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STUDY NUMBER 15773

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during May 2007 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

The effluent collected from the Attleboro WPCF did not exhibit signs of acute toxicity to the daphnid, *Ceriodaphnia dubia*, during the initial 48 hour exposure period. The effluent had significant adverse effects on daphnid reproduction but not on survival during the chronic exposure period.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	8 Days	100%	>100%	71%	Yes
Reproduction	8 Days	71%	100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 15482

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during February 2007 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

The effluent collected from the Attleboro WPCF did not exhibit signs of acute toxicity to the daphnid, *Ceriodaphnia dubia*, during the initial 48 hour exposure period. The effluent had significant adverse effects on daphnid reproduction but not on survival during the chronic exposure period.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	8 Days	100%	>100%	71%	Yes
Reproduction	8 Days	71%	100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 15219

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during November 2006 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	7 Days	71%	>71%	71%	Yes
Reproduction	7 Days	71%	>71%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 14861

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during August 2006 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	8 Days	100%	>100%	71%	Yes
Reproduction	8 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 14530

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during May 2006 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	8 Days	100%	>100%	71%	Yes
Reproduction	8 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 14255

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during March 2006 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	6 Days	100%	>100%	71%	Yes
Reproduction	6 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 13972

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted during November 2005 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	8 Days	100%	>100%	71%	Yes
Reproduction	8 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 13594

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted from August 9-15, 2005 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	6 Days	100%	>100%	71%	Yes
Reproduction	6 Days	71%	100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 13270

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted from May 10-16, 2005 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	6 Days	100%	>100%	71%	Yes
Reproduction	6 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

**TABLE 1. Summary of Chronic Results: *C. dubia*.
Attleboro WPCF Effluent Evaluation, First Quarter 2005.**

Feb. 2005

Effluent Conc.	SURVIVAL								REPRODUCTION					
	Exposure Period (Days)								Exposure Period (Days)					
	0	1	2	3	4	5	6	7	3	4	5	6	7	Total
Lab	10	10	10	10	10	10	10	10	32	49	50	111	14	256
RW	10	10	10	10	10	10	7	7	39	4	85	24	27	179
6.25%	10	10	10	10	10	10	10	10	40	25	80	98	21	264
12.5%	10	10	10	9	9	8	7	7	16	20	48	13	18	115
25%	10	10	10	10	10	10	10	10	35	33	75	73	18	234
50%	10	9	9	9	8	8	8	8	35	16	58	72	0	181
71%	10	10	10	10	10	9	9	9	31	26	60	70	10	197
100%	10	10	10	10	10	10	9	9	35	80	36	76	19	246

	Lab	RW	6.25%	12.5%	25%	50%	71%	100%
% Adult Survival, 7 days	100	70.0	100	70.0	100	80.0	90.0	90.0
% Females Producing 3 Broods	70.0	50.0	80.0	20.0	80.0	40.0	70.0	70.0
Day of First Offspring	3	3	3	3	3	3	3	3
Mean No. of Offspring/Female	25.6	17.9	26.4	11.5*	23.4	18.1	19.7	24.6

END POINT SUMMARY

Chronic Exposure Evaluation Acute Exposure Evaluation
 Survival Reproduction

C-NOEC = 100% 6.25% 48 Hour LC-50 = >100%
 LOEC = >100% 12.5% 48 Hour A-NOEC = 100%

COMMENTS:

RW - Receiving Water

* - Statistical significant (less than) in comparison to the lab water diluent.

STUDY NUMBER 12716

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay conducted from November 9-15, 2004 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	6 Days	100%	>100%	71%	Yes
Reproduction	6 Days	100%	>100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

**TABLE 1. Summary of Chronic Results: *C. dubia*.
Attleboro WPCF Effluent Evaluation, August 2004.**

Effluent Conc.	SURVIVAL							REPRODUCTION				
	Exposure Period (Days)							Exposure Period (Days)				
	0	1	2	3	4	5	6	3	4	5	6	Total
RW	10	10	10	10	10	10	10	0	39	100	91	230
Lab	10	10	10	10	10	10	10	0	43	78	113	234
6.25%	10	10	10	10	10	10	10	0	37	89	80	206
12.5%	10	10	10	10	10	9	8	0	46	67	90	203
25%	10	10	10	10	10	10	10	0	45	84	108	237
50%	10	10	10	10	10	10	10	0	37	76	85	198
71%	10	10	10	10	10	10	10	0	45	88	101	234
100%	10	10	10	10	10	10	10	0	29	80	102	211

	RW	Lab	6.25	12.5	25%	50%	71%	100%
% Adult Survival, 6 days	100	100	100	80.0	100	100	100	100
% Females Producing 3 Broods	80.0	100	70.0	80.0	90.0	80.0	90.0	90.0
Day of First Offspring	4	4	4	4	4	4	4	4
Mean No. of Offspring/Female	23.0	23.4	20.6	20.3	23.7	19.8	23.4	21.1

END POINT SUMMARY

Chronic Exposure Evaluation Acute Exposure Evaluation

Survival Reproduction

C-NOEC = 100% 100% 48 Hour LC-50 = >100%
 LOEC = >100% >100% 48 Hour A-NOEC = 100%

COMMENTS:

RW - Receiving Water

**TABLE 1. Summary of Chronic Results: *C. dubia*.
Attleboro WPCF Effluent Evaluation, May 2004.**

Effluent Conc.	SURVIVAL							REPRODUCTION				
	Exposure Period (Days)							Exposure Period (Days)				
	0	1	2	3	4	5	6	3	4	5	6	Total
RW	10	10	10	10	10	10	10	42	3	103	85	233
Lab	10	10	6	6	6	6	6	30	0	63	70	163
6.25%	10	10	10	10	10	10	10	43	1	107	111	262
12.5%	10	10	10	10	10	10	10	42	0	111	114	267
25%	10	10	10	10	10	10	10	41	0	100	122	263
50%	10	10	10	10	10	9	9	44	16	99	130	289
71%	10	10	10	10	10	9	9	37	35	32	142	246
100%	10	10	10	9	9	9	9	41	45	13	121	220

	RW	Lab	6.25	12.5	25%	50%	71%	100%
% Adult Survival, 6 days	100	60	100	100	100	90	90	90
% Females Producing 3 Broods	100	60	100	100	100	90	90	80
Day of First Offspring	3	3	3	3	3	3	3	3
Mean No. of Offspring/Female	23.3	16.3	26.2	26.7	26.3	28.9	24.6	22.0

END POINT SUMMARY

Chronic Exposure Evaluation Acute Exposure Evaluation

Survival Reproduction

C-NOEC = 100% 100% 48 Hour LC-50 = >100%

LOEC = >100% >100% 48 Hour A-NOEC = 100%

COMMENTS:

RW - Receiving Water

**TABLE 1. Summary of Chronic Results: *C. dubia*.
Attleboro WPCF Effluent Evaluation, February 2004.**

Effluent Conc.	SURVIVAL							REPRODUCTION				
	Exposure Period (Days)							Exposure Period (Days)				
	0	1	2	3	4	5	6	3	4	5	6	Total
RW	10	10	10	10	10	10	10	20	40	64	77	201
Lab	10	10	10	10	10	10	10	30	48	58	118	254
6.25%	10	10	10	10	10	10	10	26	39	72	127	264
12.5%	10	10	10	10	10	10	10	26	54	56	115	251
25%	10	10	10	10	10	10	10	26	60	55	149	290
50%	10	10	10	10	10	10	10	30	56	56	115	257
71%	10	10	10	10	10	10	10	27	40	74	122	263
100%	10	10	10	10	10	10	10	26	55	64	118	263

	RW	Lab	6.25	12.5	25%	50%	71%	100%
% Adult Survival, 6 days	100	100	100	100	100	100	100	100
% Females Producing 3 Broods	60.0	80.0	90.0	70.0	90.0	90.0	80.0	70.0
Day of First Offspring	3	3	3	3	3	3	3	3
Mean No. of Offspring/Female	20.1	25.4	26.4	25.1	29.0	25.7	26.3	26.3

END POINT SUMMARY

Chronic Exposure Evaluation Acute Exposure Evaluation

Survival Reproduction

C-NOEC = 100% 100% 48 Hour LC-50 = >100%
 LOEC = >100% >100% 48 Hour A-NOEC = 100%

COMMENTS:

RW - Receiving Water

STUDY NUMBER 11668

EXECUTIVE SUMMARY

The following summarizes the results of a chronic exposure bioassay performed from November 11-17, 2003 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Pass* Yes/No
<i>Ceriodaphnia dubia</i>					
Survival	6 Days	100%	>100%	71%	Yes
Reproduction	6 Days	71%	100%	71%	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

STUDY NUMBER 16164

EXECUTIVE SUMMARY

The following summarizes the results of a modified acute and chronic exposure bioassay conducted during August 2007 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Meets Permit Limit*	Assay Meets Protocol Limit
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Meets Permit Limit*	
<i>Ceriodaphnia dubia</i>	8 Days	71%	100%	71%	Yes	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

CETIS Test Summary

Page 1 of 2
 Report Date: 28 Aug-07 2:31 PM
 Link: 06-6154-3818

Ceriodaphnia 7-d Survival and Reproduction Test				EnviroSystems, Inc.
Test No: 03-9175-4531	Test Type: Reproduction-Survival (6-9d)	Duration: 7d 18h		
Start Date: 14 Aug-07 02:50 PM	Protocol: EPA/821/R-02-013 (2002)	Species: Ceriodaphnia dubia		
Ending Date: 22 Aug-07 09:10 AM	Dil Water: Reconstituted Water	Source: In-House Culture		
Setup Date: 14 Aug-07 02:50 PM	Brine: Not Applicable			
Sample No: 02-6157-6837	Material: Municipal WWTF Effluent	Client: Attleboro WWTP		
Sample Date: 13 Aug-07 08:00 AM	Code: 16164	Project: Third Quarter WET Compliance Test		
Receive Date: 13 Aug-07 11:21 AM	Source: Attleboro MA WWTF			
Sample Age: 31h	Station: MA0100695; Final Discharge			

Comparison Summary						
Analysis	Endpoint	NOEL	LOEL	ChV	MSDp	Method
09-8690-5003	8d Proportion Survived	71	100	84.261	N/A	Fisher's Exact
11-5160-1806	8d Reproduction	100	> 100	N/A	62.71%	Steel's Many-One Rank

Test Acceptability						
Analysis	Endpoint	Attribute	Statistic	Acceptable Range	Decision	
09-8690-5003	8d Proportion Survived	Control Response	0.9	0.8 - N/A	Passes acceptability criteria	
11-5160-1806	8d Reproduction	Control Response	32.1	15 - N/A	Passes acceptability criteria	
11-5160-1806	8d Reproduction	MSDp	0.62709	0.1 - 0.5	Fails acceptability criteria	

8d Proportion Survived Summary								
Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
0	Receiving Wat	10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
6.25		10	0.80000	0.00000	1.00000	0.13333	0.42164	52.70%
12.5		10	0.80000	0.00000	1.00000	0.13333	0.42164	52.70%
25		10	0.50000	0.00000	1.00000	0.16667	0.52705	105.41
50		10	0.80000	0.00000	1.00000	0.13333	0.42164	52.70%
71		10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
100		10	0.30000	0.00000	1.00000	0.15275	0.48305	161.02

8d Reproduction Summary								
Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	32.1	2	66	8.1887	25.895	80.67%
0	Receiving Wat	10	20.4	0	45	5.0381	15.932	78.10%
6.25		10	31.2	3	54	5.9063	18.677	59.86%
12.5		10	33.3	0	57	6.0352	19.085	57.31%
25		10	20.1	0	53	4.9361	15.609	77.66%
50		10	32.4	0	49	5.4205	17.141	52.91%
71		10	32.3	0	54	6.1555	19.466	60.26%
100		10	23.1	2	49	5.2376	16.563	71.70%

STUDY NUMBER 16540

EXECUTIVE SUMMARY

The following summarizes the results of a modified acute and chronic exposure bioassay conducted during November 2007 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Meets Permit Limit*	Assay Meets Protocol Limit
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Meets Permit Limit*	
<i>Ceriodaphnia dubia</i>	7 Days	100%	>100%	71%	Yes	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

CETIS Test Summary

Report Date: 28 Nov-07 6:24 PM

Link: 05-6860-2488

Ceriodaphnia 7-d Survival and Reproduction Test

EnviroSystems, Inc.

Test No:	01-8830-0005	Test Type:	Reproduction-Survival (7d)	Duration:	6d 16h
Start Date:	13 Nov-07 05:35 PM	Protocol:	EPA/821/R-02-013 (2002)	Species:	Ceriodaphnia dubia
Ending Date:	20 Nov-07 09:56 AM	Dil Water:	Reconstituted Water	Source:	In-House Culture
Setup Date:	13 Nov-07 05:35 PM	Brine:	Not Applicable		

Sample No:	06-2017-2928	Material:	WWTP, Municipal Treatment Plant	Client:	Attleboro WWTP
Sample Date:	13 Nov-07 08:10 AM	Code:	16540	Project:	Fourth Quarter WET Compliance Test
Receive Date:	13 Nov-07 12:27 PM	Source:	Attleboro MA WWTF		
Sample Age:	9h	Station:	MA0100595; Final Discharge		

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	MSDp	Method
07-3720-8985	7d Proportion Survived	100	> 100	N/A	N/A	Fisher's Exact
02-6571-2734	Reproduction	100	> 100	N/A	32.79%	Dunnett's Multiple Comparison

Test Acceptability

Analysis	Endpoint	Attribute	Statistic	Acceptable Range	Decision
07-3720-8985	7d Proportion Survived	Control Response	1	0.8 - N/A	Passes acceptability criteria
02-6571-2734	Reproduction	Control Response	45.3	15 - N/A	Passes acceptability criteria
02-6571-2734	Reproduction	MSDp	0.32795	0.13 - 0.47	Passes acceptability criteria

7d Proportion Survived Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
0	Receiving Wat	10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
6.25		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
12.5		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
25		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
50		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
71		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Reproduction Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	45.3	19	66	4.32319	13.6711	30.18%
0	Receiving Wat	10	32.5	0	67	6.97336	22.0517	67.85%
6.25		10	48.6	26	65	4.85844	15.3637	31.61%
12.5		10	39.8	21	58	4.005	12.6649	31.82%
25		10	42.7	6	70	5.45293	17.2437	40.38%
50		10	47.7	22	70	4.28742	13.5896	28.49%
71		10	45.3	23	68	4.06899	12.8673	28.40%
100		10	42.9	15	57	4.13777	13.0848	30.50%

STUDY NUMBER 16846

EXECUTIVE SUMMARY

The following summarizes the results of a modified acute and chronic exposure bioassay conducted during February 2008 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Meets Permit Limit*	Assay Meets Protocol Limit
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Meets Permit Limit*	
<i>Ceriodaphnia dubia</i>	7 Days	100%	>100%	71%	Yes	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

CETIS Test Summary

Ceriodaphnia 7-d Survival and Reproduction Test							EnviroSystems, Inc.	
Test No:	09-2996-9199	Test Type:	Reproduction-Survival (7d)	Duration:	7d 0h			
Start Date:	12 Feb-08	Protocol:	EPA/821/R-02-013 (2002)	Species:	Ceriodaphnia dubia			
Ending Date:	19 Feb-08	Dil Water:	Mod-Hard Synthetic Water	Source:	In-House Culture			
Setup Date:	12 Feb-08 12:00 AM	Brine:	Not Applicable					
Sample No:	08-0405-1449	Material:	Municipal WWTF Effluent	Client:	Attleboro WWTP			
Sample Date:	11 Feb-08 08:00 AM	Code:	16846	Project:	First Quarter WET Compliance Test			
Receive Date:	11 Feb-08 09:00 AM	Source:	Attleboro MA WWTF					
Sample Age:	16h	Station:	MA0100595; Final Discharge					
Comparison Summary								
Analysis	Endpoint	NOEL	LOEL	ChV	MSDp	Method		
10-3886-7470	7d Proportion Survived	100	> 100	N/A	N/A	Fisher's Exact		
15-7832-4908	Reproduction	100	> 100	N/A	44.48%	Dunnett's Multiple Comparison		
Test Acceptability								
Analysis	Endpoint	Attribute	Statistic	Acceptable Range	Decision			
15-7832-4908	Reproduction	Control Response	25.4	15 - N/A	Passes acceptability criteria			
15-7832-4908	Reproduction	MSDp	0.44477	0.13 - 0.47	Passes acceptability criteria			
7d Proportion Survived Summary								
Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	0.80000	0.00000	1.00000	0.13333	0.42164	52.70%
0	Receiving Wat	10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
6.25		10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
12.5		10	0.70000	0.00000	1.00000	0.15275	0.48305	69.01%
25		10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
50		10	0.80000	0.00000	1.00000	0.13333	0.42164	52.70%
71		10	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		10	0.90000	0.00000	1.00000	0.10000	0.31623	35.14%
Reproduction Summary								
Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Lab Water	10	25.4	1	51	4.8676	15.393	60.60%
0	Receiving Wat	10	32.2	12	42	2.5983	8.2165	25.52%
6.25		10	27.1	7	39	2.6727	8.4518	31.19%
12.5		10	21.7	4	35	3.4353	10.863	50.06%
25		10	27.8	16	39	2.5983	8.2165	29.56%
50		10	31.8	0	49	4.2812	13.538	42.57%
71		10	26.4	17	37	2.1302	6.7363	25.52%
100		10	26.5	5	36	2.9712	9.3956	35.46%

STUDY NUMBER 17168

EXECUTIVE SUMMARY

The following summarizes the results of a modified acute and chronic exposure bioassay conducted during May 2008 using samples collected from the Attleboro, Massachusetts Water Pollution Control Facility. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Meets Permit Limit*	Assay Meets Protocol Limit
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	100%	>100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	LOEC	Permit Limit (C-NOEC)	Meets Permit Limit*	
<i>Ceriodaphnia dubia</i>	7 Days	100%	>100%	71%	Yes	Yes

* - LC-50 and/or C-NOEC meets or exceeds permit limit.

CETIS Summary Report

Report Date: 21 May-08 09:44 (p 1 of 2)
 Link/Link Code: 17-5870-1427

Ceriodaphnia 7-d Survival and Reproduction Test EnviroSystems, Inc.

Test Run No: 00-8001-8822	Test Type: Reproduction-Survival (6-8d)	Analyst:
Start Date: 13 May-08 14:45	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 May-08 13:30	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 23h	Source: In-House Culture	Age: <8

Sample No: 11-0033-5611	Code: 17168	Client: Attleboro WWTP
Sample Date: 12 May-08 08:15	Material: WWTP, Municipal Treatment Plant	Project: Second Quarter WET Compliance Test
Receive Date: 12 May-08 10:35	Source: Attleboro MA WWTF (ATTLEBORO)	
Sample Age: 31h (6 °C)	Station: MA0100595; Final Discharge	

Comparison Summary

Analysis No	Endpoint	NOEL	LOEL	TQEL	PMSD	Method
20-6833-8299	6d Proportion Survived	100	> 100	N/A	N/A	Fisher Exact/Bonferroni-Holm Test
08-3942-4431	6d Reproduction	100	> 100	N/A	19.18%	Steel Many-One Rank Test

Test Acceptability

Analysis No	Endpoint	Attribute	Test Stat	Acceptability Limits	Overlap	Decision
20-6833-8299	6d Proportion Survived	Control Resp	1	0.8 - NL	Yes	Passes acceptability criteria
08-3942-4431	6d Reproduction	Control Resp	27.9	15 - NL	Yes	Passes acceptability criteria
08-3942-4431	6d Reproduction	PMSD	0.1918	0.13 - 0.47	Yes	Passes acceptability criteria

6d Proportion Survived Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Receiving Wat	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
71		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

6d Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water	10	27.9	25.97	29.83	19	36	0.9448	5.174	18.54%	0.0%
0	Receiving Wat	10	25.4	21.87	28.93	0	32	1.724	9.442	37.17%	8.96%
6.25		10	25.4	21.87	28.93	0	33	1.724	9.442	37.17%	8.96%
12.5		10	27.5	26.55	28.45	23	31	0.4655	2.55	9.27%	1.43%
25		10	28.4	27.47	29.33	24	31	0.457	2.503	8.82%	-1.79%
50		10	30.9	28.87	32.83	20	39	0.9448	5.174	16.74%	-10.75%
71		10	27.8	26.18	29.42	23	35	0.7928	4.341	15.62%	0.36%
100		10	30.8	28.72	31.88	27	35	0.5292	2.898	9.41%	-10.39%