CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 19, 2010

TO: Bob Masnado – WT/3

FROM: Kari Fleming - Biomonitoring Coordinator, Bureau of Watershed Management

SUBJECT: **SLH Biomonitoring Results for Silver Lake Ambient Sites (sampling event #2)**

Attached is a copy of the "Ambient Toxicity Test Report Form", which summarizes the toxicity tests completed by the University of Wisconsin-Madison's State Laboratory of Hygiene (SLH) with samples collected in October, 2010 from Silver Lake (Waushara County).

Acute Toxicity Tests

No toxicity was observed to *Pimephales promelas* (fathead minnow) or *Ceriodaphnia dubia* (water flea). See the report for a statistical interpretation of the data.

Chronic Toxicity Tests

No toxicity was observed to *Pimephales promelas* (fathead minnow), *Ceriodaphnia dubia* (water flea) or *Selenastrum capricornutum* (algae). See the report for a statistical interpretation of the data.

If you have any questions concerning this report or biomonitoring in general, please call me at (608) 267-7663 or email to: *Kari.Fleming@dnr.state.wi.us*.

Cc:

AMBIENT TOXICITY TEST REPORT FORM

GENERAL INFORMATION

PROJECT NAME:	**Silver Lake ambient sites, sample event #2**	LABORATORY NAME:	Wisconsin State Laboratory of Hygiene
		REPORT NUMBER:	FV000266-267
REPORT TYPE:	☑ Original ☐ Amended	If amended, original report number:	

SAMPLE INFORMATION

SAMPLE NO.	LAB NO.	FIELD NO.	SITE DESCRIPTION	STATION NO. (SWIMS, STORET or LAT/LONG)
1	FV000266	Bay A	Sample Location A	
2	FV000267	Bay B	Sample Location B	
3				
4				
5				
6				

SAMPLE NO.	SAMPLE COLLECTION			SAMPLE TEMP. °C		pH at LAB	HAND DELIVER? (If Yes, ≤ 4 hr?)	HOLD TIME ≤ 36 HR?	SAMPLE ACCEP-TABLE?
	SAMPLE TYPE	SAMPLING DATE	DATE at LAB	COLLECTION	AT LAB				
1	GRAB	10/25/2010	10/27/2010	11.1	2.0	8.23	☐ Yes ☑ No	☐ Yes ☑ No	☑ Yes ☐ No
2	GRAB	10/25/2010	10/27/2010	11.1	2.1	8.18	☐ Yes ☑ No	☐ Yes ☑ No	☑ Yes ☐ No
3							☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
4							☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
5							☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
6							☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Describe any unusual conditions during sampling that may influence test results. (see Part 6.1.2 of the Methods Manual for examples.)

COMMENTS:

TEST INFORMATION

	ACUTE	CHRONIC
Date Test Initiated:	**10/27/2010**	**10/27/2010**

QA/QC CONDITIONS

	ACUTE	CHRONIC
Temperatures maintained during test? (20 ± 1°C or 25 ± 1°C)	☑ Yes ☐ No	☐ Yes ☑ No
Dissolved oxygen ≥ 4.0 mg/l throughout test?	☑ Yes ☐ No	☑ Yes ☐ No
pH maintained within 6.0 - 9.0 s.u. throughout test?	☑ Yes ☐ No	☑ Yes ☐ No
Concurrent or monthly reference tests within acceptable limits?	☑ Yes ☐ No	☑ Yes ☐ No
Tests conducted in a carbon dioxide atmosphere throughout test?	☑ Yes ☐ No	☑ Yes ☐ No
Light intensity for *Selenastrum* maintained throughout test? (4,300 ± 430 lux)		☑ Yes ☐ No
Were samples modified prior to testing? (ex. filtration, aeration, chem addition)	☐ Yes ☑ No	☐ Yes ☑ No

COMMENTS: **Temperature in algae test was low on day 1 due to failure of the incubator test was placed in (21.0 C). Test was moved to a shaker with an internal temperature control Temperatures were within range on days 2 and 3, but were slightly high on day 4 before test was shut down (25.9 - 26.8 C).**

WATER CHEMISTRY

(All values reported in mg/L, except pH and Conductivity)

SAMPLE TYPE	SAMPLE NO.	HARDNESS	ALKALINITY	TOTAL AMMONIA	DISSOLVED OXYGEN	pH (s.u.) After Warming	Conductivity (µS)
SITES	1	136	125	0.105	8.8	8.23	263
	2	128	125	0.107	8.9	8.06	262
LAB WATER	MHW	88	70	NA	8.4	8.08	284
	DC	128	250	NA	8.5	8.80	564

COMMENTS: **MHW = Moderately hard water is used as the lab control water for the *Ceriodaphnia dubia* & *Selenastrum* tests.**
DC = Dechlorinated Madison tap water is used as the lab control for the fathead minnow test.
For ammonia analysis, limit of detection (LOD) is 0.015 mg/L, limit of quantification (LOQ) is 0.048 mg/L.

ACUTE TEST CONTROL PERFORMANCE

LAB WATER CONTROLS	
Fathead Minnow	*Ceriodaphnia dubia*
Survival ≥ 90% ☑ Yes ☐ No	Survival ≥ 90% ☑ Yes ☐ No

COMMENTS:

ACUTE TEST DATA

SPECIES		SITE DESCRIPTION	Percent Survival By Replicate				Mean Percent Survival	Statistical Significance*
			1	2	3	4		
Fathead Minnow	LC	LW Control	100	100	100	100	100.0	A
	1	Bay A	100	100	100	100	100.0	A
	2	Bay B	100	100	100	100	100.0	A
Age of Organism:								
9 Days								

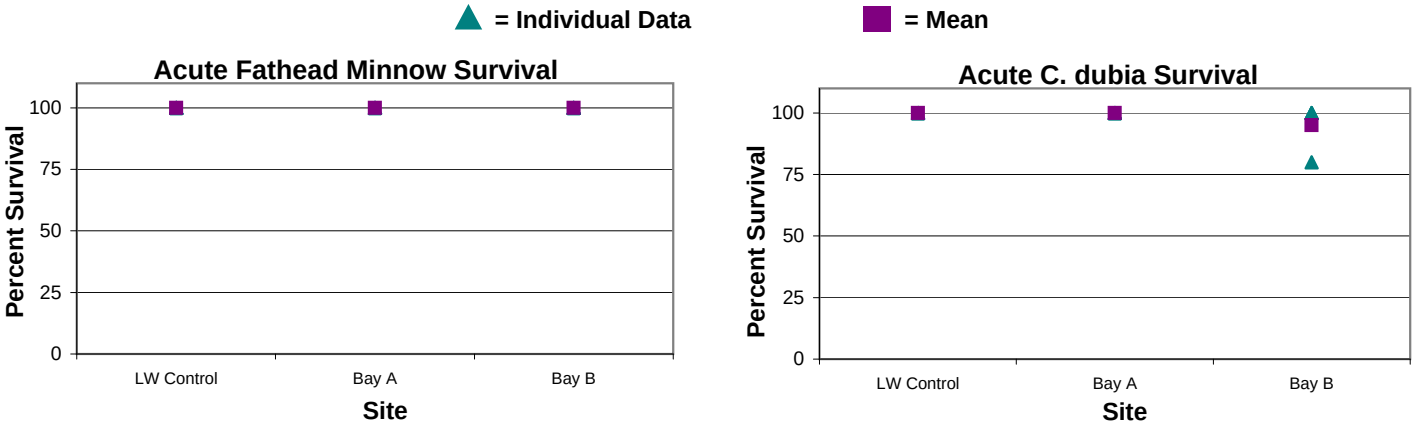
Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS: *** Samples with the same letter are not statistically different from each other.**

SPECIES		SITE DESCRIPTION	Percent Survival By Replicate				Mean Percent Survival	Statistical Significance*
			1	2	3	4		
Ceriodaphnia dubia	LC	LW Control	100	100	100	100	100.0	A
	1	Bay A	100	100	100	100	100.0	A
	2	Bay B	80	100	100	100	95.0	A
Age of Organism:								
< 24 Hours Old								

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS: *** Samples with the same letter are not statistically different from each other.**



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CHRONIC TEST CONTROL PERFORMANCE

LAB WATER CONTROLS

Fathead Minnow	*Ceriodaphnia dubia*
Survival > 80% ☑ Yes ☐ No	Survival > 80% ☑ Yes ☐ No
> 0.25 mg/fish ☑ Yes ☐ No	> 15 neonates/female ☑ Yes ☐ No
Survival Weight CV < 40% ☑ Yes ☐ No	Reproduction CV < 40% ☑ Yes ☐ No
Survival Weight % CV = 18	Reproduction %CV= 17
	> 80% 3rd brood ☑ Yes ☐ No
	< 20% males ☑ Yes ☐ No

COMMENTS:

CHRONIC TEST DATA

SPECIES	SITE DESCRIPTION		MEAN % SURVIVAL	MEAN DRY BIOMASS PER REPLICATE PAIR (mg)					MEAN BIOMASS (mg)	Statistical Significance*
				1	2	3	4	5		
Fathead Minnow Growth & Survival Test	LC	LW Control	89	0.467	0.413	0.508	0.290	0.448	0.425	A
		LW Survival Weight		*0.467*	*0.413*	*0.508*	*0.387*	*0.597*		
	1	Bay A	95	0.620	0.365	0.653	0.640	0.618	0.579	A
	2	Bay B	95	0.480	0.495	0.505	0.388	0.383	0.450	A

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS: *** Samples with the same letter are not statistically different from each other.**

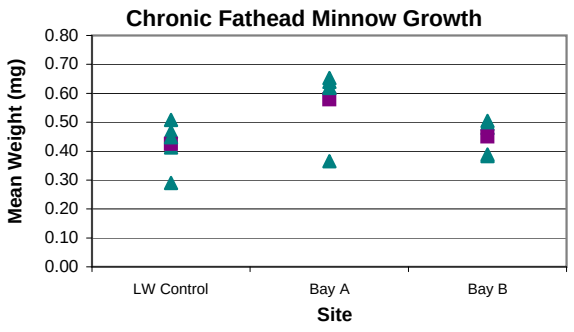
SPECIES	SITE	NEONATE PRODUCTION BY REPLICATE										MEAN NEONATES	% ADULT SURVIVAL	Statistical Significance*
		1	2	3	4	5	6	7	8	9	10			
C. dubia Reproduction & Survival Test	LC	21	26	17	22	24	20	26	26	26	16	22	90	A
	1	27	23	17	32	9	33	32	31	16	30	25	90	A
	2	22	32	32	28	24	18	28	0	35	31	25	100	A

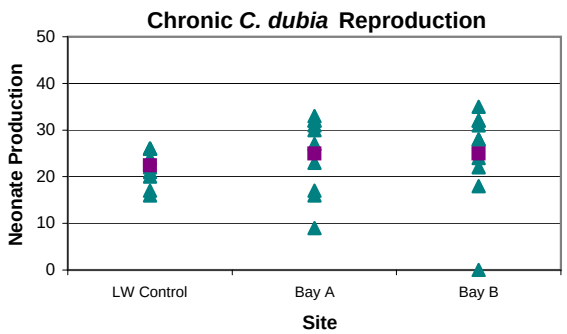
Male Production ≤ 20% Over All Treatments? ☑ Yes ☐ No

Please describe any unusual behavior and/or appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS: *** Samples with the same letter are not statistically different from each other.**

▲ = Individual Data ■ = Mean





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CHRONIC TEST CONTROL PERFORMANCE

LAB WATER CONTROLS

Selenastrum

≥ $1x10^6$ cells/ml
☑ Yes ☐ No

CV ≤ 20%
☑ Yes ☐ No

%CV = 3

GROWTH MEASUREMENT PER REPLICATE

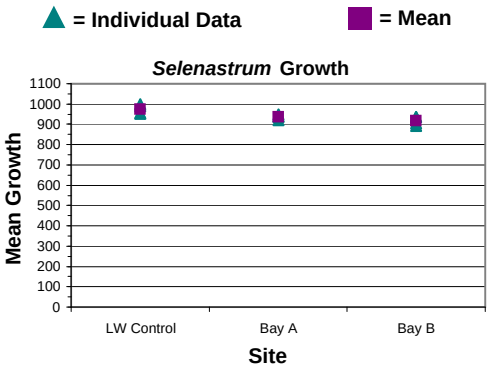
SPECIES	SITE DESCRIPTION		Blank	1		2		3		4		MEAN GROWTH	%CV	Statistical Significance*
				Initial	Adjusted	Initial	Adjusted		Adjusted	Initial	Adjusted			
Selenastrum capricornutum GROWTH TEST	LC	LW Control	0	952	952	1000	1000	955	955	991	991	975	3	A
	1	Bay A	0	935	935	919	919	939	939	948	948	935	1	B
	2	Bay B	0	905	905	893	893	936	936	935	935	917	2	B

Test Type: ☐ flask ☑ microplate **Endpoint:** ☐ count ☐ spec. ☑ fluor.

Please describe any unusual appearance of organisms.(see Part 6.1.2 of the Methods Manual for ex.)

COMMENTS: *** Samples with the same letter are not statistically different from each other.**

Temperature in algae test was low on day 1 due to failure of the incubator test was placed in (21.0 C). Test was moved to a shaker with an internal temperature control. Temperatures were within range on days 2 and 3, but were slightly high on day 4 before test was shut down (25.9 - 26.8). While algae growth at both sampling sites was statistically different from that in the control, there was not a toxic effect. Algal growth was good in the control and both samples. The statistical difference arose due to the low variability in the data.



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I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I also certify that these results relate only to these samples.

LAB REPRESENTATIVE:	Amy Mager		SIGNATURE:		
DATE:	11/19/2010				
PHONE:	(608) 224-6230	WDNR LAB CERT #:	113133790		
LAB ADDRESS:	Wisconsin State Laboratory of Hygiene, 2601 Agriculture Drive, Madison, WI 53718				
REVIEWED BY:	Steve Geis		DATE:	12/06/2010	
PERMITTEE			SIGNATURE:		
PHONE:			DATE:		

Send *all pages* of this form (plus any attachments or additional information which you believe to be relevant to the test) to: Biomonitoring Coordinator, Bureau of Watershed Management, Department of Natural Resources, 101 South Webster St., P.O. Box 7921, Madison, WI 53707-7921.

Copies of the State of Wisconsin Aquatic Life Toxicity Testing Methods Manual (Methods Manual) and the WET Guidance Document can be obtained from the WDNR Biomonitoring Coordinator at the address given above or at: http://dnr.wi.gov/org/water/wm/ww/biomon/

TO BE COMPLETED BY THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES		
Results Entered Into Database? ☐ Yes ☐ No		
COMMENTS:		
REVIEWED BY:	**Kari Fleming**	**DATE: December 15, 2010**
CC:	Bob Masnado - WT/3	
	Rob McClennan - NER	

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