	0.540	40.0	0.503	38.5	0.447	40.2	0.492	38.2	0.488	37.5	0.410
6	43.0	0.763	40.2	0.421	36.5	0.387	40.2	0.512		42.5	0.616	37.0	0.370	38.9	0.456	43.5	0.767	41.0	0.520	40.0	0.490	37.0	0.387	42.9	0.705
7	40.5	0.534	46.0	0.452	45.0	0.754	46.0	0.307		38.0	0.436	38.2	0.444	42.2	0.649	38.9	0.495	42.9	0.612	39.9	0.506	40.5	0.562	38.0	0.392
8	39.0	0.519	38.0	0.515	39.5	0.456	38.0	0.447		40.0	0.502	44.0	0.790	38.0	0.386	35.9	0.400	43.0	0.640	37.2	0.421	34.9	0.282	41.2	0.565
9	41.9	0.611	37.0	0.592	42.2	0.611	37.0	0.406		43.5	0.675	40.0	0.527	41.9	0.564	42.0	0.534	38.5	0.437	37.5	0.415	37.0	0.421	34.9	0.320
10	40.2	0.556	39.2	0.500	44.5	0.738	39.2	0.484		40.0	0.564	37.0	0.396	44.0	0.719	37.5	0.434	40.2	0.552	37.0	0.395	35.9	0.315	41.0	0.522
11	42.2	0.632	41.2	0.739	37.9	0.469	41.2	0.583		40.0	0.455	40.9	0.494	45.0	0.732	42.9	0.543	43.5	0.734	38.5	0.442	38.2	0.395	35.0	0.326
12	37.9	0.403	44.0	0.626	42.5	0.589	44.0	0.584		38.1	0.467	39.5	0.494	37.5	0.460	42.5	0.553	38.2	0.452	37.9	0.376	35.5	0.254	29.5	0.172
13	38.9	0.497	38.5	0.403	37.5	0.439	38.5	0.427		42.0	0.622	42.0	0.586	38.0	0.481	34.5	0.310	38.5	0.455	37.2	0.340	39.5	0.472	37.0	0.437
14	42.5	0.737	41.5	0.491	41.2	0.569	41.5	0.397		39.9	0.424	41.0	0.543	39.0	0.434	41.9	0.597	35.0	0.334	36.5	0.365	36.5	0.286	37.9	0.491
15	41.9	0.654	37.2	0.511	40.2	0.522	37.2	0.425		42.0	0.636	37.0	0.399	38.5	0.479	37.0	0.422	41.0	0.515	36.9	0.336	37.0	0.286	37.9	0.491
16	45.9	0.826	41.9	0.752	43.0	0.652	41.9	0.712		37.5	0.417	38.5	0.458	42.0	0.545	41.0	0.523	40.5	0.500	39.0	0.452	40.5	0.501	39.2	0.475
17	40.0	0.581	48.0	0.549	43.5	0.704	48.0	0.923		41.0	0.570	38.0	0.438	38.0	0.444	42.5	0.544	42.0	0.528	40.5	0.456	38.5	0.469	37.9	0.500
18	42.5	0.712	29.5	0.671	38.0	0.426	29.5	0.501		42.2	0.712	38.2	0.469	43.5	0.594	39.9	0.459	40.9	0.570	35.5	0.426	37.9	0.444	36.5	0.431
19	40.9	0.547	39.0	0.536	37.9	0.533	39.0	0.425		41.0	0.534	40.0	0.540	37.2	0.422	36.0	0.356	38.2	0.428	41.2	0.598	37.5	0.283	38.0	0.399
20	41.0	0.578	47.0	0.548	32.0	0.737	47.0	0.583		39.9	0.518	40.5	0.547	38.9	0.456	39.5	0.463	40.0	0.484	38.0	0.444	39.0	0.504	38.0	0.358
21	38.5	0.458	41.0	0.421	37.9	0.429	41.0	0.524		41.0	0.540	39.9	0.450	40.5	0.510	35.5	0.283	40.0	0.501	39.0	0.434	40.0	0.496	37.9	0.450
22	41.5	0.594	37.2	0.343	37.5	0.447	37.2	0.417		37.2	0.433	38.5	0.428	38.0	0.473	42.0	0.525	40.5	0.517	36.0	0.294	37.9	0.462	34.5	0.288
23	37.9	0.423	42.2	0.437	41.0	0.540	42.2	0.504		38.0	0.398	41.0	0.581	43.0	0.594	37.0	0.344	41.2	0.492	40.0	0.479	38.5	0.445	35.0	0.279
24	35.9	0.326	29.2	0.291			39.2	0.447		39.5	0.676	37.5	0.355	35.5	0.355	37.5	0.361			37.9	0.292	31.0	0.229	40.9	0.517
25			42.0	0.475			42.0	0.359								37.9	0.244			36.5	0.355	37.0	0.365	37.0	0.356

TREATMENT LEVEL		CONTROL								3								4							
		A		B		A		B		A		B		A		B		A		B		A		B	
REPLICATE		1		1		2		2		1		1		2		2		1		1		2		2	
LARVAL TAKE																									
FISH NO.		T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.
MEAN		40.3	0.573	41	0.372	40.1	0.559	41.0	0.567	40.1	0.529	39.4	0.493	39.8	0.523	39.4	0.488	40.3	0.512	37.7	0.410	37.4	0.415	38.4	0.452
ST. DEV.		2.2	0.109	3	0.164	3.8	0.191	2.9	0.120	1.8	0.086	1.8	0.092	2.6	0.120	2.6	0.120	1.9	0.086	2.5	0.086	2.2	0.079	2.6	0.100
MAX		46.9	0.772	46	1.122	50.0	1.197	48.0	0.923	43.5	0.712	44.0	0.790	45.0	0.732	43.5	0.767	43.5	0.734	41.2	0.518	40.5	0.562	43.9	0.705
MIN		35.9	0.326	27	0.241	32.0	0.277	37.0	0.406	37.2	0.394	37.0	0.355	35.5	0.352	34.5	0.303	35.0	0.333	28.5	0.154	31.0	0.219	34.9	0.268
N		24	24	25	25	25	25	25	25	24	24	24	24	24	24	24	25	25	23	23	25	25	25	25	25

TREATMENT LEVEL		3							
REPLICATE		A		B		A		B	
LIVIAL TANK		1		1		2		2	
FISH NO.	F.L.	M.V.	F.L.	M.V.	F.L.	M.V.	F.L.	M.V.	
1	27.0	0.173	28.0	0.112	32.9	0.271	31.9	0.227	
2	31.9	0.203	29.2	0.173	29.9	0.151	31.9	0.259	
3	27.9	0.172	34.5	0.311	27.0	0.116	29.0	0.157	
4	26.2	0.103	27.9	0.100	31.5	0.228	30.9	0.198	
5	28.9	0.130	34.9	0.343	30.2	0.183	32.2	0.214	
6	27.3	0.150	30.3	0.136	27.3	0.143	27.3	0.141	
7	29.3	0.187	32.3	0.207	30.0	0.139	31.9	0.205	
8	34.3	0.307	31.3	0.201	30.2	0.136	32.9	0.253	
9	31.9	0.215	27.0	0.150	31.9	0.223	31.0	0.213	
10	33.3	0.239	29.2	0.170	30.9	0.127	27.2	0.193	
11	26.3	0.149	29.0	0.157	28.3	0.126	28.9	0.123	
12	32.0	0.203	27.9	0.109	29.0	0.146	29.5	0.117	
13	31.2	0.206	28.0	0.246	27.9	0.171	29.0	0.163	
14	29.1	0.172	32.2	0.237	27.3	0.140	26.3	0.099	
15	28.0	0.137	26.9	0.133	26.2	0.104	29.0	0.127	
16	27.9	0.146	33.0	0.296	27.0	0.116	32.2	0.239	
17	32.9	0.193	29.9	0.162	27.3	0.120			
18	27.2	0.104	28.9	0.129	28.9	0.123			
19			30.3	0.202	26.9	0.110			
20			30.0	0.181					
21									
22									
23									
24									
25									

TREATMENT LEVEL		3							
REPLICATE		A		B		A		B	
LATENT TIME		1		1		2		2	
PISH NO.		P.L.	M.W.	P.L.	M.W.	P.L.	M.W.	P.L.	M.W.
Mean		29.3	0.177	30.0	0.191	29.3	0.157	29.9	0.193
S.E. Dev.		2.0	0.023	2.6	0.067	2.0	0.045	2.4	0.060
Ratio		34.3	0.307	33.0	0.343	30.0	0.271	31.9	0.289
Ratio		23.3	0.104	26.9	0.100	26.2	0.106	26.3	0.079
SD		10	10	20	20	19	19	16	16

2								1							
A		B		A		B		A		B		A		B	
1		1		2		2		1		1		2		2	
F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.

RAINBOW TROUT - EARLY LIFE STAGE
 LENGTH (MM) AND WEIGHT (GRAMS) DATA
 GROUPS XOUT RIVER GROUP 1 AT TERMINATION - INTERMITTENT EXPOSURE
 DATE: JULY 29, 1988 (50 DAYS POSTHATCH)

Table 7.3-17B

TREATMENT LEVEL										3										4									
CONTROL																													
REPLICATE		A		B		A		B		A		B		A		B		A		B		A		B		A		B	
LARVAL TANK		1		1		2		2		1		1		2		2		1		1		2		2		1		1	
FISH NO.		T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.
1	43.2	0.673	42.0	0.634	44.1	0.711	43.1	0.684		41.0	0.531	43.0	0.625	41.9	0.574	41.5	0.560	35.0	0.308	37.5	0.412	34.0	0.277	38.0	0.413				
2	41.3	0.531	38.4	0.430	42.0	0.575	40.1	0.446		41.0	0.569	38.5	0.464	42.1	0.614	40.9	0.526	37.5	0.433	38.0	0.422	29.5	0.157	37.0	0.356				
3	42.0	0.591	44.2	0.739	45.0	0.791	41.2	0.562		40.5	0.485	40.2	0.534	41.3	0.525	42.5	0.579	29.0	0.177	38.0	0.436	35.0	0.337	36.5	0.376				
4	40.6	0.581	40.0	0.505	42.2	0.612	40.3	0.492		39.6	0.460	40.5	0.523	41.0	0.525	38.1	0.402	29.0	0.181	40.0	0.491	35.5	0.305	36.5	0.381				
5	46.1	0.972	41.3	0.504	42.2	0.543	44.0	0.747		35.0	0.339	39.0	0.439	40.3	0.497	42.5	0.582	35.5	0.324	31.5	0.274	36.5	0.357	38.0	0.330				
6	40.5	0.522	43.0	0.639	43.9	0.580	38.9	0.482		41.2	0.541	41.9	0.591	39.2	0.457	42.9	0.619	37.0	0.433	36.5	0.376	31.9	0.257	36.0	0.341				
7	39.9	0.492	44.0	0.634	39.1	0.429	39.0	0.497		43.1	0.637	40.4	0.498	42.0	0.584	41.1	0.572	40.0	0.476	37.5	0.330	40.5	0.469	36.0	0.365				
8	39.3	0.476	41.1	0.540	42.2	0.640	38.9	0.505		42.6	0.527	41.0	0.573	41.3	0.584	39.9	0.441	36.5	0.349	37.0	0.410	33.0	0.258	37.5	0.372				
9	41.1	0.548	39.2	0.462	38.9	0.483	41.1	0.579		38.2	0.425	42.9	0.636	33.4	0.293	42.2	0.567	35.5	0.391	38.5	0.451	36.0	0.346	39.0	0.379				
10	35.5	0.318	41.2	0.566	41.1	0.534	44.0	0.738		36.2	0.327	39.7	0.517	41.1	0.526	39.2	0.450	38.0	0.402	37.0	0.371	34.5	0.310	36.0	0.311				
11	43.2	0.678	43.0	0.645	39.8	0.468	41.9	0.569		41.1	0.523	39.2	0.470	39.4	0.451	39.5	0.455	32.5	0.252	37.5	0.402	33.5	0.320	38.5	0.426				
12	41.0	0.560	41.0	0.531	42.1	0.591	41.9	0.572		40.2	0.520	40.5	0.509	41.3	0.564	41.3	0.538	38.5	0.445	34.0	0.305	34.0	0.374	32.0	0.279				
13	40.3	0.522	40.9	0.500	39.9	0.482	42.0	0.534		42.1	0.621	33.9	0.291	42.9	0.620	37.7	0.413	27.9	0.170	32.9	0.247	36.0	0.334	33.0	0.257				
14	38.5	0.429	42.5	0.686	44.5	0.762	38.9	0.482		37.3	0.391	41.0	0.531	42.5	0.647	37.1	0.427	34.5	0.324	40.0	0.461	38.5	0.408	33.5	0.284				
15	37.2	0.405	39.1	0.460	41.5	0.565	42.3	0.607		40.4	0.548	43.8	0.707	42.1	0.587	40.5	0.504	38.0	0.393	35.5	0.319	36.0	0.360	36.0	0.360				
16	41.5	0.545	38.0	0.420	43.0	0.502	41.7	0.537		39.0	0.472	41.0	0.528	41.8	0.568	40.2	0.491	36.5	0.378	34.5	0.291	33.5	0.319	35.5	0.318				
17	44.2	0.682	42.5	0.598	42.3	0.559	40.3	0.510		41.0	0.516	38.9	0.412	42.2	0.620	40.5	0.475	36.0	0.377	32.0	0.230	31.5	0.255	34.0	0.278				
18	39.2	0.430	39.8	0.460	42.2	0.583	44.5	0.683		38.1	0.463	41.4	0.558	44.6	0.642	41.5	0.566	37.9	0.437	32.0	0.405	33.0	0.316	37.5	0.362				
19	44.4	0.759	41.5	0.625	40.0	0.482	41.0	0.542		41.5	0.539	39.1	0.446	38.5	0.405	40.5	0.525	36.5	0.389	37.5	0.431	32.5	0.256	33.0	0.287				
20	40.0	0.484	40.9	0.512	38.5	0.437	40.5	0.504		42.0	0.581	39.1	0.485	42.1	0.596	40.6	0.508	31.5	0.210	38.0	0.433	35.0	0.302	34.5	0.305				
21	38.5	0.448	40.8	0.490	40.4	0.484	38.1	0.462		42.5	0.628	41.1	0.558	42.1	0.616	38.8	0.451	37.0	0.368	31.0	0.258	36.0	0.302	36.5	0.377				
22	43.4	0.645	34.5	0.250	41.6	0.523	39.5	0.497		44.1	0.716	41.1	0.468	41.2	0.517	39.2	0.426	38.5	0.358	37.0	0.389	35.5	0.326	38.0	0.392				
23	36.0	0.308	41.0	0.514	38.0	0.387	43.1	0.626		39.0	0.441	38.2	0.435	40.1	0.499	40.3	0.483												
24	40.1	0.478	41.1	0.516	40.1	0.481	41.9	0.612		38.3	0.444	39.5	0.447	37.1	0.401	40.9	0.525												
25			35.0	0.201	38.8	0.422						38.0	0.402			39.4	0.484												
TREATMENT LEVEL										3										4									
CONTROL																													
REPLICATE		A		B		A		B		A		B		A		B		A		B		A		B		A		B	
LARVAL TANK		1		1		2		2		1		1		2		2		1		1		2		2		1		1	
		T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.	T.L.	W.W.
MEAN		40.7	0.547	40.6	0.540	41.3	0.561	41.2	0.572	40.2	0.524	40.1	0.508	40.9	0.544	40.2	0.492	35.7	0.358	36.1	0.378	34.7	0.327	36.1	0.347				
ST. DEV.		2.6	0.126	2.4	0.121	1.9	0.106	1.8	0.089	2.2	0.090	2.0	0.091	2.2	0.090	2.1	0.089	3.2	0.087	2.6	0.072	2.4	0.062	1.8	0.051				
MAX		46.1	0.972	44.2	0.759	45.0	0.791	44.5	0.759	44.1	0.716	43.8	0.707	44.6	0.662	42.9	0.619	40.0	0.481	40.0	0.491	40.5	0.469	39.0	0.426				
MIN		35.5	0.318	34.5	0.250	38.0	0.387	38.1	0.462	35.0	0.339	33.9	0.291	33.4	0.293	32.1	0.227	27.0	0.170	31.0	0.258	29.5	0.167	32.0	0.279				
N		24	24	25	25	25	25	24	24	24	24	25	25	24	24	25	25	22	22	25	25	24	24	24	24				

TREATMENT
LEVEL

LEVEL	3							
	A		B		A		B	
REPLICATE								
LARVAL TIME	1		1		2		2	
FISH NO.	F.L.	W.W.	F.L.	W.W.	F.L.	W.W.	F.L.	W.W.
1	37.2	0.231	29.9	0.154	32.5	0.290	32.5	0.245
2	33.0	0.256	29.5	0.157	29.9	0.174	38.5	0.163
3	27.0	0.128	32.0	0.226	33.5	0.257	30.0	0.172
4	32.0	0.228	29.0	0.225	31.9	0.256	28.0	0.126
5	31.5	0.212	27.5	0.113	28.5	0.170	30.5	0.207
6	30.5	0.298	30.0	0.201	33.5	0.267	31.5	0.195
7	29.0	0.154	31.5	0.202	33.5	0.261	32.0	0.190
8	29.9	0.182	30.5	0.204	29.9	0.150	32.0	0.225
9	32.5	0.255	31.0	0.215	29.5	0.152	35.5	0.312
10	26.0	0.078	32.9	0.253	35.0	0.278	29.9	0.192
11	35.5	0.282	30.5	0.201	26.5	0.093	31.5	0.216
12	35.9	0.321	30.0	0.192	31.0	0.203	31.0	0.220
13	30.2	0.179	33.5	0.248	32.5	0.246	28.5	0.145
14	30.9	0.211	32.0	0.231	30.5	0.190	33.0	0.250
15	27.2	0.119	30.0	0.177	32.0	0.229	29.5	0.176
16	28.0	0.154	27.5	0.142	31.0	0.218	32.5	0.290
17	32.9	0.257			31.5	0.217		
18	29.2	0.167			27.0	0.118		
19	28.0	0.128			25.5	0.085		
20	29.9	0.150						
21	25.9	0.088						
22	27.0	0.102						
23								
24								
25								

TREATMENT LEVEL

LEVEL	3							
	A		B		A		B	
	1		1		2		2	
REPLICATE								
LAKYAL TIME								
	F.L.	M.V.	F.L.	M.V.	F.L.	M.V.	F.L.	M.V.
MEAN=	30.2	0.194	30.3	0.197	30.8	0.204	31.7	0.208
ST. DEV.=	2.8	0.072	1.8	0.040	2.7	0.062	2.5	0.050
RAIN=	35.9	0.321	35.5	0.281	35.0	0.270	38.3	0.312
RIN=	35.9	0.310	37.3	0.313	37.3	0.305	38.0	0.300
	22	22	16	16	19	19	16	16

Table 7.3-17B (continued)

2							
A		B		A		B	
1		1		2		2	
F.L.	W.V.	F.L.	W.V.	F.L.	W.V.	F.L.	W.V.
27.9	0.114	27.0	0.122	28.9	0.130	28.0	0.130
28.5	0.153	31.5	0.201	26.0	0.113	27.5	0.124
25.5	0.085	28.0	0.113	23.9	0.171	28.5	0.174
25.0	0.155	29.5	0.171	27.0	0.102		
29.0	0.154	27.5	0.138				
30.2	0.169						
27.9	0.131						

1							
A		B		A		B	
1		1		2		2	
T.L.	N.W.	T.L.	N.W.	T.L.	N.W.	T.L.	N.W.
25.9	0.094						

Table 7.3-18A

Regression Analysis of TRC vs Percent reduction in Length and Weight
Rainbow Trout ELS Test

Continuous Exposure - 20 dph

Level	TRC	ln TRC	Length	Weight	% red L	% red W
1						
2						
3	43	3.76	26	0.12	10.3	14.3
4	19	2.94	27	0.13	6.9	7.1
5	10	2.30	28	0.14	3.4	0.0
Control			29	0.14	0.0	0.0

Regression: ln TRC (x) vs % reduction in length (y1)

$$y1 = 4.71x - 7.23$$

% inhib in length	1	5	10
TRC	6	13	39

Regression: ln TRC (x) vs % reduction in weight (y2)

$$y2 = 9.75x - 17.63$$

% inhib in weight	1	5	10
TRC	11	16	27

Continuous Exposure - 61 dph

Level	TRC	ln TRC	Length	Weight	% red L	% red W
1						
2						
3	41	3.71	30	0.18	26.8	68.4
4	16	2.77	38	0.45	7.3	21.1
5	8	2.08	40	0.51	2.4	10.5
Control			41	0.57	0.0	0.0

Regression: ln TRC (x) vs % reduction in length (y1)

$$y1 = 15.26x - 31.38$$

% inhib in length	1	10	25
TRC	8	15	40

Regression: ln TRC (x) vs % reduction in weight (y2)

$$y2 = 36.29x - 70.28$$

% inhib in weight	1	10	25	50
TRC	7	9	14	28

Regression Output:

Constant	-7.23313
Std Err of Y Est	0.336810
R Squared	0.995229
No. of Observations	3
Degrees of Freedom	1

X Coefficient(s) 4.705596

Std Err of Coef. 0.325777

Regression Output:

Constant	-22.1257
Std Err of Y Est	0.697678
R Squared	0.995229
No. of Observations	3
Degrees of Freedom	1

X Coefficient(s) 9.747307

Std Err of Coef. 0.674824

Regression Output:

Constant	-31.3787
Std Err of Y Est	4.447204
R Squared	0.940631
No. of Observations	3
Degrees of Freedom	1

X Coefficient(s) 15.26123

Std Err of Coef. 3.834041

Regression Output:

Constant	-70.2818
Std Err of Y Est	11.41245
R Squared	0.931527
No. of Observations	3
Degrees of Freedom	1

X Coefficient(s) 36.28998

Std Err of Coef. 9.838949

Table 7.3-18B

Regression Analysis of TRC vs Percent reduction in Length and Weight
Rainbow Trout ELS Test

Intermittent Exposure - 21 dph

Level	TRC	ln TRC	Length	Weight	% red L	% red W
1	677	6.52	24	0.11	14.3	21.4
2	556	6.32	24	0.11	14.3	21.4
3	429	6.06	26	0.12	7.1	14.3
4	259	5.56	27	0.14	3.6	0.0
5	129	4.86	28	0.14	0.0	0.0
Control			28	0.14	0.0	0.0

Regression: ln TRC (x) vs % reduction in length (y1)
y1=8.81x-43.96

% inhib in length	1	5	10
TRC	165	259	457

Regression: ln TRC (x) vs % reduction in weight (y2)
y2=28.09x-156.04

% inhib in weight	1	5	10	25
TRC	268	309	369	630

Regression Output:

Constant	-43.9645
Std Err of Y Est	2.754564
R Squared	0.864029
No. of Observations	4
Degrees of Freedom	2

X Coefficient(s) 8.810013
Std Err of Coef. 2.471263

Regression Output:

Constant	-156.037
Std Err of Y Est	0.105042
R Squared	0.999953
No. of Observations	3
Degrees of Freedom	1

X Coefficient(s) 28.08551
Std Err of Coef. 0.191198

Intermittent Exposure - 60 dph

Level	TRC	ln TRC	Length	Weight	% red L	% red W
1	718	6.58	26	0.09	36.6	83.9
2	563	6.33	28	0.14	31.7	75.0
3	418	6.04	31	0.20	24.4	64.3
4	263	5.57	36	0.35	12.2	37.5
5	119	4.78	40	0.52	2.4	7.1
Control			41	0.56	0.0	0.0

Regression: ln TRC (x) vs % reduction in length (y1)
y1=24.50x-123.96

% inhib in length	1	10	25
TRC	164	237	437

Regression: ln TRC (x) vs % reduction in weight (y2)
y2=43.87x-203.47

% inhib in weight	1	10	25	50
TRC	106	130	183	323

Regression Output:

Constant	-123.958
Std Err of Y Est	0.688693
R Squared	0.997190
No. of Observations	4
Degrees of Freedom	2

X Coefficient(s) 24.50141
Std Err of Coef. 0.919663

Regression Output:

Constant	-203.465
Std Err of Y Est	2.800371
R Squared	0.993982
No. of Observations	5
Degrees of Freedom	3

X Coefficient(s) 43.86822
Std Err of Coef. 1.970694

Section 7.4 Snail Acute Tests

TEMPERATURES (CELCIUS)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
CONTINUOUS EXPOSURE

Table 7.4-1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	25.0	25.0	25.2	25.0	25.5	25.0	25.0	25.2	25.2	25.2	25.0	25.0
	25.4	24.9	25.4	25.3	25.3	25.3	25.3	25.3	25.4	25.3	25.3	25.3
3/29	25.2	25.5	25.5	25.2	25.5	25.5	25.2	25.5	25.5	25.2	25.0	25.5
	25.4	25.4	25.5	25.4	25.5	25.4	25.5	25.5	25.5	25.5	25.5	25.5
3/30	25.2	25.2	25.2	25.5	25.5	25.5	25.2	25.5	25.2	25.2	25.0	25.6
	25.4	25.5	25.4	25.9	25.4	25.8	25.5	25.7	25.5	25.6	25.4	25.5
3/31	25.2	25.5	25.2	25.5	25.2	25.2	25.5	25.2	25.2	25.5	25.5	25.2
	25.7	25.8	25.7	25.8	25.7	25.8	25.7	25.8	25.6	25.8	25.4	25.5
4/01	26.0	26.0	26.0	26.0	25.5	25.5	26.2	26.2	26.0	26.0	26.0	25.0
	25.2	25.6	25.7	25.7	25.7	25.8	25.7	25.8	25.7	25.7	25.6	25.5
4/02	26.1	26.1	26.3	26.0	26.0	26.0	26.0	26.1	26.0	26.1	25.5	26.0

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	25.4	25.5	25.6	25.6	25.5	25.5	25.5	25.6	25.5	25.6	25.4	25.4
S.D. =	0.4	0.4	0.4	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3
MAX =	26.1	26.1	26.3	26.0	26.0	26.0	26.2	26.2	26.0	26.1	26.0	26.0
MIN =	25.0	24.9	25.2	25.0	25.2	25.0	25.0	25.2	25.2	25.2	25.0	25.0
N =	11	11	11	11	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	25.5	25.6	25.5	25.6	25.5	25.4
S.D. =	0.4	0.3	0.3	0.3	0.3	0.3
MAX =	26.1	26.3	26.0	26.2	26.1	26.0
MIN =	24.9	25.0	25.0	25.0	25.2	25.0
N =	22	22	22	22	22	22

OVERALL (GRAND) STATISTICS:

MEAN = 25.5
S.D. = 0.3
MAX = 26.3
MIN = 24.9
N = 132

TEMPERATURES (CELCIUS)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
INTERMITTENT EXPOSURE

Table 7.4-1 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	25.2	25.5	25.0	25.0	25.0	25.0	25.2	25.2	25.0	25.0	25.0	25.0
	25.2	24.6	25.0	24.5	24.7	24.6	24.5	24.5	24.7	24.5	24.5	24.5
3/29	25.0	25.2	25.0	25.2	25.2	25.2	25.0	25.2	25.0	25.5	25.0	25.2
	25.3	25.3	25.3	25.3	24.7	24.9	24.7	24.5	24.7	24.5	24.5	24.5
3/30	25.0	25.2	25.0	25.0	25.2	25.2	25.2	25.2	25.0	25.0	25.0	25.2
	24.5	24.9	25.4	24.8	24.9	24.9	24.9	25.2	25.3	25.2	25.3	25.1
3/31	25.5	25.5	25.2	25.5	25.5	25.2	25.5	25.5	25.5	25.2	25.0	25.2
	25.5	25.7	25.5	25.6	25.1	25.5	25.0	25.5	24.9	25.3	25.3	25.3
4/01	25.2	25.5	25.5	25.2	25.5	25.0	25.5	25.2	25.2	25.5	25.0	25.2
	25.5	25.5	25.5	25.3	25.3	25.3	25.3	25.4	25.3	25.5	25.0	25.5
4/02	26.0	25.2	25.9	25.2	25.8	25.3	25.6	25.5	25.6	25.5	25.5	25.6

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	25.3	25.3	25.3	25.1	25.2	25.1	25.1	25.2	25.1	25.2	25.0	25.1
S.D. =	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.3	0.3
MAX =	26.0	25.7	25.9	25.6	25.8	25.5	25.6	25.5	25.6	25.5	25.5	25.6
MIN =	24.5	24.6	25.0	24.5	24.7	24.6	24.5	24.5	24.7	24.5	24.5	24.5
N =	11	11	11	11	11	11	11	11	11	11	11	11

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	25.3	25.2	25.1	25.2	25.1	25.1
S.D. =	0.3	0.3	0.3	0.3	0.3	0.3
MAX =	26.0	25.9	25.8	25.6	25.6	25.6
MIN =	24.5	24.5	24.6	24.5	24.5	24.5
N =	22	22	22	22	22	22

OVERALL (GRAND) STATISTICS:

MEAN = 25.2
S.D. = 0.3
MAX = 26.0
MIN = 24.5
N = 132

DISSOLVED OXYGEN (mg/L)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
CONTINUOUS EXPOSURE

Table 7.4-2

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	7.60	7.55	7.55	7.60	7.70	7.60	7.65	7.75	7.65	7.60	7.70	7.65
3/29	7.85	7.90	7.85	7.90	7.90	7.70	7.85	7.85	7.90	7.85	7.80	7.90
3/30	7.80	7.75	7.90	7.70	7.75	7.65	7.75	7.75	7.60	7.75	7.80	7.70
3/31	7.90	7.85	7.80	7.80	7.85	7.80	7.60	7.80	7.70	7.90	7.70	7.70
4/01	7.65	7.65	7.75	7.70	7.80	7.70	7.70	7.80	7.60	7.80	7.80	7.85
4/02	7.60	7.80	7.40	7.70	7.40	7.70	7.40	7.60	7.20	7.80	7.80	7.80

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	7.73	7.75	7.71	7.73	7.73	7.69	7.66	7.76	7.61	7.78	7.77	7.77
S.D. =	0.13	0.13	0.19	0.10	0.18	0.07	0.15	0.09	0.23	0.10	0.05	0.10
MAX =	7.90	7.90	7.90	7.90	7.90	7.80	7.85	7.85	7.90	7.90	7.80	7.90
MIN =	7.60	7.55	7.40	7.60	7.40	7.60	7.40	7.60	7.20	7.60	7.70	7.65
N =	6	6	6	6	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	7.74	7.72	7.71	7.71	7.70	7.77
S.D. =	0.13	0.15	0.13	0.13	0.19	0.07
MAX =	7.90	7.90	7.90	7.85	7.90	7.90
MIN =	7.55	7.40	7.40	7.40	7.20	7.65
N =	12	12	12	12	12	12

OVERALL (GRAND) STATISTICS:

MEAN = 7.72
S.D. = 0.14
MAX = 7.90
MIN = 7.20
N = 72

DISSOLVED OXYGEN (mg/L)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
INTERMITTENT EXPOSURE

DISSOLVED OXYGEN (mg/L)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
INTERMITTENT EXPOSURE

Table 7.4-2 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE DATE:	A	B	A	B	A	B	A	B	A	B	A	B
3/28	7.65	7.50	7.60	7.60	7.70	7.65	7.55	7.80	7.60	7.70	7.65	7.65
3/29	7.80	7.85	7.95	7.90	7.90	7.75	7.95	7.90	7.85	7.95	7.80	7.90
3/30	7.90	7.90	7.75	7.75	7.80	7.80	7.85	7.80	7.75	7.65	7.80	7.90
3/31	7.85	7.60	7.80	7.90	7.85	7.85	7.70	7.90	7.90	7.95	7.90	7.80
4/01	7.70	7.80	7.80	7.70	7.95	7.85	7.75	7.65	7.75	7.80	7.80	7.75
4/02	7.80	7.40	7.80	7.40	7.80	7.40	7.80	7.40	7.80	7.40	7.80	7.50

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	7.78	7.68	7.78	7.71	7.83	7.72	7.77	7.74	7.78	7.74	7.79	7.75
S.D. =	0.09	0.20	0.11	0.19	0.09	0.17	0.14	0.19	0.10	0.21	0.08	0.15
MAX =	7.90	7.90	7.95	7.90	7.95	7.85	7.95	7.90	7.90	7.95	7.90	7.90
MIN =	7.65	7.40	7.60	7.40	7.70	7.40	7.55	7.40	7.60	7.40	7.65	7.50
N =	6	6	6	6	6	6	6	6	6	6	6	6

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	7.73	7.75	7.78	7.75	7.76	7.77
S.D. =	0.16	0.15	0.14	0.16	0.16	0.12
MAX =	7.90	7.95	7.95	7.95	7.95	7.90
MIN =	7.40	7.40	7.40	7.40	7.40	7.50
N =	12	12	12	12	12	12

OVERALL (GRAND) STATISTICS:

MEAN =	7.76
S.D. =	0.15
MAX =	7.95
MIN =	7.40
N =	72

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

GONIOBASIS

MARCH 28 - APRIL 2, 1988

CONTINUOUS EXPOSURE

Table 7.4-3

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE DATE	A	B	A	B	A	B	A	B	A	B	A	B
3/28	468	463	202	217	105	105	48	47	25	33	1	1
	463	454	198	212	103	99	48	43	27	34	-1	-1
	462	453	201	211	93	108	50	51	23	25	-0	3
	460	456	202	207	103	107	48	48	23	37	-1	
3/29	445	472	196	216	101	108	42	41	20	18	-5	-2
	444	464	193	209	97	105	34	39	19	16	-6	-6
	460	472	191	212	103	99	47	42	29	20	-2	-2
	456	474	201	212	99	97	41	42	18	20	-9	-6
3/30	460	439	203	203	105	105	44	42	19	18	-6	-4
	468	438	193	207	102	101	42	41	16	15	-5	-3
	471	474	210	223	111	113	44	44	27	19	-3	-4
	460	466	204	224	105	101	42	45	18	19	-3	-3
3/31	452	474	200	226	115	113	48	49	24	22	-2	-1
	455	469	189	217	107	111	46	48	23	22	-1	1
	473	485	202	228	109	115	51	50	28	25	-0	2
	468	481	199	226	105	113	48	49	28	25	0	-1
4/01	472	472	196	227	104	115	45	54	21	35	3	-0
	462	462	196	219	95	114	44	44	22	22	-0	1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	461	465	199	216	103	107	45	45	23	23	-2	-1
S.D. =	8	13	5	8	5	6	4	4	4	7	3	2
MAX =	473	485	210	228	115	115	51	54	29	37	3	3
MIN =	444	438	189	203	93	97	34	39	16	15	-9	-6
N =	18	18	18	18	18	18	18	18	18	18	18	17

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	463	207	105	45	23	-2
S.D. =	11	11	6	4	5	3
MAX =	485	228	115	54	37	3
MIN =	438	189	93	34	15	-9
N =	36	36	36	36	36	35

TOTAL RESIDUAL CHLORINE - AMPEROMETRIC METHOD (ug/L)

GONIOBASIS

MARCH 28 - APRIL 2, 1988

INTERMITTENT EXPOSURE

Table 7.4-3 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE												
3/28	4600	5052	3728	3633	3065	2832	1892	1779	872	809	0	6
	4631	4778	3860	3838	2776	2864	1934	1926	717	867	3	2
3/29	4342		3443	3545	2790	3085	1802	1876	851	832	-9	-5
	4746	4766	3694	3750	3053	3133	1989	1966	830	823	-5	-3
	4483	4229	3680	3704	3065	3052	1954	1948	798	798	-6	-5
3/30	4568		3757	3896	3016	3104	1872	1840	785	819	-8	-7
	4628	4307	3857	3832	2975	3096	1839	1853	844	815	-3	3
	4445		3675		2484	2780	1777	1874	807	819	-0	
3/31	4818	4614	3630	3878	2979	3101		1874	799	809	1	2
	4818	4698	3683	3755	3107	3081	1915	1917	790	779	0	2
	4621	4482	3611	3666	3086	3001	1853	1850	762	778	3	3
TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	4609	4616	3693	3750	2945	3012	1883	1882	805	813	-2	-0
S.D. =	149	270	116	114	189	126	67	54	44	25	4	4
MAX =	4818	5052	3860	3896	3107	3133	1989	1966	872	867	3	6
MIN =	4342	4229	3443	3545	2484	2780	1777	1779	717	778	-9	-7
N =	11	8	11	10	11	11	10	11	11	11	11	10
TREATMENT	1		2		3		4		5		CONTROL	
MEAN =	4612		3720		2978		1882		809		-1	
S.D. =	202		116		161		59		35		4	
MAX =	5052		3896		3133		1989		872		6	
MIN =	4229		3443		2484		1777		717		-9	
N =	19		21		22		21		22		21	

Table 7.4-4

PERCENT MONOCHLORAMINE - DPD METHOD

GONIOBASIS

MARCH 28 - APRIL 2, 1988

CONTINUOUS EXPOSURE

TREATMENT LEVEL	1		5	
	A	B	A	B
REPLICATE				
DATE				
3/28	94.8	94.6		
3/29	96.3	95.6	100.0	100.0
3/30	94.3	95.1	100.0	100.0
3/31	95.3	96.3	94.7	91.9
4/01	93.8	93.7	95.4	94.6

TREATMENT LEVEL	1		5	
	A	B	A	B
REPLICATE				
MEAN =	94.9	95.1	97.5	96.6
S.D. =	1.0	1.0	2.9	4.1
MAX =	96.3	96.3	100.0	100.0
MIN =	93.8	93.7	94.7	91.9
N =	5	5	4	4

TREATMENT	1	5
MEAN =	95.0	97.1
S.D. =	0.9	3.3
MAX =	96.3	100.0
MIN =	93.7	91.9
N =	10	8

GRAND (OVERALL) STATISTICS

MEAN =	95.9
S.D. =	2.5
MAX =	100.0
MIN =	91.9
N =	18

PERCENT MONOCHLORAMINE - DPD METHOD

GONIOBASIS

MARCH 28 - APRIL 2, 1988

INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		5	
	A	B	A	B
REPLICATE				
DATE				
3/28	98.4	99.0		
3/29	98.1	98.2	99.2	99.3
3/30	99.2	99.0	99.0	99.9
3/31	98.2	99.0	97.0	98.3

TREATMENT LEVEL	1		5	
	A	B	A	B
REPLICATE				
MEAN =	98.4	98.8	98.4	99.2
S.D. =	0.5	0.4	1.2	0.8
MAX =	99.2	99.0	99.2	99.9
MIN =	98.1	98.2	97.0	98.3
N =	4	4	3	3

TREATMENT	1	5
MEAN =	98.6	98.8
S.D. =	0.5	1.0
MAX =	99.2	99.9
MIN =	98.1	97.0
N =	8	6

GRAND (OVERALL) STATISTICS

MEAN =	98.7
S.D. =	0.7
MAX =	99.9
MIN =	97.0
N =	14

UN-IONIZED AMMONIA-NITROGEN (ug/L)
GONIOBASIS
MARCH 28 - APRIL 2, 1988
CONTINUOUS EXPOSURE

Table 7.4-5

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
	-----		-----		-----		-----		-----		-----	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	20	20	20	19	21	19	20	19	22	18	20	20
3/30	30	27	28	28	26	29	23	26	22	20	43	15
4/01	22	24	21	22	19	19	20	21	20	19	17	18

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
	-----		-----		-----		-----		-----		-----	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	24	24	23	23	22	22	21	22	21	19	27	18
S.D. =	5	4	4	5	4	5	2	4	1	1	14	3
MAX =	30	27	28	28	26	29	23	26	22	20	43	20
MIN =	20	20	20	19	19	19	20	19	20	18	17	15
N =	3	3	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	24	23	22	21	20	22
S.D. =	4	4	4	3	2	10
MAX =	30	28	29	26	22	43
MIN =	20	19	19	19	18	15
N =	6	6	6	6	6	6

GRAND (OVERALL) STATISTICS

MEAN = 22
S.D. = 5
MAX = 43
MIN = 15
N = 36

UN-IONIZED AMMONIA-NITROGEN (ug/L)

GONIOBASIS

MARCH 28 - APRIL 2, 1988

INTERMITTENT EXPOSURE

Table 7.4-5 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	109	120	96	94	82	82			36	35	18	19
3/30	171	166	163	154	124	123	88	84	51	50	23	24
3/31	194	177	140	141	125	126	90	85	47	49	19	21
TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	158	154	133	129	110	110	89	84	45	45	20	21
S.D. =	44	30	34	32	24	25	1	1	8	8	2	3
MAX =	194	177	163	154	125	126	90	85	51	50	23	24
MIN =	109	120	96	94	82	82	88	84	36	35	18	19
N =	3	3	3	3	3	3	2	2	3	3	3	3
TREATMENT	1		2		3		4		5		CONTROL	
MEAN =	156		131		110		86		45		21	
S.D. =	34		29		22		3		7		2	
MAX =	194		163		126		90		51		24	
MIN =	109		94		82		84		35		18	
N =	6		6		6		4		6		6	

pH
GONIOBASIS
MARCH 28 - APRIL 2, 1988
CONTINUOUS EXPOSURE

Table 7.4-6

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	8.14	8.13	8.14	8.12	8.16	8.13	8.14	8.12	8.19	8.09	8.14	8.13
3/30	8.33	8.28	8.30	8.29	8.27	8.31	8.23	8.26	8.21	8.15	8.58	8.03
4/01	8.22	8.26	8.21	8.22	8.19	8.20	8.19	8.20	8.20	8.18	8.17	8.21

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.33	8.28	8.30	8.29	8.27	8.31	8.23	8.26	8.21	8.18	8.58	8.21
MIN =	8.14	8.13	8.14	8.12	8.16	8.13	8.14	8.12	8.19	8.09	8.14	8.03
N =	3	3	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MAX =	8.33	8.30	8.31	8.26	8.21	8.58
MIN =	8.13	8.12	8.13	8.12	8.09	8.03
N =	6	6	6	6	6	6

pH
GONIOBASIS
INTERMITTENT EXPOSURE

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
DATE:												
3/28	8.10	8.13	8.14	8.13	8.14	8.12	8.13	8.12	8.15	8.12	8.14	8.14
3/30	8.27	8.27	8.33	8.30	8.29	8.28	8.28	8.27	8.28	8.28	8.24	8.26
3/31	8.34	8.30	8.30	8.29	8.31	8.32	8.32	8.30	8.27	8.30	8.18	8.21

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MAX =	8.34	8.30	8.33	8.30	8.31	8.32	8.32	8.30	8.28	8.30	8.24	8.26
MIN =	8.10	8.13	8.14	8.13	8.14	8.12	8.13	8.12	8.15	8.12	8.14	8.14
N =	3	3	3	3	3	3	3	3	3	3	3	3

TREATMENT	1	2	3	4	5	CONTROL
MAX =	8.34	8.33	8.32	8.32	8.30	8.26
MIN =	8.10	8.13	8.12	8.12	8.12	8.14
N =	6	6	6	6	6	6

GONIOBASIS LENGTHS (mm)
MARCH 28 - APRIL 2, 1988
CONTINUOUS EXPOSURE

Table 7.4-7

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
CELL A	19.1	4.1	6.9	5.1	9.2	11.8	5.6	4.6	6.6	9.9	13.2	8.2
	13.8	6.0	6.4	7.1	9.7	6.1	8.5	6.4	6.7	9.1	9.0	8.3
	13.8	9.1	10.5	8.9	9.8	8.2	5.2	6.5	7.0	7.9		6.8
CELL B	12.2	11.5	7.8	7.9	10.7	12.4	9.1	10.4	7.0	9.9	12.0	12.1
	5.8	11.7	16.6	6.8	10.6	12.2	9.2	6.7	7.1	6.8	8.5	11.9
	9.6	11.1	11.6	11.2	9.8	9.5	9.2	14.1	11.2	7.9	7.8	9.2
CELL C	11.2	11.4	13.1	10.8	12.7	5.8	6.4	8.2	12.2	12.1	9.0	10.1
	8.8	12.2	10.2	10.3	12.6	7.7	6.3	7.4	16.0	9.9	10.9	12.6
	10.6	7.7	9.2	9.2	10.9	8.0	8.8	10.4	15.0	9.8	8.1	6.9
CELL D	9.2	10.3	13.2	12.2	10.1	10.7	10.8	10.3	13.3	14.5	9.4	10.8
	11.1	9.9	10.2	8.2	9.7	7.9	12.1	11.8	11.1	13.3	9.9	7.8
	10.4	8.2	8.2	11.4	8.2	12.0	8.2	8.9	7.1	6.1	14.0	8.0
CELL E	12.5	8.4	20.0	9.1	10.1	14.0	13.8	7.7	11.8	8.2	11.1	14.1
	12.6	12.2	11.5	12.1	12.2	10.5	12.7	11.4	7.8	6.9	12.3	10.1
	9.2	7.5	9.0	22.1	11.8	9.2	7.8	8.2	6.9	6.0	8.1	8.2

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	11.3	9.4	11.0	10.2	10.5	9.7	8.9	8.9	9.8	9.2	10.2	9.7
S.D. =	3.0	2.4	3.7	3.9	1.3	2.5	2.6	2.5	3.3	2.5	2.0	2.2
MAX =	19.1	12.2	20.0	22.1	12.7	14.0	13.8	14.1	16.0	14.5	14.0	14.1
MIN =	5.8	4.1	6.4	5.1	8.2	5.8	5.2	4.6	6.6	6.0	7.8	6.8
N =	15	15	15	15	15	15	15	15	15	15	14	15

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	10.4	10.6	10.1	8.9	9.5	9.9
S.D. =	2.9	3.7	2.0	2.5	2.9	2.1
MAX =	19.1	22.1	14.0	14.1	16.0	14.1
MIN =	4.1	5.1	5.8	4.6	6.0	6.8
N =	30	30	30	30	30	29

OVERALL (GRAND) STATISTICS:

MEAN =	9.9
S.D. =	2.8
MAX =	22.1
MIN =	4.1
N =	179
SEN =	0.2

GONIOBASIS LENGTHS (mm)
MARCH 28 - APRIL 2, 1988
INTERMITTENT EXPOSURE

Table 7.4-7 (continued)

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
CELL A	9.9	10.4	10.2	4.6	6.1	4.8	9.8	7.9	13.9	7.7	6.6	12.1
	9.8	14.4	9.7	6.2	8.8	8.8	10.5	7.7	10.6	9.8	7.9	9.6
	10.6	12.5	7.4	8.1	8.0	7.0	10.7	5.5	11.9	7.1	11.1	8.9
CELL B	11.5	8.9	11.0	8.2	9.7	6.5	6.6	11.8	11.3	12.0	13.2	10.7
	10.0	11.3	6.1	11.2	13.6	13.2	8.8	10.8	12.1	8.1	12.7	10.6
	10.4	11.2	7.7	8.2	7.4	14.1	6.7	9.0	10.1	9.9	11.2	8.9
CELL C	9.8	11.1	10.9	9.0	9.9	7.8	10.0	7.5	12.2	11.9	9.6	10.2
	10.7	14.4	7.1	7.3	10.2	10.3	13.3	8.7	9.6	9.2	10.3	7.9
	9.8	10.2	9.4	6.3	7.3	8.5	11.8	11.8	6.8	12.4	9.3	7.3
CELL D	11.2	9.6	7.6	10.5	14.5	11.9	8.8	11.1	13.2	11.5	11.2	8.9
	13.1	11.9	10.4	11.5	12.1	12.5	11.3	12.3	10.1	13.2	11.1	9.0
	9.4	8.7	10.3	11.6	10.4	12.0	7.6	10.7	9.7	9.2	10.3	8.1
CELL E	14.4	9.4	13.7	10.8	11.1	10.1	9.9	11.4	7.9	8.1	18.6	7.4
	11.5	7.7	13.4	14.7	11.4	11.8	9.1	11.4	7.5	7.8	11.6	3.9
	10.4	7.1	12.1	9.1	9.4	9.0	7.2	8.6	7.2	9.3	6.7	7.1

TREATMENT LEVEL	1		2		3		4		5		CONTROL	
REPLICATE	A	B	A	B	A	B	A	B	A	B	A	B
MEAN =	10.8	10.6	9.8	9.2	10.0	9.9	9.5	9.7	10.3	9.8	10.6	8.7
S.D. =	1.4	2.2	2.3	2.6	2.3	2.7	1.9	2.0	2.2	1.9	2.9	1.9
MAX =	14.4	14.4	13.7	14.7	14.5	14.1	13.3	12.3	13.9	13.2	18.6	12.1
MIN =	9.4	7.1	6.1	4.6	6.1	4.8	6.6	5.5	6.8	7.1	6.6	3.9
N =	15	15	15	15	15	15	15	15	15	15	16	15

TREATMENT	1	2	3	4	5	CONTROL
MEAN =	10.7	9.5	9.9	9.6	10.0	9.7
S.D. =	1.8	2.4	2.5	2.0	2.1	2.6
MAX =	14.4	14.7	14.5	13.3	13.9	18.6
MIN =	7.1	4.6	4.8	5.5	6.8	3.9
N =	30	30	30	30	30	31

OVERALL (GRAND) STATISTICS:

MEAN =	9.9
S.D. =	2.2
MAX =	18.6
MIN =	3.9
N =	181
SEM =	0.2

Section 7.5 Daphnia Acute Tests

Table 7.5-1

TOTAL RESIDUAL CHLORINE (ug/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	116	53	25	13	8	-2
	112	52	22	12	7	2
	115	56	26	11	6	-1
	113	52	23	11	11	1
				11	10	
1	115	57	26	12	7	2
	117	51	25	10	7	-2
			27	14	9	-1
			28	14	8	0
					9	1
2			29	17	7	1
			29	13	8	-1
MEAN =	115	53	26	12	8	-0
S.D =	2	2	2	2	1	1
MAX =	117	57	29	17	11	2
MIN =	112	51	22	10	6	-2
N =	6	6	10	11	12	11

TOTAL RESIDUAL CHLORINE (ug/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	166	139	99	75	59	-6
	156	132	102	75	52	-7
	154					
1	144	124	102	69	48	-0
	143	122	100	69	47	-1
MEAN =	153	129	101	72	52	-3
S.D =	10	8	1	4	5	3
MAX =	166	139	102	75	59	-0
MIN =	143	122	99	69	47	-7
N =	5	4	4	4	4	4

Table 7.5-2

PERCENT MONOCHLORAMINE - DPD METHOD

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
0	91	80				
1	93	100				
2	92	97				
MEAN =	92	92				
S.D =	1	11				
MAX =	93	100				
MIN =	91	80				
N =	3	3	0	0	0	0

PERCENT MONOCHLORAMINE - DPD METHOD

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
0	95				100	
1	97			99		
MEAN =	96			99	100	
S.D =	1					
MAX =	97					
MIN =	95					
N =	2	0	0	1	1	0

Table 7.5-3

TEMPERATURE (CELCIUS)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	19.0	18.8	19.1	19.2	19.3	19.1
1	19.6	19.7	19.7	19.8	19.7	19.5
2			19.8	19.8	19.8	19.6
MEAN =	19.5	19.3	19.5	19.6	19.6	19.4
S.D =		0.6	0.4	0.3	0.3	0.3
MAX =	19.8	19.7	19.8	19.8	19.8	19.6
MIN =	18.8	18.8	19.1	19.2	19.3	19.1
N =	16	2	3	3	3	3

TEMPERATURE (CELCIUS)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	19.4	19.2	19.2	19.1	19.3	19.1
1	19.9	19.7	19.8	19.8	19.7	19.7
2	20.0	19.7	20.1	19.9	19.7	19.8
MEAN =	19.6	19.5	19.7	19.6	19.6	19.5
S.D =	0.3	0.3	0.5	0.4	0.2	0.4
MAX =	20.1	19.7	20.1	19.9	19.7	19.8
MIN =	19.1	19.2	19.2	19.1	19.3	19.1
N =	18	3	3	3	3	3

Table 7.5-4

DISSOLVED OXYGEN (mg/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	8.7	8.5	8.7	8.6	8.6	8.6
1	8.5	8.4	8.5	8.5	8.5	8.6
2			8.4	8.5	8.4	8.9
MEAN =	8.6	8.5	8.5	8.5	8.5	8.7
S.D =		0.1	0.2	0.1	0.1	0.2
MAX =	8.7	8.5	8.7	8.6	8.6	8.9
MIN =	8.5	8.4	8.4	8.5	8.4	8.6
N =	2	2	3	3	3	3

DISSOLVED OXYGEN (mg/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	8.4	8.5	8.5	8.4	8.5	8.4
1	8.5	8.5	8.5	8.4	8.5	8.4
2	8.5	8.4	8.3	8.4	8.4	8.4
MEAN =	8.5	8.5	8.4	8.4	8.5	8.4
S.D =	0.1	0.1	0.1	ERR	0.1	ERR
MAX =	8.5	8.5	8.5	8.4	8.5	8.4
MIN =	8.4	8.4	8.3	8.4	8.4	8.4
N =	3	3	3	3	3	3

Table 7.5-5

PERCENT OXYGEN SATURATION

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	94	92	93	92	92	93
1	93	93	93	94	94	94
2			93	94	93	98
MEAN =	94	93	93	93	93	95
S.D =		1	0	1	1	3
MAX =	94	93	93	94	94	98
MIN =	93	92	93	92	92	93
N =	2	2	3	3	3	3

PERCENT OXYGEN SATURATION

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
4	91	92	92	92	92	91
13	94	94	93	93	93	93
19	93	93	92	93	94	93
MEAN =	93	93	92	93	93	92
S.D =	2	1	1	1	1	1
MAX =	94	94	93	93	94	93
MIN =	91	92	92	92	92	91
N =	3	3	3	3	3	3

Table 7.5-6

pH

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	8.36	8.35	8.35	8.34	8.34	8.32
1	8.46	8.46	8.46	8.46	8.45	8.45
2			8.40	8.40	8.39	8.38
MAX =	8.46	8.46	8.46	8.46	8.45	8.45
MIN =	8.36	8.35	8.35	8.34	8.34	8.32
N =	2	2	3	3	3	3

pH

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	8.36	8.36	8.36	8.36	8.36	8.35
1	8.46	8.46	8.44	8.46	8.46	8.46
MAX =	8.46	8.46	8.44	8.46	8.46	8.46
MIN =	8.36	8.36	8.36	8.36	8.36	8.35
N =	2	2	2	2	2	2

Table 7.5-7

UNIONIZED AMMONIA-NITROGEN (ug/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	3	3	3	3	3	3
1	13	15	13	15	14	12
2			11	11	12	10
MEAN =	8	9	9	10	10	8
S.D =	7	8	5	6	6	5
MAX =	13	15	13	15	14	12
MIN =	3	3	3	3	3	3
N =	2	2	3	3	3	3

UNIONIZED AMMONIA-NITROGEN (ug/L)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	12	10	9	7	6	13
1	25	23	19	21	18	25
MEAN =	19	17	14	14	12	19
S.D =	9	9	7	10	9	9
MAX =	25	23	19	21	18	25
MIN =	12	10	9	7	6	13
N =	2	2	2	2	2	2

Table 7.5-8

ALKALINITY and HARDNESS (mg/L CaCO_3)

DAPHNIA ACUTE TEST
JANUARY 5 - JANUARY 7, 1989

CONTINUOUS EXPOSURE

	ALKALINITY	HARDNESS
DAY		
0	113	166
2	107	158
MEAN =	110	162
S.D =	4	6
MAX =	113	166
MIN =	107	158
N =	2	2

Table 7.5-9

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period during continuous exposure of monochloramine to *Daphnia magna*.

Treatment Level	No. of Daphnids at Start		Observation Time (hrs)					
			3	6	8	24	48	72
1	20	TRC (ug/L)	114	114	114	114	115	115
		Cum. Mort.	0	0	2	20	20	20
		Cum. % Mort.	0	0	10	100	100	100
2	19	TRC (ug/L)	53	53	53	53	53	53
		Cum. Mort.	0	0	0	19	19	19
		Cum. % Mort.	0	0	0	100	100	100
3	19	TRC (ug/L)	24	24	24	24	25	26
		Cum. Mort.	0	0	0	0	2	9
		Cum. % Mort.	0	0	0	0	11	47
4	20	TRC (ug/L)	11	11	11	11	12	12
		Cum. Mort.	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0
5	20	TRC (ug/L)	8	8	8	8	8	8
		Cum. Mort.	0	0	0	0	1	1
		Cum. % Mort.	0	0	0	0	5	5
Control	19	TRC (ug/L)	0	0	0	0	-0	-0
		Cum. Mort.	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0
LC-50 (ug/L) (trimmed Spearman-Karber method)						36	34	26

Table 7.5-10

Summary of total residual chlorine, observed mortalities, cumulative percent mortalities, and estimated LC-50 (Trimmed Spearman-Kärber method) during the initial 24 hrs and after each 24-hr period during intermittent exposures of monochloramine to *Daphnia magna*.

Treatment Level	No. of Daphnids at Start		Observation Time (hrs)					
			3	6	8	24	48	72
1	19	TRC (ug/L)	159	159	159	159	153	153
		Cum. Mort.	0	0	0	14	19	19
		Cum. % Mort.	0	0	0	74	100	100
2	19	TRC (ug/L)	136	136	136	136	129	129
		Cum. Mort.	0	0	0	4	18	19
		Cum. % Mort.	0	0	0	21	95	100
3	20	TRC (ug/L)	100	100	100	100	101	101
		Cum. Mort.	0	0	0	2	6	8
		Cum. % Mort.	0	0	0	10	30	40
4	20	TRC (ug/L)	75	75	75	75	72	72
		Cum. Mort.	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0
5	20	TRC (ug/L)	56	56	56	56	52	52
		Cum. Mort.	0	0	0	0	0	0
		Cum. % Mort.	0	0	0	0	0	0
Control	19	TRC (ug/L)	-6	-6	-6	-6	-3	-3
		Cum. Mort.	0	0	0	0	1	3
		Cum. % Mort.	0	0	0	0	5	16
LC-50 (ug/L) (trimmed Spearman-Kärber method)						148	108	107

DAPHNIA ACUTE TEST
 CONTINUOUS EXPOSURE
 MORTALITY DATA

Table 7.5-11

ANOVA TABLE

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	Ratio of Mean Squares: Between/Within
Between treatments	3.60	5	0.721	86.560
Within treatments	0.05	6	0.008	
Total about the Grand Average	3.65	11	0.332	
	3.65	11		

Tabled F distribution with 5 and 6 d.f., alpha 0.001= 28.84

If ratio > tabled, the differences between the treatments are significant

Chi-Square Goodness of Fit statistic= 2.51

Tabled Chi-Square with 4 d.f., alpha 0.01= 13.28

If calculated < tabled, the data are normally distributed.

Bartlett's Test for Homogeneity of Variance= -0.52

Tabled Chi-Square with 5 d.f., alpha 0.01= 15.10

If calculated < tabled, the variances are equal.

Dunnett's Test

i	1	2	3	4	5
ti=	-13.69	-13.64	-6.44	0.05	-0.85

Dunnett's critical values, alpha 0.05, infinite within d.f.:
with 5 & 6 d.f.= 2.83

If (absolute value of calculated) < tabled, there is no significant difference between that treatment and the control.

Table 7.5-12

DAPHNIA ACUTE TEST
INTERMITTENT EXPOSURE
MORTALITY DATA

ANOVA TABLE

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	Ratio of Mean Squares: Between/Within
Between treatments	3.39	5	0.678	23.341
Within treatments	0.17	6	0.029	
Total about the Grand Average	3.56	11	0.324	
	3.56	11		

Tabled F distribution with 5 and 6 d.f., alpha 0.001= 28.84

If ratio > tabled, the differences between the treatments are significant

Chi-Square Goodness of Fit statistic= 2.51

Tabled Chi-Square with 4 d.f., alpha 0.01= 13.28

If calculated < tabled, the data are normally distributed.

Bartlett's Test for Homogeneity of Variance= 2.90

Tabled Chi-Square with 5 d.f., alpha 0.01= 15.10

If calculated < tabled, the variances are equal.

Dunnett's Test

i	1	2	3	4	5
ti=	-6.07	-6.07	-1.77	1.26	1.26
Dunnett's critical values, alpha 0.05, infinite within d.f.: with 5 & 6 d.f.=					2.83

If (absolute value of calculated) < tabled, there is no significant difference between that treatment and the control.

Section 7.6 Daphnia Chronic Tests

Table 7.6-1A

TOTAL RESIDUAL CHLORINE (ug/L)

DAPHNIA CHRONIC TEST

DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL

DAY	1	2	3	4	5	CONTROL
0	36	22	11	8	2	
1	30	16	9	8		
	28	13	7	6	5	0
	32		7	10	3	-0
2		13	5		6	-1
3		15	8	2	2	0
4		14	7	3	1	0
		12	8	2	2	-2
5		13	8	4	2	-0
		16	8	2	2	1
6		14	8	3	2	-0
		14	7	4	3	0
7		16	11	3	2	-2
		15	8	2	1	2
8		12	7	6	-0	0
				4		
9						
10		16	5	2	1	-1
			6	4	1	1
						-0
						1
11		13	4	2	2	0
		10	4	2	0	
12		16	10	5	2	1
		14	10	5	4	4
13		15	7	5	2	0
		17	9	5	2	0
14		14	7	4	3	1
		15	9	4	1	1
15						
16						
17		16	7	4	4	1
		15	7	2	2	-1
18		17	9	4	4	0
		17	7	4	3	2
19		12	6	3	2	0
		15	6	1	2	0
20		16	8	3	2	1
		17	9	4	2	0
21		14	6	3	2	-1
		14	6	3	2	1
MEAN =	32	15	7	4	2	0
S.D =	4	2	2	2	1	1
MAX =	36	22	11	10	6	4
MIN =	28	10	4	1	-0	-2
N =	4	33	35	35	35	34

Table 7.6-1B

TOTAL RESIDUAL CHLORINE (ug/L)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL

	1	2	3	4	5	CONTROL
DAY						
0	93	72	58	39	16	0
1	89	72	59	37	20	0
	87	70	64	37	14	-0
2			61	41	16	1
			60	38		
3	78	69	53	35	15	1
	92	65	56	34	16	0
		73		36	16	
4	88	72	56	37	15	0
	88	76	61	38	16	1
5	93	74	60	47	21	1
	94	70	60	41	20	-1
6						
7	93	73	55	36	14	2
	92	72	56	37	13	-2
8	102	83	61	38	21	1
	101	77	59	37		-1
9						
10	87	73	60	42	19	0
	102	80	60	42	18	1
						1
11	99	77	56	36	12	0
	94	74	55	36	10	
12	97	78	60	40	14	2
	82	78		39	12	1
	94					
13	96	75	57	38	11	-0
	96	71	56	31	9	-2
14	96	75	59	39	14	2
	98	73	57	36	12	0
15						
16						
17	97	75	51	33	10	1
	91	71	58	38	12	1
18	105	78	61	39	16	2
	105	75	59	34	12	-0
					14	
19	106	81	62	40	18	-1
	104	82	58	36	14	-1
20	99	74	59	37	13	0
	97	77	58	32	9	0
MEAN =	95	75	58	38	15	0
S.D =	7	4	3	3	3	1
MAX =	106	83	64	47	21	2
MIN =	78	65	51	31	9	-2
N =	32	32	32	34	33	32

Table 7.6-2

PERCENT MONOCHLORAMINE - DPD METHOD

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	94	100				
5		100	100			
10	100	83				
14	65	83				
17	98	100				
20	100	100				
MEAN =	91	94	100			
S.D =	15	9				
MAX =	100	100	100			
MIN =	65	83	100			
N =	5	6	1	0	0	0

PERCENT MONOCHLORAMINE - DPD METHOD

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	100				100	
5	94				100	
10	95				93	
14	93	100				
17	98				100	
20	99				100	
MEAN =	97	100			99	
S.D =	3				3	
MAX =	100	100			100	
MIN =	93	100			93	
N =	6	1	0	0	5	0

Table 7.6-3

TEMPERATURE (CELCIUS)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL	DILUENT RESERVOIR
DAY							
4	19.3	19.2	19.2	19.4	19.4	19.3	18.8
13		19.3	19.3	19.4	19.4	19.2	19.4
19		20.2	20.2	20.3	20.4	18.5	20.5
MEAN =	19.3	19.6	19.6	19.7	19.7	19.0	19.6
S.D =		0.6	0.6	0.5	0.6	0.4	0.9
MAX =	19.3	20.2	20.2	20.3	20.4	19.3	20.5
MIN =	19.3	19.2	19.2	19.4	19.4	18.5	18.8
N =	1	3	3	3	3	3	3

TEMPERATURE (CELCIUS)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
4	19.8	19.8	19.8	19.7	19.8	20.0
13	19.6	19.6	19.5	19.4	19.4	19.4
19	20.4	20.4	20.4	20.4	20.2	20.3
MEAN =	19.9	19.9	19.9	19.8	19.8	19.9
S.D =	0.4	0.4	0.5	0.5	0.4	0.5
MAX =	20.4	20.4	20.4	20.4	20.2	20.3
MIN =	19.6	19.6	19.5	19.4	19.4	19.4
N =	3	3	3	3	3	3

Table 7.6-4

DISSOLVED OXYGEN (mg/L)

DAPHNIA CHRONIC TEST

DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL						DILUENT	
DAY	1	2	3	4	5	CONTROL	RESERVOIR
4	8.5	8.5	8.5	8.4	8.5	8.5	9.0
13		8.7	8.7	8.7	8.7	8.7	8.9
19		8.2	8.4	8.2	8.3	8.3	8.4
MEAN =	8.5	8.5	8.5	8.4	8.5	8.5	8.8
S.D. =		0.3	0.2	0.3	0.2	0.2	0.3
MAX =	8.5	8.7	8.7	8.7	8.7	8.7	9.0
MIN =	8.5	8.2	8.4	8.2	8.3	8.3	8.4
N =	1	3	3	3	3	3	3

DISSOLVED OXYGEN (mg/L)

DAPHNIA CHRONIC TEST

DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL						CONTROL	
DAY	1	2	3	4	5		
4	8.6	8.6	8.6	8.6	8.7	9.2	
13	8.7	8.7	8.6	8.7	8.7	8.8	
19	8.3	8.3	8.3	8.3	8.3	8.3	
MEAN =	8.5	8.5	8.5	8.5	8.6	8.8	
S.D. =	0.2	0.2	0.2	0.2	0.2	0.5	
MAX =	8.7	8.7	8.6	8.7	8.7	9.2	
MIN =	8.3	8.3	8.3	8.3	8.3	8.3	
N =	3	3	3	3	3	3	

Table 7.6-5

PERCENT OXYGEN SATURATION

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL	DILUENT RESERVOIR
DAY							
4	93	92	92	91	93	93	96
13		95	95	96	95	95	98
19		92	92	92	92	92	93
MEAN =	93	93	93	93	93	93	96
S.D =		2	2	3	2	2	3
MAX =	93	95	95	96	95	95	98
MIN =	93	92	92	91	92	92	93
N =	1	3	3	3	3	3	3

PERCENT OXYGEN SATURATION

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
4	94	94	95	94	95	98
13	95	95	94	95	95	96
19	92	92	92	92	92	92
MEAN =	94	94	94	94	94	95
S.D =	2	2	2	2	2	3
MAX =	95	95	95	95	95	98
MIN =	92	92	92	92	92	92
N =	3	3	3	3	3	3

Table 7.6-6

pH

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	8.31	8.32	8.32	8.30	8.30	8.25
10		8.36	8.33	8.33	8.30	8.25
14		8.41	8.42	8.41	8.43	8.43
18		8.23	8.25	8.26	8.27	8.28
20		8.46	8.45	8.45	8.45	8.45
MAX =	8.31	8.46	8.45	8.45	8.45	8.45
MIN =	8.31	8.23	8.25	8.26	8.27	8.25
N =	1	5	5	5	5	5

pH

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	8.32	8.30	8.31	8.31	8.29	8.30
10	8.37	8.35	8.36	8.36	8.35	8.36
14	8.41	8.37	8.40	8.42	8.41	8.41
18	8.16	8.17	8.16	8.16	8.18	8.21
20	8.45	8.45	8.46	8.45	8.46	8.45
MAX =	8.45	8.45	8.46	8.45	8.46	8.45
MIN =	8.16	8.17	8.16	8.16	8.18	8.21
N =	5	5	5	5	5	5

Table 7.6-7

UNIONIZED AMMONIA-NITROGEN (ug/L)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	2	2	2	2	2	5
4	5	5	6	5	5	5
10		2	2	3	2	2
14		2	3	3	2	2
18		3	3	3	3	3
20		4	4	4	4	4
MEAN =	4	3	3	3	3	3
S.D =	2	1	2	1	1	1
MAX =	5	5	6	5	5	5
MIN =	2	2	2	2	2	2
N =	2	6	6	6	6	6

UNIONIZED AMMONIA-NITROGEN (ug/L)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

INTERMITTENT EXPOSURE

EXPOSURE LEVEL	1	2	3	4	5	CONTROL
DAY						
3	7	6	5	4	3	23
4	10	9	8	7	6	9
10	8	7	6	5	4	5
14	7	6	5	5	3	5
18	8	8	5	4	3	6
20	9	7	7	6	4	8
MEAN =	8	7	6	5	4	9
S.D =	1	1	1	1	1	7
MAX =	10	9	8	7	6	23
MIN =	7	6	5	4	3	5
N =	6	6	6	6	6	6

Table 7.6-8
ALKALINITY and HARDNESS (mg/L CaCO_3)

DAPHNIA CHRONIC TEST
DECEMBER 2 - DECEMBER 23, 1988

CONTINUOUS EXPOSURE

	ALKALINITY	HARDNESS
DAY		
5	98	163
7	98	159
11	102	169
14	116	171
18	114	171
21	112	163
MEAN =	107	166
S.D =	8	5
MAX =	116	171
MIN =	98	159
N =	6	6

Table 7.6-9A. Water quality variables observed during the chronic toxicity test of intermittent exposure of Daphnia magna to monochloramine under the renewal regime.

Parameter	Exposure Concentration (TRC ug/L)					
	Control	30	68	88	119	144
Temperature (celcius)						
Mean	18.9	18.9	18.9	18.9	18.8	18.8
± S.D.	0.25	0.25	0.29	0.32	0.31	0.23
Range	(18.3-19.4)	(18.4-19.3)	(18.5-19.8)	(18.4-19.3)	(18.3-19.1)	(18.5-18.9)
N	20	21	21	8	5	3
Dissolved Oxygen (mg/L)						
Mean	6.9	7.0	6.9	6.6	6.6	6.5
± S.D.	0.58	0.71	0.56	0.20	0.25	0.06
Range	(6.2-8.3)	(6.5-8.3)	(6.2-8.4)	(6.3-6.8)	(6.4-7.0)	(6.5-6.6)
N	20	21	21	8	5	3
pH						
Range	(6.4-6.7)	(6.8-7.0)	(6.8-7.1)	(6.8-7.0)	(6.4-6.8)	(6.9)
N	4	4	4	2	2	1
Total ammonia (ug/L)						
Mean	41	41	30	14	22	-
± S.D.	27	28	47	-	-	-
Range	(15-69)	(13-69)	(1-85)	-	-	-
N	3	3	3	1	1	-
Total alkalinity (mgCaCO ₃)						
Mean	120	-	-	-	-	-
± S.D.	4	-	-	-	-	-
Range	(116-124)	-	-	-	-	-
N	3	-	-	-	-	-
Hardness (m EQ/L)						
Mean	166	-	-	-	-	-
± S.D.	2	-	-	-	-	-
Range	(164-168)	-	-	-	-	-
N	3	-	-	-	-	-

Table 7.6-98. Water quality variables observed during the chronic toxicity test of intermittent exposure of Daphnia magna to monochloramine under the constant-flow regime.

Parameter	Exposure Concentration (TRC ug/L)					
	Control	26	57	83	120	161
Temperature (celcius)						
Mean	19.3	19.3	19.3	19.3	19.1	19.1
± S.D.	0.51	0.54	0.53	0.53	-	-
Range	(18.8-20.0)	(18.5-20.0)	(18.4-20.0)	(18.3-20.0)	-	-
N	21	21	21	21	1	1
Dissolved Oxygen (mg/L)						
Mean	7.4	7.5	7.5	7.5	7.1	7.1
± S.D.	0.49	0.47	0.48	0.45	-	-
Range	(6.4-8.3)	(6.5-8.3)	(6.5-8.4)	(6.6-8.3)	-	-
N	21	21	21	21	1	1
pH						
Range	(6.5-6.7)	(6.9-7.1)	(6.9-7.1)	(6.9-7.1)	(6.9)	(6.9)
N	3	3	3	3	1	1
Total ammonia (ug/L)						
Mean	24	85	110	62	-	-
± S.D.	-	-	-	71	-	-
Range	-	-	-	(11-112)	-	-
N	1	1	1	2	-	-
Total alkalinity (mgCaCO ₃)						
Mean	124	-	-	-	-	-
± S.D.	0	-	-	-	-	-
Range	-	-	-	-	-	-
N	2	-	-	-	-	-
Hardness (m EQ/L)						
Mean	170	-	-	-	-	-
± S.D.	3	-	-	-	-	-
Range	(168-172)	-	-	-	-	-
N	2	-	-	-	-	-

Table 7.6-10. Summary of total residual chlorine (TRC) concentrations (measured amperometrically) and percent monochlorine (DPD titrametric method) at each exposure level tested during chronic intermittent exposures to Daphnia magna under renewal and constant-flow conditions.

Exposure System/Parameter	Exposure Level					Control
	1	2	3	4	5	
<u>Renewal</u>						
TRC, ug/L						
Nominal value	150	120	90	60	30	0
Overall mean (N)	144(3)	119(5)	88(9)	68(20)	30(20)	0(41)
± S.D.	2	9	9	8	5	-
(Range)	(142-145)	(107-129)	(72-99)	(56-86)	(20-37)	-
Percent monochloramine (N)	100(1)	100(1)	100(1)	100(4)	98(4)	-
<u>Constant-flow</u>						
TRC, ug/L						
Nominal value	150	120	90	60	30	0
Overall mean (N)	161(1)	120(2)	83(21)	57(20)	26(21)	0(53)
± S.D.	-	6	10	6	3	-
(Range)	-	(116-125)	(59-96)	(47-68)	(17-32)	-
Percent monochloramine (N)	-	91(1)	96(3)	92(3)	100(2)	-

Table 7.6-11

Mortalities observed after each 24-hr period through 21 days of continuous exposure of monochloramine to *Daphnia magna*. Shown are total number of mortalities removed during each interval with cumulative percentage mortality through that day in parentheses.

[illegible]

Table 7.6-12

Mortalities observed after each 24-hr period through 21 days of intermittent exposures of monochloramine to *Daphnia magna*. Shown are total number of mortalities removed during each interval with cumulative percentage mortality through that day in parentheses.

[illegible]

Table 7.6-13

DAPHNIA CHRONIC TEST
CONTINUOUS EXPOSURE
MORTALITY DATA

ANOVA TABLE

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	Ratio of Mean Squares: Between/Within
Between treatments	1.85	5	0.370	21.974
Within treatments	0.10	6	0.017	
Total about the Grand Average	1.95	11	0.178	
	1.95	11		

Tabled F distribution with 5 and 6 d.f., $\alpha = 0.001 = 28.84$

If ratio > tabled, the differences between the treatments are significant[†]

Chi-Square Goodness of Fit statistic= 2.51

Tabled Chi-Square with 4 d.f., $\alpha = 0.01 = 13.28$

If calculated < tabled, the data are normally distributed.

Bartlett's Test for Homogeneity of Variance= -10.27

Tabled Chi-Square with 5 d.f., $\alpha = 0.01 = 15.10$

If calculated < tabled, the variances are equal.

Dunnett's Test

i	1	2	3	4	5
ti=	-8.62	-0.92	-1.15	-0.92	0.00
Dunnett's critical values, $\alpha = 0.05$, infinite within d.f.:					
with 5 & 6 d.f.=					2.83

If (absolute value of calculated) < tabled, there is no significant difference between that treatment and the control.

Table 7.6-14

DAPHNIA CHRONIC TEST
INTERMITTENT EXPOSURE
MORTALITY DATA

ANOVA TABLE

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Square	Ratio of Mean Squares: Between/Within
Between treatments	1.14	5	0.228	3.655
Within treatments	0.37	6	0.062	
Total about the Grand Average	1.51	11	0.138	
	1.51	11		

Tabled F distribution with 5 and 6 d.f., $\alpha = 0.001 = 28.84$

If ratio > tabled, the differences between the treatments are significant

Chi-Square Goodness of Fit statistic = 2.51

Tabled Chi-Square with 4 d.f., $\alpha = 0.01 = 13.28$

If calculated < tabled, the data are normally distributed.

Bartlett's Test for Homogeneity of Variance = -4.43

Tabled Chi-Square with 5 d.f., $\alpha = 0.01 = 15.10$

If calculated < tabled, the variances are equal.

Dunnett's Test

i	1	2	3	4	5
ti =	-3.05	-0.64	0.95	-0.02	-0.42
Dunnett's critical values, $\alpha = 0.05$, infinite within d.f.:					
with 5 & 6 d.f. =					2.83

If (absolute value of calculated) < tabled, there is no significant difference between that treatment and the control.

Table 7.6-15. Mortalities observed after each 24-hr period through 21 days of intermittent exposure of monochloramine to Daphnia magna under renewal and constant-flow conditions. Shown are total number of mortalities removed during each interval with cumulative percentage mortality through that day in parentheses.

Mean Exposure No. of Concentration Daphnids (µg/L as TRC)	Observation Time (Days)																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
<u>Renewal</u>																					
144	10	2(20) 7(90) 1 (100 percent mortality) -----0(100)																			
119	10	0(0) 3(30) 6(90) 0(90) 1 (100 percent mortality) -----8(100)																			
88	10	0(0) 0(0) 1(10) 8(90) 0(90) 0(90) 0(90) 1 (100 percent mortality) -----0(100)																			
68	10	0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10) 1(10)																			
30	10	(No mortalities observed in 21 days) -----0(0)																			
Control	9	0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11) 1(11)																			
<u>Constant-flow</u>																					
161	10	10 (100 percent mortality) -----0(100)																			
120	10	5(50) 10 (100 percent mortality) -----0(100)																			
83	10	0(0) 1(10) 1(10) 2(30) 3(30) 3(30) 3(30) 1(40) 1(50) 1(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60) 0(60)																			
57	10	(No mortalities observed in 21 days) -----0(0)																			
26	10	(No mortalities observed in 21 days) -----0(0)																			
Control	10	(No mortalities observed in 21 days) -----0(0)																			

Table 7.6-16. Daily LC50 estimates (TRC, ug/L) for two separate 21-day chronic intermittent exposures of *Daphnia magna* to monochloramine performed using different exposure systems.^a

Day of Exposure	Exposure System	
	Renewal	Constant-flow
1	>144	118
2	120	96
3	102	96
4	82	89
5	79	89
6	79	89
7	79	89
8	79	86
9	78 ^b	83 ^b
10	78	80 ^b
11	78	80
12	78	80
13	78	80
14	78	80
15	78	80
16	78	80
17	78	80
18	78	80
19	78	80
20	78	80
21	78	80

^aEstimates were made following the methods of Litchfield and Wilcoxon (1948), Hamilton et al. (1978), or Gelber et al. (1985); whichever produced an estimate.

^bThere was no additional mortality after 9 days in the renewal test and none after 10 days in the constant-flow test.

Table 7.6-17. Mean body lengths (mm) of surviving Daphnia after 21 days of chronic intermittent monochloramine exposure under a renewal regime.

	Mean TRC Concentration (ug/L)		
	Control	30	68
Mean length	3.53	3.48	3.22 ^a
S.D.	0.16	0.10	0.15
CV (%)	4.40	2.90	4.60
Range	(3.33-3.70)	(3.27-3.64)	(2.97-3.45)
N	8	9	9

^aSignificantly less than the control by Dunnett's multiple comparison test ($\alpha = 0.01$).

Table 7.6-18. Mean body lengths (mm) of surviving Daphnia after 21 days of chronic intermittent monochloramine exposure under constant-flow regime.

	Mean TRC Concentration (ug/L)			
	Control	26	57	83
Mean length ^a	3.10	3.06	2.86	3.00
SD	0.24	0.35	0.32	0.39
CV (%)	7.80	11.50	11.20	13.20
Range	(2.54-3.33)	(2.36-3.33)	(2.42-3.33)	(2.42-3.33)
N	10	9	7 ^b	4

^aResults of Dunnett's multiple comparison test showed that no group was significantly different from the controls ($\alpha = 0.05$).

^bTwo daphnids were not measured.

Table 7.6-19. Mean body lengths (mm) of surviving *Daphnia* measured at days 21 and 35 following 21 days of chronic continuous mono-chloramine exposure under a maintenance diet (flow-through) regime.

	Mean TRC Concentration (ug/L)				
	Control	2	4	7	15
Mean length (day 21)	2.35	2.44	2.33	2.50	2.37
S.D.	0.12	0.16	0.13	0.11	0.06
CV (%)	5.3	6.5	5.7	4.5	2.6
(Range)	2.09-2.48	2.18-2.73	2.12-2.51	2.27-2.67	2.30-2.48
N	10	10	9	8	8
Mean length (day 35)	3.61	3.61	3.43 ^a	3.51	3.56
S.D.	0.17	0.12	0.15	0.10	0.09
CV (%)	4.8	3.5	4.3	3.0	2.7
(Range)	3.21-3.82	3.33-3.82	3.21-3.64	3.39-3.64	3.39-3.70
N	8	10	9	7	9

^aSignificantly less than the control ($p \leq 0.05$) by Dunnett's multiple comparison test ($\alpha = 0.05$).

Table 7.6-20. Mean body lengths (mm) of surviving Daphnia measured at days 21 and 35 following 21 days of chronic intermittent monochloramine exposure under a maintenance diet (flow-through) regime.

	Mean TRC Concentration (ug/L)					
	Control	15	38	58	75	95
Mean length (day 21)	2.75	2.59	2.49	2.42** ^a	2.05**	2.42
S.D.	0.09	0.10	0.08	0.20	0.34	-
CV (%)	3.2	3.8	3.2	5.2	16.5	-
Range	2.67-2.88	2.42-2.67	2.42-2.61	1.94-2.63	1.58-2.42	-
N	8	6	6	10	7	1
Mean length (day 35)	3.58	3.53	3.50	3.43	3.38* ^b	3.64
S.D.	0.11	0.11	0.09	0.16	0.20	-
CV (%)	3.2	3.2	2.6	4.6	5.8	-
Range	3.33-3.70	3.33-3.64	3.39-3.64	3.21-3.64	3.09-3.58	-
N	8	6	7	10	7	1

^aSignificantly less than the control ($p \leq 0.01$) by Dunnett's multiple comparison test ($\alpha = 0.05$).

^bSignificantly less than control ($p \leq 0.05$).

