

**NJPDES BIOMONITORING REPORT FORM
FRESHWATER CHRONIC TOXICITY TEST**

NJPDES #: N/A

SCREENING SITES

FACILITY NAME: Delaware River Basin Commission
25 State Police Drive, P.O. Box 7360

FACILITY LOCATION: West Trenton, N.J. 08628-0360

LABORATORY: American Aquatic Testing, Inc.

ACUTE TOXICITY CERTIFICATION NUMBER: PA682

SRT INFORMATION DATE: March 20, 2012
CONTROL CHART
MEAN: 587.5 ppm

IC₂₅: 571.5 ppm
UCL: 642.5 ppm
LCL: 532.5 ppm

TEST START DATE: March 20, 2012

TEST END DATE: March 27, 2012

TEST TYPE AND RESULTS (Check applicable test, circle applicable endpoint and fill in NOEC &/or IC₂₅)

X Fathead minnow, (CN/FM) NOEC

Site	Conc. Tested	Diff. From Controls?	NOEC
EPA Mod. Hard Water	100%	-	-
EPA Soft Water	100%	-	-
WBL	100%	No	100%
DeIR	100%	YES	<100%
LR	100%	No	100%
DC	100%	Yes	<100%

Method 1000.0 (*Pimephales promelas* 7 day Larval Survival and Growth Test)

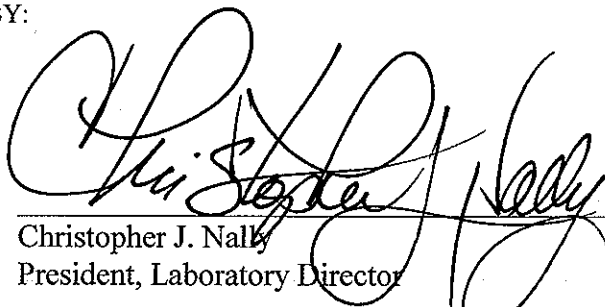
_____ Cladoceran, (CN/CD) NOEL _____, IC₂₅ _____

Method 1001.0 (*Ceriodaphnia dubia* 3 brood Survival and Reproduction Test)

CONTROL MORTALITY: 2.5%

Did the test meet the acceptability criteria for the test species as specified in Part III of the Chronic Methods Document? YES

ACCURACY OF REPORT CERTIFIED BY:



Christopher J. Nally
President, Laboratory Director

04/04/12
Date

TEST DESIGN

NUMBER OF CONCENTRATIONS: 4 SEPARATE SITES
 NUMBER OF REPLICATES / CONCENTRATION: 04
 NUMBER OF TEST ORGANISMS / REPLICATE: 10
 DILUTION SERIES: N/A
 TEST VESSEL SIZE: 1.0 L
 TEST SOLUTION VOLUME: 500 mL
 EXPLAIN ANY DEVIATIONS FROM SPECIFIED METHODS: N/A

EFFLUENT SAMPLING

SAMPLE LOCATION: WBL, DeIR, LR, DC
 EFFLUENT TYPE: River
 DISCHARGE: N/A
 RETENTION TIME: N/A
 SAMPLE TYPE: composite Other (grab)

Sample Collection			Sample data taken upon arrival at laboratory		Use in Toxicity Test	
Beginning Date & Time	Ending Date & Time		Dissolved Oxygen (ppm)	pH (Std. Units)	Date(s)	Time(s)
WBL	03/19/12, 1030	03/19/12, 1030	12.9	7.8	03/20-21/12	1600
WBL	03/21/12, 1230	03/21/12, 1230	12.3	8.0	03/22-23/12	1600 +/- 1 hr
WBL	03/23/12, 1230	03/23/12, 1230	12.5	8.2	03/24-26/12	1600 +/- 1 hr
DeIR	03/19/12, 1130	03/19/12, 1130	13.1	8.0	03/20-21/12	1600
DeIR	03/21/12, 1125	03/21/12, 1125	12.3	8.0	03/22-23/12	1600 +/- 1 hr
DeIR	03/23/12, 1100	03/23/12, 1100	12.4	8.0	03/24-26/12	1600 +/- 1 hr
LR	03/19/12, 0830	03/19/12, 0830	12.4	7.6	03/20-21/12	1600
LR	03/21/12, 1328	03/21/12, 1328	12.4	7.7	03/22-23/12	1600 +/- 1 hr
LR	03/23/12, 1300	03/23/12, 1300	12.3	7.9	03/24-26/12	1600 +/- 1 hr
DC	03/19/12, 1300	03/19/12, 1300	12.5	7.7	03/20-21/12	1600
DC	03/21/12, 1030	03/21/12, 1030	12.4	7.7	03/22-23/12	1600 +/- 1 hr
DC	03/23/12, 1015	03/23/12, 1015	12.4	8.1	03/24-26/12	1600 +/- 1 hr

Maximum holding time for any effluent sample: 72 hours

Describe any pretreatment of the effluent: N/A

TESTING LOCATION

REMOTE LABORATORY
 ON-SITE LABORATORY
 ON-SITE COMMERCIAL LABORATORY

DILUTION WATER

EFFLUENT RECEIVING WATER: Delaware River
 DILUTION WATER: None, 100% only
 DESCRIBE ANY ADJUSTMENT TO THE DILUTION WATER: N/A
 IF RECEIVING WATER IS USED AS DILUTION SOURCE, DESCRIBE COLLECTION LOCATION AND DATES OF COLLECTION: N/A

Client/Toxicant: 123
 Project Number: 01-16
 Species: P. promelas

Beginning Date & Time: 3-20-12 1600
 Ending Date & Time: 3-27-12 1500
 Hatch Date: 3-19-12

Chronic Test
American Aquatic Testing, Inc.
Live Count

Conc.	Rep	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
EPA Soft Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
WBL	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	9'
	D	10	10	10	10	10	10	10	9'
DeLR	A	10	10	10	10	10	10	9'	9
	B	10	10	10	10	8 ²⁰	6 ²⁰	5	6
	C	10	10	10	7 ³	5 ²⁰	5	5	5
	D	10	10	10	10	10	10	10	10
LR	A	10	10	9	9	9	9	9	9
	B	10	10	10	10	10	9'	8'	8
	C	10	10	10	10	10	9'	9	8'
	D	10	10	10	10	10	10	10	10
DC	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
/	A								
	B								
	C								
	D								
Initials	WAL	MTP	WAL	MTP	MTP	WAL	WAL	MTP	
Date	3-20	3-21	3-22	3-23	3-24	3-25	3-26	3-27	

Observations: ① Fungus observed on one dead fish mmp 3-24

Client/Toxicant: 123
 Project Number: 01-16
 Species: P. promelas

Beginning Date & Time: 3-20-12 1600
 Ending Date & Time: 3-27-12 1500
 Hatch Date: 3-19-12

Chronic Test
 American Aquatic Testing, Inc.
 Weight Data

% Conc.	Rep	Pan #	A weight of boat (g)	B weight of boat & fish (g)	(B-A)*1000=C dry weight of fish (mg)	D # of surviving fish	C/D mean dry weight (mg)	C/E IC ₂₅ & NOEC calc. weight (mg)
Control	A	1	0.01167	0.01620	4.53	10	0.453	0.453
	B	2	0.01341	0.01770	4.29	10	0.429	0.429
	C	3	0.01291	0.01743	4.52	10	0.452	0.452
	D	4	0.01171	0.01575	4.04	10	0.404	0.404
EPA Soft Control	A	5	0.01147	0.01554	4.07	10		0.407
	B	6	0.01222	0.01632	4.10	10		0.410
	C	7	0.01145	0.01533	3.68	10		0.368
	D	8	0.01144	0.01574	4.30	10		0.430
WBL	A	9	0.01161	0.01544	3.83	10		0.383
	B	10	0.01274	0.01677	4.03	10		0.403
	C	11	0.01224	0.01659	4.35	9		0.435
	D	12	0.01179	0.01556	3.77	9		0.377
DeLR	A	13	0.01168	0.01538	3.70	9		0.370
	B	14	0.01203	0.01460	2.57	6		0.257
	C	15	0.01211	0.01473	2.62	5		0.262
	D	16	0.01185	0.01562	3.77	10		0.377
LR	A	17	0.01219	0.01576	3.57	9		0.357
	B	18	0.01310	0.01664	3.54	8		0.354
	C	19	0.01327	0.01699	3.72	8		0.372
	D	20	0.01288	0.01644	3.56	10		0.356
DC	A	21	0.01212	0.01495	2.83	10		0.283
	B	22	0.01269	0.01648	3.79	10		0.379
	C	23	0.01237	0.01584	3.47	10		0.347
	D	24	0.01196	0.01536	3.40	10		0.340
/	A							
	B							
	C							
	D							
Initials			Yhd	Yhd	Yhd	AMF	Yhd	Yhd
Date			3/27/12	3/28/12	3/28/12	3-27	3/28/12	3/28/12

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

Observations:

Larval Fish Growth and Survival Test-7 Day Survival

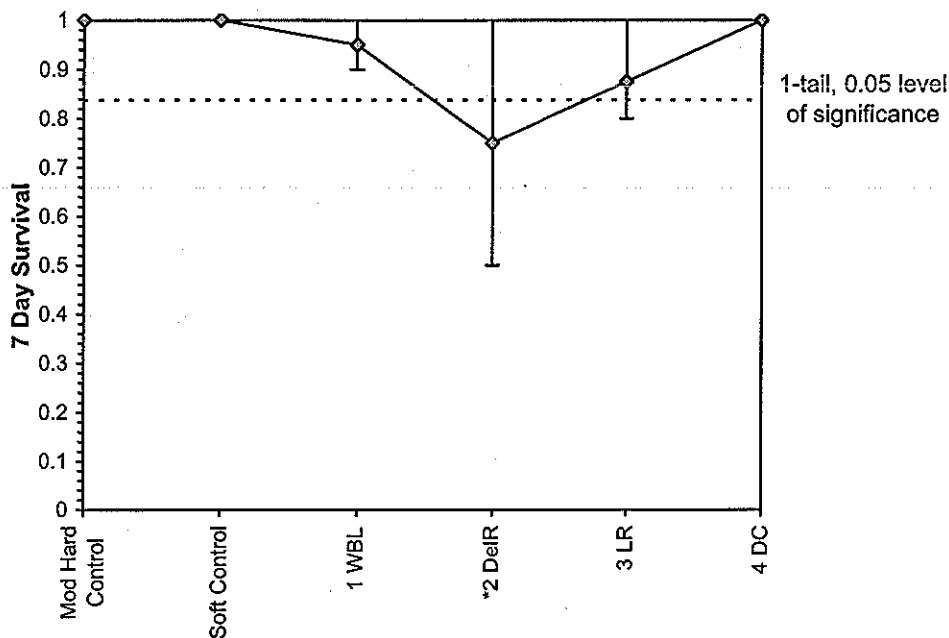
Start Date: 3/20/2012 Test ID: 1230116Pp Sample ID: FATHEAD
 End Date: 3/27/2012 Lab ID: AAT, INC Sample Type: Grab
 Sample Date: Protocol: EPAF 94-EPA/600/4-91/002 Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4
Hard Control	1.0000	1.0000	1.0000	1.0000
Soft Control	1.0000	1.0000	1.0000	1.0000
1 WBL	1.0000	1.0000	0.9000	0.9000
2 DelR	0.9000	0.6000	0.5000	1.0000
3 LR	0.9000	0.8000	0.8000	1.0000
4 DC	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%				
Hard Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4			
Soft Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	*		
1 WBL	0.9500	0.9500	1.3305	1.2490	1.4120	7.072	4	0.751	2.360	0.2560
*2 DelR	0.7500	0.7500	1.0831	0.7854	1.4120	27.345	4	3.032	2.360	0.2560
3 LR	0.8750	0.8750	1.2188	1.1071	1.4120	11.906	4	1.781	2.360	0.2560
4 DC	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	0.000	2.360	0.2560

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93948	0.868	0.24359	1.42426		
Equality of variance cannot be confirmed						
The control means are not significantly different (p = 1.00)	0	2.44691				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs Soft Control	0.13737	0.1409	0.07927	0.02353	0.03715	4, 15

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

Start Date: 3/20/2012	Test ID: 1230116Pp	Sample ID: FATHEAD
End Date: 3/27/2012	Lab ID: AAT, INC	Sample Type: Grab
Sample Date:	Protocol: EPAF 94-EPA/600/4-91/002	Test Species: PP-Pimephales promelas

Comments:

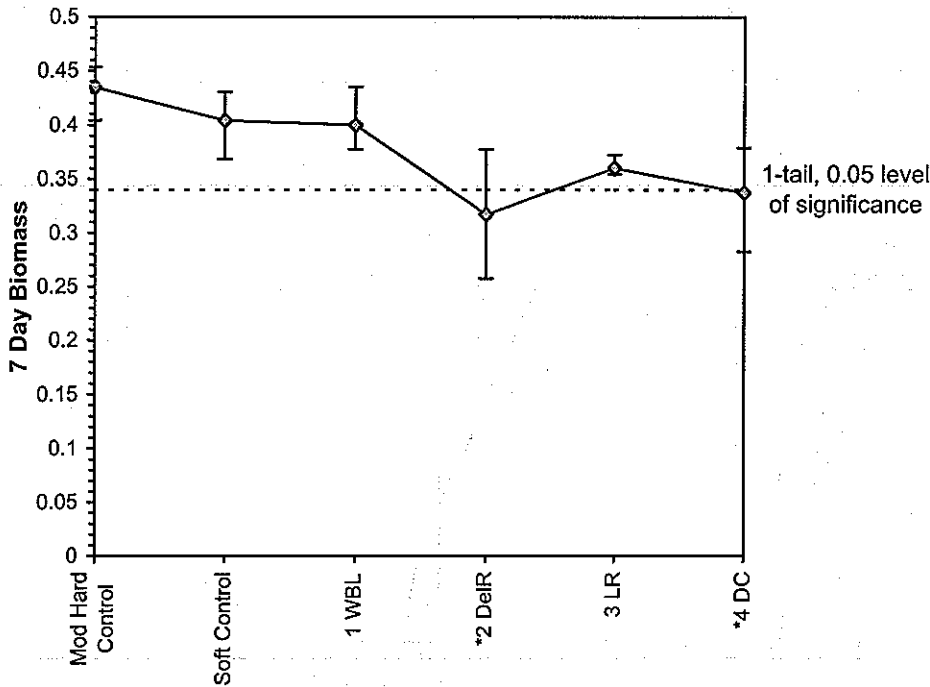
Conc-%	1	2	3	4
Hard Control	0.4530	0.4290	0.4520	0.4040
Soft Control	0.4070	0.4100	0.3680	0.4300
1 WBL	0.3830	0.4030	0.4350	0.3770
2 DelR	0.3700	0.2570	0.2620	0.3770
3 LR	0.3570	0.3540	0.3720	0.3560
4 DC	0.2830	0.3790	0.3470	0.3400

Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%				
Hard Control	0.4345	1.0762	0.4345	0.4040	0.4530	5.330	4			
Soft Control	0.4038	1.0000	0.4038	0.3680	0.4300	6.422	4	*		
1 WBL	0.3995	0.9895	0.3995	0.3770	0.4350	6.545	4	0.157	2.360	0.0640
*2 DelR	0.3165	0.7839	0.3165	0.2570	0.3770	20.825	4	3.215	2.360	0.0640
3 LR	0.3598	0.8910	0.3598	0.3540	0.3720	2.296	4	1.621	2.360	0.0640
*4 DC	0.3373	0.8353	0.3373	0.2830	0.3790	11.847	4	2.450	2.360	0.0640

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95914	0.868	-0.1191	-0.4029
Bartlett's Test indicates equal variances (p = 0.06)	9.16357	13.2767		
The control means are not significantly different (p = 0.13)	1.76904	2.44691		

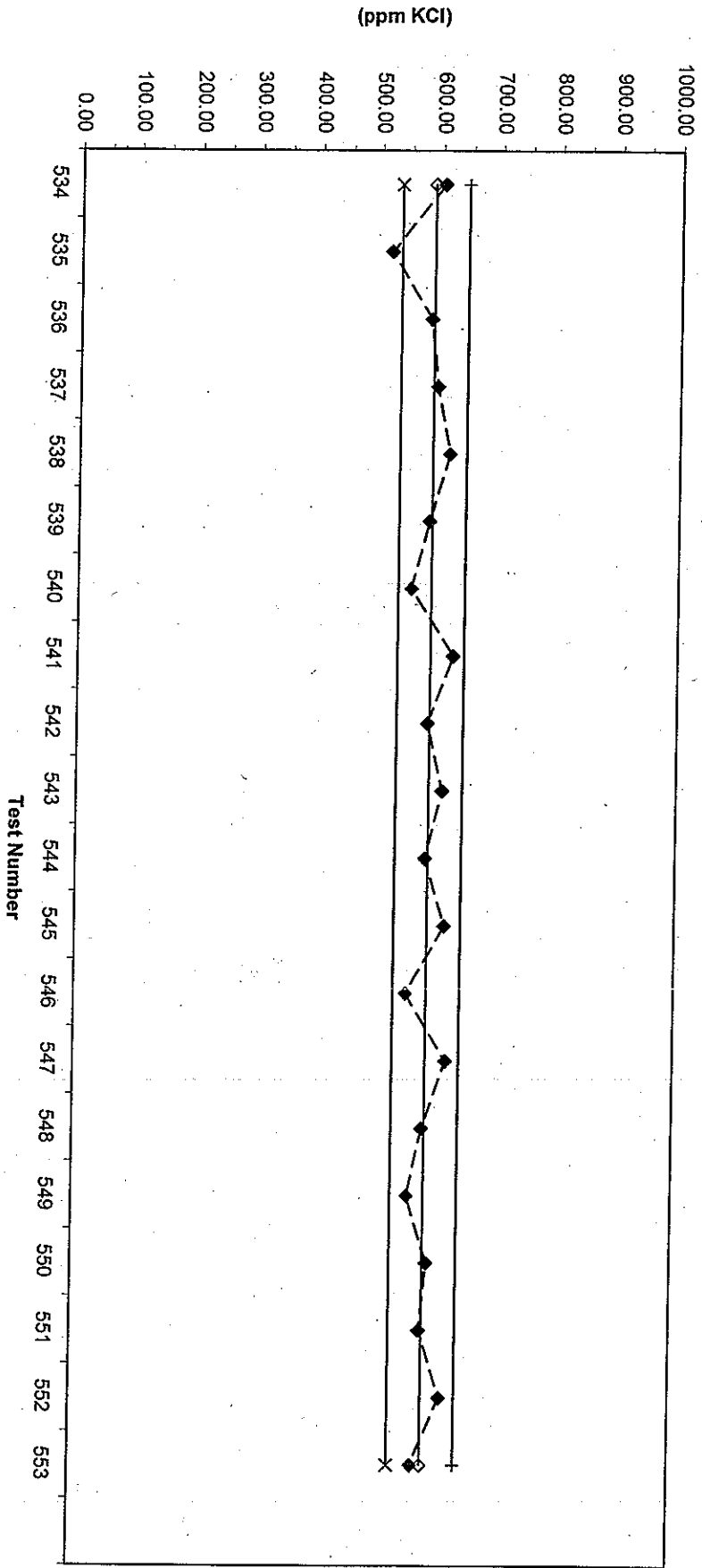
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences Treatments vs Soft Control	0.06405	0.15863	0.00583	0.00147	0.02185	4, 15

Dose-Response Plot



Quality Control Chart *Pimephales promelas* Chronic Toxicity

American Aquatic Testing, Inc.
Chart date: 03/03012 Chart #: 530



AAT

Delaware River Basin Commission - Chain of Custody Record

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Proj. No.		Project Name:		Wayne County Baseline Toxicity		No. of Containers		P. promelas chronic screen C. dubia chronic screen P. subcapitata algal screen				Remarks	
Time	Date	Matrix	Comp.	Grab	Sample Number								
1030	03/19/12	water		X	WBL-031912	1	✓	✓	✓				12260
1130	03/19/12	water		X	DeLR@C-031912	1	✓	✓	✓				12261
0830	03/19/12	water		X	LR-031912	1	✓	✓	✓				12262
1300	03/19/12	water		X	DC-031912	1	✓	✓	✓				12263
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)									
Ron MacGillivray		3/15/12 1600											
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)									
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)									
Relinquished by: (Signature)		Date/Time:		Received for Laboratory by: (Signature)									
				AAT									

Point of Contact at DRBC:

Ron MacGillivray 609-477-7252



Delaware River Basin Commission
 25 State Police Drive, P.O. Box 7360
 West Trenton, NJ 08629-0360

Delaware River Basin Commission - Chain of Custody Record Page of

Proj. No.		Project Name:		Wayne County Baseline Toxicity		No. of Containers		P. promelas chronic screen		C. dubia chronic screen		P. subcapitata screen		Remarks	
Time	Date	Matrix	Comp.	Grab	Sample Number										
Samplers: (Signature) <i>Ron MacGillivray</i>															
1330	03/21/12	water		X	WBL-032112	1	✓	✓	✓	✓	✓	✓	✓	ESTN - 12268	
1125	03/21/12	water		X	DeIR@C032112	1	✓	✓	✓	✓	✓	✓	✓	ESTN - 12269	
1328	03/21/12	water		X	LR-032112	1	✓	✓	✓	✓	✓	✓	✓	ESTN - 12270	
1030	03/21/12	water		X	DC-032112	1	✓	✓	✓	✓	✓	✓	✓	ESTN - 12271	
Relinquished by: (Signature) <i>Ron MacGillivray</i> Date/Time: <i>3/21/12 0535</i> Received by: (Signature)															
Relinquished by: (Signature) Date/Time: Received by: (Signature)															
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Relinquished by: (Signature) Date/Time: Received by: (Signature)															

Point of Contact at DRBC:

Ron MacGillivray 609-477-7252

Received for Laboratory (Signature) *Ron MacGillivray* 3/21/12 1535



Delaware River Basin Commission
 25 State Police Drive, P.O. Box 7360
 West Trenton, NJ 08628-0360

Delaware River Basin Commission - Chain of Custody Record

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Proj. No.		Project Name: Wayne County Baseline Toxicity								
Samplers: (Signature) <i>Ron Mac Gillivray</i>										
Time	Date	Matrix	Comp.	Grab	Sample Number	No. of Containers	P. promelas chronic screen	C. dubia chronic screen	P. subcapitata screen	Remarks
1230	03/23/12	water		X	WBL-032312	1	✓	✓	✓	
1100	03/23/12	water		X	DeIR@C-032312	1	✓	✓	✓	
1300	03/23/12	water		X	LR-032312	1	✓	✓	✓	
1615	03/23/12	water		X	DC-032312	1	✓	✓	✓	
Relinquished by: (Signature) <i>Ron Mac Gillivray</i>		Date/Time: 03/23/2012		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time:		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time:		Received for Laboratory by: (Signature) <i>Tam Sillge</i>						

Point of Contact at DRBC:

Ron MacGillivray 609-477-7252

**NJPDES BIOMONITORING REPORT FORM
FRESHWATER CHRONIC TOXICITY TEST**

NJPDES #: N/A SCREENING SITES

FACILITY NAME: Delaware River Basin Commission
25 State Police Drive, P.O. Box 7360

FACILITY LOCATION: West Trenton, N.J. 08628-0360

LABORATORY: American Aquatic Testing, Inc.

ACUTE TOXICITY CERTIFICATION NUMBER: PA682

SRT INFORMATION	DATE:	March 21, 2012	IC ₂₅ :	319.9 ppm
	CONTROL CHART		UCL:	396.4 ppm
	MEAN:	318.5 ppm	LCL:	240.6 ppm

TEST START DATE: March 20, 2012 TEST END DATE: March 26, 2012

TEST TYPE AND RESULTS (Check applicable test, circle applicable endpoint and fill in NOEC &/or IC₂₅)

 Fathead minnow, (CN/FM) NOEL , IC₂₅

 Method 1000.0 (*Pimephales promelas* 7 day Larval Survival and Growth Test)

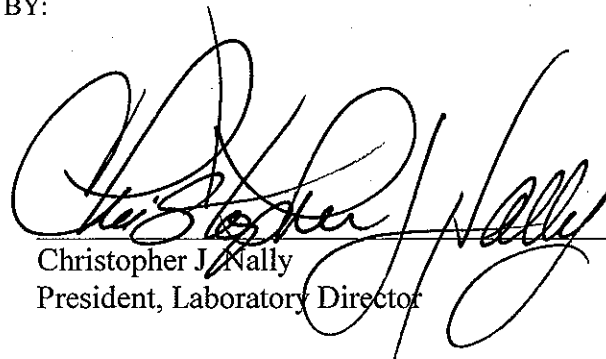
X Cladoceran, (CN/CD) NOEC

Site	Conc. Tested	Diff. From Controls?	NOEC
EPA Mod. Hard Water	100%	-	-
EPA Soft Water	100%	-	-
WBL	100%	No	100%
DeIR	100%	No	100%
LR	100%	No	100%
DC	100%	No	100%

CONTROL MORTALITY: 0%

Did the test meet the acceptability criteria for the test species as specified in Part III of the Chronic Methods Document? YES

ACCURACY OF REPORT CERTIFIED BY:


 Christopher J. Nally
 President, Laboratory Director

04/04/12
 Date

TEST DESIGN

NUMBER OF CONCENTRATIONS: 4 SEPARATE SITES
 NUMBER OF REPLICATES / CONCENTRATION: 10
 NUMBER OF TEST ORGANISMS / REPLICATE: 01
 DILUTION SERIES: 0.5
 TEST VESSEL SIZE: 30 mL
 TEST SOLUTION VOLUME: 15 mL
 EXPLAIN ANY DEVIATIONS FROM SPECIFIED METHODS: N/A

EFFLUENT SAMPLING

SAMPLE LOCATION: WBL, DelR, LR, DC
 EFFLUENT TYPE: River
 DISCHARGE: N/A
 RETENTION TIME: N/A
 SAMPLE TYPE: composite Other (grab)

Sample Collection			Sample data taken upon arrival at laboratory		Use in Toxicity Test	
Beginning Date & Time	Ending Date & Time		Dissolved Oxygen (ppm)	pH (Std. Units)	Date(s)	Time(s)
WBL	03/19/12, 1030	03/19/12, 1030	12.9	7.8	03/20-21/12	1500
WBL	03/21/12, 1230	03/21/12, 1230	12.3	8.0	03/22-23/12	1500 +/- 1 hr
WBL	03/23/12, 1230	03/23/12, 1230	12.5	8.2	03/24-25/12	1500 +/- 1 hr
DelR	03/19/12, 1130	03/19/12, 1130	13.1	8.0	03/20-21/12	1500
DelR	03/21/12, 1125	03/21/12, 1125	12.3	8.0	03/22-23/12	1500 +/- 1 hr
DelR	03/23/12, 1100	03/23/12, 1100	12.4	8.0	03/24-25/12	1500 +/- 1 hr
LR	03/19/12, 0830	03/19/12, 0830	12.4	7.6	03/20-21/12	1500
LR	03/21/12, 1328	03/21/12, 1328	12.4	7.7	03/22-23/12	1500 +/- 1 hr
LR	03/23/12, 1300	03/23/12, 1300	12.3	7.9	03/24-25/12	1500 +/- 1 hr
DC	03/19/12, 1300	03/19/12, 1300	12.5	7.7	03/20-21/12	1500
DC	03/21/12, 1030	03/21/12, 1030	12.4	7.7	03/22-23/12	1500 +/- 1 hr
DC	03/23/12, 1015	03/23/12, 1015	12.4	8.1	03/24-25/12	1500 +/- 1 hr

Maximum holding time for any effluent sample: 72 hours

Describe any pretreatment of the effluent: N/A

TESTING LOCATION

REMOTE LABORATORY
 ON-SITE LABORATORY
 ON-SITE COMMERCIAL LABORATORY

DILUTION WATER

EFFLUENT RECEIVING WATER: Delaware River
 DILUTION WATER: None, 100% only
 DESCRIBE ANY ADJUSTMENT TO THE DILUTION WATER: N/A
 IF RECEIVING WATER IS USED AS DILUTION SOURCE, DESCRIBE COLLECTION LOCATION AND DATES OF COLLECTION: N/A

**SUMMARY SHEET FOR THE CLADOCERAN
CERIODAPHNIA DUBIA TEST**

Site Location	Mean Percent Survival	Mean Number of Young per Surviving Female	Percent of Females with Third Brood
EPA Mod. Hard Water	100	30.0	80
EPA Soft Water	100	30.4	80
WBL	100	32.4	90
DeIR	100	30.5	90
LR	100	27.9	70
DC	100	27.6	90

Organism source: X cultured stock, commercial supplier

Name of supplier: N/A

Age of organisms (hours): <24

Test organisms all released within an 08 hour period? Yes

Neonates obtained from: mass culture, X individually cultured organisms

Was the test terminated when 60 % of the surviving females in the controls had produced their third brood? Yes

Within how many hours after test termination were the organisms counted? Immediately

NUMBER OF MALES / EPHIPPIA

Percent Effluent	Number of Males	Number of Ehippia
Control	00	00
12.5	00	00
25.0	00	00
50.0	00	00
75.0	00	00
100.0	00	00

Did the number of males in the controls and/or the test concentrations influence the determination of the NOEC/IC₂₅? No

Project Number: 123-01-16

Beginning Date & Time: 3-20-12 1500
 Ending Date & Time: 3-26-12 1636

Ceriodaphnia dubia, Survival and Reproduction Test
 American Aquatic Testing, Inc.,
 Survival / Reproduction Data

Day	Conc.		Replicate										Initials									
	Control		1	2	3	4	5	6	7	8	9	10										
1	N	B	0	0	0	0	0	0	0	0	0	0	0	MP								
2	N	B	0	0	0	0	0	0	0	0	0	0	0	TAP								
3	N	B	0	0	0	0	0	0	6	1	4	1	0	TAP								
4	N	B	6	1	6	1	6	1	8	1	6	1	0	MP								
5	N	B	14	2	12	2	14	2	14	2	12	2	12	2	MP							
6	N	B	14	3	0	14	3	10	3	16	3	12	3	14	3	TAP						
7	N	B																				
8	N	B																				
Tot N	Tot B		34	3	18	23	4	3	32	3	36	3	30	3	30	3	32	3	20	2	34	3
																	Tot A	10				

Average Neonates per Female = 30.0 % Females with 3rd Brood = 80

Day	Conc.		Replicate										Initials									
	EPA Soft Control		1	2	3	4	5	6	7	8	9	10										
1	N	B	0	0	0	0	0	0	0	0	0	0	0	MP								
2	N	B	0	0	0	0	0	0	0	0	0	0	0	TAP								
3	N	B	0	0	0	0	0	0	0	4	1	0	0	TAP								
4	N	B	4	1	6	1	6	1	4	1	6	1	0	MP								
5	N	B	10	2	12	2	12	2	14	2	14	2	12	2	MP							
6	N	B	0	0	14	3	15	3	17	3	16	3	16	3	14	3	18	3	12	3	TAP	
7	N	B																				
8	N	B																				
Tot N	Tot B		14	2	18	2	32	3	35	3	35	3	34	3	30	3	38	3	32	3	32	3
																	Tot A	10				

Average Neonates per Female = 31.4 % Females with 3rd Brood = 80

Day	Conc.		Replicate										Initials									
	WBL		1	2	3	4	5	6	7	8	9	10										
1	N	B	0	0	0	0	0	0	0	0	0	0	0	MP								
2	N	B	0	0	0	0	0	0	0	0	0	0	0	TAP								
3	N	B	0	0	0	0	0	0	0	6	1	0	0	TAP								
4	N	B	6	1	4	1	4	1	6	1	4	1	0	MP								
5	N	B	14	2	12	2	12	2	10	2	14	2	16	2	16	2	14	2	12	2	MP	
6	N	B	16	3	0	16	3	12	3	16	3	17	3	14	3	16	3	16	3	10	3	TAP
7	N	B																				
8	N	B																				
Tot N	Tot B		36	3	16	2	32	3	36	3	32	3	35	3	36	3	38	3	35	2	28	3
																	Tot A	10				

Average Neonates per Female = 32.4 % Females with 3rd Brood = 90
 (N=Neonates, B=Broods, A=Alive)

Observations: ① 36 } 22 3-30
 ② 30.4 }

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

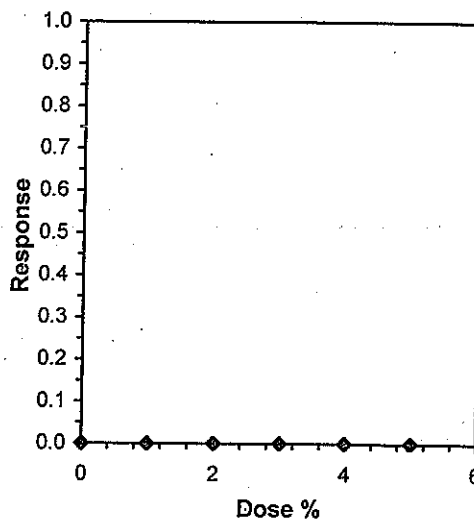
Start Date: 3/20/2012 Test ID: 1230116cdc Sample ID: DRBC
 End Date: 3/26/2012 Lab ID: AAT, INC Sample Type: COMPOSITE
 Sample Date: Protocol: EPAF 94-EPA/600/4-91/002 Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's 1-Tailed		Isotonic	
							Exact P	Critical	Mean	N-Mean
Control	1.0000	1.0000	0	10	10	10			1.0000	1.0000
1	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000
2	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000
3	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000
4	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000
5	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	5	>5		20
Treatments vs Control				

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL	Skew
IC05	>5			
IC10	>5			
IC15	>5			
IC20	>5			
IC25	>5			
IC40	>5			
IC50	>5			



Ceriodaphnia Survival and Reproduction Test-Reproduction

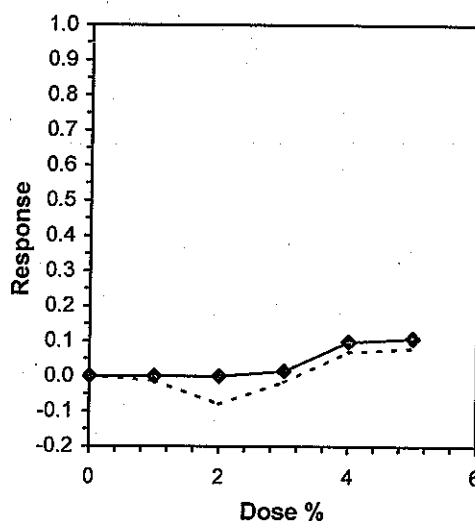
Start Date: 3/20/2012	Test ID: 1230116cdc	Sample ID: DRBC
End Date: 3/26/2012	Lab ID: AAT, INC	Sample Type: COMPOSITE
Sample Date:	Protocol: EPAF 94-EPA/600/4-91/002	Test Species: CD-Ceriodaphnia dubia
Comments:		

Conc-%	1	2	3	4	5	6	7	8	9	10
Control	34.000	18.000	34.000	32.000	36.000	30.000	30.000	32.000	20.000	34.000
1	14.000	18.000	32.000	35.000	35.000	34.000	36.000	30.000	38.000	32.000
2	36.000	16.000	32.000	36.000	32.000	35.000	36.000	38.000	35.000	28.000
3	30.000	20.000	32.000	32.000	30.000	28.000	35.000	30.000	32.000	36.000
4	34.000	14.000	34.000	38.000	39.000	32.000	32.000	16.000	14.000	26.000
5	30.000	16.000	30.000	26.000	31.000	32.000	31.000	22.000	30.000	28.000

Conc-%	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD	Isotonic	
			Mean	Min	Max	CV%	Mean					N-Mean	
Control	30.000	1.0000	30.000	18.000	36.000	20.367	10				30.933	1.0000	
1	30.400	1.0133	30.400	14.000	38.000	26.233	10	-0.130	2.287	7.025	30.933	1.0000	
2	32.400	1.0800	32.400	16.000	38.000	19.854	10	-0.781	2.287	7.025	30.933	1.0000	
3	30.500	1.0167	30.500	20.000	36.000	14.437	10	-0.163	2.287	7.025	30.500	0.9860	
4	27.900	0.9300	27.900	14.000	39.000	35.136	10	0.684	2.287	7.025	27.900	0.9019	
5	27.600	0.9200	27.600	16.000	32.000	18.252	10	0.781	2.287	7.025	27.600	0.8922	

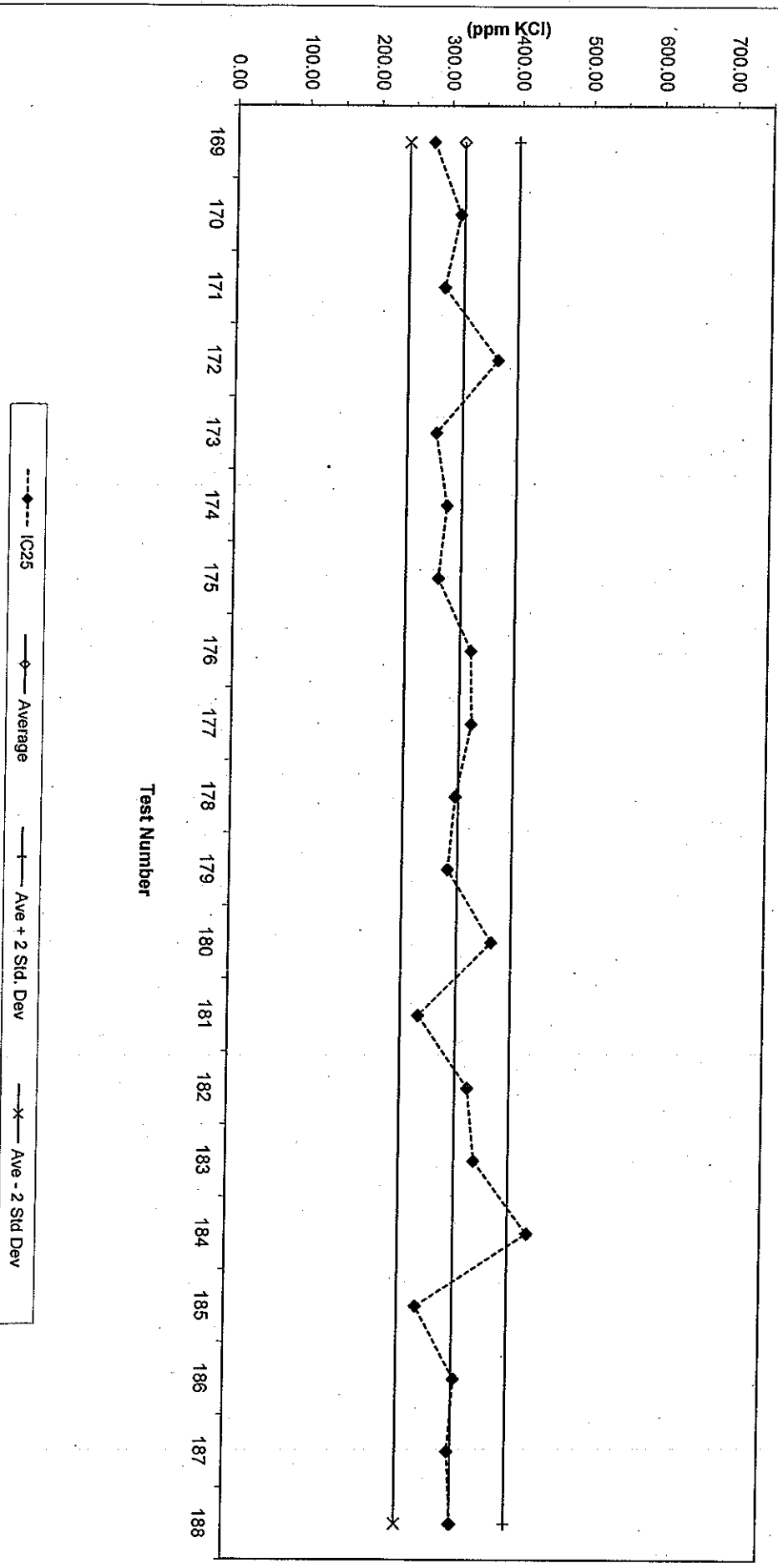
Auxiliary Tests			Statistic		Critical		Skew		Kurt			
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)			1.72354		1.035		-1.1375		0.51691			
Bartlett's Test indicates equal variances (p = 0.19)			7.47708		15.0863							
Hypothesis Test (1-tail, 0.05)			NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test			5	>5		20	7.02541	0.23418	32.2	47.1963	0.63883	5, 54
Treatments vs Control												

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL	Skew
IC05	3.4282			
IC10	4.2000			
IC15	>5			
IC20	>5			
IC25	>5			
IC40	>5			
IC50	>5			



Quality Control Chart *Ceriodaphnia dubia*

American Aquatic Testing, Inc.
Chart date: 03/30/12 Chart #: 174



NJPDES BIOMONITORING REPORT FORM
FRESHWATER CHRONIC TOXICITY TEST

NJPDES #: N/A

SCREENING SITES

FACILITY NAME: Delaware River Basin Commission
25 State Police Drive, P.O. Box 7360

FACILITY LOCATION: West Trenton, N.J. 08628-0360

LABORATORY: American Aquatic Testing, Inc.

ACUTE TOXICITY CERTIFICATION NUMBER: PA682

SRT INFORMATION DATE: March 20, 2012
 CONTROL CHART
 MEAN: 2124.8 ppm

IC₂₅: 1913.2 ppm
 UCL: 3518.7 ppm
 LCL: 729.9 ppm

TEST START DATE: March 20, 2012

TEST END DATE: March 24, 2012

TEST TYPE AND RESULTS (Check applicable test, circle applicable endpoint and fill in NOEC &/or IC₂₅)

X *Selenastrum capricornutum*, NOEC

Site	Conc. Tested	Diff. From Controls?	NOEC
EPA Mod. Hard Water	100%	-	-
EPA Soft Water	100%	-	-
WBL	100%	YES	<100%
DelR	100%	YES	<100%
LR	100%	No	100%
DC	100%	YES	<100%

Method 1003.0 (Green Alga *Selenastrum capricornutum*, Growth Test)

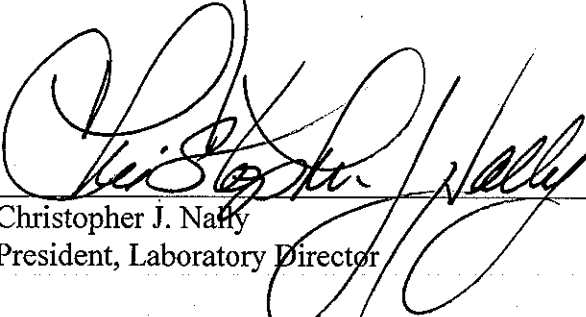
_____ Cladoceran, (CN/CD) NOEL _____, IC₂₅ _____

Method 1001.0 (*Ceriodaphnia dubia* 3 brood Survival and Reproduction Test)

CONTROL GROWTH: 4.440 10⁶ cells/mL

Did the test meet the acceptability criteria for the test species as specified in Part III of the Chronic Methods Document? YES

ACCURACY OF REPORT CERTIFIED BY


 Christopher J. Nafly
 President, Laboratory Director

04/23/12
 Date

TEST DESIGN

NUMBER OF CONCENTRATIONS: 4 SEPARATE SITES
 NUMBER OF REPLICATES / CONCENTRATION: 04
 NUMBER OF TEST ORGANISMS / REPLICATE: 10,000 cells/mL
 DILUTION SERIES: N/A
 TEST VESSEL SIZE: 125 mL
 TEST SOLUTION VOLUME: 25 mL
 EXPLAIN ANY DEVIATIONS FROM SPECIFIED METHODS: N/A

EFFLUENT SAMPLING

SAMPLE LOCATION: WBL, DelR, LR, DC
 EFFLUENT TYPE: River
 DISCHARGE: N/A
 RETENTION TIME: N/A
 SAMPLE TYPE: composite Other (grab)

Sample Collection			Sample Data taken upon arrival at laboratory		Use in Toxicity Test	
Beginning Date & Time		Ending Date & Time	Dissolved Oxygen (ppm)	pH (Std. Units)	Date(s)	Time(s)
WBL	03/19/12, 1030	03/19/12, 1030	12.9	7.8	03/20-24/12	1610
DelR	03/19/12, 1130	03/19/12, 1130	13.1	8.0	03/20-24/12	1610
LR	03/19/12, 0830	03/19/12, 0830	12.4	7.6	03/20-24/12	1610
DC	03/19/12, 1300	03/19/12, 1300	12.5	7.7	03/20-24/12	1610

Maximum holding time for any effluent sample: 72 hours

Describe any pretreatment of the effluent: N/A

TESTING LOCATION

REMOTE LABORATORY
 ON-SITE LABORATORY
 ON-SITE COMMERCIAL LABORATORY

DILUTION WATER

EFFLUENT RECEIVING WATER: Delaware River
 DILUTION WATER: moderately hard recon. water
 DESCRIBE ANY ADJUSTMENT TO THE DILUTION WATER: N/A
 IF RECEIVING WATER IS USED AS DILUTION SOURCE, DESCRIBE COLLECTION LOCATION AND DATES OF COLLECTION: N/A

Phytoplankton Test-Growth-Cell Density

Start Date: 3/20/2012 Test ID: 1230116Sc Sample ID: Algae
 End Date: 3/24/2012 Lab ID: AAT, INC. Sample Type: GRAB
 Sample Date: Protocol: EPAF 94-EPA/600/4-91/002 Test Species: SC-Selenastrum capricornutum
 Comments:

Conc-%	1	2	3	4
d Hard Control	4229000	4342000	4543000	4644000
'A Soft Control	3779000	3908000	3602000	3933000
1 WBL	3479000	3063000	3085000	3480000
2 DelR	3188000	3171000	2927000	2966000
3 LR	3693000	3577000	3147000	3756000
4 DC	3080000	3101000	3052000	2900000

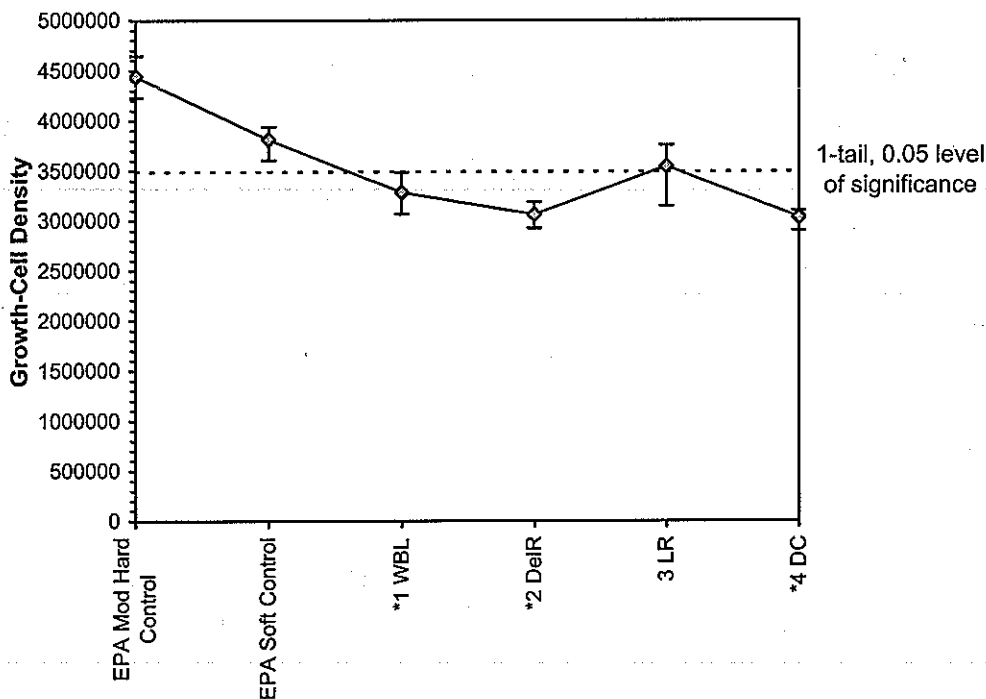
Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%			Critical	MSD
d Hard Control	4439500	1.1666	4439500	4229000	4644000	4.241	4			
'A Soft Control	3805500	1.0000	3805500	3602000	3933000	3.982	4	*		
*1 WBL	3276750	0.8611	3276750	3063000	3480000	7.150	4	3.943	2.360	316471
*2 DelR	3063000	0.8049	3063000	2927000	3188000	4.428	4	5.537	2.360	316471
3 LR	3543250	0.9311	3543250	3147000	3756000	7.744	4	1.956	2.360	316471
*4 DC	3033250	0.7971	3033250	2900000	3101000	3.002	4	5.759	2.360	316471

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93061	0.868	-0.6942	-0.1997
Bartlett's Test indicates equal variances (p = 0.44)	3.77095	13.2767		
The control means are significantly different (p = 1.93E-03)	5.24663	2.44691		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences	316471	0.08316	4.3E+11	3.6E+10	1.4E-04	4, 15

→ Treatments vs EPA Soft Control ←

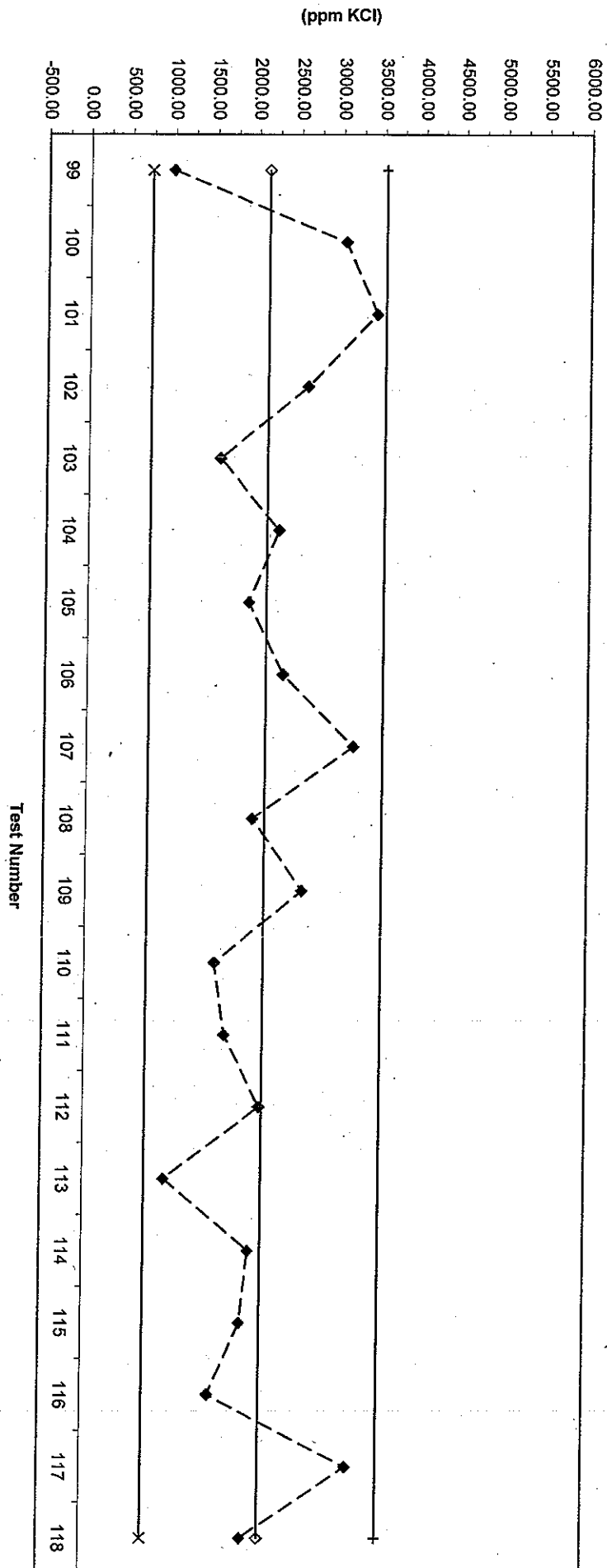
Dose-Response Plot



Quality Control Chart Selenastrum capricornutum

American Aquatic Testing, Inc.

Chart date: 03/30/12 Chart #: 99



Legend:
---◆--- 1025
—◆— Average
—+— Ave + 2 Std. Dev
—x— Ave - 2 Std. Dev