30 Day Progress Report to the US EPA

RE: Statoil Eisenbarth Well Pad Site, Clarington, Ohio, Docket No. V-W-14-C-012, Administrative Settlement Agreement and Order on Consent for Removal Action, US EPA Region 5 (effective August 20, 2014)
Reporting Period February 16, 2016 – March 15, 2016

Prepared for
Statoil USA Onshore Properties Inc.
By
Moody and Associates, Inc.

Table of Contents

EXECUTIVE SUMMARY 2

1.0 INTRODUCTION 3

2.0 SIGNIFICANT DEVELOPMENTS OF THE PRECEDING 30 DAYS (FEBRUARY 16, 2016 TO MARCH 15, 2016) 3

2.1 Actions Performed 3

2.2 Problems Encountered 3

2.3 Analytical Data Received 3

3.0 ANTICIPATED DEVELOPMENTS: MARCH 16, 2016 TO APRIL 15, 2016 3

3.1 Schedule of Actions 3

3.2 Anticipated Problems 3

3.3 Planned Resolutions 3

4.0 CONCLUSIONS 3

EXECUTIVE SUMMARY

Statoil USA Onshore Properties Inc. (Statoil) and the United States Environmental Protection Agency (US EPA), Region 5, entered into an Administrative Settlement Agreement and Order on Consent for Removal Action (AOC), Docket No. V-W-14-C-012, effective August 20, 2014. On March 2, 2015, Statoil received US EPA's conditional approval of Statoil's Draft Work Plan, which was submitted to US EPA pursuant to the AOC on September 3, 2014 (initial submittal), and December 23, 2014 (revised submittal per US EPA comments). Statoil received EPA's final approval of the Work Plan on May 5, 2015. As specified in Paragraph 19.a of the AOC, Statoil is required to submit a progress report to US EPA every 30th day following receipt of US EPA's approval of the Work Plan. Statoil is submitting this Progress Report (PR) pursuant to Paragraph 19.a.

Also as specified in Paragraph 19.a, this PR describes all significant developments during the preceding period, including actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems. For purposes of this PR, the reporting period is February 16, 2016 through March 15, 2016.

1.0 INTRODUCTION

This Progress Report (PR) prepared by Moody and Associates (Moody) on behalf of Statoil addresses the areas specified in AOC Paragraph 19.a for the period of February 16, 2016 to March 15, 2016 (i.e., the preceding period) as well as anticipated developments for March 16, 2016 to April 15, 2016 (i.e., the next reporting period).

2.0 SIGNIFICANT DEVELOPMENTS OF THE PRECEDING 30 DAYS (FEBRUARY 16, 2016 TO MARCH 15, 2016)

2.1 Actions Performed

Statoil submitted the 15.a.ii report on February 18, 2016.

2.2 Problems Encountered

No problems were encountered during the reporting period.

2.3 Analytical Data Received

Statoil received final data for the 2015 electrofishing and Hester-Dendy sampling from Midwest Biodiversity Institute (MBI) as well as the final data of the American Aquatic Testing Inc. (AAT) Whole Effluent Toxicity (WET) and Whole Sediment Toxicity (WST) testing. AAT and MBI data are attached as **Appendix A**.

3.0 ANTICIPATED DEVELOPMENTS: MARCH 16, 2016 TO APRIL 15, 2016

3.1 Schedule of Actions

Review and evaluation of data will continue pursuant to the schedule in the approved Work Plan.

3.2 Anticipated Problems

Statoil does not anticipate any problems in performing work required by the AOC during the next reporting period.

3.3 Planned Resolutions

Statoil does not anticipate any problems and as a result, there are no planned resolutions during the next reporting period.

4.0 CONCLUSIONS

Monitoring and evaluation of data will proceed pursuant to the schedule in the approved Work Plan. This PR described all significant developments during the preceding period (February 16, 2016 - March 15, 2016), including actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period (March 16, 2016-

April 15, 2016), including a schedule of actions to be performed, anticipated problems, and planned resolutions.

Statoil's next progress report will be submitted to the US EPA on May 1, 2016 for the March 16, 2016 to April 15, 2016 reporting period.

APPENDIX A.1 American Aquatic Testing, Inc.

Raw Data for *Chironomus dilutus* Long-Term Exposure Study

Client/Toxicant: 369
Project Number: 01-01
Species: C. d. lutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 10/10/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10 Observ.	Day 10 Final Live Count
Control	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	/											
04	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	Initials	MP	MJF	JK	[illegible]	MP	TD	TD	TD	TD	TD	
	Date	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10 Observ.	Day 10 Final Live Count
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
12	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	/											
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
17	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	MP	MJF	JK	[illegible]	MP	TMD	TMD	TMD	TMD	TMD	
	Date	10/10	10-11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 10/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10 Observ.	Day 10 Final Live Count
20	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	/											
	/											
	/											
21	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	A											
	B											
	C											
	D											
	E											
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	Intials	MO	MT	JK	[illegible]	MS	TMD	TMD	TMD	TMD	TMD	
	Date	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 10/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20 obs	Day 20 Live Count
Control	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	IF	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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04	A	N	N	N	N	N	IF	N	N	N	N	
	B	N	N	N	N	N	IF	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	IF	N	IF	N	N	N	N	N	IF	N	
	H	N	N	N	N	N	IF	N	N	N	N	
	I	N	N	IF	N	N	N	IF	N	N	N	
	J	N	N	N	N	N	N	IF	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	Initials	TAP	TAP	TAP	JK	AW	TAP	JK	JK	AW	TAP	
	Date	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	

Comments:

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FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15 18

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20 obs.	Day 20 Live Count
	A	N	N	N	N	N	F	N	N	N	N	
	B	N	N	N	F	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	F	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
12	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	/											
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
17	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	C											
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	G											
	H											
	Initials	TMD	TMD	TMD	JK	MMD	TMD	JK	JK	PP	PP	
	Date	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20 obs.	Day 20 Live Count
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	2F	2F	1F	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	1F	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
20	I	N	N	N	N	N	N	N	N	1F	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	1F	N	N	N	N	
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	/											
	/											
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	1F	1F	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	1F	1F	N	N	N	
	E	N	N	N	N	N	1F	N	N	N	N	
	F	N	N	N	N	N	N	N	N	1F	N	
	G	N	N	N	N	N	N	N	N	N	N	
21	H	N	N	N	N	N	N	N	N	N	N	
	I	N	N	N	N	N	N	N	N	N	N	
	J	N	N	N	N	N	N	N	N	N	N	
	K	N	N	N	N	N	N	N	N	N	N	
	L	N	N	N	N	N	N	N	N	N	N	
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	E											
	F											
	G											
	H											
	Initials	TAP	TAP	TAP	JK	MA	TAP	JK	JK	MA	TAP	
	Date	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-~~20~~ 9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-~~20~~ 9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30 Observ.	Day 30 Final Live Count
Control	A	N	N	N	N	N	1F	N	N	N	N	
	B	N	N	N	N	N	N	N	N	1Fly	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	1F	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	1Fly	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	1Fly	N	N	N	N	
04	A	N	N	N	N	N	1F	N	N	N	N	~~1Fly~~
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	~~1Fly~~
	E	N	N	N	N	N	N	N	N	N	1F	~~1Fly~~
	F	N	N	N	N	N	N	N	1Fly	N	N	
	G	N	N	N	N	N	N	1F	N	N	1F	
	H	N	N	N	1F	N	N	N	N	N	N	
12	A	N	N	N	N	N	~~N~~ ②	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	1F	N	N	
	D	N	N	N	N	1F	N	2F	3F	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	1F	N	1F	2F	
	G	N	N	1F	N	N	2F	1Fly	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
17	A	N	N	N	N	N	N	N	N	N	2F	
	B	N	N	N	1F	N	1F	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	1F	1F	2F	3F	4F	N	N	1F	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
20	A	N	N	N	N	N	~~N~~ ①	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	1F	N	N	N	1F	N	N	N	~~1Fly~~
	D	N	N	N	N	N	N	N	1P	1F	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	1F, 1P	1Fly	
	G	N	N	1F	2F	1F	2F	2F	N	1F	N	
	H	N	N	N	N	N	N	N	N	N	N	
	Intials	TMP	TMP	[illegible]	JK	MK	TMP	JK	JK	JK		
	Date	10/30	10/31	11/02	11/2	11-3	11/4	11/5	11/6	11/7	11/8	

Comments: ① 1P, 1Fly ② 1Fly

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30 Observ.	Day 30 Final Live Count
21	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	(1) ~~N~~	N	
	C	N	N	IF	N	IF	N	2F	2F	N	N	
	D	N	N	IF	IF	IF	IF	IF	IF	~~N~~ (2)	IF	
	E	N	N	N	N	N	2F	2F	2F	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	IF	IF	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
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	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	TPP	TPP	[illegible]	JK	MK	JK	JK	JK	JK	JK	
	Date	10/30	10/31	11/01	11/2	11/3	11/4	11/5	11/6	11/7	11/8	

Comments: (1) IFly thd 11/7 (2) IF-JK 11/7

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 31	Day 32	Day 33	Day 34	Day 35	Day 36	Day 37	Day 38	Day 39	Day 40 Observ.	Day 40 Final Live Count
Control	A	N	N	1Fly	N	1FN	N	N	1Fly	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	1Fly	N	N	1Fly	N	N	N	1Fly	N	
	D	N	N	2Fly	N	N	N	N	N	N	N	
	E	N	N	N	N	N	1Fly	N	N	N	N	
	F	N	N	2Fly	N	1Fly	N	N	N	1Fly	N	
	G	N	N	N	1Fly	N	1Fly	N	2Fly	N	1Fly	
	H	1Fly	2Fly	N	N	1F	N	N	N	N	N	
04	A	1Fly	2Fly	N	1Fly	1Fly	N	1Fly	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	1Fly	2Fly	N	N	1Fly	N	N	N	1Fly	
	D	1Fly	N	N	1Fly	1Fly	1Fly	N	N	N	N	
	E	1Fly	N	N	N	N	N	N	N	N	N	
	F	N	1P	1Fly	N	1Fly	N	1Fly	N	N	N	
	G	N	1F,1P	1Fly	1F	1Fly	2Fly	N	N	1Fly	N	
	H	N	2Fly	N	1Fly	1Fly	N	N	N	N	N	
12	A	N	N	N	1Fly	N	N	N	N	N	N	
	B	N	N	N	1Fly	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	1Fly	N	1Fly	1Fly	N	1Fly	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	1F	1F	1F	2F	N	N	1F	N	1Fly	
	G	N	N	N	N	1Fly	1Fly	N	1Fly	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
17	A	N	N	N	N	N	N	N	N	N	N	
	B	N	1F	1F	N	N	N	1Fly	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	2F	N	N	1Fly	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	1F	N	N	N	1F	N	N	N	
	G	N	N	N	N	N	1Fly	1Fly	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
20	A	N	N	N	N	N	1Fly	N	N	N	1F	
	B	N	N	N	N	N	N	N	N	N	N	
	C	1Fly	1F	4F	1F	1F,2P	N	N	3F	N	N	
	D	N	N	1Fly	N	2F	1Fly	N	N	N	N	
	E	N	N	2Fly	N	1Fly	N	N	1Fly	N	N	
	F	N	1Fly	N	N	N	N	1F	N	N	1F	
	G	N	1F	1F	N	N	N	1Fly	1Fly	N	N	
	H	N	1Fly	N	1Fly	1F	N	1Fly	N	N	N	
	Intials	TAO	JK	JK	JK	JK	MP	MP	JK	MP	MP	
	Date	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 31	Day 32	Day 33	Day 34	Day 35	Day 36	Day 37	Day 38	Day 39	Day 46 Observ.	Day 46 Final Live Count
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	1Fly	N	N	N	1Fly	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
~~Control~~	D	N	2F	2F	N	1F	1Fly	N	2F	N	N	
21	E	N	N	N	N	N	N	N	1Fly	N	N	
	F	N	N	1Fly	N	N	1Fly	N	N	N	N	
	G	N	~~N~~ (1)	N	2Fly	N	N	N	N	1Fly	N	
	H	N	N	1Fly	N	N	N	N	N	N	N	
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
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	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	TAP	JK	TAP	JK	JK	MP	MP	JK	MPK	MPK	
	Date	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11/16	11-17	12/16	

Comments: (1) IP-JK 11/10

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 41	Day 42	Day 43	Day 44	Day 45	Day 46	Day 47	Day 48	Day 49	Day 50 Observ.	Day 50 Final Live Count
Control	A	N	N	2Fly	2Fly	N	//	N	N	N	1Fly	~~1Fly~~
	B	1Fly	N	N	//	N	//	N	1Fly	1Fly	N	
	C	N	N	N	//	N	//	N	1Fly	N	1Fly	~~1Fly~~
	D	1Fly	N	N	//	N	//	2Fly	N	N	W	
	E	N	1Fly, 2F	2W	//	N	//	N	N	1Fly	N	
	F	1Fly	1Fly	//	//	N	//	1Fly	1Fly	N	N	
	G	2Fly	N	//	//	N	//	N	N	N	1Fly	~~1Fly~~
	H	1Fly	N	//	//	N	1Fly	N	N	1Fly	1Fly	~~1Fly~~
04 (1)	A	N	N	//	//	N	//	N	N	N	N	
	B	N	N	//	//	N	//	N	N	N	N	
	C	N	N	//	//	N	//	N	N	N	N	
	D	N	N	//	//	N	//	N	N	N	1Fly	~~1Fly~~
	E	N	N	1Fly	//	N	//	N	N	N	N	
	F	N	N	//	//	N	//	N	N	N	N	
	G	N	N	1W	//	N	//	N	N	N	N	
	H	N	N	//	//	N	//	N	N	N	N	
12 (1)	A	N	N	//	//	N	//	N	N	N	N	
	B	N	N	//	//	N	1Fly	N	N	N	N	
	C	N	1F	1Fly	//	1Fly	//	1F	N	N	N	
	D	N	1Fly	//	//	N	//	N	1Fly	N	N	
	E	N	N	//	//	N	//	N	N	N	N	
	F	3Fly	N	//	1Fly	N	//	N	1Fly	N	N	
	G	N	N	//	//	N	//	N	N	N	N	
	H	N	1Fly	//	//	N	//	N	N	N	N	
17	A	N	N	//	//	1Fly	//	N	N	N	N	
	B	N	1Fly	//	//	N	//	N	N	N	N	
	C	1Fly	N	//	//	N	//	N	N	N	N	
	D	2Fly	N	//	//	N	//	N	N	N	N	
	E	N	N	//	//	N	//	N	1Fly	N	N	
	F	N	N	//	//	N	//	N	N	N	N	
	G	N	N	//	//	N	//	N	N	N	N	
	H	N	N	//	//	N	//	N	N	1Fly	N	
20	A	N	N	//	//	N	//	N	N	N	N	
	B	N	N	//	//	N	//	N	N	N	N	
	C	N	N	1Fly	//	N	//	1Fly	N	N	2Fly	
	D	N	1Fly	//	//	N	//	N	1Fly	1Fly	N	
	E	N	N	//	1Fly	N	//	N	N	N	N	
	F	N	N	//	//	N	//	N	N	N	N	
	G	1Fly	N	//	//	N	//	N	N	1Fly	N	
	H	1Fly	N	//	//	3Fly	//	N	N	N	N	
	Intials	TAP	JK	MM	MM	JK	//	JK	TAP	TAP	TAP	
	Date	11/19	11/20	11-21	11-22	11/23	//	11/25	11/26	11/27	11/28	

Comments: (1) Dragonfly nymphs found in sediment on day 47. -JK 11/25

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 41	Day 42	Day 43	Day 44	Day 45	Day 46	Day 47	Day 48	Day 49	Day 60 Observ.	Final Live Count
	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	P	1Fly	N	N	
	C	N	N	N	1Fly	1Fly	N	N	N	N	N	
~~Control~~	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	1Fly	1Fly	N	
21	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	TAP	JK	JK	JK	JK		JK	TAP	TAP	TAP	
	Date	11/19	11/20	11/21	11/22	11/23	11/24	11/25	11/26	11/27	11/28	

Comments: (1) N - JK 11/22

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations P = pupae

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 51	Day 52	Day 53	Day 54	Day 55	Day 56	Day 57	Day 58	Day 59	Day 60 Flies Observ.	Day 60 Final Live Count	total
Control	A	1Fly	N								9	3	12
	B	N	N								4	8	12
	C	N	N								5	4	9
	D	1Fly	N								6	6	12
	E	N	N								4	4	8
	F	N	N								8	1	9
	G	N	N								8	3	11
	H	N	1Fly								9	2	11
04	A	N	N	N	N	N	N	N	N	N	6	0	6
	B	N	N	N	N	N	N	N	N	N	0	0	0
	C	N	N	N	N	N	N	N	N	N	5	0	5
	D	N	N	N	N	N	N	N	N	N	5	2	7
	E	N	N	N	N	N	N	N	N	N	3②	0	2
	F	N	N	N	N	N	N	N	N	N	4	0	4
	G	N	1Fly	N	N	N	N	N	N	N	6	0	6
	H	N	N	N	N	N	N	N	N	N	4	0	4
12	A	N	N	N	N	N	N	N	N	N	N		
	B	N	N	N	N	N	N	N	N	N	N		
	C	N	N	N	N	N	N	1Fly	N	N	N		
	D	N	N	N	N	N	N	N	N	N	N		
	E	N	N	N	N	N	N	N	N	N	N		
	F	1Fly	N	N	N	N	N	N	N	N	N		
	G	N	1Fly	N	N	N	N	N	N	N	N		
	H	N	N	N	N	N	N	N	N	N	N		
17	A	N	N	N	N	N	N	N	N	N	N		
	B	N	N	N	N	N	N	N	N	N	N		
	C	N	N	1Fly	N	N	1Fly	N	N	N	N		
	D	N	N	N	N	1F	1F	N	N	N	N		
	E	N	N	N	N	N	N	N	N	N	N		
	F	N	1Fly	N	N	N	N	N	N	N	N		
	G	N	N	N	N	N	N	N	N	N	N		
	H	N	N	N	N	N	N	N	N	N	N		
20	A	N①	N	N	N	N	N	N	N	N	1Fly		
	B	N	N	1Fly	N	N	N	N	N	N	N		
	C	1Fly	N	1Fly	N	N	N	N	1Fly	N	N		
	D	N	N	N	N	N	N	N	N	N	N		
	E	N	N	N	N	N	N	N	N	N	N		
	F	N	N	N	N	N	N	N	N	N	N		
	G	N	1Fly	N	N	N	N	1F	N	N	N		
	H	N	N	N	N	N	N	N	N	N	N		
	Intials	TAD	TAD	TAD	JK	MJK	MJK	JK	JK	TAD	TAD		
	Date	11/29	11/30	12-1	12/2	12-3	12-4	12/5	12/6	12/7	12/7		

Comments: ① Found large dragonfly nymph - TAD 11/29 ② 2-JK 12/7

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 51	Day 52	Day 53	Day 54	Day 55	Day 56	Day 57	Day 58	Day 59	Day 63 Prev Observ.	Day 63 Final Live Count	Total
	A	N	N	N	N	N	N	N	N	N	0	0	0
	B	N	N	N	N	N	N	N	N	N	~~4~~ 0	0	~~4~~ 0
	C	N	N	N	N	N	N	N	N	N	1	0	1
~~Control~~	D	N	N	N	N	N	N	N	N	N	1	0	1
	E	N	N	N	N	N	N	N	N	N	3	0	3
21	F	N	N	N	N	N	N	N	N	N	2	1	3
	G	N	N	N	N	N	N	N	N	N	3	0	3
	H	N	NFly	N	N	N	N	N	N	N	2	0	2
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	Intials	TAD	TAD	TAD	JK	MTF	MTF	JK	JK	TAD		JK	
	Date	11/25	11/30	12/1	12/2	12/3	12/4	12/5	12/6	12/7		12/7	

Comments: (1) 4 @ 12/08/15

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15
Hatch Date: 10-9-15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 61	Day 62	Day 63	Day 64	Day 65	Day 66	Day 67	Day 68	Day 69	Day 70 Flies Observ.	Day 70 ~~Final~~ Live Count	Total
12	A	N	N	N	N						2	0	2
	B	N	N	N	N						2	0	2
	C	N	N	N	N						3	0	3
	D	N	N	N	N						6	0	6
	E	N	N	N	N						0	0	0
	F	N	N	N	N						7	2	9
	G	N	N	N	N						5	0	5
	H	N	N	N	N						1	0	1
17	A	N	N	N							1	0	1
	B	N	N	N							2	0	2
	C	N	N	N							3	0	3
	D	N	N	N							3	0	3
	E	N	N	N							1	0	1
	F	N	N	N							1	0	1
	G	N	N	N							2	0	2
	H	N	N	N							1	0	1
20	A	N	N	N	N	N	N	N	N		3	0	3
	B	1 Fly	N	N	N	N	N	N	N		2	0	2
	C	N	N	N	N	N	N	N	N		8	0	8
	D	N	N	N	N	N	N	N	N		5	1	6
	E	N	N	N	N	N	N	N	N		5	4	9
	F	N	N	N	N	N	N	N	N		2	2	4
	G	N	N	N	N	N	N	N	N		5	1	6
	H	N	N	N	N	N	N	N	N		7	0	7
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	A												
	B												
	C												
	D												
	E												
	F												
	G												
	H												
	Intials	JK	MP	JK	MP	MP	JK	JK	JK				
	Date	12/9	12/10	12/11	12/12	12/13	12/14	12/15	12/16				

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-09-15 1830
Ending Date & Time: 10/16/15
Hatch Date: 10/9/15

Chronic Test

American Aquatic Testing, Inc.

Weight Data

Conc.	Rep	Pan #	A* weight of boat (g)	B weight of boat/ANIMAL (g)	C (mg)	D (mg)	# of surviving ANIMALS	E WT. OF BOAT + ANIMALS/ASH (mg)	F AFDW TOTAL (mg)	G AVE. AFDW
CON	A	1	0.03765	0.04414	6.49	0.59	11	0.03922	4.92	0.447
	B	2	0.03478	0.04165	6.87	0.57	12	0.03774	3.91	~~0.323~~ ③
	C	3	0.03744	0.04425	6.81	0.62	11	0.03838	5.87	0.534
	D	4	0.04120	0.04820	7.46	0.75	10	0.04202	6.64	0.664
04	A	5	0.04146	0.04649	5.03	1.01	5	0.04265	3.84	0.768
	B	6	0.03793	0.04023	2.30	0.58	4	0.03935	0.88	0.220
	C	7	0.03608	0.04173	5.05	0.84	6	0.03863	3.10	0.516
	D	8	0.04078	0.04602	5.24	0.75	7	0.04497	1.05	0.150
12	A	9	0.03519	0.03810	2.91	1.46	2	0.03643	1.67	0.835
	B	10	0.03369	0.03422	1.53	0.51	3	0.03339	0.83	0.277
	C	11	0.03478	0.03575	0.97	0.32	3	0.03520	0.55	0.183
	D	12	0.04061	0.04242	1.81	0.46	4	0.04165	0.77	0.193
17	A	13	0.03955	0.04196	2.41	0.60	4	0.04075	1.21	0.303
	B	14	0.03564	0.03677	1.13	0.28	4	0.03633	0.44	0.110
	C	15	0.03707	0.04009	3.02	0.60	5	0.03866	1.44	0.288
	D	16	0.04084	0.04328	1.44	0.29	5	0.04149	0.79	0.158
20	A	17	0.03399	0.03627	2.28	0.38	6	0.03465	1.62	0.270
	B	18	0.03519	0.03997	4.78	0.96	5	0.03804	1.93	0.386
	C	19	0.03468	0.03912	4.44	0.66	8	~~0.04122~~ ②	2.10	0.263
	D	20	0.03810	0.04256	4.46	0.64	7	0.03994	2.62	0.374
21	A	21	0.04037	0.04239	2.02	0.51	4	0.04362 ①	0.87	0.218
	B	22	0.03572	0.03654	0.82	0.41	2	0.03594	0.60	0.300
	C	23	0.03619	0.03699	0.80	0.40	2	0.03641	0.58	0.290
	D	24	0.03824	0.03902	0.78	0.78	1	0.03826	0.76	0.760
	A									
	B									
	C									
	D									
	Initials		CJ				CJ			
	Date		10/29				10/29			

E = Original number of organisms at test initiation, adjusted for losses.

Observations:
*PANS ASHED PRIOR TO INITIAL WEIGHTS
C - TOTAL WEIGHT (DRY)
D - AVE DRY WT of SURVIVING ANIMALS
E - WT of PANS + SURV. ANIMALS AFTER ASHING
F - ASH FREE DRY WET TOTAL (B-E X 1000)
G AVE AFDW of SURV ANIMALS

① 0.04162
② 0.03701
③ 0.326

CHFHWT.wk3

Job Number: 369-01-01
Species: C. dilutus

Start Date & Time: 10-9-15 1830
End Date & Time: 12/16/15

Sediment Test

American Aquatic Testing, Inc.,

Water Change Log/Initial Water Readings/General Testing Information

Test Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Morning change(time)		0840	0830	1015	7:30	0730	0730	0900	0600	0915	0730	0730	0530	0730	0850
D.O. mg/L		8.3	8.2	7.8	8.5	8.4	8.3	8.0	8.4	8.7	8.3	8.5	8.2	8.2	8.6
pH		8.1	8.1	8.1	8.1	8.1	8.0	7.8	8.2	8.1	8.1	8.2	8.0	7.8	8.0
Temp. (C)		23.5	23.5	23.0	23.5	23.0	23.0	23.5	23.5	23.0	23.0	23.5	23.0	22.0	22.5
Initials		MTF	MTF	TAP	TAP	MP	TAP	JK	TAP	TAP	thd	thd	thd	thd	JK
Date		10/10-5	10-11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	10/20	10/21	10/22	10/23
Afternoon change(time)	1600	1620	1900	1615	1500	1710	1550	1615	1300	1945	1800	1800	1600	1630	1510
D.O. mg/L	8.2	8.2	8.1	8.3	8.3	8.4	8.2	8.4	8.3	8.4	8.4	8.4	8.2	8.4	8.3
pH	8.1	8.1	8.1	8.0	8.1	8.1	8.0	8.1	8.1	8.1	8.1	8.2	8.2	8.2	8.1
Temp. (C)	23.0	23.5	23.0	23.0	23.0	23.0	23.0	23.5	23.5	23.0	23.0	23.5	22.5	22.5	22.5
Initials	TAP	MTF	[illegible]	MTF	[illegible]	[illegible]	TAP	JK	TAP	TAP	[illegible]	thd	TAP	JK	JK
Date	10/9	10-10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	10/20	10/21	10/22	10/23

Test Day	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Morning change(time)	0700	8:45	0730	0730	0730	0730	1000	6:00	0700	0730	0600	0700	0700	0730
D.O. mg/L	8.4	8.3	8.4	8.8	8.6	8.3	8.3	8.5	8.6	8.6	8.3	9.0	8.7	8.4
pH	7.7	7.5	8.0	8.0	8.0	8.0	8.0	7.9	7.9	8.2	7.0	7.8	7.7	7.8
Temp. (C)	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.0	22.5	22.5	23.0	22.0	22.5	23.5
Initials	JK	JK	thd	thd	thd	thd	TAP	thd	[illegible]	thd	thd	thd	thd	thd
Date	10/24	10/25	10/26	10/27	10/28	10/29	10/30	10/31	11/01	11/2	11/3	11/4	11/5	11/6
Afternoon change(time)	1700	1500	1710	1950	1900	2030	1930	1810	1700	1710	1620	1730	1815	1700
D.O. mg/L	8.6	8.6	8.2	8.5	8.4	8.5	7.7	8.2	8.3	7.8	8.5	8.7	8.7	8.4
pH	8.1	8.0	7.7	7.9	8.1	7.9	7.9	7.9	7.8	8.2	7.7	7.9	8.1	7.8
Temp. (C)	22.5	22.5	22.5	22.5	23.0	22.5	22.5	22.5	22.0	23.0	23.0	22.0	23.0	23.5
Initials	JK	JK	JK	JK	[illegible]	MTF	TAP	TAP	MP	JK	MTF	JK	JK	MTF
Date	10/24	10/25	10/26	10/27	10/28	10-29	10/30	10/31	11/1	11/2	11-3	11/4	11/5	11-6

Control Sed. collection date/by: 10/5/15 TAP

Control Sed. sieve date/by: 10/5/15 TAP

Sieve size used: 1mm

Sample sieve date/by: 9/9/15 Moody Assoc

Sieve size used: 1mm

Organism source: ABS

Test organism Lot number: 1644

Number of animals per chamber: 12

Food Type: algae/flake

Frequency of feeding:

Test Chamber size: 300ml

Test Volume of sediment: 100ml

Test Volume of water: 150ml

Test Duration: Emergence

Test Temperature Range: 23±1°C

Job Number: 369-01-01
Species: C. dilutus

Start Date & Time: 10-9-15 1830
End Date & Time: 12/16/15

Sediment Test
American Aquatic Testing, Inc.,
Water Change Log/Initial Water Readings/General Testing Information

Test Day	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Morning change(time)	0630	0700	0800	0730	0730	0730	0730	0745	0800	0730	0730	0730	0730	0815	0745
D.O. mg/L	8.2	8.4	8.6	8.6	8.5	8.2	8.6	8.3	8.8	8.2	8.6	8.3	8.5	8.0	8.3
pH	7.8	7.8	7.8	7.6	7.8	7.3	7.8	8.2	7.4	7.5	7.7	7.5	7.7	7.8	7.7
Temp. (C)	23.0	22.5	22.5	22.2	22.3	23.0	23.0	22.5	23.0	22.0	22.2	22.0	22.5	23.0	23.0
Initials	thd	thd	thd	thd	thd	thd	thd	TP	me	thd	thd	thd	thd	JK	MT
Date	11/7	11/8	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11-21
Afternoon change(time)	2100	1630	1500	1700	1730	1700	1800	1800	1800	1600	1700	1630	1645	1630	1800
D.O. mg/L	8.3	8.4	8.2	8.6	8.5	8.5	8.6	8.5	8.7	8.4	8.6	8.3	8.0	7.9	8.0
pH	8.1	7.6	7.5	7.6	7.8	7.9	7.9	8.0	7.6	8.0	7.5	7.9	7.9	7.6	7.7
Temp. (C)	23.0	23.0	23.0	23.0	22.5	22.5	23.0	23.0	22.5	23.0	22.0	22.0	22.5	23.0	23.0
Initials	[illegible]	JK	JK	[illegible]	JK	JK	JK	me	me	MT	TP	MT	MT	JK	MT
Date	11/07	11/8	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11-16	11/17	11-18	11-19	11/20	11-21

Test Day	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Morning change(time)	0800	0730	0600	0800	0930	0950	925	0915	0600	0730	0730	0730	0905	0805
D.O. mg/L	8.2	8.8	8.8	9.0	8.7	8.4	8.5	8.6	8.8	8.5	9.0	8.9	8.6	8.4
pH	7.8	7.4	7.5	7.5	7.6	7.7	7.7	7.8	7.8	7.6	7.4	7.4	7.3	7.8
Temp. (C)	22.5	22.0	23.0	22.0	22.0	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5
Initials	MT	thd	thd	TP	TP	TP	TP	TP	thd	thd	thd	thd	MT	MT
Date	11-22	11-23	11-24	11/25	11/26	11/27	11/28	11/29	11/30	12/1	12/2	12/3	12/4	12/5
Afternoon change(time)	1800	1600	1830	1630	1520	1745	1545	1715	1805	1645	1545	1700	1630	1445
D.O. mg/L	8.1	8.7	8.9	8.8	8.5	8.5	8.4	8.6	8.7	8.9	8.5	8.9	8.5	8.1
pH	7.8	7.7	8.0	7.8	7.9	7.8	7.9	7.9	7.7	7.6	7.7	8.4	8.2	8.1
Temp. (C)	22.5	22.0	22.0	22.0	22.5	22.5	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Initials	MT	JK	MT	JK	TP	TP	TP	TP	TP	TP	JK	MT	MT	JK
Date	11-22	11/23	11/24	11/25	11/26	11/27	11/28	11/29	11/30	12/1	12/2	12-3	12-4	12/5

Control Sed. collection date/by:_____

Control Sed. sieve date/by:_____

Sieve size used:_____

Sample sieve date/by:_____

Sieve size used:_____

Organism source:_____

Test organism Lot number:_____

Number of animals per chamber:_____

Food Type:_____

Frequency of feeding:_____

Test Chamber size:_____

Test Volume of sediment:_____

Test Volume of water:_____

Test Duration:_____

Test Temperature Range:_____

Job Number: 369-01-01
Species: C. dilutus

Start Date & Time: 10-9-15 1830
End Date & Time: 12-16-15 1800

Sediment Test

American Aquatic Testing, Inc.,

Water Change Log/Initial Water Readings/General Testing Information

Test Day	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Morning change(time)	0730	0730	0730	0730	0915	0930	1000	0900	0800	0800	0730				
D.O. mg/L	8.0	8.8	8.8	8.5	8.6	8.1	8.8	8.7	8.9	8.7	8.3				
pH	7.3	7.6	7.8	6.9	7.8	7.5	7.7	7.9	8.2	8.1	8.2				
Temp. (C)	22.5	22.5	22.5	22.5	22.0	22.5	22.0	22.5	22.5	22.5	22.5				
Initials	JK	thd	thd	thd	TMP	JK	MP	MP	thd	thd	thd				
Date	12/6	12/7	12/8	12/9	12/10	12/11	12/12	12/13	12/14	12/15	12/16				
Afternoon change(time)	1615	1615	1620	1600	1600	1615	1830	1715	1630	1815					
D.O. mg/L	7.9	8.4	7.9	8.3	8.0	7.8	8.4	8.5	7.9	8.3					
pH	7.5	7.8	7.7	6.9 ①	7.9	7.9	8.0	8.4	8.0	7.9					
Temp. (C)	22.5	22.5	22.5	22.0	22.0	22.5	22.0	22.0	22.5	23.0					
Initials	JK	JK	JK	JK	MP	JK	MP	MP	JK	TMP					
Date	12/6	12/7	12/8	12/9	12/10	12/11	12/12	12/13	12/14	12/15					

Test Day	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Morning change(time)														
D.O. mg/L														
pH														
Temp. (C)														
Initials														
Date														
Afternoon change(time)														
D.O. mg/L														
pH														
Temp. (C)														
Initials														
Date														

Control Sed. collection date/by: _____

Control Sed. sieve date/by: _____

Sieve size used: _____

Sample sieve date/by: _____

Sieve size used: _____

Organism source: _____

Test organism Lot number: _____

Number of animals per chamber: _____

Food Type: _____

Frequency of feeding: _____

Test Chamber size: _____

Test Volume of sediment: _____

Test Volume of water: _____

Test Duration: _____

Test Temperature Range: _____

① 7.3-JK 12/9

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 10/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 0	1	2	3	4	5	6	7	8	9	10
TEMP (C)	Control	23.0	22.5	22.0	22.5	22.0	22.5	22.5	23.0	22.5	22.5	22.5
	04	23.0	22.5	22.0	23.0	22.0	22.5	22.0	22.5	22.5	22.5	22.5
	12	23.0	22.5	22.0	23.0	22.0	22.5	22.0	22.5	22.5	22.5	22.5
	17	23.0	22.5	22.0	23.0	22.0	22.5	22.0	22.5	22.5	22.5	22.5
	20	23.0	22.5	22.0	23.0	22.0	22.5	22.0	22.0	22.5	22.5	22.5
	21	23.0	22.0	22.0	23.0	22.0	22.5	22.0	22.0	22.5	22.5	22.5
Dissolved Oxygen (mg/L)	Control	6.2	6.6	6.1	6.0	6.0	5.0	4.9	5.1	5.8	6.0	6.0
	04	7.3	7.6	6.3	7.0	6.3	6.5	6.8	6.9	6.7	7.0	6.8
	12	7.1	7.6	6.3	7.0	6.6	6.7	7.1	7.3	7.4	7.2	7.2
	17	6.5	7.3	6.5	6.7	6.2	6.5	6.3	7.4	7.1	7.0	7.1
	20	6.8	7.2	7.0	6.9	6.0	6.5	6.9	7.3	7.2	7.1	7.0
	21	6.7	7.3	6.9	6.7	6.1	6.2	6.9	7.5	7.0	7.2	6.9
pH	Control	7.5	7.5	7.6	7.6	7.7	7.9	8.0	8.0	7.9	7.8	7.9
	04	7.8	7.7	7.8	7.7	7.8	7.9	8.0	8.1	8.0	8.0	8.0
	12	7.8	7.8	7.8	7.8	7.8	7.9	8.0	8.0	8.0	8.1	8.0
	17	7.8	7.7	7.8	7.8	7.8	7.8	7.9	8.0	7.9	8.0	8.0
	20	7.8	7.7	7.8	7.8	7.8	7.8	7.9	8.0	7.9	8.0	8.0
	21	7.9	7.8	7.8	7.8	7.8	7.8	7.9	8.0	7.9	8.0	8.0
	Initials	WM	MO	[illegible]	JK	[illegible]	MO	JK	JK	AND	MO	TM
	Date	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19

Concentration	Cond. (umhos) Initial	Final	Alkalinity (mg/L) Initial	Final	Hardness (mg/L) Initial	Final	Ammonia (mg/L) Initial	Final
Control	297		60		60		0.32	
04	297		~~80~~ (1)		80		0.02	
12	301		~~80~~ (2)		90		0.01	
17	307		~~80~~ (3)		80		0.10	
20	305		80		80		0.04	
21	317		~~80~~ (4)		80		0.12	
Initials	WM		MTF		MTF		MTF	
Date	10/9		10-9		10-9		10-9	

Comments:
(1) 70 - MTF 10-9
(2) 70 -
(3) 60 -
(4) 70

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 11	12	13	14	15	16	17	18	19	20	21
TEMP (C)	Control	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5	23.0	22.5
	04	22.5	23.0	23.0	22.5	22.5	22.5	22.5	22.5	22.5	23.0	22.5
	12	22.5	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5	23.0	22.5
	17	22.5	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.5	23.0	22.5
	20	22.5	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.5	23.0	22.5
	21	22.5	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.5	23.0	22.5
Dissolved Oxygen (mg/L)	Control	4.9	3.9	4.3	5.1	4.6	5.3	4.1	3.7	3.1	2.6	1.3
	04	7.4	6.3	6.8	6.3	6.6	7.5	6.2	6.7	5.2	3.7	5.1
	12	7.5	6.5	7.1	7.0	6.8	7.4	6.1	6.4	5.8	5.2	5.6
	17	7.2	6.1	6.7	6.9	6.8	7.0	6.1	6.5	4.7	4.7	4.3
	20	7.3	6.5	7.2	7.1	6.8	7.5	6.0	6.1	5.4	5.3	4.9
	21	6.7	6.0	6.9	7.1	6.5	6.9	5.3	5.2	4.3	3.5	4.9
pH	Control	7.5	7.8	7.5	7.6	7.6	7.6	7.5	7.6	7.5	7.5	7.7
	04	7.7	7.9	7.6	7.6	7.6	7.7	7.4	7.6	7.4	7.5	7.6
	12	7.7	7.9	7.6	7.7	7.6	7.7	7.4	7.6	7.4	7.5	7.6
	17	7.7	7.9	7.7	7.7	7.7	7.7	7.5	7.7	7.4	7.5	7.5
	20	7.7	7.8	7.8	7.7	7.6	7.7	7.5	7.6	7.4	7.5	7.6
	21	7.7	7.8	7.8	7.7	7.7	7.7	7.4	7.7	7.4	7.5	7.5
	Initials	JK	MP	JK	JK	MP	TAP	MF	JK	MP	MF	JK
	Date	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	10/30

Concentration	Cond. (umhos) Initial	Final	Alkalinity (mg/L) Initial	Final	Hardness (mg/L) Initial	Final	Ammonia (mg/L) Initial	Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 10/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 22	23	24	25	26	27	28	29	30	31	32
TEMP (C)	Control	22.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.0	22.5	22.0
	04	22.0	22.0	23.0	22.5	23.0	23.0	23.0	23.0	22.0	22.5	22.0
	12	22.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.0	22.5	22.0
	17	22.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.0	22.5	22.0
	20	22.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.0	22.5	22.0
	21	22.0	22.0	23.0	23.0	23.0	23.0	23.0	23.0	22.0	22.5	22.0
Dissolved Oxygen (mg/L)	Control	4.9	4.0	1.2	2.1	1.9	2.0	2.0	2.0	1.6	2.8	2.5
	04	5.8	6.3	4.6	4.6	5.4	5.1	6.0	5.3	5.5	6.3	5.1
	12	5.6	6.3	5.0	3.4	4.6	4.4	6.0	4.5	4.9	5.6	4.5
	17	5.0	6.2	4.9	3.1	4.2	4.8	5.1	5.0	4.9	5.6	5.0
	20	5.5	6.0	4.7	4.0	4.9	4.9	5.4	4.9	5.2	6.2	5.3
	21	5.5	5.2	4.6	4.2	5.6	5.8	5.6	5.9	5.6	5.7	4.4
pH	Control	8.0	7.3	7.2	7.3	7.0	7.1	7.2	7.2	7.3	7.0	7.3
	04	8.0	7.3	7.2	7.3	7.1	7.0	7.2	7.3	7.3	7.1	7.3
	12	8.0	7.4	7.2	7.3	7.1	7.1	7.2	7.3	7.3	7.1	7.3
	17	8.0	7.4	7.2	7.3	7.1	7.1	7.3	7.3	7.3	7.1	7.3
	20	8.0	7.4	7.2	7.3	7.1	7.1	7.3	7.3	7.3	7.2	7.3
	21	8.0	7.4	7.2	7.3	7.1	7.1	7.3	7.3	7.3	7.2	7.3
	Initials	thd	MP	JK	MP	MP	JK	JK	thd	thd	MP	JK
	Date	10/31	11/1	11/2	11-3	11-4	11/5	11/6	11/7	11/8	11/9	11/10

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus

Beginning Date & Time: 11-9-15 1322
Ending Date & Time: 12/11/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 33	34	35	36	37	38	39	40	41	42	43
TEMP (C)	Control	22.0	22.5	22.5	22.0	22.0	22.5	22.5	22.0	22.0	22.5	22.5
	04	22.0	22.5	22.5	22.0	22.0	22.0	22.5	22.5	22.0	22.5	22.5
	12	22.0	22.5	22.5	22.0	22.0	22.0	22.5	22.5	22.0	22.5	22.5
	17	22.0	22.5	22.5	22.0	22.0	22.0	22.5	22.5	22.0	22.5	22.5
	20	22.0	22.5	22.5	22.0	22.0	22.0	22.5	22.5	22.0	22.5	22.5
	21	22.0	22.5	~~6.10~~	22.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5
Dissolved Oxygen (mg/L)	Control	1.7	2.2	3.0	4.2	5.1	4.1	3.7	1.1	3.0	3.6	2.4
	04	5.6	6.2	6.8	6.5	6.2	5.3	6.0	6.0	5.1	5.3	5.1
	12	4.0	5.1	6.0	6.5	5.9	5.8	5.8	6.3	4.0	5.3	4.7
	17	5.0	5.5	6.0	6.1	6.6	5.6	4.0	4.5	4.3	4.6	4.1
	20	5.5	5.6	6.1	6.3	5.7	6.0	4.6	5.1	3.9	5.1	4.4
	21	4.6	4.4	5.4	6.1	6.4	6.1	3.8	4.1	2.6	4.6	3.9
pH	Control	7.5	7.0	8.3	7.7	7.4	7.8	7.5	7.8	7.8	8.3	7.9
	04	7.5	7.0	8.3	7.7	7.3	7.7	7.5	7.7	7.8	8.3	7.7
	12	7.5	7.1	8.3	7.7	7.4	7.7	7.5	7.7	7.8	8.3	7.9
	17	7.5	7.1	8.2	7.7	7.4	7.7	7.5	7.7	7.8	8.3	7.9
	20	7.5	7.0	8.2	7.7	7.4	7.7	7.5	7.7	7.7	8.3	7.9
	21	7.4	7.0	8.2	7.7	7.4	7.7	7.4	7.7	7.8	8.2	7.9
	Initials	Jhd	JK	MTF	JK	JK	JK	TP	MTF	MTF	JK	MTF
	Date	11/11	11/12	11-13	11/14	11/15	11/16	11/17	11-18	11-19	11/20	11-21

① 22.5 MTF 11-13

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 44	45	46	47	48	49	50	51	52	53	54
TEMP (C)	Control	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	—	—
	04	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.5	22.5
	12	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.5
	17	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.5
	20	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.5
	21	22.5	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.0	22.5
Dissolved Oxygen (mg/L)	Control	2.2	2.1	1.4	5.4	3.9	2.6	3.3	3.9	4.0	—	—
	04	6.2	5.2	5.2	6.4	5.9	5.1	5.4	5.5	5.4	6.3	7.1
	12	5.8	5.4	5.4	6.6	6.2	5.4	5.8	5.7	5.9	7.4	7.7
	17	4.6	5.1	5.5	6.7	6.0	5.2	5.3	5.5	5.7	6.6	7.3
	20	4.6	4.7	4.1	6.2	5.5	4.6	4.9	5.0	5.2	6.3	6.5
	21	4.1	6.5	4.1	6.6	6.1	5.0	5.2	5.3	5.2	6.4	7.0
pH	Control	7.7	7.4	7.4	7.1	7.2	7.3	7.2	7.4	7.3	—	—
	04	7.7	7.3	7.5	7.2	7.2	7.2	7.2	7.4	7.3	7.6	7.6
	12	7.7	7.5	7.6	7.2	7.2	7.2	7.2	7.3	7.3	7.7	7.7
	17	7.7	7.5	7.4	7.1	7.2	7.2	7.2	7.3	7.3	7.6	7.7
	20	7.7	7.4	7.4	7.1	7.2	7.2	7.2	7.3	7.2	7.6	7.6
	21	7.7	7.8	7.4	7.1	7.2	7.2	7.2	7.4	7.2	7.6	7.6
	Initials	MT	JK	MT	JK	TP	TP	TP	TP	TP	JK	JK
	Date	11-22	11/23	11-24	11/25	11/26	11/27	11/28	11/29	11/30	12/1	12/2

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C. dilutus.

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 55	56	57	58	59	60	61	62	63	64	65
TEMP (C)	Control	—	—	—	—	—	—	—	—	—	—	—
	04	22.0	22.0	22.0	22.0	22.5	—	—	—	—	—	—
	12	22.0	22.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	22.0	—
	17	22.0	22.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	—	—
	20	22.0	22.0	22.0	22.0	22.5	22.5	22.5	22.5	22.5	22.0	22.5
	21	22.0	22.0	22.0	22.0	22.5	—	—	—	—	—	—
	—											
	—											
	—											
	—											
	—											
Dissolved Oxygen (mg/L)	Control	—	—	—	—	—	—	—	—	—	—	—
	04	8.0	8.5	7.9	8.3	8.2	—	—	—	—	—	—
	12	8.6	8.5	8.1	7.2	7.5	7.9	8.2	8.0	7.6	7.1	—
	17	7.7	8.0	7.8	7.5	7.8	7.1	7.0	7.6	7.3	—	—
	20	6.7	7.1	6.9	6.6	7.0	6.5	6.9	6.2	7.0	7.0	7.0
	21	6.8	7.1	6.8	7.1	7.2	—	—	—	—	—	—
	—											
	—											
	—											
	—											
	—											
pH	Control	—	—	—	—	—	—	—	—	—	—	—
	04	8.7	8.8	8.1	7.7	7.8	—	—	—	—	—	—
	12	8.4	8.8	8.1	7.7	7.9	8.0	7.9	7.9	7.9	8.1	—
	17	8.3	8.6	8.1	7.7	7.8	7.7	7.8	7.8	7.8	—	—
	20	8.2	8.4	7.9	7.7	7.8	7.6	7.7	7.6	7.6	8.0	8.2
	21	8.2	8.4	7.9	7.6	7.7	—	—	—	—	—	—
	—											
	—											
	—											
	—											
	—											
	Initials	MMF	MMF	JK	JK	JK	JK	JK	MMF	JK	MP	MP
	Date	12-3	12-4	12/5	12/6	12/7	12/8	12/9	12/10	12/11	12/12	12/13

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: C.dilutus

Beginning Date & Time: 10-9-15 1830
Ending Date & Time: 12/16/15

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	66 ~~0~~	67 ~~1~~	68 ~~2~~	69 ~~3~~	70 ~~4~~	Day ~~5~~	~~6~~	~~7~~	~~8~~	~~9~~	~~10~~
TEMP (C)	20	23.0	23.0	22.5								
Dissolved Oxygen (mg/L)	20	6.5	7.0	8.0								
pH	20	7.7	7.9	7.8								
	Initials	JK	JK	JK								
	Date	12/14	12/15	12/16								

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Initials								
Date								

Comments:

FWSEDPAR.wk3

C. dilutus 20 Day Survival

Start Date:	10/9/2015	Test ID:	3690101Cd	Sample ID:	MOODY OHIO
End Date:	10/29/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

Conc-%	1	2	3	4	
Control	0.9167	1.0000	0.9167	0.8333	CONTROL INCLUDED FOR COMPARISON ONLY
12	0.1667	0.2500	0.2500	0.3333	
4	0.4167	0.3333	0.5000	0.5833	
17	0.3333	0.3333	0.4167	0.4167	
20	0.5000	0.4167	0.6667	0.5833	
21	0.3333	0.1667	0.1667	0.0833	

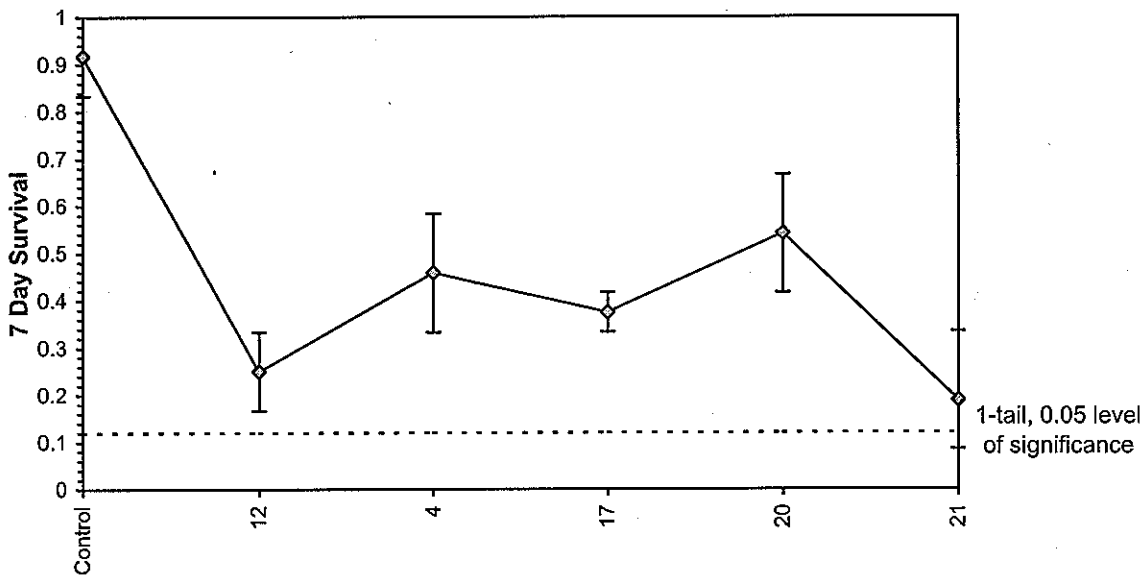
			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.9167	3.6667	1.2830	1.1503	1.4260	8.784	4			
12	0.2500	1.0000	0.5208	0.4205	0.6155	15.294	4	*		
4	0.4583	1.8333	0.7429	0.6155	0.8691	14.678	4	-3.131	2.360	0.1674
17	0.3750	1.5000	0.6586	0.6155	0.7017	7.556	4	-1.942	2.360	0.1674
20	0.5417	2.1667	0.8279	0.7017	0.9553	13.172	4	-4.328	2.360	0.1674
21	0.1875	0.7500	0.4373	0.2928	0.6155	30.442	4	1.176	2.360	0.1674

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96429	0.868	0.20356	-0.4672
Bartlett's Test indicates equal variances (p = 0.64)	2.55363	13.2767		
The control means are significantly different (p = 3.28E-05)	11.0461	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	21	>21		4.7619	0.12782	0.51627	0.10148	0.01007	3.6E-04	4, 15

Treatments vs 12

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by: _____

C. dilutus Ash Free Dry Weight - Growth

Start Date:	10/9/2015	Test ID:	3690101Cd	Sample ID:	MOODY OHIO
End Date:	10/29/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

Conc-%	1	2	3	4	
Control	0.4473	0.3258	0.5336	0.6640	CONTROL INCLUDED FOR COMPARISON ONLY
12	0.8350	0.2767	0.1833	0.1925	
4	0.7680	0.2200	0.5167	0.1500	
17	0.3025	0.1100	0.2880	0.1580	
20	0.2700	0.3860	0.2625	0.3743	
21	0.2175	0.3000	0.2900	0.7600	

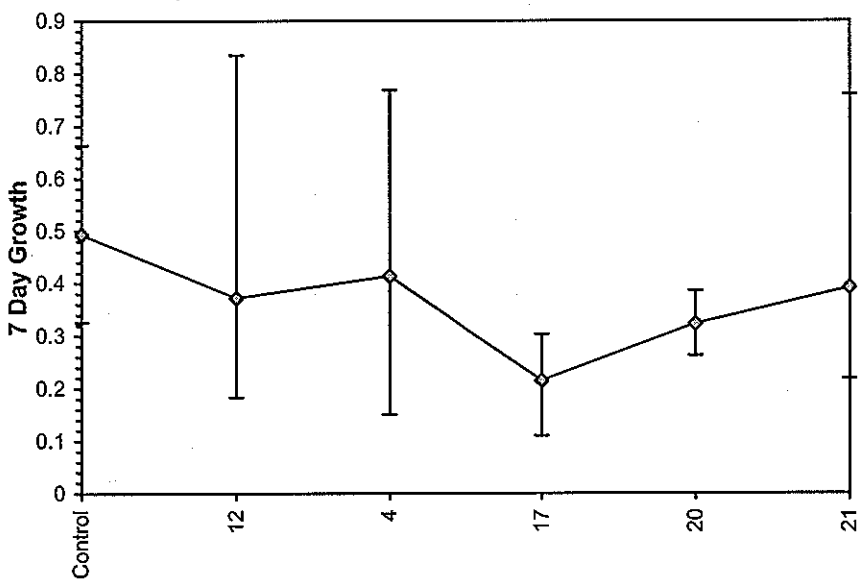
			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.4927	1.3249	0.4927	0.3258	0.6640	28.925	4			
12	0.3719	1.0000	0.3719	0.1833	0.8350	83.790	4	*		
4	0.4137	1.1124	0.4137	0.1500	0.7680	68.827	4	-0.263	2.360	0.3755
17	0.2146	0.5771	0.2146	0.1100	0.3025	44.413	4	0.988	2.360	0.3755
20	0.3232	0.8691	0.3232	0.2625	0.3860	20.421	4	0.306	2.360	0.3755
21	0.3919	1.0538	0.3919	0.2175	0.7600	63.325	4	-0.126	2.360	0.3755

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.8838	0.868	1.08645	0.53974
Bartlett's Test indicates equal variances (p = 0.11)	7.55388	13.2767		
The control means are not significantly different (p = 0.51)	0.70518	2.44691		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	21	>21		4.7619	0.37551	1.00978	0.02509	0.05064	0.73936	4, 15

Treatments vs 12

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by:

Chironomus dilutus Long Term Survival

Start Date:	10/9/2015	Test ID:	3690101Cd1	Sample ID:	STATOIL
End Date:	12/16/2015	Lab ID:	AAT, INC	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

Conc-ppm	1	2	3	4	5	6	7	8	
CONTROL	1.0000	1.0000	0.7500	1.0000	0.6667	0.7500	0.9167	0.9167	CONTROL FOR COMPARISON ONLY
12	0.1667	0.1667	0.2500	0.5000	0.0000	0.7500	0.4167	0.0833	
4	0.5000	0.0000	0.4167	0.5833	0.1667	0.3333	0.5000	0.3333	
17	0.0833	0.1667	0.2500	0.2500	0.0833	0.0833	0.1667	0.0833	
20	0.2500	0.1667	0.6667	0.5000	0.7500	0.3333	0.5000	0.5833	
21	0.0000	0.3333	0.0833	0.0833	0.2500	0.2500	0.2500	0.1667	

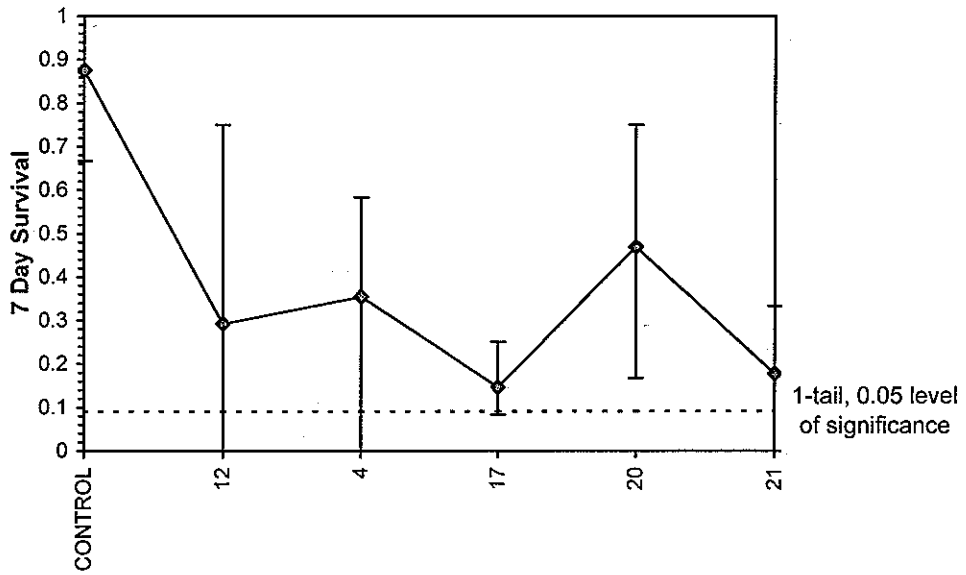
			Transform: Arcsin Square Root						1-Tailed	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.8750	3.0000	1.2354	0.9553	1.4260	15.655	8			
12	0.2917	1.0000	0.5421	0.1448	1.0472	53.540	8	*		
4	0.3542	1.2143	0.6172	0.1448	0.8691	38.191	8	-0.713	2.239	0.2361
17	0.1458	0.5000	0.3825	0.2928	0.5236	27.040	8	1.514	2.239	0.2361
20	0.4688	1.6071	0.7503	0.4205	1.0472	28.723	8	-1.974	2.239	0.2361
21	0.1771	0.6071	0.4172	0.1448	0.6155	38.268	8	1.184	2.239	0.2361

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98592	0.919	-0.1505	0.29992
Bartlett's Test indicates equal variances (p = 0.13)	7.14105	13.2767		
The control means are significantly different (p = 6.28E-05)	5.623	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					0.17542	0.65904	0.18014	0.04448	0.00841	4, 35

Treatments vs 12

Dose-Response Plot



Chironomus dilitus Long Term Test - Emergence

Start Date:	10/9/2015	Test ID:	3690101Cd1	Sample ID:	STATOIL
End Date:	12/16/2015	Lab ID:	AAT, INC	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

Conc-ppm	1	2	3	4	5	6	7	8	
CONTROL	0.7500	0.3333	0.4167	0.5000	0.3333	0.6667	0.6667	0.7500	CONTROL FOR COMPARISON ONLY
12	0.1667	0.1667	0.2500	0.5000	0.0000	0.5833	0.4167	0.0833	
4	0.5000	0.0000	0.4167	0.4167	0.1667	0.3333	0.5000	0.3333	
17	0.0833	0.1667	0.2500	0.2500	0.0833	0.0833	0.1667	0.0833	
20	0.2500	0.1667	0.6667	0.4167	0.4167	0.1667	0.4167	0.5833	
21	0.0000	0.3333	0.0833	0.0833	0.2500	0.1667	0.2500	0.1667	

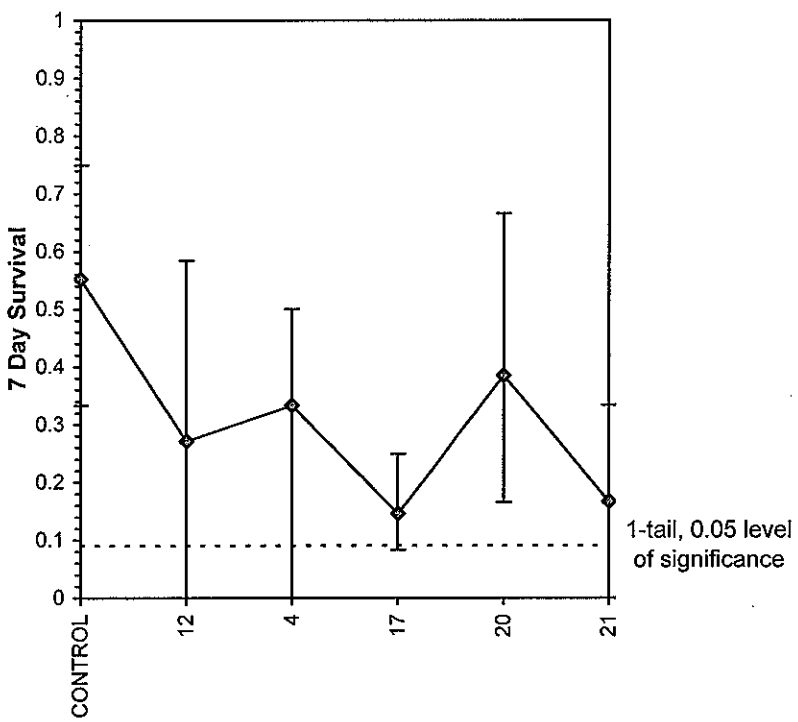
			Transform: Arcsin Square Root						1-Tailed	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.5521	2.0385	0.8404	0.6155	1.0472	21.821	8			
12	0.2708	1.0000	0.5198	0.1448	0.8691	48.092	8	*		
4	0.3333	1.2308	0.5963	0.1448	0.7854	36.365	8	-0.801	2.239	0.2138
17	0.1458	0.5385	0.3825	0.2928	0.5236	27.040	8	1.438	2.239	0.2138
20	0.3854	1.4231	0.6618	0.4205	0.9553	29.646	8	-1.486	2.239	0.2138
21	0.1667	0.6154	0.4043	0.1448	0.6155	38.062	8	1.210	2.239	0.2138

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97584	0.919	-0.3712	-0.0752
Bartlett's Test indicates equal variances (p = 0.25)	5.38244	13.2767		
The control means are significantly different (p = 0.01)	2.92446	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					0.15596	0.63208	0.11596	0.03648	0.02498	4, 35

Treatments vs 12

Dose-Response Plot



C. dilutus 20 Day Survival

Start Date:	10/9/2015	Test ID:	3690101Cd	Sample ID:	Moody Ohio site
End Date:	10/29/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

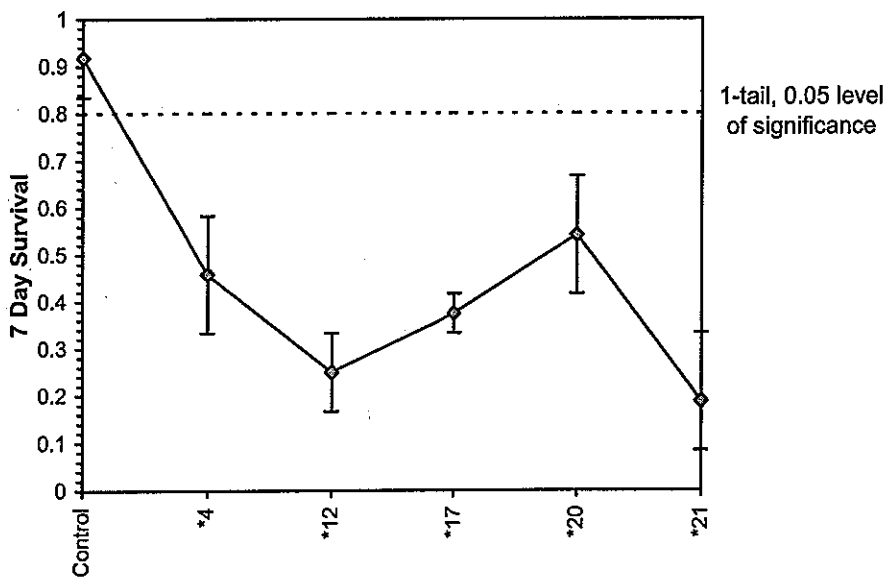
Conc-%	1	2	3	4
Control	0.9167	1.0000	0.9167	0.8333
4	0.4167	0.3333	0.5000	0.5833
12	0.1667	0.2500	0.2500	0.3333
17	0.3333	0.3333	0.4167	0.4167
20	0.5000	0.4167	0.6667	0.5833
21	0.3333	0.1667	0.1667	0.0833

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.9167	1.0000	1.2830	1.1503	1.4260	8.784	4			
*4	0.4583	0.5000	0.7429	0.6155	0.8691	14.678	4	7.452	2.410	0.1747
*12	0.2500	0.2727	0.5208	0.4205	0.6155	15.294	4	10.517	2.410	0.1747
*17	0.3750	0.4091	0.6586	0.6155	0.7017	7.556	4	8.616	2.410	0.1747
*20	0.5417	0.5909	0.8279	0.7017	0.9553	13.172	4	6.280	2.410	0.1747
*21	0.1875	0.2045	0.4373	0.2928	0.6155	30.442	4	11.669	2.410	0.1747

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95547	0.884	0.19372	-0.5835
Bartlett's Test indicates equal variances (p = 0.76)	2.62501	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<4	4			0.11848	0.12886	0.35899	0.01051	1.4E-08	5, 18
Treatments vs Control										

Dose-Response Plot



ToxCalc325.0.23

Reviewed by

C. dilutus Ash Free Dry Weight 20 Day Growth

Start Date:	10/9/2015	Test ID:	3690101Cd	Sample ID:	Moody Ohio site
End Date:	10/29/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

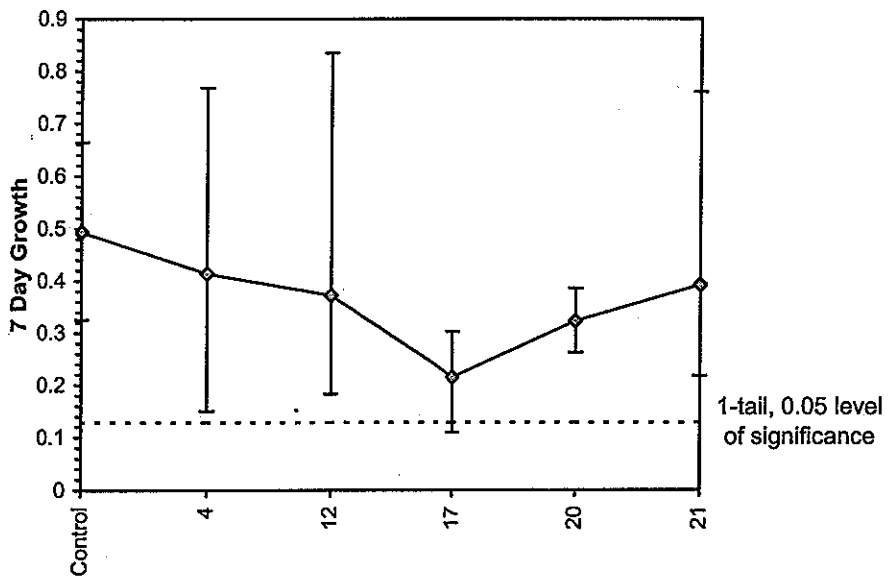
Conc-%	1	2	3	4
Control	0.4473	0.3258	0.5336	0.6640
4	0.7680	0.2200	0.5167	0.1500
12	0.8350	0.2767	0.1833	0.1925
17	0.3025	0.1100	0.2880	0.1580
20	0.2700	0.3860	0.2625	0.3743
21	0.2175	0.3000	0.2900	0.7600

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.4927	1.0000	0.4927	0.3258	0.6640	28.925	4			
4	0.4137	0.8396	0.4137	0.1500	0.7680	68.827	4	0.523	2.410	0.3638
12	0.3719	0.7548	0.3719	0.1833	0.8350	83.790	4	0.800	2.410	0.3638
17	0.2146	0.4356	0.2146	0.1100	0.3025	44.413	4	1.842	2.410	0.3638
20	0.3232	0.6560	0.3232	0.2625	0.3860	20.421	4	1.123	2.410	0.3638
21	0.3919	0.7954	0.3919	0.2175	0.7600	63.325	4	0.668	2.410	0.3638

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90259	0.884	1.04786	0.64175
Bartlett's Test indicates equal variances (p = 0.14)	8.32922	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs Control	21	>21		4.7619	0.36383	0.73845	0.035	0.04558	0.58496	5, 18

Dose-Response Plot



ToxCalc 5.0.23

Reviewed by:

Chironomus dilutus Log Term Survival

Start Date:	10/9/2015	Test ID:	3690101Cd1	Sample ID:	STATOIL
End Date:	12/16/2015	Lab ID:	AAT, INC	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

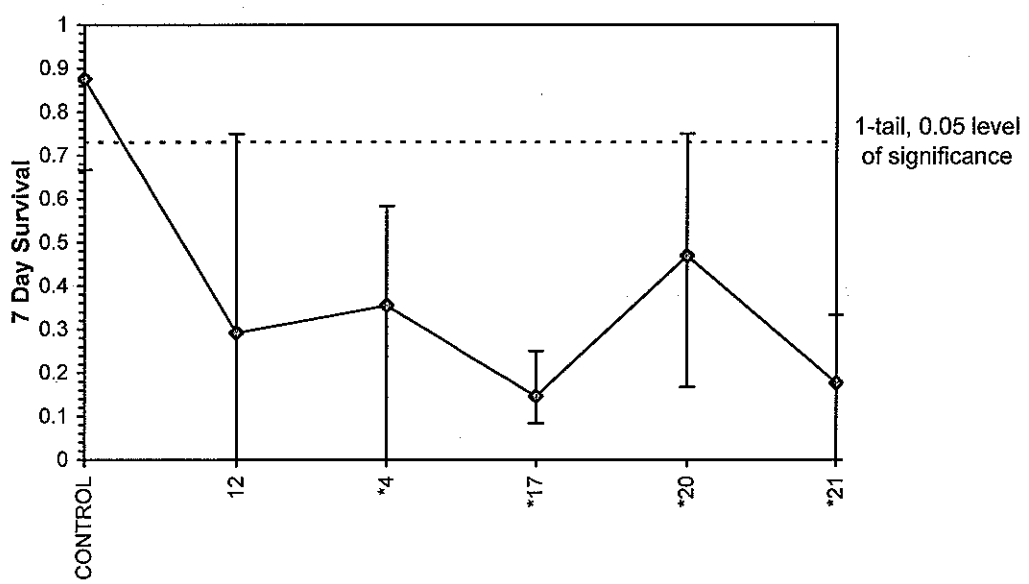
Conc-ppm	1	2	3	4	5	6	7	8
CONTROL	1.0000	1.0000	0.7500	1.0000	0.6667	0.7500	0.9167	0.9167
12	0.1667	0.1667	0.2500	0.5000	0.0000	0.7500	0.4167	0.0833
4	0.5000	0.0000	0.4167	0.5833	0.1667	0.3333	0.5000	0.3333
17	0.0833	0.1667	0.2500	0.2500	0.0833	0.0833	0.1667	0.0833
20	0.2500	0.1667	0.6667	0.5000	0.7500	0.3333	0.5000	0.5833
21	0.0000	0.3333	0.0833	0.0833	0.2500	0.2500	0.2500	0.1667

			Transform: Arcsin Square Root						1-Tailed	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.8750	3.0000	1.2354	0.9553	1.4260	15.655	8	*		
12	0.2917	1.0000	0.5421	0.1448	1.0472	53.540	8			
*4	0.3542	1.2143	0.6172	0.1448	0.8691	38.191	8	6.598	2.239	0.2098
*17	0.1458	0.5000	0.3825	0.2928	0.5236	27.040	8	9.103	2.239	0.2098
*20	0.4688	1.6071	0.7503	0.4205	1.0472	28.723	8	5.178	2.239	0.2098
*21	0.1771	0.6071	0.4172	0.1448	0.6155	38.268	8	8.733	2.239	0.2098

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95659	0.919	-0.6005	-0.1411
Bartlett's Test indicates equal variances (p = 0.32)	4.68964	13.2767		
The control means are significantly different (p = 6.28E-05)	5.623	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					0.16055	0.18005	0.94999	0.03512	2.8E-10	4, 35
Treatments vs CONTROL										

Dose-Response Plot



Chironomus dilutus Long Term Test - Emergence

Start Date:	10/9/2015	Test ID:	3690101Cd1	Sample ID:	STATOIL
End Date:	12/16/2015	Lab ID:	AAT, INC	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	C. dilutus
Comments:					

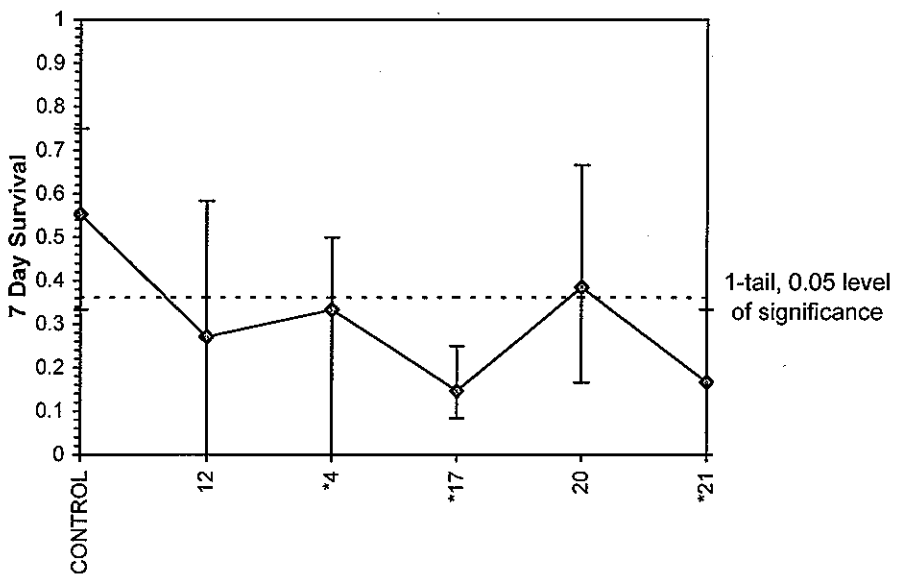
Conc-ppm	1	2	3	4	5	6	7	8
CONTROL	0.7500	0.3333	0.4167	0.5000	0.3333	0.6667	0.6667	0.7500
12	0.1667	0.1667	0.2500	0.5000	0.0000	0.5833	0.4167	0.0833
4	0.5000	0.0000	0.4167	0.4167	0.1667	0.3333	0.5000	0.3333
17	0.0833	0.1667	0.2500	0.2500	0.0833	0.0833	0.1667	0.0833
20	0.2500	0.1667	0.6667	0.4167	0.4167	0.1667	0.4167	0.5833
21	0.0000	0.3333	0.0833	0.0833	0.2500	0.1667	0.2500	0.1667

			Transform: Arcsin Square Root						1-Tailed	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.5521	2.0385	0.8404	0.6155	1.0472	21.821	8	*		
12	0.2708	1.0000	0.5198	0.1448	0.8691	48.092	8			
*4	0.3333	1.2308	0.5963	0.1448	0.7854	36.365	8	2.786	2.239	0.1961
*17	0.1458	0.5385	0.3825	0.2928	0.5236	27.040	8	5.227	2.239	0.1961
20	0.3854	1.4231	0.6618	0.4205	0.9553	29.646	8	2.039	2.239	0.1961
*21	0.1667	0.6154	0.4043	0.1448	0.6155	38.062	8	4.978	2.239	0.1961

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95896	0.919	-0.5151	-0.1129
Bartlett's Test indicates equal variances (p = 0.44)	3.78125	13.2767		
The control means are significantly different (p = 0.01)	2.92446	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					0.19415	0.34989	0.28921	0.0307	2.8E-05	4, 35
Treatments vs CONTROL										

Dose-Response Plot



AMERICAN AQUATIC TESTING, INC.
890 North Graham St
Allentown, Pa 18109
610-434-9015

Job# 14-467-EM. 369-01-01

CHAIN OF CUSTODY

Client Moody And Associates, INC.
Address 199 Johnson Rd. Houston PA 15342 Contact Josh Boyda
Phone # 724-746-5200

Sample Disposal: Return to Client ( ) Lab disposal (X)

Sample #	Initial Chemistry Upon Arrival @ AAT: Temp °C	Dis O2 ppm	pH Std Unit	Alk. mg/L	Hard mg/L	Cl- mg/L	SAMPLE INFORMATION: Sample ID	Sample Type	Sample Volume	Sample Date	Sample Time	Toxicity Testing Req'd.: Acute	Chronic	Sediment	Other
1	4.0						HAOH0909SW17S		1 gallon Bucket	9/9/2015	1000			X	
2	3.5						HAOH0909SW21S		1 gallon Bucket	9/9/2015	1200			X	
3	4.0						HAOH0909SW12S		1 gallon Bucket	9/9/2015	1500			X	
4	2.5						HAOH0909SW20S		1 gallon Bucket	9/9/2015	1540			X	
5	3.0						HAOH0909SW04S		1 gallon Bucket	9/9/2015	1700			X	

Sample collected by: AAT personnel ( ) Client personnel (✓)
Sample Rec'd on ice: YES NO N/A
Sample rec'd w/in hold. Time? YES NO N/A
Sample container intact? YES NO N/A
Correct vol. for testing received? YES NO N/A

Sample #	Relinquished by:	Received by	Date	Time	Relinquished by:	Received by	Date	Time	Lab ISTN
1	[signature]	Crystal Smith	9/10/15	843	Crystal Smith	[signature]	09/10/15	1630	151129
2	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151130
3	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151131
4	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151132
5	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151133

Special Instructions:

Dilution Water Collection Date(s): N/A

Will ammonia be analyzed on these samples? YES NO (✓)
Will additional parameters be analyzed on these samples? YES NO (✓)

36

APPENDIX A.2 American Aquatic Testing, Inc.

Raw Data for *Hyalella azteca* 28-Day Study

Client/Toxicant: 869
Project Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10 Observ.	Day 10 Final Live Count
Control	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
04	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
12	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
17	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
20	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	Intials	JK	TMP	MP	MP	JK	CS	MP	TMP	TMP	TMP	
	Date	10/8	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10 Observ.	Day 10 Final Live Count
21	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
\	A											
	B											
	C											
	D											
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	G											
	H											
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	JK	TAP	MP	MF	JK	[illegible]	MP	TAP	TAP	TAP	
	Date	10/8	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: H.azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20 Observ.	Day 20 Final Live Count
Control	A	N	N	N	N	IF	N	N	N	N	N	
	B	N	IM	N	IM	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	IM	N	IF	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	IF	N	N	N	N	N	N	N	N	
	G	IF	N	N	N	N	N	N	N	N	N	
	H	N	IM	N	N	N	IF	N	N	N	N	
04	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
12	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
17	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	IF	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
20	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
	Intials	TMP	TMP	TMP	TMP	TMP	JK	MP	TMP	JK	JK	
	Date	10/18	10/19	10/20	10/21	10/22	10/23	10/24	10/25	10/26	10/27	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 09/29-10/01/15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20 Observ.	Day 20 Final Live Count
21	A	N	N	N	N	N	N	N	N	N	N	
	B	N	N	N	N	N	N	N	N	N	N	
	C	N	N	N	N	N	N	N	N	N	N	
	D	N	N	N	N	N	N	N	N	N	N	
	E	N	N	N	N	N	N	N	N	N	N	
	F	N	N	N	N	N	N	N	N	N	N	
	G	N	N	N	N	N	N	N	N	N	N	
	H	N	N	N	N	N	N	N	N	N	N	
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
\	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	TAP	TAP	TAP	TAP	TAP	JK	MO	TAP	JK	JK	
	Date	10/18	10/19	10/20	10/21	10/22	11/23	10/24	10/25	11/26	10/27	

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Sediment Test
American Aquatic Testing, Inc.
Observations / Live Count

Conc.	Rep	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day ~~30~~ 28 Observ.	Final Live Count
Control	A	N	N	N	N	N	N	N	N			10
	B	N	N	N	N	N	N	N	N			8
	C	N	N	N	N	N	N	N	N			9
	D	N	N	N	N	N	N	N	N			7
	E	N	N	N	N	N	N	N	N			9
	F	N	N	N	N	N	N	N	N			9
	G	N	N	N	N	N	N	N	N			10
	H	N	N	N	N	N	N	N	N			8
04	A	N	N	N	N	N	N	N	N			6
	B	N	N	N	N	N	N	N	N			3
	C	N	N	N	N	N	N	N	N			0
	D	N	N	N	N	N	N	N	N			2
	E	N	N	N	N	N	N	N	N			2
	F	N	N	N	N	N	N	N	N			1
	G	N	N	N	N	N	N	N	N			0
	H	N	N	N	N	N	N	N	N			7
12	A	N	N	N	N	N	N	N	N			0
	B	N	N	N	N	N	N	N	N			0
	C	N	N	N	N	N	N	N	N			0
	D	N	N	N	N	N	N	N	N			6
	E	N	N	N	N	N	N	N	N			1
	F	N	N	N	N	N	N	N	N			0
	G	N	N	N	N	N	N	N	N			0
	H	N	N	N	N	N	N	N	N			0
17	A	N	N	N	N	N	N	N	N			8
	B	N	N	N	N	N	N	N	N			6
	C	N	N	N	N	N	N	N	N			9
	D	N	N	N	N	N	N	N	N			9
	E	N	N	N	N	N	N	N	N			10
	F	N	N	N	N	N	N	N	N			8
	G	N	N	N	N	N	N	N	N			7
	H	N	N	N	N	N	N	N	N			9
20	A	N	N	N	N	N	N	N	N			8
	B	N	N	N	N	N	N	N	N			8
	C	N	N	N	N	N	N	N	N			8
	D	N	N	N	N	N	N	N	N			7
	E	N	N	N	N	N	N	N	N			9
	F	N	N	N	N	N	N	N	N			7
	G	N	N	N	N	N	N	N	N			8
	H	N	N	N	N	N	N	N	N			10
	Intials	WND	TP	TP	TP	[illegible]	JK	[illegible]	[illegible]			[illegible]
	Date	10/28	10/29	10/30	10/31	11/01	11/2	11-3	11/04			11/04

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Client/Toxicant: 369
Project Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1640
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Sediment Test

American Aquatic Testing, Inc.

Observations / Live Count

Conc.	Rep	Day 21	Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28	Day 29	Day ~~30~~ 28 Observ.	Final Live Count
21	A	N	N	N	N	N	N	N	N			2
	B	N	N	N	N	N	N	N	N			4
	C	N	N	N	N	N	N	N	N			4
	D	N	N	N	N	N	N	N	N			6
	E	N	N	N	N	N	N	N	N			5
	F	N	N	N	N	N	N	N	N			5
	G	N	N	N	N	N	N	N	N			4
	H	N	N	N	N	N	N	N	N			3
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	Intials	VWP	TMP	TMP	TMP	[illegible]	JK	MK	[illegible]			[illegible]
	Date	10/28	10/29	10/30	10/31	11/01	11/2	11-3	11/04			11/04

Comments:

Key: D=dead, W=on water surface, M=swimming, F=on sediment surface, N=no observations

FWSEDOBS.wk4

Project Number: 369-01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29 - 10/1/15

Chronic Test
American Aquatic Testing, Inc.
Weight/Fecundity Data

Conc.	Rep	Pan #	A weight of boat (g)	B weight of boat & org. (g)	(B−A)*1000=C dry weight of organism (mg)	D # of surviving	C/D mean dry weight (mg)	C/E IC_{25} & NOEC calc. weight (mg)	FECUNDITY DATA # of females	# of females w/eggs	# of males	# of immat.
Control	A	1	0.00782	0.00909	1.27	10	0.127					
	B	2	0.00720	0.00782	0.62	8	0.078					
	C	3	0.00726	0.00851	1.25	9	0.139					
	D	4	0.00646	0.00731	0.85	7	0.121					
	E	5	0.00565	0.00635	0.70	9	0.077					
	F	6	0.00616	0.00714	0.98	9	0.109					
	G	7	0.00595	0.00710	1.15	10	0.115					
	H	8	0.00608	0.00706	0.98	8	0.123					
04	A	9	0.00710	0.00741	0.31	6	~~0.517~~ ①					
	B	10	0.00703	0.00726	0.23	3	~~0.767~~ ②					
	C	11	0.00721	0.0 —	—	Ø	—					
	D	12	0.00667	0.00676	0.09	2	0.045					
	E	13	0.00647	0.00671	0.24	2	0.120					
	F	14	0.00675	0.00680	0.05	1	0.050					
	G	15	0.00651	0.0 —	—	Ø	—					
	H	16	0.00685	0.00731	0.46	7	0.066					
12	A	17	0.00740	0.0 —	—	Ø	—					
	B	18	0.00732	0.0 —	—	Ø	—					
	C	19	0.00705	0.0 —	—	Ø	—					
	D	20	0.00652	0.00676	0.24	6	0.040					
	E	21	0.00591	0.00605	0.14	1	0.14					
	F	22	0.00564	0.0 —	—	Ø	—					
	G	23	0.00646	0.0 —	—	Ø	—					
	H	24	0.00654	0.0 —	—	Ø	—					
	Initials		thd	[illegible]	[illegible]	[illegible]	[illegible]					
	Date		11/4/15	11/06	11/06	11/04	11/10					

E = Original number of organisms at test initiation, adjusted for losses.

Observations: ① 0.0517 3 11/10 [illegible]
② 0.0767 3

CHMBWT.wk3

Project Number: 369-01-01
Species: N. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400
Hatch Date: 9/29-10/1/15

Chronic Test
American Aquatic Testing, Inc.
Weight/Fecundity Data

Conc.	Rep	Pan #	A weight of boat (g)	B weight of boat & org. (g)	(B−A)*1000=C dry weight of organism (mg)	D # of surviving	C/D mean dry weight (mg)	C/E IC_{25} & NOEC calc. weight (mg)	FECUNDITY DATA # of females	# of females w/eggs	# of males	# of immat.
17	A	25	0.00720	0.00757	0.37	8	0.046					
	B	26	0.00683	0.00741	0.58	6	~~0.097~~	(2)				
	C	27	0.00767	0.00808	0.41	9	0.046					
	D	28	0.00607	0.00656	0.49	9	0.054					
	E	29	0.00630	0.00667	0.37	10	0.037					
	F	30	0.00665	0.00716	0.51	8	0.064					
	G	31	0.00670	0.00732	0.62	7	0.089					
	H	32	0.00685	0.00728	0.43	9	0.048					
20	A	33	0.00632	0.00704	0.72	8	~~0.08~~ (3)					
	B	34	0.00664	0.00707	0.43	8	0.054					
	C	35	0.00680	0.00749	0.69	8	0.086					
	D	36	0.00589	0.00616	0.27	7	0.039					
	E	37	0.00592	0.00646	0.54	9	0.06					
	F	38	0.00564	0.00601	0.37	7	0.053					
	G	39	0.00592	0.00641	0.49	8	0.061					
	H	40	0.00585	0.00645	0.60	10	0.06					
21	A	41	0.00744	0.00758	0.14	2	0.07					
	B	42	0.00723	0.00744	0.21	4	0.053					
	C	43	0.00776	0.00799	0.23	4	0.058					
	D	44	0.00679	0.00708	0.29	6	0.048					
	E	45	0.00678	0.00689	0.11	5	0.022					
	F	46	0.00657	~~0.00709~~ (1)	0.52	5	0.104					
	G	47	0.00627	0.00649	0.22	4	0.055					
	H	48	0.00642	0.00680	0.38	9	0.042					
Initials			HD	[illegible]	[illegible]	[illegible]	[illegible]					
Date			11/4/15	11/06	11/06	11/04	11/10					

E = Original number of organisms at test initiation, adjusted for losses.

Observations: (1) 0.00709
(2) 0.097
(3) 0.09

CHMBWT.wk3

Job Number: 369-01-01
Species: H. azteca

Start Date & Time: 10-7-15 1540
End Date & Time: 11/04/15 1400

Sediment Test

American Aquatic Testing, Inc.,

Water Change Log/Initial Water Readings/General Testing Information

Test Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Morning change(time)		0915	0900	0840	0830	1010	1130	0730	0730	0900	0600	0915	0730	0730	0530
D.O. mg/L		7.8	8.4	8.3	8.2	7.8	8.5	8.4	8.3	8.0	8.4	8.7	8.3	8.5	8.2
pH		8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.0	7.8	8.2	8.1	8.1	8.2	8.0
Temp. (C)		24.0	23.5	23.5	23.5	23.0	23.5	23.0	23.0	23.5	23.5	23.0	23.0	23.5	23.0
Initials		TAP	TAP	MTF	MTF	TAP	TAP	MP	TAP	JK	TAP	TAP	thd	thd	thd
Date		10/8	10/9	10-10	10-11	10/12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	10/20	10/21
Afternoon change(time)	1500	1740	2000	1620	1900	1415	1600	1710	1550	1615	1800	1945	1800	1800	1600
D.O. mg/L	7.9	7.9	8.2	8.2	8.1	8.3	8.3	8.4	8.2	8.4	8.3	8.4	8.4	8.4	8.2
pH	7.8	8.1	8.1	8.1	8.1	8.0	8.1	8.1	8.0	8.1	8.1	8.1	8.1	8.2	8.2
Temp. (C)	24.0	24.0	23.0	23.5	23.0	23.0	23.0	23.0	23.0	23.5	23.5	23.0	23.0	23.5	22.5
Initials	TAP	TAP	TAP	MTF	[illegible]	MTF	[illegible]	[illegible]	TAP	JK	TAP	TAP	[illegible]	MTF	TAP
Date	10/7	10/8	10/9	10-10	10/11	10-12	10/13	10/14	10/15	10/16	10/17	10/18	10/19	10-20	10/21

Test Day	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Morning change(time)	0730	0650	0700	0845	0730	0730	0730	0730	1000	0600	0700	0730	0600	0700
D.O. mg/L	8.2	8.6	8.4	8.3	8.4	8.8	8.6	8.3	8.3	8.5	8.6	8.6	8.3	9.0
pH	7.8	8.0	7.7	7.5	8.0	8.0	8.0	8.0	8.0	7.9	7.9	8.2	7.0	7.8
Temp. (C)	22.0	22.5	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.0	22.5	22.5	23.0	22.0
Initials	thd	JK	JK	JK	thd	thd	thd	thd	TAP	thd	[illegible]	thd	thd	thd
Date	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10/29	10/30	10/31	11/01	11/2	11/3	11/4
Afternoon change(time)	1630	1540	1700	1500	1710	1950	1900	2000	1930	1810	1700	1710	1620	
D.O. mg/L	8.4	8.3	8.6	8.6	8.2	8.5	8.4	8.5	7.7	8.2	8.3	7.8	8.5	
pH	8.2	8.1	8.1	8.0	7.7	7.9	8.0	7.9	7.9	7.9	7.8	8.2	7.7	
Temp. (C)	22.5	22.5	22.5	22.5	22.5	22.5	23.0	22.5	22.5	22.5	22.0	23.0	23.0	
Initials	JK	JK	JK	JK	JK	JK	[illegible]	MTF	TAP	MP	MP	JK	MTF	
Date	10/22	10/23	10/24	10/25	10/26	10/27	10/28	10-29	10/30	10/31	11/1	11/2	11-3	

Control Sed. collection date/by: 10/5/15 TAP

Control Sed. sieve date/by: 10/5/15 TAP

Sieve size used: 1mm

Sample sieve date/by: 9/9/15 Moody Assoc.

Sieve size used: 1mm

Organism source: ABS

Test organism Lot number: 1643

Number of animals per chamber: 10

Food Type: flake

Frequency of feeding:

Test Chamber size: 300ml

Test Volume of sediment: 100ml

Test Volume of water: 150ml

Test Duration: 28 days

Test Temperature Range: 23±1°C

Client/Toxicant: 369
Job Number: 01-01
Species: H.azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 0	1	2	3	4	5	6	7	8	9	10
TEMP (C)	Control	22.0	22.5	23.0	22.5	22.0	23.0	22.5	23.0	22.0	22.5	22.5
	04	22.0	22.5	23.0	22.5	22.0	23.0	22.5	22.5	22.0	22.0	22.5
	12	22.5	22.0	23.0	22.0	22.0	23.0	22.5	22.5	22.0	22.0	22.5
	17	22.5	22.0	23.0	22.0	22.0	23.0	22.5	22.5	22.0	22.0	22.5
	20	22.5	22.0	23.0	22.0	22.0	23.0	22.5	22.5	22.0	22.0	22.5
	21	22.5	22.0	23.0	22.0	22.0	23.0	22.0	22.5	22.0	22.0	22.5
	-											
	-											
	-											
	-											
	-											
Dissolved Oxygen (mg/L)	Control	6.8	6.1	6.4	6.5	6.0	5.7	5.3	5.4	5.9	6.2	5.9
	04	7.2	6.7	6.8	7.1	5.9	6.7	6.0	6.5	6.5	7.2	6.9
	12	7.4	6.6	7.1	7.1	5.9	7.0	6.1	6.8	7.0	7.8	7.4
	17	6.4	6.3	6.4	7.1	5.3	6.5	5.9	6.6	6.7	7.3	7.0
	20	7.0	6.5	6.8	7.2	6.1	7.0	6.2	6.8	6.8	7.3	7.1
	21	7.0	6.2	6.6	7.0	6.0	6.6	6.1	6.5	6.8	7.3	7.0
	-											
	-											
	-											
	-											
	-											
pH	Control	7.7	7.7	7.8	7.7	7.7	7.7	7.9	7.8	7.9	8.1	8.0
	04	7.7	7.8	7.8	7.8	7.7	7.7	7.9	7.8	7.9	8.0	8.1
	12	7.7	7.8	7.9	7.8	7.8	7.8	7.9	7.8	7.9	8.0	8.1
	17	7.7	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.9	8.0	8.1
	20	7.7	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.9	8.0	8.0
	21	7.8	7.8	7.9	7.8	7.9	7.8	7.8	7.8	7.8	8.0	8.0
	-											
	-											
	-											
	-											
	-											
	Initials	JK	JK	GSM	MP	[illegible]	JK	[illegible]	MP	JK	JK	HH
	Date	10/7	10/8	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16	10/17

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control	417	311	70		80		0.16	
04	300	304	70		90		0.02	
12	295	305	70		90		0.03	
17	300	299	70		90		0.02	
20	303	306	80		90		0.17	
21	312	316	70		100		0.10	
-								
-								
-								
-								
-								
Initials	JK	MP	JK		JK		TAP	
Date	10/7	11/4	10/7		10/7		10/7	

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1540
Ending Date & Time: 11/04/15 1400

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 11	12	13	14	15	16	17	18	19	20	21
TEMP (C)	Control	23.0	22.5	23.0	22.5	23.0	22.5	22.5	22.5	22.5	22.5	22.5
	04	23.0	22.5	23.0	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.5
	12	23.0	22.5	23.0	22.5	23.0	22.5	22.0	22.5	22.5	22.5	22.5
	17	23.0	22.5	22.5	22.5	22.5	22.5	22.0	22.5	22.5	22.5	22.5
	20	23.0	22.5	22.5	22.5	22.5	22.5	22.0	22.5	22.5	22.5	22.5
	21	23.0	22.5	22.5	22.5	22.5	22.5	22.0	22.5	22.5	22.5	22.5
	-											
	-											
	-											
	-											
	-											
Dissolved Oxygen (mg/L)	Control	6.3	6.5	5.5	4.8	5.4	6.1	6.0	6.8	5.2	5.0	4.8
	04	7.5	7.3	6.9	6.7	7.1	7.4	7.4	7.6	6.9	6.8	5.5
	12	7.3	7.4	7.7	6.9	8.0	6.9	7.5	7.5	6.7	6.9	6.0
	17	7.4	7.7	7.0	6.2	7.2	7.4	7.4	7.5	6.4	6.2	5.8
	20	7.6	7.8	7.4	6.9	7.2	7.5	7.4	7.4	6.3	6.4	5.4
	21	7.6	7.6	6.8	6.3	7.1	7.1	6.9	7.1	6.5	6.2	5.4
	-											
	-											
	-											
	-											
	-											
pH	Control	8.1	8.0	7.9	7.8	7.7	7.7	7.7	7.5	7.5	7.6	7.5
	04	8.1	8.0	8.0	7.9	7.7	7.8	7.7	7.7	7.5	7.6	7.4
	12	8.2	8.0	8.0	7.9	7.7	7.8	7.7	7.8	7.5	7.6	7.4
	17	8.1	8.0	7.9	7.8	7.7	7.8	7.8	7.8	7.6	7.6	7.5
	20	8.1	8.0	7.9	7.8	7.7	7.8	7.8	7.8	7.7	7.6	7.5
	21	8.1	8.0	7.9	7.8	7.7	7.8	7.7	7.8	7.6	7.6	7.5
	-											
	-											
	-											
	-											
	-											
	Initials	TDP	TDP	JK	MO	JK	JK	MO	TDP	MF	JK	MO
	Date	10/18	10/19	10/20	10/21	10/22	10/23	10/24	10/25	10-26	10/27	10/28

Concentration	Cond. (umhos) Initial	Final	Alkalinity (mg/L) Initial	Final	Hardness (mg/L) Initial	Final	Ammonia (mg/L) Initial	Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

Client/Toxicant: 369
Job Number: 01-01
Species: H. azteca

Beginning Date & Time: 10-7-15 1840
Ending Date & Time: 11/04/15 1400

Freshwater Sediment Test
American Aquatic Testing, Inc.,
Physical / Chemical Parameters

Parameter	Concentration	Day 22	23	24	25	26	27	28	29	30	31	32
TEMP (C)	Control	23.0	22.5	22.0	22.0	23.0	23.5	23.5				
	04	23.0	22.5	22.0	22.0	23.0	23.5	23.0				
	12	23.0	22.5	22.0	22.0	23.0	23.5	23.0				
	17	23.0	22.5	22.0	22.0	23.0	23.5	23.0				
	20	23.0	22.5	22.0	22.0	23.0	23.0	23.0				
	21	23.0	22.5	22.0	22.0	23.0	23.0	23.0				
	-											
	-											
	-											
	-											
	-											
Dissolved Oxygen (mg/L)	Control	5.1	4.9	5.5	6.7	5.2	3.9	5.2				
	04	5.9	6.5	6.5	6.6	6.3	4.1	4.8				
	12	5.7	6.6	6.3	6.8	5.7	4.7	6.1				
	17	5.9	5.3	6.2	7.0	5.4	5.2	6.2				
	20	5.8	5.9	6.3	7.2	5.4	5.4	5.6				
	21	5.7	5.6	6.2	7.2	5.3	5.3	6.2				
	-											
	-											
	-											
	-											
	-											
pH	Control	7.5	7.5	7.9	7.6	7.3	7.4	7.4				
	04	7.5	7.5	7.9	7.6	7.4	7.3	7.3				
	12	7.5	7.5	7.8	7.6	7.4	7.4	7.4				
	17	7.5	7.6	7.8	7.6	7.4	7.4	7.4				
	20	7.5	7.5	7.8	7.6	7.4	7.4	7.3				
	21	7.5	7.5	7.8	7.5	7.4	7.4	7.3				
	-											
	-											
	-											
	-											
	-											
	Initials	MM	JC	HD	MP	JK	MF	MO				
	Date	10-29	10/30	10/31	11/1	11/2	11-3	11-4				

Concentration	Cond. (umhos) Initial	Cond. (umhos) Final	Alkalinity (mg/L) Initial	Alkalinity (mg/L) Final	Hardness (mg/L) Initial	Hardness (mg/L) Final	Ammonia (mg/L) Initial	Ammonia (mg/L) Final
Control								
Initials								
Date								

Comments:

FWSEDPAR.wk3

H. azteca 28 Day Survival

Start Date:	10/7/2015	Test ID:	3690101Ha	Sample ID:	MOODY OHIO
End Date:	11/6/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	H. azteca
Comments:					

Conc-%	1	2	3	4	5	6	7	8	
Control	1.0000	0.8000	0.9000	0.7000	0.9000	0.9000	1.0000	0.8000	CONTROL FOR COMPARISON ONLY
12	0.0000	0.0000	0.0000	0.6000	0.1000	0.0000	0.0000	0.0000	
4	0.6000	0.3000	0.0000	0.2000	0.2000	0.1000	0.0000	0.7000	
17	0.8000	0.6000	0.9000	0.9000	1.0000	0.8000	0.7000	0.9000	
20	0.8000	0.8000	0.8000	0.7000	0.9000	0.7000	0.8000	1.0000	
21	0.2000	0.4000	0.4000	0.6000	0.5000	0.5000	0.4000	0.9000	

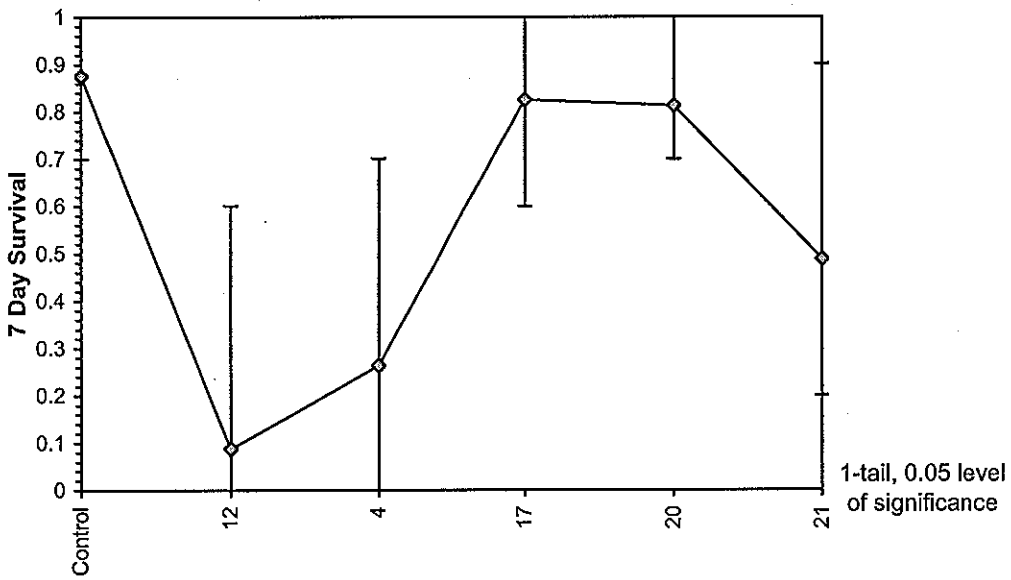
			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.8750	10.0000	1.2221	0.9912	1.4120	12.140	8			
12	0.0875	1.0000	0.2701	0.1588	0.8861	94.554	8	*		
4	0.2625	3.0000	0.5029	0.1588	0.9912	61.231	8	-2.048	2.239	0.2545
17	0.8250	9.4286	1.1563	0.8861	1.4120	14.483	8	-7.796	2.239	0.2545
20	0.8125	9.2857	1.1340	0.9912	1.4120	12.211	8	-7.599	2.239	0.2545
21	0.4875	5.5714	0.7780	0.4636	1.2490	29.093	8	-4.468	2.239	0.2545

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.90376	0.919	1.06723	1.33156
Bartlett's Test indicates equal variances (p = 0.27)	5.12307	13.2767		
The control means are significantly different (p = 2.90E-07)	9.11771	2.14479		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	21	>21		4.7619	0.07094	0.99659	1.20611	0.0517	1.8E-09	4, 35

Treatments vs 12

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by: _____

H. azteca 28 Day Growth

Start Date:	10/7/2015	Test ID:	3690101Ha	Sample ID:	MOODY OHIO
End Date:	11/6/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	H. azteca
Comments:					

Conc-%	1	2	3	4	5	6	7	8	
Control	0.1270	0.0775	0.1389	0.1214	0.0778	0.1089	0.1150	0.1225	CONTROL FOR COMPARISON ONLY
12	0.0400	0.1400							
4	0.0517	0.0767	0.0450	0.1200	0.0500	0.0657			
17	0.0463	0.0967	0.0456	0.0544	0.0370	0.0638	0.0886	0.0478	
20	0.0900	0.0538	0.0863	0.0386	0.0600	0.0529	0.0613	0.0600	
21	0.0700	0.0525	0.0575	0.0483	0.0220	0.1040	0.0550	0.0422	

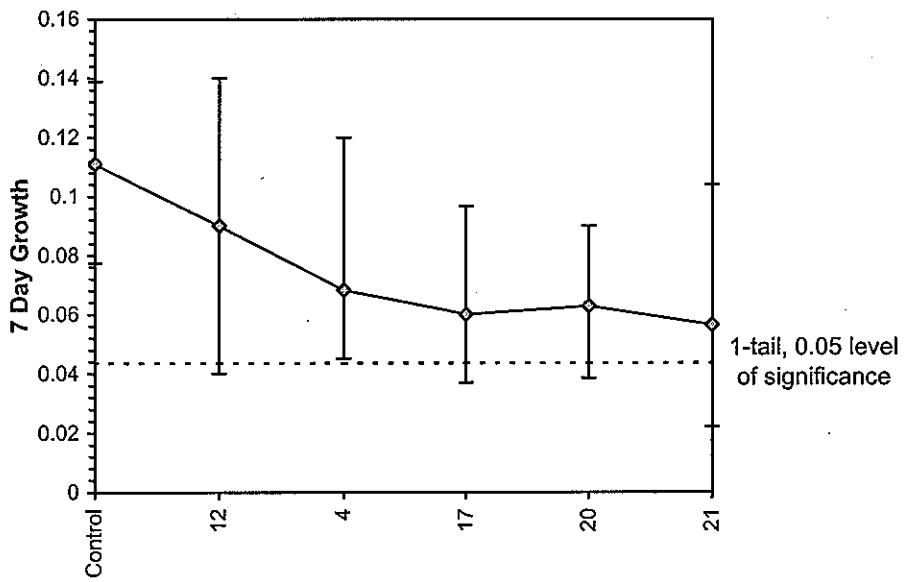
			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.1111	1.2347	0.1111	0.0775	0.1389	20.183	8			
12	0.0900	1.0000	0.0900	0.0400	0.1400	78.567	2	*		
4	0.0682	0.7575	0.0682	0.0450	0.1200	40.987	6	1.030	2.263	0.0480
17	0.0600	0.6667	0.0600	0.0370	0.0967	36.086	8	1.462	2.263	0.0464
20	0.0628	0.6982	0.0628	0.0386	0.0900	27.405	8	1.324	2.263	0.0464
21	0.0564	0.6272	0.0564	0.0220	0.1040	41.917	8	1.636	2.263	0.0464

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93547	0.904	0.61111	0.19922
Bartlett's Test indicates equal variances (p = 0.20)	6.02346	13.2767		
The control means are not significantly different (p = 0.44)	0.81868	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	21	>21		4.7619	0.04643	0.51589	0.00051	0.00067	0.56367	4, 27

Treatments vs 12

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by:

H. azteca 28 Day Survival

Start Date:	10/7/2015	Test ID:	3690101Ha	Sample ID:	MOODY OHIO SITE
End Date:	11/6/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	H azteca
Comments:					

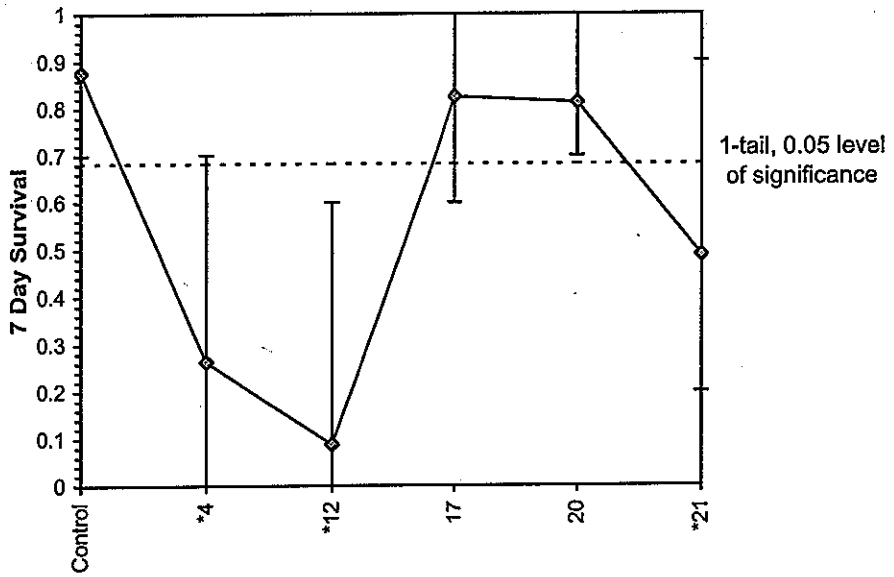
Conc-%	1	2	3	4	5	6	7	8
Control	1.0000	0.8000	0.9000	0.7000	0.9000	0.9000	1.0000	0.8000
4	0.6000	0.3000	0.0000	0.2000	0.2000	0.1000	0.0000	0.7000
12	0.0000	0.0000	0.0000	0.6000	0.1000	0.0000	0.0000	0.0000
17	0.8000	0.6000	0.9000	0.9000	1.0000	0.8000	0.7000	0.9000
20	0.8000	0.8000	0.8000	0.7000	0.9000	0.7000	0.8000	1.0000
21	0.2000	0.4000	0.4000	0.6000	0.5000	0.5000	0.4000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.8750	1.0000	1.2221	0.9912	1.4120	12.140	8			
*4	0.2625	0.3000	0.5029	0.1588	0.9912	61.231	8	6.652	2.306	0.2493
*12	0.0875	0.1000	0.2701	0.1588	0.8861	94.554	8	8.806	2.306	0.2493
17	0.8250	0.9429	1.1563	0.8861	1.4120	14.483	8	0.608	2.306	0.2493
20	0.8125	0.9286	1.1340	0.9912	1.4120	12.211	8	0.815	2.306	0.2493
*21	0.4875	0.5571	0.7780	0.4636	1.2490	29.093	8	4.108	2.306	0.2493

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.92096	0.929	1.02329	1.44169
Bartlett's Test indicates equal variances (p = 0.24)	6.79045	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<4	4			0.20019	0.22665	1.23949	0.04675	5.4E-12	5, 42
Treatments vs Control										

Dose-Response Plot



ToxCalc 5.0.23

Reviewed by:

H. azteca 28 Day Growth

Start Date:	10/7/2015	Test ID:	3690101Ha	Sample ID:	MOODY OHIO
End Date:	11/6/2015	Lab ID:	AAT, INC.	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	H. azteca
Comments:					

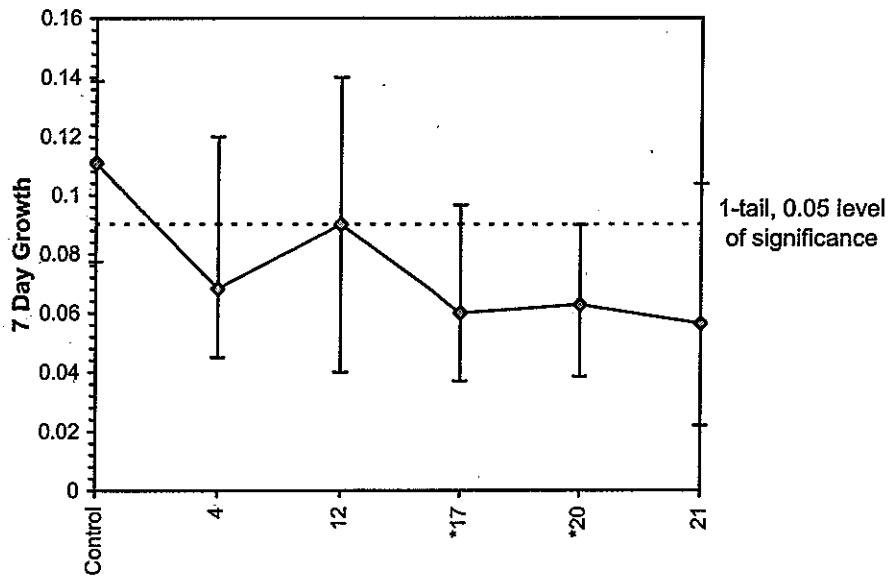
Conc-%	1	2	3	4	5	6	7	8	
Control	0.1270	0.0775	0.1389	0.1214	0.0778	0.1089	0.1150	0.1225	
4	0.0517	0.0767	0.0450	0.1200	0.0500	0.0657			SITES 4, 12, AND 21 FOR COMPARISON ONLY
12	0.0400	0.1400							NOT INCLUDED IN GROWTH ANALYSIS
17	0.0463	0.0967	0.0456	0.0544	0.0370	0.0638	0.0886	0.0478	
20	0.0900	0.0538	0.0863	0.0386	0.0600	0.0529	0.0613	0.0600	
21	0.0700	0.0525	0.0575	0.0483	0.0220	0.1040	0.0550	0.0422	

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Control	0.1111	1.0000	0.1111	0.0775	0.1389	20.183	8			
4	0.0682	0.6135	0.0682	0.0450	0.1200	40.987	6			
12	0.0900	0.8099	0.0900	0.0400	0.1400	78.567	2			
*17	0.0600	0.5400	0.0600	0.0370	0.0967	36.086	8	4.972	2.024	0.0208
*20	0.0628	0.5655	0.0628	0.0386	0.0900	27.405	8	4.697	2.024	0.0208
21	0.0564	0.5079	0.0564	0.0220	0.1040	41.917	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96644	0.884	0.14145	-0.682
Bartlett's Test indicates equal variances (p = 0.20)	3.17899	9.21035		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs Control	<17	17			0.02081	0.18728	0.0066	0.00042	7.0E-05	2, 21

Dose-Response Plot



ToxCalc 5.0.23

Reviewed by:

AMERICAN AQUATIC TESTING, INC.
890 North Graham St
Allentown, Pa 18109
610-434-9015

Job# 14-467-EM 369-01-01

CHAIN OF CUSTODY

Client Moody And Associates, INC.
Address 199 Johnson Rd. Houston PA 15342 Contact Josh Boyda
Phone # 724-746-5200

Sample Disposal: Return to Client ( ) Lab disposal (X)

Sample #	Initial Chemistry Upon Arrival @ AAT: Temp °C	Dis O2 ppm	pH Std Unit	Alk. mg/L	Hard mg/L	Cl- mg/L	SAMPLE INFORMATION: Sample ID	Sample Type	Sample Volume	Sample Date	Sample Time	Toxicity Testing Req'd.: Acute	Chronic	Sediment	Other
1	4.0						HAOH0909SW17S		1 gallon Bucket	9/9/2015	1000			X	
2	3.5						HAOH0909SW21S		1 gallon Bucket	9/9/2015	1200			X	
3	4.0						HAOH0909SW12S		1 gallon Bucket	9/9/2015	1500			X	
4	2.5						HAOH0909SW20S		1 gallon Bucket	9/9/2015	1540			X	
5	3.0						HAOH0909SW04S		1 gallon Bucket	9/9/2015	1700			X	

Sample collected by: AAT personnel ( ) Client personnel (✓)
Sample Rec'd on ice: (YES) NO N/A
Sample rec'd w/in hold. Time? (YES) NO N/A
Sample container intact? (YES) NO N/A
Correct vol. for testing received? (YES) NO N/A

Sample #	Relinquished by:	Received by	Date	Time	Relinquished by:	Received by	Date	Time	Lab ISTN
1	[signature]	Crystal Smith	9/10/15	843	Crystal Smith	[signature]	09/10/15	1020	151129
2	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151130
3	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151131
4	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151132
5	[signature]	Crystal Smith	9/10/15	843	Crystal Smith				151133

Special Instructions:

Dilution Water Collection Date(s): N/A

Will ammonia be analyzed on these samples? YES (NO)

Will additional parameters be analyzed on these samples? YES (NO)

APPENDIX A.3 Midwest Biodiversity Institute

Fish Assemblage Data from Sunfish Creek and Opossum Creek 2009 and 2015

Headwater IBI scores and metrics for site sampled in Oppossum Run in 2015 by MBI.

				Number of						Percent of Individuals						
River Mile	Type	Date	Drainage area (sq mi)	Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
Opossum Creek - (06-033)																
Year: 2015																
2.20	F	08/13/2015	22.10	23(5)	12(0)	2(0)	*(5)	5(0)	10(3)	6(5)	1(5)	7(0)	35(3)	0.0(5)	1158(5)	52
2.20	F	09/24/2015	22.10	20(5)	11(0)	1(0)	9(5)	4(0)	7(3)	20(5)	15(5)	22(0)	39(3)	0.1(5)	1216(5)	50
1.10	D	08/13/2015	24.00	21(5)	9(0)	1(0)	8(3)	5(0)	7(3)	37(3)	35(1)	38(0)	49(3)	0.0(5)	866(5)	40
1.10	E	09/24/2015	24.00	24(5)	8(0)	1(0)	*(3)	6(0)	8(3)	12(5)	11(5)	12(0)	72(5)	0.2(3)	720(3)	46

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Wadeable IBI scores and metrics for site sampled in Sunfish Creek in 2015 by MBI.

				Number of					Percent of Individuals								
River Mile	Type	Date	Drainage area (sq mi)	Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
Sunfish Creek - (06700)																	
Year: 2015																	
25.10	F	08/14/2015	21.0	19(5)	0(1)	3(5)	3(5)	4(5)	33(3)	32(3)	17(5)	0.9(1)	32(3)	0.0(5)	1016(5)	46	8.4
25.10	F	09/24/2015	21.0	18(5)	1(1)	3(5)	3(5)	4(5)	29(3)	36(3)	27(3)	0.1(1)	35(3)	0.0(5)	1412(5)	44	8.3
23.90	F	08/14/2015	22.0	20(5)	2(3)	3(5)	3(3)	4(5)	30(3)	46(3)	31(3)	1.1(3)	33(3)	0.0(5)	916(5)	46	8.3
23.90	F	09/25/2015	22.0	20(5)	2(3)	2(3)	5(5)	4(5)	22(3)	36(3)	27(3)	0.9(1)	26(3)	0.1(5)	1356(5)	44	7.8

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

02/29/2016

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-033 Opossum Creek RM: 1.10 Date: 08/13/2015

Time Fished: 3600 Distance: 0.200 Drainge (sq mi): 24.0 Depth: 0

Location: at ford, upst. Gilmore Run Lat: 39.72610 Long: -80.85920

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-015	NORTHERN HOG SUCKER	I	M	S	R	14	21.0	1.52	120	4.35	5.7
43-012	LONGNOSE DACE	I	R	S	N	1	1.5	0.11	1	0.05	1.0
43-013	CREEK CHUB	G	T	N	N	9	13.5	0.98	40	1.47	3.0
43-022	ROSYFACE SHINER	I	I	S	N	45	67.5	4.90	30	1.09	0.4
43-025	STRIPED SHINER	I		S	N	45	67.5	4.90	249	9.03	3.6
43-032	SPOTFIN SHINER	I		M	N	5	7.5	0.54	9	0.33	1.2
43-035	MIMIC SHINER	I	I	M	N	152	228.0	16.54	216	7.83	0.9
43-039	SILVERJAW MINNOW	I		M	N	1	1.5	0.11	3	0.11	2.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	319	478.5	34.71	784	28.44	1.6
43-044	CENTRAL STONEROLLER	H		N	N	124	186.0	13.49	424	15.39	2.2
47-004	YELLOW BULLHEAD	I	T	C		1	1.5	0.11	60	2.18	40.0
54-001	EASTERN BANDED KILLIFISH	I	T	M	E	1	1.5	0.11	4	0.16	3.0
77-003	ROCK BASS	C		C	S	10	15.0	1.09	75	2.72	5.0
77-004	SMALLMOUTH BASS	C	M	C	F	7	10.5	0.76	75	2.72	7.1
77-005	SPOTTED BASS	C		C	F	3	4.5	0.33	22	0.82	5.0
77-008	GREEN SUNFISH	I	T	C	S	12	18.0	1.31	195	7.07	10.8
77-009	BLUEGILL SUNFISH	I	P	C	S	17	25.5	1.85	202	7.34	7.9
80-011	LOGPERCH	I	M	S	D	4	6.0	0.44	51	1.85	8.5
80-014	JOHNNY DARTER	I		C	D	7	10.5	0.76	15	0.54	1.4
80-015	GREENSIDE DARTER	I	M	S	D	20	30.0	2.18	45	1.63	1.5
80-022	RAINBOW DARTER	I	M	S	D	78	117.0	8.49	105	3.81	0.9
80-024	FANTAIL DARTER	I		C	D	44	66.0	4.79	30	1.09	0.4

No Species: 22 **Nat. Species:** 21 **Hybrids:** 0 **Total Counted:** 919 **Total Rel. Wt. :** 2758

IBI: 40.0 **MIwb:** 8.2

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-033 Opossum Creek RM: 1.10 Date: 09/24/2015

Time Fished: 2160 Distance: 0.150 Drainge (sq mi): 24.0 Depth: 0

Location: at ford, upst. Gilmore Run Lat: 39.72610 Long: -80.85920

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-010	GOLDEN REDHORSE	I	M	S	R	4	8.0	0.98	70	3.18	8.7
40-015	NORTHERN HOG SUCKER	I	M	S	R	31	62.0	7.58	362	16.42	5.8
43-013	CREEK CHUB	G	T	N	N	1	2.0	0.24	16	0.73	8.0
43-020	EMERALD SHINER	I		M	N	2	4.0	0.49	14	0.64	3.5
43-022	ROSYFACE SHINER	I	I	S	N	5	10.0	1.22	16	0.73	1.6
43-025	STRIPED SHINER	I		S	N	17	34.0	4.16	114	5.17	3.3
43-032	SPOTFIN SHINER	I		M	N	17	34.0	4.16	78	3.54	2.2
43-035	MIMIC SHINER	I	I	M	N	58	116.0	14.18	118	5.35	1.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	43	86.0	10.51	164	7.44	1.9
43-044	CENTRAL STONEROLLER	H		N	N	59	118.0	14.43	350	15.88	2.9
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.24	8	0.36	4.0
54-001	EASTERN BANDED KILLIFISH	I	T	M	E	1	2.0	0.24	6	0.27	3.0
70-001	BROOK SILVERSIDE	I	M	M		67	134.0	16.38	280	12.70	2.0
77-003	ROCK BASS	C		C	S	7	14.0	1.71	20	0.91	1.4
77-004	SMALLMOUTH BASS	C	M	C	F	2	4.0	0.49	50	2.27	12.5
77-005	SPOTTED BASS	C		C	F	1	2.0	0.24	6	0.27	3.0
77-006	LARGEMOUTH BASS	C		C	F	3	6.0	0.73	20	0.91	3.3
77-008	GREEN SUNFISH	I	T	C	S	3	6.0	0.73	220	9.98	36.6
77-009	BLUEGILL SUNFISH	I	P	C	S	6	12.0	1.47	80	3.63	6.6
80-011	LOGPERCH	I	M	S	D	16	32.0	3.91	100	4.54	3.1
80-014	JOHNNY DARTER	I		C	D	3	6.0	0.73	6	0.27	1.0
80-015	GREENSIDE DARTER	I	M	S	D	8	16.0	1.96	30	1.36	1.8
80-017	VARIEGATE DARTER	I	I	S	D	1	2.0	0.24	2	0.09	1.0
80-022	RAINBOW DARTER	I	M	S	D	47	94.0	11.49	62	2.81	0.6
80-024	FANTAIL DARTER	I		C	D	6	12.0	1.47	12	0.54	1.0

No Species: 25 **Nat. Species:** 24 **Hybrids:** 0 **Total Counted:** 409 **Total Rel. Wt. :** 2204

IBI: 46.0 **MIwb:** 8.7

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-033 Opossum Creek RM: 2.20 Date: 08/13/2015

Time Fished: 2880 Distance: 0.150 Drainge (sq mi): 22.1 Depth: 0

Location: Lat: 39.72110 Long: -80.87860

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-015	NORTHERN HOG SUCKER	I	M	S	R	32	64.0	5.19	980	11.05	15.3
40-016	WHITE SUCKER	O	T	S	W	2	4.0	0.32	6	0.07	1.5
43-005	RIVER CHUB	I	I	N	N	2	4.0	0.32	280	3.16	70.0
43-012	LONGNOSE DACE	I	R	S	N	11	22.0	1.79	40	0.45	1.8
43-013	CREEK CHUB	G	T	N	N	18	36.0	2.92	64	0.72	1.7
43-017	REDSIDE DACE	I	I	S	N	1	2.0	0.16	2	0.02	1.0
43-021	SILVER SHINER	I	I	S	N	6	12.0	0.97	14	0.16	1.1
43-022	ROSYFACE SHINER	I	I	S	N	1	2.0	0.16	4	0.05	2.0
43-025	STRIPED SHINER	I		S	N	8	16.0	1.30	16	0.18	1.0
43-032	SPOTFIN SHINER	I		M	N	2	4.0	0.32	8	0.09	2.0
43-035	MIMIC SHINER	I	I	M	N	37	74.0	6.01	86	0.97	1.1
43-039	SILVERJAW MINNOW	I		M	N	2	4.0	0.32	2	0.02	0.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	5	10.0	0.81	30	0.34	3.0
43-044	CENTRAL STONEROLLER	H		N	N	338	676.0	54.87	1410	15.89	2.0
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.16	140	1.58	70.0
77-003	ROCK BASS	C		C	S	9	18.0	1.46	1120	12.62	62.2
77-004	SMALLMOUTH BASS	C	M	C	F	28	56.0	4.55	3874	43.67	69.1
77-008	GREEN SUNFISH	I	T	C	S	11	22.0	1.79	480	5.41	21.8
80-011	LOGPERCH	I	M	S	D	2	4.0	0.32	40	0.45	10.0
80-014	JOHNNY DARTER	I		C	D	9	18.0	1.46	14	0.16	0.7
80-015	GREENSIDE DARTER	I	M	S	D	29	58.0	4.71	94	1.06	1.6
80-022	RAINBOW DARTER	I	M	S	D	37	74.0	6.01	110	1.24	1.4
80-024	FANTAIL DARTER	I		C	D	25	50.0	4.06	58	0.65	1.1

No Species: 23 **Nat. Species:** 23 **Hybrids:** 0 **Total Counted:** 616 **Total Rel. Wt. :** 8872

IBI: 52.0 **MIwb:** 8.2

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-033 Opossum Creek RM: 2.20 Date: 09/24/2015

Time Fished: 2940 Distance: 0.150 Drainge (sq mi): 22.1 Depth: 0

Location: Lat: 39.72110 Long: -80.87860

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-015	NORTHERN HOG SUCKER	I	M	S	R	48	96.0	6.30	730	6.66	7.6
43-005	RIVER CHUB	I	I	N	N	8	16.0	1.05	464	4.23	29.0
43-012	LONGNOSE DACE	I	R	S	N	6	12.0	0.79	22	0.20	1.8
43-013	CREEK CHUB	G	T	N	N	31	62.0	4.07	174	1.59	2.8
43-021	SILVER SHINER	I	I	S	N	6	12.0	0.79	22	0.20	1.8
43-022	ROSYFACE SHINER	I	I	S	N	6	12.0	0.79	20	0.18	1.6
43-025	STRIPED SHINER	I		S	N	45	90.0	5.91	376	3.43	4.1
43-032	SPOTFIN SHINER	I		M	N	4	8.0	0.52	22	0.20	2.7
43-035	MIMIC SHINER	I	I	M	N	49	98.0	6.43	112	1.02	1.1
43-039	SILVERJAW MINNOW	I		M	N	1	2.0	0.13	2	0.02	1.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	116	232.0	15.22	656	5.98	2.8
43-044	CENTRAL STONEROLLER	H		N	N	276	552.0	36.22	1208	11.02	2.1
77-003	ROCK BASS	C		C	S	7	14.0	0.92	1520	13.86	108.5
77-004	SMALLMOUTH BASS	C	M	C	F	23	46.0	3.02	4870	44.41	105.8
77-006	LARGEMOUTH BASS	C		C	F	10	20.0	1.31	200	1.82	10.0
77-008	GREEN SUNFISH	I	T	C	S	7	14.0	0.92	300	2.74	21.4
80-014	JOHNNY DARTER	I		C	D	11	22.0	1.44	10	0.09	0.4
80-015	GREENSIDE DARTER	I	M	S	D	36	72.0	4.72	122	1.11	1.6
80-022	RAINBOW DARTER	I	M	S	D	57	114.0	7.48	106	0.97	0.9
80-024	FANTAIL DARTER	I		C	D	15	30.0	1.97	30	0.27	1.0

No Species: 20 **Nat. Species:** 20 **Hybrids:** 0 **Total Counted:** 762 **Total Rel. Wt. :** 10966

IBI: 50.0 **MIwb:** 8.8

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-700 Sunfish Creek RM: 23.90 Date: 08/14/2015

Time Fished: 1239 Distance: 0.150 Drainge (sq mi): 22.0 Depth: 0

Location: Lat: 39.79310 Long: -81.10780

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-010	GOLDEN REDHORSE	I	M	S	R	1	2.0	0.12	16	0.34	8.0
40-015	NORTHERN HOG SUCKER	I	M	S	R	3	6.0	0.36	16	0.34	2.6
40-016	WHITE SUCKER	O	T	S	W	71	142.0	8.43	214	4.61	1.5
43-005	RIVER CHUB	I	I	N	N	1	2.0	0.12	150	3.23	75.0
43-011	WESTERN BLACKNOSE DACE	G	T	S	N	5	10.0	0.59	8	0.17	0.8
43-013	CREEK CHUB	G	T	N	N	112	224.0	13.30	802	17.29	3.5
43-017	REDSIDE DACE	I	I	S	N	13	26.0	1.54	16	0.34	0.6
43-022	ROSYFACE SHINER	I	I	S	N	49	98.0	5.82	76	1.64	0.7
43-025	STRIPED SHINER	I		S	N	83	166.0	9.86	438	9.44	2.6
43-039	SILVERJAW MINNOW	I		M	N	54	108.0	6.41	100	2.16	0.9
43-043	BLUNTNOSE MINNOW	O	T	C	N	192	384.0	22.80	808	17.42	2.1
43-044	CENTRAL STONEROLLER	H		N	N	172	344.0	20.43	1354	29.19	3.9
77-004	SMALLMOUTH BASS	C	M	C	F	1	2.0	0.12	10	0.22	5.0
77-006	LARGEMOUTH BASS	C		C	F	8	16.0	0.95	140	3.02	8.7
77-008	GREEN SUNFISH	I	T	C	S	4	8.0	0.48	200	4.31	25.0
77-009	BLUEGILL SUNFISH	I	P	C	S	14	28.0	1.66	160	3.45	5.7
80-014	JOHNNY DARTER	I		C	D	17	34.0	2.02	10	0.22	0.2
80-015	GREENSIDE DARTER	I	M	S	D	13	26.0	1.54	50	1.08	1.9
80-022	RAINBOW DARTER	I	M	S	D	18	36.0	2.14	30	0.65	0.8
80-024	FANTAIL DARTER	I		C	D	11	22.0	1.31	40	0.86	1.8

No Species: 20 **Nat. Species:** 20 **Hybrids:** 0 **Total Counted:** 842 **Total Rel. Wt. :** 4638

IBI: 46.0 **MIwb:** 8.3

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-700 Sunfish Creek RM: 23.90 Date: 09/25/2015

Time Fished: 1629 Distance: 0.150 Drainge (sq mi): 22.0 Depth: 0

Location: Lat: 39.79310 Long: -81.10780

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-010	GOLDEN REDHORSE	I	M	S	R	1	2.0	0.09	20	0.37	10.0
40-016	WHITE SUCKER	O	T	S	W	35	70.0	3.29	120	2.22	1.7
43-005	RIVER CHUB	I	I	N	N	1	2.0	0.09	20	0.37	10.0
43-011	WESTERN BLACKNOSE DACE	G	T	S	N	8	16.0	0.75	16	0.30	1.0
43-013	CREEK CHUB	G	T	N	N	87	174.0	8.18	648	11.97	3.7
43-017	REDSIDE DACE	I	I	S	N	17	34.0	1.60	34	0.63	1.0
43-021	SILVER SHINER	I	I	S	N	36	72.0	3.39	60	1.11	0.8
43-022	ROSYFACE SHINER	I	I	S	N	9	18.0	0.85	24	0.44	1.3
43-025	STRIPED SHINER	I		S	N	87	174.0	8.18	152	2.81	0.8
43-039	SILVERJAW MINNOW	I		M	N	32	64.0	3.01	76	1.40	1.1
43-043	BLUNTNOSE MINNOW	O	T	C	N	254	508.0	23.89	1078	19.92	2.1
43-044	CENTRAL STONEROLLER	H		N	N	390	780.0	36.69	2832	52.33	3.6
47-008	STONECAT MADTOM	I	I	C		3	6.0	0.28	62	1.15	10.3
77-006	LARGEMOUTH BASS	C		C	F	9	18.0	0.85	110	2.03	6.1
77-008	GREEN SUNFISH	I	T	C	S	1	2.0	0.09	20	0.37	10.0
77-009	BLUEGILL SUNFISH	I	P	C	S	3	6.0	0.28	10	0.18	1.6
80-014	JOHNNY DARTER	I		C	D	36	72.0	3.39	28	0.52	0.3
80-015	GREENSIDE DARTER	I	M	S	D	10	20.0	0.94	22	0.41	1.1
80-022	RAINBOW DARTER	I	M	S	D	35	70.0	3.29	48	0.89	0.6
80-024	FANTAIL DARTER	I		C	D	9	18.0	0.85	32	0.59	1.7

No Species: 20 **Nat. Species:** 20 **Hybrids:** 0 **Total Counted:** 1063 **Total Rel. Wt. :** 5412

IBI: 44.0 **MIwb:** 7.8

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-700 Sunfish Creek RM: 25.10 Date: 08/14/2015

Time Fished: 704 Distance: 0.150 Drainge (sq mi): 21.0 Depth: 0

Location: Lat: 39.78670 Long: -81.11680

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-010	GOLDEN REDHORSE	I	M	S	R	6	12.0	0.81	182	3.16	15.1
40-015	NORTHERN HOG SUCKER	I	M	S	R	4	8.0	0.54	220	3.82	27.5
40-016	WHITE SUCKER	O	T	S	W	51	102.0	6.85	286	4.97	2.8
43-005	RIVER CHUB	I	I	N	N	2	4.0	0.27	200	3.48	50.0
43-011	WESTERN BLACKNOSE DACE	G	T	S	N	19	38.0	2.55	52	0.90	1.3
43-013	CREEK CHUB	G	T	N	N	88	176.0	11.83	1204	20.93	6.8
43-016	SOUTH. REDBELLY DACE	H		S	N	7	14.0	0.94	18	0.31	1.2
43-017	REDSIDE DACE	I	I	S	N	52	104.0	6.99	82	1.43	0.7
43-022	ROSYFACE SHINER	I	I	S	N	9	18.0	1.21	22	0.38	1.2
43-025	STRIPED SHINER	I		S	N	45	90.0	6.05	240	4.17	2.6
43-034	SAND SHINER	I	M	M	N	1	2.0	0.13	2	0.03	1.0
43-039	SILVERJAW MINNOW	I		M	N	9	18.0	1.21	44	0.76	2.4
43-043	BLUNTNOSE MINNOW	O	T	C	N	78	156.0	10.48	254	4.42	1.6
43-044	CENTRAL STONEROLLER	H		N	N	254	508.0	34.14	2490	43.29	4.9
77-006	LARGEMOUTH BASS	C		C	F	7	14.0	0.94	130	2.26	9.2
80-014	JOHNNY DARTER	I		C	D	40	80.0	5.38	52	0.90	0.6
80-015	GREENSIDE DARTER	I	M	S	D	34	68.0	4.57	182	3.16	2.6
80-022	RAINBOW DARTER	I	M	S	D	22	44.0	2.96	48	0.83	1.0
80-024	FANTAIL DARTER	I		C	D	16	32.0	2.15	44	0.76	1.3

No Species: 19 **Nat. Species:** 19 **Hybrids:** 0 **Total Counted:** 744 **Total Rel. Wt. :** 5752

IBI: 46.0 **MIwb:** 8.4

Midwest Biodiversity Institute
Fish Species List

Site ID: River: 06-700 Sunfish Creek RM: 25.10 Date: 09/24/2015

Time Fished: 1096 Distance: 0.150 Drainge (sq mi): 21.0 Depth: 0

Location: Lat: 39.78670 Long: -81.11680

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-010	GOLDEN REDHORSE	I	M	S	R	2	4.0	0.18	34	0.52	8.5
40-015	NORTHERN HOG SUCKER	I	M	S	R	3	6.0	0.27	120	1.85	20.0
40-016	WHITE SUCKER	O	T	S	W	36	72.0	3.26	206	3.18	2.8
43-011	WESTERN BLACKNOSE DACE	G	T	S	N	18	36.0	1.63	30	0.46	0.8
43-013	CREEK CHUB	G	T	N	N	80	160.0	7.25	1364	21.04	8.5
43-017	REDSIDE DACE	I	I	S	N	51	102.0	4.62	152	2.34	1.4
43-021	SILVER SHINER	I	I	S	N	7	14.0	0.63	30	0.46	2.1
43-022	ROSYFACE SHINER	I	I	S	N	4	8.0	0.36	14	0.22	1.7
43-025	STRIPED SHINER	I		S	N	83	166.0	7.52	248	3.83	1.4
43-039	SILVERJAW MINNOW	I		M	N	20	40.0	1.81	60	0.93	1.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	264	528.0	23.91	1112	17.16	2.1
43-044	CENTRAL STONEROLLER	H		N	N	320	640.0	28.99	2606	40.20	4.0
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	0.09	30	0.46	15.0
77-009	BLUEGILL SUNFISH	I	P	C	S	6	12.0	0.54	80	1.23	6.6
80-014	JOHNNY DARTER	I		C	D	82	164.0	7.43	66	1.02	0.4
80-015	GREENSIDE DARTER	I	M	S	D	36	72.0	3.26	170	2.62	2.3
80-022	RAINBOW DARTER	I	M	S	D	78	156.0	7.07	122	1.88	0.7
80-024	FANTAIL DARTER	I		C	D	13	26.0	1.18	38	0.59	1.4

No Species: 18 **Nat. Species:** 18 **Hybrids:** 0 **Total Counted:** 1104 **Total Rel. Wt. :** 6482

IBI: 44.0 **MIwb:** 8.3

ICI metrics and index scores for sites in the Opossum Run and Sunfish Creek study areas in 2015.

Site ID	River Mile	Drainage Area (sq mi)	Number of Total Taxa	Number of Mayfly Taxa	Number of Caddisfly Taxa	Number of Dipteran Taxa	Percent: Mayflies	Percent: Caddis-flies	Percent: Tany-tarsini	Percent: Other Dipt/NI	Percent: Tolerant Organisms	Percent: Qual. EPT	ICI or Narrative
Opossum Creek (06-033)													
Year: 2015													
OP02	2.20	22.4	43(6)	6(4)	4(6)	26(6)	18.2(4)	6.0(4)	17.8(4)	55.7(2)	2.2(6)	22(6)	48
OP01	1.10	24.1	45(6)	8(6)	4(6)	25(6)	16.9(4)	2.6(2)	28.6(6)	50.4(2)	13.2(4)	20(6)	48
Sunfish Creek (06-700)													
Year: 2015													
SU01	25.10	21.0	41(6)	7(6)	2(4)	25(6)	7.9(2)	1.0(2)	20.9(4)	69.1(0)	14.1(4)	16(6)	40
SU02	23.90	21.3	34(4)	5(4)	2(4)	22(6)	5.0(2)	0.3(2)	39.0(6)	55.5(2)	23.6(0)	14(6)	36

Macroinvertebrate taxa collected in the Opossum Run and Sunfish Creek study area in 2015 by MBI.

Site ID: **OP02** Coll. Date: 09/24/2015 River Code 06-033 River Opossum Creek RM: 2.20

Location: Sample: **B**

Taxa Code	Taxa	Tolerance	Qt./Ql.
01900	Nemertea	F	9
03600	Oligochaeta	T	5 +
06830	Gammarus minus	F	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	F	+
11120	Baetis flavistriga	F	30 +
11130	Baetis intercalaris	F	8 +
11250	Neocloeon sp. (Centroptilum sp, w/o hindwing pads)	MI	+
11650	Procloeon sp (w/ hindwing pads)	MI	+
12200	Isonychia sp	MI	9 +
13400	Stenacron sp	F	+
13521	Stenonema femoratum	F	+
13590	Maccaffertium vicarium	MI	100 +
15000	Paraleptophlebia sp	F	+
16200	Eurylophella sp	MI	11
17200	Caenis sp	F	7 +
18600	Ephemera sp	MI	+
21200	Calopteryx sp	F	+
22300	Argia sp	F	+
25510	Stylogomphus albistylus	MI	+
34120	Acroneuria carolinensis	MI	2 +
34130	Acroneuria frisoni	MI	3 +
36001	Chloroperlidae	MI	+
36500	Sweltsa sp	MI	+
47600	Sialis sp	MT	+
48410	Corydalus cornutus	MI	3 +
50301	Chimarra aterrima	MI	7 +
50315	Chimarra obscura	MI	4 +
51600	Polycentropus sp	MI	+
52200	Cheumatopsyche sp	F	25 +
52430	Ceratopsyche morosa group	MI	18 +
52530	Hydropsyche depravata group	F	+
58505	Helicopsyche borealis	MI	+
60300	Dineutus sp	F	+
60900	Peltodytes sp	MT	+
68075	Psephenus herricki	MI	+
68130	Helichus sp	F	+
69275	Optioservus trivittatus	MI	2 +
69400	Stenelmis sp	F	11 +
71100	Hexatoma sp	MI	+
74100	Simulium sp	F	2 +
74501	Ceratopogonidae	T	1

Taxa Code	Taxa	Tol.	Qt./Ql.
77800	Helopelopia sp	F	43
78401	Natarsia species A (sensu Roback, 1978)	T	+
78450	Nilotanypus fimbriatus	F	2
78655	Procladius (Holotanypus) sp	MT	+
80363	Corynoneura sp 12	MI	24
80370	Corynoneura lobata	F	191
80420	Cricotopus (C.) bicinctus	T	10 +
81460	Orthocladius (O.) sp	F	5
81650	Parametriocnemus sp	F	24
81825	Rheocricotopus (Psilocricotopus) robacki	F	10
82101	Thienemanniella taurocapita	MI	10
82141	Thienemanniella xena	F	24
83040	Dicrotendipes neomodestus	F	+
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	MI	5
83840	Microtendipes pedellus group	F	29 +
84210	Paratendipes albimanus or P. duplicatus	F	+
84300	Phaenopsectra obediens group	F	29 +
84440	Polypedilum (Uresipedilum) aviceps	MI	19
84450	Polypedilum (Uresipedilum) flavum	F	14
84460	Polypedilum (P.) fallax group	F	5
84700	Stenochironomus sp	F	5
85615	Rheotanytarsus pellucidus	MI	5
85625	Rheotanytarsus sp	F	58
85720	Stempellinella fimbriata	MI	2
85800	Tanytarsus sp	F	24
85821	Tanytarsus glabrescens group sp 7	F	53
85840	Tanytarsus sepp	F	19
87540	Hemerodromia sp	F	39
95100	Physella sp	T	+

No. Quantitative Taxa:	43	Total Taxa:	70
No. Qualitative Taxa:	46	ICI:	48
Number of Organisms:	906	Qual EPT:	22

Macroinvertebrate taxa collected in the Opossum Run and Sunfish Creek study area in 2015 by MBI.

Site ID: **OP01** Coll. Date: 09/24/2015 River Code 06-033 River Opossum Creek RM: 1.10

Location at ford, upst. Gilmore Run Sample: **B**

Taxa Code	Taxa	Tolerance	Qt./Ql.
01320	Hydra sp	F	1
01801	Turbellaria	F	4
01900	Nemertea	F	13
03600	Oligochaeta	T	87 +
08255	Orconectes rusticus x sanbornii	F	+
11120	Baetis flavistriga	F	6 +
11130	Baetis intercalaris	F	2 +
11245	Anafroptilum or Neocoloeon sp. =(Centroptilum sp.)	F	1
11250	Neocloeon sp. (Centroptilum sp, w/o hindwing pads)	MI	+
11645	Procloeon sp	MI	1 +
12200	Isonychia sp	MI	1 +
13400	Stenacron sp	F	+
13521	Stenonema femoratum	F	+
13561	Maccaffertium pulchellum	MI	+
13590	Maccaffertium vicarium	MI	82 +
16200	Eurylophella sp	MI	6
17200	Caenis sp	F	42 +
18600	Ephemera sp	MI	+
21200	Calopteryx sp	F	+
22001	Coenagrionidae	T	+
22300	Argia sp	F	+
23909	Boyeria vinosa	F	+
34120	Acroneuria carolinensis	MI	3 +
34130	Acroneuria frisoni	MI	+
47600	Sialis sp	MT	+
48410	Corydalus cornutus	MI	7 +
48620	Nigronia serricornis	F	+
50301	Chimarra aterrima	MI	+
50315	Chimarra obscura	MI	2 +
51600	Polycentropus sp	MI	1
52200	Cheumatopsyche sp	F	14 +
52430	Ceratopsyche morosa group	MI	5 +
53501	Hydroptilidae	F	+
58505	Helicopsyche borealis	MI	+
59400	Nectopsyche sp	MI	+
60300	Dineutus sp	F	+
60900	Peltodytes sp	MT	+
63300	Hydroporini	T	+
68075	Psephenus herricki	MI	+
68130	Helichus sp	F	+
68708	Dubiraphia vittata group	F	1 +
68901	Macronychus glabratus	F	1
69400	Stenelmis sp	F	+
70600	Antocha sp	MI	1
72700	Anopheles sp	F	+
77120	Ablabesmyia mallochi	F	3
77800	Helopelopia sp	F	47
78401	Natarsia species A (sensu Roback, 1978)	T	+
78450	Nilotanypus fimbriatus	F	6
80351	Corynoneura caudicula	F	4
80370	Corynoneura lobata	F	97
80410	Cricotopus (C.) sp	F	27 +
80420	Cricotopus (C.) bicinctus	T	20
80430	Cricotopus (C.) tremulus group	MT	13 +
81270	Nanocladius (N.) spiniplenus	F	3
81630	Parakiefferiella sp	F	3
81650	Parametriocnemus sp	F	10
82141	Thienemanniella xena	F	8
82730	Chironomus (C.) decorus group	T	+
83040	Dicrotendipes neomodestus	F	7
84210	Paratendipes albimanus or P. duplicatus	F	+
84450	Polypedilum (Uresipedilum) flavum	F	33
84470	Polypedilum (P.) illinoense	T	3
84520	Polypedilum (Tripodura) halterale group	MT	+
84750	Stictochironomus sp	F	+
85500	Paratanytarsus sp	F	7
85615	Rheotanytarsus pellucidus	MI	3
85625	Rheotanytarsus sp	F	33 +
85752	Sublettea coffmani	MI	3
85800	Tanytarsus sp	F	63 +
85802	Tanytarsus n. sp nr. curticornis	F	3
85821	Tanytarsus glabrescens group sp 7	F	113
85840	Tanytarsus sepp	F	13
86100	Chrysops sp	F	+
87540	Hemerodromia sp	F	29
95100	Physella sp	T	+
96002	Helisoma anceps anceps	F	+
96264	Planorbella (Pierosoma) pilsbryi	T	+
96900	Ferrissia sp	F	+

Macroinvertebrate taxa collected in the Opossum Run and Sunfish Creek study area in 2015 by MBI.

Site ID: **OP01** Coll. Date: 09/24/2015 River Code 06-033 River Opossum Creek RM: 1.10

Location at ford, upst. Gilmore Run Sample: **B**

Taxa Code	Taxa	Tolerance	Qt./Ql.	Taxa Code	Taxa	Tol.	Qt./Ql.

No. Quantitative Taxa:	45	Total Taxa:	79
No. Qualitative Taxa:	51	ICI:	48
Number of Organisms:	832	Qual EPT:	20

Macroinvertebrate taxa collected in the Opossum Run and Sunfish Creek study area in 2015 by MBI.

Site ID: **SU01** Coll. Date: 09/24/2015 River Code 06-700 River Sunfish Creek RM: 25.10

Location: Sample:

Taxa Code	Taxa	Tolerance	Qt./Ql.
01801	Turbellaria	F	1 +
03360	Plumatella sp	F	1
03600	Oligochaeta	T	98 +
11120	Baetis flavistriga	F	2 +
11130	Baetis intercalaris	F	2 +
13400	Stenacron sp	F	1 +
13521	Stenonema femoratum	F	+
13590	Maccaffertium vicarium	MI	7 +
15000	Paraleptophlebia sp	F	2 +
16200	Eurylophella sp	MI	+
16700	Tricorythodes sp	MI	1
17200	Caenis sp	F	49 +
18600	Ephemera sp	MI	+
21200	Calopteryx sp	F	+
22300	Argia sp	F	+
23600	Aeshna sp	MT	+
25510	Stylogomphus albistylus	MI	+
34130	Acroneuria frisoni	MI	6 +
36500	Sweltsa sp	MI	1
48410	Corydalus cornutus	MI	+
50315	Chimarra obscura	MI	+
51600	Polycentropus sp	MI	1
52200	Cheumatopsyche sp	F	7 +
52530	Hydropsyche depravata group	F	+
56001	Limnephilidae		+
58505	Helicopsyche borealis	MI	+
59120	Ceraclea flava complex	MI	+
67800	Tropisternus sp	T	+
68075	Psephenus herricki	MI	+
68130	Helichus sp	F	+
68708	Dubiraphia vittata group	F	+
69275	Optioservus trivittatus	MI	+
69400	Stenelmis sp	F	1 +
72700	Anopheles sp	F	+
74100	Simulium sp	F	+
74501	Ceratopogonidae	T	1 +
77120	Ablabesmyia mallochi	F	10 +
77500	Conchapelopia sp	F	19 +
77800	Helopelopia sp	F	53 +
78350	Meropelopia sp	F	10
78400	Natarsia sp	F	5
78401	Natarsia species A (sensu Roback, 1978)	T	+
78450	Nilotanypus fimbriatus	F	5 +
80370	Corynoneura lobata	F	64
81630	Parakiefferiella sp	F	5
81650	Parametriocnemus sp	F	48 +
82141	Thienemanniella xena	F	4
82200	Tvetenia bavarica group	MI	5
82730	Chironomus (C.) decorus group	T	+
82820	Cryptochironomus sp	F	5 +
83840	Microtendipes pedellus group	F	163 +
84210	Paratendipes albimanus or P. duplicatus	F	+
84300	Phaenopsectra obediens group	F	+
84450	Polypedilum (Uresipedilum) flavum	F	38 +
84460	Polypedilum (P.) fallax group	F	14
84470	Polypedilum (P.) illinoense	T	+
84540	Polypedilum (Tripodura) scalaenum group	F	5 +
84750	Stictochironomus sp	F	+
85500	Paratanytarsus sp	F	5
85625	Rheotanytarsus sp	F	10 +
85720	Stempellinella fimbriata	MI	10 +
85800	Tanytarsus sp	F	38 +
85802	Tanytarsus n. sp nr. curticornis	F	24
85821	Tanytarsus glabrescens group sp 7	F	53 +
85840	Tanytarsus sepp	F	29 +
86200	Tabanus sp	F	+
87540	Hemerodromia sp	F	2
96900	Ferrissia sp	F	2 +
98200	Pisidium sp	MT	+
98600	Sphaerium sp	F	+

No. Quantitative Taxa:	41	Total Taxa:	70
No. Qualitative Taxa:	56	ICI:	40
Number of Organisms:	807	Qual EPT:	16

Macroinvertebrate taxa collected in the Opossum Run and Sunfish Creek study area in 2015 by MBI.

Site ID: **SU02** Coll. Date: 09/24/2015 River Code 06-700 River Sunfish Creek RM: 23.90

Location: Sample:

Taxa Code	Taxa	Tolerance	Qt./Ql.
01801	Turbellaria	F	+
03360	Plumatella sp	F	1 +
03600	Oligochaeta	T	319 +
08250	Orconectes (Procericambarus) rusticus	F	+
11120	Baetis flavistriga	F	+
11130	Baetis intercalaris	F	+
13400	Stenacron sp	F	+
13521	Stenonema femoratum	F	2 +
13590	Maccaffertium vicarium	MI	35 +
15000	Paraleptophlebia sp	F	3 +
16200	Eurylophella sp	MI	3
17200	Caenis sp	F	32 +
21200	Calopteryx sp	F	+
22001	Coenagrionidae	T	+
22300	Argia sp	F	+
25510	Stylogomphus albistylus	MI	+
34130	Acroneuria frisoni	MI	2 +
45300	Sigara sp	MT	+
50315	Chimarra obscura	MI	+
52200	Cheumatopsyche sp	F	4 +
52430	Ceratopsyche morosa group	MI	+
52530	Hydropsyche depravata group	F	+
58505	Helicopsyche borealis	MI	1 +
59120	Ceraclea flava complex	MI	+
59970	Petrophila sp	MI	+
63900	Laccophilus sp	T	+
65700	Anacaena sp	MT	+
68075	Psephenus herricki	MI	+
68708	Dubiraphia vittata group	F	1
69400	Stenelmis sp	F	+
70501	Tipulidae		+
71100	Hexatoma sp	MI	+
72700	Anopheles sp	F	+
74501	Ceratopogonidae	T	4 +
77120	Ablabesmyia mallochi	F	25 +
77500	Conchapelopia sp	F	18 +
77800	Helopelopia sp	F	91 +
78401	Natarsia species A (sensu Roback, 1978)	T	+
80370	Corynoneura lobata	F	108
80430	Cricotopus (C.) tremulus group	MT	8
81630	Parakiefferiella sp	F	8
81650	Parametriocnemus sp	F	+
81825	Rheocricotopus (Psilocricotopus) robacki	F	+
82141	Thienemanniella xena	F	8
82730	Chironomus (C.) decorus group	T	17 +
83040	Dicrotendipes neomodestus	F	8
83840	Microtendipes pedellus group	F	167 +
84450	Polypedilum (Uresipedilum) flavum	F	8 +
84470	Polypedilum (P.) illinoense	T	8 +
84540	Polypedilum (Tripodura) scalaenum group	F	8
84750	Stictochironomus sp	F	8
85500	Paratanytarsus sp	F	8
85625	Rheotanytarsus sp	F	+
85720	Stempellinella fimbriata	MI	20
85800	Tanytarsus sp	F	117 +
85802	Tanytarsus n. sp nr. curticornis	F	33
85821	Tanytarsus glabrescens group sp 7	F	309
85840	Tanytarsus sepp	F	100 +
86401	Atherix lantha	MI	+
87540	Hemerodromia sp	F	12
95100	Physella sp	T	+
96900	Ferrissia sp	F	11 +
98600	Sphaerium sp	F	+

No. Quantitative Taxa:	34	Total Taxa:	63
No. Qualitative Taxa:	49	ICI:	36
Number of Organisms:	1507	Qual EPT:	14

QHEI metric scores for sites in the Opossum Run and Sunfish Creek study areas in 2015.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
(06033) Opossum Creek Year: 2015									
2.20	**71.00**	14.0	10.0	16.5	9.00	11.0	4.5	39.70 - (6)	**Good**
1.10	**75.00**	13.0	13.0	16.0	9.00	11.0	3.0	16.82 - (10)	**Excellent**
(06700) Sunfish Creek Year: 2015									
25.10	**68.00**	16.0	10.0	16.5	9.00	5.0	3.5	18.52 - (8)	**Good**
23.90	**71.50**	14.0	13.0	16.0	8.50	7.0	3.0	14.93 - (10)	**Good**