APPENDIX 7B.11

CHIRONOMUS TENANS, 10-DAY ACUTE TOXICITY TESTS

Aquatec Biological Sciences

Ecology | Environmental Toxicology | Natural Resource Assessments | Microbiology

August 26, 1999

Charles Menzie, Ph.D.
Menzie-Cura & Associates, Inc.
1 Courthouse Lane, Suite 2
Chelmsford, Massachusetts 01824

Dear Dr. Menzie:

Enclosed please find one unbound copy of the report of *Chironomus tentans* 10-day survival and growth tests completed on samples received for the Industriplex project.

If you have any questions regarding the report, please contact me or Dr. Philip C. Downey.

Sincerely,

John Williams
Manager, Environmental Toxicology
ciblr3152ct.doc

75 Green Mountain Drive, South Burlington, Vt. 05403 Tel: 802.860.1638 Fax: 802.658.3189

Results of
Chironomus tentans Survival and Growth
Sediment Toxicity Tests

Reference BTRs 3152, 3153, 3169, 3189, 3196

Prepared for:
Menzie-Cura & Associates
1 Courthouse Lane, Suite 2
Chelmsford, MA 01824

August 1999

Aquatec Biological Sciences

Ecology | Environmental Toxicology | Natural Resource Assessments | Microbiology

BTRs 3152, 3153, 3169, 3189, 3196

PROJECT: 99026

I have reviewed this data package, which was completed under my supervision. This data package is complete, and to the best of my ability, accurately reflects the conditions and the results of the reported tests.

John W. Williams
Toxicity Laboratory Manager

8/25/99
Date

I have reviewed and discussed this data package with the responsible laboratory manager. Based on this review, the data package was, to the best of my knowledge and belief, conducted in accordance with established company quality assurance procedures.

Philip C. Downey, Ph.D.
Director

8/25/99
Date

75 Green Mountain Drive, South Burlington, Vt. 05403 Tel: 802.860.1638 Fax: 802.658.3189

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EXECUTIVE SUMMARY

Results of Toxicity Tests
Conducted June 20-July 6, 1999
for Menzie-Cura & Associates
Industriplex Site

Laboratory Sample ID	Client Sample ID	Species	Mean Survival (%)	Mean Dry Weight (mg)
10219	SD-04 Hall's Brook	*Chironomus tentans*	99	1.358
10220	SD-12 Hall's Brook	*Chironomus tentans*	94	1.836
10221	SD-13 Aberjona River	*Chironomus tentans*	84	1.585
10223	Laboratory Control	*Chironomus tentans*	93	1.648
10224	SD-03 Phillips Pond	*Chironomus tentans*	98	1.995
10341	SD-01 Aberjona S. Branch	*Chironomus tentans*	95	1.360 *
10342	SD-02 South Pond	*Chironomus tentans*	88	1.629
10343	SD-10 HBHA Creek	*Chironomus tentans*	88	1.596
10344	SD-11 HBHA Pond	*Chironomus tentans*	96	1.292 *
10346	Laboratory Control	*Chironomus tentans*	93	1.741
10446	SD-06 HBHA	*Chironomus tentans*	94	0.959
10447	SD-07 HBHA	*Chironomus tentans*	49 *	0.169 *
10449	Laboratory Control	*Chironomus tentans*	94	1.314
10472	SD-8	*Chironomus tentans*	95	0.997
10473	SD-9	*Chironomus tentans*	94	1.076
10474	SD-5	*Chironomus tentans*	1 *	0.116 *
10475	SD-5DUP	*Chironomus tentans*	8 *	0.052 *

* Statistically significantly different from the laboratory control sediment ($p \leq 0.05$)

INTRODUCTION:

Samples were received for toxicity testing at Aquatec Biological Sciences of 75 Green Mountain Drive, South Burlington, Vermont. Tests were conducted at Aquatec Biological Sciences. The results of the following tests are reported:

Client:	Menzie-Cura & Associates
Facility/Location:	Industriplex Site
Initial Sampling Date:	June 17, 1999
Testing Date:	June 20-July 6, 1999
Tests Conducted:	Midge, *Chironomus tentans*, 10-day Survival and Growth

METHODS:

The procedures followed in conducting these toxicity tests were based on methods described by the USEPA (EPA 600/R-94/024). Specific test parameters for the *Chironomus tentans* whole sediment toxicity test are listed in Table 1. Testing was completed in three separate groupings based upon chronological sequencing from the time of sediment collection. The objective for the test groupings was to complete the 10-day acute tests prior to expiration of a 14-day sediment storage time so that subsequent chronic toxicity tests could be started within a 14-day time frame. The first testing group was initiated on June 20, 1999. The second testing group was initiated on June 24, 1999. The third testing group was initiated on June 26, 1999. A laboratory control (artificial sediment) was included with each testing group. Statistical comparisons were performed against the concurrent laboratory control.

PROTOCOL DEVIATIONS

Replicate C of Sample 10221 (SD-13 Aberjona River) was excluded from data analysis. No larvae were recovered from this replicate, in contrast the remaining seven replicates where 90-to-100 percent recovery of larvae occurred. It is possible that larvae were inadvertently not distributed to this replicate when the test was started.

RESULTS:

Summary result tabulations for the *Chironomus tentans* whole sediment toxicity tests are located in Appendix A.

Group 1 Test Results: This group included samples 10219 (SD-04 Hall's Brook), 10220 (SD-12 Hall's Brook), 10221 (SD-13 Aberjona River), and 10224 (SD-03 Phillips Pond). None of the samples in this testing group had survival or growth responses that were significantly less than the Laboratory Control sample (10223). All of the samples within this testing group were scheduled for chronic toxicity testing.

Group 2 Test Results: This group included samples 10341 (SD-01 Aberjona S. Branch), 10342 (SD-02 South Pond), 10343 (SD-10 HBHA Creek), and 10344 (SD-11 HBHA Pond). None of the samples in this testing group had survival responses that were significantly less than the Laboratory Control sample (10346). Two of the samples, 10341 (SD-01 Aberjona S. Branch) and 10344 (SD-11 HBHA Pond) had growth responses which were significantly less than the Laboratoy Control. All of the samples within this testing group were scheduled for chronic toxicity testing.

Group 3 Test Results: This group included samples 10446 (SD-06 HBHA), 10447 (SD-07 HBHA), 10472 (SD-8), 10473 (SD-9), 10474 (SD-5), and 10475 (SD-5DUP). Survival and growth responses for Samples 10446 (SD-06 HBHA), 10472 (SD-8), and 10473 (SD-9) were not significantly less than the Laboratory Control sample (10449). Both survival and growth responses for Samples 10447 (SD-07 HBHA), 10474 (SD-5), and 10475 (SD-5DUP) were significantly less than the Laboratory Control. Samples 10446 (SD-06 HBHA), 10472 (SD-8), and 10473 (SD-9) were scheduled for chronic toxicity testing. Samples 10447 (SD-07 HBHA), 10474 (SD-5), and 10475 (SD-5DUP) exhibited acute toxicity (defined as <50% survival and/or statistically lower than the control) and were not scheduled for chronic toxicity testing.

Total Ammonia and Sulfide: Porewater and overlying water ammonia concentrations for samples 10474 (SD-5) and 10475 (SD-5DUP) were measured as approximately 2000 and 200

mg/L respectively. The presence of high ammonia concentrations in the porewater of these samples was communicated to Dr. Menzie of Menzie-Cura Associates during testing. Total sulfide was less than 0.5 in porewater for all samples, therefore, testing fo sulfide in overlying water was not conducted.

QUALITY ASSURANCE:

A standard reference toxicant SRT test was conducted for each batch *Chironomus tentans* used in testing. The resulting LC50 values fell within control chart limits and were viewed as being acceptable.

Table 1. Test Conditions for the Midge *(Chironomus tentans)* 10-day Whole Sediment Survival and Growth Toxicity Test.

ASSOCIATED PROTOCOL: EPA, 1994. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates Method 100.1* (EPA/600/R-94/024).

1. Test type:	Whole-sediment toxicity (static renewal)
2. Temperature:	23 ± 1 °C
3. Light quality:	Wide-spectrum fluorescent lights
4. Light illuminance:	500 to 1000 lux
5. Photoperiod:	16 hr. light, 8 hr. dark
6. Test chamber size:	300 mL beaker
7. Sediment volume:	100 mL (distributed to test chambers on the day prior to administration of test organisms)
8. Overlying water volume:	175 mL
9. Renewal of overlying water:	Twice daily
10. Age of test organism:	3rd instar (approximately 9-11 days post-hatch) or younger
11. Number of organisms/test chamber:	10
12. Number of replicate test chambers / treatment:	8
13. Feeding regime:	1.5 mL Tetrafin suspension daily (1.5 mL contains 4.0 mg of dry solids)
14. Aeration:	None unless dissolved oxygen in overlying water drops below 40 % saturation or demonstrates a declining trend during daily monitoring. If required, aeration will be sufficiently gentle to prevent resuspension of sediments to the overlying water. Additional water renewals may be used in lieu of aeration.

Table 1. Test Conditions for the Midge *(Chironomus tentans)* 10-day Whole Sediment Survival and Growth Toxicity Test (continued).

15. Overlying water:	Reconstituted water (EPA/600/R-94/024)
16. Control sediment:	Formulated sediment (EPA/600/R-94/024, Section 7.2.3.2)
17. Test chamber cleaning:	None
18. Monitoring:	
Overlying water	
Temperature	Daily
Dissolved oxygen	Daily
pH	Daily
Conductivity	Beginning and end of test
Alkalinity	Beginning and end of test
Hardness	Beginning and end of test
Ammonia	Beginning and end of test
Organism behavior	Within 2 hours to remove "floaters" Daily
19. Test duration:	10 days.
20. End points:	Survival and growth (dry weight of larvae to 0.01 mg, 60°C overnight), by replicate
21. Reference toxicant:	96-h acute, water only (KCl)
22. Test acceptability:	Minimum mean control survival of 70% and performance-based criteria outlined in EPA/600/R-94/024, Table 12.3
23. Statistical analysis and data interpretation:	Arc-sine (square-root) transformation of survival data. Homogeneity and normality tests followed by hypothesis testing versus the negative control responses. If responses in a test sample were greater than the control responses, the sample responses were viewed as being not significant by direct observation (statistical analysis not performed).

APPENDIX: A

Midge (*Chironomus tentans*) Sediment Toxicity Test Results

BTR Number: 3152/3153 Project Number: 99026 Test Start Date: 6/20/99

Species: *Chironomus tentans* Test End Date: 6/30/99

Project Description: Aquatec Biological Sciences Industriplex

Sample Number	Replicate	Start Count	Total No. Surviving	*Proportion Surviving*	*Mean Proportion Surviving*	Initial Boat Weight (mg)	Total Dry Weight (mg)	No. of Organisms Weighed	*Mean Weight Within Replicate (mg)*	*Mean Weight Over All Replicates (mg)*
10219	A	10	10	1.00		31.82	43.93	10	1.211	
	B	10	10	1.00		34.78	48.26	10	1.348	
	C	12	12	1.00		36.63	53.90	12	1.439	
	D	10	10	1.00		38.23	54.19	10	1.596	
	E	10	9	0.90		37.35	49.19	9	1.316	
	F	10	10	1.00		36.66	50.99	10	1.433	
	G	10	10	1.00		38.84	49.99	10	1.115	
	H	10	10	1.00	0.99	34.92	48.97	10	1.405	1.358
10220	A	10	9	0.90		27.08	45.48	9	2.044	
	B	10	9	0.90		26.96	42.70	9	1.749	
	C	10	10	1.00		29.31	45.81	10	1.650	
	D	10	10	1.00		29.90	46.83	10	1.693	
	E	10	10	1.00		32.83	50.75	10	1.792	
	F	10	10	1.00		31.09	49.37	10	1.828	
	G	10	10	1.00		27.27	47.71	10	2.044	
	H	10	7	0.70	0.94	28.50	41.72	7	1.869	1.836
10221	A	10	10	1.00		27.96	43.01	10	1.505	
	B	10	10	1.00		28.25	42.20	10	1.395	
	C	10	0	0.00		26.56	26.56	0	0.000	
	D	10	9	0.90		29.60	44.81	9	1.690	
	E	10	10	1.00		31.08	49.15	10	1.807	
	F	10	9	0.90		30.57	42.96	9	1.377	
	G	10	10	1.00		30.09	46.69	10	1.660	
	H	10	9	0.90	0.84	26.62	41.55	9	1.659	1.585
10223	A	10	10	1.00		32.65	49.10	10	1.645	
	B	10	10	1.00		31.85	49.94	10	1.809	
	C	10	7	0.70		34.63	51.19	7	2.366	
	D	10	10	1.00		27.82	44.83	10	1.701	
	E	10	9	0.90		33.28	46.00	9	1.413	
	F	10	10	1.00		33.50	47.06	10	1.356	
	G	10	9	0.90		30.42	48.65	9	2.026	
	H	10	9	0.90	0.93	32.57	40.36	9	0.866	1.648
10224	A	10	10	1.00		25.53	44.66	10	1.913	
	B	10	10	1.00		25.52	43.89	10	1.837	
	C	10	10	1.00		27.35	47.02	10	1.967	
	D	10	9	0.90		25.99	45.59	9	2.178	
	E	10	9	0.90		26.13	44.69	9	2.062	
	F	11	11	1.00		24.49	46.73	11	2.022	
	G	10	10	1.00		29.74	48.93	10	1.919	
	H	10	10	1.00	0.98	29.41	50.02	10	2.061	1.995

Midge (*Chironomus tentans*) Sediment Toxicity Test Results

BTR Number: 3169 Project Number: 99026 Test Start Date: 6/24/99
Species: *Chironomus tentans* Test End Date: 7/4/99
Aquatec Biological Sciences
Project Description: Industriplex

Sample Number	Replicate	Start Count	Total No. Surviving	*Proportion Surviving*	*Mean Proportion Surviving*	Initial Boat Weight (mg)	Total Dry Weight (mg)	No. of Organisms Weighed	*Mean Weight Within Replicate (mg)*	*Mean Weight Over All Replicates (mg)*
10341	A	10	10	1.00		52.17	66.05	10	1.388	
	B	10	9	0.90		51.18	65.14	9	1.551	
	C	10	9	0.90		49.23	63.16	9	1.548	
	D	10	10	1.00		49.99	63.05	10	1.306	
	E	10	9	0.90		52.45	63.34	9	1.210	
	F	10	10	1.00		53.52	65.24	10	1.172	
	G	10	10	1.00		49.94	65.19	10	1.525	
	H	10	9	0.90	0.95	49.54	60.15	9	1.179	1.360
10342	A	10	9	0.90		37.60	51.30	9	1.522	
	B	10	9	0.90		49.97	62.16	9	1.354	
	C	10	10	1.00		37.54	52.21	10	1.467	
	D	10	6	0.60		35.85	48.46	6	2.102	
	E	10	10	1.00		35.37	49.14	10	1.377	
	F	10	9	0.90		48.56	63.31	9	1.639	
	G	10	9	0.90		43.42	58.86	9	1.716	
	H	10	8	0.80	0.88	48.86	63.71	8	1.856	1.629
10343	A	10	9	0.90		43.55	57.12	9	1.508	
	B	10	8	0.80		37.67	51.02	8	1.669	
	C	10	9	0.90		37.51	51.36	9	1.539	
	D	10	8	0.80		37.84	53.13	8	1.911	
	E	10	10	1.00		43.55	60.06	10	1.651	
	F	10	9	0.90		43.08	57.48	9	1.600	
	G	10	8	0.80		34.84	46.16	8	1.415	
	H	10	9	0.90	0.88	37.51	50.77	9	1.473	1.596
10344	A	10	9	0.90		45.42	54.33	9	0.990	
	B	10	10	1.00		37.65	48.26	10	1.063	
	C	10	10	1.00		42.53	56.77	10	1.424	
	D	10	10	1.00		48.74	61.44	10	1.270	
	E	10	10	1.00		44.51	56.70	10	1.219	
	F	10	10	1.00		42.84	55.73	10	1.289	
	G	10	10	1.00		43.15	57.32	10	1.417	
	H	10	8	0.80	0.96	39.43	52.76	8	1.666	1.292
10346	A	10	8	0.80		48.40	59.91	8	1.439	
	B	10	10	1.00		44.62	57.48	10	1.286	
	C	10	9	0.90		45.55	60.91	9	1.707	
	D	10	10	1.00		40.11	59.35	10	1.924	
	E	10	10	1.00		42.33	58.42	10	1.609	
	F	10	10	1.00		40.00	57.76	10	1.776	
	G	10	8	0.80		43.81	59.48	8	1.959	
	H	10	9	0.90	0.93	38.36	58.44	9	2.231	1.741

Midge (*Chironomus tentans*) Sediment Toxicity Test Results

BTR Number: 3189/3196 Project Number: 99026 Test Start Date: 6/26/99
Species: *Chironomus tentans* Test End Date: 7/6/99
Aquatec Biological Sciences
Project Description: Industriplex

Sample Number	Replicate	Start Count	Total No. Surviving	Proportion Surviving	Mean Proportion Surviving	Initial Boat Weight (mg)	Total Dry Weight (mg)	No. of Organisms Weighed	Mean Weight Within Replicate (mg)	Mean Weight Over All Replicates (mg)
10446	A	11	11	1.00		38.08	50.40	11	1.120	
	B	10	5	0.50		37.67	43.16	5	1.098	
	C	10	10	1.00		34.76	42.79	10	0.803	
	D	10	10	1.00		37.36	45.82	10	0.846	
	E	10	10	1.00		39.89	51.38	10	1.149	
	F	10	10	1.00		37.40	43.95	10	0.655	
	G	10	10	1.00		43.87	54.53	10	1.066	
	H	10	10	1.00	0.94	35.98	45.32	10	0.934	0.959
10447	A	10	5	0.50		33.23	34.64	5	0.282	
	B	10	9	0.90		38.02	39.68	9	0.184	
	C	10	4	0.40		35.84	36.23	4	0.097	
	D	10	8	0.80		35.54	36.75	8	0.151	
	E	10	1	0.10		31.90	32.01	1	0.110	
	F	10	3	0.30		34.67	35.23	3	0.187	
	G	10	5	0.50		33.73	34.57	5	0.168	
	H	10	4	0.40	0.49	35.28	35.96	4	0.170	0.169
10449	A	10	9	0.90		35.87	41.41	9	0.616	
	B	10	10	1.00		33.54	51.66	10	1.812	
	C	10	10	1.00		33.26	43.95	10	1.069	
	D	10	9	0.90		37.16	46.42	9	1.029	
	E	10	10	1.00		35.04	51.69	10	1.665	
	F	10	10	1.00		32.05	45.12	10	1.307	
	G	10	9	0.90		34.06	44.19	9	1.126	
	H	10	8	0.80	0.94	36.77	51.90	8	1.891	1.314
10472	A	10	9	0.90		42.01	54.44	9	1.381	
	B	10	9	0.90		40.86	50.07	9	1.023	
	C	10	10	1.00		37.34	45.37	10	0.803	
	D	10	9	0.90		34.32	43.72	9	1.044	
	E	10	10	1.00		33.05	43.05	10	1.000	
	F	10	10	1.00		30.97	40.02	10	0.905	
	G	11	11	1.00		35.76	46.28	11	0.956	
	H	10	9	0.90	0.95	33.21	40.94	9	0.859	0.997
10473	A	10	10	1.00		36.05	43.92	10	0.787	
	B	10	9	0.90		38.70	47.82	9	1.013	
	C	10	10	1.00		39.13	48.42	10	0.929	
	D	10	9	0.90		38.62	51.64	9	1.447	
	E	10	10	1.00		39.23	49.76	10	1.053	
	F	10	8	0.80		33.45	44.63	8	1.423	
	G	10	9	0.90		35.73	45.39	9	1.073	
	H	10	10	1.00	0.94	41.63	50.50	10	0.887	1.076

Midge (*Chironomus tentans*) Sediment Toxicity Test Results

BTR Number: 3189/3196 Project Number: 99026 Test Start Date: 6/26/99

Species: *Chironomus tentans* Test End Date: 7/6/99

Aquatec Biological Sciences

Project Description: Industriplex

Sample Number	Replicate	Start Count	Total No. Surviving	*Proportion Surviving*	*Mean Proportion Surviving*	Initial Boat Weight (mg)	Total Dry Weight (mg)	No. of Organisms Weighed	*Mean Weight Within Replicate (mg)*	*Mean Weight Over All Replicates (mg)*
10474	A	10	0	0.00		0.00	0.00	0	0.000	
	B	10	0	0.00		0.00	0.00	0	0.000	
	C	10	0	0.00		0.00	0.00	0	0.000	
	D	10	0	0.00		0.00	0.00	0	0.000	
	E	10	0	0.00		0.00	0.00	0	0.000	
	F	10	0	0.00		0.00	0.00	0	0.000	
	G	10	1	0.10		36.34	37.27	1	0.930	
	H	10	0	0.00	0.01	0.00	0.00	0	0.000	0.116
10475	A	10	0	0.00		0.00	0.00	0	0.000	
	B	10	0	0.00		0.00	0.00	0	0.000	
	C	10	0	0.00		0.00	0.00	0	0.000	
	D	10	0	0.00		0.00	0.00	0	0.000	
	E	10	0	0.00		0.00	0.00	0	0.000	
	F	10	0	0.00		0.00	0.00	0	0.000	
	G	10	2	0.20		37.12	37.57	2	0.225	
	H	10	4	0.40	0.08	35.85	36.62	4	0.192	0.052

APPENDIX: B

Industri-Plex Site
CHAIN OF CUSTODY RECORD

Project No.	Project Name:	Project Location:
578	Industriplex	Woburn, MA

DATE: 6/17/99

SAMPLERS: CAM/PK

MENZIE-CURA & ASSOCIATES, INC.
1 COURTHOUSE LANE, SUITE 2
CHELMSFORD, MA 01824
TEL: 978/453-4300 FAX: 978/453-7260

Analyses Required

SAMPLE ID	Date	Comp.	Grab	Station Locations	No. of Containers	Acute Chironomus	Acute Hyalella	Chronic Chironomus	Chronic Hyalella		NOTES
SD-04	6/17		✓	Halls Brook	1	X	X	X	X		
SD-12	6/17		✓	Halls Brook	1	X	X	X	X		
SD-13	6/17		✓	Aberjona Riv	1	X	X	X	X		
											Internal Cooler Temp 0.6 °C on delivery

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
[signature]	6/17/99	1800	[signature]	6/18/99	1000
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

Laboratory:

Phone:

Contact Person:

Remarks: Halls Brook are reference areas. SD-13 is possibly contaminated with arsenic.

CHAIN OF CUSTODY RECORD

Project No.	Project Name:	Project Location:
578	Industriplex	

DATE: 6/18/99

SAMPLERS: CAM

MENZIE-CURA & ASSOCIATES, INC.
1 COURTHOUSE LANE, SUITE 2
CHELMSFORD, MA 01824
TEL: 978/453-4300 FAX: 978/453-7280

Analyses Required

SAMPLE ID	Date	Comp.	Grab	Station Locations	No. of Containers	Acute Amphibians	Chronic Amphibians	Acute Chironomid	Chronic Chironomid		NOTES
2A SD-03	6/18	✓		Phillips Pond	11	X	X	X	X		

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
[signature]	6/18/99	1600			
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
	6/19/99	10:30	[signature]		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

Laboratory:

Phone:

Contact Person:

Cooler Temp. 7.8 C

Remarks:

CHAIN OF CUSTODY RECORD

Project No.	Project Name:	Project Location:
578	Industriplex	Woburn

DATE: 6/21/99

SAMPLERS: MA, CM, KC,

MENZIE-CURA & ASSOCIATES, INC.
1 COURTHOUSE LANE, SUITE 2
CHELMSFORD, MA 01824
TEL: 978/453-4300 FAX: 978/453-7260

SAMPLE ID	Date	Comp.	Grab	Station Locations	No. of Containers	Acute Hydrolic	Chronic Hydrolic	Acute Chronic	Chronic Chronic		NOTES
SD-01	6/21	✓		Aberjona S. Branch	1	X	X	X	X		
SD-02	"	✓		South Pond	1	X	X	X	X		
SD-10	"	✓		HBHA Creek	1	X	X	X	X		
SD-11	"	✓		HBHA Pond 3	1	X	X	X	X		

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
[signature]	6/21/99	1800			
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
	6/22/99	11:00	[signature]		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

Laboratory:

Phone:

Contact Person:

Remarks:

Cooler Temp.: 10.3 °C

CHAIN OF CUSTODY RECORD

Project No.: 578

Project Name: Industri-plex

Project Location: Woburn

DATE: 6/22/99

SAMPLERS: C. Menzie

MENZIE-CURA & ASSOCIATES, INC.
1 COURTHOUSE LANE, SUITE 2
CHELMSFORD, MA 01824
TEL: 978/453-4300 FAX: 978/453-7260

Analyses Required

SAMPLE ID	Date	Comp.	Grab	Station Locations	No. of Containers	BioAssay					NOTES
SD-8	6/22/99	✓			1	✓					
SD-9	6/22/99	✓			1	✓					
SD-5	6/22/99	✓			1	✓					
SD-5 (dup)	6/22/99	✓			1	✓					

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
[signature]	6/22/99	5:13pm	Karen Downey	6/23/99	10:00
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

Remarks: TD

Laboratory: Aquatech Biological Sciences

Phone: 802-860-1638

Contact Person: John Williams

Cooler Temp = 5.5°C

CHAIN OF CUSTODY RECORD

Project No.	Project Name:	Project Location:
578	Industriplex	Woburn

DATE: 6-23-99

SAMPLERS

MENZIE-CURA & ASSOCIATES, INC.
1 COURTHOUSE LANE, SUITE 2
CHELMSFORD, MA 01824
TEL: 978/453-4300 FAX: 978/453-7260

Analyses Required

SAMPLE ID	Date	Comp.	Grab	Station Locations	No. of Containers	Bioassay C. Hamus H. azteca	Acute T. Chronic				NOTES
SD-6	6-23-99		✓	SD-06 HBHA	1	✓	✓				
SD-07	6-23-99		✓	SD-07 HBHA	1	✓	✓				

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
Bart Holmes	6-23-99	1220	[signature]	6/24/99	1010
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time

Laboratory:

Phone:

Contact Person:

Remarks:
Final 2 Samples for Industriplex Bioassays
Cooler Temp. 9.3°C

APPENDIX: C

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))
Number of Groups: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10223	1	1.0000	1.4120
1	10223	2	1.0000	1.4120
1	10223	3	0.7000	0.9912
1	10223	4	1.0000	1.4120
1	10223	5	0.9000	1.2490
1	10223	6	1.0000	1.4120
1	10223	7	0.9000	1.2490
1	10223	8	0.9000	1.2490
2	10219	1	1.0000	1.4120
2	10219	2	1.0000	1.4120
2	10219	3	1.0000	1.4120
2	10219	4	1.0000	1.4120
2	10219	5	0.9000	1.2490
2	10219	6	1.0000	1.4120
2	10219	7	1.0000	1.4120
2	10219	8	1.0000	1.4120
3	10220	1	0.9000	1.2490
3	10220	2	0.9000	1.2490
3	10220	3	1.0000	1.4120
3	10220	4	1.0000	1.4120
3	10220	5	1.0000	1.4120
3	10220	6	1.0000	1.4120
3	10220	7	1.0000	1.4120
3	10220	8	0.7000	0.9912
4	10221	1	1.0000	1.4120
4	10221	2	1.0000	1.4120
4	10221	3	0.9000	1.2490
4	10221	4	1.0000	1.4120
4	10221	5	0.9000	1.2490
4	10221	6	1.0000	1.4120
4	10221	7	0.9000	1.2490
5	10224	1	1.0000	1.4120
5	10224	2	1.0000	1.4120
5	10224	3	1.0000	1.4120
5	10224	4	0.9000	1.2490
5	10224	5	0.9000	1.2490
5	10224	6	1.0000	1.4120
5	10224	7	1.0000	1.4120
5	10224	8	1.0000	1.4120

8/25/95

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 8.8806 (p-value = 0.0642)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 13.2767 (alpha = 0.01, df = 4)
= 9.4877 (alpha = 0.05, df = 4)

Using Average Degrees of Freedom
(Based on average replicate size of 7.80)

Calculated B2 statistic = 7.6393 (p-value = 0.1057)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

D = 0.4225
W = 0.8475

Critical W = 0.9170 (alpha = 0.01 , N = 39)
W = 0.9390 (alpha = 0.05 , N = 39)

Data FAIL normality test (alpha = 0.01). Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normality and should not be performed with this data as is.

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10223	8	0.9912	1.4120	1.2983
2	10219	8	1.2490	1.4120	1.3916
3	10220	8	0.9912	1.4120	1.3187
4	10221	7	1.2490	1.4120	1.3422
5	10224	8	1.2490	1.4120	1.3713

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10223	0.0219	0.1480	0.0523	11.4001
2	10219	0.0033	0.0576	0.0204	4.1404
3	10220	0.0229	0.1514	0.0535	11.4840
4	10221	0.0076	0.0871	0.0329	6.4905
5	10224	0.0057	0.0754	0.0267	5.5016

Title: Chironomus tentans survival vs. Lab Control (10223)
File: 10223cts Transform: ARC SINE(SQUARE ROOT(Y))

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	REPS	SIG 0.05
1	10223	1.2983				
2	10219	1.3916	80.50	46	8	
3	10220	1.3187	71.50	46	8	
4	10221	1.3422	59.50	36	7	
5	10224	1.3713	77.00	46	8	

Critical values are 1 tailed (k = 4)

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION
Number of Groups: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10223	1	1.6450	1.6450
1	10223	2	1.8090	1.8090
1	10223	3	2.3660	2.3660
1	10223	4	1.7010	1.7010
1	10223	5	1.4130	1.4130
1	10223	6	1.3560	1.3560
1	10223	7	2.0260	2.0260
1	10223	8	0.8660	0.8660
2	10219	1	1.2110	1.2110
2	10219	2	1.3480	1.3480
2	10219	3	1.4390	1.4390
2	10219	4	1.5960	1.5960
2	10219	5	1.3160	1.3160
2	10219	6	1.4330	1.4330
2	10219	7	1.1150	1.1150
2	10219	8	1.4050	1.4050
3	10220	1	2.0440	2.0440
3	10220	2	1.7490	1.7490
3	10220	3	1.6500	1.6500
3	10220	4	1.6930	1.6930
3	10220	5	1.7920	1.7920
3	10220	6	1.8280	1.8280
3	10220	7	2.0440	2.0440
3	10220	8	1.8990	1.8990
4	10221	1	1.5050	1.5050
4	10221	2	1.3950	1.3950
4	10221	3	1.6900	1.6900
4	10221	4	1.8070	1.8070
4	10221	5	1.3770	1.3770
4	10221	6	1.6600	1.6600
4	10221	7	1.6590	1.6590
5	10224	1	1.9130	1.9130
5	10224	2	1.8370	1.8370
5	10224	3	1.9670	1.9670
5	10224	4	2.1780	2.1780
5	10224	5	2.0620	2.0620
5	10224	6	2.0220	2.0220
5	10224	7	1.9190	1.9190
5	10224	8	2.0610	2.0610

8/25/99

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 1.9863
W = 0.9273

Critical W = 0.9170 (alpha = 0.01 , N = 39)
W = 0.9390 (alpha = 0.05 , N = 39)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 19.7865 (p-value = 0.0006)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 13.2767 (alpha = 0.01, df = 4)
= 9.4877 (alpha = 0.05, df = 4)

Using Average Degrees of Freedom
(Based on average replicate size of 7.80)

Calculated B2 statistic = 17.0366 (p-value = 0.0019)

Data FAIL B2 homogeneity test at 0.01 level. Try another transformation.

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10223	8	0.8660	2.3660	1.6478
2	10219	8	1.1150	1.5960	1.3579
3	10220	8	1.6500	2.0440	1.8374
4	10221	7	1.3770	1.8070	1.5847
5	10224	8	1.8370	2.1780	1.9949

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10223	0.2056	0.4534	0.1603	27.5178
2	10219	0.0219	0.1481	0.0524	10.9077
3	10220	0.0222	0.1489	0.0526	8.1013
4	10221	0.0262	0.1619	0.0612	10.2132
5	10224	0.0116	0.1078	0.0381	5.4027

Title: Chironomus tentans growth vs. Lab Control (10223)
File: 10223ctg Transform: NO TRANSFORMATION

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

GROUP	IDENTIFICATION	MEAN IN ORIGINAL UNITS	RANK SUM	CRIT. VALUE	REPS	SIG 0.05
1	10223	1.6478				
2	10219	1.3579	51.00	46	8	
3	10220	1.8374	80.00	46	8	
4	10221	1.5847	52.00	36	7	
5	10224	1.9949	87.00	46	8	

Critical values are 1 tailed (k = 4)

Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026 Industriplex	BTR: 3152 / 3153
	Test Start: June 20, 1998	Test End: June 30, 1998

Sample	Repl.	# Alive	Init.	Repick #	Repick Init.	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10219	A	10	J	—	—	10	10	31.82	43.93
	B	10	J	—	—	10	10	34.78	48.26
	C (1)	12	J	—	—	12	12	36.63	53.90
	D	10	JJG	—	—	10	10	38.23	54.19
	E	9	J	—	—	9	9	37.35	49.19
	F	10	SJ	—	—	10	10	36.66	50.99
	G	10	JJG	—	—	10	10	38.84	49.99
	H	10	J	—	—	10	10	34.92	48.97
10220	A	9	J	—	—	9	9	27.08	45.48
	B	9	J	—	—	9	9	26.96	42.70
	C	10	JJG	—	—	10	10	29.31	45.81
	D	10	J	—	—	10	10	29.90	46.83
	E	10	JJG	—	—	10	10	32.83	50.75
	F	10	J	—	—	10	10	31.09	49.37
	G	10	SJ	—		10	10	27.27	47.71
	H	7	SJ	0	SJ	7	7	28.50	41.72
10221	A	10	J	—	—	10	10	27.96	43.01
	B	10	SJ	—		10	10	28.25	42.20
	C	0	SJ	0	J	0	0	26.56	—
	D	9	SJ	—	—	9	9	29.60	44.81
	E	10	JJG	—	—	10	10	31.08	49.15
	F	9	SJ	—	—	9	9	30.57	42.46
	G	10	SJ	—		10	10	30.09	46.69
	H	9	SJ	—	—	9	9	26.62	41.55
10222 3 J	A	10	JJG	—	—	10	10	32.65	49.16
	B	10	SJ	—	—	10	10	31.85	49.94
	C	7	SJ	0	SJ	7	7	34.63	51.19
	D	10	SJ	—	—	10	10	27.82	44.83
	E	9	SJ	—	—	9	9	33.28	46.00
	F	10	J	—	—	10	10	33.50	47.66
	G	9	SJ	—	—	9	9	30.42	48.65
	H	9	J	—	—	9	9	32.57	40.36

Exclude R cotron analysis

Balance QC: Initial (20 mg = 19.99 cmc)	Final (20 mg = 19.99 cmc)	Balance Asset #:
Date/time In Temp(°C) Init.	Date/time out 7/1 1030 Temp(°C) 79°C	Init. SJ
Comments: (1) May include indigenous Chironomus larvae (2) [illegible]		

Balance QC 7/8/99 I = 19.99 mg P = 20.00 mg

Reviewer: J Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026 Industriplex	BTR: 3152 / 3153
	Test Start: June 20, 1998	Test End: June 30, 1998

Sample	Repl.	# Alive	Init.	Repick #	Repick Init.	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10224	A	10	SF	—		10	10	25.53	44.66
	B	10	SF	—		10	10	25.52	43.89
	C	10	SF	—		10	10	27.35	47.02
	D	9	SF	—	—	9	9	25.99	45.59
	E	9	SF	—	—	9	9	26.13	44.69
	F	11	SF	—	—	11	11	24.49	46.73
	G	10	SF	—	—	10	10	29.74	48.93
	H	10	SF	—	—	10	10	29.41	50.02
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								

Balance QC: Initial (20 mg = 19.97)	Final (20 mg = 19.97)	Balance Asset #:	
Date/time In	Temp(°C)	Init.	Date/time out 7/1 1130 Temp(°C) 79°C Init. SF
Comments:			

Balance QC 7/1/99
F = 19.99
F = 20.00

Reviewer: T Date: 8/25/99
Laboratory: Aquatic Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3152 / 3153

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
10219	T (°C)	23.1	23.2	23.1	23.6	24.2	23.0	23.3	23.2	23.9	24.2	22.9
	pH	7.1	7.1	7.0	7.6	7.2	7.3	7.4	7.2	7.2	7.42 JG	7.3
	DO (mg/L)	6.4	6.5	5.9	7.4	4.7	5.8 ~~6.4~~	5.8	4.0	4.2	~~5.5~~ 4.8 JG	4.5
	Conductivity	310	X	X	X	X	280	X	X	X	X	280
	Ammonia, alk/hardness	✓	X	X	X	X	X	X	X	X	X	✓
10220	T (°C)	23.0	23.4	23.1	23.5	24.0	23.1	23.4	23.0	24.0	24.4	23.0
	pH	7.4	7.4	7.2	7.8	7.4	7.13	7.2	7.3	7.2	7.53 JG	7.3
	DO (mg/L)	7.3	7.0	6.5	7.3	5.6	5.2 ~~7.05~~	4.0	4.9	4.0	~~5.8~~ 4.6 JG	4.1
	Conductivity	320	X	X	X	X	280	X	X	X	X	300
	Ammonia, alk/hardness	✓	X	X	X	X	X	X	X	X	X	✓
10221	T (°C)	22.9	23.3	23.2	23.7	24.1	23.1	23.7	23.1	24.0	24.3	23.2
	pH	7.3	7.14	7.2	7.8	7.4	7.45	7.4	7.2	7.2	7.3	7.3
	DO (mg/L)	7.0	6.8	6.0	7.2	5.4	6.3 ~~5.9~~	5.2	4.0	4.2	~~4.5~~ 3.9	4.0
	Conductivity	330	X	X	X	X	310	X	X	X	X	310
	Ammonia, alk/hardness	✓	X	X	X	X	X	X	X	X	X	✓
	Init./Date: 1999	6/20 JG	6/21 CC	6/22 JG	6/23 JG	6/24	6/25	6/26	6/27 JG	6/28 JG	6/29 JG	6/30 JG CC

Comments:

Review: _____ Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3152 / 3153

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
~~40223~~ 10223 JG	T (°C)	23.1	23.2	23.3	23.5	24.2	23.5	23.7	23.2	24.1	24.4	23.2
	pH	7.9	7.8	7.7	8.0	7.8	7.8	7.6	7.5	7.6	7.6	7.7
	DO (mg/L)	8.1	7.8	6.3	7.5	6.9	7.0	7.0	6.0	5.7	5.5	6.0
	Conductivity	340	X	X	X	X	340	X	X	X	X	330
	Ammonia, alk/hardness	✓	X	X	X	X	X	X	X	X	X	✓
10224	T (°C)	22.8	23.6	23.4	23.8	24.1	23.2	23.7	23.4	24.2	24.4	23.3
	pH	7.4	7.4	7.3	7.6	7.3	7.4	7.2	7.2	7.3	7.4	7.3
	DO (mg/L)	7.3	7.3		7.2	4.5	5.5	4.6	4.1	4.0	~~5.2~~ 4.1 JG	4.1
	Conductivity	400	X	X	X	X	400	X	X	X	X	340
	Ammonia, alk/hardness	✓	X	X	X	X	X	X	X	X	X	✓
~~40225~~	T (°C)											
	pH											
	DO (mg/L)											
	Conductivity		X	X	X	X		X	X	X	X	
	Ammonia, alk/hardness		X	X	X	X	X	X	X	X	X	
	Init./Date: 1999	6/20 JG	6/21 CC	6/22 JG	6/23 JG	6/24 JG	6/25	6/26	6/27 JG	6/28 JG	6/29 JG	6/30 JG CC

Comments:

Review: _____ Date: 8/23/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Chironomus tentans Culture and Pre-test Environmental Conditions Data

Egg Deposit Date: 6/9	Larval Hatch Date: 6/10	Culture ID: 6/11
Culture Source (flies): Aquatec	No. Egg Cases: ~7 cases	

Instructions: Isolate egg cases in petri dish with sediment recon. water. Hold in petri dish up to two days or until larval hatching begins. Add mono-layer of *Selenastrum* prior to hatching. Transfer egg cases with hatching larvae to culture box with mono-layer of fine sand, water, and *Selenastrum*. Feed daily increasing amounts of Cerophyll/Tetrafin slurry to match consumption rates (food should not accumulate). Measure water chemistry / change 80% of water weekly. Measure temperature daily in one representative culture. Split cultures if needed to accomodate larval growth. When emergence occurs, remove flies daily to mating flask or disposal flask. Remove discarded body castes.

Date	Day	Temp	pH	DO	Cond	Fed	WC	Observations (hatching)	Init.
6/11	0					✓TC liquid		added cases TC box	JJG
6/12	1					✓TC liquid		tiny tubes w/ sand visible	JJG
6/13	2					✓TC			JJG
6/14	3	25.1	—	—	—	✓TC		many larvae - added subtrack	JJG
6/15	4	22.6	—	—	—	TC			JJG
6/16	5	24.3	—	—	—	TC			JJG
6/17	6	21.7				TC			JJG
6/19	7					TC			[illegible]
6/19	8					✓			JJG
6/20	9	24.2	7.7	6.7	420	✓		used culture to start [illegible]	JJG
6/21	10							2nd SRT	
6/22	11							Samples 10219, 10220	
								10221, 10222, 10224	

TEST 8

Chironomus tentans Head Capsule Width

Culture ID: 6/11 Age (d) of larvae: 9 days
Target head capsule width (mm) third instar: 0.33 - 0.45 (EPA/600/R-94/024)
Acceptability criterion for use in 10-d survival and growth tests:
>50% in third instar with remaining larve second instar.
Magnification: 32 Ocular micrometer calibration: 35 micrometer units = 1 mm
Microscope Asset #: 1068 .

Calculation of head capsule width:
head capsule width (micrometer units) / micrometer calibration units

Organism Number	Head Capsule Width (micrometer units)	Head Capsule Width (mm)
1	15	0.42
2	15	0.42
3	15	0.42
4	14	0.40
5	15	0.42
6	15	0.42
7	16	0.46
8	15	0.42
9	15	0.42
10	16	0.46
11	14	0.40
12	14	0.40
13	13	0.37
14	16	0.46
15	15	0.42
16	14	0.40
17	14	0.40
18	16	0.46
19	8	0.23
20	16	0.46
Initials: JWW	Larval heads were severed and mounted on a slide for measurement.	
Date: 8/10/99	Subset of larvae used to start Menzie Cura Industriplex acute tests.	
	Samples 10219, 10220, 10221, 10223, 10224	

Sediment Characterization

Client: Menzie-Cura & Assoc.	Project: 99026	BTR: 3152 / 3153

Date sediments distributed to test chambers (100 mL homogenized sediment):

- *H. azteca* acute test: 6/20/99
- *C. tentans* acute test: 6/20/99
- *H. azteca* chronic test: 7/1/99 } entire sample used with exception of aliquot reserved
- *C. tentans* chronic test: 7/1/99 } for C. tentans 2 auxillary male measurements.

7/11/99 – Sediments into beakers on Day 9 for aux. males.

Sample Number	porew pH	porew H2S	porew Amm	Sediment Visual Characterization
10219	215 mL 6.7	extracted	6/21/99 1.7	black mud, watery, Chironomids (several) present removed
				black, watery mud, few Chironomids removed
10220	213 mL 7.1	extracted	6/21/99 1.86	
10221	240 mL 7.3	extracted	6/21/99 13.5	brownish, black watery mud few Chironomids removed.
~~10222~~				
10224	125 mL 6.7	extracted	3.62	very black, watery mud. 125 mL extracted 6/21/99
	Pore water	centrifuged	6/21/99	250 g / centrifuge bottle
Number ~~10225~~ NOT USED	15 m,	7640 RPM.		
~~10226~~ Number NOT USED				
~~10227~~ Number NOT USED				
10222 / 23 LCS	/	/	/	EPA artificial control sediment (77% med. and fine sand; 17% kaolinite clay; 5% 0.5 mm-sieved peat; 1% CaCO3). Stored dry, then hydrated prior to addition to test chambers.

S = sample collected / preserved.

Extract porewater, measure and record pH, decant and preserve sulfide and ammonia samples.

Entered by: _____ Date: 6/20 7/1/99

Sediments distributed to beakers 6/19/99 13:00 JJG

Reviewer _____ Date: 8/19/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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H. azteca added to beakers 6/20/99 15:30 JJG

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))
Number of Groups: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10346	1	0.8000	1.1071
1	10346	2	1.0000	1.4120
1	10346	3	0.9000	1.2490
1	10346	4	1.0000	1.4120
1	10346	5	1.0000	1.4120
1	10346	6	0.9000	1.2490
1	10346	7	0.8000	1.1071
1	10346	8	0.9000	1.2490
2	10341	1	1.0000	1.4120
2	10341	2	0.9000	1.2490
2	10341	3	0.9000	1.2490
2	10341	4	1.0000	1.4120
2	10341	5	0.9000	1.2490
2	10341	6	1.0000	1.4120
2	10341	7	1.0000	1.4120
2	10341	8	0.9000	1.2490
3	10342	1	0.9000	1.2490
3	10342	2	0.9000	1.2490
3	10342	3	1.0000	1.4120
3	10342	4	0.6000	0.8861
3	10342	5	1.0000	1.4120
3	10342	6	0.9000	1.2490
3	10342	7	0.9000	1.2490
3	10342	8	0.8000	1.1071
4	10343	1	0.9000	1.2490
4	10343	2	0.8000	1.1071
4	10343	3	0.9000	1.2490
4	10343	4	0.8000	1.1071
4	10343	5	1.0000	1.4120
4	10343	6	0.9000	1.2490
4	10343	7	0.8000	1.1071
4	10343	8	0.9000	1.2490
5	10344	1	0.9000	1.2490
5	10344	2	1.0000	1.4120
5	10344	3	1.0000	1.4120
5	10344	4	1.0000	1.4120
5	10344	5	1.0000	1.4120
5	10344	6	1.0000	1.4120
5	10344	7	1.0000	1.4120
5	10344	8	0.8000	1.1071

8/25/99

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

D = 0.5393
W = 0.9501

Critical W = 0.9190 (alpha = 0.01 , N = 40)
W = 0.9400 (alpha = 0.05 , N = 40)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 3.3215 (p-value = 0.5055)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 13.2767 (alpha = 0.01, df = 4)
= 9.4877 (alpha = 0.05, df = 4)

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10346	8	1.1071	1.4120	1.2747
2	10341	8	1.2490	1.4120	1.3305
3	10342	8	0.8861	1.4120	1.2267
4	10343	8	1.1071	1.4120	1.2162
5	10344	8	1.1071	1.4120	1.3535

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10346	0.0164	0.1280	0.0453	10.0418
2	10341	0.0076	0.0871	0.0308	6.5472
3	10342	0.0287	0.1695	0.0599	13.8140
4	10343	0.0112	0.1058	0.0374	8.6982
5	10344	0.0132	0.1147	0.0406	8.4766

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA Table

SOURCE	DF	SS	MS	F
Between	4	0.1192	0.0298	1.9342
Within (Error)	35	0.5393	0.0154	
Total	39	0.6585		

(p-value = 0.1265)

Critical F = 3.9082 (alpha = 0.01, df = 4,35)
= 2.6415 (alpha = 0.05, df = 4,35)

Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Dunnett's Test - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	TRANS T STAT	SIG 0.05
1	10346	1.2747	0.9125		
2	10341	1.3305	0.9500	-0.8998	
3	10342	1.2267	0.8750	0.7735	
4	10343	1.2162	0.8750	0.9422	
5	10344	1.3535	0.9625	-1.2705	

Dunnett critical value = 2.2500 (1 Tailed, alpha = 0.05, df [used] = 4,30)
(Actual df = 4,35)

Title: Chironomus tentans survival vs. Lab Control (10346)
File: 10346cts Transform: ARC SINE(SQUARE ROOT(Y))

Dunnett's Test - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	10346	8			
2	10341	8	0.0930	10.2	-0.0375
3	10342	8	0.0930	10.2	0.0375
4	10343	8	0.0930	10.2	0.0375
5	10344	8	0.0930	10.2	-0.0500

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION
Number of Groups: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10346	1	1.4390	1.4390
1	10346	2	1.2860	1.2860
1	10346	3	1.7070	1.7070
1	10346	4	1.9240	1.9240
1	10346	5	1.6090	1.6090
1	10346	6	1.7760	1.7760
1	10346	7	1.9590	1.9590
1	10346	8	2.2310	2.2310
2	10341	1	1.3880	1.3880
2	10341	2	1.5510	1.5510
2	10341	3	1.5480	1.5480
2	10341	4	1.3060	1.3060
2	10341	5	1.2100	1.2100
2	10341	6	1.1720	1.1720
2	10341	7	1.5250	1.5250
2	10341	8	1.1790	1.1790
3	10342	1	1.5220	1.5220
3	10342	2	1.3540	1.3540
3	10342	3	1.4670	1.4670
3	10342	4	2.1020	2.1020
3	10342	5	1.3770	1.3770
3	10342	6	1.6390	1.6390
3	10342	7	1.7160	1.7160
3	10342	8	1.8560	1.8560
4	10343	1	1.5080	1.5080
4	10343	2	1.6690	1.6690
4	10343	3	1.5390	1.5390
4	10343	4	1.9110	1.9110
4	10343	5	1.6510	1.6510
4	10343	6	1.6000	1.6000
4	10343	7	1.4150	1.4150
4	10343	8	1.4730	1.4730
5	10344	1	0.9900	0.9900
5	10344	2	1.0630	1.0630
5	10344	3	1.4230	1.4230
5	10344	4	1.2700	1.2700
5	10344	5	1.2190	1.2190
5	10344	6	1.2890	1.2890
5	10344	7	1.4170	1.4170
5	10344	8	1.6660	1.6660

8/25/99

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 1.7809
W = 0.9806

Critical W = 0.9190 (alpha = 0.01 , N = 40)
W = 0.9400 (alpha = 0.05 , N = 40)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 4.1842 (p-value = 0.3816)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 13.2767 (alpha = 0.01, df = 4)
= 9.4877 (alpha = 0.05, df = 4)

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10346	8	1.2860	2.2310	1.7414
2	10341	8	1.1720	1.5510	1.3599
3	10342	8	1.3540	2.1020	1.6291
4	10343	8	1.4150	1.9110	1.5958
5	10344	8	0.9900	1.6660	1.2921

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10346	0.0913	0.3022	0.1068	17.3524
2	10341	0.0276	0.1662	0.0588	12.2216
3	10342	0.0657	0.2563	0.0906	15.7310
4	10343	0.0238	0.1542	0.0545	9.6642
5	10344	0.0460	0.2145	0.0758	16.6020

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

ANOVA Table

SOURCE	DF	SS	MS	F
Between	4	1.1532	0.2883	5.6662
Within (Error)	35	1.7809	0.0509	
Total	39	2.9341		

(p-value = 0.0013)

Critical F = 3.9082 (alpha = 0.01, df = 4,35)
= 2.6415 (alpha = 0.05, df = 4,35)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG 0.05
1	10346	1.7414	1.7414		
2	10341	1.3599	1.3599	3.3825	*
3	10342	1.6291	1.6291	0.9953	
4	10343	1.5958	1.5958	1.2912	
5	10344	1.2921	1.2921	3.9833	*

Dunnett critical value = 2.2500 (1 Tailed, alpha = 0.05, df [used] = 4,30)
(Actual df = 4,35)

Title: Chironomus tentans growth vs Lab Control (10346)
File: 10346ctg Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	10346	8			
2	10341	8	0.2538	14.6	0.3815
3	10342	8	0.2538	14.6	0.1123
4	10343	8	0.2538	14.6	0.1456
5	10344	8	0.2538	14.6	0.4493

Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026	BTR: 3169
	Test Start: June 24, 1998	Test End: July 4, 1998

Sample	Repl.	# Alive	Init.	Repick #	Repick Init. 7/4/99	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10341	A	10	JJG	—	—	10	JG ~~9~~ 10	52.17	66.05
	B	9	JJG	0	∅	9	JG ~~10~~ 9	51.19	65.14
	C	9	JJG	0	∅	9	9	49.23	63.16
	D ①	10	JJG	—	—	10	10	49.99	69.05
	E	9	KRD	0	∅	9	9	52.45	63.34
	F	10	PCD	—	—	10	10	53.52	65.24
	G	10	JJG	—	—	10	10	49.94	65.19
	H	9	PCD	0	—	9	9	49.54	60.15
10342	A	9	PCD	1 dead	∅	9	9	37.60	51.30
	B	9	KRD	0	∅	9	9	49.97	62.16
	C	10	JJG	—	—	10	10	37.54	52.21
	D	6	JJG	0	∅	6	6	35.85	48.46
	E	10	KRD	—	—	10	10	JG ~~39~~ 37	49.14
	F	9	PCD	0	∅	9	9	48.56	63.31
	G	9	JJG	0	∅	9	9	43.47	58.86
	H	~~8~~	JJG	0	∅	8	8	48.86	63.71
10343	A	8	PCD	1	∅	9	9	43.55	~~59.91~~ ① JG 57.12
	B	8	KRD	0	∅	8	8	37.67	~~57.48~~ 51.02
	C	9	JJG	0	∅	9	9 JG	37.51	~~60.81~~ 51.36
	D	8	JJG	0	∅	8	7 ③	37.84	~~59.35~~ 53.13
	E	10	KRD	—	—	10	10	43.55	~~58.42~~ 60.06
	F	9	PCD	0	∅	9	9	43.08	~~57.76~~ 57.48
	G	8	JJG	0	∅	8	8	34.84	~~59.48~~ 46.16
	H	9	JJG	0	∅	9	9	37.51	~~58.44~~ 50.77
10344	A	9	PCD	0	∅	9	9	45.42	~~54.33~~
	B	10	KRD	—	—	10	10	37.65	48.28
	C	10	PCD	0	—	10	10	42.53	56.77
	D	10	JJG	—	—	10	10	48.74	61.44
	E	10	KRD	—	—	10	10	44.51	56.70
	F	10	KRD	—	—	10	10	42.84	55.73
	G	10	KRD	—	—	10	10	43.15	57.32
	H	8	PCD	0	∅	8	8	39.43	52.76

Balance QC: Initial (20 mg = 19.99) Final (20 mg = 20.00) Balance Asset #:

Date/time In 7/4 15:00 Temp(°C) 87 °C Init. JJG Date/time out 7/6 13:55 Temp(°C) 89 °C Init. JJG

Comments: init 20 mg = 20.02 Final 20mg = 20.00

① One Hyalella species found - 7/4/99 JJG (indigenous)

② Total dry-weights recorded in wrong sample Rep. boxes. 7/5/99 JJG

③ only 7 were in the cup to be weighed. 7/4/99 JJG 8/26/99

④ total # weighed recorded in wrong spaces. JJG 8/26/99

Reviewer: [signature] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026	BTR: 3169
	Test Start: June 24, 1998	Test End: July 4, 1998

Sample	Repl.	# Alive	Init.	Repick #	Repick Init.	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10346	A	8	[illegible]	0	[illegible]	8	8	48.40	59.91
	B	10	KRD	—	—	10	10	44.62	57.48
	C	9	[illegible]	—	—	9	9	45.55	60.91
	D	10	[illegible]	—	—	10	10	40.11	59.35
	E	10	KRD	—	—	10	10	42.33	58.42
	F	10	JJG	—	—	10	10	40.00	57.76
	G	8	PCD	0	[illegible]	8	8	43.81	59.48
	H	9	KRD	—	—	9	9	38.36	58.44
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								

Balance QC: Initial (20 mg =)	Final (20 mg =)	Balance Asset #:
Date/time In	Temp(°C)	Init.	Date/time out	Temp(°C)	Init.
Comments:					

Reviewer: [illegible] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3169

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
10341	T (°C)	23.8	23.5	23.9	23.7	24.4	24.5	23.5	23.0	23.6	21.8	22.9
	pH	7.0	7.3	7.0	7.2	7.2	7.1	7.1	7.3	7.2	7.3	7.4
	DO (mg/L)	4.6	6.4	6.0	4.5	4.6	4.0	4.4	5.8	5.0	6.0	~~6.7~~ 5.4 JG
	Conductivity	310	X	X	X	X	300	X	X	X	X	300
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10342	T (°C)	23.6	23.9	23.3	23.9	24.6	24.5	23.0	23.2	23.6	21.0	22.8
	pH	7.2	7.2	7.2	7.2	7.1	7.0	7.0	7.0	7.0	7.2	7.5
	DO (mg/L)	6.2	6.0	5.4	5.2	4.5	3.8	4.0	5.8	5.0	5.9	~~6.8~~ 5.5 JG
	Conductivity	330	X	X	X	X	280	X	X	X	X	290
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10343	T (°C)	23.5	23.1	23.3	22.9	24.1	24.5	22.7	22.6	22.9	21.7	22.4
	pH	7.1	7.4	7.1	7.1	7.2	7.1	7.1	7.1	7.1	7.2	7.5
	DO (mg/L)	5.6	7.2	5.2	4.9	5.0	3.9	4.4	6.8	5.1	5.9	~~6.7~~ 5.3 JG
	Conductivity	330	X	X	X	X	300	X	X	X	X	290
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
	Init./Date: 1999	6/24	BT 6/25	ST 6/26	JG 6/27	6/28 JG	6/29 JG	6/30 JG/KC	7/1 KC	7/2 JG/KC	7/3	7/4 JG

Comments: Test start 6/24/99 ~~183g~~

Review: _____ Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3169

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
10344	T (°C)	23.5	23.2	23.4	22.9	24.4	24.4	23.1	22.3	23.4	21.6	22.7
	pH	7.3	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.3	7.3	7.5
	DO (mg/L)	5.6	6.7	6.0	5.8	5.0	3.9	4.6	6.3	5.5	4.7	~~6.7~~ 5.1 JG
	Conductivity	390	X	X	X	X	330	X	X	X	X	310
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10346 * Beakers labeled as 345 ct. ok JW	T (°C)	23.4	23.4	23.7	22.8	24.0	24.4	23.1	22.9	23.2	22.0	22.5
	pH	7.4	7.6	7.6	7.6	7.7	7.6	7.6	7.8	7.6	7.7	7.8
	DO (mg/L)	7.6	6.9	6.3	6.3	6.6	5.8	5.7	7.1	~~5.5~~ 6.3 cc	7.5	7.3
	Conductivity	450	X	X	X	X	410	X	X	X	X	350
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
	T (°C)											
	pH											
	DO (mg/L)											
	Conductivity		X	X	X	X		X	X	X	X	
	Ammonia, alk/hardness Sulfide		X	X	X	X	X	X	X	X	X	
	Init./Date: 1999	6/24 JG	6/25 SF	6/26 SF	6/27 JG	6/28 JG	6/29 JG	6/30 JG cc	7/1 SF	7/2 JG/cc	7/3 SF	7/4 JG

Comments: TEST STRIT 6/24/99 ~~1820~~ J

Review: [signature] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

ctenv.doc

Chironomus tentans Culture and Pre-test Environmental Conditions Data

Egg Deposit Date: 6/11	Larval Hatch Date: 6/12	Culture ID: 6/13
Culture Source (flies): Aquatec	No. Egg Cases: 6+ cases	

Instructions: Isolate egg cases in petri dish with sediment recon. water. Hold in petri dish up to two days or until larval hatching begins. Add mono-layer of *Selenastrum* prior to hatching. Transfer egg cases with hatching larvae to culture box with mono-layer of fine sand, water, and *Selenastrum*. Feed daily increasing amounts of Cerophyll/Tetrafin slurry to match consumption rates (food should not accumulate). Measure water chemistry / change 80% of water weekly. Measure temperature daily in one representative culture. Split cultures if needed to accomodate larval growth. When emergence occurs, remove flies daily to mating flask or disposal flask. Remove discarded body castes.

Date	Day	Temp	pH	DO	Cond	Fed	WC	Observations	Init.
6/13	0					✓ Fed	Equil	Hatching out in culture box	JJG
6/14	1					FS 1/4 ml	fed	Few larvae	J
6/15	2					✓ CT			J
6/16	3					✓ CT/GL		Looking better	J
6/17	4	21.8				✓ CT/GL			J
6/18	5					✓			J
6/19	6					✓			JJG
6/20	7	22.6				✓			J
6/21	8	22.7				✓		FS = ~200 larvae - Looking	J
6/22	9					✓			JJG
6/23	10	22.7				TC	✓	Transf. to 1g Rox	J
6/24	11	22.9	?	?	?	✓			J
6/25	12	22.6	7.6	6.5	330			Combined w/ 6/12 culture	J
6/26	13					✓			JJG

Culture used for test 5/24/99 - 2130

J

Chironomus tentans Culture and Pre-test Environmental Conditions Data

Egg Deposit Date: 6/9	Larval Hatch Date: 6/11	Culture ID: 6/12
Culture Source (flies): Aquatec	No. Egg Cases: 6 + Cases	

Instructions: Isolate egg cases in petri dish with sediment recon. water. Hold in petri dish up to two days or until larval hatching begins. Add mono-layer of *Selenastrum* prior to hatching. Transfer egg cases with hatching larvae to culture box with mono-layer of fine sand, water, and *Selenastrum*. Feed daily increasing amounts of Cerophyll/Tetrafin slurry to match consumption rates (food should not accumulate). Measure water chemistry / change 80% of water weekly. Measure temperature daily in one representative culture. Split cultures if needed to accomodate larval growth. When emergence occurs, remove flies daily to mating flask or disposal flask. Remove discarded body castes.

Date	Day	Temp	pH	DO	Cond	Fed	WC	Observations	Init.
6/12	0					TC liquid		hatching	JJG
6/13	1					TC		tiny tubes visible	JJG
							0	Added 1/1 substrate	
6/14	2	25.2	—	—	—	TC/Sel		OK - Tubes visible	J
6/15	3	22.4	—	—	—	TC			J
6/16	4	22.5				TC			J
6/17	5	21.9				TC			J
6/18	6					✓			SY
6/19	7					✓			JJG
6/20	8	22.5				✓			J
6/21	9	22.4	—	—	—	✓			JJG
6/22	10					✓			J
6/23	11	22.6	7.8	6.4	380	TC			J
6/24	12					TC		Combined w/ 6/13 culture	J
6/25	13					✓			J
6/26	14					✓			JG

Testing Age

Culture used for test starts 6/24/99 - 2130

J

Chironomus tentans Head Capsule Width

Culture ID: 6/13 Age (d) of larvae: 11 days
Target head capsule width (mm) third instar: 0.33 - 0.45 (EPA/600/R-94/024)
Acceptability criterion for use in 10-d survival and growth tests:
>50% in third instar with remaining larve second instar.
Magnification: 32 Ocular micrometer calibration: 35 micrometer units = 1 mm
Microscope Asset #: 1068

Calculation of head capsule width:
head capsule width (micrometer units) / micrometer calibration units

Organism Number	Head Capsule Width (micrometer units)	Head Capsule Width (mm)
1	15	0.42
2	15	0.42
3	15	0.42
4	14	0.40
5	15	0.42
6	14	0.40
7	14	0.40
8	15	0.42
9	15	0.42
10	15	0.42
11	17	0.49
12	14	0.40
13	16	0.46
14	14	0.40
15	14	0.40
16	16	0.46
17	15	0.42
18	14	0.40
19	12	0.34
20	13	0.37
Initials: JWW	Larval heads were severed and mounted on a slide for measurement.	
Date: 8/10/99	Subset of larvae used to start Menzie Cura Industriplex acute tests.	
	Samples 10341, 10342, 10343, 10344, 10346	

Reviewer: jww Date: 8/10/99
Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

Sediment Characterization

Client: Menzie-Cura & Assoc.	Project: 99026	BTR: 3169

Date sediments distributed to test chambers (100 mL homogenized sediment):

- *H. azteca* acute test: > 6/23/99
- *C. tentans* acute test:
- *H. azteca* chronic test:
- *C. tentans* chronic test: > 7/15/99 For Auxiliary make on 7/15/99

Sample Number	porew pH	porew H2S	porew Amm	Sediment Visual Characterization
10341	6.4			Brown/black liquid/mud. Some vegetation
10342	6.6			Sooty black ~~brown~~ sediment
10343	6.4			Sooty black sediment / Debris
10344	6.8			Very liquid black fine mud.
				Sediments distributed to test
				beakers, overlying water added
				6/23/99 1800
10345 / 46 LCS	/	/	/	EPA artificial control sediment (77% med. and fine sand; 17% kaolinite clay; 5% 0.5 mm-sieved peat; 1% $CaCO_3$). Stored dry, then hydrated prior to addition to test chambers.

Extract porewater, measure and record pH, decant and preserve sulfide and ammonia samples.

Entered by: [signature] Date: 6/23/99

Reviewer: [signature] Date: 8/19/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

hasurvw1.do

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))
Number of Groups: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10449	1	0.9000	1.2490
1	10449	2	1.0000	1.4120
1	10449	3	1.0000	1.4120
1	10449	4	0.9000	1.2490
1	10449	5	1.0000	1.4120
1	10449	6	1.0000	1.4120
1	10449	7	0.9000	1.2490
1	10449	8	0.8000	1.1071
2	10446	1	1.0000	1.4120
2	10446	2	0.5000	0.7854
2	10446	3	1.0000	1.4120
2	10446	4	1.0000	1.4120
2	10446	5	1.0000	1.4120
2	10446	6	1.0000	1.4120
2	10446	7	1.0000	1.4120
2	10446	8	1.0000	1.4120
3	10447	1	0.5000	0.7854
3	10447	2	0.9000	1.2490
3	10447	3	0.4000	0.6847
3	10447	4	0.8000	1.1071
3	10447	5	0.1000	0.3218
3	10447	6	0.3000	0.5796
3	10447	7	0.5000	0.7854
3	10447	8	0.4000	0.6847
4	10472	1	0.9000	1.2490
4	10472	2	0.9000	1.2490
4	10472	3	1.0000	1.4120
4	10472	4	0.9000	1.2490
4	10472	5	1.0000	1.4120
4	10472	6	1.0000	1.4120
4	10472	7	1.0000	1.4120
4	10472	8	0.9000	1.2490
5	10473	1	1.0000	1.4120
5	10473	2	0.9000	1.2490
5	10473	3	1.0000	1.4120
5	10473	4	0.9000	1.2490
5	10473	5	1.0000	1.4120
5	10473	6	0.8000	1.1071
5	10473	7	0.9000	1.2490
5	10473	8	1.0000	1.4120
6	10474	1	0.0000	0.1588
6	10474	2	0.0000	0.1588
6	10474	3	0.0000	0.1588
6	10474	4	0.0000	0.1588
6	10474	5	0.0000	0.1588
6	10474	6	0.0000	0.1588
6	10474	7	0.1000	0.3218
6	10474	8	0.0000	0.1588
7	10475	1	0.0000	0.1588

7	10475	2	0.0000	0.1588
7	10475	3	0.0000	0.1588
7	10475	4	0.0000	0.1588
7	10475	5	0.0000	0.1588
7	10475	6	0.0000	0.1588
7	10475	7	0.2000	0.4636
7	10475	8	0.4000	0.6847

8/25/99

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

******** Shapiro - Wilk's Test is aborted ********

This test can not be performed because total number of replicates is greater than 50.

Total number of replicates = 56

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Chi-Square Test for Normality

Actual and Expected Frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	3.7520	13.5520	21.3920	13.5520	3.7520
OBSERVED	4	17	18	14	3

Chi-Square = 1.5970 (p-value = 0.8093)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 22.7656 (p-value = 0.0009)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10449	8	1.1071	1.4120	1.3128
2	10446	8	0.7854	1.4120	1.3337
3	10447	8	0.3218	1.2490	0.7747
4	10472	8	1.2490	1.4120	1.3305
5	10473	8	1.1071	1.4120	1.3128
6	10474	8	0.1588	0.3218	0.1792
7	10475	8	0.1588	0.6847	0.2626

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10449	0.0134	0.1158	0.0409	8.8207
2	10446	0.0491	0.2215	0.0783	16.6113
3	10447	0.0850	0.2916	0.1031	37.6373
4	10472	0.0076	0.0871	0.0308	6.5472
5	10473	0.0134	0.1158	0.0409	8.8207
6	10474	0.0033	0.0576	0.0204	32.1620
7	10475	0.0405	0.2012	0.0711	76.5967

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA Table

SOURCE	DF	SS	MS	F
Between	6	13.1978	2.1996	72.5267
Within (Error)	49	1.4861	0.0303	
Total	55	14.6839		

(p-value = 0.0000)

Critical F = 3.1948 (alpha = 0.01, df = 6,49)
= 2.2904 (alpha = 0.05, df = 6,49)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: Chironomus tentans survival vs. Lsb Control (10449)
File: 10449cts Transform: ARC SINE(SQUARE ROOT(Y))

Steel's Many-One Rank Test - Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	DF	SIG 0.05
1	10449	1.3128				
2	10446	1.3337	78.00	46.00	8.00	
3	10447	0.7747	39.00	46.00	8.00	*
4	10472	1.3305	70.00	46.00	8.00	
5	10473	1.3128	68.00	46.00	8.00	
6	10474	0.1792	36.00	46.00	8.00	*
7	10475	0.2626	36.00	46.00	8.00	*

Critical values are 1 tailed (k = 6)

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION
Number of Groups: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	10449	1	0.6160	0.6160
1	10449	2	1.8120	1.8120
1	10449	3	1.0690	1.0690
1	10449	4	1.0290	1.0290
1	10449	5	1.6650	1.6650
1	10449	6	1.3070	1.3070
1	10449	7	1.1260	1.1260
1	10449	8	1.8910	1.8910
2	10446	1	1.1200	1.1200
2	10446	2	1.0980	1.0980
2	10446	3	0.8030	0.8030
2	10446	4	0.8490	0.8490
2	10446	5	1.1490	1.1490
2	10446	6	0.6550	0.6550
2	10446	7	1.0660	1.0660
2	10446	8	0.9340	0.9340
3	10447	1	0.2820	0.2820
3	10447	2	0.1840	0.1840
3	10447	3	0.0970	0.0970
3	10447	4	0.1510	0.1510
3	10447	5	0.1100	0.1100
3	10447	6	0.1870	0.1870
3	10447	7	0.1680	0.1680
3	10447	8	0.1700	0.1700
4	10472	1	1.3810	1.3810
4	10472	2	1.0230	1.0230
4	10472	3	0.8030	0.8030
4	10472	4	1.0440	1.0440
4	10472	5	1.0000	1.0000
4	10472	6	0.9050	0.9050
4	10472	7	0.9560	0.9560
4	10472	8	0.8590	0.8590
5	10473	1	0.7870	0.7870
5	10473	2	1.0130	1.0130
5	10473	3	0.9290	0.9290
5	10473	4	1.4470	1.4470
5	10473	5	1.0530	1.0530
5	10473	6	1.4230	1.4230
5	10473	7	1.0730	1.0730
5	10473	8	0.8870	0.8870
6	10474	1	0.0000	0.0000
6	10474	2	0.0000	0.0000
6	10474	3	0.0000	0.0000
6	10474	4	0.0000	0.0000
6	10474	5	0.0000	0.0000
6	10474	6	0.0000	0.0000
6	10474	7	0.9300	0.9300
6	10474	8	0.0000	0.0000
7	10475	1	0.0000	0.0000

7	10475	2	0.0000	0.0000
7	10475	3	0.0000	0.0000
7	10475	4	0.0000	0.0000
7	10475	5	0.0000	0.0000
7	10475	6	0.0000	0.0000
7	10475	7	0.2250	0.2250
7	10475	8	0.1920	0.1920

8/25/99

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

******** Shapiro - Wilk's Test is aborted ********

This test can not be performed because total number of replicates is greater than 50.

Total number of replicates = 56

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	3.7520	13.5520	21.3920	13.5520	3.7520
OBSERVED	2	18	22	9	5

Chi-Square = 4.2394 (p-value = 0.3746)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 30.7132 (p-value = 0.0000)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	10449	8	0.6160	1.8910	1.3144
2	10446	8	0.6550	1.1490	0.9592
3	10447	8	0.0970	0.2820	0.1686
4	10472	8	0.8030	1.3810	0.9964
5	10473	8	0.7870	1.4470	1.0765
6	10474	8	0.0000	0.9300	0.1163
7	10475	8	0.0000	0.2250	0.0521

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	10449	0.1954	0.4421	0.1563	33.6335
2	10446	0.0318	0.1782	0.0630	18.5762
3	10447	0.0032	0.0565	0.0200	33.4779
4	10472	0.0310	0.1761	0.0623	17.6779
5	10473	0.0576	0.2401	0.0849	22.3002
6	10474	0.1081	0.3288	0.1163	282.8427
7	10475	0.0094	0.0969	0.0343	185.9355

Title: Chironomus tentans growth vs. Lab Control (10449)
File: 10449ctg Transform: NO TRANSFORMATION

Steel's Many-One Rank Test - Ho: Control<Treatment

GROUP	IDENTIFICATION	MEAN IN ORIGINAL UNITS	RANK SUM	CRIT. VALUE	DF	SIG 0.05
1	10449	1.3144				
2	10446	0.9592	52.00	46.00	8.00	
3	10447	0.1686	36.00	46.00	8.00	*
4	10472	0.9964	49.00	46.00	8.00	
5	10473	1.0765	55.00	46.00	8.00	
6	10474	0.1163	37.00	46.00	8.00	*
7	10475	0.0521	36.00	46.00	8.00	*

Critical values are 1 tailed (k = 6)

Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026 Industriplex	BTR: 3189 / 3196
	Test Start: June 26, 1999	Test End: July 6, 1999

Sample	Repl.	# Alive	Init.	Repick #	Repick Init.	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10446	A	11 ~~10~~	St	—	—	6+0 11	11	38.08	50.40
	B	5	St	—	—	5	5	37.67	43.16
	C	10	St	—	—	10	10	34.76	42.79
	D	10	JJG	—	—	10	10	37.36	45.82
	E	10	JJG	—	—	10	10	39.89	51.58
	F	10	St	—	—	10	10	37.40	43.95
	G	10	St	—	—	10	10	43.87	54.53
	H	10	JJG	—	—	10	10	35.98	45.32
10447	A	~~4~~ 5 St	St			5	5	33.23	34.64
	B	~~3~~ 4 St	JJG St	—	—	~~3~~ 4 St	~~3~~ 4	38.02	39.68
	C	4	St	—	—	4	4	35.84	36.23
	D	8	St	—	—	8	8	35.54	36.75
	E	1	St			1	1	31.90	32.01
	F	3	St	—	—	3	3	34.67	35.23
	G	5	JJG	—	—	5	5	33.73	34.57
	H	4	St	—	—	4	4	35.28	35.96
10449	A	9	St	—	—	9	10	35.87	41.41
	B	10	JJG	—	—	10	10	33.54	51.66
	C	10	St	—	—	10	10	33.26	43.95
	D	9	JJG	0	0	9	9	37.16	46.42
	E	10	St	—	—	10	10	35.04	51.69
	F	10	St	—	—	10	10	32.05	45.12
	G	9	JJG	0	0	9	9	34.06	~~51.71~~ 44.19 sr
	H	8	St	—	—	8	8	36.77	51.90
10472	A	9	St	—	—	9	9	42.01	54.44
	B	9	JJG	—	—	9	9	40.86	50.07
	C	10	St	—	—	10	10	37.34	45.37
	D	9	St			9	9	34.32	43.72
	E	10	St	—	—	10	10	33.05	43.05
	F	10	St	—	—	10	10	30.97	40.02
	G	11	St	—	—	11	11	35.76	46.28
	H	9	St	—	—	9	9	33.21	40.94

Balance QC: Initial (20 mg = 20.09 cc)	Final (20 mg = 20.06 cc)	Balance Asset #:	
Date/time In	Temp(°C)	Init.	Date/time out 7/7 1530 Temp(°C) 8.0 Init. St
Comments:			

Reviewer: _____ Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Day 10 Survival and Dry Weight Data

Client: Menzie-Cura & Assoc.	Project: 99026 Industriplex	BTR: 3189 / 3196
	Test Start: June 26, 1999	Test End: July 6, 1999

Sample	Repl.	# Alive	Init.	Repick #	Repick Init.	Total Surv	# Weighed	Init Pan Wt.	Total Dry Wt.
10473	A	10	JJG	—	—	10	10	36.05	43.92
	B	9	St	—	—	9	10	38.70	47.82
	C	JG 9 10	JJG	—	—	10	10	39.13	48.42
	D	9	JJG	—	—	9	9	38.62	51.64
	E	10	St	—	—	10	10	39.23	49.76
	F	8	St	0	JJG 7/6	8	8	33.45	44.83
	G	9	St	—	—	9	9	35.73	45.39
	H	10	St	—	—	10	10	41.63	50.50
10474	A	0	St	—	—	0	0	37.20	—
	B	0	St	—	—	0	0	39.47	—
	C	0	St	—	—	0	0	37.58	—
	D	0	St	—	—	0	0	42.49	—
	E	0	St	—	—	0	0	34.91	—
	F	0	St	—	—	0	0	44.26	—
	G	1	St	—	—	1	1	36.34	37.27
	H	0	JJG	—	—	0	0	36.44	—
10475	A	0	St	—	—	0	0	34.31	—
	B	0	St	—	—	0	0	33.18	—
	C	0	St	—	—	0	0	37.95	—
	D	0	JJG	—	—	0	0	37.56	—
	E	0	St	—	—	0	0	35.99	—
	F	0	St	—	—	0	0	32.89	—
	G	2	St	—	—	2	2	37.12	37.57
	H	4	St	—	—	4	4	35.85	36.62
	A								
	B								
	C								
	D								
	E								
	F								
	G								
	H								

Balance QC:	Initial (20 mg = 20.04cc)	Final (20 mg = 20.0611)	Balance Asset #:		
Date/time In	Temp(°C)	Init.	Date/time out 7/7/0830	Temp(°C) 86	Init SA
Comments:					

Reviewer: JJ Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3189 / 3196 Test Starts 6/26/99

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
10446	T (°C)	24.0	22.7	23.5	24.7	22.4	23.4	23.3	22.2	22.5	23.1	22.9
	pH	7.5	7.4	7.4	7.3	7.4	7.3	7.4	7.4	7.3	7.2	7.2
	DO (mg/L)	7.4	7.0	6.8	6.7	5.9	6.0	5.9	7.5	5.0	4.8	5.1
	Conductivity	340	X	X	X	X	340	X	X	X	X	310
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10447	T (°C)	23.8	22.5	23.4	23.4	22.1	23.4	23.4	22.3	22.7	22.9	22.6
	pH	7.6	7.7	7.6	7.8	7.7	7.5	7.6	7.4	7.6	7.4	7.5
	DO (mg/L)	6.6	6.7	7.1	7.4	7.1	6.2	6.6	7.3	6.3	5.3	6.0
	Conductivity	410	X	X	X	X	360	X	X	X	X	320
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10472	T (°C)	23.8	22.3	23.5	23.4	22.3	23.1	23.3	22.0	22.5	23.1	22.7
	pH	7.5	7.5	7.4	7.5	7.4	7.2	7.3	7.8	7.2	7.2	7.2
	DO (mg/L)	7.0	7.1	6.7	6.7	6.1	4.4	5.7	6.9	4.2	4.4	5.0
	Conductivity	330	X	X	X	X	350	X	X	X	X	320
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
	Init./Date: 1999	JG 6/26	JG 6/27	6/28 JG	6/29 JG	6/30 JG CL	7/1	7/2 JG/CL	7/3 SH	7/4 BD JG	7/5 JG	7/6 CL JG

Comments: TEST START 6/26/99 17:00 JJG C.T. CULNES 6/15 + 6/17 (5 from each culner per replicate)

Review: [signature] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3189 / 3196 Test Starts 6/26/99

Sample	Parameter	Day of Analysis 0	1	2	3	4	5	6	7	8	9	10
10473	T (°C)	23.7	22.2	23.1	23.5	21.9	23.1	23.1	21.9	22.7	23.2	22.5
	pH	7.4	7.5	7.4	7.5	7.2	7.6	7.2	7.2	7.1	7.1	7.1
	DO (mg/L)	6.8	6.9	6.7	7.2	5.4	4.2	6.1	7.0	4.3	4.0	4.3
	Conductivity	400	X	X	X	X	330	X	X	X	X	320
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10474	T (°C)	23.7	22.1	23.4	23.6	21.9	23.1	22.9	22.0	22.7	23.1	22.6
	pH	8.0	7.9	7.9	8.0	8.0	7.9	7.9	7.9	7.8	7.7	7.8
	DO (mg/L)	7.0	6.9	6.6	7.5	7.4	6.4	6.7	7.9	6.5	6.2	5.8
	Conductivity	1,900	X	X	X	X	650	X	X	X	X	400
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
10475	T (°C)	23.6	22.5	23.2	23.7	22.6	23.2	23.1	21.9	22.5	23.2	22.7
	pH	8.1	7.9	7.8	8.1	8.0	7.9	7.9	7.9	7.9	7.8	7.8
	DO (mg/L)	7.6	7.2	6.0	7.6	7.5	6.5	6.8	7.1	9.4	5.9	5.8
	Conductivity	1,200	X	X	X	X	700	X	X	X	X	410
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
	Init./Date: 1999	JG 6/26	JG 6/27	6/28 JG	6/29 JG	6/30 JG CC	7/1	7/2 JG CC	7/3 JG	7/4 JG	7/5 JG	7/6 CC

Comments: Test Start 6/26/99 19:00

Review: [signature] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Midge (*Chironomus tentans*) Overlying Water Environmental Monitoring

Project: Menzie-Cura & Associates	Project: 99026 Industriplex	BTR: 3189 / 3196 Test Starts 6/26/99

		Day of Analysis										
Sample	Parameter	0	1	2	3	4	5	6	7	8	9	10
10449	T (°C)	23.6	22.4	23.5	23.8	21.8	23.1	23.2	22.2	22.6	22.9	22.7
	pH	7.5	7.5	7.7	7.9	7.7	7.6	7.6	7.6	7.7	7.5	7.6
	DO (mg/L)	8.3	7.6	7.2	7.7	7.1	6.3	6.6	7.6	6.7	5.0	5.6
	Conductivity	390	X	X	X	X	390	X	X	X	X	370
	Ammonia, alk/hardness Sulfide	✓	X	X	X	X	X	X	X	X	X	✓
	T (°C)											
	pH											
	DO (mg/L)											
	Conductivity		X	X	X	X		X	X	X	X	
	Ammonia, alk/hardness Sulfide		X	X	X	X	X	X	X	X	X	
	T (°C)											
	pH											
	DO (mg/L)											
	Conductivity		X	X	X	X		X	X	X	X	
	Ammonia, alk/hardness Sulfide		X	X	X	X	X	X	X	X	X	
	Init./Date: 1999	JG 6/26	JG 6/27	6/28 JG	6/29 JG	6/30 JG CC	7/1	7/2 CC	7/3 SR	7/4 KD JG	7/5 JG	7/6 CC

Comments: Test start 6/26/99 17:00

Review: [signature] Date: 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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Chironomus tentans Culture and Pre-test Environmental Conditions Data

Egg Deposit Date: 6/13	Larval Hatch Date: 6/15	Culture ID: 6/15
Culture Source (flies): Aquatec	No. Egg Cases: 5	

Instructions: Isolate egg cases in petri dish with sediment recon. water. Hold in petri dish up to two days or until larval hatching begins. Add mono-layer of *Selenastrum* prior to hatching. Transfer egg cases with hatching larvae to culture box with mono-layer of fine sand, water, and *Selenastrum*. Feed daily increasing amounts of Cerophyll/Tetrafin slurry to match consumption rates (food should not accumulate). Measure water chemistry / change 80% of water weekly. Measure temperature daily in one representative culture. Split cultures if needed to accomodate larval growth. When emergence occurs, remove flies daily to mating flask or disposal flask. Remove discarded body castes.

Date	Day	Temp	pH	DO	Cond	Fed	WC	Observations	Init.
6/15	0					Sel ✓		Beginning to hatch → box	J
6/16	1	22.6				Sel		Leaving egg case / tubing	J
6/17	2	21.8				Sel/TC	water	tubing.	J
6/18	3	22.6				✓			SJ
6/19	4					✓			JJG
6/20	5	22.6				TC		Many larvae	J
6/21	6	22.0				TC		Transferred to lg box	J
6/22	7					✓			JJG
6/23	8	22.4				TC			J
6/24	9					✓			J
6/25	10	22.8							J
6/26	11		7.6	5.7	370	✓		Used to [illegible] tests	[illegible]
6/								BTRS 3189 / 3196	
								+ SRT 6/26/09	
								J	

6/17

Chironomus tentans Culture and Pre-test Environmental Conditions Data

Egg Deposit Date: 6/15	Larval Hatch Date: 6/17	Culture ID: 6/17
Culture Source (flies): Aquatec	No. Egg Cases: 7	

Instructions: Isolate egg cases in petri dish with sediment recon. water. Hold in petri dish up to two days or until larval hatching begins. Add mono-layer of *Selenastrum* prior to hatching. Transfer egg cases with hatching larvae to culture box with mono-layer of fine sand, water, and *Selenastrum*. Feed daily increasing amounts of Cerophyll/Tetrafin slurry to match consumption rates (food should not accumulate). Measure water chemistry / change 80% of water weekly. Measure temperature daily in one representative culture. Split cultures if needed to accomodate larval growth. When emergence occurs, remove flies daily to mating flask or disposal flask. Remove discarded body castes.

Date	Day	Temp	pH	DO	Cond	Fed	WC	Observations	Init.
6/17	0					Sel	✓	Hatching → sm. culture box	✓
6/18	1					✓			JJG
6/19	2					✓		tiny tubes visible	JJG
6/20	3	22.6	—	—	—	Sel/TC			J
6/21	4	22.7				TC			
6/22	5					TC		transferred to fg. box.	JJG
6/23	6	22.6				TC/Sel			J
6/24	7					✓			J
6/25	8	22.9				✓			J
6/26	9		7.7	6.1	370	✓		used to start tests	
								BTRS 3189/3196	
6/27	10							J 6/26/99 + SRT	
6/28	11								

Chironomus tentans Head Capsule Width

Culture ID: 6/15 & 6/17 Age (d) of larvae: 9 -11 days
Target head capsule width (mm) third instar: 0.33 - 0.45 (EPA/600/R-94/024)
Acceptability criterion for use in 10-d survival and growth tests:
>50% in third instar with remaining larve second instar.
Magnification: 32 Ocular micrometer calibration: 35 micrometer units = 1 mm
Microscope Asset #: 1068 .

Calculation of head capsule width:
head capsule width (micrometer units) / micrometer calibration units

Organism Number	Head Capsule Width (micrometer units)	Head Capsule Width (mm)
1	15	0.42
2	9	0.25
3	9	0.25
4	8	0.23
5	15	0.42
6	16	0.46
7	7	0.20
8	17	0.49
9	8	0.23
10	8	0.23
11	8	0.23
12	8	0.23
13	16	0.46
14	8	0.23
15	9	0.25
16	16	0.46
17	7	0.20
18	9	0.25
19	9	0.25
20	8	0.23
Initials: JWW	Larval heads were severed and mounted on a slide for measurement.	
Date: 8/10/99	Subset of larvae used to start Menzie Cura Industriplex acute tests.	
	Samples 10446, 10447, 10449, 10472, 10473, 10474, 10475	

Sediment Characterization

Client: Menzie-Cura & Assoc.	Project: 99026	BTR: 3189 / 3196

Date sediments distributed to test chambers (100 mL homogenized sediment):

- *H. azteca* acute test: 6/25/99
- *C. tentans* acute test: 6/25/99
- *H. azteca* chronic test: 7/6/99 (Samples 10446, 10472, 10473)
- *C. tentans* chronic test: 7/6/99

Sample Number	porew pH	porew H2S	porew Amm	Sediment Visual Characterization
10446	6.6			Soft black mud
10447	7.1			Black, very liquid, fine
10472	6.8			Black, viscous mud.
10473	6.8			Black, very liquid, fine
10474	7.6 pore water black/dark Tan			Black, very liquid, fine, odorous
10475	7.6 pore water black/dark Tan			Black, soupy, very fine sediment
10448 / 449 LCS				EPA artificial control sediment (77% med. and fine sand; 17% kaolinite clay; 5% 0.5 mm-sieved peat; 1% CaCO3). Stored dry, then hydrated prior to addition to test chambers.

Extract porewater, measure and record pH, decant and preserve sulfide and ammonia samples.

Entered by: [signature] Date: 6/25/99

Reviewer: [signature] Date: 8/17/99

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Results of Ammonia Analyses (Total, mg/L)				
Sample ID	Porewater	Day 0	Day 10 *Hyalella azteca*	Day 10 *Chironomus tentans*
10219	1.7	0.6	<0.5	1.1
10220	1.9	<0.5	<0.5	0.9
10221	13.5	3.0	0.6	1.9
10222/3	-	<0.5	<0.5	0.7
10224	3.6	<0.5	<0.5	1.3
10341	1.1	0.5	1.1	1.0
10342	5.2	2.0	0.9	1.1
10343	2.4	1.2	<0.5	0.8
10344	2.3	1.3	1.6	0.9
10345/6	-	<0.5	0.5	0.5
10446	1.4	<0.5	<0.5	0.7
10447	70	8.8	<0.5	1.6
10448/9	-	1.3	0.6	0.6
10472	14	1.7	1.1	1.4
10473	10	1.5	<0.5	0.8
10474	2030 *	259 *	9.1	11
10475	2130 *	175 *	13	14

* The result was outside of calibration range. The result should be viewed as an estimate of the ammonia concentration.

AMMONIA ANALYSIS

Client: MENZIE CURA	Project #: 99026	BTR: 3152/3153
Sample Description:		

1999 Sample Date	Sample Description	Meter Reading (ppm NH_3-N)
	Meter Calibration	
	1 ppm / 5 ppm	
	Slope = - 55.7	
6/22	2 ppm ext. STD	1.87
	0.5 ppm check STD	0.497
6/21	Sample 10219 porewater	1.7
6/21	10220 porewater	1.86
6/21	10221 porewater	13.6
6/21	10221 1:5 dilution	2.7x5=13.5
6/21	10224 1:1 dilution	1.81 x2=3.62
6/22	Blank (DI H_2O)	0.03
	1 ppm	0.85

Analyst:	Analysis Date: 6/22/99	Reviewer:	Review Date:

AMMONIA ANALYSIS

Client: MENZIE CURA	Project #: 99026	BTR: 3169
Sample Description: Porewater & Day 0 overlying water (OLW)		

Sample Date	Sample Description	Meter Reading (ppm NH_3-N)	
	calibration 1ppm/5ppm slope = -58.9		cc 6/24/99
	2ppm ext. std. = 1.94 0.5 chk std. = 0.519		
6/23/99	10341 - Porewater	1.08	
6/23/99	10342 - Porewater	5.18	
6/23/99	10343 - Porewater	2.39	
6/23/99	10344 - Porewater	2.29	
*			
6/24	10341 Ha/Ct OLW - Day 0	0.517	cc 6/25/99
6/24	10342 - Ha/Ct OLW - Day 0	2.03	
6/24	10343 - Ha/Ct OLW - Day 0	1.24	
6/24	10344 - Ha/Ct OLW - Day 0	1.28	
6/24	10345/46 - Ha/Ct OLW - Day 0	<0.3	

Analyst: CMC	Analysis Date: 6/24/99	Reviewer:	Review Date:

OLW = overlying water Ha = Hyalella azteca Ct = Chironomus tentans

* calibration 6/25 1ppm/5ppm slope = -58.2 2ppm ext. std. = 1.95

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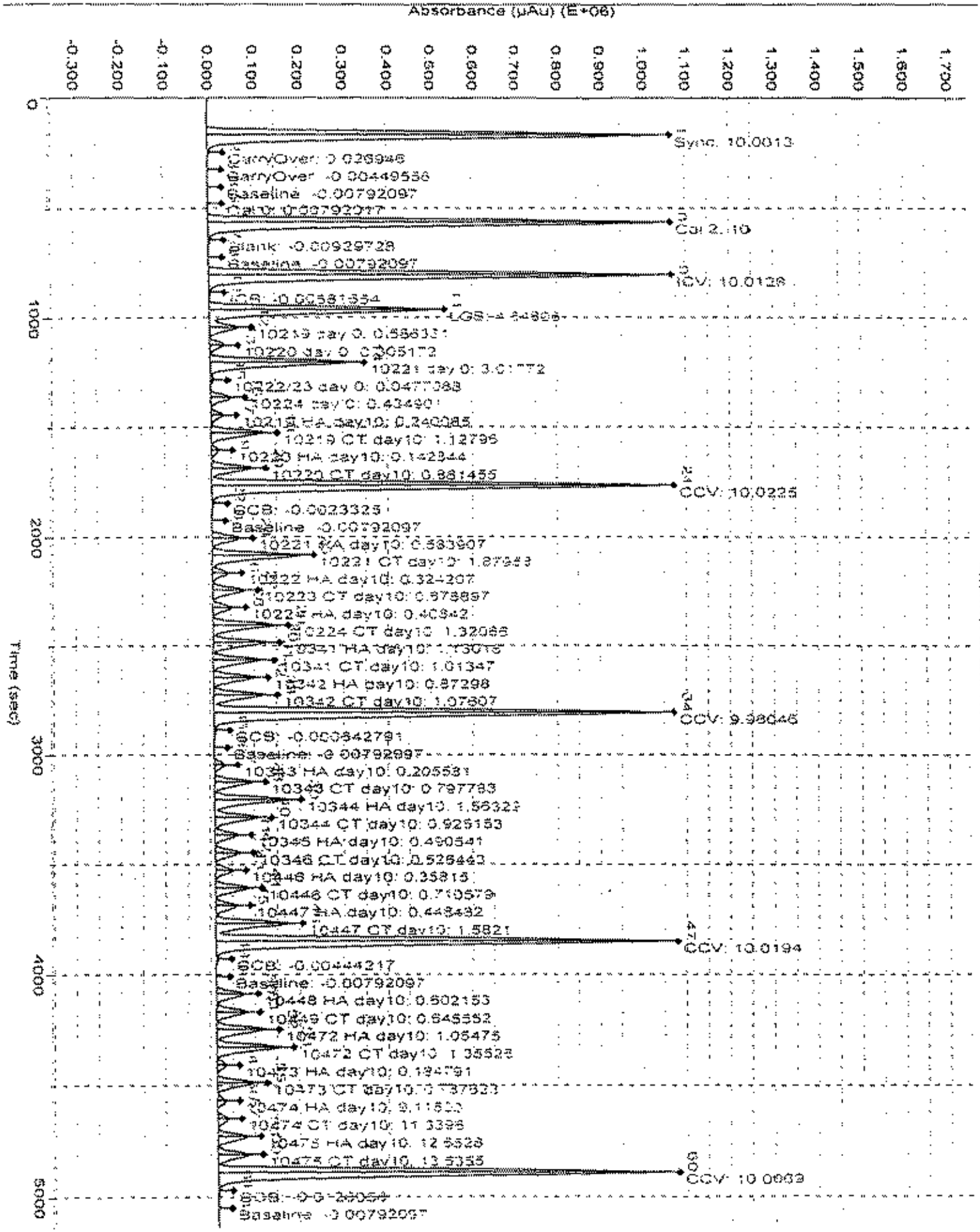
AMMONIA ANALYSIS

Client: MENZIE CURA	Project #: 99026	BTR:
Sample Description: Porewater & Day 0 (*C. tentans* / *H. azteca*).Total Ammonia		

Sample Date	Sample Description	Meter Reading (ppm NH_3-N)
	calibration 1ppm/50ppm slope = -56.8	
	2ppm external std. = 2.06	
6/25/99	10446 - Porewater	1.39
6/25/99	10447 - Porewater	69.7
6/25/99	10472 - Porewater	14.5
6/25/99	10473 - Porewater	10.5
6/25/99	10474 - Porewater	2030.
6/25/99	10475 - Porewater	2130.
	calibration check 2ppm ext. std. = 2.07	
6/26/99	10446 - Day 0 Overlying Water [illegible] / H_2	<0.4
6/26/99	10447 - Day 0 Overlying Water [illegible] / H_2	8.75
	(10449)	
6/26/99	10449 - Day 0 Overlying Water [illegible] / H_2	1.31
6/26/99	10472 - Day 0 Overlying Water [illegible] / H_2	1.70
6/26/99	10473 - Day 0 Overlying Water [illegible] / H_2	1.46
6/26/99	10474 - Day 0 Overlying Water [illegible] / H_2	259.
6/26/99	10475 - Day 0 Overlying Water [illegible] / H_2	175.

Analyst: [illegible]	Analysis Date:	Reviewer:	Review Date:



Hiemzie - LWRL

Peak Table: ammonia

File name: C:\FLOW_4\071499C.RST
Date: July 14, 1999
Operator: lks

Peak	Cup	Name	Type	Dil	Wt	Height	Calc. (mg/L)	Flags
1	2	Sync	SYNC	1	1	1033485	10.001280	
2	0	CarryOver	CO	1	1	3600	0.026946	
3	0	CarryOver	CO	1	1	354	-0.004496	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL
5	1	Cal 0	C	1	1	1636	0.007920	
6	2	Cal 2	C	1	1	1033353	10.000001	
7	0	Blank	U	1	1	-142	-0.009297	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL
9	2	ICV	U	1	1	1034676	10.012811	
10	1	ICB	U	1	1	217	-0.005817	LO
11	3	LCS	U	1	1	501396	4.848050	
12	4	10219 day 0	U	1	1	61359	0.586331	
13	5	10220 day 0	U	1	1	32328	0.305172	
14	6	10221 day 0	U	1	1	312408	3.017717	
15	7	10222/23 day 0	U	1	1	5744	0.047709	
16	8	10224 day 0	U	1	1	45723	0.434901	
17	9	10219 HA day10	U	1	1	25607	0.240085	
18	10	10219 CT day10	U	1	1	117283	1.127956	
19	11	10220 HA day10	U	1	1	15567	0.142844	
20	12	10220 CT day10	U	1	1	89766	0.861455	
21	2	CCV	U	1	1	1035671	10.022450	
22	1	CCB	U	1	1	577	-0.002332	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL
24	13	10221 HA day10	U	1	1	61108	0.583907	
25	14	10221 CT day10	U	1	1	194891	1.879560	
26	15	10222 HA day10	U	1	1	34293	0.324207	
27	16	10223 CT day10	U	1	1	70710	0.676897	
28	17	10224 HA day10	U	1	1	42989	0.408420	
29	18	10224 CT day10	U	1	1	137202	1.320863	
30	19	10341 HA day10	U	1	1	117513	1.130183	
31	20	10341 CT day10	U	1	1	105462	1.013469	
32	21	10342 HA day10	U	1	1	90956	0.872980	
33	22	10342 CT day10	U	1	1	111926	1.076071	
34	2	CCV	U	1	1	1031336	9.980465	
35	1	CCB	U	1	1	751	-0.000643	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL
37	23	10343 HA day10	U	1	1	22045	0.205581	
38	24	10343 CT day10	U	1	1	83192	0.797783	
39	25	10344 HA day10	U	1	1	162239	1.563290	
40	26	10344 CT day10	U	1	1	96343	0.925153	
41	27	10345 HA day10	U	1	1	51468	0.490541	
42	28	10346 CT day10	U	1	1	55175	0.526443	
43	29	10446 HA day10	U	1	1	37798	0.358150	
44	30	10446 CT day10	U	1	1	74188	0.710579	
45	31	10447 HA day10	U	1	1	47125	0.448482	
46	32	10447 CT day10	U	1	1	164175	1.582098	
47	2	CCV	U	1	1	1035356	10.019403	
48	1	CCB	U	1	1	359	-0.004442	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL
50	33	10448 HA day10	U	1	1	62992	0.602153	
51	34	10449 CT day10	U	1	1	67473	0.645552	
52	35	10472 HA day10	U	1	1	109725	1.054754	
53	36	10472 CT day10	U	1	1	140753	1.355256	
54	37	10473 HA day10	U	1	1	19898	0.184791	

Peak	Cup	Name	Type	Dil	Wt	Height	Calc. (mg/L)	Flags
55	38	10473 CT day10	U	1	1	82143	0.767623	
56	39	10474 HA day10	U	50	1	19641	9.115034	
57	40	10474 CT day10	U	50	1	24235	11.339641	
58	41	10475 HA day10	U	20	1	66140	12.652802	
59	42	10475 CT day10	U	20	1	70697	13.535489	
60	2	CCV	U	1	1	1034061	10.006860	
61	1	CCB	U	1	1	-504	-0.012806	LO
B	0	Baseline	RB	1	1	0	-0.007921	BL

ammonia: Calibration, Peak 5-62

File name: C:\FLOW_4\071499C.RST
Date: July 14, 1999
Operator: lks

Name	Conc	Height
* Cal 0	0.0000	1636
* Cal 2	10.0000	1033353

Calib Coef:
y=bx+a
a: (intercept) 8.1787e+02
b: 1.0325e+05

Corr Coef: 0.999999

Carryover: 0.348%

No Drift Peaks

Run Results Report
Results: C:\FLOW_4\071499C.RST
Results completed: 15:55 July 14, 1999.
Operator: lks

			ammonia		
Time	Cup	Name	Height	Calc.	Flags
---------- User request: Start Data Collect ----------					
14:31	0	CarryOver	3600	0.026946	
14:32	0	CarryOver	354	-0.004496	LO
		Mean & RSD:	1977	0.011225	NoRSD
14:33	0	Baseline	0	-0.007921	BL
14:35	1	Cal 0	1636	0.007920	
14:36	2	Cal 2	1033353	10.000001	
14:37	0	Blank	-142	-0.009297	LO
14:39	0	Baseline	0	-0.007921	BL
14:40	2	ICV	1034676	10.012811	
14:41	1	ICB	217	-0.005817	LO
14:43	3	LCS	501396	4.848050	
14:44	4	10219 day 0	61359	0.586331	
14:45	5	10220 day 0	32328	0.305172	
14:47	6	10221 day 0	312408	3.017717	
14:48	7	10222/23 day	5744	0.047709	
14:49	8	10224 day 0	45723	0.434901	
14:51	9	10219 HA day	25607	0.240085	
14:52	10	10219 CT day	117283	1.127956	
14:53	11	10220 HA day	15567	0.142844	
14:55	12	10220 CT day	89766	0.861455	
14:56	2	CCV	1035671	10.022450	
14:57	1	CCB	577	-0.002332	LO
14:59	0	Baseline	0	-0.007921	BL
15:00	13	10221 HA day	61108	0.583907	
15:01	14	10221 CT day	194891	1.879580	
15:03	15	10222 HA day	34293	0.324207	
15:04	16	10223 CT day	70710	0.676897	
15:05	17	10224 HA day	42989	0.408420	
15:07	18	10224 CT day	137202	1.320863	
15:08	19	10341 HA day	117513	1.130193	
15:09	20	10341 CT day	105462	1.013469	
15:11	21	10342 HA day	90956	0.872980	
15:12	22	10342 CT day	111926	1.076071	
15:13	2	CCV	1031336	9.980465	
15:15	1	CCB	751	-0.000643	LO
15:16	0	Baseline	0	-0.007921	BL
15:17	23	10343 HA day	22045	0.205581	
15:19	24	10343 CT day	83192	0.797783	
15:20	25	10344 HA day	162233	1.563290	
15:21	26	10344 CT day	96343	0.925153	
15:23	27	10345 HA day	51468	0.490541	
15:24	28	10346 CT day	55175	0.526443	
15:25	29	10446 HA day	37798	0.358150	

Run Results Report
Results: C:\FLOW_4\071499C.RST
Results completed: 15:55 July 14, 1999.
Operator: lks

			ammonia		
Time	Cup	Name	Height	Calc.	Flags
15:27	30	10446 CT day	74188	0.710579	
15:28	31	10447 HA day	47125	0.448482	
15:29	32	10447 CT day	164175	1.582098	
15:31	2	CCV	1035356	10.019403	
15:32	1	CCB	359	-0.004442	LO
15:33	0	Baseline	0	-0.007921	BL
15:35	33	10448 HA day	62992	0.602153	
15:36	34	10449 CT day	67473	0.645552	
15:37	35	10472 HA day	109725	1.054754	
15:39	36	10472 CT day	140753	1.355256	
15:40	37	10473 HA day	19898	0.184791	
15:41	38	10473 CT day	82143	0.787623	
15:43	39	10474 HA day	19641	9.115034	
15:44	40	10474 CT day	24235	11.339641	
15:45	41	10475 HA day	66140	12.652802	
15:47	42	10475 CT day	70697	13.535489	
15:48	2	CCV	1034061	10.006860	
15:49	1	CCB	-504	-0.012806	LO
15:51	0	Baseline	0	-0.007921	BL

---------- User request: End Run ----------

Sulfide Screen

NVW 7/15/99

	NVW $S^{=} < 0.5$	JWW $S^{=} < 0.5$
10219	Y	Y
10222		
10221		
10224		
10341		
10342		
10343		
10344		
10446		
10447		
10472		
10473		
10473 MS	N	N
10474 (1-5)	Y	Y
10475 (1-5)		

standard

5.0 ml Sample
0.150 ml Am-Sul
0.05 ml Fehly
[illegible]

Preparation of Formulated Control Sediment
for
Freshwater Sediment Toxicity Tests

Procedure based on EPA/600/R-94/024

Batch No. 6/18/99 Preparation Date: 6/18/99 Prepared by: [illegible]

Ingredient	Amount (g)	Percent composition
Fine sand	1848 ✓	
Medium sand	924 ✓	77
Kaolinite clay	612 ✓	17
Blended and 0.~~3~~ 5 mm sieved Canadian sphagnum peat	180 ✓	5
$CaCO_3$	36 ✓	1
Total	3600	100

Store well-mixed and dry in a sealed Rubbermaid box. Label by batch number. Store copy of this documentation in project file. Store original in Sed/Water preparation notebook.

Hydrate to a cohesive sediment consistency before use.

Hydrated/placed in refrig.
Assigned sample #s
10222 - H
10223 - C

Preparation of Formulated Control Sediment
for
Freshwater Sediment Toxicity Tests

Procedure based on EPA/600/R-94/024

Batch No. 6/25/99 Preparation Date: 4/15/99 Prepared by: ST

Ingredient	Amount (g)		Percent composition
Fine sand	1848	X2 = 3696	
Medium sand	924	1848	77
Kaolinite clay	612	1224	17
Blended and 0.~~3~~ 56 mm sieved Canadian sphagnum peat	180	360	5
CaCO3	36	72	1
Total	3600		100

Store well-mixed and dry in a sealed Rubbermaid box. Label by batch number. Store copy of this documentation in project file. Store original in Sed/Water preparation notebook.

Hydrate to a cohesive sediment consistency before use.

DAILY CHECKLIST FOR AUTOMATED DELIVERY SEDIMENT TOXICITY TESTS

Project: 99026 Menzie-Cura
Industriplex
Week of June 20, 1999

H. azteca 10 d Survival & Growth
C. tentans 10 d Survival & Growth
BTR: 3152 / 3153

ACTIVITY / DAY	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Prior to noon fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Noon delivery cycle							
• splitter boxes filling?	✓	✓	✓	✓	✓	✓	✓
• syringes filling?	✓	✓	✓	✓	✓	✓	✓
• needles flowing?	✓	✓	✓	✓	[illegible]	✓	✓
• beaker screens clear, flowing?	✓	✓	✓	✓	✓	✓	✓
• drainage to waste ok?	✓	✓	✓	✓	✓	✓	✓
• empty waste buckets?	—	✓	—	✓	✓	✓	
Test monitoring							
• test temperature ok?	✓	✓	✓	✓	[illegible] 1:20	✓	✓
• D.O. ok?	✓	✓	✓	✓	✓	✓	✓
• check for floating organisms	✓	✓	✓	✓	✓	✓	✓
• feeding completed?	H. azteca 1:00 C. tentans 2:15	✓	✓	✓	✓	✓	✓
Additional activities							
Prior to midnight fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Check sediment water supply	✓	✓	✓	✓	✓	✓	✓
Corrective Action / Comments							
Initials/Date	6/20/99 J	6/21/99 J	6/22/99 J	6/23/99 J	6/24/99 J	6/25/99 JJG	6/26 JJG

Procedure: All operating systems listed above must be checked on a daily basis when sediment toxicity tests are in progress. Corrective action must be taken whenever appropriate. Document corrective action on this form. If project-specific documentation is required, write a brief description (on Project Documentation form) and include with the test data package.

Comments:

Reviewer J Date 8/25/99
Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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DAILY CHECKLIST FOR AUTOMATED DELIVERY SEDIMENT TOXICITY TESTS

Project: 99026 Menzie-Cura Industriplex
Week of June 27, 1999

H. azteca 10 d Survival & Growth
C. tentans 10 d Survival & Growth
BTR: 3152 / 3153

ACTIVITY / DAY	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Prior to noon fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Noon delivery cycle							
• splitter boxes filling?	✓	✓	✓	✓	✓	✓	✓
• syringes filling?	✓	✓	✓	✓	✓	✓	✓
• needles flowing?	✓	✓	✓	✓	✓	✓	✓
• beaker screens clear, flowing?	✓	✓	✓	✓	✓	✓	✓
• drainage to waste ok?	✓	✓	✓	✓	✓	✓	✓
• empty waste buckets?	✓	✓	✓	✓	✓	✓	✓
Test monitoring							
• test temperature ok?	✓	✓	✓	✓	✓	✓	✓
• D.O. ok?	✓	✓	✓	✓	✓	✓	✓
• check for floating organisms	✓	✓	✓	✓	✓	✓	✓
• feeding completed?	✓	✓	✓	✓	✓	✓	✓
Additional activities							
Prior to midnight fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Check sediment water supply	✓	✓	✓	✓	✓	✓	✓
Corrective Action / Comments							
Initials/Date	JJG 6/27	JJG 6/28	JJG 6/29	6/30	7/1	7/2	7/3

Procedure: All operating systems listed above must be checked on a daily basis when sediment toxicity tests are in progress. Corrective action must be taken whenever appropriate. Document corrective action on this form. If project-specific documentation is required, write a brief description (on Project Documentation form) and include with the test data package.

Comments: Removed 1 dead Chironomus from 4758 6/29/99 14:45 JJG

Reviewer [signature] Date 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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DAILY CHECKLIST FOR AUTOMATED DELIVERY SEDIMENT TOXICITY TESTS

Week of July 4, 1999

ACTIVITY / DAY	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
Prior to noon fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Noon delivery cycle							
• splitter boxes filling?	✓	✓	✓	✓	✓	✓	✓
• syringes filling?	✓	✓	✓	✓	✓	✓	✓
• needles flowing?	✓	✓	✓	✓	✓	✓	✓
• beaker screens clear, flowing?	✓	✓	✓	✓	✓	✓	✓
• drainage to waste ok?	✓	✓	✓	✓	✓	✓	✓
• empty waste buckets?	✓	✓	✓	✓			✓
Test monitoring							
• test temperature ok?	✓	✓	✓	✓	✓	✓	✓
• D.O. ok?	✓	✓	✓	✓	✓	✓	✓
• check for floating organisms	✓	✓	✓	✓	✓	✓	✓
• feeding completed?	✓	✓	✓	✓	✓	✓	✓
Additional activities							
Prior to midnight fill reservoirs (1L)	✓	✓	✓	✓	✓	✓	✓
Check sediment water supply	✓	✓	✓	✓	✓	✓	✓
Corrective Action / Comments							
Initials/Date	JJG 7/4/99	JJG 7/5/99	JJG 7/6/99	[illegible] 7/7/99	JJG 7/8/99	[illegible] 7/9/99	[illegible] 7/10/99

Procedure: All operating systems listed above must be checked on a daily basis when sediment toxicity tests are in progress. Corrective action must be taken whenever appropriate. Document corrective action on this form. If project-specific documentation is required, write a brief description (on Project Documentation form) and include with the test data package.

Comments:

Reviewer [illegible] Date 8/25/99

Laboratory: Aquatec Biological Sciences, South Burlington, Vermont

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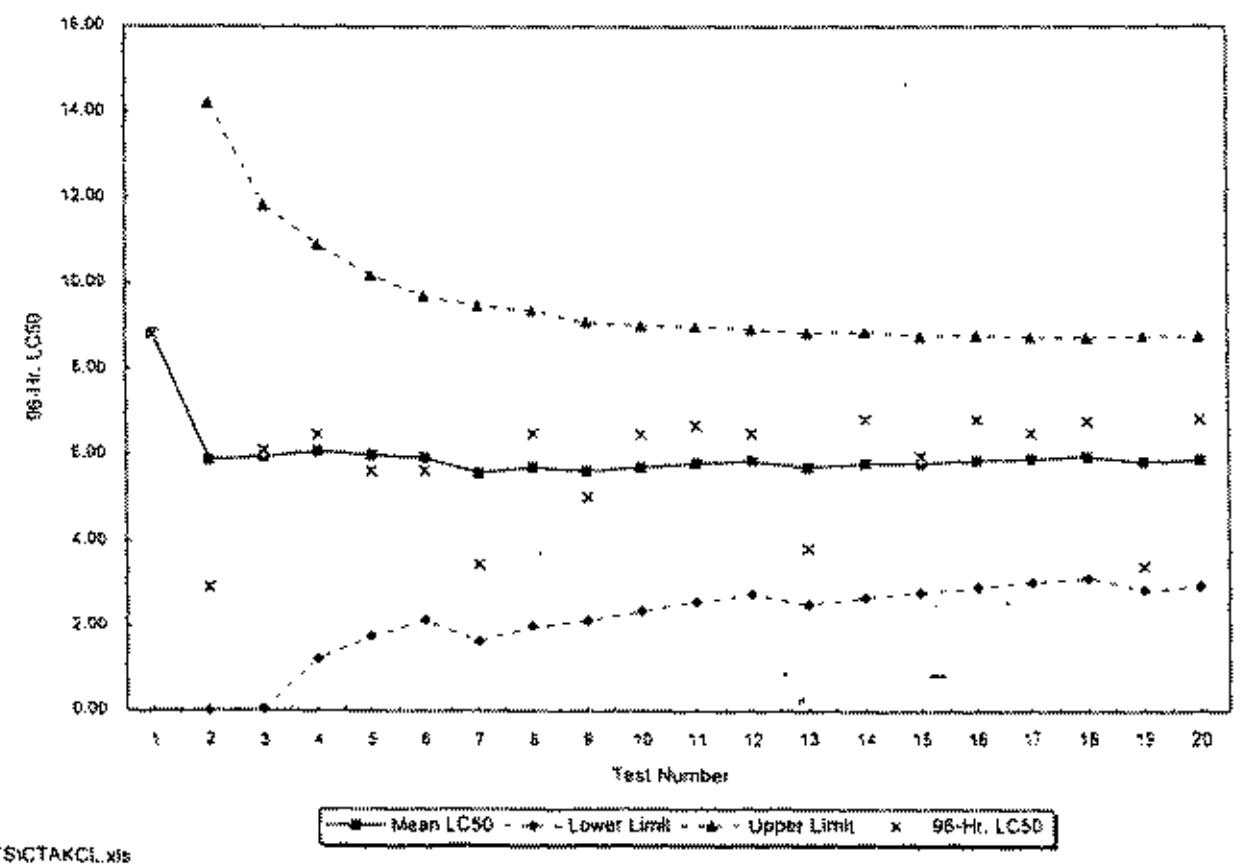
APPENDIX: D

CLICK TO CONTINUE

Reference Toxicant Control Chart
Chironomus tentans
in Potassium chloride (g/L)

Test Number	Test Date	Organism Age (Days)	96-Hr. LC50	Mean LC50	Lower Limit	Upper Limit	Organism Source
1	10/10/97	11	8.816	8.82			Aquatec Biological Sciences
2	10/14/97	11	2.930	5.87	0.00	14.20	Aquatec Biological Sciences
3	10/20/97	11	6.095	5.95	0.06	11.84	Aquatec Biological Sciences
4	10/21/97	11	6.484	6.08	1.24	10.92	Aquatec Biological Sciences
5	10/28/97	10	5.612	5.99	1.77	10.20	Aquatec Biological Sciences
6	10/31/97	9	5.612	5.92	2.14	9.71	Aquatec Biological Sciences
7	11/02/97	9	3.466	5.57	1.65	9.49	Aquatec Biological Sciences
8	11/09/97	10	6.484	5.69	2.00	9.37	Aquatec Biological Sciences
9	11/10/97	9	5.000	5.61	2.13	9.09	Aquatec Biological Sciences
10	08/23/98	11	6.484	5.70	2.37	9.02	Aquatec Biological Sciences
11	09/15/98	9	6.674	5.79	2.58	9.00	Aquatec Biological Sciences
12	10/23/98	10	6.484	5.85	2.76	8.93	Aquatec Biological Sciences
13	11/10/98	9	3.827	5.69	2.53	8.85	Aquatec Biological Sciences
14	06/20/99	9	6.804	5.77	2.68	8.86	Aquatec Biological Sciences
15	06/24/99	11 and 12	5.946	5.78	2.80	8.76	Aquatec Biological Sciences
16	06/26/99	9 and 11	6.804	5.85	2.92	8.77	Aquatec Biological Sciences
17	07/15/99	13	6.484	5.88	3.03	8.73	Env. Consulting & Testing
18	07/16/99	10	6.771	5.93	3.14	8.73	Aquatec Biological Sciences
19	07/16/99	9	3.400	5.80	2.84	8.75	Aquatec Biological Sciences
20	07/16/99	8	6.804	5.85	2.94	8.76	Env. Consulting & Testing



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