

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: August 09, 2017

TEST DATE: August 09, 2017

TEST NUMBER: 1708RT2A.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \cdot \text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic

RESULT:

NOEC = 50 $\mu\text{g/L}$ (Survival)

NOEC = 25 $\mu\text{g/L}$ (Reproduction)

EC₅₀ = 89.1 $\mu\text{g/L}$ (Survival)

IC₂₅ = 25.4 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw
Analyst


Signature

Water Biologist II
Title

9/10/17
Date

Denise Li
Acting Supervisor


Signature

Water Biologist II
Title

9.20.17
Date

CETIS Summary Report

Report Date: 07 Sep-17 15:32 (p 1 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Batch ID:	10-8583-5339	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw
Start Date:	09 Aug-17 14:50	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water
Ending Date:	16 Aug-17 11:02	Species:	Ceriodaphnia dubia	Brine:	
Duration:	6d 20h	Source:	In-House Culture	Age:	<8h 8/9/17 (0857-1424)
Sample ID:	04-7844-2243	Code:	Cu RT	Client:	Los Angeles-Glendale WRP
Sample Date:	09 Aug-17 09:30	Material:	Copper chloride	Project:	NPDES
Receive Date:	09 Aug-17 09:30	Source:	Reference Toxicant		
Sample Age:	5h	Station:			

Sample Renewals					
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	10 Aug-17 10:36	10 Aug-17 10:36	10 Aug-17 12:30	
2	Cu RT	11 Aug-17 11:10	11 Aug-17 11:10	11 Aug-17 12:15	
3	Cu RT	12 Aug-17 09:44	12 Aug-17 09:44	12 Aug-17 11:17	
4	Cu RT	13 Aug-17 10:36	13 Aug-17 10:36	13 Aug-17 11:55	
5	Cu RT	14 Aug-17 11:05	14 Aug-17 11:05	14 Aug-17 11:57	
6	Cu RT	15 Aug-17 10:50	15 Aug-17 10:50	15 Aug-17 13:12	

Test Note: Concentration-response relationship is ideal.

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-3639-1873	7d Survival Rate	50	100	70.71	N/A		Fisher Exact/Bonferroni-Holm Test
11-7644-8406	Reproduction	25	50	35.36	26.2%		Dunnett Multiple Comparison Test

Point Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
02-7143-5836	7d Survival Rate	EC5	52.99	51.97	56.15		Linear Interpolation (ICPIN)
		EC10	56.15	54.02	63.05		
		EC15	59.5	56.15	70.77		
		EC20	63.05	58.36	79.43		
		EC25	66.8	60.66	89.13		
		EC40	79.43	68.1	110.4		
		EC50	89.13	73.55	121.9		
12-8828-7274	Reproduction	IC5	0.7745	0.4623	12.74		Linear Interpolation (ICPIN)
		IC10	2.149	1.138	16.17		
		IC15	4.587	2.127	25.71		
		IC20	8.915	3.572	27.31		
		IC25	25.45	5.686	29.5		
		IC40	33.26	24.66	52.7		
		IC50	39.71	32.02	60.27		

Test Acceptability						
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-7143-5836	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
13-3639-1873	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
11-7644-8406	Reproduction	Control Resp	37.9	15 - NL	Yes	Passes Acceptability Criteria
12-8828-7274	Reproduction	Control Resp	37.9	15 - NL	Yes	Passes Acceptability Criteria
11-7644-8406	Reproduction	PMSD	0.2618	0.13 - 0.47	Yes	Passes Acceptability Criteria

CETIS Summary Report

Report Date: 07 Sep-17 15:32 (p 2 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Periodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Survival Rate Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	0.4	0.2072	0.5928	0	1	0.1633	0.5164	129.1%	60.0%
200		10	0	0	0	0	0	0	0		100.0%

Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	37.9	36.21	39.59	31	46	1.433	4.533	11.96%	0.0%
12.5		10	29.3	25.05	33.55	10	44	3.603	11.39	38.88%	22.69%
25		10	28.8	25.18	32.42	8	38	3.069	9.705	33.7%	24.01%
50		10	14	8.874	19.13	4	40	4.341	13.73	98.05%	63.06%
100		10	4.8	2.93	6.67	0	13	1.583	5.007	104.3%	87.34%
200		10	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	1	1	1	0	1	0	0
200		0	0	0	0	0	0	0	0	0	0

Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	40	46	36	42	33	36	39	41	35	31
12.5		18	44	17	40	31	42	27	10	33	31
25		38	36	36	24	34	21	36	8	33	22
50		7	6	37	4	5	5	6	40	10	20
100		0	4	0	11	13	5	5	10	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 1 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Analysis ID: 13-3639-1873	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 16 Aug-17 11:38	Analysis: STP 2x2 Contingency Tables	Official Results: Yes
Batch ID: 10-8583-5339	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 09 Aug-17 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 16 Aug-17 11:02	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 20h	Source: In-House Culture	Age: <8h 8/9/17(0857-1424)
Sample ID: 04-7844-2243	Code: Cu RT	Client: Los Angeles-Glendale WRP
Sample Date: 09 Aug-17 09:30	Material: Copper chloride	Project: NPDES
Receive Date: 09 Aug-17 09:30	Source: Reference Toxicant	
Sample Age: 5h	Station:	

Test Note: Concentration-response relationship is ideal.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU
Untransformed		C > T	Not Run	50	100	70.71	

Fisher Exact/Bonferroni-Holm Test					
Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)
Dilution Water		12.5	1	1.0000	Non-Significant Effect
		25	1	1.0000	Non-Significant Effect
		50	1	1.0000	Non-Significant Effect
		100	0.005418	0.0217	Significant Effect

Test Acceptability Criteria				
Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

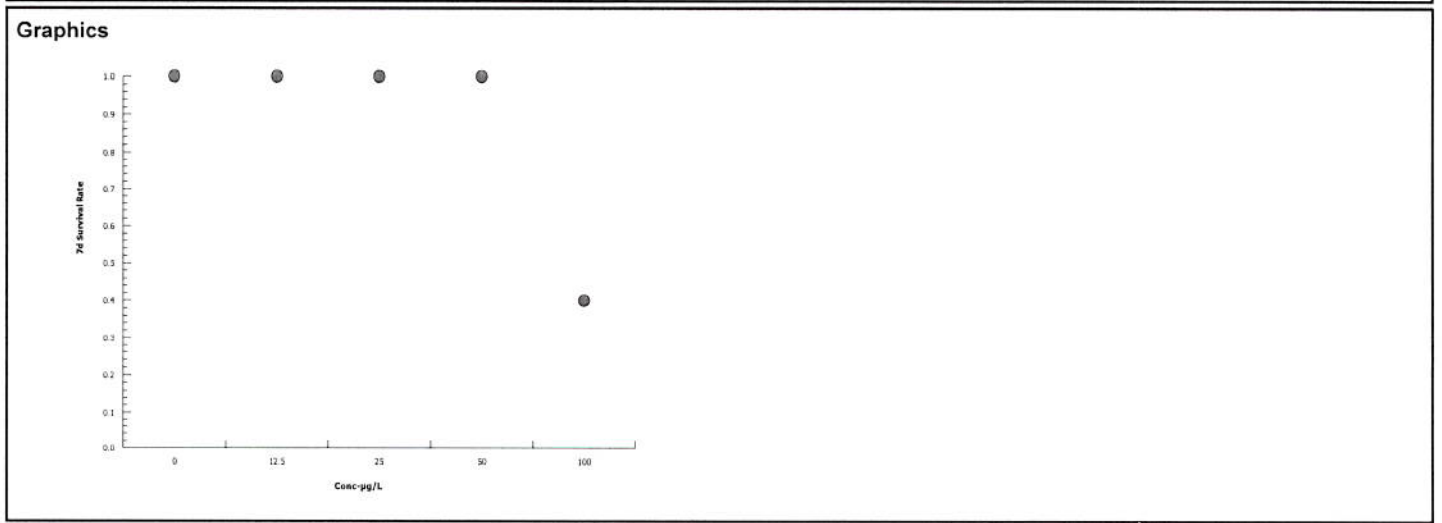
Data Summary				
Conc-µg/L	Control Type	No-Resp	Resp	Total
0	Dilution Water	10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		4	6	10

7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	1	1	1	0	1	0	0

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 2 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Daphnia 7-d Survival and Reproduction Test			Hyperion Treatment Plant Laboratory	
Analysis ID:	13-3639-1873	Endpoint:	7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed:	16 Aug-17 11:38	Analysis:	STP 2x2 Contingency Tables	Official Results: Yes



Concentration-response relationship is ideal. 9/7/17 KC

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 1 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

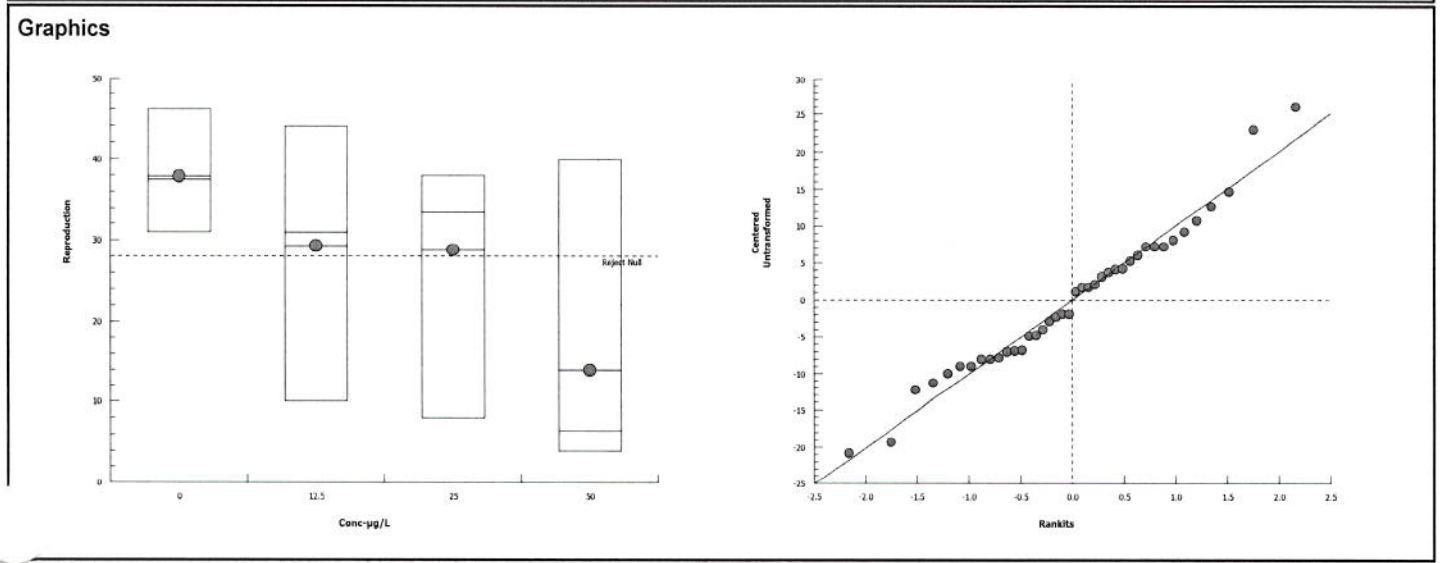
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID:	11-7644-8406	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1						
Analyzed:	16 Aug-17 11:38	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes						
Batch ID:	10-8583-5339	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	09 Aug-17 14:50	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water						
Ending Date:	16 Aug-17 11:02	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 20h	Source:	In-House Culture	Age:	<8h 8/9/17 (0857-1424)						
Sample ID:	04-7844-2243	Code:	Cu RT	Client:	Los Angeles-Glendale WRP						
Sample Date:	09 Aug-17 09:30	Material:	Copper chloride	Project:	NPDES						
Receive Date:	09 Aug-17 09:30	Source:	Reference Toxicant								
Sample Age:	5h	Station:									
Test Note: Concentration-response relationship is ideal.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD			
Untransformed	0	C > T	Not Run	25	50	35.36		26.2%			
Dunnett Multiple Comparison Test											
Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)			
Dilution Water		12.5	1.848	2.133	18	9.923	0.0876	Non-Significant Effect			
		25	1.956	2.133	18	9.923	0.0713	Non-Significant Effect			
		50*	5.137	2.133	18	9.923	<0.0001	Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	37.9	15 - NL	Yes	Passes Acceptability Criteria							
SD	0.2618	0.13 - 0.47	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.601	3.036	0.2683	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2953.4	984.4667	3	9.095	0.0001	Significant Effect					
Error	3896.6	108.2389	36								
Total	6850	1092.706	39								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Bartlett Equality of Variance	9.16	11.34	0.0272	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9765	0.9236	0.5622	Normal Distribution						
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	37.9	36.18	39.62	31	46	1.433	4.533	11.96%	0.0%
12.5		10	29.3	24.97	33.63	10	44	3.603	11.39	38.88%	22.69%
25		10	28.8	25.11	32.49	8	38	3.069	9.705	33.7%	24.01%
50		10	14	8.778	19.22	4	40	4.341	13.73	98.05%	63.06%

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 2 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Daphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	11-7644-8406	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1
Analyzed:	16 Aug-17 11:38	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	40	46	36	42	33	36	39	41	35	31
12.5		18	44	17	40	31	42	27	10	33	31
25		38	36	36	24	34	21	36	8	33	22
50		7	6	37	4	5	5	6	40	10	20



Concentration-response relationship is ideal. 9/7/17 Rc

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 1 of 4)
 Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-8828-7274	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 16 Aug-17 11:38	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 10-8583-5339	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 09 Aug-17 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 16 Aug-17 11:02	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 20h	Source: In-House Culture	Age: <8h 8/9/17 (0857-1424)
Sample ID: 04-7844-2243	Code: Cu RT	Client: Los Angeles-Glendale WRP
Sample Date: 09 Aug-17 09:30	Material: Copper chloride	Project: NPDES
Receive Date: 09 Aug-17 09:30	Source: Reference Toxicant	
Sample Age: 5h	Station:	

Test Note: Concentration-response relationship is ideal.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	26296502	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	37.9	15 - NL	Yes	Passes Acceptability Criteria

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	3.111	3.2	0.0719	No Outliers Detected

Concentration Estimates

Level	µg/L	95% LCL	95% UCL
IC5	0.7745	0.4623	12.74
IC10	2.149	1.138	16.17
IC15	4.587	2.127	25.71
IC20	8.915	3.572	27.31
IC25	25.45	5.686	29.5
IC40	33.26	24.66	52.7
IC50	39.71	32.02	60.27

Reproduction Summary

Calculated Variate

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	37.9	31	46	1.433	4.533	11.96%	0.0%
12.5		10	29.3	10	44	3.603	11.39	38.88%	22.69%
25		10	28.8	8	38	3.069	9.705	33.7%	24.01%
50		10	14	4	40	4.341	13.73	98.05%	63.06%
100		10	4.8	0	13	1.583	5.007	104.3%	87.34%
200		10	0	0	0	0	0		100.0%

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	40	46	36	42	33	36	39	41	35	31
12.5		18	44	17	40	31	42	27	10	33	31
25		38	36	36	24	34	21	36	8	33	22
50		7	6	37	4	5	5	6	40	10	20
100		0	4	0	11	13	5	5	10	0	0
		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 2 of 4)
Test Code: 1708RT2A.C | 05-1646-5416

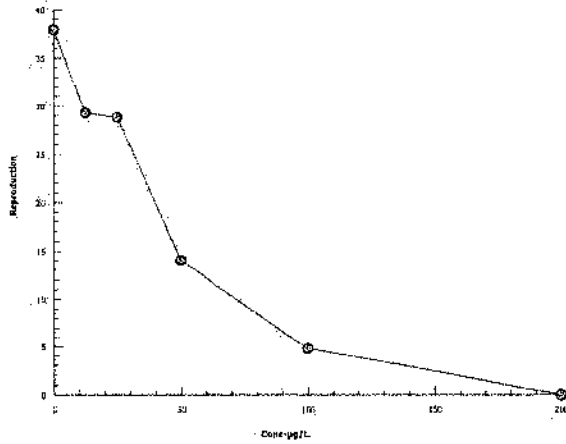
Pariodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-8828-7274 Endpoint: Reproduction
Analyzed: 16 Aug-17 11:38 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p 3 of 4)
Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 02-7143-5836		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 16 Aug-17 11:38		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 10-8583-5339		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 09 Aug-17 14:50		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 16 Aug-17 11:02		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: <8h 8/9/17(0857-1424)							
Sample ID: 04-7844-2243		Code: Cu RT		Client: Los Angeles-Glendale WRP							
Sample Date: 09 Aug-17 09:30		Material: Copper chloride		Project: NPDES							
Receive Date: 09 Aug-17 09:30		Source: Reference Toxicant									
Sample Age: 5h		Station:									
Test Note: Concentration-response relationship is ideal.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	688022179	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
EC5	52.99	51.97	56.15								
10	56.15	54.02	63.05								
15	59.5	56.15	70.77								
EC20	63.05	58.36	79.43								
EC25	66.8	60.66	89.13								
EC40	79.43	68.1	110.4								
EC50	89.13	73.55	121.9								
7d Survival Rate Summary											
		Calculated Variate(A/B)									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	0.4	0	1	0.1633	0.5164	129.1%	60.0%	4	10
200		10	0	0	0	0	0		100.0%	0	10
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	1	1	1	0	1	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 07 Sep-17 15:32 (p.4 of 4)
Test Code: 1708RT2A.C | 05-1646-5416

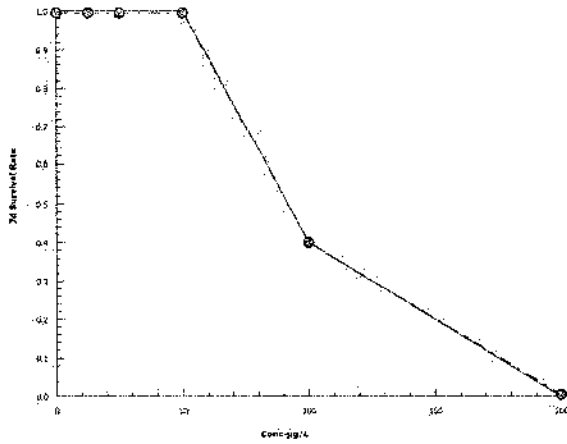
Periodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 02-7143-5836 Endpoint: 7d Survival Rate
Analyzed: 16 Aug-17 11:38 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

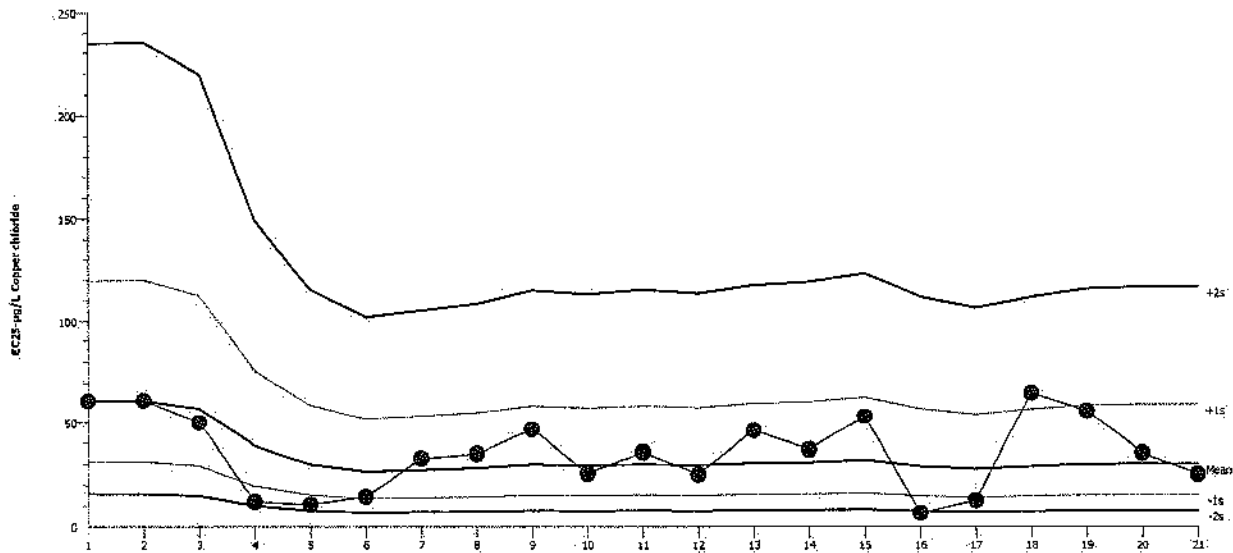
Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: Reproduction

Material: Copper chloride
Source: Reference Toxicant-REF

Ceriodaphnia 7-d Survival and Reproduction Test



Mean: 30.42
Sigma: N/A

Count: 20
CV: 95.90%

-1s Warning Limit: 15.53
+1s Warning Limit: 59.56

-2s Action Limit: 7.928
+2s Action Limit: 116.7

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Nov	13	61.11	30.7	1.038	(+)		13-9213-9561	00-4240-2427
2		Dec	4	61.4	30.98	1.045	(+)		11-6677-0498	05-2928-7744
3	2015	Jan	22	50.33	19.91	0.749			01-5526-0247	05-9407-7070
4		Jun	17	12.13	-18.29	-1.368	(-)		20-9387-7144	17-7691-6079
5		Dec	14	10.71	-19.71	-1.553	(-)		15-8925-6767	02-6642-1182
6	2016	Jan	21	14.62	-15.8	-1.09	(-)		18-3843-6965	14-9842-1935
7		Feb	1	32.9	2.485	0.1168			11-0794-9751	03-7350-2523
8			18	35.1	4.679	0.2129			08-3683-2844	04-0850-8624
9		Mar	7	46.92	16.5	0.6447			03-8131-3022	11-6058-4627
10		Apr	4	25.73	-4.689	-0.2491			20-8785-7541	21-2139-2262
11		Jul	28	35.91	5.495	0.2471			11-3245-2063	13-6804-5542
12		Aug	31	25.21	-5.208	-0.2794			04-2198-2948	01-9086-3175
13		Dec	16	46.2	15.79	0.6219			05-9377-8224	05-6497-3539
14	2017	Mar	30	37.14	6.721	0.297			20-5811-5356	06-6352-3022
15		May	10	53.41	23	0.8377			04-6904-8294	08-3814-7144
16			25	6.656	-23.76	-2.261	(-)	(-)	16-2272-5797	04-1379-9830
17		Jun	6	12.78	-17.64	-1.29	(-)		00-1105-6011	17-2178-2673
18			22	65.16	34.74	1.133	(+)		10-7002-0112	00-8698-9715
19		Jul	12	56.24	25.82	0.9144			13-9476-5989	15-6562-8470
20			27	35.41	4.997	0.2263			00-3533-4104	15-5816-8081
21		Aug	9	25.45	-4.969	-0.2654			05-1646-5416	12-8828-7274

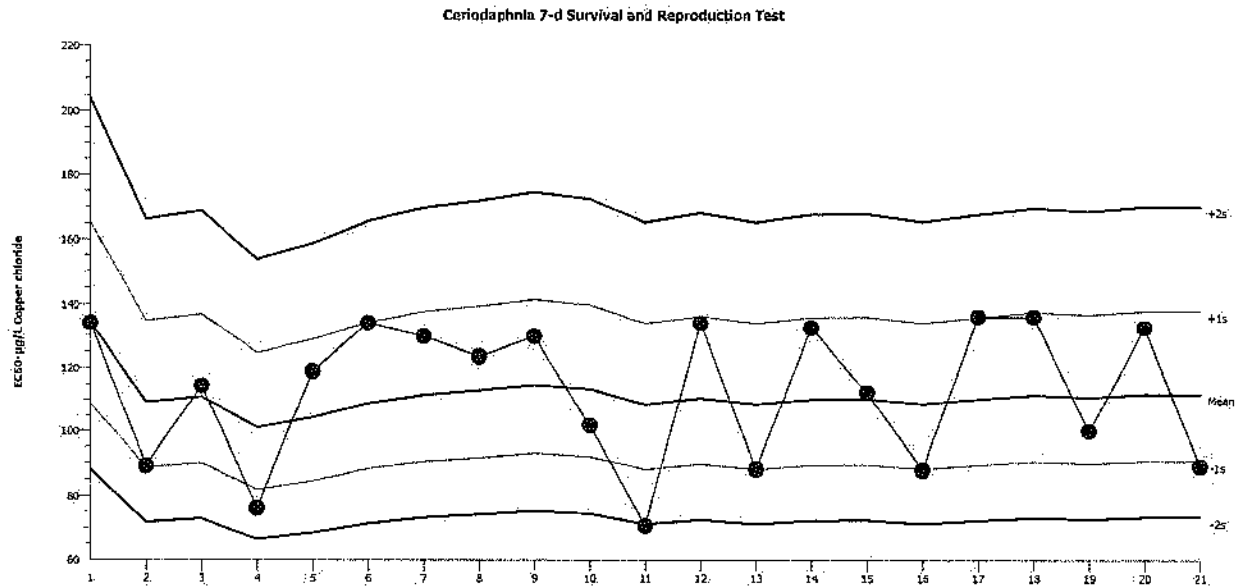
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: 7d Survival Rate

Material: Copper chloride
Source: Reference Toxicant-REF



Mean: 111.9

Count: 20

-1s Warning Limit: 90.72

-2s Action Limit: 73.55

Sigma: N/A

CV: 23.30%

+1s Warning Limit: 138

+2s Action Limit: 170.2

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Nov	13	134	22.08	0.858			13-9213-9561	07-1032-9840
2		Dec	4	89.13	-22.82	-1.086	(-)		11-6677-0498	02-1926-0405
3	2015	Jan	22	114.5	2.517	0.106			01-5526-0247	07-4843-8959
4		Jun	17	76.22	-35.72	-1.832	(-)		20-9387-7144	01-1636-6576
5		Dec	14	119	7.017	0.2898			15-8925-8767	02-2142-4772
6	2016	Jan	21	134.1	22.19	0.862			18-3843-6965	17-3443-6664
7		Feb	1	129.7	17.79	0.7031			11-0794-9751	09-9142-3700
8			18	123.6	11.69	0.4735			08-3683-2844	13-1421-5523
9		Mar	7	129.7	17.79	0.7031			03-8131-3022	08-3988-9211
10		Apr	4	101.8	-10.19	-0.455			20-8785-7541	14-5275-7464
11		Jul	28	70.77	-41.17	-2.186	(-)	(-)	11-3245-2063	20-4501-7131
12		Aug	31	134	22.08	0.858			04-2198-2948	19-3434-0384
13		Dec	16	88.2	-23.74	-1.136	(-)		05-9377-8224	02-8710-1182
14	2017	Mar	30	132.6	20.64	0.8064			20-5811-5356	10-6838-6662
15		May	10	112.3	0.3308	0.01406			04-6904-8294	00-0571-6326
16			25	87.85	-24.09	-1.155	(-)		16-2272-5797	20-6787-6120
17		Jun	6	136.1	24.19	0.9326			00-1105-6011	07-1957-9297
18			22	136.1	24.19	0.9326			10-7002-0112	10-9615-6318
19		Jul	12	100	-11.94	-0.5378			13-9476-5989	08-1211-5310
20			27	132.6	20.64	0.8064			00-3533-4104	07-3102-4627
21		Aug	9	89.13	-22.82	-1.086	(-)		05-1646-5416	02-7143-5836

CETIS Test Data Worksheet

Report Date:
Test Code:

08 Aug-17 10:21 (p 1 of 2)
05-1646-5416/1708RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17
End Date: 16 Aug-17
Sample Date: 09 Aug-17
Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Copper chloride

Sample Code: 1C847303
Sample Source: Reference Toxicant
Sample Station:

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	37	1	0	0	0	8	14	0	18	40	40
0	D	2	12	1	0	0	0	6	0	16	24	40	46
0	D	3	51	1	0	0	0	7	0	13	16	47	36
0	D	4	28	1	0	0	0	7	0	14	21	44	42
0	D	5	29	1	0	0	0	6	0	12	15	42	33
0	D	6	26	1	0	0	0	5	0	13	18	45	36
0	D	7	42	1	0	0	0	8	0	14	17	41	39
0	D	8	33	1	0	0	0	7	0	14	20	41	41
0	D	9	40	1	0	0	0	5	0	13	17	41	35
0	D	10	7	1	0	0	0	4	12	0	15	46	31
12.5		1	34	1	0	0	0	6	6	0	6	46	18
12.5		2	3	1	0	0	0	7	0	13	24	46	44
12.5		3	9	1	0	0	0	0	0	3	14	10	
12.5		4	36	1	0	0	0	7	0	12	21	40	
12.5		5	1	1	0	0	0	7	0	0	24	31	
12.5		6	23	1	0	0	0	5	0	12	25	42	
12.5		7	56	1	0	0	0	7	0	12	8	27	
12.5		8	54	1	0	0	0	7	0	1	2	10	
12.5		9	53	1	0	0	0	6	0	11	16	33	
12.5		10	30	1	0	0	0	4	0	10	17	31	
25		1	60	1	0	0	0	6	15	0	17	38	
25		2	57	1	0	0	0	5	0	13	18	36	
25		3	5	1	0	0	0	6	0	12	18	36	
25		4	58	1	0	0	0	5	6	11	7	24	
25		5	31	1	0	0	0	5	0	12	17	34	
25		6	10	1	0	0	0	5	12	0	4	21	
25		7	17	1	0	0	0	7	0	13	16	36	
25		8	4	1	0	0	0	4	0	3	1	8	
25		9	41	1	0	0	0	5	0	8	20	33	
25		10	39	1	0	0	0	5	0	10	7	22	
50		1	35	1	0	0	0	6	0	1	0	7	
50		2	46	1	0	0	0	6	0	0	0	6	
50		3	44	1	0	0	0	6	0	10	21	37	
50		4	49	1	0	0	0	4	0	0	0	4	
50		5	8	1	0	0	0	5	0	0	0	5	
50		6	13	1	0	0	0	0	5	0	0	5	
50		7	27	1	0	0	0	6	0	0	0	6	
50		8	18	1	0	0	0	8	0	12	20	40	
50		9	24	1	0	0	0	7	0	0	3	10	
50		10	25	1	0	0	0	8	0	6	6	20	
100		1	21	1	0	0	0	0	0	0	0	0	
100		2	59	1	0	0	0	4	0	0	0	4	
100		3	47	1	0	0	0	0	0	0	0	0	
100		4	52	1	0	0	0	0	4	7	0	11	
100		5	43	1	0	0	0	0	0	4	9	13	
100		6	50	1	0	0	0	0	0	3	0	5	
100		7	14	1	0	0	0	0	3	2	0	5	

CETIS Test Data Worksheet

Report Date:

08 Aug-17 10:21 (p 2 of 2)

Test Code:

05-1646-5416/1708RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	2	1	0	0	0	0	4	6	0	10	
100		9	45	1	0	0X	X	X	X	X	X	0	
100		10	38	1	0X	X	X	X	X	X	X	0	
200		1	19	1	0X	X	X	X	X	X	X	0	
200		2	22	1	0	0	0X	X	X	X	X	0	
200		3	32	1	0	0	0X	X	X	X	X	0	
200		4	11	1	0X	X	X	X	X	X	X	0	
200		5	16	1	0X	X	X	X	X	X	X	0	
200		6	15	1	0X	X	X	X	X	X	X	0	
200		7	48	1	0X	X	X	X	X	X	X	0	
200		8	55	1	0	0	0	0	0X	X	X	0	
200		9	20	1	0	0	0	0	0X	X	X	0	
200		10	6	1	0X	X	X	X	X	X	X	0	

8/9 8/10 8/11 8/12 8/13 8/14 8/15 8/16
 Food Added: 1440 1125 1125 0957 1100 1123 1230
 Pc Pc Pc Pc Pc Pc Pc
 Count
 1102
 Pc

Transferred: 1450 1230 1245 1117 1155 1157 1312
 Pc Pc Pc Pc Pc Pc Pc

CETIS Measurement Worksheet

Report Date: 08 Aug-17 10:22 (p 1 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17 Species: Ceriodaphnia dubia Sample Code: 1C847303
End Date: 16 Aug-17 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
Sample Date: 09 Aug-17 Material: Copper chloride Sample Station:

Alkalinity (CaCO ₃)-mg/L		
Conc-µg/L	Code	Reading 1
0	D	116
200		112
Measure Time: 1608		
Instrument ID: TTHake		
Analyst: PC		

See Reconstituted Water Prep Logbook (8/4/17 AS)
8/4/17

Conductivity-µmhos								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	582	577	579	576	580	582	585
12.5		583	579	578	578	581	582	586
25		583	578	576	576	582	582	586
50		582	577	576	576	582	584	584
100		582	576	574	574	580	582	574
200		576	568	572	565	575	576	—
Measure Time: 1125								
Instrument ID: #3								
Analyst: PC								

Final Dissolved Oxygen-mg/L								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.11	8.24	8.21	8.32	8.27	8.37	7.62
12.5		8.31	8.31	8.30	8.37	8.35	8.45	8.13
25		8.37	8.32	8.33	8.46	8.42	8.47	8.24
50		8.43	8.26	8.33	8.45	8.43	8.50	8.32
100		8.48	8.31	8.28	8.44	8.46	8.52	8.37
200		8.48	8.35	8.34	8.53	8.51	—	—
Measure Time: 1233								
Instrument ID: #3								
Analyst: PC								

8/4/17
8.13 PC

Initial Dissolved Oxygen-mg/L								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.44	8.35	8.41	8.36	8.52	8.31	8.58
12.5		8.45	8.43	8.42	8.45	8.54	8.47	8.62
25		8.45	8.42	8.41	8.44	8.54	8.51	8.60
50		8.45	8.44	8.43	8.43	8.53	8.54	8.32
100		8.45	8.45	8.44	8.43	8.54	8.56	8.58
200		8.45	8.47	8.43	8.43	8.54	8.58	—
Measure Time: 1125								
Instrument ID: #3								
Analyst: PC								

Hardness (CaCO ₃)-mg/L		
Conc-µg/L	Code	Reading 1
0	D	172
200		168
Measure Time: 1608		
Instrument ID: TTHake		
Analyst: PC		

See Reconstituted Water Prep Logbook (8/4/17 AS)
8/4/17

CETIS Measurement Worksheet

Report Date: 08 Aug-17 10:22 (p 2 of 2)
Test Code: 1708RT2A.C | 05-1646-5416

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17 Species: Ceriodaphnia dubia Sample Code: 1C847303
End Date: 16 Aug-17 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
Sample Date: 09 Aug-17 Material: Copper chloride Sample Station:

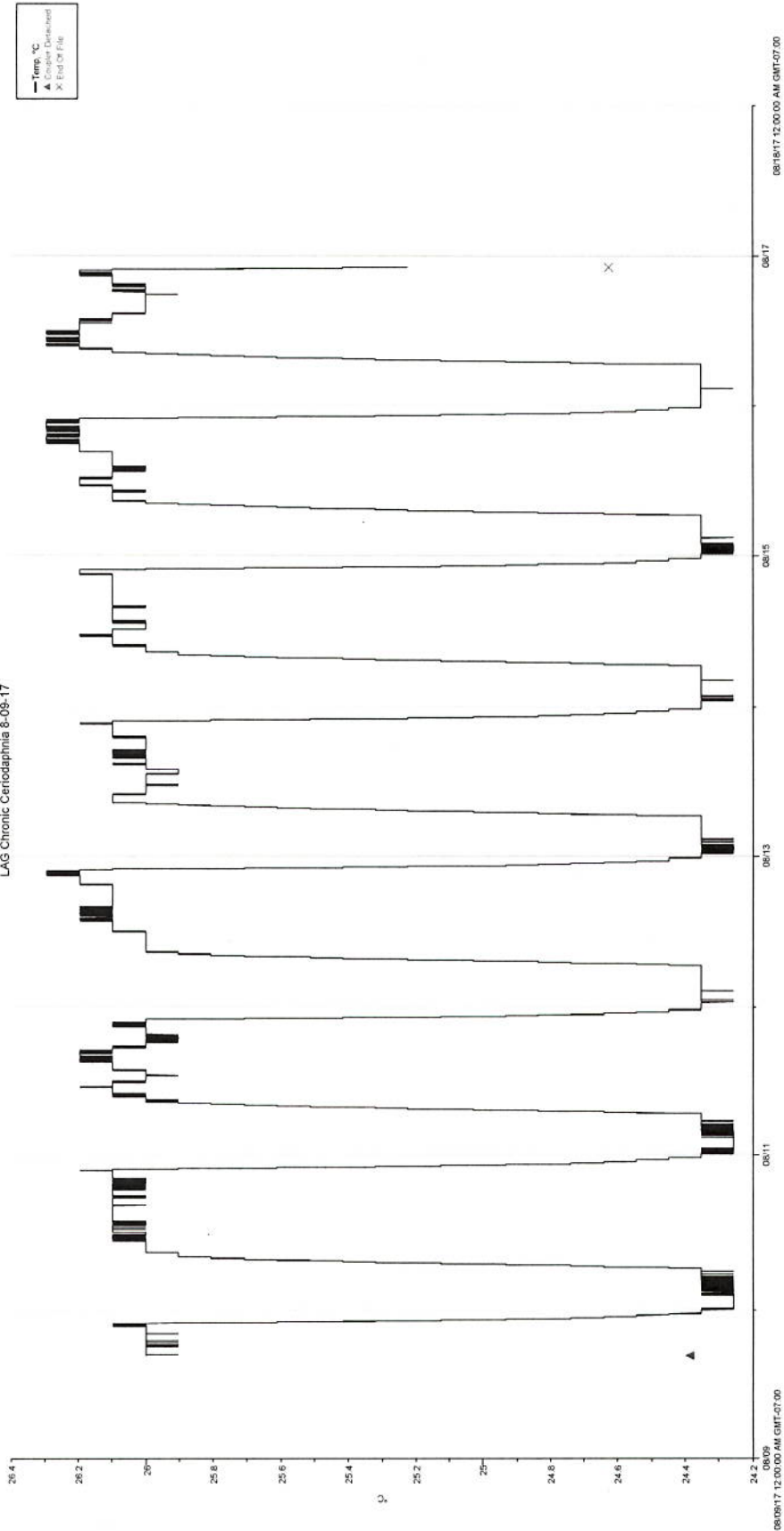
Final pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.38	8.42	8.44	8.38	8.46	8.39	8.57
12.5		8.40	8.40	8.43	8.38	8.45	8.41	8.62
25		8.41	8.42	8.45	8.42	8.45	8.42	8.62
50		8.41	8.39	8.43	8.40	8.46	8.41	8.63
100		8.42	8.41	8.42	8.39	8.47	8.41	8.62
200		8.40	8.41	8.45	8.42	8.48	—	—
Measure Time: 1233		1230	1138	1205	1202	1341	1117	
Instrument ID: #4		#4	#4	#4	#4	#4	#4	
Analyst: Kc		Kc	Kc	Kc	Kc	Kc	Kc	

Initial pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.50	8.40	8.45	8.49	8.42	8.49	8.43
12.5		8.54	8.41	8.47	8.49	8.43	8.50	8.43
25		8.54	8.40	8.47	8.49	8.43	8.51	8.44
50		8.54	8.40	8.47	8.49	8.43	8.51	8.43
100		8.53	8.40	8.46	8.49	8.43	8.50	8.44
200		8.52	8.39	8.46	8.48	8.42	8.49	—
Measure Time: 1125		1036	1110	0944	1036	1105	1050	
Instrument ID: #4		#4	#4	#4	#4	#4	#4	
Analyst: Kc		Kc	Kc	Kc	Kc	Kc	Kc	

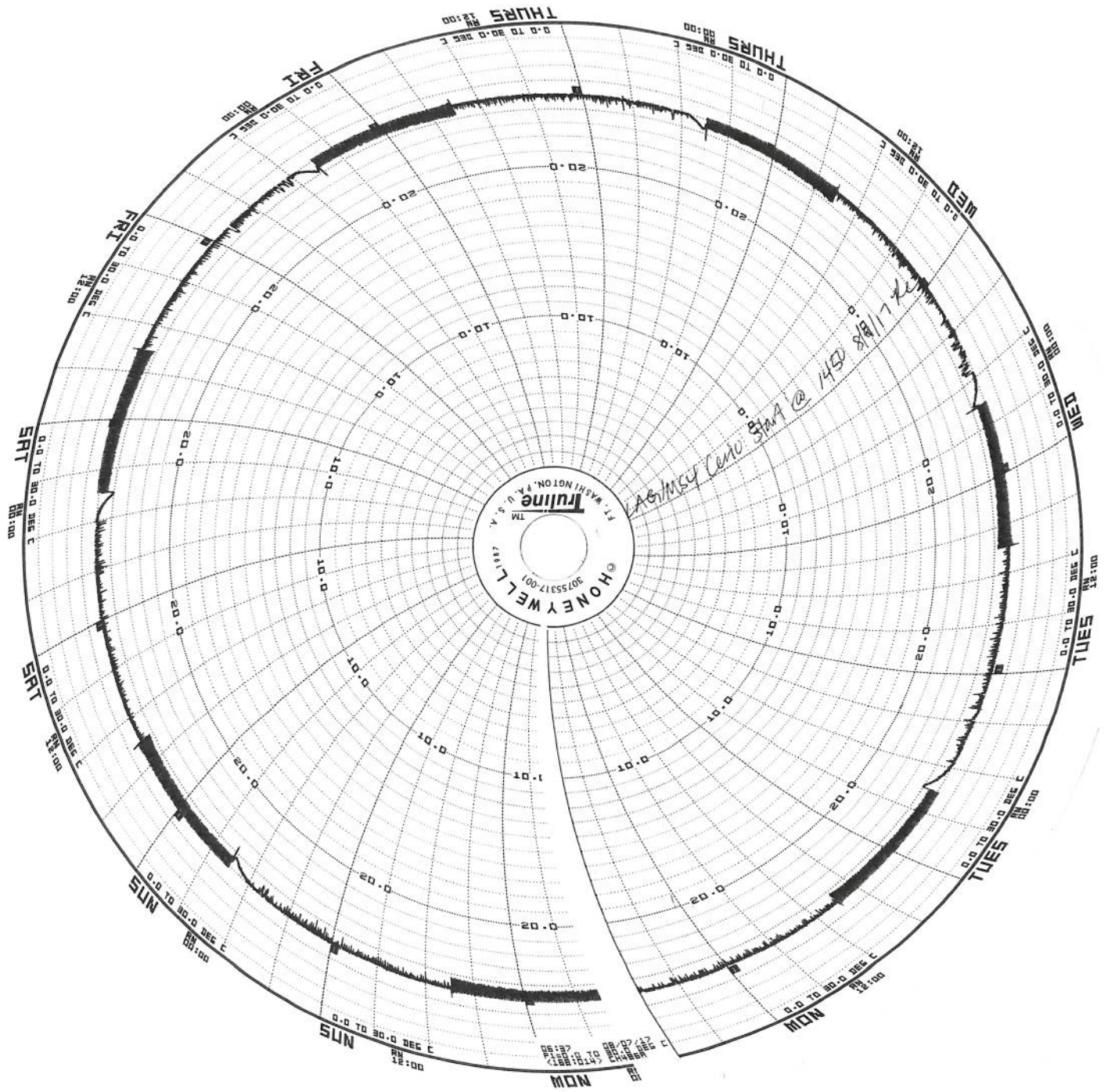
Final Temperature-°C								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.9	24.9	24.9	25.1	24.6	25.0	25.0
12.5		25.0	24.8	24.9	25.1	24.5	24.9	24.9
25		25.0	24.9	24.9	25.2	24.7	24.9	24.9
50		24.8	24.7	24.7	25.0	24.8	24.8	24.7
100		24.8	24.7	24.8	25.0	24.7	24.8	24.6
200		24.8	24.4	24.5	25.0	24.8	—	—
Measure Time: 1233		1230	1138	1205	1202	1341	1117	
Instrument ID: #4		#4	#4	#4	#4	#4	#4	
Analyst: Kc		Kc	Kc	Kc	Kc	Kc	Kc	

Initial Temperature-°C								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.6	24.6	24.7	24.4	24.9	24.9	24.5
12.5		24.6	25.0	24.7	24.9	24.9	24.8	24.9
25		24.7	24.9	24.8	25.0	24.9	24.8	24.9
50		24.7	24.8	24.7	24.9	24.8	24.6	24.6
100		24.6	24.8	24.7	24.8	24.8	24.6	24.6
200		24.5	24.6	24.6	24.6	24.7	24.6	—
Measure Time: 1125		1036	1110	0944	1036	1105	1050	
Instrument ID: #4		#4	#4	#4	#4	#4	#4	
Analyst: Kc		Kc	Kc	Kc	Kc	Kc	Kc	

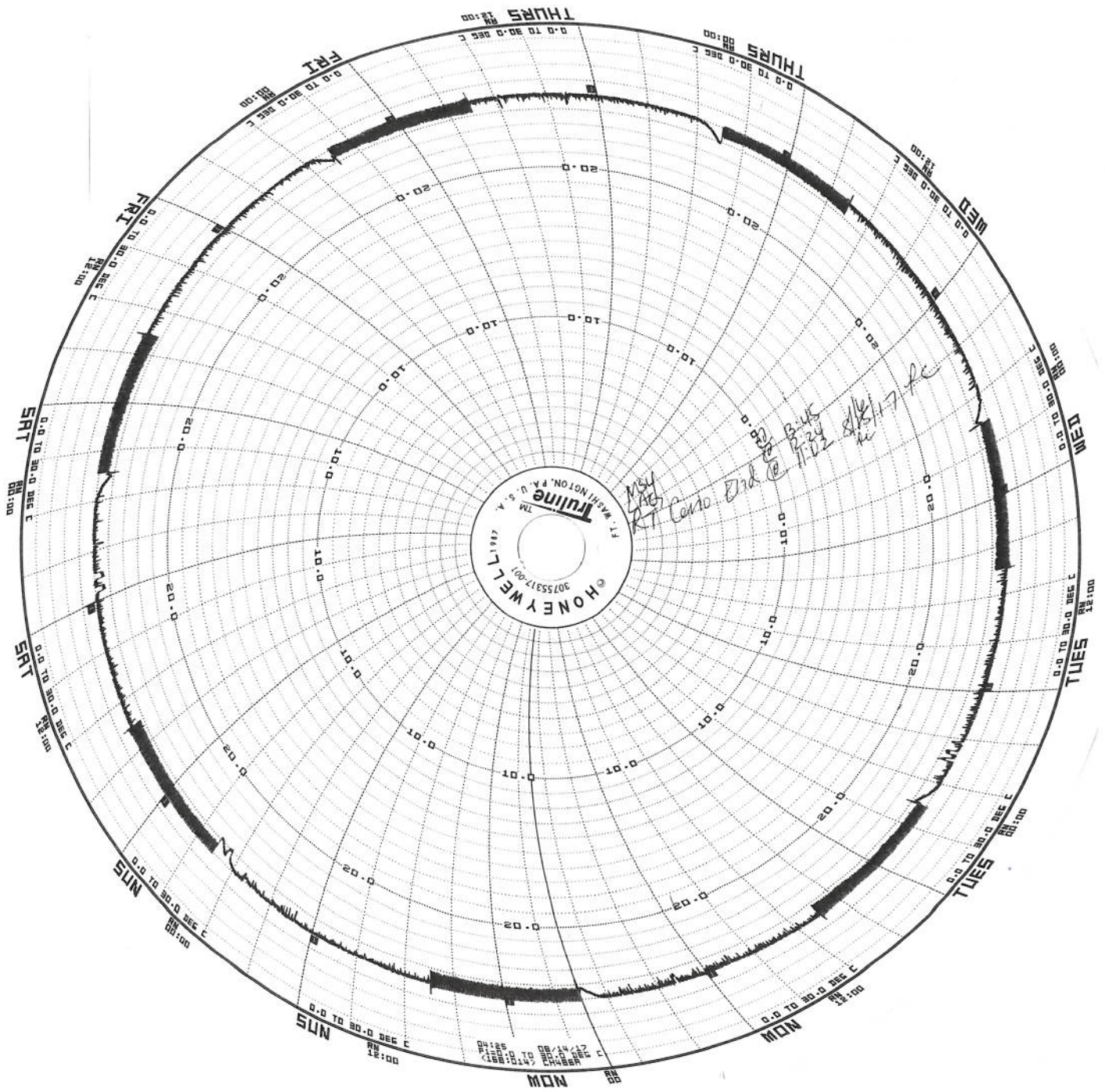
LAG Chronic Ceriodaphnia 8-09-17



Test: 1708RT2A.C, 1708052A.C, 1708072A-C.C
Date: 8/9/17(1450) - 8/16/17(1345)



Test: 1708RT2A.C, 1708052A.C, 1708072A.C.C
 Date: 8/9/17 (1450) - 8/16/17 (1345)



Test: 1708RT 2A.C, 170805 2A.C, 170807 2A -C.C
 Date: 8/9/17(1450) - 8/16/17(1345)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: August 23, 2017

TEST DATE: August 23, 2017

TEST NUMBER: 1708RT2B.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \bullet \text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic

RESULT:

NOEC = 100 $\mu\text{g/L}$ (Survival)

NOEC = 12.5 $\mu\text{g/L}$ (Reproduction)

EC₅₀ = 130 $\mu\text{g/L}$ (Survival)

IC₂₅ = 20.9 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw

Analyst

Rea Mara A Crinklaw

Signature

Water Biologist II

Title

9/14/17

Date

Denise Li

Acting Supervisor

Denise Li

Signature

Water Biologist II

Title

9-18-17

Date

CETIS Summary Report

Report Date: 14 Sep-17 13:33 (p 1 of 2)
Test Code: 1708RT2B.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Batch ID: 15-9645-0555	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 23 Aug-17 15:26	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 30 Aug-17 10:35	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8h 8/23/17 (0830-1505)

Sample ID: 11-1921-9210	Code: Cu RT	Client: Donald C. Tillman WRP
Sample Date: 23 Aug-17 11:16	Material: Copper chloride	Project: NPDES
Receive Date: 23 Aug-17 11:16	Source: Reference Toxicant	
Sample Age: 4h	Station:	

Sample Renewals					
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	24 Aug-17 10:38	24 Aug-17 10:38	24 Aug-17 15:33	
2	Cu RT	25 Aug-17 15:08	25 Aug-17 15:08	25 Aug-17 15:28	
3	Cu RT	26 Aug-17 08:28	26 Aug-17 08:28	26 Aug-17 09:22	
4	Cu RT	27 Aug-17 10:37	27 Aug-17 10:37	27 Aug-17 11:15	
5	Cu RT	28 Aug-17 12:20	28 Aug-17 12:20	28 Aug-17 13:40	
6	Cu RT	29 Aug-17 11:05	29 Aug-17 11:05	29 Aug-17 13:03	

Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-8519-6958	7d Survival Rate	100	>100	N/A	N/A		Fisher Exact/Bonferroni-Holm Test
05-1859-0951	Reproduction	12.5	25	17.68	27.4%		Bonferroni Adj t Test

Int Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
14-9065-9379	7d Survival Rate	EC5	17.73	14.9	100		Linear Interpolation (ICPIN)
		EC10	50	17.73	103.7		
		EC15	70.77	21.07	107.6		
		EC20	100	25	111.6		
		EC25	104.4	56.15	115.7		
		EC40	119	84.14	129.1		
		EC50	129.7	100	138.9		
01-4455-3838	Reproduction	IC5	9.766	1.056	18.38		Linear Interpolation (ICPIN)
		IC10	14.11	3.226	25.33		
		IC15	16.11	7.687	26.87		
		IC20	18.37	13.32	28.43		
		IC25	20.93	15.17	30.22		
		IC40	28.7	20.02	38.16		
		IC50	33.97	23.84	46.71		

Test Acceptability						
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
04-8519-6958	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
14-9065-9379	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
01-4455-3838	Reproduction	Control Resp	42	15 - NL	Yes	Passes Acceptability Criteria
05-1859-0951	Reproduction	Control Resp	42	15 - NL	Yes	Passes Acceptability Criteria
05-1859-0951	Reproduction	PMSD	0.2741	0.13 - 0.47	Yes	Passes Acceptability Criteria

CETIS Summary Report

Report Date: 14-Sep-17 13:33 (p 2 of 2)
Test Code: 1708RT2B.C | 18-0928-7994

Periodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Survival Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	10.0%
50		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	10.0%
100		10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	20.0%
200		10	0	0	0	0	0	0	0		100.0%

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	8	42	38.04	45.96	16	47	3.751	10.61	25.26%	0.0%
12.5		10	39.7	37.74	41.66	34	49	1.66	5.25	13.23%	5.48%
25		8	28.63	22.9	34.35	0	46	5.418	15.32	53.54%	31.85%
50		10	11.3	6.583	16.02	0	36	3.995	12.63	111.8%	73.1%
100		10	9.1	6.788	11.41	0	20	1.958	6.19	68.03%	78.33%
200		10	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	0	1	1	1	1	1	1
50		1	1	1	1	1	0	1	1	1	1
100		1	1	0	0	1	1	1	1	1	1
200		0	0	0	0	0	0	0	0	0	0

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	46	44	47	47	43	46	47	16		
12.5		37	35	42	47	49	42	40	35	36	34
25		41	38	31	0	46	24	14	35		
50		36	20	0	0	22	1	22	4	4	4
100		7	0	0	8	7	20	11	12	11	15
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 1 of 2)
Test Code: 1708RT2B.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID:	04-8519-6958	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1						
Analyzed:	30 Aug-17 12:30	Analysis:	STP 2x2 Contingency Tables	Official Results:	Yes						
Batch ID:	15-9645-0555	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	23 Aug-17 15:26	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water						
Ending Date:	30 Aug-17 10:35	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 19h	Source:	In-House Culture	Age:	<8h 8/23/17 (0830-1505)						
Sample ID:	11-1921-9210	Code:	Cu RT	Client:	Donald C. Tillman WRP						
Sample Date:	23 Aug-17 11:16	Material:	Copper chloride	Project:	NPDES						
Receive Date:	23 Aug-17 11:16	Source:	Reference Toxicant								
Sample Age:	4h	Station:									
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU				
Untransformed		C > T	Not Run	100	>100	N/A					
Fisher Exact/Bonferroni-Holm Test											
Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)						
Dilution Water		12.5	1	1.0000	Non-Significant Effect						
		25	0.5	1.0000	Non-Significant Effect						
		50	0.5	1.0000	Non-Significant Effect						
		100	0.2368	0.9474	Non-Significant Effect						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Data Summary											
Conc-µg/L	Control Type	No-Resp	Resp	Total							
0	Dilution Water	10	0	10							
12.5		10	0	10							
25		9	1	10							
50		9	1	10							
100		8	2	10							
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	0	1	1	1	1	1	1
50		1	1	1	1	1	0	1	1	1	1
100		1	1	0	0	1	1	1	1	1	1

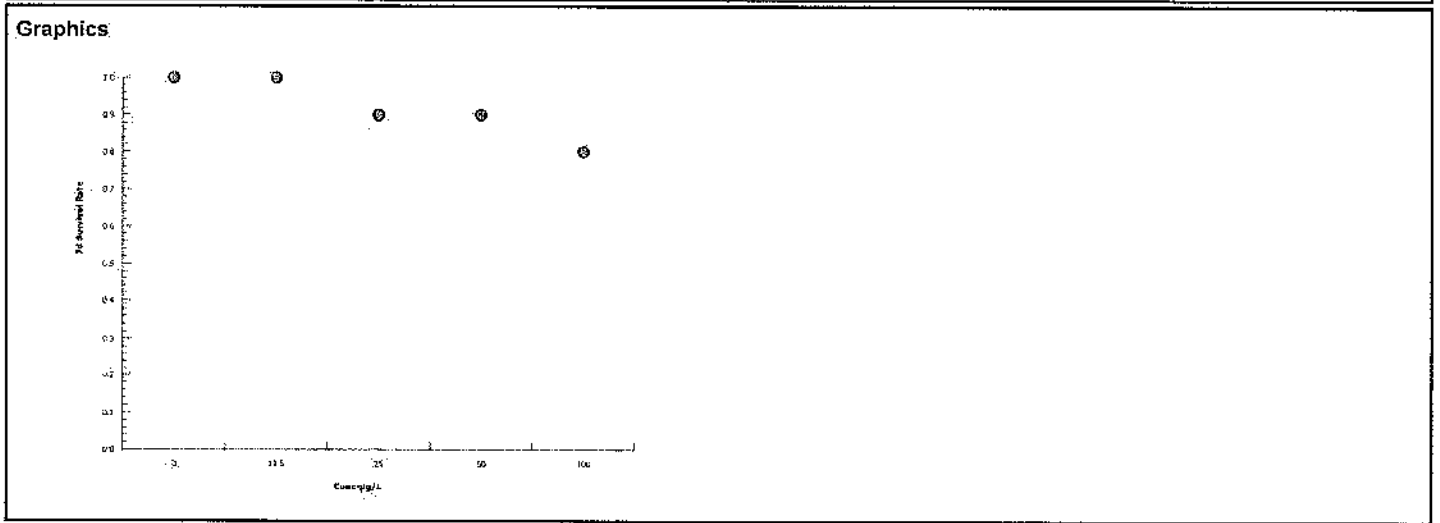
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CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 2 of 2)
Test Code: 1708RT2B.C | 18-0928-7994

Pariodaphnia 7-d Survival and Reproduction Test		Hyperion Treatment Plant Laboratory	
Analysis ID: 04-8519-6958	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1	
Analyzed: 30 Aug-17 12:30	Analysis: STP 2x2 Contingency Tables	Official Results: Yes	



Concentration-response relationship is all or nothing. 9/13/17
Re

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 1 of 2)
 Test Code: 1708RT2B.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID:	05-1859-0951	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1						
Analyzed:	30 Aug-17 12:31	Analysis:	Parametric-Multiple Comparison	Official Results:	Yes						
Batch ID:	15-9645-0555	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	23 Aug-17 15:26	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water						
Ending Date:	30 Aug-17 10:35	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 19h	Source:	In-House Culture	Age:	<8h 8/23/17 (0830-1805)						
Sample ID:	11-1921-9210	Code:	Cu RT	Client:	Donald C. Tillman WRP						
Sample Date:	23 Aug-17 11:16	Material:	Copper chloride	Project:	NPDES						
Receive Date:	23 Aug-17 11:16	Source:	Reference Toxicant								
Sample Age:	4h	Station:									
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU				
Untransformed	0	C > T	Not Run	12.5	25	17.68	PMSD 27.4%				
Bonferroni Adj t Test											
Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)			
Dilution Water		12.5	0.4649	2.327	16	11.51	1.0000	Non-Significant Effect			
		25*	2.564	2.327	14	12.13	0.0282	Significant Effect			
		50*	6.205	2.327	16	11.51	<0.0001	Significant Effect			
		100*	6.649	2.327	16	11.51	<0.0001	Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	42	15 - NL	Yes	Passes Acceptability Criteria							
MSD	0.2741	0.13 - 0.47	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.875	3.094	0.1209	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	8977.46	2244.365	4	20.63	<0.0001	Significant Effect					
Error	4460.975	108.8043	41								
Total	13438.44	2353.169	45								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Bartlett Equality of Variance	12.08	13.28	0.0168	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9663	0.9321	0.2013	Normal Distribution						
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	8	42	37.96	46.04	16	47	3.751	10.61	25.26%	0.0%
12.5		10	39.7	37.7	41.7	34	49	1.66	5.25	13.23%	5.48%
25		8	28.63	22.8	34.45	0	46	5.418	15.32	53.54%	31.85%
50		10	11.3	6.495	16.1	0	36	3.995	12.63	111.8%	73.1%
100		10	9.1	6.745	11.45	0	20	1.958	6.19	68.03%	78.33%

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p.2 of 2)
Test Code: 1708RT2B.C | 18-0928-7994

Paritydaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 05-1859-0951 Endpoint: Reproduction
Analyzed: 30 Aug-17 12:31 Analysis: Parametric-Multiple Comparison

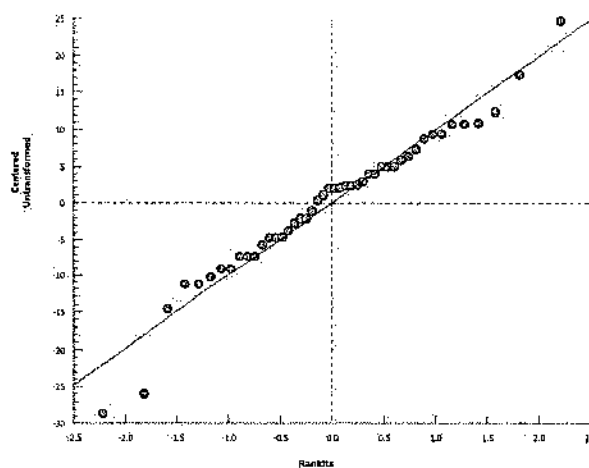
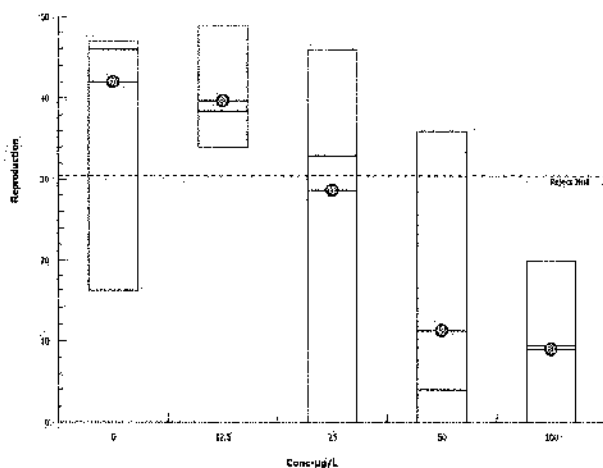
CETIS Version: CETISv1.8.1

Official Results: Yes

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	46	44	47	47	43	46	47	16		
12.5		37	35	42	47	49	42	40	35	36	34
25		41	38	31	0	46	24	14	35		
50		36	20	0	0	22	1	22	4	4	4
100		7	0	0	8	7	20	11	12	11	15

Graphics



Concentration-response relationship is ideal. 9/13/17 RC

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 1 of 4)
 Test Code: 1708RT2B.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 01-4455-3838	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 30 Aug-17 12:31	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes									
Batch ID: 15-9645-0555	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 23 Aug-17 15:26	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 30 Aug-17 10:35	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 19h	Source: In-House Culture	Age: <8h	8/23/17 (0830-1505)								
Sample ID: 11-1921-9210	Code: Cu RT	Client: Donald C. Tillman WRP									
Sample Date: 23 Aug-17 11:16	Material: Copper chloride	Project: NPDES									
Receive Date: 23 Aug-17 11:16	Source: Reference Toxicant										
Sample Age: 4h	Station:										
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples								
Log(X+1)	Linear	525590600	200								
Exp 95% CL		Method									
Yes		Two-Point Interpolation									
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap								
Control Resp	42	15 - NL	Yes								
Decision: Passes Acceptability Criteria											
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
IC5	9.766	1.056	18.38								
10	14.11	3.226	25.33								
15	16.11	7.687	26.87								
IC20	18.37	13.32	28.43								
IC25	20.93	15.17	30.22								
IC40	28.7	20.02	38.16								
IC50	33.97	23.84	46.71								
Reproduction Summary											
		Calculated Variate									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	Dilution Water	8	42	16	47	3.751	10.61	25.26%	0.0%		
12.5		10	39.7	34	49	1.66	5.25	13.23%	5.48%		
25		8	28.63	0	46	5.418	15.32	53.54%	31.85%		
50		10	11.3	0	36	3.995	12.63	111.8%	73.1%		
100		10	9.1	0	20	1.958	6.19	68.03%	78.33%		
200		10	0	0	0	0	0		100.0%		
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	46	44	47	47	43	46	47	16		
12.5		37	35	42	47	49	42	40	35	36	34
25		41	38	31	0	46	24	14	35		
50		36	20	0	0	22	1	22	4	4	4
100		7	0	0	8	7	20	11	12	11	15
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p. 2 of 4)
Test Code: 1708RT2B.C | 18-0928-7994

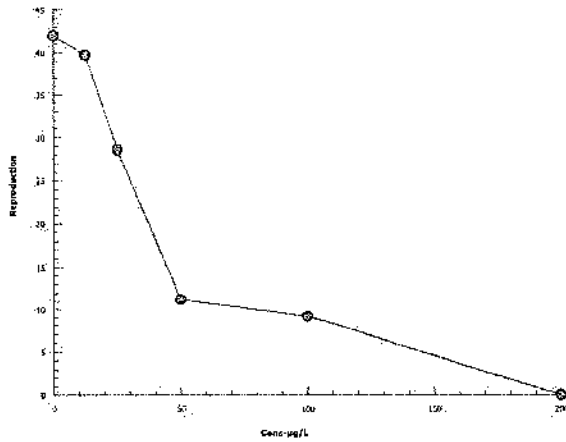
Periodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 01-4455-3838 Endpoint: Reproduction
Analyzed: 30 Aug-17 12:31 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 3 of 4)
 Test Code: 1708RT2B.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 14-9065-9379	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 30 Aug-17 12:31	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 15-9645-0555	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 23 Aug-17 15:26	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 30 Aug-17 10:35	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8h 8/23/17 (0805-1505)
Sample ID: 11-1921-9210	Code: Cu RT	Client: Donald C. Tillman WRP
Sample Date: 23 Aug-17 11:16	Material: Copper chloride	Project: NPDES
Receive Date: 23 Aug-17 11:16	Source: Reference Toxicant	
Sample Age: 4h	Station:	

Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1.609E+09	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	17.73	14.9	100
10	50	17.73	103.7
15	70.77	21.07	107.6
EC20	100	25	111.6
EC25	104.4	56.15	115.7
EC40	119	84.14	129.1
EC50	129.7	100	138.9

7d Survival Rate Summary

Calculated Variate(A/B)

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
50		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
100		10	0.8	0	1	0.1333	0.4216	52.7%	20.0%	8	10
200		10	0	0	0	0	0		100.0%	0	10

7d Survival Rate Detail

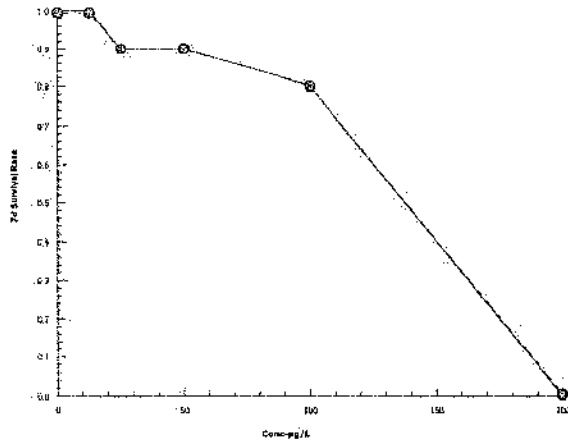
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	0	1	1	1	1	1	1
50		1	1	1	1	1	0	1	1	1	1
100		1	1	0	0	1	1	1	1	1	1
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 14 Sep-17 13:33 (p 4 of 4)
Test Code: 1708RT2B.C | 18-0928-7994

Daphnia 7-d Survival and Reproduction Test			Hyperion Treatment Plant Laboratory
Analysis ID: 14-9065-9379	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1	
Analyzed: 30 Aug-17 12:31	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

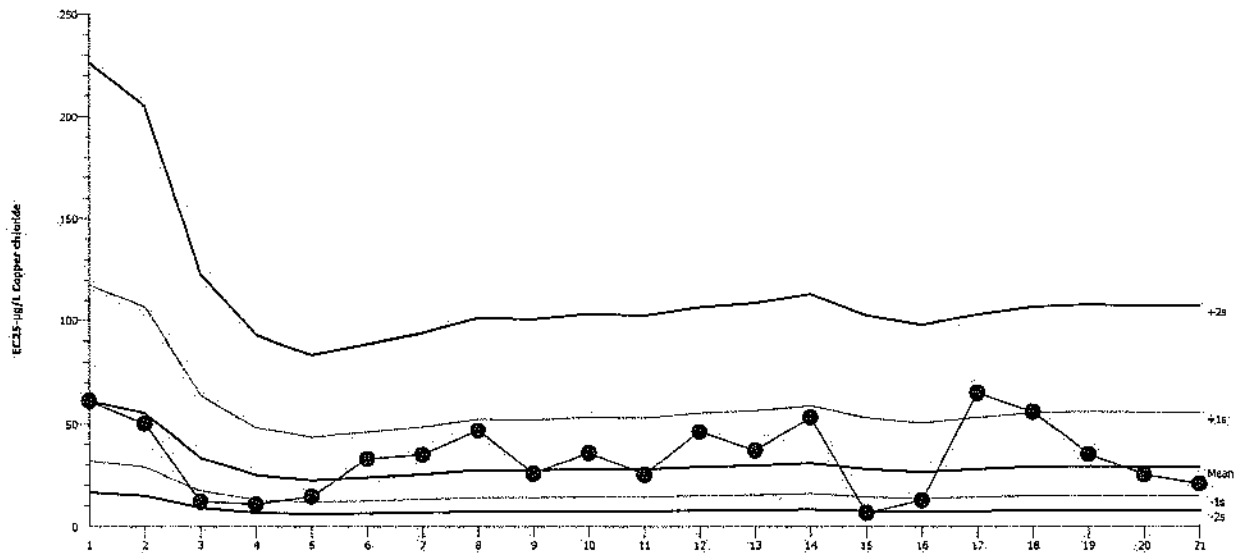
Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: Reproduction

Material: Copper chloride
Source: Reference Toxicant-REF

Ceriodaphnia 7-d Survival and Reproduction Test



Mean: 29.11
Sigma: N/A

Count: 20
CV: 92.10%

-1s Warning Limit: 15.16
+1s Warning Limit: 55.9

-2s Action Limit: 7.892
+2s Action Limit: 107.4

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Dec	4	61.4	32.29	1.144	(+)		11-5677-0498	05-2928-7744
2	2015	Jan	22	50.33	21.22	0.839			01-5526-0247	05-9407-7070
3		Jun	17	12.13	-16.98	-1.342	(-)		20-9387-7144	17-7691-6079
4		Dec	14	10.71	-18.4	-1.532	(-)		15-8925-6767	02-6642-1182
5	2016	Jan	21	14.62	-14.49	-1.056	(-)		18-3843-6965	14-9842-1935
6		Feb	1	32.9	3.794	0.1878			11-0794-9751	03-7350-2523
7			18	35.1	5.988	0.2867			08-3683-2844	04-0850-8624
8		Mar	7	46.92	17.81	0.7315			03-8131-3022	11-6058-4627
9		Apr	4	25.73	-3.38	-0.1891			20-8785-7541	21-2139-2262
10		Jul	28	35.91	6.805	0.3219			11-3245-2063	13-6804-5542
11		Aug	31	25.21	-3.898	-0.2203			04-2198-2948	01-9086-3175
12		Dec	16	46.2	17.1	0.708			05-9377-8224	05-6497-3539
13	2017	Mar	30	37.14	8.031	0.3734			20-5811-5356	06-6352-3022
14		May	10	53.41	24.31	0.9302			04-6904-8294	08-3814-7144
15			25	6.656	-22.45	-2.261	(-)	(-)	16-2272-5797	04-1379-9830
16		Jun	6	12.78	-16.33	-1.261	(-)		00-1105-6011	17-2178-2673
17			22	65.16	36.05	1.235	(+)		10-7002-0112	00-8698-9715
18		Jul	12	56.24	27.13	1.009	(+)		13-9476-5989	15-6562-8470
19			27	35.41	6.307	0.3005			00-3533-4104	15-5816-8081
20		Aug	9	25.45	-3.66	-0.2059			05-1646-5416	12-8828-7274
21			23	20.93	-8.175	-0.5052			18-0928-7994	01-4455-3838

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

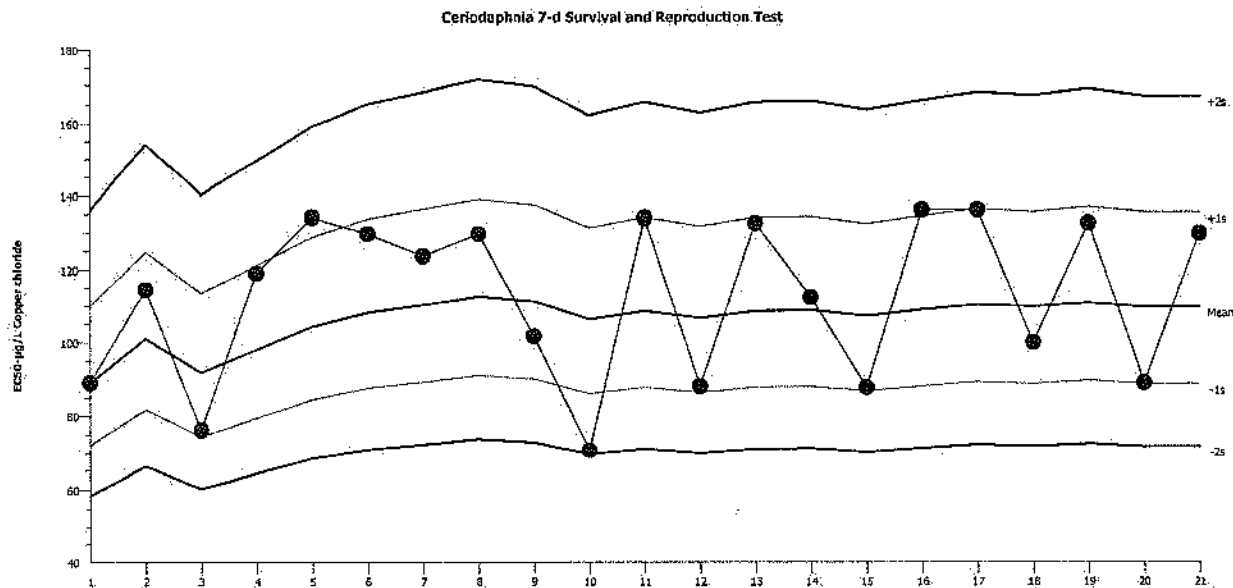
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 109.6

Count: 20

-1s Warning Limit: 88.76

-2s Action Limit: 71.86

Sigma: N/A

CV: 23.50%

+1s Warning Limit: 135.4

+2s Action Limit: 167.3

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Dec	4	89.13	-20.49	-0.9797			11-6677-0498	02-1926-0405
2	2015	Jan	22	114.5	4.843	0.2047			01-5526-0247	07-4843-8959
3		Jun	17	76.22	-33.4	-1.72	(-)		20-9387-7144	01-1636-6576
4		Dec	14	119	9.343	0.3873			15-8925-6767	02-2142-4772
5	2016	Jan	21	134.1	24.52	0.9557			18-3843-6965	17-3443-6664
6		Feb	1	129.7	20.12	0.7979			11-0794-9751	09-9142-3700
7			18	123.6	14.02	0.5698			08-3683-2844	13-1421-5523
8		Mar	7	129.7	20.12	0.7979			03-8131-3022	08-3988-9211
9		Apr	4	101.8	-7.865	-0.3525			20-8785-7541	14-5275-7464
10		Jul	28	70.77	-38.85	-2.072	(-)	(-)	11-3245-2063	20-4501-7131
11		Aug	31	134	24.41	0.9518			04-2198-2948	19-3434-0384
12		Dec	16	88.2	-21.42	-1.029	(-)		05-9377-8224	02-8710-1182
13	2017	Mar	30	132.6	22.96	0.9005			20-5811-5356	10-6838-6662
14		May	10	112.3	2.657	0.1134			04-6904-8294	00-0571-6326
15			25	87.85	-21.76	-1.048	(-)		16-2272-5797	20-6787-6120
16		Jun	6	136.1	26.52	1.026	(+)		00-1105-6011	07-1957-9297
17			22	136.1	26.52	1.026	(+)		10-7002-0112	10-9615-6318
18		Jul	12	100	-9.618	-0.4348			13-9476-5989	08-1211-5310
19			27	132.6	22.96	0.9005			00-3533-4104	07-3102-4627
20		Aug	9	89.13	-20.49	-0.9797			05-1646-5416	02-7143-5836
21			23	129.7	20.12	0.7979			18-0928-7994	14-9065-9379

CETIS Test Data Worksheet

Report Date: 22 Aug-17 16:26 (p 1 of 2)
Test Code: 18-0928-7994/1709RT2A.C

riodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 23 Aug-17 ¹⁵²⁶
End Date: 30 Aug-17 ¹⁰³⁵
Sample Date: 23 Aug-17
Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Copper chloride

Sample Code: 42B5EE0A
Sample Source: Reference Toxicant
Sample Station:

9/1/17

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	43	1	0	0	0	6	0	18	22	49	46
0	D	2	40	1	0	0	0	6	14	0	24	41	44
0	D	3	30	1	0	0	0	8	16	0	23	52	47
0	D	4	45	1	0	0	0	7	0	17	23	42	43
0	D	5	50	1	0	0	0	6	15	0	22	46	40
0	D	6	41	1	0	0	0	6	0	14	26	43	46
0	D	7	47	1	0	0	0	7	0	16	24	48	47
0	D	8	1	1	0	0	0	0	0	0	0	0	Y
0	D	9	26	1	0	0	0	0	4	12	0	16	
0	D	10	8	1	0	0	0	0	0	0	0	0	Y
12.5		1	55	1	0	0	0	6	11	0	20	37	
12.5		2	31	1	0	0	0	3	0	13	19	35	
12.5		3	60	1	0	0	0	6	13	0	23	42	
12.5		4	44	1	0	0	0	7	0	15	25	47	
12.5		5	32	1	0	0	0	7	0	17	25	49	
12.5		6	46	1	0	0	0	6	0	15	21	42	
12.5		7	33	1	0	0	0	4	0	15	21	40	
12.5		8	38	1	0	0	0	3	0	11	21	35	
12.5		9	37	1	0	0	0	4	0	11	21	36	
12.5		10	2	1	0	0	0	0	4	12	18	34	
25		1	25	1	0	0	0	5	15	0	21	41	
25		2	3	1	0	0	0	7	13	0	18	38	
25		3	49	1	0	0	0	0	14	0	17	31	
25		4	13	1	0	0	0	0	0	0	0	0	
25		5	18	1	0	0	0	7	16	0	23	46	
25		6	57	1	0	0	0	5	0	15	4	24	
25		7	59	1	0	0	0	0	3	4	7	14	
25		8	24	1	0	0	0	0	0	0	0	0	Y
25		9	51	1	0	0	0	0	0	0	0	0	Y
25		10	6	1	0	0	0	0	4	14	17	35	
50		1	5	1	0	0	0	6	14	0	16	36	
50		2	35	1	0	0	0	6	14	0	0	20	
50		3	22	1	0	0	0	0	0	0	0	0	N
50		4	14	1	0	0	0	0	0	0	0	0	N
50		5	54	1	0	0	0	5	16	0	0	22	
50		6	21	1	0	0	0	1	0	0	0	1	
50		7	19	1	0	0	0	7	0	15	0	22	
50		8	4	1	0	0	0	4	0	0	0	4	
50		9	27	1	0	0	0	0	4	0	0	4	
50		10	56	1	0	0	0	0	4	0	0	4	
100		1	15	1	0	0	0	0	2	0	5	7	
100		2	20	1	0	0	0	0	0	0	0	0	N
100		3	39	1	0	0	0	0	0	0	0	0	
100		4	16	1	0	0	0	0	4	4	0	8	
100		5	42	1	0	0	0	4	0	3	0	7	
100		6	48	1	0	0	0	0	4	6	10	20	
100		7	17	1	0	0	0	0	4	7	0	11	

CETIS Test Data Worksheet

Report Date:
Test Code:

22 Aug-17 16:26 (p 2 of 2)
18-0928-7994/1709RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	58	1	0	0	0	5	0	7	0	12	
100		9	28	1	0	0	0	0	4	7	0	11	
100		10	9	1	0	0	0	0	5	2	8	15	
200		1	52	1	0X	XX	XX	XX	XX	XX	XX	0	
200		2	53	1	0X	XX	XX	XX	XX	XX	XX	0	
200		3	36	1	0X	XX	XX	XX	XX	XX	XX	0	
200		4	10	1	0X	XX	XX	XX	XX	XX	XX	0	
200		5	11	1	0X	XX	XX	XX	XX	XX	XX	0	
200		6	34	1	0X	XX	XX	XX	XX	XX	XX	0	
200		7	7	1	0X	XX	XX	XX	XX	XX	XX	0	
200		8	23	1	0X	XX	XX	XX	XX	XX	XX	0	
200		9	12	1	0	0X	XX	XX	XX	XX	XX	0	
200		10	29	1	0X	XX	XX	XX	XX	XX	XX	0	

8/23 8/24 8/25 8/26 8/27 8/28 8/29 8/30
count
1035
Fe

Food Added: 1515 1335 1508 0856 1051 1242 1245
Fe Fe Fe Fe Fe Fe Fe

Transferred: 1526 1533 1528 0922 1115 1340 1303
Fe Fe Fe Fe Fe Fe Fe

★ Reps 8-10 from Master Culture 1 & 3 Pool. No blocking by known parentages in Reps 8-10.

Re

Re

CETIS Measurement Worksheet

Report Date: 22 Aug-17 16:26 (p 1 of 2)
Test Code: 1709RT2A.C | 18-0928-7994

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 23 Aug-17 Species: Ceriodaphnia dubia
End Date: 30 Aug-17 Protocol: EPA/821/R-02-013 (2002)
Sample Date: 23 Aug-17 Material: Copper chloride

Sample Code: 42B5EE0A
Sample Source: Reference Toxicant
Sample Station:

Alkalinity (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	116
200		112
Measure Time:		1305
Instrument ID:		titrate
Analyst:		Rc

- See Reconstituted Water Prep Logbook (8/4/17 AS)
9/13/17 Rc
9/14/17 Rc

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	591	593	596	594	587	611	601
12.5		595	594	597	592	593	609	604
25		594	595	596	594	593	609	601
50		593	594	595	590	592	607	600
100		592	593	594	582	571	602	592
200		582	585	584				
Measure Time:		1209	1038	1508	0828	1037	1220	1105
Instrument ID:		#3	#3	#3	#3	3	#3	#3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.83	7.79	8.18	8.21	7.87	7.03	8.30
12.5		8.05	8.00	8.23	8.32	8.08	7.79	8.22
25		8.15	8.07	8.26	8.38	8.13	8.16	8.21
50		8.17	8.12	8.27	8.38	8.17	8.16	8.23
100		8.19	8.18	8.31	8.41	8.17	8.19	8.28
200		8.17	8.19					
Measure Time:		1605	1546	0933	1147	1441	1325	1052
Instrument ID:		#3	#3	#3	3	#3	#3	#3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

8/24/17 Rc
8/25/17 Rc
8/26/17 Rc
8/27/17 Rc
8/28/17 Rc
8/29/17 Rc
8/30/17 Rc
7.92 8/29/17 Rc
8.12 8/29/17 Rc

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.98	8.32	7.96	8.39	8.29	8.01	8.30
12.5		8.19	8.34	8.21	8.37	8.41	8.23	8.37
25		8.21	8.32	8.24	8.35	8.47	8.30	8.35
50		8.21	8.31	8.25	8.36	8.48	8.34	8.36
100		8.20	8.32	8.24	8.37	8.47	8.38	8.37
200		8.21	8.33	8.25				
Measure Time:		1209	1038	1508	0828	1037	1220	1105
Instrument ID:		#3	#3	#3	#3	3	#3	#3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Hardness (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	172
200		172
Measure Time:		1305
Instrument ID:		titrate
Analyst:		Rc

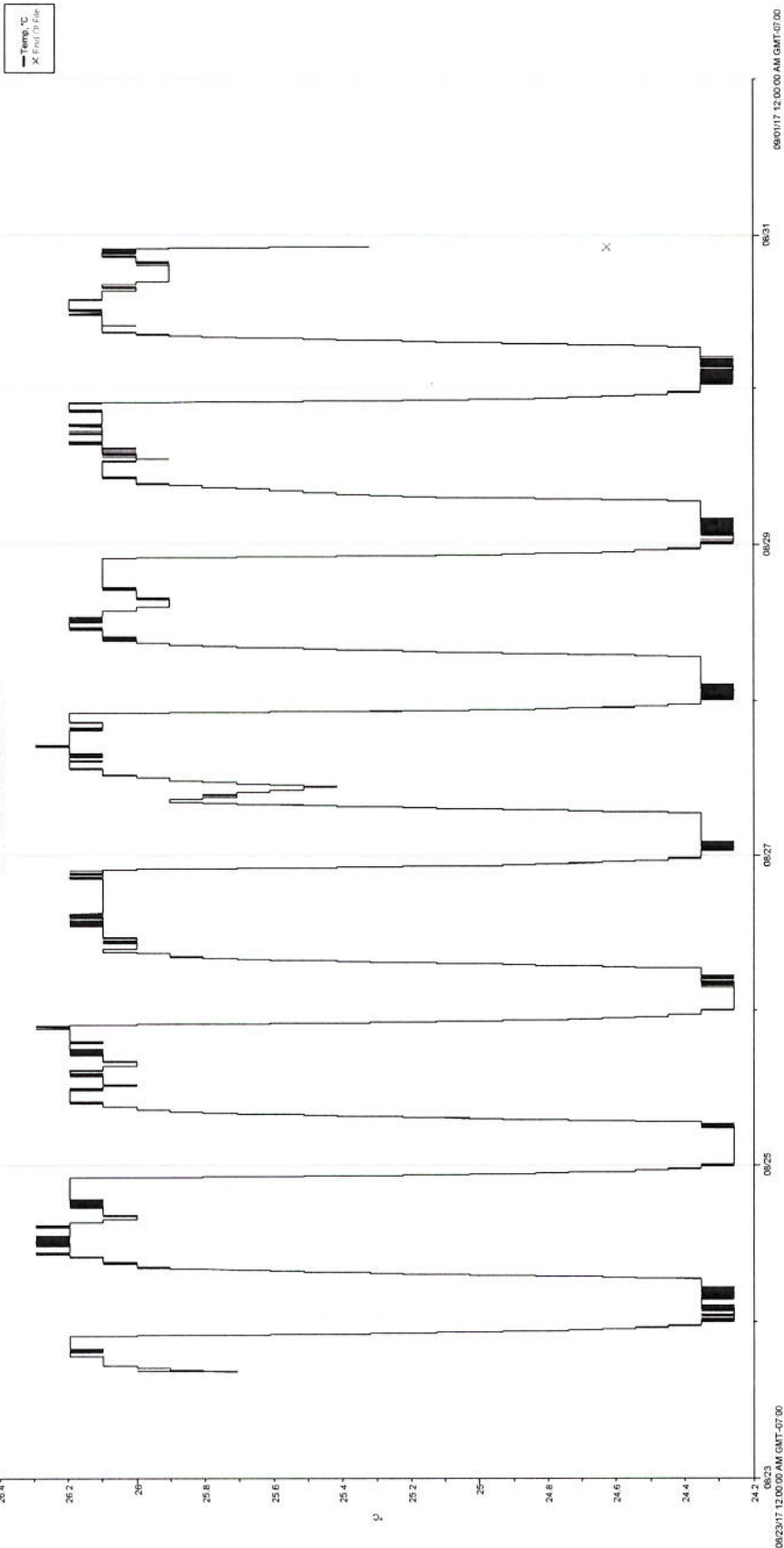
- See Reconstituted Water Prep Logbook (8/4/17 AS)
9/13/17 Rc
9/14/17 Rc

CETIS Measurement Worksheet

Report Date: 22 Aug-17 16:26 (p 2 of 2)
Test Code: 1709RT2A.C | 18-0928-7994

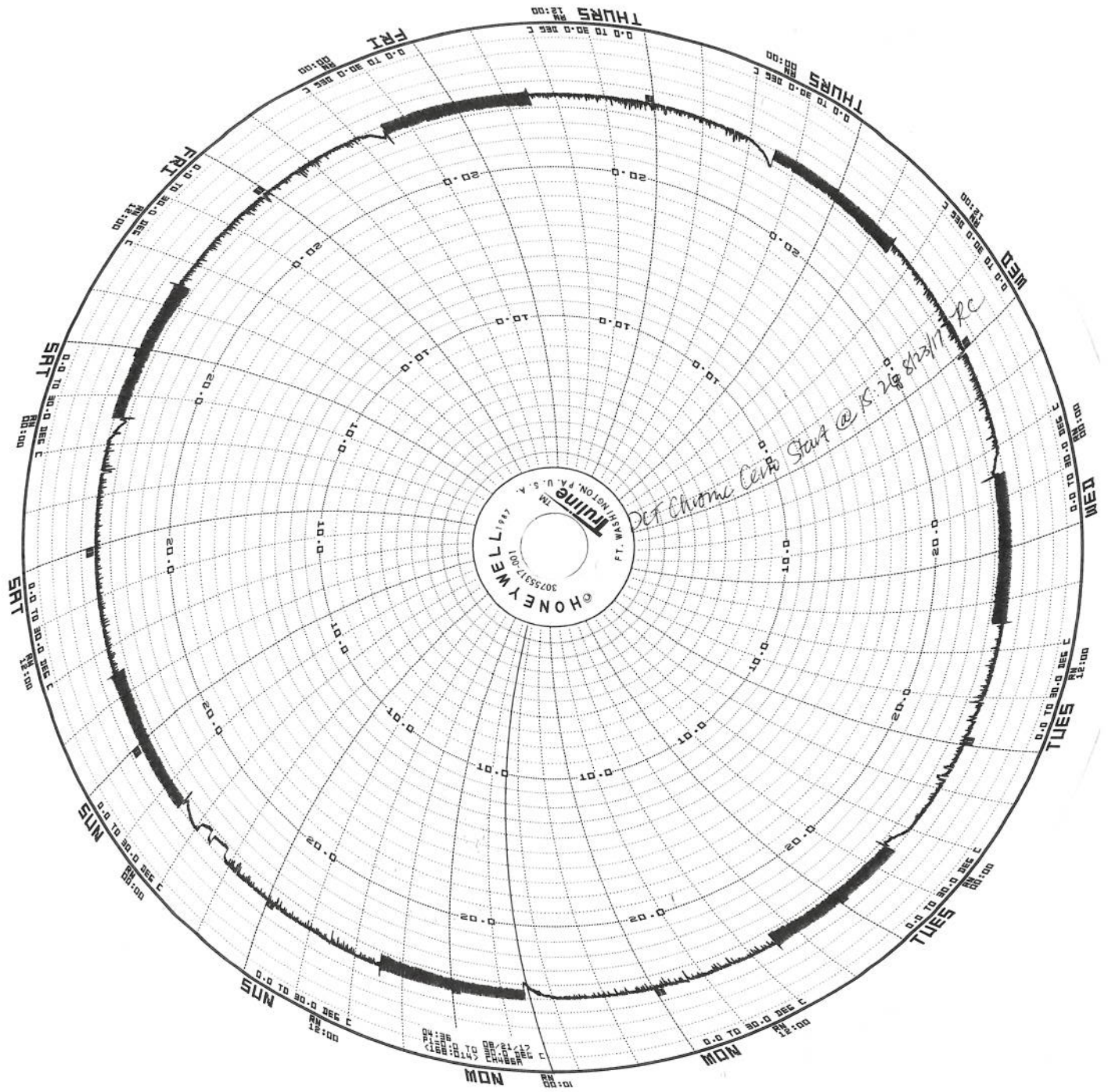
Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 23 Aug-17		Species: Ceriodaphnia dubia				Sample Code: 42B5EE0A					
End Date: 30 Aug-17		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Reference Toxicant					
Sample Date: 23 Aug-17		Material: Copper chloride				Sample Station:					
Final pH											
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	8.36	8.16	8.17	8.21	8.21	8.13	8.16			
12.5		8.38	8.17	8.15	8.36	8.24	8.16	8.14			
25		8.38	8.19	8.16	8.26	8.25	8.13	8.14			
50		8.38	8.19	8.15	8.24	8.24	8.14	8.13			
100		8.37	8.19	8.16	8.26	8.24	8.15	8.17			
200		8.37	8.20	—	—	—	—	—			
Measure Time:		1605	1546	0933	1147	1441	1325	1052			
Instrument ID:		#3	#3	#3	3	#3	#3	#3			
Analyst:		fc	fc	fc	RL	fc	fc	fc			
Initial pH											
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	8.26	8.03	8.17	7.98	8.24	8.28	8.16			
12.5		8.29	8.10	8.20	8.01	8.25	8.30	8.17			
25		8.29	8.13	8.20	8.03	8.26	8.30	8.18			
50		8.31	8.15	8.20	8.05	8.27	8.30	8.18			
100		8.32	8.16	8.21	8.06	8.26	8.31	8.18			
200		8.31	8.17	8.21	—	—	—	—			
Measure Time:		1209	1038	1508	0828	1037	1220	1005			
Instrument ID:		#3	#3	#3	#3	3	#3	#3			
Analyst:		fc	fc	fc	fc	RL	fc	fc			
Final Temperature-°C											
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	25.0	24.6	24.8	24.4	25.1	24.8	25.0			
12.5		24.7	24.7	24.8	24.2	25.0	24.8	24.8			
25		24.5	24.7	24.7	24.2	24.9	24.7	24.7			
50		24.7	24.8	24.7	24.1	24.9	24.7	24.7			
100		24.7	24.8	24.7	24.0	24.8	24.7	24.7			
200		24.8	24.8	—	—	—	—	—			
Measure Time:		1605	1546	0933	1147	1441	1325	1052			
Instrument ID:		#3	#3	#3	3	#3	#3	#3			
Analyst:		fc	fc	fc	RL	fc	fc	fc			
Initial Temperature-°C											
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	24.3	24.6	24.6	24.5	24.5	24.9	25.0			
12.5		25.3	24.6	25.1	24.7	24.4	24.8	25.1			
25		25.3	24.6	25.1	24.6	24.2	24.7	25.0			
50		25.0	24.6	25.0	24.6	24.2	24.6	24.9			
100		24.9	24.6	24.8	24.6	24.0	24.6	24.8			
200		24.8	24.6	24.5	—	—	—	—			
Measure Time:		1209	1038	1508	0828	1037	1220	1105			
Instrument ID:		#3	#3	#3	#3	3	#3	#3			
Analyst:		fc	fc	fc	fc	RL	fc	fc			

DCT Chronic Ceriodaphnia 8-23-17



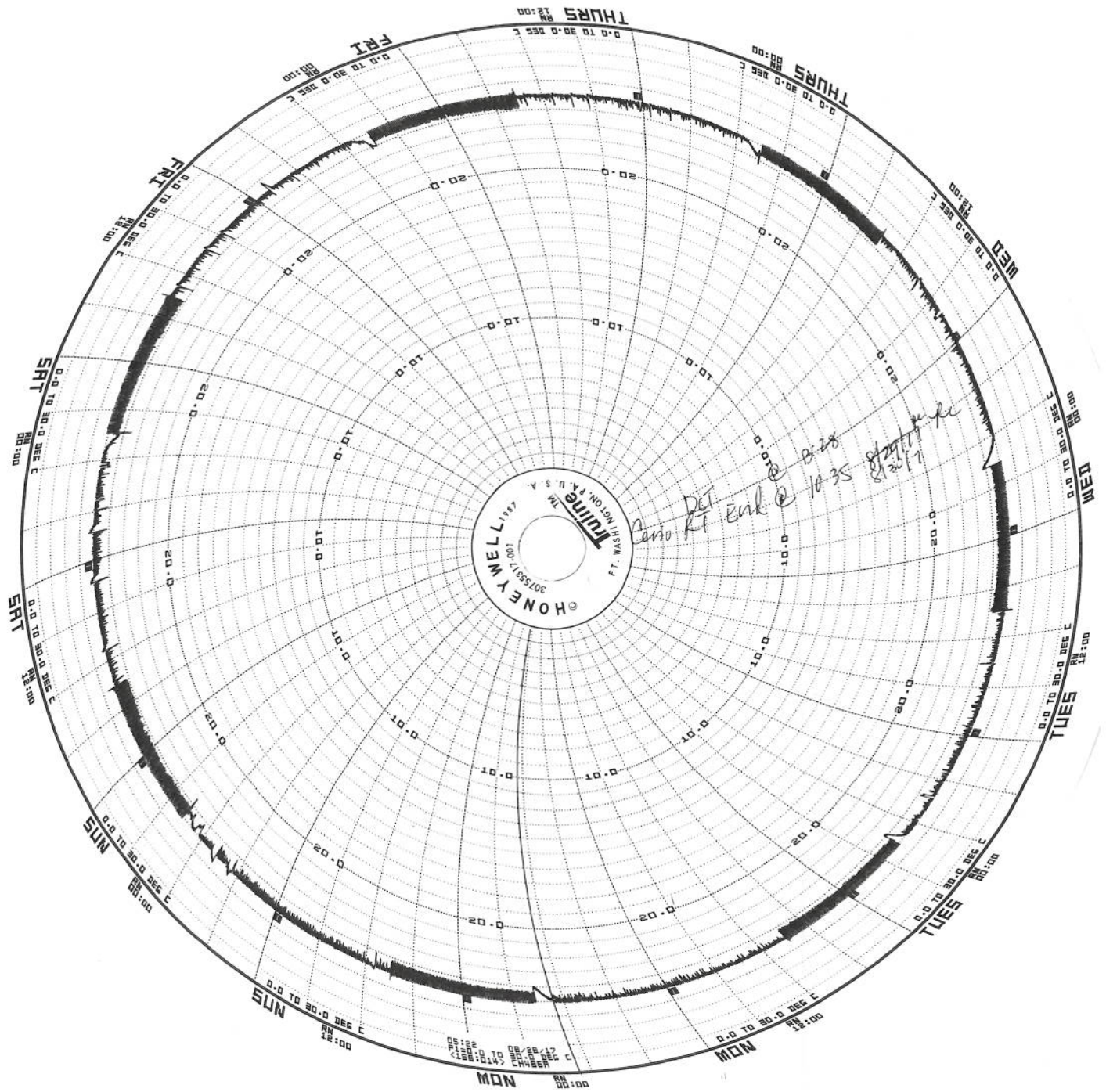
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9/14/17
9/14/17
9/14/17

Date: 8/23/17 (1526) - 8/30/17 (1328)



Test: 1708RT2B.L, 1708062A.L

Date: 8/23/17 (1526) - 8/30/17 (1328)



Test: 1708RT2B.C, 1708062A.C
 Date: 8/23/17(1524) - 8/30/17(1328)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 08, 2017

TEST DATE: August 09, 2017

TEST NUMBER: 1708072C.C

TEST MATERIAL: Station RW-SMB-2

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic


REFERENCE TOXICANT TEST: 1708RT2A.C

RESULT:

Survival
Reproduction

Pass, 0% effect
Pass, 6.56% effect

Rea Mara A Crinklaw

Analyst



Signature

Water Biologist II

Title
10/24/17

Date

Leslie Sidio

Supervisor


Signature

Laboratory Manager I

Title
10/31/17

Date

CETIS Summary Report

Report Date: 18 Oct-17 11:51 (p 1 of 1)
Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID:	20-8450-3606	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	09 Aug-17 14:50	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water						
Ending Date:	16 Aug-17 13:45	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 23h	Source:	In-House Culture	Age:	<8h 8/9/17 (0857-1424)						
Sample ID:	01-9493-3369	Code:	1382902	Client:	Watershed Protection Division						
Sample Date:	08 Aug-17 10:30	Material:	Stormwater Monitoring Sample	Project:	MS4						
Receive Date:	08 Aug-17 14:55	Source:	Stormwater (STORMWATER)								
Sample Age:	28h (12.3 °C)	Station:	RW-SMB-2								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	1382902	08 Aug-17 10:30	08 Aug-17 14:55	10 Aug-17 11:57	12.3						
2	1382902	08 Aug-17 10:30	08 Aug-17 14:55	11 Aug-17 11:52	12.3						
3	1382902	08 Aug-17 10:30	08 Aug-17 14:55	12 Aug-17 10:47	12.3						
4	1382902	08 Aug-17 10:30	08 Aug-17 14:55	13 Aug-17 11:22	12.3						
5	1382902	08 Aug-17 10:30	08 Aug-17 14:55	14 Aug-17 11:42	12.3						
6	1382902	08 Aug-17 10:30	08 Aug-17 14:55	15 Aug-17 12:45	12.3						
Batch Note: Batch: 1020; HBN: 28266											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
08-1517-2630	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
20-9424-9259	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
08-1517-2630	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
20-9424-9259	Reproduction	Control Resp	42.7	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	42.7	41.74	43.66	40	47	0.8172	2.584	6.05%	0.0%
100		10	39.9	37.61	42.19	29	47	1.941	6.136	15.38%	6.56%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	40	40	47	44	42	45	41	41	41	46
100		40	40	44	47	39	30	44	46	29	40

CETIS Analytical Report

Report Date: 18 Oct-17 11:51 (p 1 of 4)
Test Code: 1708072C.C | 06-6855-6923

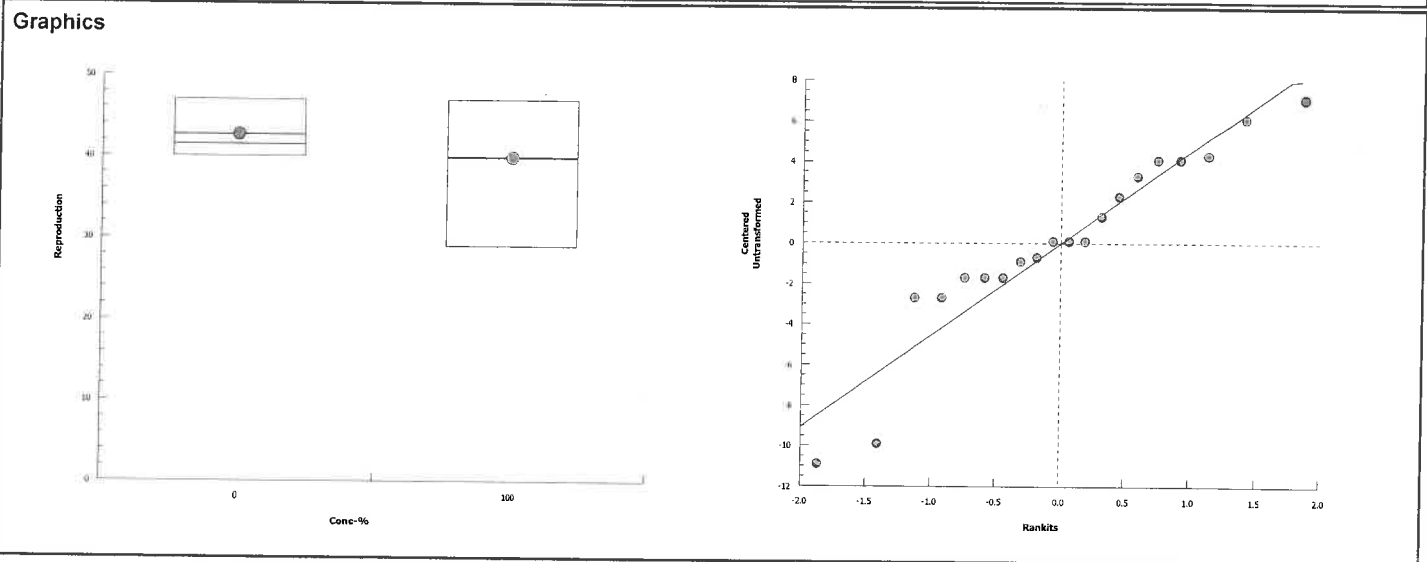
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 20-9424-9259		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 21 Aug-17 11:51		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 20-8450-3606		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 09 Aug-17 14:50		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 16 Aug-17 13:45		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: <8h		8/19/17 (0857-1424)					
Sample ID: 01-9493-3369		Code: 1382902		Client: Watershed Protection Division							
Sample Date: 08 Aug-17 10:30		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 08 Aug-17 14:55		Source: Stormwater (STORMWATER)									
Sample Age: 28h (12.3 °C)		Station: RW-SMB-2									
Batch Note: Batch: 1020; HBN: 28266											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	3.87	0.8791	10		0.0016	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	42.7	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.379	2.708	0.2051	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	39.2	39.2	1	1.768	0.2002	Non-Significant Effect					
Error	399	22.16667	18								
Total	438.2	61.36667	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	5.639	6.541	0.0167	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.916	0.866	0.0829	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	42.7	41.72	43.68	40	47	0.8172	2.584	6.05%	0.0%
100		10	39.9	37.57	42.23	29	47	1.941	6.136	15.38%	6.56%

CETIS Analytical Report

Report Date: 18 Oct-17 11:51 (p 2 of 4)
Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	20-9424-9259	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1
Analyzed:	21 Aug-17 11:51	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	40	40	47	44	42	45	41	41	41	46
100		40	40	44	47	39	30	44	46	29	40



CETIS Analytical Report

Report Date: 18 Oct-17 11:51 (p 3 of 4)
Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Analysis ID: 08-1517-2630	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Aug-17 11:51	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes

Batch ID: 20-8450-3606	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 09 Aug-17 14:50	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 16 Aug-17 13:45	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 23h	Source: In-House Culture	Age: <8h 8/19/17 (0857-1424)

Sample ID: 01-9493-3369	Code: 1382902	Client: Watershed Protection Division
Sample Date: 08 Aug-17 10:30	Material: Stormwater Monitoring Sample	Project: MS4
Receive Date: 08 Aug-17 14:55	Source: Stormwater (STORMWATER)	
Sample Age: 28h (12.3 °C)	Station: RW-SMB-2	

Batch Note: Batch: 1020; HBN: 28266

Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint

TST-Welch's t Test								
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)
Dilution Water		100*	0.2618				<0.2	Non-Significant Effect

Test Acceptability Criteria				
Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65540	<0.0001	Significant Effect
Error	0	0	18			
Total	0	0	19			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	65540	8.285	<0.0001	Unequal Variances

7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%

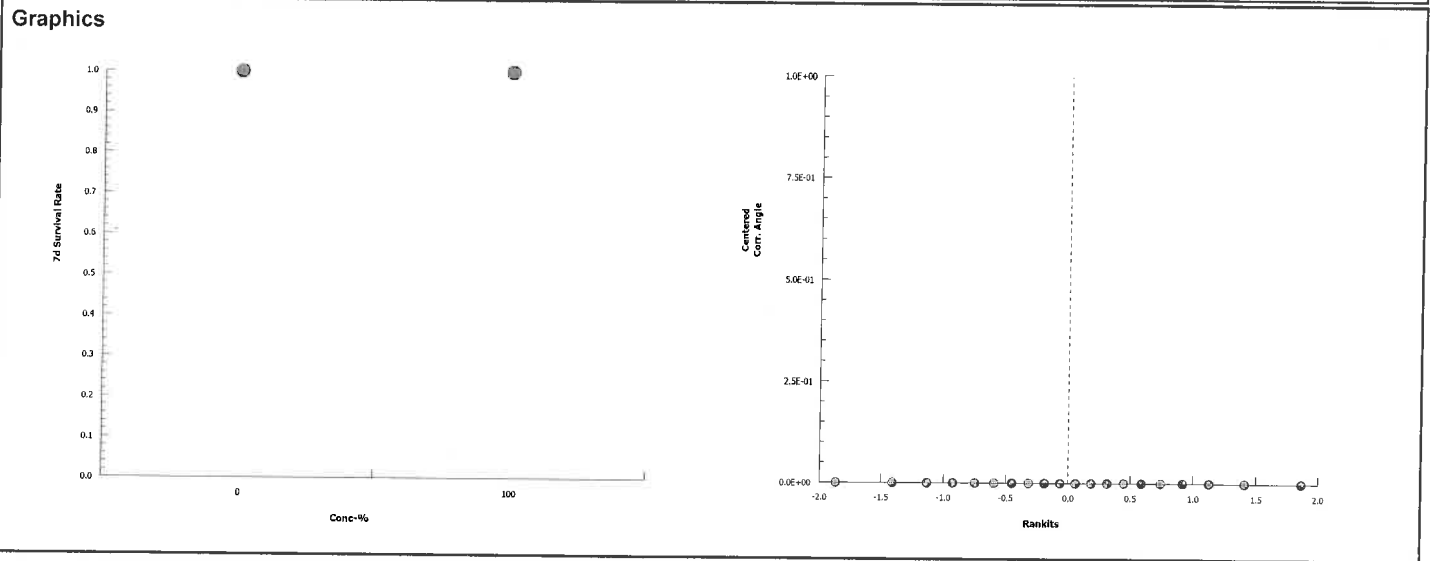
CETIS Analytical Report

Report Date: 18 Oct-17 11:51 (p 4 of 4)
 Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Analysis ID: 08-1517-2630	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Aug-17 11:51	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes

7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1



CETIS Test Data Worksheet

SMB

Report Date:

08 Aug-17 14:10 (p 1 of 1)

Test Code:

06-6855-6923/1708072C.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17 **1450**

Species: Ceriodaphnia dubia

Sample Code: 1

End Date: 16 Aug-17 **1345**

Protocol: EPA/821/R-02-013 (2002)

Sample Source: Stormwater

Sample Date: 08 Aug-17

Material: Stormwater Monitoring Sample

Sample Station: RW-SMB-2

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	7	14	0	19	40	
0	D	2		1	0	0	0	8	13	0	19	40	
0	D	3		1	0	0	0	7	0	17	23	47	
0	D	4		1	0	0	0	8	0	15	21	44	
0	D	5		1	0	0	0	8	0	14	20	42	
0	D	6		1	0	0	0	7	0	14	24	45	
0	D	7		1	0	0	0	6	0	14	21	41	
0	D	8		1	0	0	0	8	0	14	19	41	
0	D	9		1	0	0	0	4	0	15	22	41	
0	D	10		1	0	0	0	6	0	17	23	46	
100		1	19	1	0	0	0	6	0	13	21	46	40
100		2	20	1	0	0	0	6	0	13	21	46	40
100		3	35	1	0	0	0	7	0	15	22	51	44
100		4	25	1	0	0	0	7	16	0	24	4	47
100		5	17	1	0	0	0	4	0	14	21	39	
100		6	13	1	0	0	0	0	0	10	20	30	
100		7	40	1	0	0	0	7	0	13	24	44	
100		8	18	1	0	0	0	8	0	14	24	46	
100		9	26	1	0	0	0	3	0	9	17	29	
100		10	9	1	0	0	0	6	0	12	22	40	

8/9

8/10

8/11

8/12

8/13

8/14

8/15

8/16
count

Food Added: 1440 _{pc} 1125 _{pc} 1125 _{pc} 0957 _{pc} 1100 _{pc} 1123 _{pc} 1230 _{pc}

Transferred: 1450 _{pc} 1157 _{pc} 1152 _{pc} 1047 _{pc} 1122 _{pc} 1142 _{pc} 1245 _{pc}

pc

[Signature]

Shared control-5
See 1708072A.C for original data

CETIS Measurement Worksheet

SMB

Report Date: 08 Aug-17 14:10 (p 1 of 2)
Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17 Species: Ceriodaphnia dubia
End Date: 16 Aug-17 Protocol: EPA/821/R-02-013 (2002)
Sample Date: 08 Aug-17 Material: Stormwater Monitoring Sample

Sample Code: 1
Sample Source: Stormwater
Sample Station: RW-SMB-2

Alkalinity (CaCO3)-mg/L

Conc-%	Code	Reading 1
0	D	72
100		244
Measure Time: 1538		
Instrument ID: Titrate		
Analyst: RC		

8/14/17 16:08 RC
10/16/17

Conductivity-µmhos

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	342	349	345	348	355	365	370
100		1509	1458	1471	1479	1466	1493	1483
Measure Time:		1119	1041	1100	0936	1040	1110	1214
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		RC	RC	RC	RC	RC	RC	RC

Final Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.97	8.14	7.98	8.07	8.17	8.09	7.89
100		8.24	8.17	8.34	8.35	8.44	8.46	8.25
Measure Time:		1233	1230	1120	1158	1158	1332	1650
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		RC	RC	RC	RC	RC	RC	RC

Initial Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.35	8.35	8.33	8.24	8.48	8.33	8.52
100		9.58	9.79	9.39	9.64	9.49	9.48	9.12
Measure Time:		1119	1041	1100	0936	1040	1110	1214
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		RC	RC	RC	RC	RC	RC	RC

Hardness (CaCO3)-mg/L

Conc-%	Code	Reading 1
0	D	100
100		548
Measure Time: 1547		
Instrument ID: Titrate		
Analyst: RC		

8/14/17 16:08 RC
10/16/17

Final pH

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.18	8.18	8.25	8.24	8.30	8.23	8.29
100		8.33	8.35	8.55	8.38	8.45	8.43	8.57
Measure Time:		1233	1230	1120	1158	1158	1332	1650
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		RC	RC	RC	RC	RC	RC	RC

CETIS Measurement Worksheet

SMB

Report Date: 08 Aug-17 14:10 (p 2 of 2)
Test Code: 1708072C.C | 06-6855-6923

Ceriodaphnia 7-d Survival and Reproduction Test

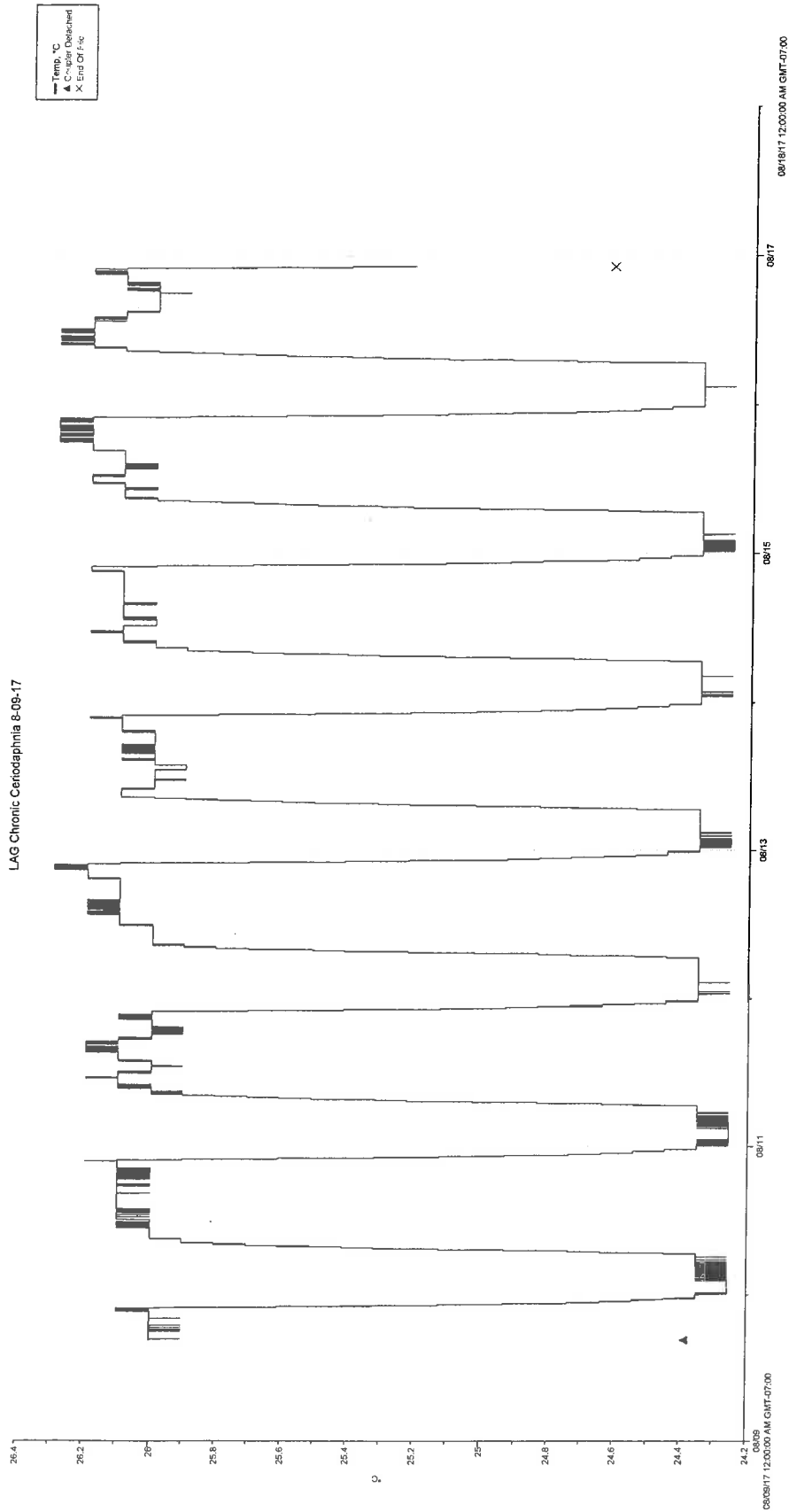
Hyperion Treatment Plant Laboratory

Start Date: 09 Aug-17 Species: Ceriodaphnia dubia Sample Code: 1
End Date: 16 Aug-17 Protocol: EPA/821/R-02-013 (2002) Sample Source: Stormwater
Sample Date: 08 Aug-17 Material: Stormwater Monitoring Sample Sample Station: RW-SMB-2

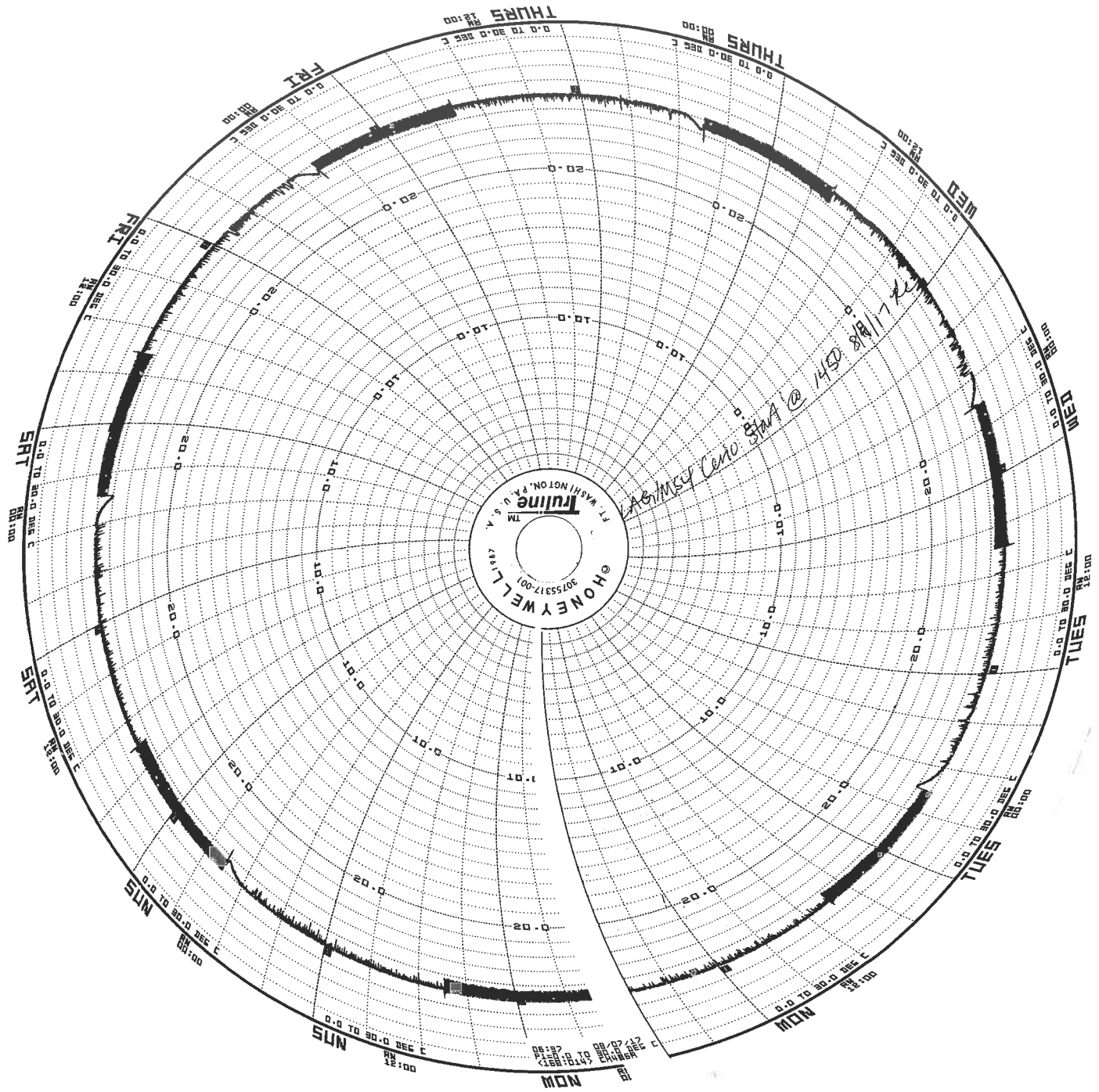
Initial pH		8/9	8/10	8/11	8/12	8/13	8/14	8/15
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.32	8.26	8.17	8.25	8.24	8.32	8.28
100		8.57	8.49	8.46	8.52	8.42	8.51	8.48
Measure Time:		1119	1041	1100	0936	1040	1110	1214
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		ke	ke	ke	ke	ke	ke	ke

Final Temperature-°C		8/10	8/11	8/12	8/13	8/14	8/15	8/16
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.8	25.1	24.9	24.9	24.2	24.9	25.0
100		24.7	24.7	24.6	24.8	24.1	24.7	24.6
Measure Time:		1233	1230	1120	1158	1158	1332	1050
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		ke	ke	ke	ke	ke	ke	ke

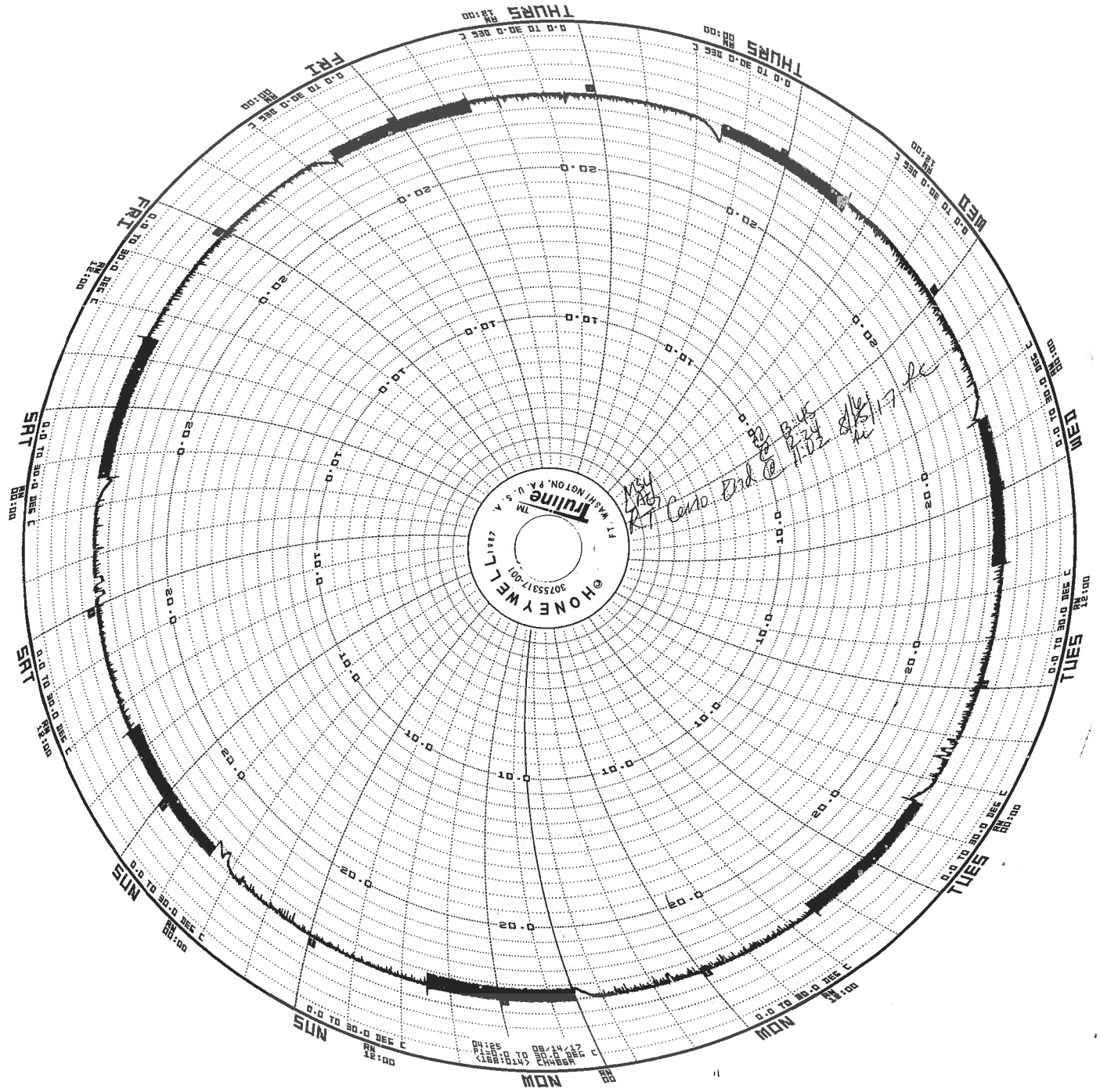
Initial Temperature-°C		8/9	8/10	8/11	8/12	8/13	8/14	8/15
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.8	24.7	24.5	24.5	24.7	24.8	24.7
100		24.4	24.0	24.4	24.5	24.2	24.4	24.7
Measure Time:		1119	1041	1100	0936	1040	1110	1214
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		ke	ke	ke	ke	ke	ke	ke



Test: 1708RT2A.C, 1708052A.C, 1708072A-C.C
Date: 8/9/17(1450) - 8/16/17(1345)



Test: 1708RT2A.C, 1708052A.C, 1708072A.C.C
 Date: 8/9/17 (1450) - 8/16/17 (1345)



Test: 1708RT 2A.C, 170805 2A.C, 170807 2A -C.C
 Date: 8/9/17(1450) - 8/16/17(1345)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: January 4, 2018

TEST DATE: January 4, 2018

TEST NUMBER: 1801RT2A.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic

RESULT:

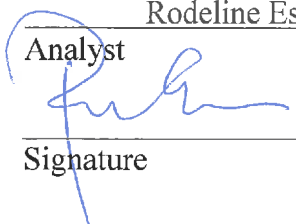
NOEC = 100 $\mu\text{g/L}$ (Survival)

EC₅₀ = 121.9 $\mu\text{g/L}$ (Survival)

NOEC = 50 $\mu\text{g/L}$ (Reproduction)

IC₂₅ = 59.2 $\mu\text{g/L}$ (Reproduction)

Rodeline Estiva

Analyst



Signature

Water Biologist II

Title
JANUARY 25, 2018

Date

Leslie Sidio

Supervisor


Signature

Laboratory Manager I

Title
3/1/18

Date

CETIS Summary Report

Report Date: 16 Jan-18 12:12 (p 1 of 2)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Batch ID: 16-0230-9047
Start Date: 04 Jan-18 13:10
Ending Date: 11 Jan-18 07:30
Duration: 6d 18h
Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)
Species: Ceriodaphnia dubia
Source: In-House Culture

Analyst: Rodeline Estiva
Diluent: Hard Synthetic Water
Brine:
Age: 48 hr RE 3/11/2018

Sample ID: 16-2424-6612
Sample Date: 04 Jan-18 07:30
Receive Date: 04 Jan-18 07:30
Sample Age: 6h
Code: 60D00954
Material: Copper chloride
Source: Reference Toxicant
Station:

Client: Donald C. Tillman WRP
Project: NPDES

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	05 Jan-18 09:50	
2	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	06 Jan-18 10:00	
3	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	07 Jan-18 11:36	
4	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	08 Jan-18 10:00	
5	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	09 Jan-18 09:00	
6	Cu RT	04 Jan-18 07:30	04 Jan-18 07:30	10 Jan-18 09:10	

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-7106-1910	7d Survival Rate	100	200	141.4	N/A		Fisher Exact/Bonferroni-Holm Test
14-2393-8948	Reproduction	50	100	70.71	18.6%		Steel Many-One Rank Test
03-5438-8774		50	100	70.71	11.9%		Bonferroni Adj t Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
05-5922-1635	7d Survival Rate	EC5	52.23	2.674	101.8		Linear Interpolation (ICPIN)
		EC10	59.5	50	105.5		
		EC15	67.77	54.55	109.3		
		EC20	77.17	59.5	113.3		
		EC25	87.85	63.5	117.4		
		EC40	110.4	77.17	130.6		
		EC50	121.9	87.85	140.2		
03-9405-5395	Reproduction	IC5	34.72	1.681	51.2		Linear Interpolation (ICPIN)
		IC10	50.6	6.187	53.87		
		IC15	53.33	41.64	56.68		
		IC20	56.2	51.45	59.63		
		IC25	59.22	54.33	62.73		
		IC40	69.27	64.17	73.42		
		IC50	76.88	71.33	81.68		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
05-5922-1635	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
15-7106-1910	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
03-5438-8774	Reproduction	Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria
03-9405-5395	Reproduction	Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria
14-2393-8948	Reproduction	Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria
03-5438-8774	Reproduction	PMSD	0.1188	0.13 - 0.47	Yes	Below Acceptability Criteria
14-2393-8948	Reproduction	PMSD	0.186	0.13 - 0.47	Yes	Passes Acceptability Criteria

OK, min
PMSD
is 13%.
RE lizz18

CETIS Summary Report

Report Date: 16 Jan-18 12:12 (p 2 of 2)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

7d Survival Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	10.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	0.7	0.5196	0.8804	0	1	0.1528	0.483	69.01%	30.0%
200		10	0	0	0	0	0	0	0		100.0%

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.4	36.2	40.6	28	44	1.863	5.892	15.34%	0.0%
12.5		10	36.4	31.58	41.22	0	43	4.083	12.91	35.47%	5.21%
25		10	39.2	37.74	40.66	33	44	1.236	3.91	9.98%	-2.08%
50		10	35	33.74	36.26	30	40	1.065	3.367	9.62%	8.85%
100		10	9.5	7.453	11.55	2	18	1.734	5.482	57.71%	75.26%
200		10	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		0	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	0	1	0	1	1	1	0
200		0	0	0	0	0	0	0	0	0	0

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	44	42	40	38	42	44	28	35	42	29
12.5		0	37	42	42	43	39	41	41	39	40
25		41	37	44	36	38	33	42	35	44	42
50		31	37	39	30	34	36	32	37	40	34
100		9	18	5	2	12	2	14	15	11	7
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 1 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 14-2393-8948	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 11 Jan-18 8:26	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 16-0230-9047	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 04 Jan-18 13:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 11 Jan-18 07:30	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age:
Sample ID: 16-2424-6612	Code: 60D00954	Client: Donald C. Tillman WRP
Sample Date: 04 Jan-18 07:30	Material: Copper chloride	Project: NPDES
Receive Date: 04 Jan-18 07:30	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.71		18.6%

Steel Many-One Rank Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water		12.5	101.5	76	18	2	0.7024	Non-Significant Effect
		25	105	76	18	5	0.8000	Non-Significant Effect
		50	82.5	76	18	1	0.1302	Non-Significant Effect
		100*	55	76	18	0	0.0003	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.186	0.13 - 0.47	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	5.287	3.128	<0.0001	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6269.6	1567.4	4	30.36	<0.0001	Significant Effect
Error	2322.9	51.62	45			
Total	8592.5	1619.02	49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	21.53	13.28	0.0002	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.7258	0.9367	<0.0001	Non-normal Distribution

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.4	36.16	40.64	28	44	1.863	5.892	15.34%	0.0%
12.5		10	36.4	31.49	41.31	0	43	4.083	12.91	35.47%	5.21%
25		10	39.2	37.71	40.69	33	44	1.236	3.91	9.98%	-2.08%
50		10	35	33.72	36.28	30	40	1.065	3.367	9.62%	8.85%
100		10	9.5	7.415	11.59	2	18	1.734	5.482	57.71%	75.26%
200		10	0	0	0	0	0	0	0		100.0%

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 2 of 4)
 Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

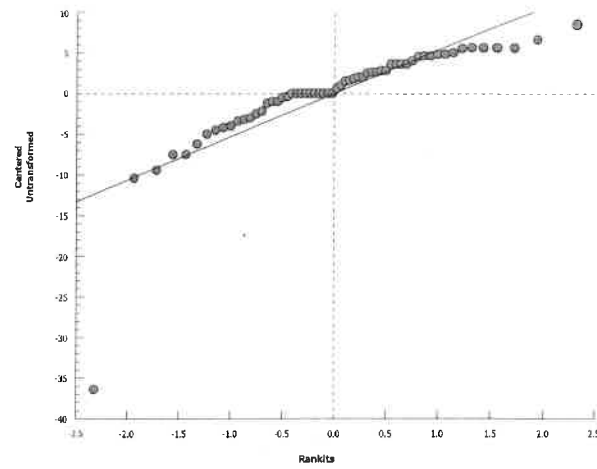
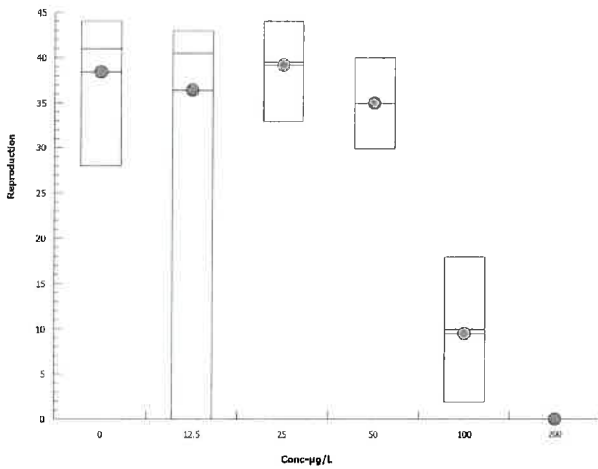
Analysis ID: 14-2393-8948
 Analyzed: 11 Jan-18 8:26
 Endpoint: Reproduction
 Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.1
 Official Results: Yes

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	44	42	40	38	42	44	28	35	42	29
12.5		0	37	42	42	43	39	41	41	39	40
25		41	37	44	36	38	33	42	35	44	42
50		31	37	39	30	34	36	32	37	40	34
100		9	18	5	2	12	2	14	15	11	7
200		0	0	0	0	0	0	0	0	0	0

Graphics



Ideal concentration-response relationship.
 Re 11/25/2018.

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 3 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 03-5438-8774	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 11 Jan-18 8:26	Analysis: Parametric-Multiple Comparison	Official Results: Yes
Batch ID: 16-0230-9047	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 04 Jan-18 13:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 11 Jan-18 07:30	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age:
Sample ID: 16-2424-6612	Code: 60D00954	Client: Donald C. Tillman WRP
Sample Date: 04 Jan-18 07:30	Material: Copper chloride	Project: NPDES
Receive Date: 04 Jan-18 07:30	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.71		11.9%

Bonferroni Adj t Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		12.5	-1.012	2.321	17	4.689	1.0000	Non-Significant Effect
		25	-0.4068	2.321	18	4.564	1.0000	Non-Significant Effect
		50	1.729	2.321	18	4.564	0.1816	Non-Significant Effect
		100*	14.7	2.321	18	4.564	<0.0001	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.1188	0.13 - 0.47	Yes	Below Acceptability Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6716.38	1679.095	4	86.84	<0.0001	Significant Effect
Error	850.7222	19.3346	44			
Total	7567.102	1698.43	48			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	10.8	13.28	0.0289	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9738	0.9356	0.3405	Normal Distribution

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.4	36.16	40.64	28	44	1.863	5.892	15.34%	0.0%
12.5		9	40.44	39.73	41.16	37	43	0.6261	1.878	4.64%	-5.32%
25		10	39.2	37.71	40.69	33	44	1.236	3.91	9.98%	-2.08%
50		10	35	33.72	36.28	30	40	1.065	3.367	9.62%	8.85%
100		10	9.5	7.415	11.59	2	18	1.734	5.482	57.71%	75.26%
200		10	0	0	0	0	0	0	0		100.0%

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 4 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

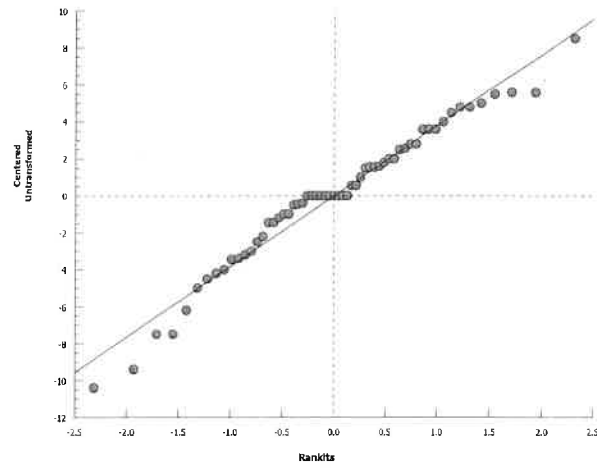
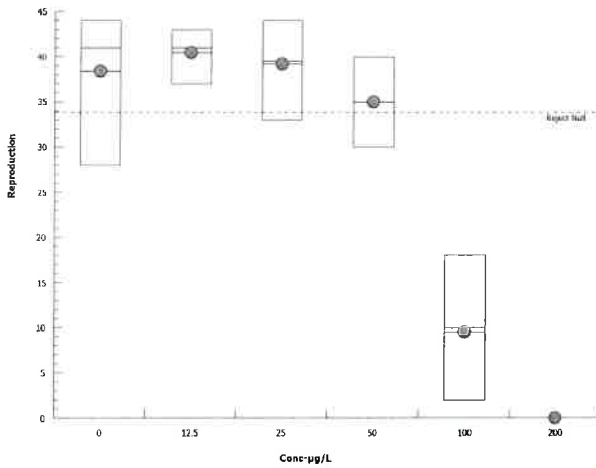
Analysis ID: 03-5438-8774
Analyzed: 11 Jan-18 8:26
Endpoint: Reproduction
Analysis: Parametric-Multiple Comparison

CETIS Version: CETISv1.8.1
Official Results: Yes

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	44	42	40	38	42	44	28	35	42	29
12.5		Outlier	37	42	42	43	39	41	41	39	40
25		41	37	44	36	38	33	42	35	44	42
50		31	37	39	30	34	36	32	37	40	34
100		9	18	5	2	12	2	14	15	11	7
200		0	0	0	0	0	0	0	0	0	0

Graphics



Ideal concentration-response relationship.
PE 1/22/2018

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 1 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID:	05-5922-1635	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1
Analyzed:	11 Jan-18 8:26	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	16-0230-9047	Test Type:	Reproduction-Survival (7d)	Analyst:	Rodeline Estiva
Start Date:	04 Jan-18 13:10	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water
Ending Date:	11 Jan-18 07:30	Species:	Ceriodaphnia dubia	Brine:	
Duration:	6d 18h	Source:	In-House Culture	Age:	
Sample ID:	16-2424-6612	Code:	60D00954	Client:	Donald C. Tillman WRP
Sample Date:	04 Jan-18 07:30	Material:	Copper chloride	Project:	NPDES
Receive Date:	04 Jan-18 07:30	Source:	Reference Toxicant		
Sample Age:	6h	Station:			

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	804076861	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	52.23	2.674	101.8
EC10	59.5	50	105.5
EC15	67.77	54.55	109.3
EC20	77.17	59.5	113.3
EC25	87.85	63.5	117.4
EC40	110.4	77.17	130.6
EC50	121.9	87.85	140.2

7d Survival Rate Summary

Calculated Variate(A/B)

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	0.7	0	1	0.1528	0.483	69.01%	30.0%	7	10
200		10	0	0	0	0	0		100.0%	0	10

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		0	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	0	1	0	1	1	1	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 2 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

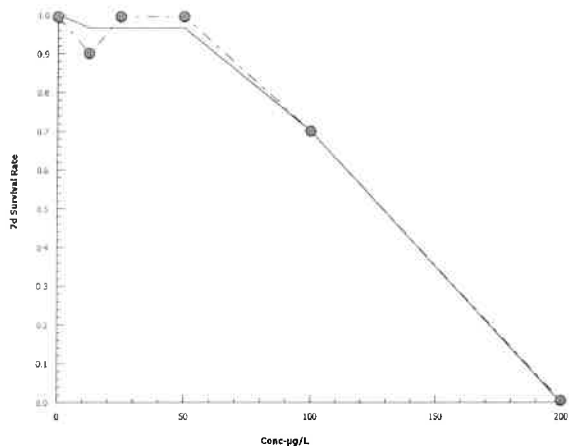
Hyperion Treatment Plant Laboratory

Analysis ID: 05-5922-1635
Analyzed: 11 Jan-18 8:26

Endpoint: 7d Survival Rate
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



significant effect at the highest concentration.
Re 11/22/2018,

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 3 of 4)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Analysis ID: 03-9405-5395	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 11 Jan-18 8:26	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 16-0230-9047	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 04 Jan-18 13:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 11 Jan-18 07:30	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age:
Sample ID: 16-2424-6612	Code: 60D00954	Client: Donald C. Tillman WRP
Sample Date: 04 Jan-18 07:30	Material: Copper chloride	Project: NPDES
Receive Date: 04 Jan-18 07:30	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	290427797	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	38.4	15 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	34.72	1.681	51.2
IC10	50.6	6.187	53.87
IC15	53.33	41.64	56.68
IC20	56.2	51.45	59.63
IC25	59.22	54.33	62.73
IC40	69.27	64.17	73.42
IC50	76.88	71.33	81.68

Reproduction Summary

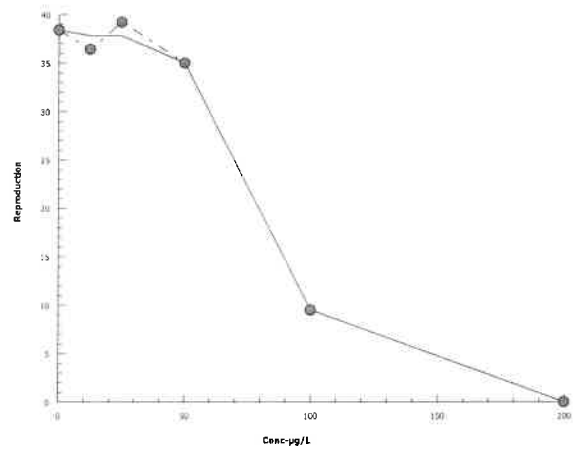
		Calculated Variate							
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.4	28	44	1.863	5.892	15.34%	0.0%
12.5		10	36.4	0	43	4.083	12.91	35.47%	5.21%
25		10	39.2	33	44	1.236	3.91	9.98%	-2.08%
50		10	35	30	40	1.065	3.367	9.62%	8.85%
100		10	9.5	2	18	1.734	5.482	57.71%	75.26%
200		10	0	0	0	0	0		100.0%

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	44	42	40	38	42	44	28	35	42	29
12.5		0	37	42	42	43	39	41	41	39	40
25		41	37	44	36	38	33	42	35	44	42
50		31	37	39	30	34	36	32	37	40	34
100		9	18	5	2	12	2	14	15	11	7
200		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test		Hyperion Treatment Plant Laboratory
Analysis ID: 03-9405-5395	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 11 Jan-18 8:26	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Graphics



Ideal concentration-response relationship,
Re 1/25/2018.

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 1 of 2)

Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 15-7106-1910	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 11 Jan-18 8:25	Analysis: STP 2x2 Contingency Tables	Official Results: Yes
Batch ID: 16-0230-9047	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 04 Jan-18 13:10	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 11 Jan-18 07:30	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age:
Sample ID: 16-2424-6612	Code: 60D00954	Client: Donald C. Tillman WRP
Sample Date: 04 Jan-18 07:30	Material: Copper chloride	Project: NPDES
Receive Date: 04 Jan-18 07:30	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1034, HBN 36431

Test Note: Concentration-response for survival shows significant effect at the highest concentration and for reproduction is ideal. 1/16/2018 RE

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU
Untransformed		C > T	Not Run	100	200	141.4	

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)
Dilution Water		12.5	0.5	1.0000	Non-Significant Effect
		25	1	1.0000	Non-Significant Effect
		50	1	1.0000	Non-Significant Effect
		100	0.1053	0.4211	Non-Significant Effect
		200	5.41E-06	<0.0001	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Data Summary

Conc-µg/L	Control Type	No-Resp	Resp	Total
0	Dilution Water	10	0	10
12.5		9	1	10
25		10	0	10
50		10	0	10
100		7	3	10
200		0	10	10

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		0	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	0	1	0	1	1	1	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 16 Jan-18 11:55 (p 2 of 2)
Test Code: 1801RT2A.C | 17-7500-8361

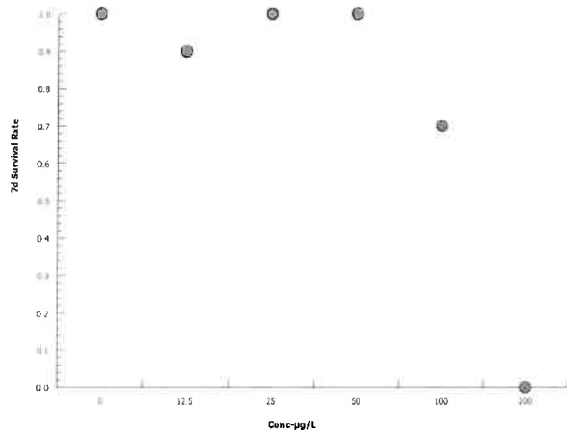
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 15-7106-1910 Endpoint: 7d Survival Rate
Analyzed: 11 Jan-18 8:25 Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

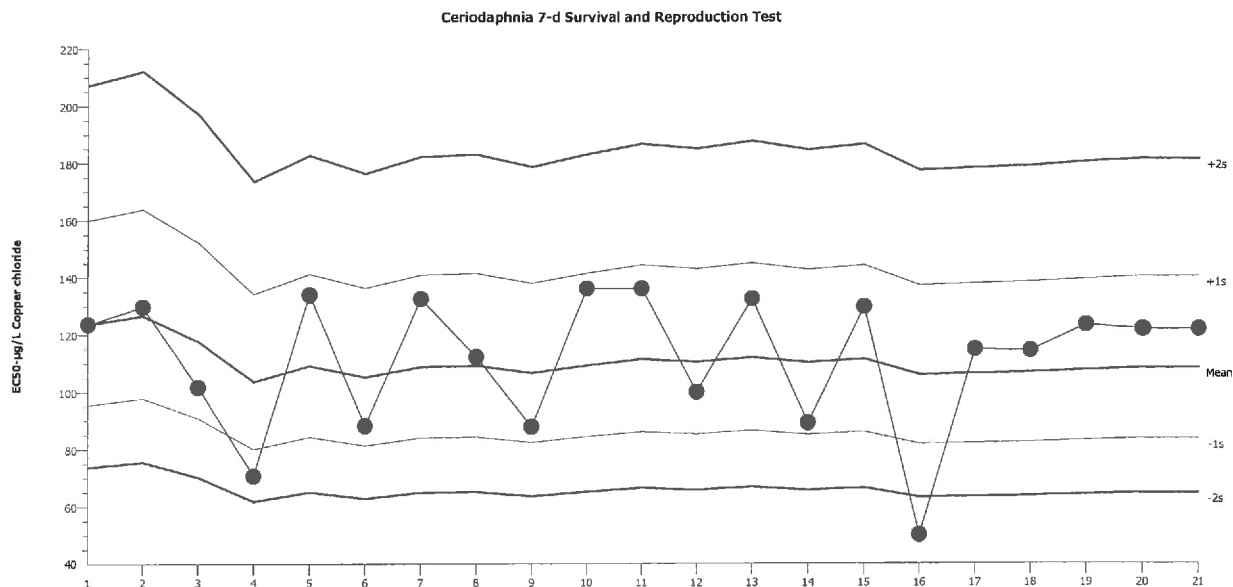
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 108.4

Count: 20

-1s Warning Limit: 83.74

-2s Action Limit: 64.68

Sigma: N/A

CV: 29.50%

+1s Warning Limit: 140.3

+2s Action Limit: 181.7

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Feb	18	123.6	15.22	0.5087			08-3683-2844	13-1421-5523
2		Mar	7	129.7	21.32	0.6952			03-8131-3022	08-3988-9211
3		Apr	4	101.8	-6.666	-0.2458			20-8785-7541	14-5275-7464
4		Jul	28	70.77	-37.65	-1.652	(-)		11-3245-2063	20-4501-7131
5		Aug	31	134	25.6	0.8211			04-2198-2948	19-3434-0384
6		Dec	16	88.2	-20.22	-0.7993			05-9377-8224	02-8710-1182
7	2017	Mar	30	132.6	24.16	0.7792			20-5811-5356	10-6838-6662
8		May	10	112.3	3.856	0.1354			04-6904-8294	00-0571-6326
9			25	87.85	-20.56	-0.8145			16-2272-5797	20-6787-6120
10		Jun	6	136.1	27.72	0.8817			00-1105-6011	07-1957-9297
11			22	136.1	27.72	0.8817			10-7002-0112	10-9615-6318
12		Jul	12	100	-8.419	-0.3131			13-9476-5989	08-1211-5310
13			27	132.6	24.16	0.7792			00-3533-4104	07-3102-4627
14		Aug	9	89.13	-19.29	-0.7588			05-1646-5416	02-7143-5836
15			23	129.7	21.32	0.6952			18-0928-7994	14-9065-9379
16		Sep	6	50	-58.42	-2.998	(-)	(-)	04-1283-5528	07-2201-0667
17			20	114.9	6.485	0.225			09-2547-5700	02-6449-6736
18		Oct	18	114.5	6.043	0.2101			14-7896-4665	17-5474-2245
19		Nov	15	123.5	15.05	0.5034			09-2671-6353	07-5336-3496
20		Dec	13	121.9	13.53	0.4554			19-3949-3034	10-6518-1710
21	2018	Jan	4	121.9	13.53	0.4554			17-7500-8361	05-5922-1635

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

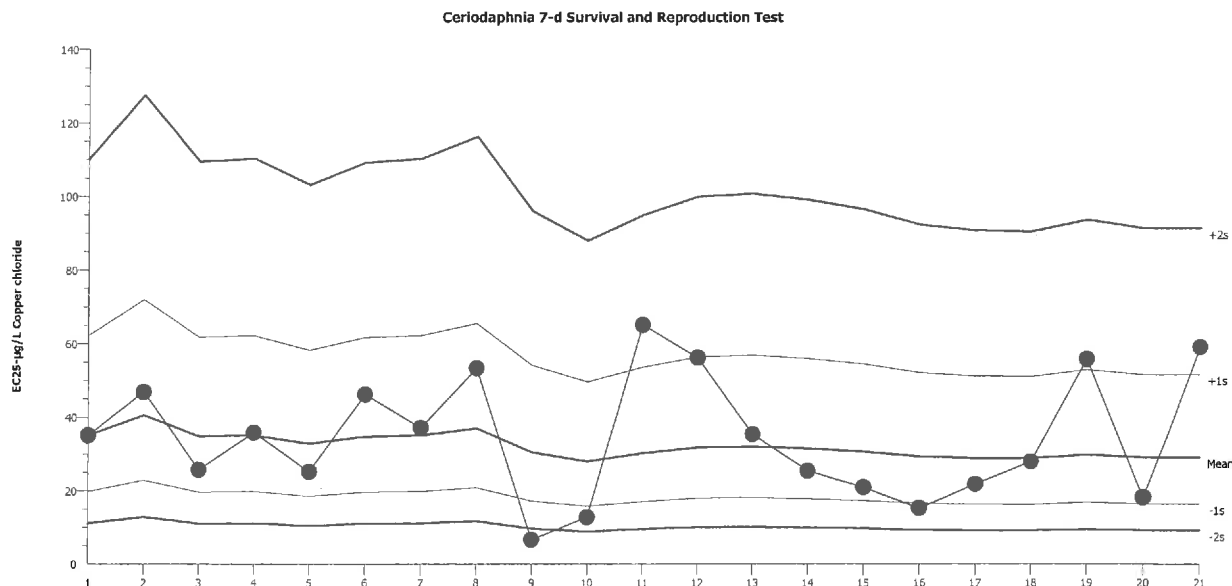
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 29.17

Count: 20

-1s Warning Limit: 16.45

-2s Action Limit: 9.275

Sigma: N/A

CV: 77.30%

+1s Warning Limit: 51.7

+2s Action Limit: 91.66

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Feb	18	35.1	5.93	0.3232			08-3683-2844	04-0850-8624
2		Mar	7	46.92	17.75	0.83			03-8131-3022	11-6058-4627
3		Apr	4	25.73	-3.438	-0.219			20-8785-7541	21-2139-2262
4		Jul	28	35.91	6.746	0.3633			11-3245-2063	13-6804-5542
5		Aug	31	25.21	-3.957	-0.2546			04-2198-2948	01-9086-3175
6		Dec	16	46.2	17.04	0.8033			05-9377-8224	05-6497-3539
7	2017	Mar	30	37.14	7.972	0.4219			20-5811-5356	06-6352-3022
8		May	10	53.41	24.25	1.057	(+)		04-6904-8294	08-3814-7144
9			25	6.656	-22.51	-2.58	(-)	(-)	16-2272-5797	04-1379-9830
10		Jun	6	12.78	-16.38	-1.441	(-)		00-1105-6011	17-2178-2673
11			22	65.16	35.99	1.404	(+)		10-7002-0112	00-8698-9715
12		Jul	12	56.24	27.08	1.147	(+)		13-9476-5989	15-6562-8470
13			27	35.41	6.248	0.3389			00-3533-4104	15-5816-8081
14		Aug	9	25.45	-3.718	-0.2381			05-1646-5416	12-8828-7274
15			23	20.93	-8.234	-0.5792			18-0928-7994	01-4455-3838
16		Sep	6	15.28	-13.89	-1.129	(-)		04-1283-5528	07-4663-1403
17			20	21.83	-7.337	-0.506			09-2547-5700	05-2225-6686
18		Oct	18	27.98	-1.187	-0.07256			14-7896-4665	10-2719-4408
19		Nov	15	55.96	26.8	1.138	(+)		09-2671-6353	12-1707-6477
20		Dec	13	18.28	-10.88	-0.8155			19-3949-3034	15-1089-9957
21	2018	Jan	4	59.22	30.05	1.237	(+)		17-7500-8361	03-9405-5395

CETIS Test Data Worksheet

Report Date: 02 Jan-18 13:43 (p 1 of 2)
Test Code: 17-7500-8361/1801RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 04 Jan-18
End Date: 11 Jan-18
Sample Date: 04 Jan-18
Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Copper chloride

Sample Code: 60D00954
Sample Source: Reference Toxicant
Sample Station:

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	6		0	0	0	0	15	0	23	44	
0	D	2	23		0	0	0	0	0	0	19	42	
0	D	3	16		0	0	0	0	0	0	20	40	
0	D	4	14		0	0	0	0	0	0	20	38	
0	D	5	15		0	0	0	0	0	0	20	42	
0	D	6	58		0	0	0	0	0	0	20	44	
0	D	7	9		0	0	0	0	0	0	20	28	
0	D	8	3		0	0	0	0	0	0	20	35	
0	D	9	21		0	0	0	0	0	0	20	42	
0	D	10	7		0	0	0	0	0	0	20	29	
12.5		1	60		0	0	0	0	0	0	0	0	
12.5		2	32		0	0	0	0	0	0	0	37	
12.5		3	24		0	0	0	0	0	0	0	42	
12.5		4	26		0	0	0	0	0	0	0	42	
12.5		5	48		0	0	0	0	0	0	0	43	
12.5		6	22		0	0	0	0	0	0	0	33	
12.5		7	43		0	0	0	0	0	0	0	41	
12.5		8	18		0	0	0	0	0	0	0	41	
12.5		9	39		0	0	0	0	0	0	0	39	
12.5		10	19		0	0	0	0	0	0	0	40	
25		1	36		0	0	0	0	0	0	0	41	
25		2	51		0	0	0	0	0	0	0	37	
25		3	8		0	0	0	0	0	0	0	44	
25		4	47		0	0	0	0	0	0	0	36	
25		5	41		0	0	0	0	0	0	0	38	
25		6	37		0	0	0	0	0	0	0	33	
25		7	29		0	0	0	0	0	0	0	42	
25		8	57		0	0	0	0	0	0	0	35	
25		9	50		0	0	0	0	0	0	0	44	
25		10	2		0	0	0	0	0	0	0	42	
50		1	42		0	0	0	0	0	0	0	31	
50		2	49		0	0	0	0	0	0	0	37	
50		3	53		0	0	0	0	0	0	0	39	
50		4	20		0	0	0	0	0	0	0	30	
50		5	59		0	0	0	0	0	0	0	34	
50		6	54		0	0	0	0	0	0	0	36	
50		7	40		0	0	0	0	0	0	0	32	
50		8	13		0	0	0	0	0	0	0	37	
50		9	55		0	0	0	0	0	0	0	40	
50		10	46		0	0	0	0	0	0	0	34	
100		1	56		0	0	0	0	0	0	0	39	
100		2	38		0	0	0	0	0	0	0	18	
100		3	11		0	0	0	0	0	0	0	5	
100		4	35		0	0	0	0	0	0	0	2	
100		5	52		0	0	0	0	0	0	0	12	
100		6	45		0	0	0	0	0	0	0	2	
100		7	10		0	0	0	0	0	0	0	14	

Set up @ 9:25 AM, RD 1/4/2018

RT

CETIS Test Data Worksheet

Report Date:

02 Jan-18 13:43 (p 2 of 2)

Test Code:

17-7500-8361/1801RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	31	1	0	0	0	0	4	3	8	15	
100		9	27	1	0	0	0	0	3	0	8	11	
100		10	44	1	0	0	0	4	0	3	X	7	
200		1	5	1	0 X	X	X	X	X	X	X	0	
200		2	4	1	0	0 X	X	X	X	X	X	0	
200		3	12	1	0	0 X	X	X	X	X	X	0	
200		4	34	1	0	0 X	X	X	X	X	X	0	
200		5	1	1	0 X	X	X	X	X	X	X	0	
200		6	30	1	0 X	X	X	X	X	X	X	0	
200		7	28	1	0 X	X	X	X	X	X	X	0	
200		8	25	1	0 X	X	X	X	X	X	X	0	
200		9	33	1	0 X	X	X	X	X	X	X	0	
200		10	17	1	0	0	0 X	X	X	X	X	0	

114/18
1310
RE

1/5

1/6

1/7

1/8

1/9

1/10

1/11
RE
7:30AM

fed :

1245
RE

930
RE

945
RE

1053
RE

930
RE

840
RE

830
RE

transfer :

950
RE

1000
RE

1136
RE

1000
RE

900
RE

910
RE

RE

RE

CETIS Measurement Worksheet

Report Date: 02 Jan-18 13:43 (p 1 of 2)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 04 Jan-18 Species: Ceriodaphnia dubia Sample Code: 60D00954
End Date: 11 Jan-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
Sample Date: 04 Jan-18 Material: Copper chloride Sample Station:

Alkalinity (CaCO₃)-mg/L 1110
Conc-µg/L Code Reading 1
0 D 112
200 114
Measure Time: 1400
Instrument ID: TITRATE
Analyst: RE

Conductivity-µmhos 11418 115 116 1.7 118 119 110
Conc-µg/L Code Reading 1 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
0 D 619 601 610 569 619 593 598
12.5 619 596 620 578 623 606 607
25 619 595 622 577 622 606 606
50 619 593 622 577 621 606 604
100 620 592 622 559 600 586 590
200 616 565 620 — — — —
Measure Time: 1140 915 930 1057 935 830 810
Instrument ID: #2 #2 #2 1 #2 #2 #2
Analyst: RE RE RE OL RE RE RE

Final Dissolved Oxygen-mg/L 115 116 1.7 118 119 110 111
Conc-µg/L Code Reading 1 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
0 D 7.44 7.37 7.28 7.56 7.38 7.52 7.26
12.5 7.45 7.45 7.52 7.53 7.47 7.58 7.56
25 7.48 7.44 7.53 7.55 7.46 7.61 7.59
50 7.49 7.42 7.52 7.52 7.39 7.64 7.58
100 7.51 7.46 7.52 7.50 7.53 7.66 7.65
200 7.56 7.45 AE — — — —
Measure Time: 1000 1055 1202 1030 920 935 855
Instrument ID: #4 #4 4 #4 #4 #4 #4
Analyst: RE RE OL RE RE RE RE

Initial Dissolved Oxygen-mg/L 11418 115 116 1.7 118 119 110
Conc-µg/L Code Reading 1 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
0 D 7.38 7.50 7.56 7.60 7.59 7.60 7.71
12.5 7.43 7.49 7.60 7.57 7.60 7.60 7.74
25 7.44 7.47 7.62 7.56 7.60 7.59 7.75
50 7.47 7.46 7.67 7.56 7.61 7.58 7.75
100 7.49 7.47 7.65 7.54 7.60 7.55 7.73
200 7.52 7.47 7.68 — — — —
Measure Time: 1140 915 930 1057 940 830 810
Instrument ID: #4 #4 #4 4 #4 #4 #4
Analyst: RE RE RE OL RE RE RE

Hardness (CaCO₃)-mg/L 1110
Conc-µg/L Code Reading 1
0 D 170
200 176
Measure Time: 1400
Instrument ID: TITRATE
Analyst: RE

CETIS Measurement Worksheet



Report Date: 02 Jan-18 13:43 (p 2 of 2)
Test Code: 1801RT2A.C | 17-7500-8361

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 04 Jan-18
End Date: 11 Jan-18
Sample Date: 04 Jan-18

Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Copper chloride

Sample Code: 60D00954
Sample Source: Reference Toxicant
Sample Station:

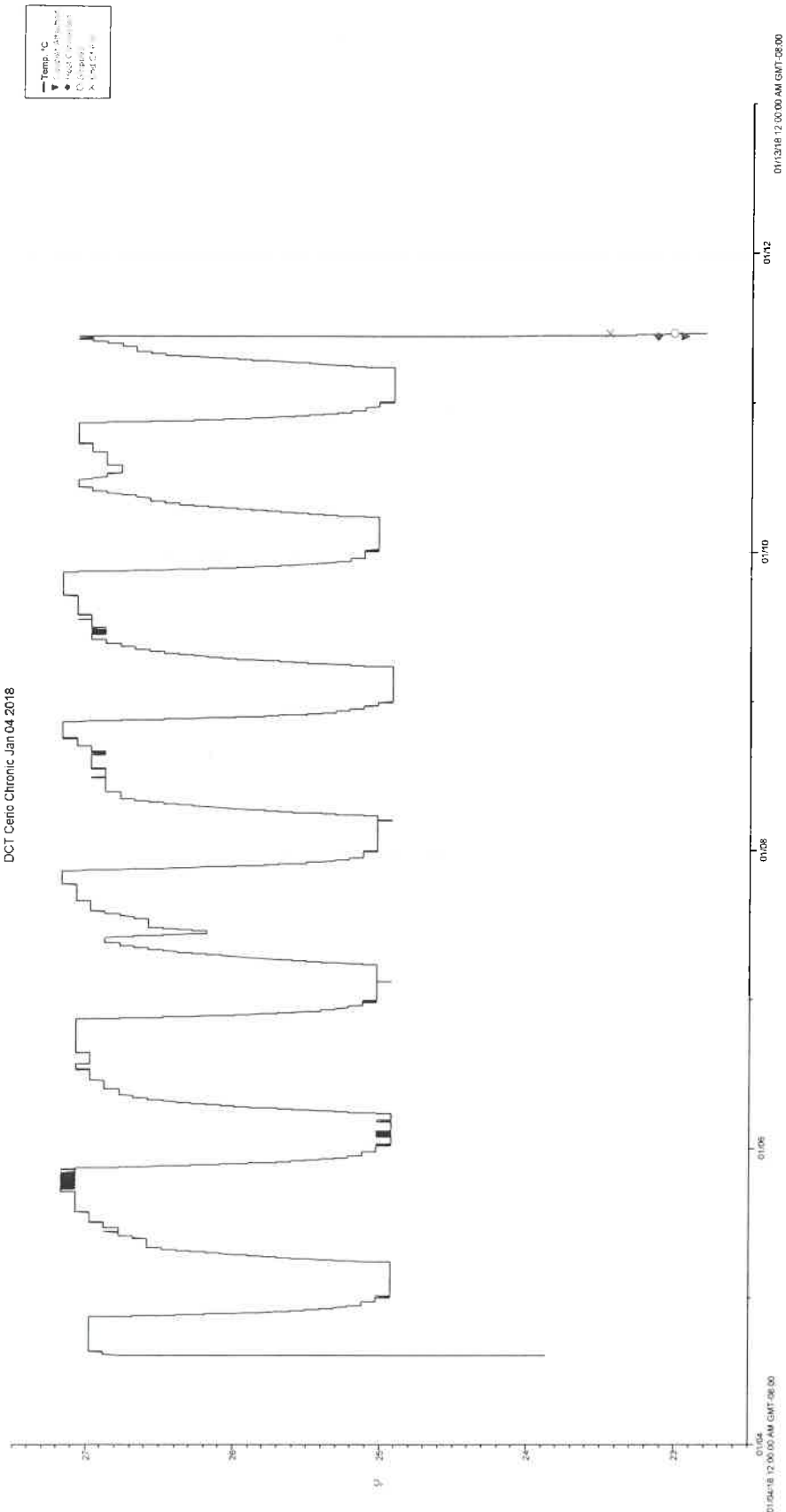
Final pH		115	116	1-7	118	119	1110	1111
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.35	8.35	7.80	8.38	8.40	8.32	8.20
12.5		8.36	8.38	7.88	8.37	8.41	8.33	8.25
25		8.38	8.38	7.91	8.38	8.40	8.32	8.26
50		8.38	8.37	7.90	8.37	8.37	8.32	8.26
100		8.37	8.37	7.92	8.39	8.40	8.36	8.28
200		8.38	8.38	AE	—	—	—	—
Measure Time:		1000	1055	1202	1030	920	935	1110 855
Instrument ID:		#4	#4	1	#4	#4	#4	#4
Analyst:		RE	RE	RE	RE	RE	RE	RE

Initial pH		114118	115	116	1-7	118	119	1110
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.06	8.24	8.42	7.80	8.47	8.45	8.39
12.5		8.15	8.29	8.43	7.78	8.46	8.44	8.39
25		8.20	8.31	8.43	7.79	8.45	8.44	8.38
50		8.23	8.32	8.42	7.82	8.47	8.44	8.38
100		8.26	8.32	8.42	7.83	8.47	8.44	8.38
200		8.26	8.33	8.41	—	—	—	—
Measure Time:		1140	915	930	1057	935	830	810
Instrument ID:		#4	#4	#4	1	#4	#4	#4
Analyst:		RE	RE	RE	RE	RE	RE	RE

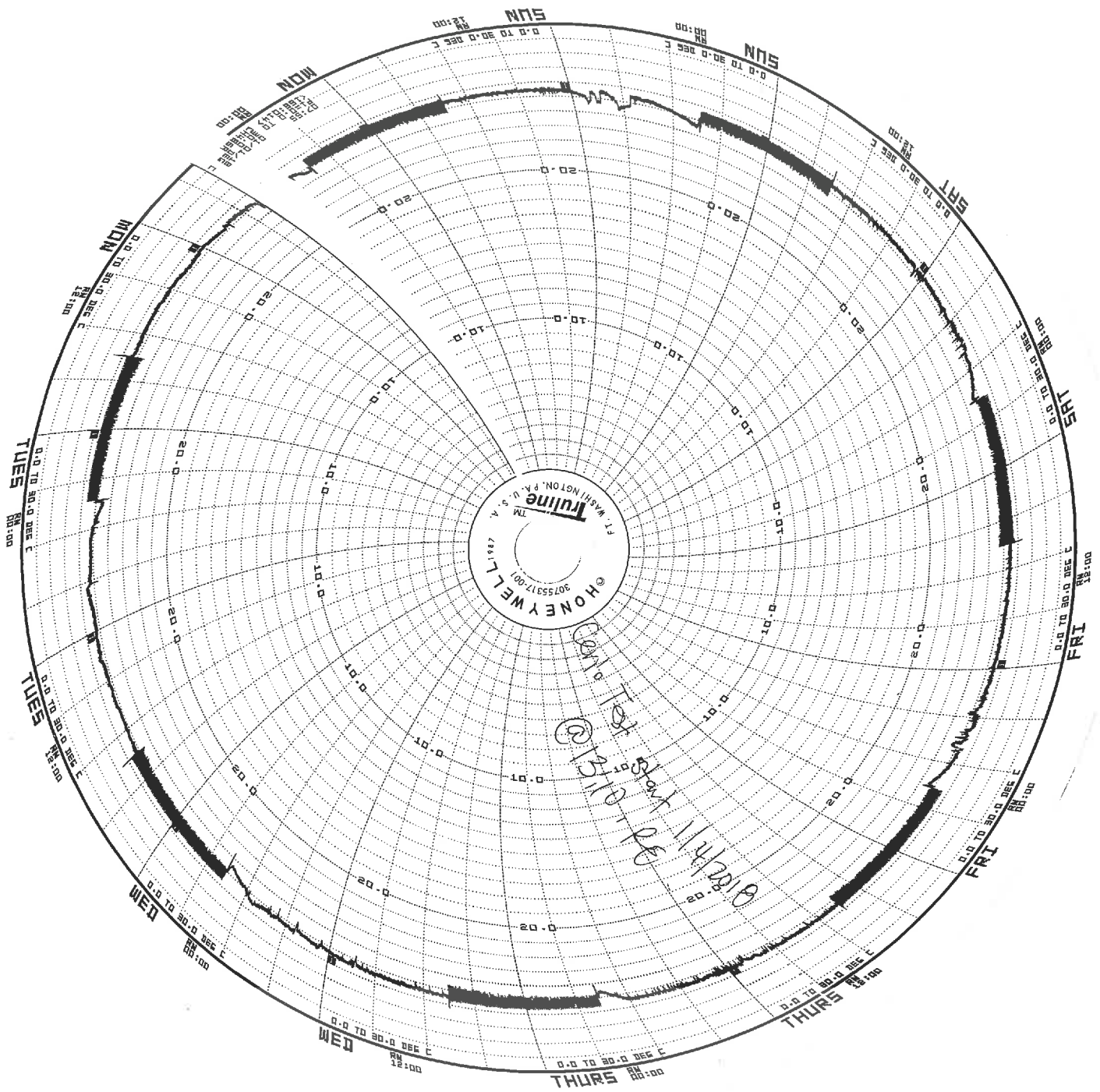
Final Temperature-°C		115	116	1-7	118	119118	1110	1111
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.1	25.1	25.1	25.5	25.3	25.2	25.1
12.5		25.2	25.0	24.8	25.3	25.1	25.0	25.2
25		24.9	25.0	24.8	25.4	25.2	25.2	25.1
50		24.8	24.9	24.8	25.4	25.2	25.1	25.1
100		24.9	24.9	24.8	25.4	25.0	25.1	25.1
200		24.9	24.7	AE	—	—	—	—
Measure Time:		1000	1055	1020 AE 1030	1030	920	935	855
Instrument ID:		#4	#4	1	#4	#4	#4	#4
Analyst:		RE	RE	RE	RE	RE	RE	RE

Initial Temperature-°C		114118	115	116	1-7	118	119	1110
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.9	24.8	25.2	25.3	25.2	25.1	24.8
12.5		25.1	25.1	25.2	25.1	25.2	25.2	25.0
25		25.1	25.0	25.2	25.0	25.2	25.1	24.9
50		25.0	24.9	25.1	24.7	25.1	25.1	24.8
100		25.0	24.8	25.0	24.4	24.8	24.8	24.7
200		25.0	24.6	25.0	—	—	—	—
Measure Time:		1140	915	930	1057	935	830	810
Instrument ID:		#4	#4	#4	1	#4	#4	#4
Analyst:		RE	RE	RE	RE	RE	RE	RE

DCT Cerio Chronic Jan 04 2018

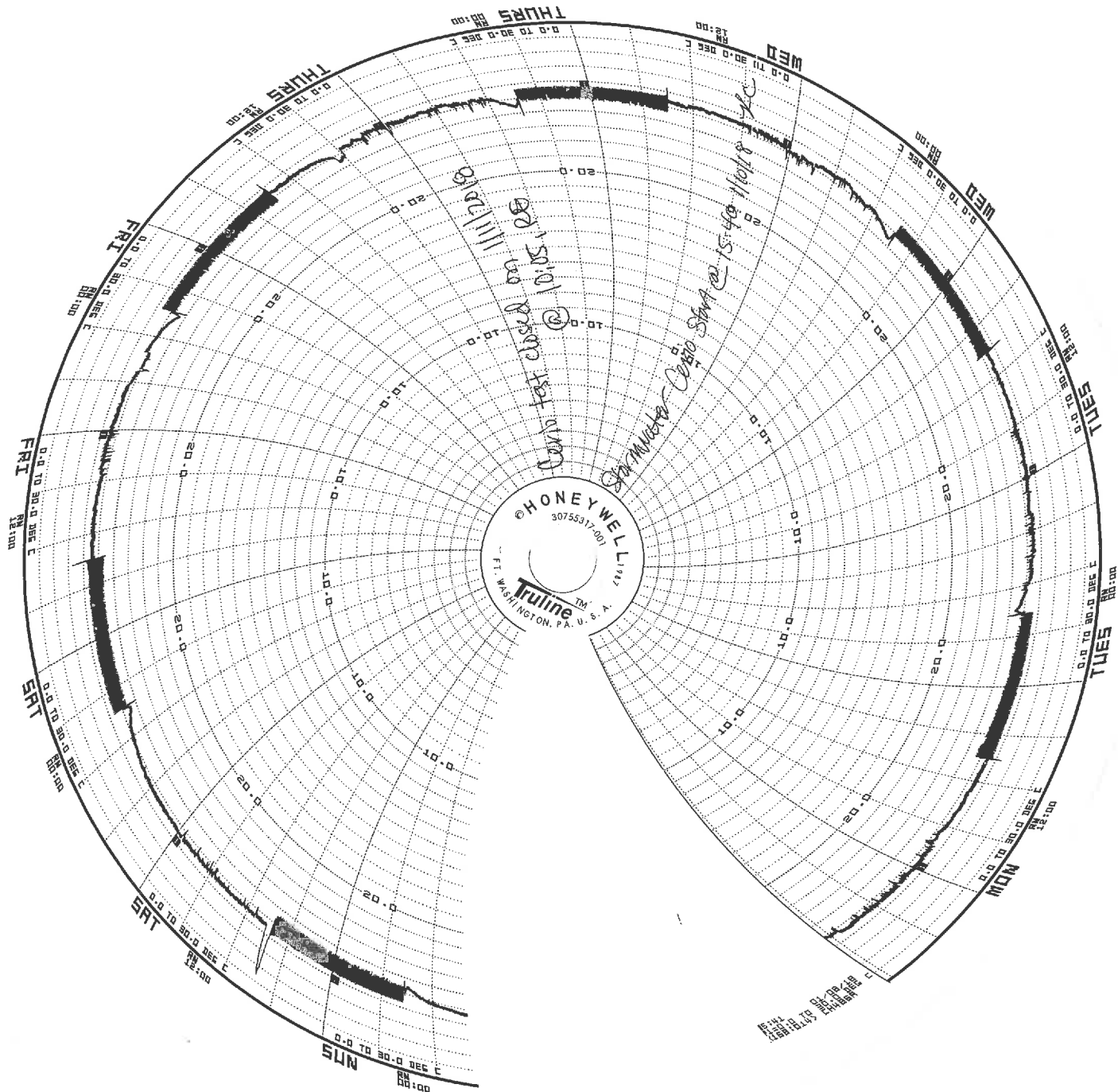


Ceriodaphnia Chronic Toxicity Test,
Test start: Thursday, Jan 4, 2018
Test end: Thursday, Jan 11, 2018



Cenidaphnia Chronic Toxicity Test,
 Test start: Thursday, Jan 4, 2018
 Test end: Thursday, Jan 11, 2018
 RT - 1801RT2A.C
 DCT - 1801062A.C

pg 1 of 2



pg 2 of 2

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: January 09, 2018

TEST DATE: January 10, 2018

TEST NUMBER: 1801072G.C

TEST MATERIAL: Station RW-SMB-2

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1801RT2A.C

RESULT:

Survival

Pass, -11.1% effect

Reproduction

Pass, 3.93% effect

Rea Mara A Crinklaw

Analyst

Rea Mara A Crinklaw

Signature

Water Biologist III

Title

2/23/18

Date

Leslie Sidio

Supervisor

Leslie Sidio

Signature

Laboratory Manager I

Title

4/19/18

Date

CETIS Summary Report

Report Date: 23 Feb-18 11:37 (p 1 of 1)
Test Code: 1801072G.C | 05-3970-0738

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID:	20-7201-0750	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	10 Jan-18 15:40	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water						
Ending Date:	17 Jan-18 07:58	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 16h	Source:	In-House Culture	Age:	<8h 1/10/18(0843-1427)						
Sample ID:	10-1217-7432	Code:	1548307	Client:	Watershed Protection Division						
Sample Date:	09 Jan-18 05:00	Material:	Stormwater Monitoring Sample	Project:	MS4						
Receive Date:	09 Jan-18 14:00	Source:	Stormwater (STORMWATER)	Batch: 1049, HBN: 40195							
Sample Age:	35h (13.3 °C)	Station:	RW-SMB-2								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	1548307	09 Jan-18 05:00	09 Jan-18 14:00	11 Jan-18 13:54	13.3						
2	1548307	09 Jan-18 05:00	09 Jan-18 14:00	12 Jan-18 14:33	13.3						
3	1548307	09 Jan-18 05:00	09 Jan-18 14:00	13 Jan-18 16:20	13.3						
4	1548307	09 Jan-18 05:00	09 Jan-18 14:00	14 Jan-18 13:56	13.3						
5	1548307	09 Jan-18 05:00	09 Jan-18 14:00	15 Jan-18 15:00	13.3						
6	1548307	09 Jan-18 05:00	09 Jan-18 14:00	16 Jan-18 11:45	13.3						
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
09-4861-1232	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
17-8190-7865	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
09-4861-1232	7d Survival Rate	Control Resp	0.9	0.8 - NL	Yes	Passes Acceptability Criteria					
17-8190-7865	Reproduction	Control Resp	37.89	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	-11.11%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	37.89	34.44	41.34	18	49	3.08	9.239	24.38%	0.0%
100		10	36.4	34.49	38.31	30	45	1.621	5.125	14.08%	3.93%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	0	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	42	35	40	49	18	42	45	30		40
100		31	32	33	45	42	30	39	35	41	36

CETIS Analytical Report

Report Date: 23 Feb-18 11:37 (p 1 of 4)
 Test Code: 1801072G.C | 05-3970-0738

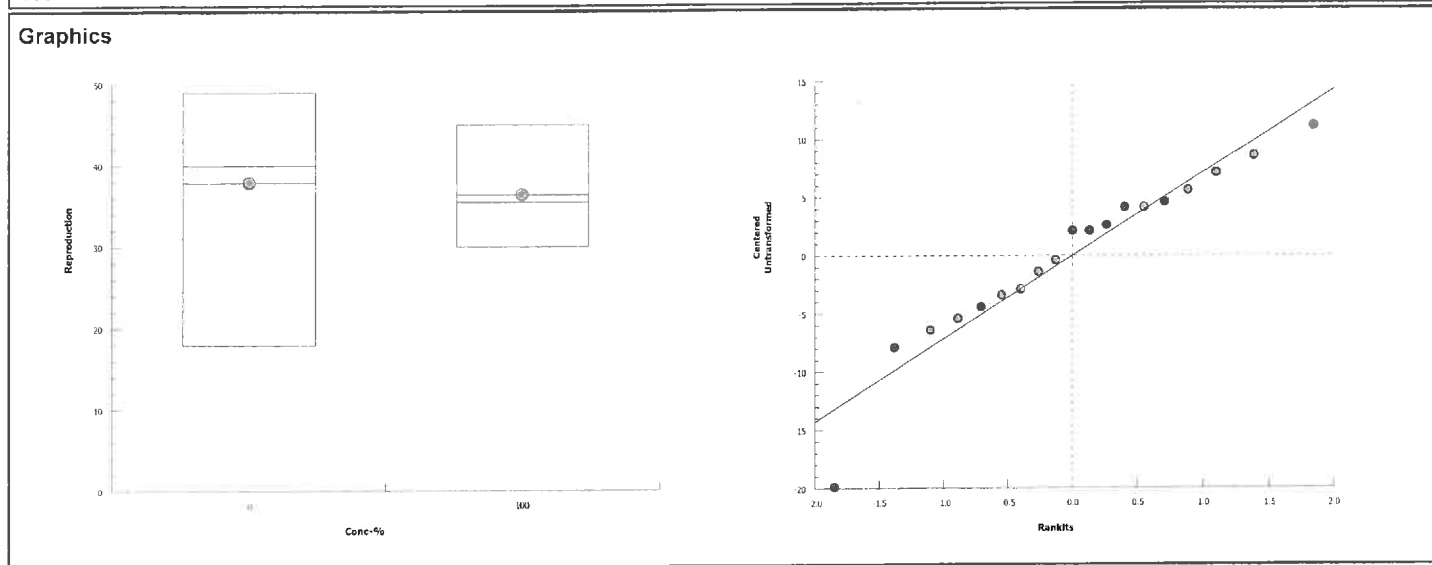
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 17-8190-7865	Endpoint: Reproduction	CETIS Version: CETISv1.8.1		Official Results: Yes							
Analyzed: 22 Jan-18 9:17	Analysis: Parametric Bioequivalence-Two Sample										
Batch ID: 20-7201-0750	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw		Diluent: Mod-Hard Synthetic Water							
Start Date: 10 Jan-18 15:40	Protocol: EPA/821/R-02-013 (2002)	Brine:		Age: <8h 1/10/18 (0843-1427)							
Ending Date: 17 Jan-18 07:58	Species: Ceriodaphnia dubia										
Duration: 6d 16h	Source: In-House Culture										
Sample ID: 10-1217-7432	Code: 1548307	Client: Watershed Protection Division		Project: MS4							
Sample Date: 09 Jan-18 05:00	Material: Stormwater Monitoring Sample										
Receive Date: 09 Jan-18 14:00	Source: Stormwater (STORMWATER)										
Sample Age: 35h (13.3 °C)	Station: RW-SMB-2										
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	2.829	0.8681	14		0.0067	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	37.89	15 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	10.50058	10.50058	1	0.1942	0.6650	Non-Significant Effect					
Error	919.2889	54.07582	17								
Total	929.7895	64.5764	18								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	3.25	6.693	0.0983	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9379	0.8605	0.2413	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	37.89	34.37	41.4	18	49	3.08	9.239	24.38%	0.0%
100		10	36.4	34.45	38.35	30	45	1.621	5.125	14.08%	3.93%

CETIS Analytical Report

Report Date: 23 Feb-18 11:37 (p 2 of 4)
 Test Code: 1801072G.C | 05-3970-0738

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	17-8190-7865	Endpoint:	Reproduction			CETIS Version:	CETISv1.8.1				
Analyzed:	22 Jan-18 9:17	Analysis:	Parametric Bioequivalence-Two Sample			Official Results:	Yes				

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	42	35	40	49	18	42	45	30	Outlier	40
100		31	32	33	45	42	30	39	35	41	36



CETIS Analytical Report

Report Date: 23 Feb-18 11:37 (p 3 of 4)
 Test Code: 1801072G.C | 05-3970-0738

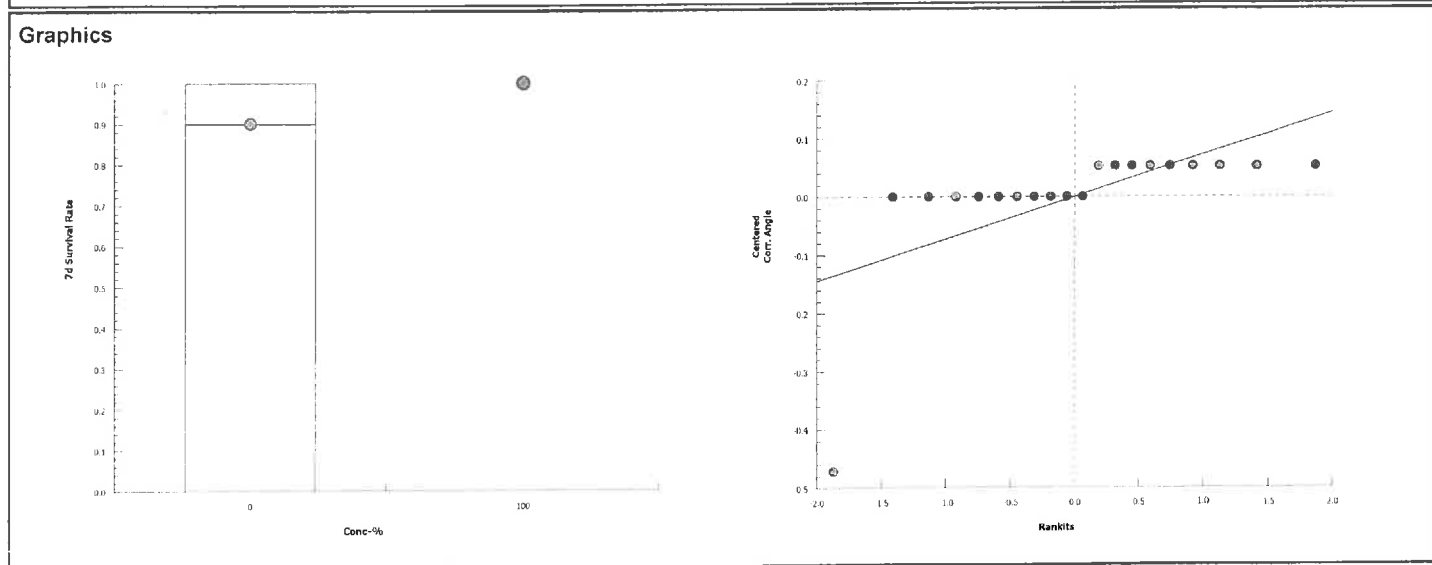
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 09-4861-1232		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 22 Jan-18 9:17		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 20-7201-0750		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 10 Jan-18 15:40		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 17 Jan-18 07:58		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 16h		Source: In-House Culture		Age: <8h 1/10/18 (0843-1427)							
Sample ID: 10-1217-7432		Code: 1548307		Client: Watershed Protection Division							
Sample Date: 09 Jan-18 05:00		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 09 Jan-18 14:00		Source: Stormwater (STORMWATER)									
Sample Age: 35h (13.3 °C)		Station: RW-SMB-2									
Data Transform		Zeta	Alt Hyp	MC Trials	TST b	Test Result					
Angular (Corrected)		0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint					
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	7.667	0.8834	9		<0.0001	Non-Significant Effect			
Test Acceptability Criteria											
Attribute		Test Stat	TAC Limits	Overlap	Decision						
Control Resp		0.9	0.8 - NL	Yes	Passes Acceptability Criteria						
ANOVA Table											
Source		Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Between		0.01370778	0.01370778	1	1	0.3306	Non-Significant Effect				
Error		0.2467401	0.01370778	18							
Total		0.2604479	0.02741557	19							
Distributional Tests											
Attribute		Test	Test Stat	Critical	P-Value	Decision(α:1%)					
Variances		Mod Levene Equality of Variance	1	8.285	0.3306	Equal Variances					
Distribution		Shapiro-Wilk W Normality	0.4049	0.866	<0.0001	Non-normal Distribution					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.9	0.7797	1	0	1	0.1	0.3162	35.14%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	-11.11%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.9948	0.9319	1.058	0.5236	1.047	0.05236	0.1656	16.64%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	-5.26%

CETIS Analytical Report

Report Date: 23 Feb-18 11:37 (p 4 of 4)
 Test Code: 1801072G.C | 05-3970-0738

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	09-4861-1232	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1	
Analyzed:	22 Jan-18 9:17	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes	

7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	0	1
100		1	1	1	1	1	1	1	1	1	1



CETIS Test Data Worksheet

Report Date: 10 Jan-18 10:58 (p 1 of 1)
Test Code: 05-3970-0738/1801072G.C

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory			
Start Date:	10 Jan-18	1540	Species:	Ceriodaphnia dubia	Sample Code:	3C549A18					
End Date:	17 Jan-18	0758	Protocol:	EPA/821/R-02-013 (2002)	Sample Source:	Stormwater					
Sample Date:	09 Jan-18		Material:	Stormwater Monitoring Sample	Sample Station:	RW-SMB-2					

See 1801072F.C

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	8	13	0	21	42	
0	D	2		1	0	0	0	6	11	0	18	35	
0	D	3		1	0	0	0	7	14	0	19	40	
0	D	4		1	0	0	0	9	0	16	24	49	
0	D	5		1	0	0	0	0	7	0	11	18	
0	D	6		1	0	0	0	8	14	0	20	42	
0	D	7		1	0	0	0	8	14	0	23	45	
0	D	8		1	0	0	0	4	0	12	14	30	
0	D	9		1	0	X	X	X	X	X	X	0	
0	D	10		1	0	0	0	3	16	0	21	40	
100		1	41	1	0	0	0	5	8	0	18	31	
100		2	36	1	0	0	0	7	13	0	12	32	
100		3	42	1	0	0	0	6	11	0	16	33	
100		4	33	1	0	0	0	8	13	0	24	45	
100		5	23	1	0	0	0	7	13	0	22	42	
100		6	34	1	0	0	0	5	9	0	16	30	
100		7	31	1	0	0	0	7	13	0	19	39	
100		8	50	1	0	0	0	6	12	17	0	35	
100		9	32	1	0	0	0	7	12	0	22	41	
100		10	39	1	0	0	0	5	12	0	19	36	
				1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1	

Food Added: 1433 1240 1413 1604 1319 1429 1120
Re Re Re Re Re Re Re

Transferred: 1540 1354 1433 1620 1356 1500 1145
Re Re Re Re Re Re Re

End
0758
Re

Re 2/25/18

CETIS Measurement Worksheet

Report Date: 10 Jan-18 11:09 (p 1 of 2)
Test Code: 1801072G.C | 05-3970-0738

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory	
Start Date: 10 Jan-18		Species: Ceriodaphnia dubia		Sample Code: 3C549A18			
End Date: 17 Jan-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater			
Sample Date: 09 Jan-18		Material: Stormwater Monitoring Sample		Sample Station: RW-SMB-2			

Alkalinity (CaCO ₃)-mg/L							
Conc.-%	Code	Reading 1					
0	D	AE - not measured					
100		40					
Measure Time:		1343					
Instrument ID:		Titrate					
Analyst:		PC					

Conductivity-µmhos								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	314	317	319	325	325	323	334
100		215	216	218	219	219	230	220
Measure Time:		1323	1207	1339	1530	1251	1332	1054
Instrument ID:		#4	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC

Final Dissolved Oxygen-mg/L								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	6.75	7.43	7.57	7.46	7.16	7.10	7.17
100		7.31	7.48	7.34	7.36	7.44	7.37	7.41
Measure Time:		1455	1510	1638	2234	1530	1250	1000
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		PC	PC	PC	PC	PC	PC	PC

Initial Dissolved Oxygen-mg/L								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.49	7.13	7.00	7.00	7.06	7.45	7.32
100		7.37	7.31	7.09	7.60	7.48	8.02	8.50
Measure Time:		1323	1207	1339	1530	1251	1332	1054
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		PC	PC	PC	PC	PC	PC	PC

Hardness (CaCO ₃)-mg/L		
Conc.-%	Code	Reading 1
0	D	AE - not measured
100		76
Measure Time:		1343
Instrument ID:		Titrate
Analyst:		PC

Final pH								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.91	7.83	8.10	8.10	7.97	7.89	7.98
100		7.65	7.58	7.63	7.70	7.60	7.55	7.58
Measure Time:		1455	1510	1638	2234	1332	1250	1000
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		PC	PC	PC	PC	PC	PC	PC

1530

PC 1/15/18

CETIS Measurement Worksheet

Report Date: 10 Jan-18 11:09 (p 2 of 2)
 Test Code: 1801072G.C | 05-3970-0738

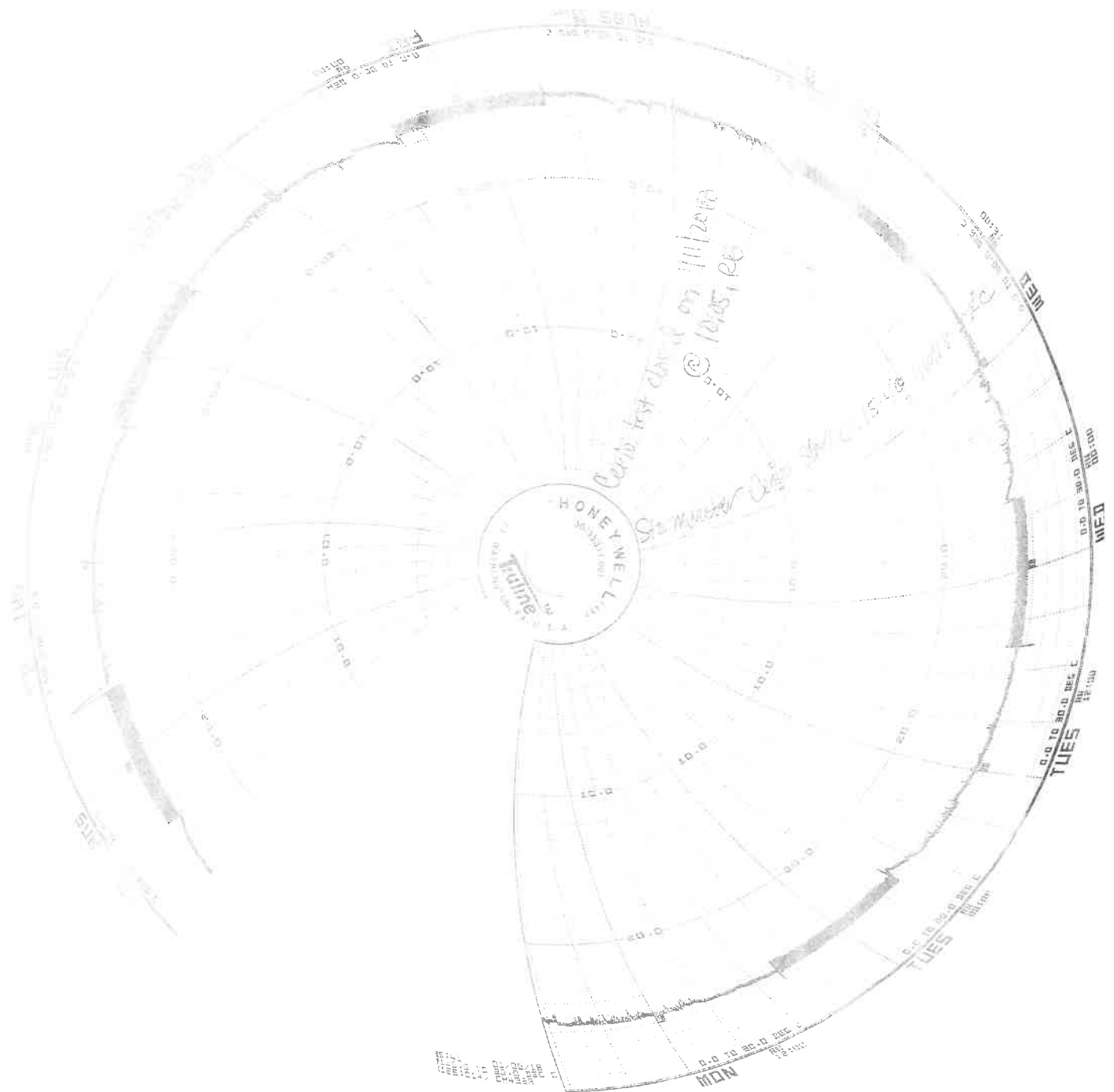
Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory			
Start Date:		10 Jan-18		Species:		Ceriodaphnia dubia		Sample Code:		3C549A18	
End Date:		17 Jan-18		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Stormwater	
Sample Date:		09 Jan-18		Material:		Stormwater Monitoring Sample		Sample Station:		RW-SMB-2	

Initial pH		1/10		1/11		1/12		1/13		1/14		1/15		1/16	
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7							
0	D	7.75	8.03	8.01	8.15	8.10	8.09	7.99							
100		7.42	7.30	7.17	7.21	7.30	7.20	7.17							
Measure Time:		1323	1207	1339	1530	1251	1332	1054							
Instrument ID:		#4	#4	#4	#4	#4	#4	#4							
Analyst:		fc	fc	fc	fc	fc	fc	fc							

Final Temperature-°C		1/11		1/12		1/13		1/14		1/15		1/16		1/17	
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7							
0	D	25.4	25.3	24.9	24.1	25.4	25.3	25.1							
100		25.3	25.2	24.8	24.3	25.0	25.1	25.1							
Measure Time:		1455	1510	1638	1234	1530	1250	1500							
Instrument ID:		#4	#4	#4	#4	#4	#4	#4							
Analyst:		fc	fc	fc	fc	fc	fc	fc							

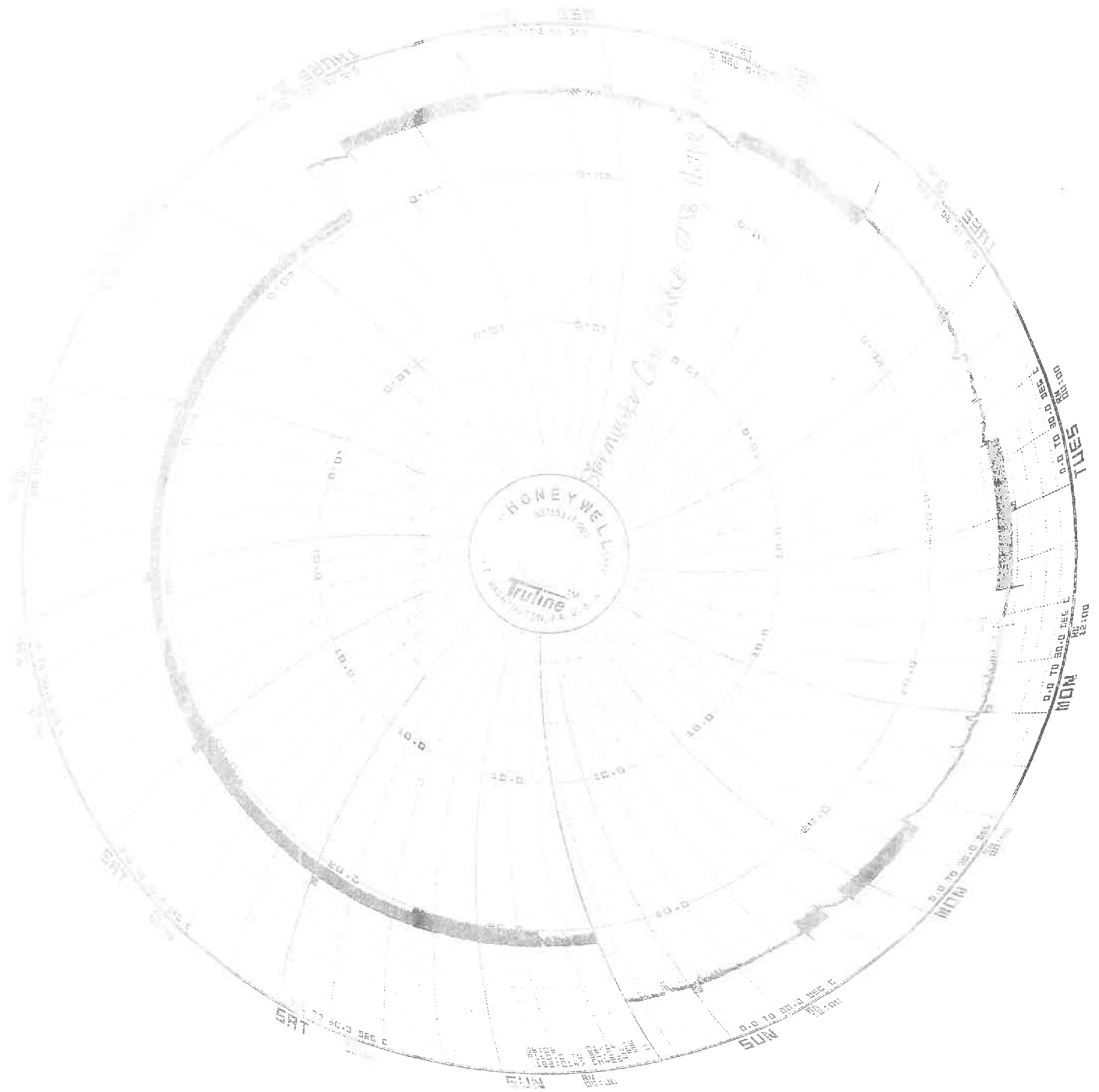
Initial Temperature-°C		1/10		1/11		1/12		1/13		1/14		1/15		1/16	
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7							
0	D	24.9	25.1	25.2	24.9	24.6	24.3	25.2							
100		24.4	25.0	24.4	24.2	24.6	24.5	24.2							
Measure Time:		1323	1207	1339	1530	1251	1332	1054							
Instrument ID:		#4	#4	#4	#4	#4	#4	#4							
Analyst:		fc	fc	fc	fc	fc	fc	fc							

1530
 1/15/18



Test : 1801072A-I.C

Date : 1/10/18(1540) - 1/17/18(0758)



Test: 1801072A-I.C

Date: 1/10/18(1540) - 1/17/18(0758)



Test: 180 1072A-I.C
 Date: 11/10/18 11/10/18 (15:40) - 11/17/18 (07:58)
 11/14/18 11/14/18 (07:58) -

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: March 2, 2018

TEST DATE: March 2, 2018

TEST NUMBER: 1803RT2A.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)


TEST TYPE: Chronic

RESULT:

NOEC = 50 $\mu\text{g/L}$ (Survival)
 EC_{50} = 68.1 $\mu\text{g/L}$ (Survival)


NOEC = 12.5 $\mu\text{g/L}$ (Reproduction)
 IC_{25} = 26.4 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw

Analyst


Signature

Water Biologist III

Title


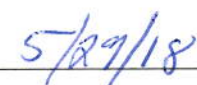
Date

Leslie Sidio

Supervisor


Signature

Laboratory Manager I

Title


Date

CETIS Summary Report

Report Date: 20 May-18 16:18 (p 1 of 2)
Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Batch ID:	07-9212-4058	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw		
Start Date:	02 Mar-18 15:45	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water		
Ending Date:	09 Mar-18 11:30	Species:	Ceriodaphnia dubia	Brine:			
Duration:	6d 20h	Source:	In-House Culture	Age:	1-9h 3/2/18(0730-1435)		
Sample ID:	16-6698-9109	Code:	Cu RT	Client:	Watershed Protection Division		
Sample Date:	02-Mar-18 09:15	Material:	Copper chloride	Project:	NPDES		
Receive Date:	02 Mar-18 09:15	Source:	Reference Toxicant				
Sample Age:	7h	Station:					
Sample Renewals							
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C		
1	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	03 Mar-18 12:15			
2	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	04 Mar-18 13:02			
3	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	05 Mar-18 12:47			
4	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	06 Mar-18 13:30			
5	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	07 Mar-18 10:30			
6	Cu RT	02 Mar-18 09:15	02 Mar-18 09:15	08 Mar-18 11:14			
Batch Note: Batch: 1065, HBN: 48489							
Test Note: The concentration-response relationship is all or nothing for survival and ideal for reproduction.							
Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-7412-8599	7d Survival Rate	50	>50	N/A	N/A		Fisher Exact/Bonferroni-Holm Test
14-4184-2716	Reproduction	12.5	25	17.68	15.1%		Dunnett Multiple Comparison Test
Point Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
06-1686-5917	7d Survival Rate	EC5	35.41	28.09	51.77		Linear Interpolation (ICPIN)
		EC10	50	31.55	53.61		
		EC15	51.97	35.41	55.5		
		EC20	54.02	39.74	57.47		
		EC25	56.15	44.58	59.5		
		EC40	63.05	55.23	66.03		
		EC50	68.1	60.99	70.77		
08-2696-1620	Reproduction	IC5	2.929	0.9576	15		Linear Interpolation (ICPIN)
		IC10	12.87	2.832	19.28		
		IC15	17.31	6.502	25.54		
		IC20	23.16	14.09	27.44		
		IC25	26.44	20.52	29.67		
		IC40	33.22	29.68	37.69		
		IC50	38.63	34.07	46.49		
Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
04-7412-8599	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
06-1686-5917	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
08-2696-1620	Reproduction	Control Resp	34.7	15 - NL	Yes	Passes Acceptability Criteria	
14-4184-2716	Reproduction	Control Resp	34.7	15 - NL	Yes	Passes Acceptability Criteria	
14-4184-2716	Reproduction	PMSD	0.1513	0.13 - 0.47	Yes	Passes Acceptability Criteria	

CETIS Summary Report

Report Date: 20 May-18 16:18 (p 2 of 2)
Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test											Hyperion Treatment Plant Laboratory
7d Survival Rate Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	10.0%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	34.7	33.52	35.88	31	40	1.001	3.164	9.12%	0.0%
12.5		10	31.4	29.42	33.38	18	36	1.675	5.296	16.87%	9.51%
25		10	27.3	25.83	28.77	21	33	1.248	3.945	14.45%	21.33%
50		10	11.4	8.33	14.47	0	22	2.6	8.222	72.12%	67.15%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	0	1	1	1	1	1	1	1
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	39	31	34	31	31	35	40	35	36
12.5		30	29	32	36	36	34	33	31	35	18
25		29	26	29	31	22	24	21	28	30	33
50		4	5	0	8	22	20	22	5	17	11
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 20 May-18 16:18 (p 1 of 2)
Test Code: 1803RT2A.C | 11-4862-8707

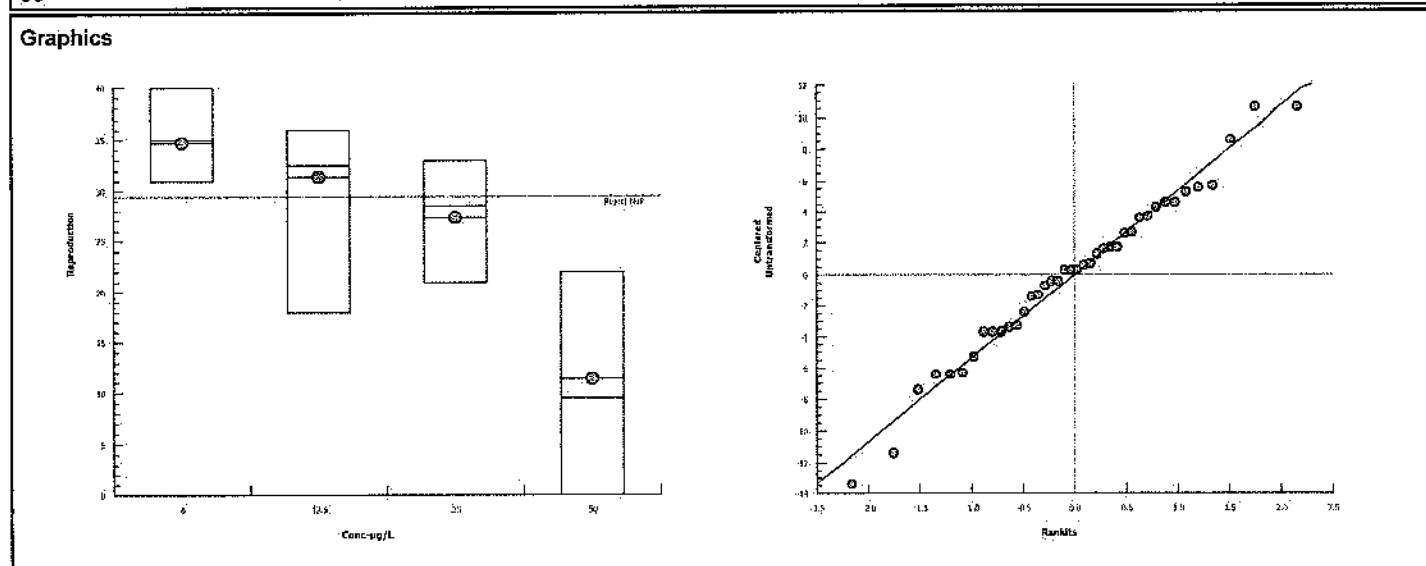
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 14-4184-2716	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 14 Mar-18 15:17	Analysis: Parametric-Control vs Treatments	Official Results: Yes									
Batch ID: 07-9212-4058	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 02 Mar-18 15:45	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 09 Mar-18 11:30	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 20h	Source: In-House Culture	Age: 1-9h 3/2/18/0730-1435									
Sample ID: 16-6698-9109	Code: Cu RT	Client: Watershed Protection Division									
Sample Date: 02 Mar-18 09:15	Material: Copper chloride	Project: NPDES									
Receive Date: 02 Mar-18 09:15	Source: Reference Toxicant										
Sample Age: 7h	Station:										
Batch Note: Batch: 1065, HBN: 48489											
Test Note: The concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD			
Untransformed	0	C > T	Not Run	12.5	25	17.68		15.1%			
Dunnett Multiple Comparison Test											
Control	vs Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)				
Dilution Water	12.5	1.34	2.133	18	5.251	0.2060	Non-Significant Effect				
	25*	3.006	2.133	18	5.251	0.0066	Significant Effect				
	50*	9.464	2.133	18	5.251	<0.0001	Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	34.7	15 - NL	Yes	Passes Acceptability Criteria							
PMSD	0.1513	0.13 - 0.47	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.534	3.036	0.3380	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	3195.4	1065.133	3	35.15	<0.0001	Significant Effect					
Error	1091	30.30556	36								
Total	4286.4	1095.439	39								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Bartlett Equality of Variance	9.024	11.34	0.0290	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9821	0.9236	0.7651	Normal Distribution						
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	34.7	33.5	35.9	31	40	1.001	3.164	9.12%	0.0%
12.5		10	31.4	29.39	33.41	18	36	1.675	5.296	16.87%	9.51%
25		10	27.3	25.8	28.8	21	33	1.248	3.945	14.45%	21.33%
50		10	11.4	8.273	14.53	0	22	2.6	8.222	72.12%	67.15%

CETIS Analytical Report

Report Date: 20-May-18 16:18 (p. 2 of 2)
Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	14-4184-2716	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1	
Analyzed:	14 Mar-18 15:17	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes	

Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	39	31	34	31	31	35	40	35	36
12.5		30	29	32	36	36	34	33	31	35	18
25		29	26	29	31	22	24	21	28	30	33
50		4	5	0	8	22	20	22	5	17	11



Concentration-response relationship is ideal. 5/20/18 R

CETIS Analytical Report

Report Date: 20 May-18 16:18 (p 2 of 2)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test

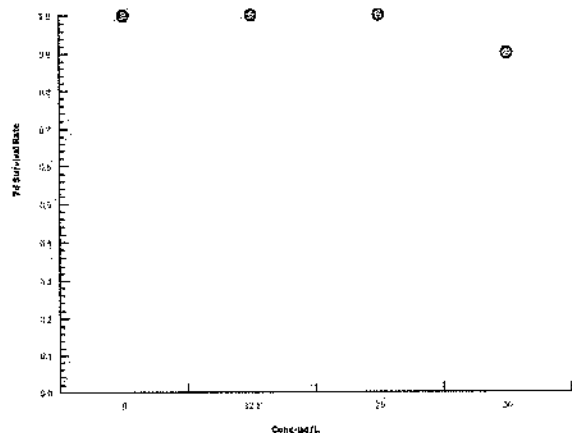
Hyperion Treatment Plant Laboratory

Analysis ID: 04-7412-8599
 Analyzed: 14 Mar-18 15:17

Endpoint: 7d Survival Rate
 Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.1
 Official Results: Yes

Graphics



CETIS Analytical Report

 Report Date: 20-May-18 16:18 (p 1 of 2)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 04-7412-8599	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 14-Mar-18 15:17	Analysis: STP 2x2 Contingency Tables	Official Results: Yes									
Batch ID: 07-9212-4058	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 02-Mar-18 15:45	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 09-Mar-18 11:30	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 20h	Source: In-House Culture	Age: 1-9h	3/2/18 (0730-1435)								
Sample ID: 16-6698-9109	Code: Cu RT	Client: Watershed Protection Division									
Sample Date: 02-Mar-18 09:15	Material: Copper chloride	Project: NPDES									
Receive Date: 02-Mar-18 09:15	Source: Reference Toxicant										
Sample Age: 7h	Station:										
Batch Note: Batch: 1065, HBN: 48489											
Test Note: The concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU				
Untransformed		C > T	Not Run	50	>50	N/A					
Fisher Exact/Bonferroni-Holm Test											
Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)						
Dilution Water		12.5	1	1.0000	Non-Significant Effect						
		25	1	1.0000	Non-Significant Effect						
		50	0.5	1.0000	Non-Significant Effect						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Data Summary											
Conc-µg/L	Control Type	No-Resp	Resp	Total							
0	Dilution Water	10	0	10							
12.5		10	0	10							
25		10	0	10							
50		9	1	10							
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	0	1	1	1	1	1	1	1

CETIS Analytical Report

 Report Date: 20 May-18 16:18 (p 1 of 4)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 08-2696-1620	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 14 Mar-18 15:18	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes									
Batch ID: 07-9212-4058	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 02 Mar-18 15:45	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 09 Mar-18 11:30	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 20h	Source: In-House Culture	Age: 1-9h	3/2/18 (0730-1435)								
Sample ID: 16-6698-9109	Code: Cu RT	Client: Watershed Protection Division									
Sample Date: 02 Mar-18 09:15	Material: Copper chloride	Project: NPDES									
Receive Date: 02 Mar-18 09:15	Source: Reference Toxicant										
Sample Age: 7h	Station:										
Batch Note: Batch: 1065, HBN: 48489											
Test Note: The concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples								
Log(X+1)	Linear	1.337E+09	200								
		Exp 95% CL	Method								
		Yes	Two-Point Interpolation								
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap								
Control Resp	34.7	15 - NL	Yes								
Decision: Passes Acceptability Criteria											
Residual Analysis											
Attribute	Method	Test Stat	Critical								
Extreme Value	Grubbs Extreme Value	3.116	3.2								
		P-Value	Decision(α:5%)								
		0.0703	No Outliers Detected								
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
IC5	2.929	0.9576	15								
IC10	12.87	2.832	19.28								
IC15	17.31	6.502	25.54								
IC20	23.16	14.09	27.44								
IC25	26.44	20.52	29.67								
IC40	33.22	29.68	37.69								
IC50	38.63	34.07	46.49								
Reproduction Summary											
		Calculated Variate									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	Dilution Water	10	34.7	31	40	1.001	3.164	9.12%	0.0%		
12.5		10	31.4	18	36	1.675	5.296	16.87%	9.51%		
25		10	27.3	21	33	1.248	3.945	14.45%	21.33%		
50		10	11.4	0	22	2.6	8.222	72.12%	67.15%		
100		10	0	0	0	0	0		100.0%		
200		10	0	0	0	0	0		100.0%		
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	39	31	34	31	31	35	40	35	36
12.5		30	29	32	36	36	34	33	31	35	18
25		29	26	29	31	22	24	21	28	30	33
50		4	5	0	8	22	20	22	5	17	11
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 20 May-18 16:18 (p 2 of 4)
Test Code: 1803RT2A.C | 11-4862-8707

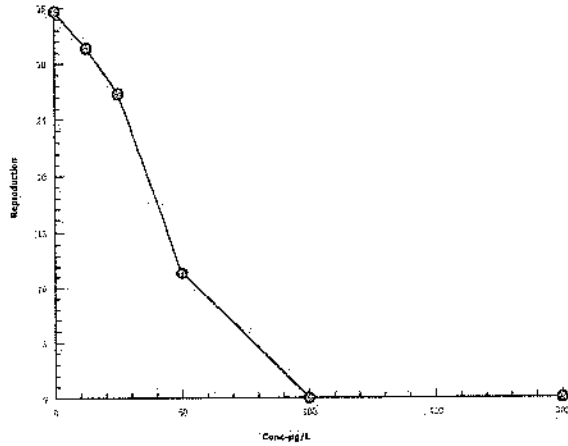
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 08-2696-1620 Endpoint: Reproduction
Analyzed: 14 Mar-18 15:18 Analysis: Linear interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

 Report Date: 20 May-18 16:18 (p 3 of 4)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 06-1686-5917		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 14 Mar-18 15:17		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 07-9212-4058		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 02 Mar-18 15:45		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 09 Mar-18 11:30		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: 1-9h		3/2/18 (0730-1435)					
Sample ID: 16-6698-9109		Code: Cu RT		Client: Watershed Protection Division							
Sample Date: 02 Mar-18 09:15		Material: Copper chloride		Project: NPDES							
Receive Date: 02 Mar-18 09:15		Source: Reference Toxicant									
Sample Age: 7h		Station:									
Batch Note: Batch: 1065, HBN: 48489											
Test Note: The concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	274127447	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
EC5	35.41	28.09	51.77								
EC10	50	31.55	53.61								
EC15	51.97	35.41	55.5								
EC20	54.02	39.74	57.47								
EC25	56.15	44.58	59.5								
EC40	63.05	55.23	66.03								
EC50	68.1	60.99	70.77								
7d Survival Rate Summary				Calculated Variate(A/B)							
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
100		10	0	0	0	0	0		100.0%	0	10
200		10	0	0	0	0	0		100.0%	0	10
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	0	1	1	1	1	1	1	1
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 20 May-18 16:18 (p 4 of 4)
Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test

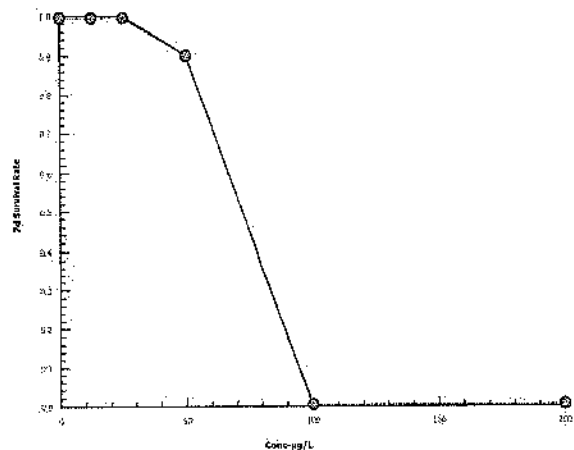
Hyperion Treatment Plant Laboratory

Analysis ID: 06-1686-5917
Analyzed: 14 Mar-18 15:17

Endpoint: 7d Survival Rate
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

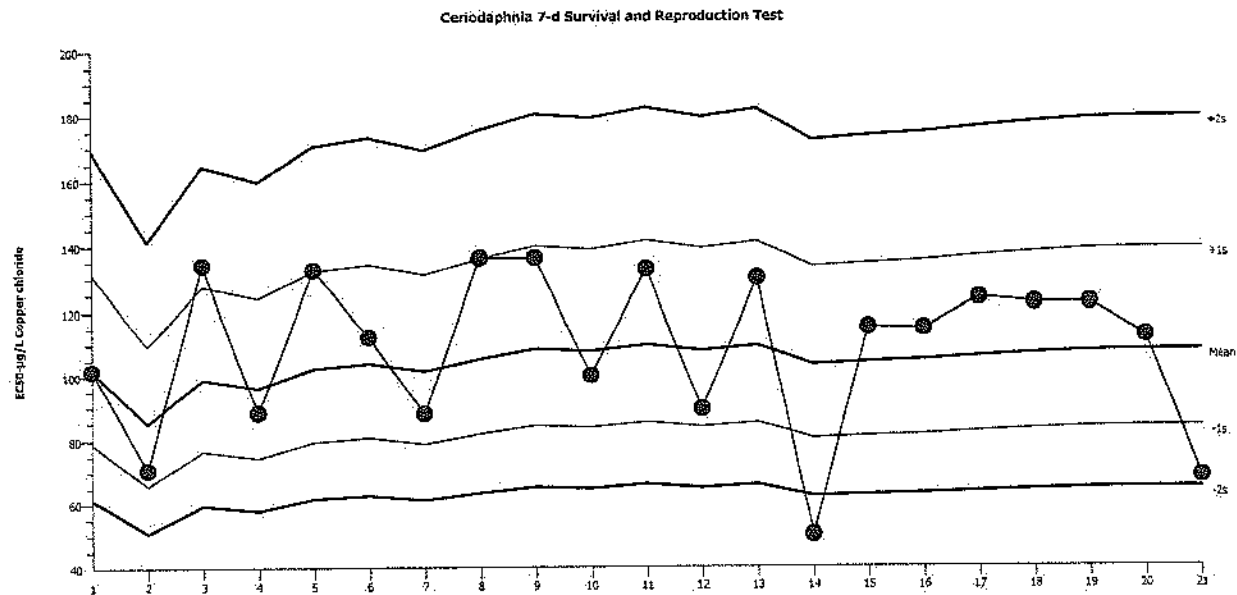
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 107.6

Count: 20

-1s Warning Limit: 83.38

-2s Action Limit: 64.65

Sigma: N/A

CV: 29.00%

+1s Warning Limit: 138.7

+2s Action Limit: 178.9

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Apr	4	101.8	-5.802	-0.2179			20-8785-7541	14-5275-7464
2		Jul	28	70.77	-36.78	-1.645	(-)		11-3245-2063	20-4501-7131
3		Aug	31	134	26.47	0.8645			04-2198-2948	19-3434-0384
4		Dec	16	88.2	-19.35	-0.7795			05-9377-8224	02-8710-1182
5	2017	Mar	30	132.6	25.02	0.8219			20-5811-5356	10-6838-6662
6		May	10	112.3	4.72	0.1688			04-6904-8294	00-0571-6326
7			25	87.85	-19.7	-0.795			16-2272-5797	20-6787-6120
8		Jun	6	136.1	28.58	0.926			00-1105-6011	07-1957-9297
9			22	136.1	28.58	0.926			10-7002-0112	10-9615-6318
10		Jul	12	100	-7.555	-0.2862			13-9476-5989	08-1211-5310
11			27	132.6	25.02	0.8219			00-3533-4104	07-3102-4627
12		Aug	9	89.13	-18.43	-0.7384			05-1646-5416	02-7143-5836
13			23	129.7	22.18	0.7368			18-0928-7994	14-9065-9379
14		Sep	6	50	-57.55	-3.01	(-)	(-)	04-1283-5528	07-2201-0667
15			20	114.9	7.349	0.2597			09-2547-5700	02-6449-6736
16		Oct	18	114.5	6.906	0.2445			14-7896-4665	17-5474-2245
17		Nov	15	123.5	15.91	0.5421			09-2671-6353	07-5336-3496
18		Dec	13	121.9	14.39	0.4934			19-3949-3034	10-6518-1710
19	2018	Jan	4	121.9	14.39	0.4934			17-7500-8361	05-5922-1635
20		Feb	7	112.3	4.72	0.1688			04-8492-7543	17-6325-1645
21		Mar	2	68.1	-39.46	-1.796	(-)		11-4862-8707	06-1686-5917

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

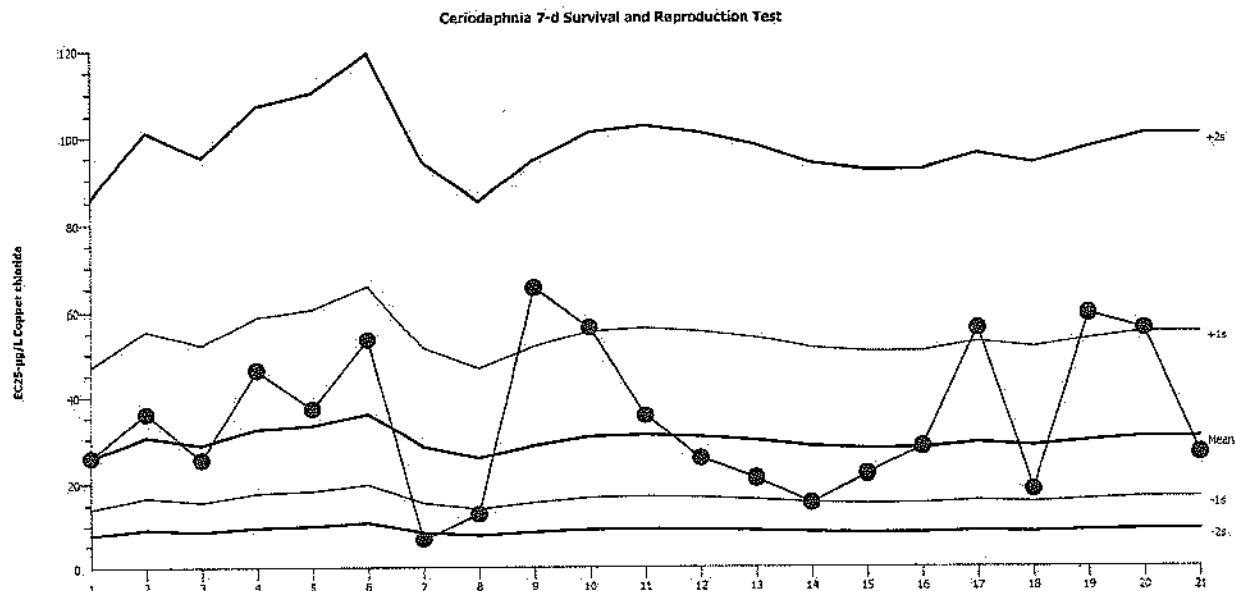
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 30.2

Count: 20

-1s Warning Limit: 16.55

-2s Action Limit: 9.07

Sigma: N/A

CV: 82.40%

+1s Warning Limit: 55.08

+2s Action Limit: 100.5

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Apr	4	25.73	-4.477	-0.2668			20-8785-7541	21-2139-2262
2		Jul	26	35.91	5.708	0.2878			11-3245-2063	13-6804-5542
3		Aug	31	25.21	-4.995	-0.3007			04-2198-2948	01-9086-3175
4		Dec	16	46.2	16	0.7069			05-9377-8224	05-6497-3539
5	2017	Mar	30	37.14	6.934	0.3437			20-5811-5356	06-6352-3022
6		May	10	53.41	23.21	0.9481			04-6904-8294	08-3814-7144
7			25	6.656	-23.55	-2.515	(-)	(-)	16-2272-5797	04-1379-9830
8		Jun	6	12.78	-17.42	-1.43	(-)		00-1105-6011	17-2178-2673
9			22	65.16	34.95	1.279	(+)		10-7002-0112	00-8698-9715
10		Jul	12	56.24	26.04	1.034	(+)		13-9476-5989	15-6562-8470
11			27	35.41	5.21	0.2646			00-3533-4104	15-5816-8081
12		Aug	9	25.45	-4.757	-0.285			05-1646-5416	12-8828-7274
13			23	20.93	-9.273	-0.6099			18-0928-7994	01-4455-3838
14		Sep	6	15.28	-14.93	-1.134	(-)		04-1283-5528	07-4663-1403
15			20	21.83	-8.376	-0.5401			09-2547-5700	05-2225-6686
16		Oct	18	27.98	-2.226	-0.1273			14-7896-4665	10-2719-4408
17		Nov	15	55.96	25.76	1.026	(+)		09-2671-6353	12-1707-6477
18		Dec	13	18.28	-11.92	-0.8349			19-3949-3034	15-1089-9957
19	2018	Jan	4	59.22	29.01	1.12	(+)		17-7500-8361	03-9405-5395
20		Feb	7	55.8	25.59	1.021	(+)		04-8492-7543	19-3721-5481
21		Mar	2	26.44	-3.761	-0.2212			11-4862-8707	08-2696-1620

CETIS Test Data Worksheet

Report Date: 26 Feb-18 11:46 (p 1 of 2)
Test Code: 11-4862-8707/1803RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory						
Start Date:		02 Mar-18		Species:		Ceriodaphnia dubia		Sample Code:		635C3C35				
End Date:		09 Mar-18		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Reference Toxicant				
Sample Date:		01 Mar-18		Material:		Copper chloride		Sample Station:						
Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	
0	D	1	51	1	0	0	0	5	12	0	100	35		
0	D	2	32	1	0	0	0	6	15	0	100	39		
0	D	3	10	1	0	0	0	5	13	13	100	31		
0	D	4	39	1	0	0	0	6	11	0	100	34		
0	D	5	8	1	0	0	0	6	11	14	100	31		
0	D	6	7	1	0	0	0	4	12	15	100	31		
0	D	7	52	1	0	0	0	4	0	14	100	35		
0	D	8	23	1	0	0	0	6	13	0	100	40		
0	D	9	55	1	0	0	0	6	0	14	100	35		
0	D	10	59	1	0	0	0	5	14	0	100	36		
12.5		1	9	1	0	0	0	4	10	0	100	30		
12.5		2	58	1	0	0	0	4	10	15	100	29		
12.5		3	24	1	0	0	0	4	13	15	100	32		
12.5		4	54	1	0	0	0	5	12	0	100	36		
12.5		5	53	1	0	0	0	6	13	0	100	36		
12.5		6	2	1	0	0	0	6	13	15	100	34		
12.5		7	17	1	0	0	0	3	0	12	100	33		
12.5		8	4	1	0	0	0	4	11	16	100	31		
12.5		9	33	1	0	0	0	5	0	13	100	35		
12.5		10	15	1	0	0	0	5	0	8	100	18		
25		1	47	1	0	0	0	4	11	0	100	29		
25		2	43	1	0	0	0	4	11	0	100	26		
25		3	57	1	0	0	0	4	10	15	100	29		
25		4	45	1	0	0	0	5	12	0	100	31		
25		5	31	1	0	0	0	3	9	0	100	22		
25		6	60	1	0	0	0	3	9	0	100	24		
25		7	49	1	0	0	0	5	0	9	100	21		
25		8	21	1	0	0	0	5	9	0	100	28		
25		9	1	1	0	0	0	6	13	0	100	30		
25		10	44	1	0	0	0	6	11	0	100	33		
50		1	16	1	0	0	0	0	0	4	100	4		
50		2	12	1	0	0	0	0	0	5	100	5		
50		3	48	1	0	0	0	0	0	0	100	0		
50		4	37	1	0	0	0	6	2	0	100	8		
50		5	3	1	0	0	0	3	9	10	100	22		
50		6	50	1	0	0	0	4	0	8	100	20		
50		7	27	1	0	0	0	4	0	3	100	22		
50		8	41	1	0	0	0	0	4	1	100	5		
50		9	30	1	0	0	0	5	2	0	100	17		
50		10	26	1	0	0	0	3	0	0	100	11		
100		1	18	1	0	0	0	0	0	0	100	0		
100		2	34	1	0	0	0	0	0	0	100	0		
100		3	25	1	0	0	0	0	0	0	100	0		
100		4	29	1	0	0	0	0	0	0	100	0		
100		5	38	1	0	0	0	0	0	0	100	0		
100		6	28	1	0	0	0	0	0	0	100	0		
100		7	14	1	0	0	0	0	0	0	100	0		

CETIS Test Data Worksheet



Report Date:

26 Feb-18 11:46 (p 2 of 2)

Test Code:

11-4862-8707/1803RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	11	1	0X	X	X	X	X	X	X	0	
100		9	22	1	0	0	0	0	0X	X	X	0	
100		10	36	1	0X	X	X	X	X	X	X	0	
200		1	6	1	0X	X	X	X	X	X	X	0	
200		2	40	1	0X	X	X	X	X	X	X	0	
200		3	19	1	0X	X	X	X	X	X	X	0	
200		4	5	1	0X	X	X	X	X	X	X	0	
200		5	46	1	0X	X	X	X	X	X	X	0	
200		6	42	1	0X	X	X	X	X	X	X	0	
200		7	56	1	0X	X	X	X	X	X	X	0	
200		8	13	1	0X	X	X	X	X	X	X	0	
200		9	35	1	0	0X	X	X	X	X	X	0	
200		10	20	1	0X	X	X	X	X	X	X	0	
					3/2	3/3	3/4	3/5	3/6	3/7	3/8	3/9	

11:30 RE

Food Added: 1505 1147 1245 1112 1315 1000 1058
 Re Re Re Re Re Re Re

Transferred: 1545 1215 1302 1247 1330 1030 1114
 Re Re Re Re Re Re Re

CETIS Measurement Worksheet

Report Date: 26 Feb-18 11:45 (p 1 of 2)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 02 Mar-18 Species: Ceriodaphnia dubia Sample Code: 635C3C35
 End Date: 09 Mar-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
 Sample Date: 01 Mar-18 Material: Copper chloride Sample Station:

Alkalinity (CaCO₃)-mg/L

Conc-µg/L Code Reading 1

0 D 120
 112 200

-See Reconstituted Water Prep Logbook (2/9/18 AS)
 not measured - 5/20/18

Measure Time:

Instrument ID:

Analyst:

Conductivity-µmhos

Conc-µg/L Code Reading 1

0 D 611
 12.5 612
 25 613
 50 611
 100 608
 200 601

3/2 3/3 3/4 3/5 3/6 3/7 3/8
 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
 603 610 609 608 616 604
 605 611 612 617 625 604
 604 607 607 615 626 616
 605 606 611 621 616
 604 596 600 604 596
 595 595
 1440 1052 1128 1039 0840 0745 0804
 #2 #2 #2 #2 #2 #2 #2
 Re Re Re Re Re Re Re

Measure Time:

Instrument ID:

Analyst:

Final Dissolved Oxygen-mg/L

Conc-µg/L Code Reading 1

0 D 6.42
 12.5 6.83
 25 6.96
 50 7.16
 100 7.29
 200 7.31

3/3 3/4 3/5 3/6 3/7 3/8 3/9
 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
 7.04 7.18 7.46 7.52 7.03 7.58
 7.40 7.43 7.47 7.61 7.45 7.53
 7.46 7.53 7.42 7.57 7.52 7.51
 7.50 7.53 7.32 7.51 7.61 7.52
 7.48 7.52 6.89 7.02 7.65
 7.51
 1330 1410 1345 1645 1519 1500 9.15
 #2 #2 #2 #2 #2 #2 #2
 Re Re Re Re Re Re Re

Measure Time:

Instrument ID:

Analyst:

Initial Dissolved Oxygen-mg/L

Conc-µg/L Code Reading 1

0 D 6.80
 12.5 7.22
 25 7.35
 50 7.40
 100 7.42
 200 7.46

3/3 3/4 3/5 3/6 3/7 3/8
 Reading 2 Reading 3 Reading 4 Reading 5 Reading 6 Reading 7
 7.06 7.57 7.37 7.23 7.64 7.73
 7.33 7.55 7.47 7.46 7.69 7.72
 7.39 7.56 7.51 7.56 7.66 7.69
 7.44 7.59 7.54 7.60 7.55 7.62
 7.47 7.61 7.56 7.65 7.26 7.40
 7.47 7.62
 1440 1052 1128 1039 0840 0745 0804
 #2 #2 #2 #2 #2 #2 #2
 Re Re Re Re Re Re Re

Measure Time:

Instrument ID:

Analyst:

Hardness (CaCO₃)-mg/L

Conc-µg/L Code Reading 1

0 D 172
 200

-See Reconstituted Water Prep Logbook (2/9/18 AS)
 not measured - 5/20/18
 no hardness buffer available to perform titration

Measure Time:

Instrument ID:

Analyst:

CETIS Measurement Worksheet

 Report Date: 26 Feb-18 11:45 (p 2 of 2)
 Test Code: 1803RT2A.C | 11-4862-8707

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

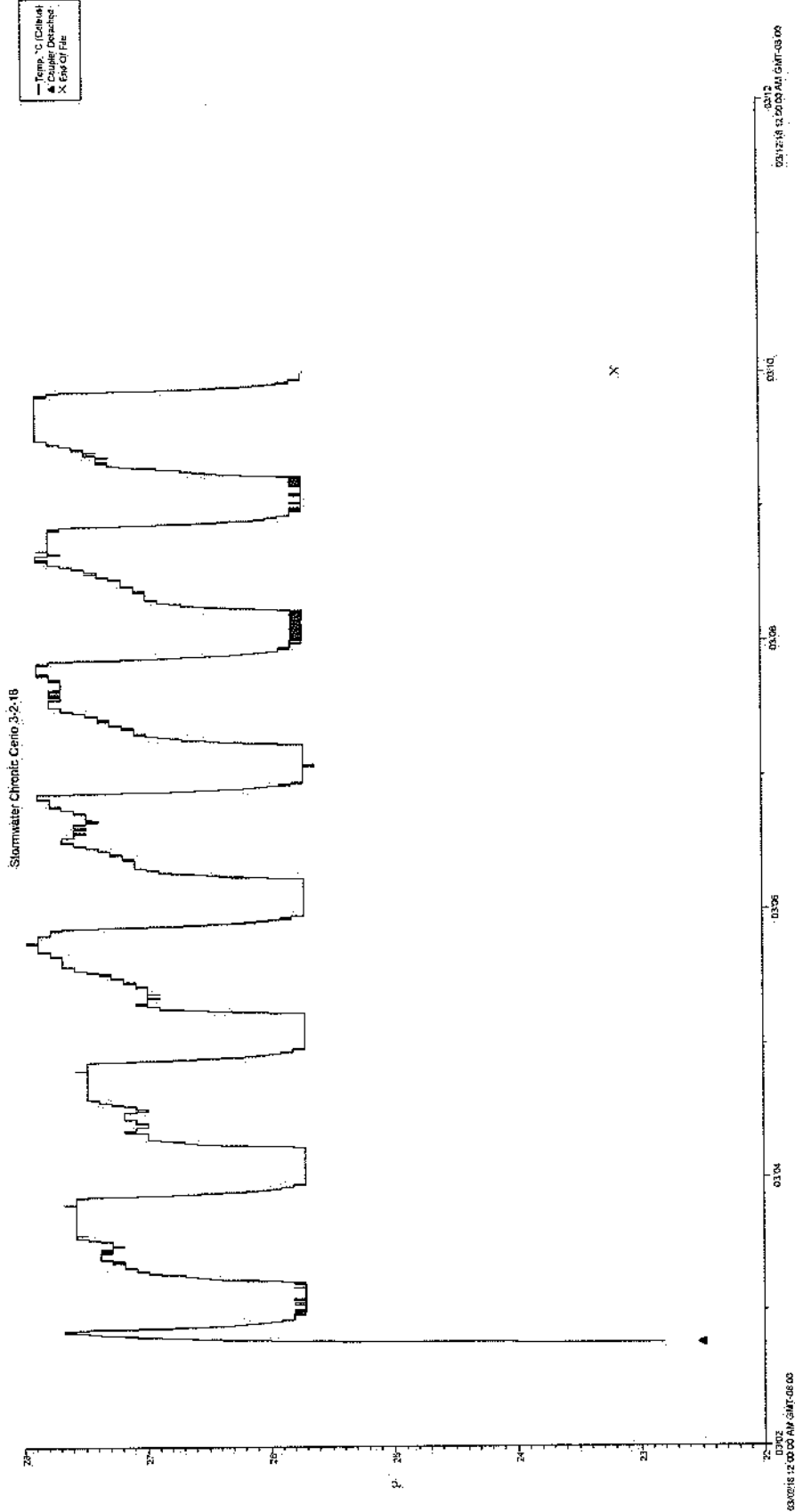
Start Date: 02 Mar-18 Species: Ceriodaphnia dubia Sample Code: 635C3C35
 End Date: 09 Mar-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
 Sample Date: 01 Mar-18 Material: Copper chloride Sample Station:

Final pH		3/3	3/4	3/5	3/6	3/7	3/8	3/9
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.20	8.24	8.21	8.18	8.10	8.22	8.28
12.5		8.25	8.26	8.31	8.24	8.17	8.27	8.30
25		8.25	8.27	8.34	8.21	8.18	8.29	8.28
50		8.28	8.26	8.33	8.20	8.20	8.31	8.30
100		8.29	8.27	8.34	8.00	8.11	8.32	
200		8.31	8.27					
Measure Time:		1330	1410	1345	1645	1579	1500	915
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		RC	RC	RC	RC	RC	RC	RC

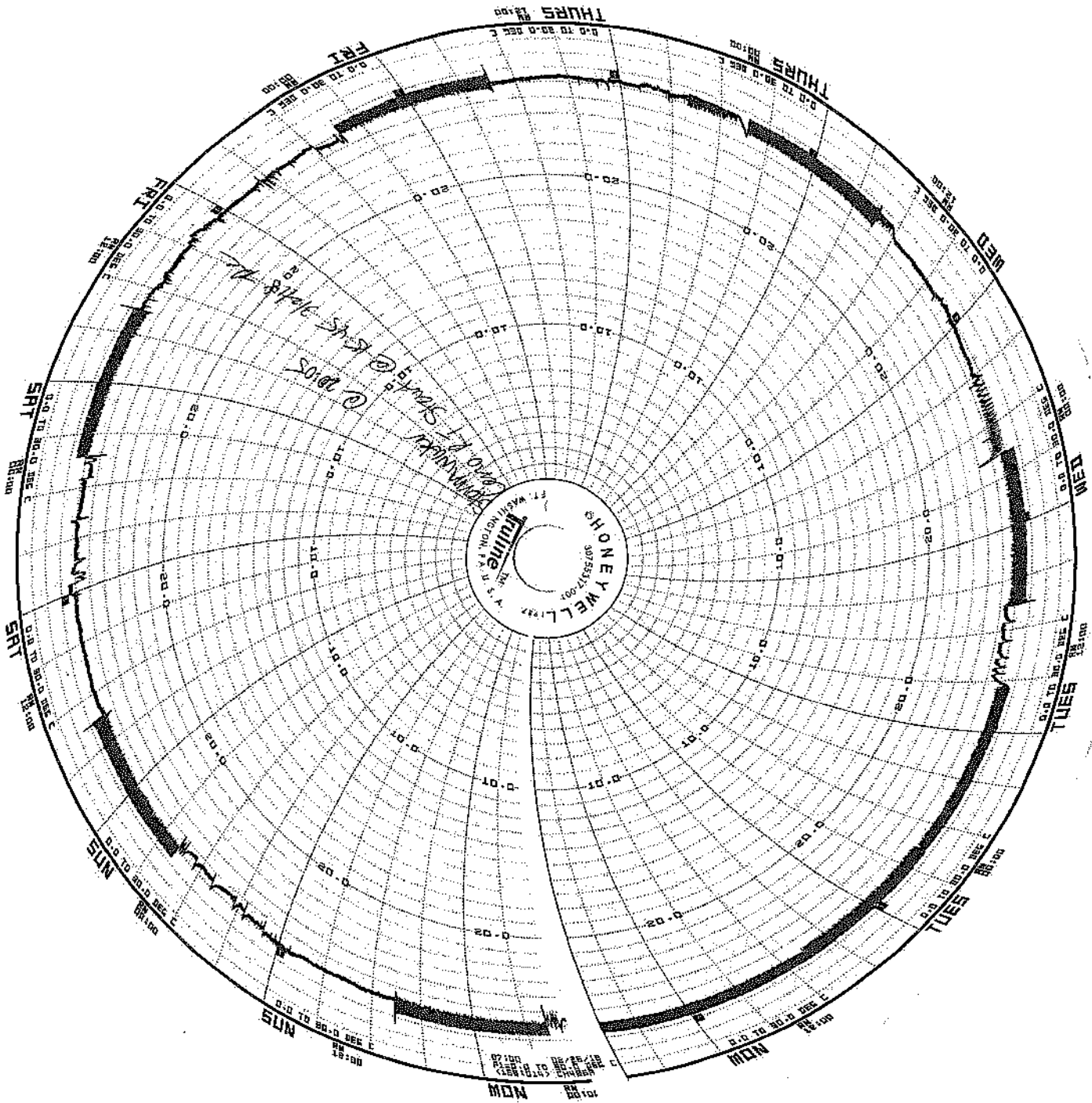
Initial pH		3/2	3/3	3/4	3/5	3/6	3/7	3/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.36	8.30	8.18	8.38	8.19	8.10	8.12
12.5		8.41	8.34	8.28	8.39	8.25	8.16	8.27
25		8.43	8.35	8.32	8.41	8.29	8.21	8.30
50		8.45	8.35	8.32	8.40	8.30	8.20	8.31
100		8.45	8.35	8.33	8.40	8.31	8.13	8.21
200		8.44	8.35	8.33				
Measure Time:		1440	1052	1128	1039	0840	0745	0804
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		RC	RC	RC	RC	RC	RC	RC

Final Temperature-°C		3/3	3/4	3/5	3/6	3/7	3/8	3/9
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	26.0	25.4	25.5	25.6	25.8	25.9	26.0
12.5		25.7	25.4	25.3	25.5	25.7	25.8	25.5
25		25.7	25.3	25.1	25.4	25.6	25.8	25.5
50		25.6	25.3	25.1	25.3	25.6	25.7	25.3
100		25.4	25.2	25.1	24.8	25.5	25.5	
200		25.4	25.1					
Measure Time:		1330	1410	1345	1645	1579	1500	915
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		RC	RC	RC	RC	RC	RC	RC

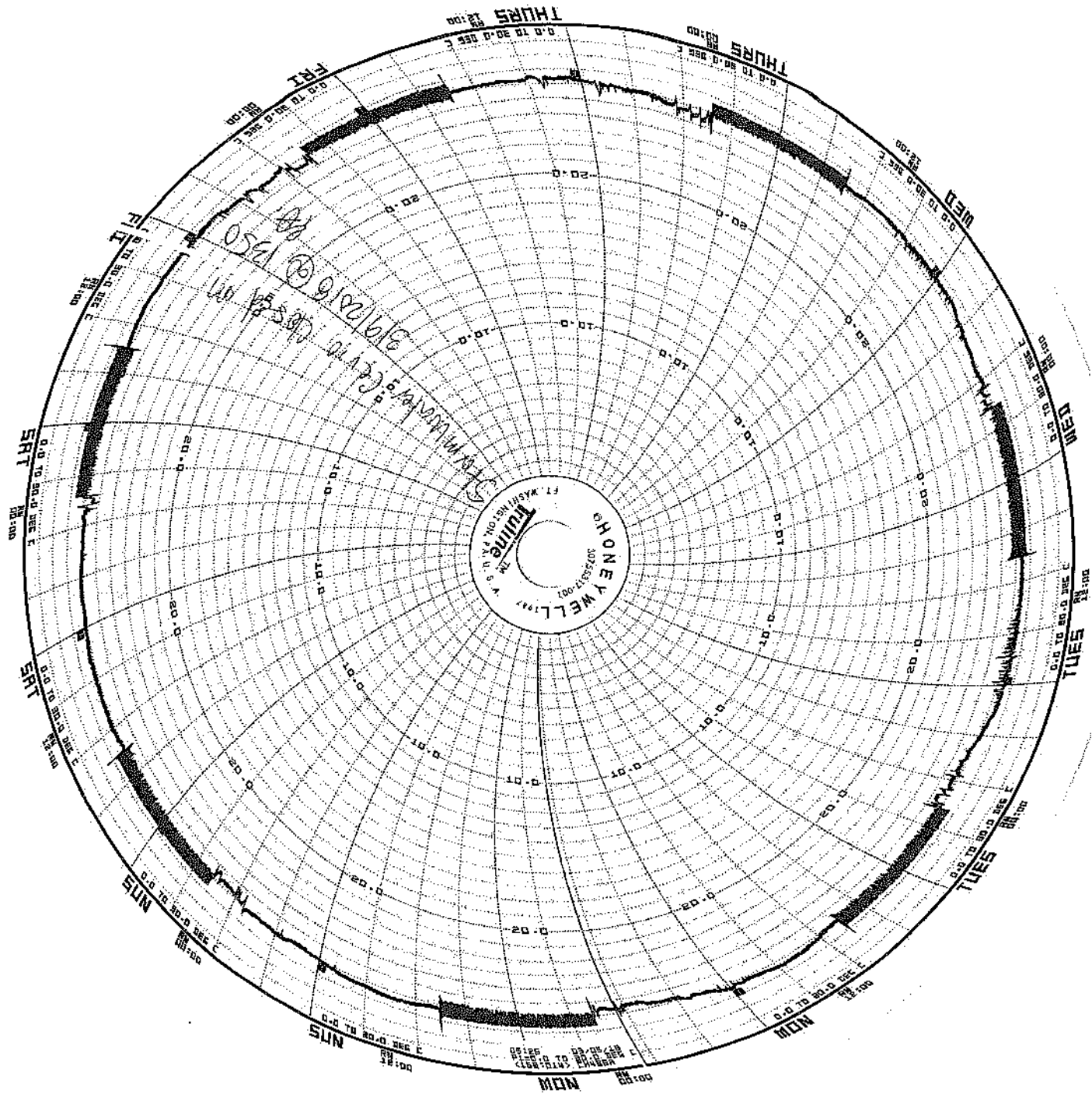
Initial Temperature-°C		3/2	3/3	3/4	3/5	3/6	3/7	3/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.7	25.6	25.9	25.8	25.6	24.8	25.2
12.5		25.5	25.6	25.6	25.4	25.4	25.4	25.2
25		25.5	25.5	25.3	25.0	25.0	25.2	24.9
50		25.3	25.4	25.0	24.8	24.8	24.9	24.8
100		25.1	25.3	24.8	24.6	24.5	24.8	24.8
200		25.2	25.1	24.4				
Measure Time:		1440	1052	1128	1039	0840	0745	0804
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		RC	RC	RC	RC	RC	RC	RC



Test: 1803AT2A.C, 1803072A-I.C
 Date: 3/2/18(15:45) - 3/9/18(13:50)



Test: 1803RT2A.C, 1803072A-I.C
 Date: 3/2/18(15:45) - 3/9/18(13:50)



Test: 1803RT2A.C, 1803072A-I.C
 Date: 3/2/18(15:45) - 3/9/18(13:50)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: March 2, 2018

TEST DATE: March 2, 2018

TEST NUMBER: 1803072G.C

TEST MATERIAL: Station RW-SMB-2

TEST SPECIES: *Ceriodaphnia dubia*

PROTOCOL: EPA/821/R-02-013 (2002)

TEST TYPE: Chronic


REFERENCE TOXICANT TEST: 1803RT2A.C

RESULT:

Survival
Reproduction

Pass, 0.0% effect
Pass, -0.27% effect

Rea Mara A Crinklaw

Analyst



Signature

Water Biologist III

Title
5/21/18

Date

Leslie Sidio

Supervisor


Signature

Laboratory Manager I

Title
5/30/18

Date

CETIS Summary Report

Report Date: 21 May-18 11:39 (p 1 of 1)
Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Batch ID:	07-9212-4058	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	02 Mar-18 20:05	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mid Hard Synthetic Water						
Ending Date:	09 Mar-18 12:25	Species:	Ceriodaphnia dubia	Brine:	6-14h						
Duration:	6d 16h	Source:	In-House Culture	Age:	12-18h 3/2/18 (0730-1435)						
Sample ID:	10-9210-6281	Code:	2221104	Client:	Watershed Protection Division						
Sample Date:	02 Mar-18 04:35	Material:	Stormwater Monitoring Sample	Project:	MS4						
Receive Date:	02 Mar-18 11:00	Source:	Stormwater (STORMWATER)								
Sample Age:	16h (16.1 °C)	Station:	RW-SMB-2								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	2221104	02 Mar-18 04:35	02 Mar-18 11:00	03 Mar-18 12:48	16.1						
2	2221104	02 Mar-18 04:35	02 Mar-18 11:00	04 Mar-18 13:20	16.1						
3	2221104	02 Mar-18 04:35	02 Mar-18 11:00	05 Mar-18 13:05	16.1						
4	2221104	02 Mar-18 04:35	02 Mar-18 11:00	06 Mar-18 14:33	16.1						
5	2221104	02 Mar-18 04:35	02 Mar-18 11:00	07 Mar-18 11:28	16.1						
6	2221104	02 Mar-18 04:35	02 Mar-18 11:00	08 Mar-18 11:44	16.1						
Batch Note: Batch: 1065, HBN: 48489											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
19-3460-7986	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
18-5157-1700	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
19-3460-7986	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
18-5157-1700	Reproduction	Control Resp	37.1	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	37.1	35.43	38.77	31	44	1.418	4.483	12.08%	0.0%
100		10	37.2	35.86	38.54	33	43	1.133	3.584	9.63%	-0.27%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	43	31	35	39	32	36	40	38	44	33
100		33	40	33	39	36	36	43	41	38	33

CETIS Analytical Report

 Report Date: 21 May-18 11:39 (p 1 of 4)
 Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 18-5157-1700	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 20 Mar-18 8:36	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 07-9212-4058	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 02 Mar-18 20:05	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod Hard Synthetic Water									
Ending Date: 09 Mar-18 12:25	Species: Ceriodaphnia dubia	Brine: 6-14h									
Duration: 6d 16h	Source: In-House Culture	Age: 2-9h 3/2/18 (0730-1435)									
Sample ID: 10-9210-6281	Code: 2221104	Client: Watershed Protection Division									
Sample Date: 02 Mar-18 04:35	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 02 Mar-18 11:00	Source: Stormwater (STORMWATER)										
Sample Age: 16h (16.1 °C)	Station: RW-SMB-2										
Batch Note: Batch: 1065, HBN: 48489											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)				
Dilution Water	100*	6.033	0.8633	17		<0.0001	Non-Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	37.1	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	1.747	2.708	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.05	0.05	1	0.003035	0.9567	Non-Significant Effect					
Error	296.5	16.47222	18								
Total	296.55	16.52222	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.565	6.541	0.5152	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9485	0.866	0.3456	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	37.1	35.39	38.81	31	44	1.418	4.483	12.08%	0.0%
100		10	37.2	35.84	38.56	33	43	1.133	3.584	9.63%	-0.27%

CETIS Analytical Report

Report Date: 21 May-18 11:39 (p 2 of 4)
 Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 18-5157-1700
 Analyzed: 20 Mar-18 8:36

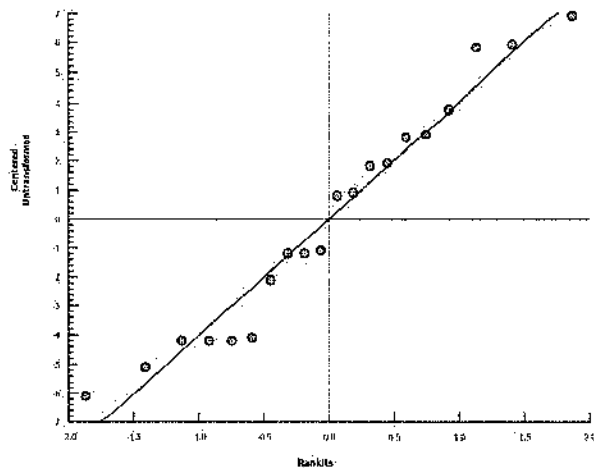
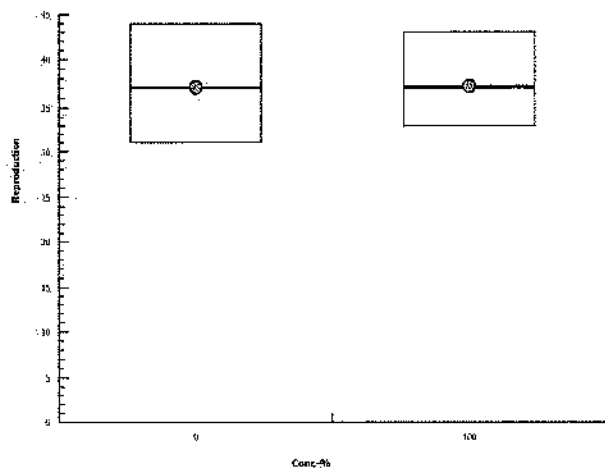
Endpoint: Reproduction
 Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
 Official Results: Yes

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	43	31	35	39	32	36	40	38	44	33
100		33	40	33	39	36	36	43	41	38	33

Graphics



CETIS Analytical Report

 Report Date: 21 May-18 11:39 (p. 3 of 4)
 Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 19-3460-7986		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 20 Mar-18 8:36		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 07-9212-4058		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 02 Mar-18 20:05		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Hard Synthetic Water							
Ending Date: 09 Mar-18 12:25		Species: Ceriodaphnia dubia		Brine: 6 14h							
Duration: 6d 16h		Source: In-House Culture		Age: 10h 3/2/18 (0730-1435)							
Sample ID: 10-9210-6281		Code: 2221104		Client: 92118 Watershed Protection Division							
Sample Date: 02 Mar-18 04:35		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 02 Mar-18 11:00		Source: Stormwater (STORMWATER)									
Sample Age: 16h (16.1 °C)		Station: RW-SMB-2									
Batch Note: Batch: 1065, HBN: 48489											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint						
TST-Welch's t Test											
Control	vs Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)				
Dilution Water	100*	0.2618				<0.2	Non-Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	65540	<0.0001	Significant Effect					
Error	0	0	18								
Total	0	0	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	65540	8.285	<0.0001	Unequal Variances						
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%

CETIS Analytical Report

Report Date: 21 May-18 11:39 (p 4 of 4)
Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 19-3460-7986
Analyzed: 20 Mar-18 8:36

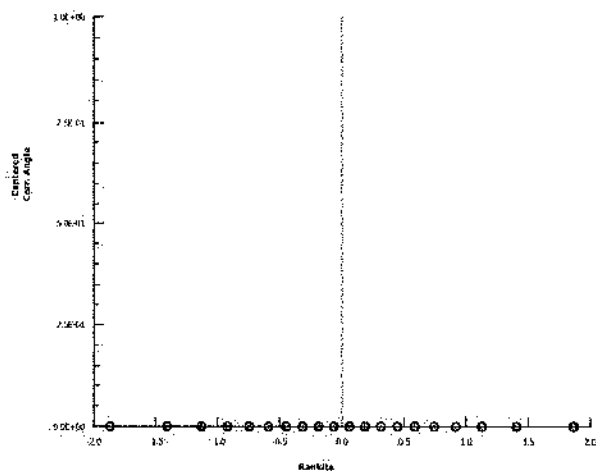
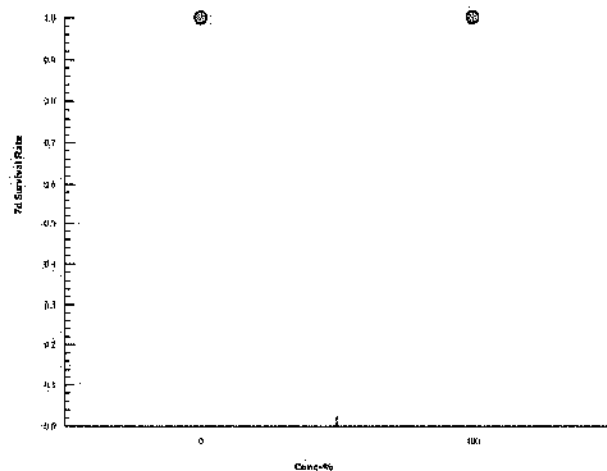
Endpoint: 7d Survival Rate
Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
Official Results: Yes

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

Graphics



CETIS Test Data Worksheet

Report Date: 01 Mar-18 14:19 (p 1 of 1)
 Test Code: 20-8328-9654/1803072G.C

Ceriodaphnia 7-d Survival and Reproduction Test									Hyperion Treatment Plant Laboratory				
Start Date:		02 Mar-18		Species:		Ceriodaphnia dubia		Sample Code:		41183829			
End Date:		09 Mar-18		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Stormwater			
Sample Date:		01 Mar-18		Material:		Stormwater Monitoring Sample		Sample Station:		RW-SMB-2			
Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	7	0	14	22	43	
0	D	2		1	0	0	0	5	13	0	13	31	
0	D	3		1	0	0	0	6	14	15	0	35	
0	D	4		1	0	0	0	7	0	14	18	39	
0	D	5		1	0	0	0	6	0	12	14	32	
0	D	6		1	0	0	0	5	12	0	19	36	
0	D	7		1	0	0	0	5	14	0	21	40	
0	D	8		1	0	0	0	5	14	0	19	38	
0	D	9		1	0	0	0	7	0	15	22	44	
0	D	10		1	0	0	0	3	13	0	17	33	
100		1	11	1	0	0	0	6	10	17	0	33	
100		2	43	1	0	0	0	7	14	0	19	40	
100		3	23	1	0	0	0	6	11	0	16	33	
100		4	3	1	0	0	0	7	0	14	18	39	
100		5	9	1	0	0	0	6	13	0	17	36	
100		6	31	1	0	0	0	6	13	0	17	36	
100		7	26	1	0	0	0	5	13	0	25	43	
100		8	5	1	0	0	0	7	15	0	19	41	
100		9	25	1	0	0	0	7	14	0	17	38	
100		10	16	1	0	0	0	4	12	17	0	33	

3/2 3/3 3/4 3/5 3/6 3/7 3/8 3/9
 12:25 Re

Food Added: 1910 1147 1245 1112 1365 1000 1058
 Re Re Re Re Re Re Re

Transferred: 2005 1248 1320 1305 1433 1128 1144
 Re Re Re Re Re Re Re

CETIS Measurement Worksheet

Report Date: 01 Mar-18 14:19 (p 1 of 2)
Test Code: 1803072G.C | 20-8328-9654

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory		
Start Date: 02 Mar-18		Species: Ceriodaphnia dubia		Sample Code: 41183829				
End Date: 09 Mar-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater				
Sample Date: 01 Mar-18		Material: Stormwater Monitoring Sample		Sample Station: RW-SMB-2				

Alkalinity (CaCO ₃)-mg/L								
Conc.-%	Code	Reading 1						
0	D	56	- 3/2/18 1845 Rc					
100		64	- see attached worksheet					
Measure Time:								
Instrument ID:								
Analyst:								

Conductivity-umhos								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	309	323	321	312	314	325	315
100		379	370	386	385	380	382	397
Measure Time:		1552	1058	1154	1048	0850	0836	1034
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Final Dissolved Oxygen-mg/L								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	6.78	7.26	7.22	7.49	7.16	6.98	7.40
100		6.58	7.02	7.07	7.28	7.15	7.25	7.33
Measure Time:		1352	1420	1350	1652	1519	1510	930
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Initial Dissolved Oxygen-mg/L								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	6.94	7.07	7.25	7.32	7.27	7.89	7.73
100		7.06	7.70	7.22	7.27	7.62	7.93	7.79
Measure Time:		1552	1058	1154	1048	0850	0836	1034
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Hardness (CaCO ₃)-mg/L		
Conc.-%	Code	Reading 1
0	D	88 - 3/2/18 1845 Rc
100		* not measured - No buffer to perform hardness titration
Measure Time:		
Instrument ID:		
Analyst:		

Final pH								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.93	7.90	7.91	8.05	7.80	7.78	8.10
100		7.75	7.77	7.84	7.82	7.74	7.80	7.90
Measure Time:		1352	1420	1350	1652	1519	1510	930
Instrument ID:		#4	#4	#4	#4	#4	#4	#4
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

CETIS Measurement Worksheet

Report Date: 01 Mar-18 14:19 (p 2 of 2)
 Test Code: 1803072G.C | 20-8328-9654

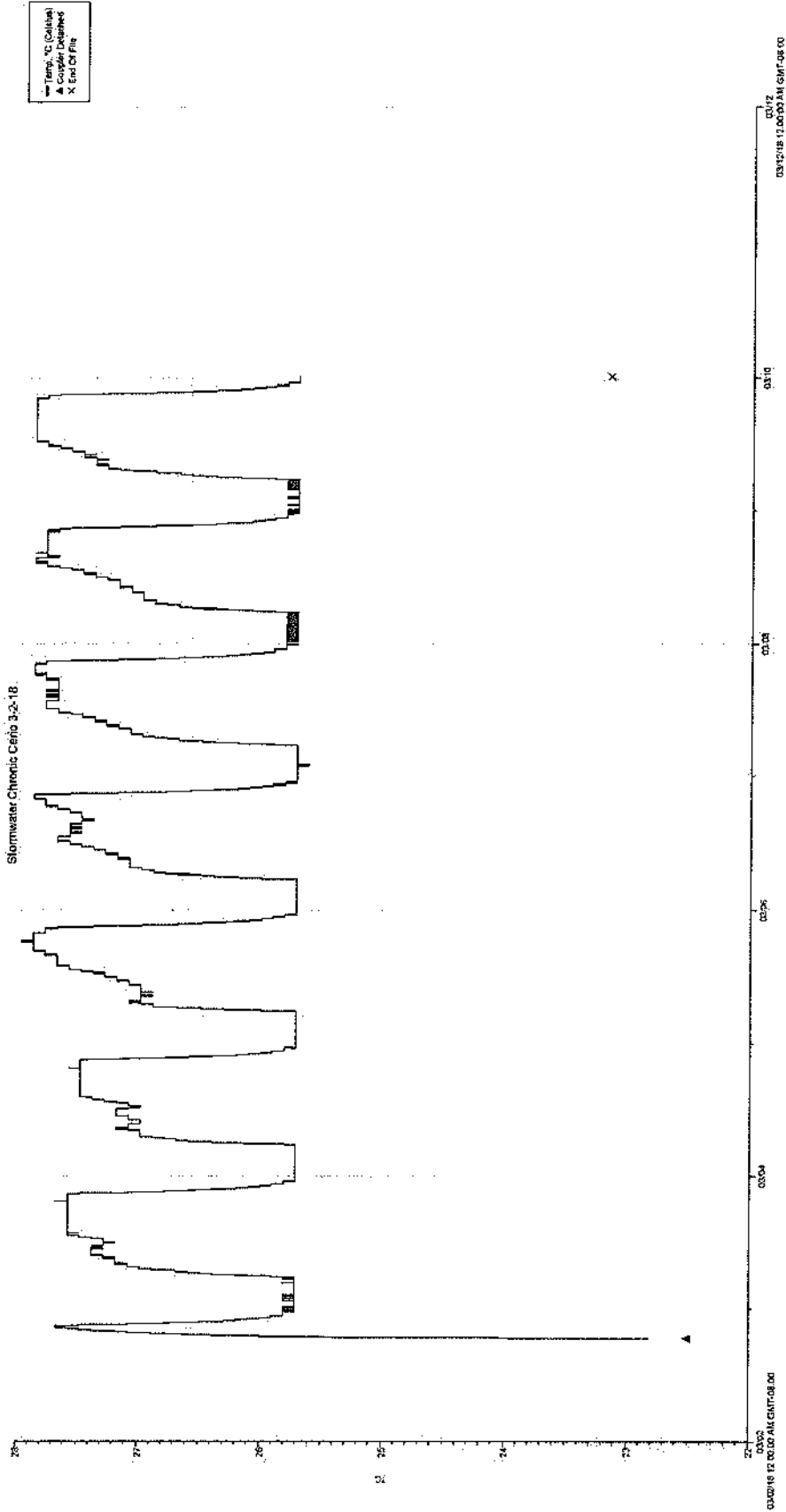
Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 02 Mar-18		Species: Ceriodaphnia dubia			Sample Code: 41183829			
End Date: 09 Mar-18		Protocol: EPA/821/R-02-013 (2002)			Sample Source: Stormwater			
Sample Date: 01 Mar-18		Material: Stormwater Monitoring Sample			Sample Station: RW-SMB-2			
Initial pH								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	8.08	8.24	8.24	8.06	8.02	7.76	
100		7.75	7.82	7.53	7.62	7.48	7.66	
Measure Time:		1552	1058	1154	1048	0850	0836	
Instrument ID:		#4	#4	#4	#4	#4	#4	
Analyst:		Re	Re	Re	Re	Re	Re	
Final Temperature-°C								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	25.8	25.2	24.9	25.1	25.8	25.7	
100		25.2	25.2	25.1	25.1	25.2	25.6	
Measure Time:		1352	1420	1350	1652	1519	1510	
Instrument ID:		#4	#4	#4	#4	#4	#4	
Analyst:		Re	Re	Re	Re	Re	Re	
Initial Temperature-°C								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	25.3	25.1	24.8	24.5	24.3	24.9	
100		25.0	24.4	24.1	24.5	24.1	24.2	
Measure Time:		1552	1058	1154	1048	0850	0836	
Instrument ID:		#4	#4	#4	#4	#4	#4	
Analyst:		Re	Re	Re	Re	Re	Re	

24.3

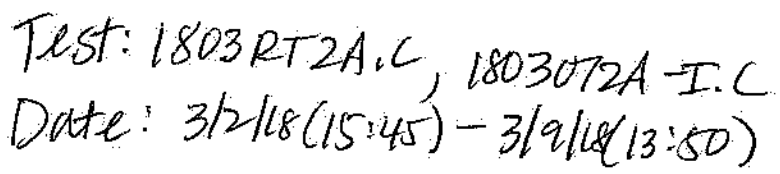
Alkalinity

Date/Time: 5/18/18 @Project: Storm Water C&CAnalyst: ASTitrant: 0.02 NH₂SO₄Factor: 20

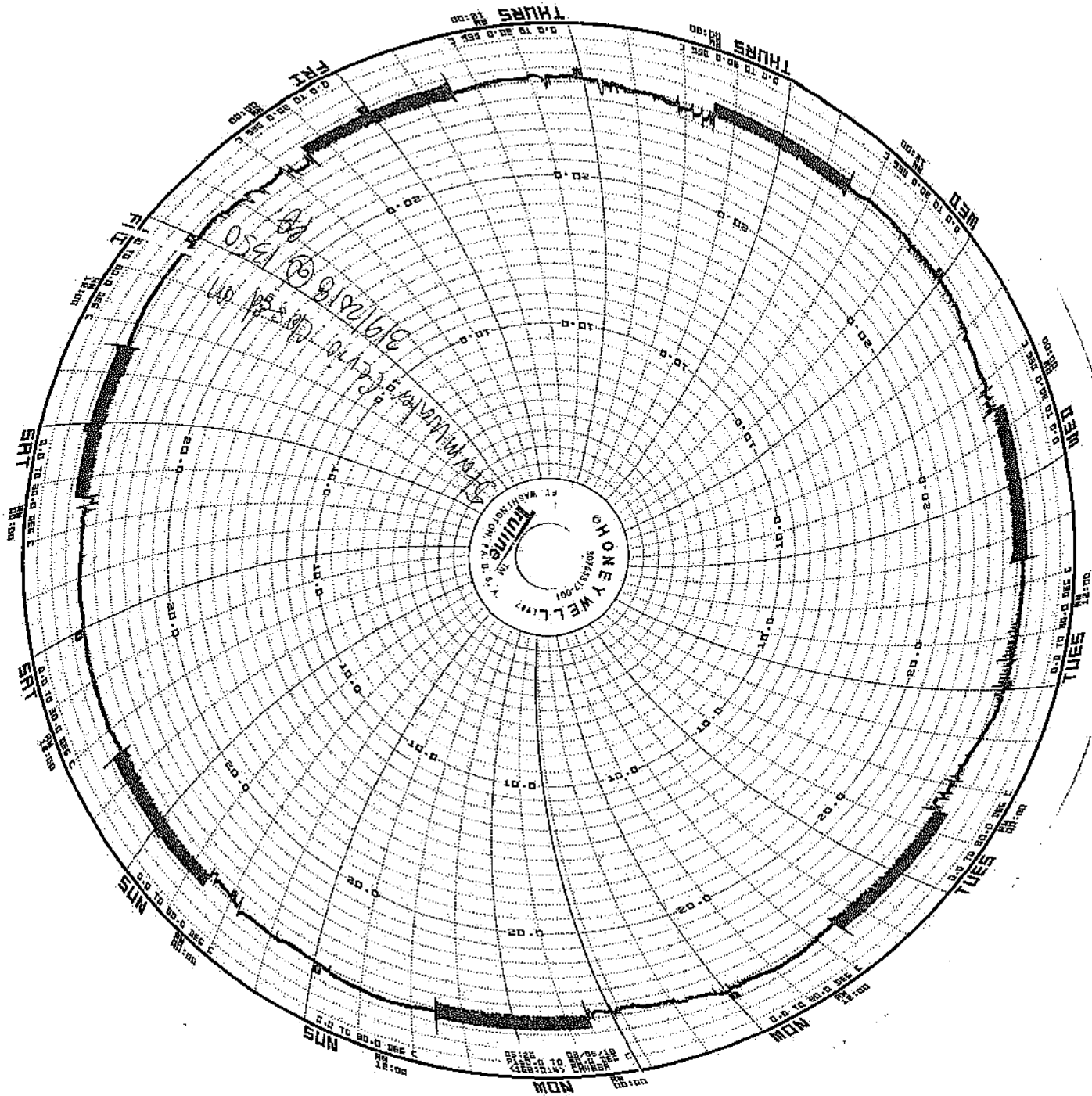
Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
DOM	25ml	1.8 X2	72
NAT	25ml	1.2 X2	48
SAW	25ml	0.5 X2	20
SMB	25ml	1.6 X2	64
WHI	25ml	0.9 X2	36
FLG	25ml	1.7 X2	68
TUJ	25ml	1.1 X2	44
WAS	25ml	1.8 X2	72
RHSLA	25ml	0.8 X2	32



Test: 1803RT2A.C, 1803072A-I.C
Date: 3/2/18(15:45) - 3/9/18(13:50)



Test: 1803RT2A.C, 1803072A-I.C
Date: 3/2/18 (15:45) - 3/9/18 (13:50)



Test: 1803RT2A.C, 1803072A-I.C
 Date: 3/2/18(15:45) - 3/9/18(13:50)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT
TOXICITY TESTING REPORT

SAMPLE DATE: March 6, 2018

TEST DATE: March 6, 2018

TEST NUMBER: 1803RT2A.H

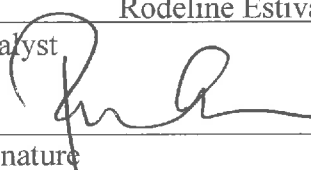
TEST MATERIAL: Zinc Sulfate

TEST SPECIES: *Haliotis rufescens*


PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic

RESULT NOEC: 32 µg/L
IC25: 44.3 µg/L

Analyst Rodeline Estiva

Signature

Title Water Biologist II
March 28, 2018
Date

Supervisor Rea Crinklaw

Signature

Title Water Biologist III
3/29/18
Date

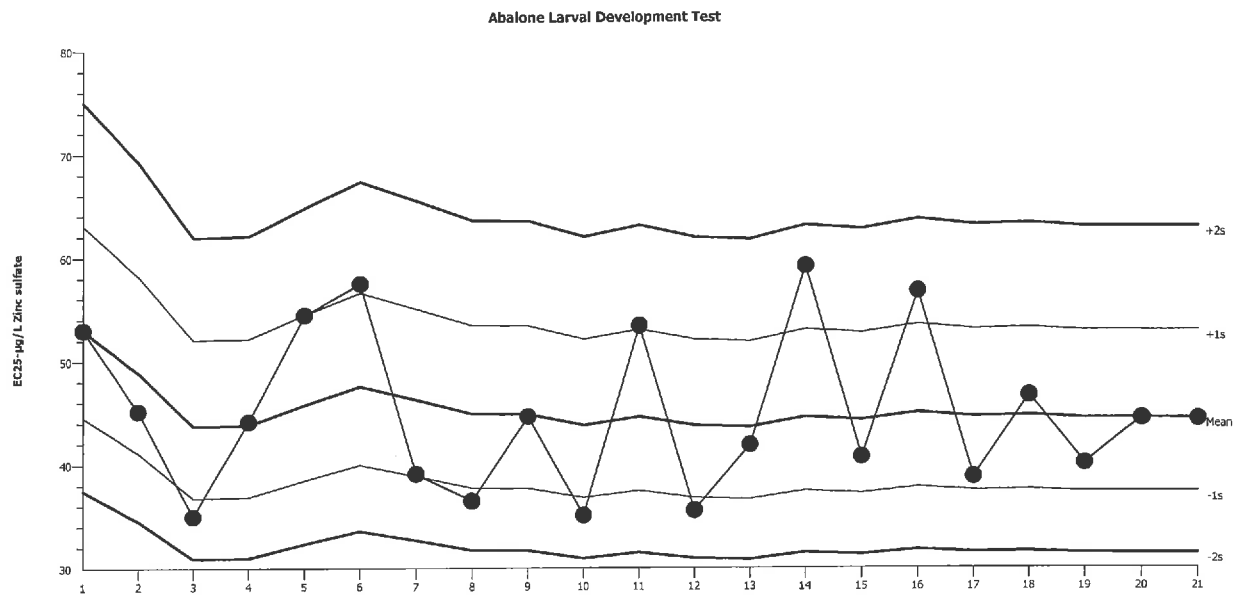
Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Test Type: Development
Protocol: EPA/600/R-95/136 (1995)

Organism: Haliotis rufescens (Red Abalone)
Endpoint: Development Rate

Material: Zinc sulfate
Source: Reference Toxicant-REF



Mean: 44.43

Count: 20

-1s Warning Limit: 37.35

-2s Action Limit: 31.39

Sigma: N/A

CV: 19.00%

+1s Warning Limit: 52.87

+2s Action Limit: 62.91

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Feb	9	53	8.562	1.014	(+)		06-7880-7546	02-0581-1379
2		Mar	23	45.17	0.7396	0.09499			11-2760-5170	19-5054-9005
3		Apr	5	34.99	-9.447	-1.375	(-)		11-1215-1162	19-2219-9156
4		May	10	44.15	-0.2797	-0.03633			12-0215-4193	05-1895-1744
5		Jun	7	54.44	10.01	1.169	(+)		14-4930-2277	18-7876-8418
6		Jul	12	57.45	13.02	1.479	(+)		12-3983-3660	00-3100-6703
7		Aug	9	39.08	-5.35	-0.7381			07-0065-4337	08-5146-6340
8		Sep	6	36.49	-7.94	-1.133	(-)		05-8092-4057	09-1753-9978
9		Oct	4	44.63	0.1962	0.02535			15-2271-0521	06-3374-6293
10		Nov	8	35.1	-9.338	-1.357	(-)		09-7023-1451	03-4792-9290
11			22	53.38	8.946	1.055	(+)		08-9314-9192	01-4922-1660
12		Dec	6	35.56	-8.877	-1.282	(-)		10-6522-7040	06-3190-7076
13			17	41.86	-2.573	-0.3432			10-6343-8866	05-4689-7562
14	2017	Jan	10	59.13	14.7	1.644	(+)		05-1541-3436	10-3097-1924
15		Feb	7	40.72	-3.718	-0.5028			15-3118-9322	17-3000-4025
16		Mar	14	56.7	12.27	1.403	(+)		17-3868-2242	09-6891-6373
17		May	16	38.78	-5.651	-0.7827			12-3329-2288	20-2046-6316
18		Jun	13	46.62	2.187	0.2764			05-5108-7222	07-7978-0762
19		Jul	18	40.08	-4.358	-0.594			19-1777-5893	05-8217-6902
20		Aug	15	44.4	-0.03649	-0.00473			14-8277-9368	10-0777-5321
21	2018	Mar	6	44.33	-0.1024	-0.01328			12-9060-7895	08-5208-8675

CETIS Summary Report

Report Date: 21 Mar-18 14:33 (p 1 of 1)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Batch ID:	16-6080-8043	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	06 Mar-18 14:29	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	08 Mar-18 12:14	Species:	Haliotis rufescens	Brine:	Frozen Seawater
Duration:	46h	Source:	Cultured Abalone	Age:	
Sample ID:	11-4674-5844	Code:	4459F3F4	Client:	Terminal Island WRP
Sample Date:	06 Mar-18 07:05	Material:	Zinc sulfate	Project:	NPDES
Receive Date:	06 Mar-18 07:05	Source:	Reference Toxicant		
Sample Age:	7h	Station:			

Batch Note: Batch 1052 HBN42888

Sample Note: Ideal concentration-response relationship. RE 3/19/2018

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-1303-5168	Development Rate	32	56	42.33	16.4%		Steel Many-One Rank Test
14-6471-0733		32	56	42.33	7.78%		Bonferroni Adj t Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
08-5208-8675	Development Rate	EC5	34.16	32.82	35.23		Linear Interpolation (ICPIN)
		EC10	36.47	34.39	38.86		
		EC15	38.92	35.76	42.94		
		EC20	41.54	37.09	47.47		
		EC25	44.33	38.46	52.45		
		EC40	53.84	42.77	63.41		
		EC50	60.25	46.34	68.48		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
08-5208-8675	Development Rate	Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria
10-1303-5168	Development Rate	Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria
14-6471-0733	Development Rate	Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria
10-1303-5168	Development Rate	NOEL	32	NL - 56	No	Passes Acceptability Criteria
14-6471-0733	Development Rate	NOEL	32	NL - 56	No	Passes Acceptability Criteria
10-1303-5168	Development Rate	PMSD	0.1642	0.038 - 0.16	No	Above Acceptability Criteria
14-6471-0733	Development Rate	PMSD	0.07779	0.038 - 0.16	No	Passes Acceptability Criteria

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9261	0.9132	0.939	0.8783	0.964	0.01541	0.03447	3.72%	0.0%
10		5	0.9213	0.9075	0.9352	0.8812	0.9722	0.01656	0.03704	4.02%	0.51%
18		5	0.942	0.9317	0.9523	0.9057	0.9808	0.01235	0.02763	2.93%	-1.72%
32		5	0.9399	0.9347	0.9451	0.9182	0.9524	0.006239	0.01395	1.48%	-1.49%
56		4	0.5316	0.474	0.5892	0.3077	0.65	0.07713	0.1543	29.02%	42.6%
100		5	0.01502	0.01187	0.01817	0.009259	0.02857	0.00377	0.008429	56.12%	98.38%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9352	0.9483	0.8783	0.964	0.9048
10		0.8812	0.9406	0.8911	0.9216	0.9722
18		0.9426	0.951	0.9298	0.9808	0.9057
32		0.9346	0.95	0.9182	0.9524	0.9444
56			0.65	0.6132	0.3077	0.5556
100		0.009259	0.02857	0.01802	0.009901	0.009346

OK; Cetis
detected
outlier
RE
3/21/2018

CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 1 of 4)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 10-1303-5168	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 13 Mar-18 11:04	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 16-6080-8043	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 06 Mar-18 14:29	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 08 Mar-18 12:14	Species: Haliotis rufescens	Brine: Frozen Seawater
Duration: 46h	Source: Cultured Abalone	Age:
Sample ID: 11-4674-5844	Code: 4459F3F4	Client: Terminal Island WRP
Sample Date: 06 Mar-18 07:05	Material: Zinc sulfate	Project: NPDES
Receive Date: 06 Mar-18 07:05	Source: Reference Toxicant	
Sample Age: 7h	Station:	

Sample Note: Ideal concentration-response relationship. RE 3/19/2018

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	32	56	42.33		16.4%

Steel Many-One Rank Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water		10	27	16	8	0	0.8003	Non-Significant Effect
		18	31	16	8	0	0.9676	Non-Significant Effect
		32	30	16	8	0	0.9446	Non-Significant Effect
		56*	15	16	8	0	0.0191	Significant Effect
		100*	15	16	8	0	0.0191	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria
NOEL	32	NL - 56	No	Passes Acceptability Criteria
PMSD	0.1642	0.038 - 0.16	No	Above Acceptability Criteria

OK, outlier is detected by cetis, 03/19/18

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	4.168	2.908	<0.0001	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.376708	1.275342	5	55.81	<0.0001	Significant Effect
Error	0.5484792	0.0228533	24			
Total	6.925187	1.298195	29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	34.76	15.09	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.7533	0.9031	<0.0001	Non-normal Distribution

CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 2 of 4)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 10-1303-5168
Analyzed: 13 Mar-18 11:04
Endpoint: Development Rate
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.1
Official Results: Yes

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9261	0.913	0.9392	0.8783	0.964	0.01541	0.03447	3.72%	0.0%
10		5	0.9213	0.9072	0.9354	0.8812	0.9722	0.01656	0.03704	4.02%	0.51%
18		5	0.942	0.9315	0.9525	0.9057	0.9808	0.01236	0.02763	2.93%	-1.72%
32		5	0.9399	0.9346	0.9452	0.9182	0.9524	0.006239	0.01395	1.48%	-1.49%
56		5	0.4273	0.325	0.5295	0.01	0.65	0.1202	0.2688	62.91%	53.86%
100		5	0.01502	0.01181	0.01823	0.009259	0.02857	0.00377	0.008429	56.12%	98.38%

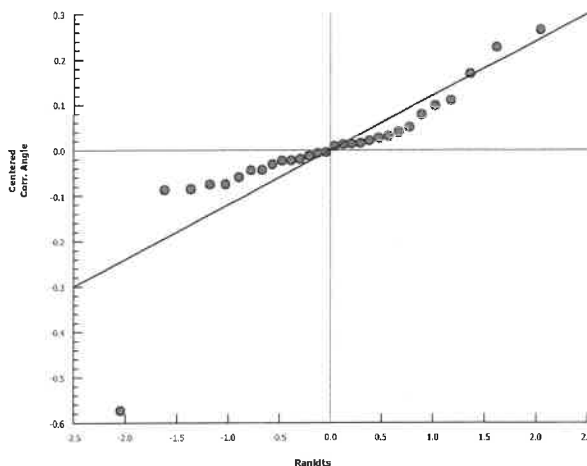
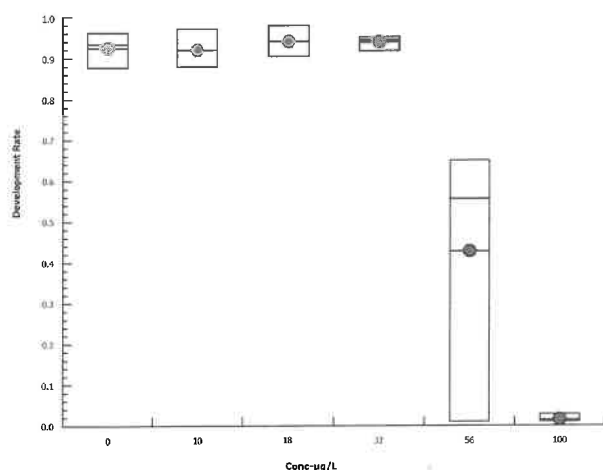
Angular (Corrected) Transformed Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.301	1.276	1.326	1.214	1.38	0.02952	0.066	5.07%	0.0%
10		5	1.294	1.265	1.322	1.219	1.403	0.03326	0.07438	5.75%	0.58%
18		5	1.334	1.31	1.358	1.259	1.432	0.02865	0.06406	4.8%	-2.51%
32		5	1.324	1.313	1.335	1.281	1.351	0.01278	0.02857	2.16%	-1.78%
56		5	0.6733	0.5409	0.8058	0.1002	0.9377	0.1557	0.3482	51.72%	48.25%
100		5	0.1195	0.1071	0.1318	0.09637	0.1698	0.0145	0.03243	27.14%	90.82%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9352	0.9483	0.8783	0.964	0.9048
10		0.8812	0.9406	0.8911	0.9216	0.9722
18		0.9426	0.951	0.9298	0.9808	0.9057
32		0.9346	0.95	0.9182	0.9524	0.9444
56		0.01	0.65	0.6132	0.3077	0.5556
100		0.009259	0.02857	0.01802	0.009901	0.009346

Graphics



CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 3 of 4)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 14-6471-0733	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 13 Mar-18 11:03	Analysis: Parametric-Multiple Comparison	Official Results: Yes
Batch ID: 16-6080-8043	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 06 Mar-18 14:29	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 08 Mar-18 12:14	Species: Haliotis rufescens	Brine: Frozen Seawater
Duration: 46h	Source: Cultured Abalone	Age:
Sample ID: 11-4674-5844	Code: 4459F3F4	Client: Terminal Island WRP
Sample Date: 06 Mar-18 07:05	Material: Zinc sulfate	Project: NPDES
Receive Date: 06 Mar-18 07:05	Source: Reference Toxicant	
Sample Age: 7h	Station:	

Sample Note: Ideal concentration-response relationship. RE 3/19/2018

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	32	56	42.33		7.78%

Bonferroni Adj t Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		10	0.1542	2.5	8	0.1224	1.0000	Non-Significant Effect
		18	-0.6675	2.5	8	0.1224	1.0000	Non-Significant Effect
		32	-0.473	2.5	8	0.1224	1.0000	Non-Significant Effect
		56*	9.331	2.5	7	0.1298	<0.0001	Significant Effect
		100*	24.13	2.5	8	0.1224	<0.0001	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria
NOEL	32	NL - 56	No	Passes Acceptability Criteria
PMSD	0.07779	0.038 - 0.16	No	Passes Acceptability Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.935417	1.187083	5	198.1	<0.0001	Significant Effect
Error	0.1378553	0.005993709	23			
Total	6.073272	1.193077	28			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	12.51	15.09	0.0285	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9337	0.9004	0.0688	Normal Distribution

CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 4 of 4)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 14-6471-0733
Analyzed: 13 Mar-18 11:03
Endpoint: Development Rate
Analysis: Parametric-Multiple Comparison

CETIS Version: CETISv1.8.1
Official Results: Yes

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9261	0.913	0.9392	0.8783	0.964	0.01541	0.03447	3.72%	0.0%
10		5	0.9213	0.9072	0.9354	0.8812	0.9722	0.01656	0.03704	4.02%	0.51%
18		5	0.942	0.9315	0.9525	0.9057	0.9808	0.01236	0.02763	2.93%	-1.72%
32		5	0.9399	0.9346	0.9452	0.9182	0.9524	0.006239	0.01395	1.48%	-1.49%
56		4	0.5316	0.4729	0.5903	0.3077	0.65	0.07713	0.1543	29.02%	42.6%
100		5	0.01502	0.01181	0.01823	0.009259	0.02857	0.00377	0.008429	56.12%	98.38%

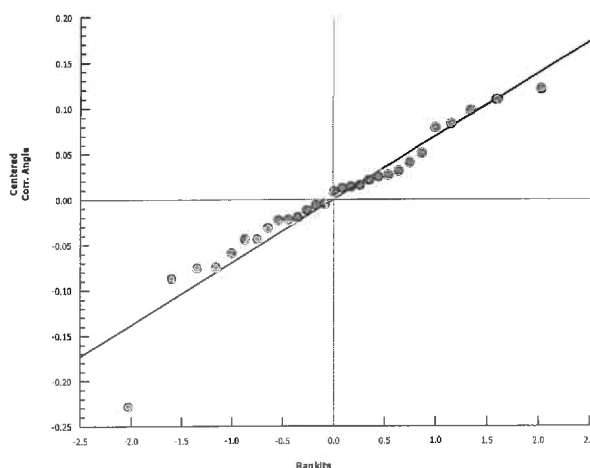
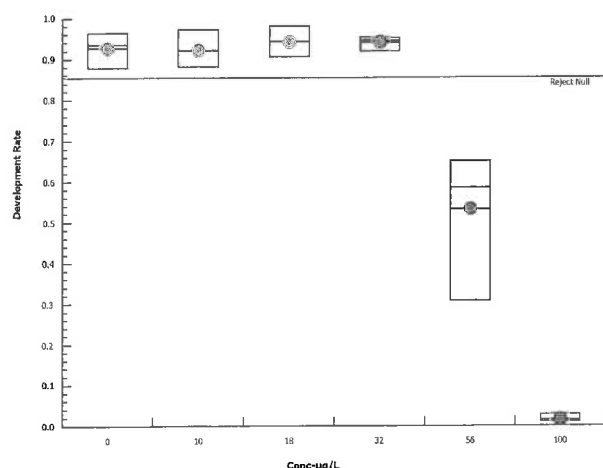
Angular (Corrected) Transformed Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.301	1.276	1.326	1.214	1.38	0.02952	0.066	5.07%	0.0%
10		5	1.294	1.265	1.322	1.219	1.403	0.03326	0.07438	5.75%	0.58%
18		5	1.334	1.31	1.358	1.259	1.432	0.02865	0.06406	4.8%	-2.51%
32		5	1.324	1.313	1.335	1.281	1.351	0.01278	0.02857	2.16%	-1.78%
56		4	0.8166	0.7567	0.8765	0.588	0.9377	0.07875	0.1575	19.29%	37.24%
100		5	0.1195	0.1071	0.1318	0.09637	0.1698	0.0145	0.03243	27.14%	90.82%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9352	0.9483	0.8783	0.964	0.9048
10		0.8812	0.9406	0.8911	0.9216	0.9722
18		0.9426	0.951	0.9298	0.9808	0.9057
32		0.9346	0.95	0.9182	0.9524	0.9444
56		Outlier	0.65	0.6132	0.3077	0.5556
100		0.009259	0.02857	0.01802	0.009901	0.009346

Graphics



Ideal concentration-response
relationship, RE
3/21/2018

CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 1 of 2)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 08-5208-8675	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 13 Mar-18 11:05	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 16-6080-8043	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 06 Mar-18 14:29	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 08 Mar-18 12:14	Species: Haliotis rufescens	Brine: Frozen Seawater
Duration: 46h	Source: Cultured Abalone	Age:
Sample ID: 11-4674-5844	Code: 4459F3F4	Client: Terminal Island WRP
Sample Date: 06 Mar-18 07:05	Material: Zinc sulfate	Project: NPDES
Receive Date: 06 Mar-18 07:05	Source: Reference Toxicant	
Sample Age: 7h	Station:	

Sample Note: Ideal concentration-response relationship. RE 3/19/2018

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1.654E+09	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9261	0.8 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	34.16	32.82	35.23
EC10	36.47	34.39	38.86
EC15	38.92	35.76	42.94
EC20	41.54	37.09	47.47
EC25	44.33	38.46	52.45
EC40	53.84	42.77	63.41
EC50	60.25	46.34	68.48

Development Rate Summary

Calculated Variate(A/B)

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	5	0.9261	0.8783	0.964	0.01541	0.03447	3.72%	0.0%	514	555
10		5	0.9213	0.8812	0.9722	0.01656	0.03704	4.02%	0.51%	473	513
18		5	0.942	0.9057	0.9808	0.01236	0.02763	2.93%	-1.72%	516	548
32		5	0.9399	0.9182	0.9524	0.006239	0.01395	1.48%	-1.49%	498	530
56		4	0.5316	0.3077	0.65	0.07713	0.1543	29.02%	42.6%	222	418
100		5	0.01502	0.009259	0.02857	0.00377	0.008429	56.12%	98.38%	7	532

Development Rate Detail

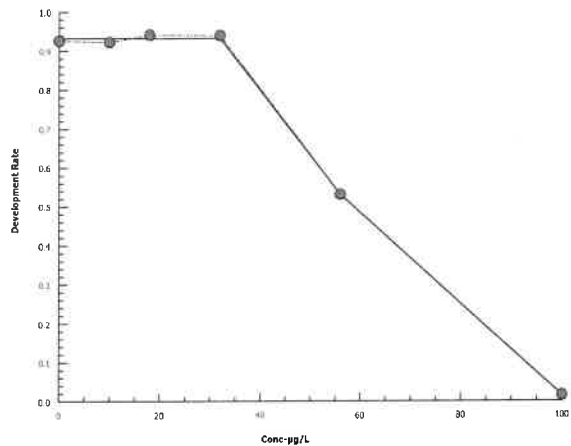
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9352	0.9483	0.8783	0.964	0.9048
10		0.8812	0.9406	0.8911	0.9216	0.9722
18		0.9426	0.951	0.9298	0.9808	0.9057
32		0.9346	0.95	0.9182	0.9524	0.9444
56		0.65	0.6132	0.3077	0.5556	
100		0.009259	0.02857	0.01802	0.009901	0.009346

CETIS Analytical Report

Report Date: 19 Mar-18 13:41 (p 2 of 2)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test		Hyperion Treatment Plant Laboratory	
Analysis ID: 08-5208-8675	Endpoint: Development Rate	CETIS Version: CETISv1.8.1	
Analyzed: 13 Mar-18 11:05	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	

Graphics



CETIS Test Data Worksheet

RT

 Report Date: 27 Feb-18 09:14 (p 1 of 1)
 Test Code: 12-9060-7895/1803RT2A.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

 Start Date: 06 Mar-18 1429 Species: Haliotis rufescens
 End Date: 08 Mar-18 1244 Protocol: EPA/600/R-95/136 (1995)
 Sample Date: 06 Mar-18 705 Material: Zinc sulfate

 Sample Code: 4459F3F4
 Sample Source: Reference Toxicant
 Sample Station:

Conc-µg/L	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	4	108	101	
0	D	2	28	116	110	
0	D	3	21	115	101	
0	D	4	3	111	107	
0	D	5	30	105	95	
10		1	11	101	89	
10		2	26	101	95	
10		3	22	101	90	
10		4	17	102	94	
10		5	12	108	105	
18		1	18	122	115	
18		2	6	102	97	
18		3	19	114	106	
18		4	7	104	102	
18		5	14	106	96	
32		1	2	107	100	
32		2	25	100	95	
32		3	20	110	101	
32		4	24	105	100	
32		5	1	108	102	
56		1	27	100	1	* per Cetis outlier
56		2	29	100	65	
56		3	23	106	65	
56		4	10	104	32	
56		5	15	108	60	
100		1	8	108	1	
100		2	13	105	3	
100		3	9	111	2	
100		4	5	101	1	
100		5	16	107	1	

Batch 1052 HBN 42888

Set up @ 8:00 AM, RE

CETIS Measurement Worksheet

RT

Report Date: 27 Feb-18 09:14 (p 1 of 1)
Test Code: 1803RT2A.H | 12-9060-7895

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Mar-18 Species: Haliotis rufescens
End Date: 08 Mar-18 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 06 Mar-18 Material: Zinc sulfate

Sample Code: 4459F3F4
Sample Source: Reference Toxicant
Sample Station:

Dissolved Oxygen-mg/L				
Conc-µg/L	Code	Reading 1	Reading 2	
0	D	7.37	7.99	
10		7.48	7.78	
18		7.52	7.80	
32		7.55	7.78	
56		7.58	7.76	
100		7.58	7.74	
Measure Time:		913	959	
Instrument ID:		#2	#3	
Analyst:		RE	RE	

pH				
Conc-µg/L	Code	Reading 1	Reading 2	
0	D	8.27	8.17	
10		8.27	8.09	
18		8.25	8.10	
32		8.26	8.11	
56		8.26	8.08	
100		8.23	8.09	
Measure Time:		848	959	
Instrument ID:		#3	#3	
Analyst:		RE	RE	

Salinity-ppt				
Conc-µg/L	Code	Reading 1	Reading 2	
0	D	33	32	
10		33	32	
18		33	32	
32		33	32	
56		33	32	
100		33	32	
Measure Time:		848	959	
Instrument ID:		#3	#3	
Analyst:		RE	RE	

Temperature-°C					
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	
0	D	14.8	14.9	14.9	
10		15.0	14.8	14.8	
18		15.1	14.8	14.8	
32		15.0	14.9	14.9	
56		15.1	14.9	14.9	
100		15.1	14.9	15.0	
Measure Time:		848	912	959	
Instrument ID:		#3	#3	#3	
Analyst:		RE	RE	RE	

RE

RE

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: TIWRP, Stormwater

TEST START DATE: March 6, 2018

Batch #: 180215

TEST ID: 1803RT2A.H, 1803042A.H, 1803072A.H, 1803072B.H

TIME SPAWNING START: 900

Number of abalone	Gonad index	Temperature		
Males <u>3</u> <u>2</u> <u>2</u> <u>2</u>	<u>2.25</u>	<u>15° C</u>		
Females <u>3</u> <u>3</u> <u>2</u> <u>2</u>	<u>2.15</u>	<u>15° C</u>		
	<u>316</u>			
	Time	Male		Female
Beginning of spawning treatment:	Male <u>1026</u> Female <u>925</u>	<u>15° C</u>		<u>15° C</u>
Taken out of H2O2:	<u>1256</u> <u>1256</u>			
First male abalone spawn:	<u>1310</u>	<u>15° C</u>		<u>15° C</u>
First female abalone spawn:	<u>1256</u>	<u>15° C</u>		<u>15° C</u>
Fertilization start:	<u>1321</u>	<u>15° C</u>		<u>15° C</u>
Fertilization completed:	<u>1336</u>	<u>15° C</u>		<u>15° C</u>
Fertilized eggs density count:				

Mean 209 eggs / 0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml
836 eggs / 0.3 ml = 2786.7 eggs/ml

Temperature of embryos: 14.9° C

Temperature of test containers: 14.3° C

Time embryos added to test chambers (TEST START): 1321 1429

① 123 20316 1414 0.3 ml

② 125 eggs / 0.3 ml

③ 118 eggs / 0.3 ml

④ 128 egg / 0.3 ml

⑤ 132 eggs / 0.3 ml

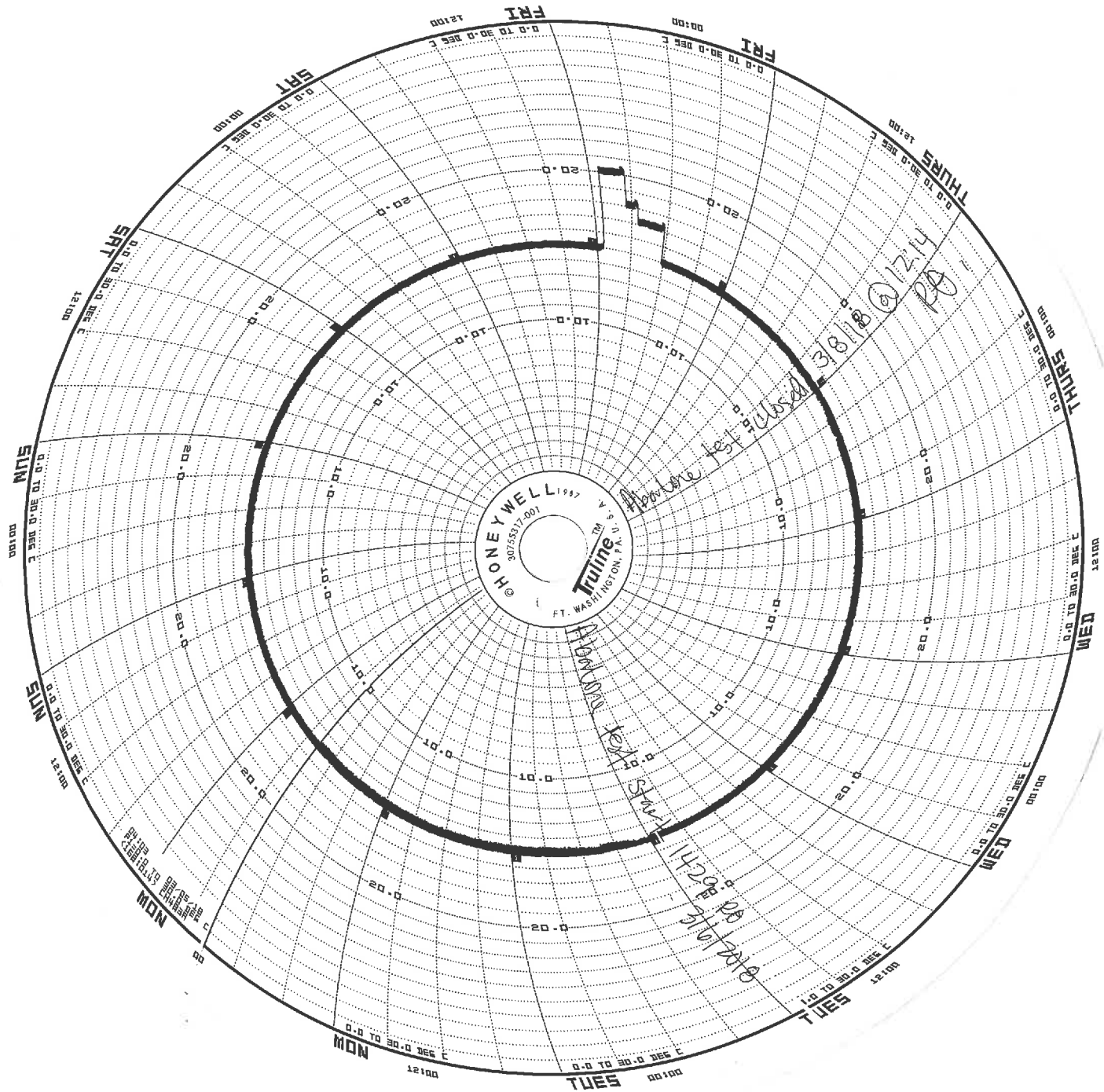
$$125 \text{ eggs} / 0.3 \text{ ml} = 209 \text{ eggs} / 0.15 \text{ ml}$$

TEST CLOSING

DATE: 3/8/2018

TIME: 12:14

RE



Abalone Chronic Toxicity Test

Test start: Tuesday, March 6, 2018

Test end: Thursday, March 8, 2018

RT - 1803 RT 2A.H

TIWRP - 180304 2A.H

SMB 1 - 180307 2A.H

SMB 3 - 180367 2B.H

* Hobo not activated,
RE 3/28/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: March 5, 2018

TEST DATE: March 6, 2018

TEST NUMBER: 1803072A.H

TEST MATERIAL: Station RW-SMB-1

TEST SPECIES: *Haliotis rufescens*

PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1803RT2A.H

RESULT: PASS

% Effect = 0.95 %

Rodeline Estiva

Analyst

Signature

Water Biologist II

Title

Date

March 28, 2018

Rea Crinklaw

Supervisor

Signature

Water Biologist III

Title

Date

3/29/18

CETIS Summary Report

Report Date: 21 Mar-18 14:34 (p 1 of 1)
Test Code: 1803072A.H | 05-9029-8179

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Batch ID:	16-6080-8043	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	06 Mar-18 14:29	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	08 Mar-18 12:14	Species:	Haliotis rufescens	Brine:	Frozen Seawater
Duration:	46h	Source:	Cultured Abalone	Age:	
Sample ID:	17-7928-2006	Code:	2221101	Client:	Watershed Protection Division
Sample Date:	05 Mar-18 09:54	Material:	Stormwater Monitoring Sample	Project:	MS4
Receive Date:	05 Mar-18 14:30	Source:	WPD (WATERSHED)		
Sample Age:	29h (12.6 °C)	Station:	RW-SMB-1		

Batch Note: Batch 1052 HBN42888

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-2265-5043	Development Rate	100	>100	N/A	N/A	1	TST-Welch's t Test

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
17-2265-5043	Development Rate	Control Resp	0.9649	0.8 - NL	Yes	Passes Acceptability Criteria

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9649	0.9561	0.9738	0.9266	0.9907	0.01056	0.02361	2.45%	0.0%
100		5	0.9558	0.9497	0.9619	0.9298	0.9744	0.007313	0.01635	1.71%	0.95%

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.964	0.9266	0.9732	0.9703	0.9907
100		0.9744	0.9608	0.9298	0.9604	0.9537

CETIS Analytical Report

Report Date: 19 Mar-18 13:45 (p 1 of 2)
Test Code: 1803072A.H | 05-9029-8179

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 17-2265-5043	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 15 Mar-18 14:04	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes
Batch ID: 16-6080-8043	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 06 Mar-18 14:29	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 08 Mar-18 12:14	Species: Haliotis rufescens	Brine: Frozen Seawater
Duration: 46h	Source: Cultured Abalone	Age:
Sample ID: 17-7928-2006	Code: 2221101	Client: Watershed Protection Division
Sample Date: 05 Mar-18 09:54	Material: Stormwater Monitoring Sample	Project: MS4
Receive Date: 05 Mar-18 14:30	Source: WPD (WATERSHED)	
Sample Age: 29h (12.6 °C)	Station: RW-SMB-1	

Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes development rate endpoint

TST-Welch's t Test

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		100*	11.57	1.895	7		<0.0001	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9649	0.8 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	1.897	2.29	0.3527	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002123133	0.002123133	1	0.7626	0.4080	Non-Significant Effect
Error	0.02227352	0.00278419	8			
Total	0.02439665	0.004907323	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	2.685	23.15	0.3620	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9448	0.7411	0.6080	Normal Distribution

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9649	0.956	0.9739	0.9266	0.9907	0.01056	0.02361	2.45%	0.0%
100		5	0.9558	0.9496	0.962	0.9298	0.9744	0.007313	0.01635	1.71%	0.95%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.391	1.367	1.415	1.296	1.474	0.02849	0.0637	4.58%	0.0%
100		5	1.362	1.347	1.376	1.303	1.41	0.01739	0.03887	2.86%	2.1%

CETIS Analytical Report

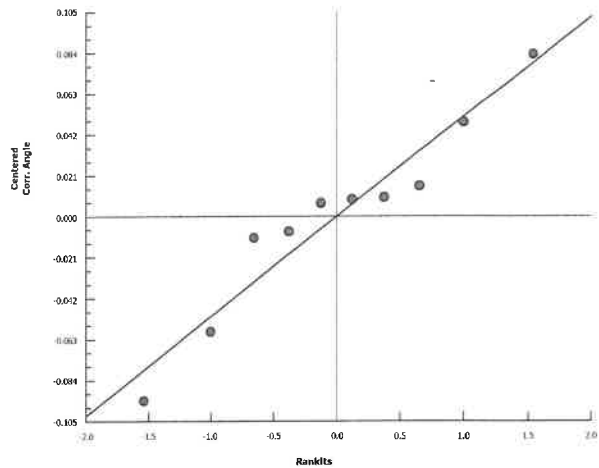
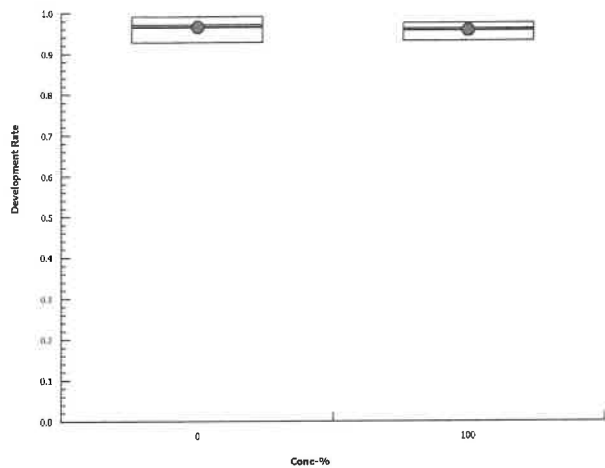
Report Date: 19 Mar-18 13:45 (p 2 of 2)
Test Code: 1803072A.H | 05-9029-8179

Abalone Larval Development Test			Hyperion Treatment Plant Laboratory		
Analysis ID:	17-2265-5043	Endpoint:	Development Rate	CETIS Version:	CETISv1.8.1
Analyzed:	15 Mar-18 14:04	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.964	0.9266	0.9732	0.9703	0.9907
100		0.9744	0.9608	0.9298	0.9604	0.9537

Graphics



CETIS Test Data Worksheet

SMB1

Report Date: 27 Feb-18 09:14 (p 1 of 1)
Test Code: 05-9029-8179/1803072A.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Mar-18 1429 Species: Haliotis rufescens
End Date: 08 Mar-18 1214 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 05 Mar-18 954 Material: Stormwater Monitoring Sample

Sample Code: 6A0DB056
Sample Source: WPD
Sample Station: RW-SMB-1

Conc-%	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	6	111	107	
0	D	2	10	109	101	
0	D	3	14	112	109	
0	D	4	9	101	98	
0	D	5	12	107	106	
100		1	7	117	114	
100		2	4	102	98	
100		3	1	114	106	
100		4	5	101	97	
100		5	15	108	103	

2221101, sampled 3/5/18 @ 9:54, T=12.6°C, sample arrived 3/5/18 @ 14:30.

set-up @ 10:15. Re 3/6/2018

CETIS Measurement Worksheet

SMB 1

Report Date: 27 Feb-18 09:14 (p 1 of 1)
 Test Code: 1803072A.H | 05-9029-8179

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Mar-18 Species: *Haliotis rufescens*
 End Date: 08 Mar-18 Protocol: EPA/600/R-95/136 (1995)
 Sample Date: 05 Mar-18 Material: Stormwater Monitoring Sample

Sample Code: 6A0DB056
 Sample Source: WPD
 Sample Station: RW-SMB-1

Dissolved Oxygen-mg/L 3/6					
Conc-%	Code	Reading 1	Reading 2		
0	D	7.35	7.72		
100		7.94	7.68		
Measure Time:		1016	1009		
Instrument ID:		#2	#3		
Analyst:		Rc	Rc		
pH 3/6					
Conc-%	Code	Reading 1	Reading 2		
0	D	8.19	8.18		
100		8.26	8.15		
Measure Time:		1016	1009		
Instrument ID:		#3	#3		
Analyst:		Rc	Rc		
Salinity-ppt 3/6					
Conc-%	Code	Reading 1	Reading 2		
0	D	33	32		
100		34	33		
Measure Time:		1016	1009		
Instrument ID:		#3	#3		
Analyst:		Rc	Rc		
Temperature-°C 3/6					
Conc-%	Code	Reading 1	Reading 2	Reading 3	
0	D	14.9	15.1	15.2	
100		15.2	15.1	15.2	
Measure Time:		1016	917	1009	
Instrument ID:		#3	#3	#3	
Analyst:		Rc	Rc	Rc	

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: TIWRP, Stormwater

TEST START DATE: March 6, 2018

Batch #: 180215

TEST ID: 1803RT2A.H, 1803042A.H, 1803072A.H, 1803072B.H

TIME SPAWNING START: 900

Number of abalone

Gonad index

Temperature

Males	<u>3</u>	<u>2</u>	<u>2</u>	<u>2</u>		<u>2,25</u>	<u>15° C</u>
Females	<u>3</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>316</u>	<u>2,15</u>	<u>15° C</u>

Time

Male

Female

Male Female Temperature

Temperature

Beginning of spawning treatment: 1020 | 925 10316 15° C

Taken out of H2O2: 1256 | 1256 1156 15° C

First male abalone spawn: 1310 15° C

First female abalone spawn: 1256 15° C

Fertilization start: 1321 15° C

Fertilization completed: 1336 15° C

Fertilized eggs density count:

Mean 209 eggs / 0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml

836 eggs / 0.2 ml / beaker = ml/test per beaker

Temperature of embryos: 14.9° C

Temperature of test containers: 14.3° C

Time embryos added to test chambers (TEST START): 132 1429

① 123 10316 10316
125 0.4 ml
0.3 ml

125 eggs / 0.3 ml = 209 eggs / 0.5 ml

② 125 eggs / 0.3 ml

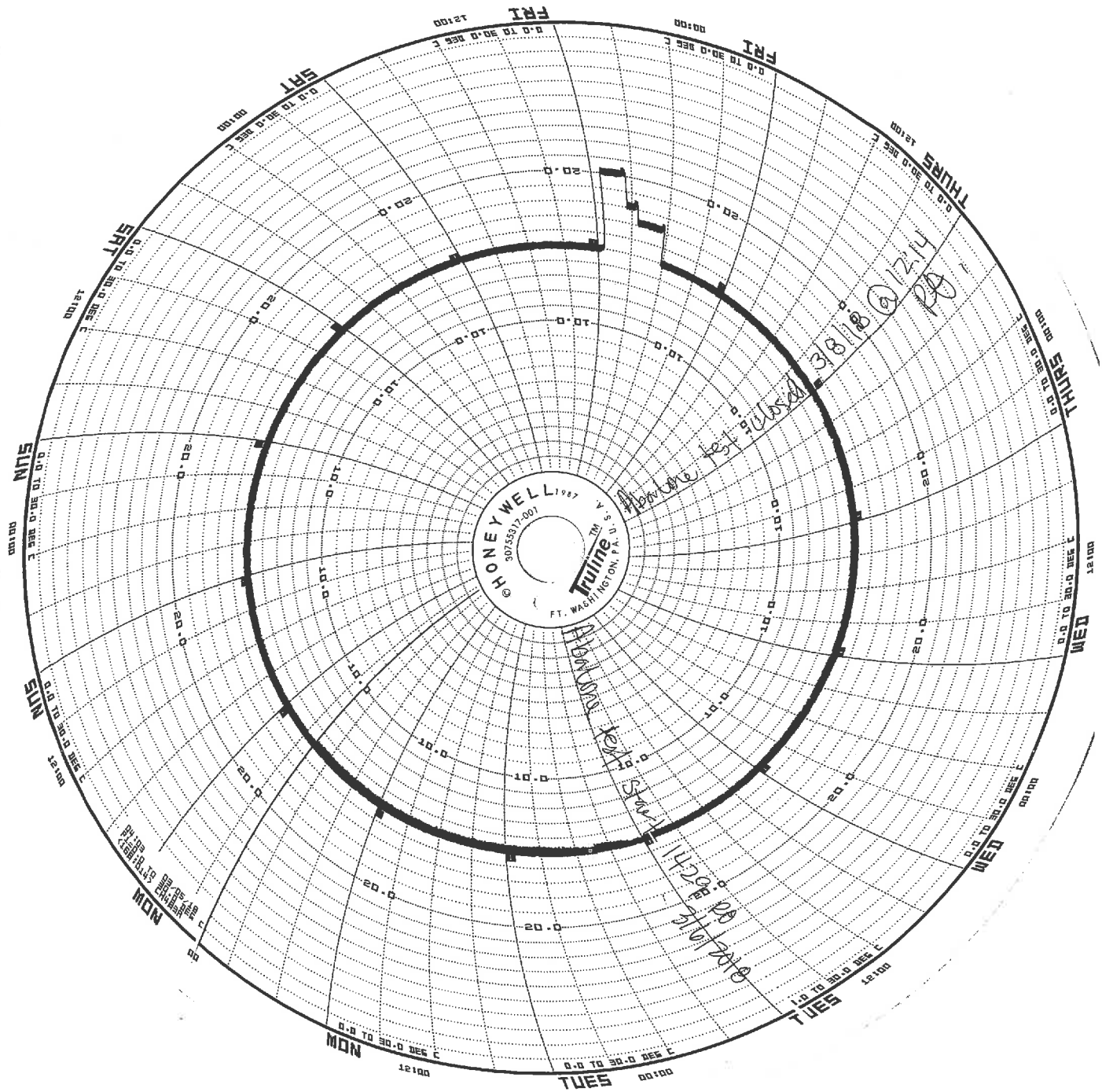
③ 118 eggs / 0.3 ml

④ 128 eggs / 0.3 ml

⑤ 132 eggs / 0.3 ml

TEST CLOSING
DATE: 3/8/2018

TIME: 12:14 RE



Abalone Chronic Toxicity Test

Test start: Tuesday, March 6, 2018

Test end: Thursday, March 8, 2018

RT-1803RT2A.H

TIWRP-1803042A.H

SMB1-1803072A.H

SMB3-1803672B.H

* Hobo not activated,
RE 3/28/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: March 5, 2018

TEST DATE: March 6, 2018

TEST NUMBER: 1803072B.H

TEST MATERIAL: Station RW-SMB-3

TEST SPECIES: *Haliotis rufescens*

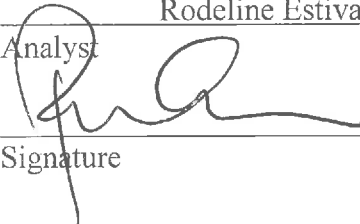
PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic

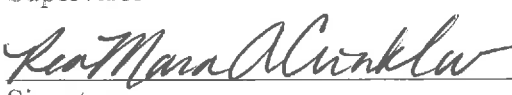
REFERENCE TOXICANT TEST: 1803RT2A.H

RESULT: PASS

% Effect = 0.42 %

Analyst Rodeline Estiva

Signature

Title Water Biologist II
March 28, 2018
Date

Supervisor Rea Crinklaw

Signature

Title Water Biologist III
3/29/18
Date

CETIS Summary Report

Report Date: 21 Mar-18 14:35 (p 1 of 1)
 Test Code: 1803072B.H | 10-0425-9666

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Batch ID:	16-6080-8043	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	06 Mar-18 14:29	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	08 Mar-18 12:14	Species:	Haliotis rufescens	Brine:	Frozen Seawater
Duration:	46h	Source:	Cultured Abalone	Age:	
Sample ID:	03-4530-8698	Code:	2221102	Client:	Watershed Protection Division
Sample Date:	05 Mar-18 10:26	Material:	Stormwater Monitoring Sample	Project:	MS4
Receive Date:	05 Mar-18 14:30	Source:	WPD (WATERSHED)		
Sample Age:	28h (11.4 °C)	Station:	RW-SMB-3		

Batch Note: Batch 1052 HBN42888

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-9779-8300	Development Rate	100	>100	N/A	N/A	1	TST-Welch's t Test

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-9779-8300	Development Rate	Control Resp	0.9649	0.8 - NL	Yes	Passes Acceptability Criteria

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9649	0.9561	0.9738	0.9266	0.9907	0.01056	0.02361	2.45%	0.0%
100		5	0.9609	0.9571	0.9647	0.9515	0.9725	0.004554	0.01018	1.06%	0.42%

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.964	0.9266	0.9732	0.9703	0.9907
100		0.9714	0.9545	0.9725	0.9515	0.9545

CETIS Analytical Report

Report Date: 19 Mar-18 13:46 (p 1 of 2)
Test Code: 1803072B.H | 10-0425-9666

Abalone Larval Development Test Hyperion Treatment Plant Laboratory

Analysis ID: 07-9779-8300	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 15 Mar-18 14:09	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes
Batch ID: 16-6080-8043	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 06 Mar-18 14:29	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 08 Mar-18 12:14	Species: Haliotis rufescens	Brine: Frozen Seawater
Duration: 46h	Source: Cultured Abalone	Age:
Sample ID: 03-4530-8698	Code: 2221102	Client: Watershed Protection Division
Sample Date: 05 Mar-18 10:26	Material: Stormwater Monitoring Sample	Project: MS4
Receive Date: 05 Mar-18 14:30	Source: WPD (WATERSHED)	
Sample Age: 28h (11.4 °C)	Station: RW-SMB-3	

Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes development rate endpoint

TST-Welch's t Test

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		100*	13.44	1.943	6		<0.0001	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9649	0.8 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	2.046	2.29	0.1914	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.000784899	0.000784899	1	0.3278	0.5827	Non-Significant Effect
Error	0.01915339	0.002394174	8			
Total	0.01993829	0.003179073	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	5.549	23.15	0.1257	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9441	0.7411	0.5996	Normal Distribution

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9649	0.956	0.9739	0.9266	0.9907	0.01056	0.02361	2.45%	0.0%
100		5	0.9609	0.957	0.9648	0.9515	0.9725	0.004554	0.01018	1.06%	0.42%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.391	1.367	1.415	1.296	1.474	0.02849	0.0637	4.58%	0.0%
100		5	1.373	1.363	1.383	1.349	1.404	0.01209	0.02704	1.97%	1.27%

CETIS Analytical Report

Report Date: 19 Mar-18 13:46 (p 2 of 2)
Test Code: 1803072B.H | 10-0425-9666

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

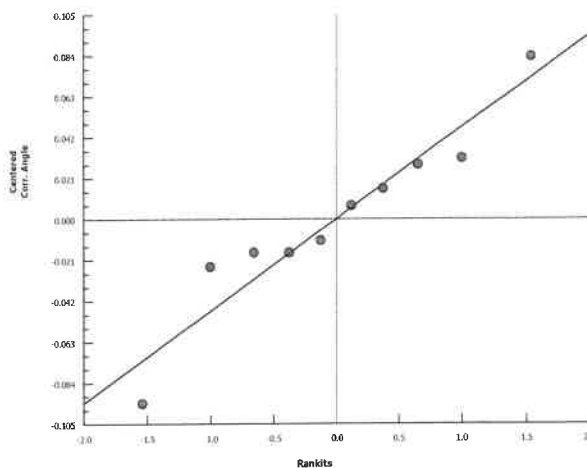
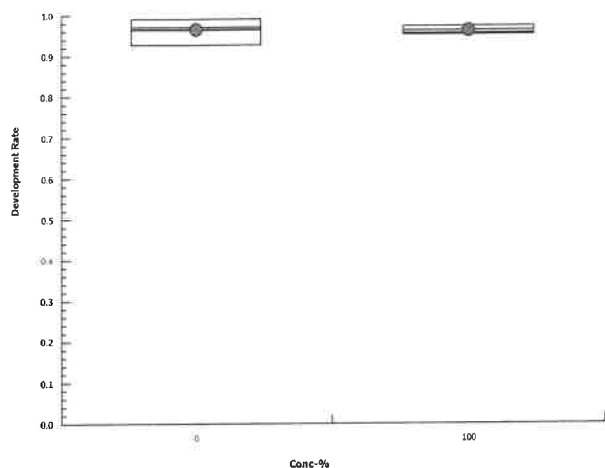
Analysis ID: 07-9779-8300 Endpoint: Development Rate
Analyzed: 15 Mar-18 14:09 Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
Official Results: Yes

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.964	0.9266	0.9732	0.9703	0.9907
100		0.9714	0.9545	0.9725	0.9515	0.9545

Graphics



CETIS Test Data Worksheet

SMB3

Report Date: 27 Feb-18 09:15 (p 1 of 1)
Test Code: 10-0425-9666/1803072B.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Mar-18 1429 Species: Haliotis rufescens
End Date: 08 Mar-18 1214 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 05 Mar-18 10:26 Material: Stormwater Monitoring Sample

Sample Code: 1494FE1A
Sample Source: WPD
Sample Station: RW-SMB-3

Conc-%	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	6	111	107	
0	D	2	10	109	101	
0	D	3	14	112	109	
0	D	4	9	101	98	
0	D	5	12	107	106	
100		1	2	105	102	
100		2	11	116	105	
100		3	8	109	106	
100		4	13	103	98	
100		5	3	110	105	

2221102, sampled 3/5/18 @ 10:26, T=11.4°C, arrived 3/5/18 @ 14:30

set-up @ 10:20
10:30, RE 3/6/18
Re
3/6/18

CETIS Measurement Worksheet

SMB3

Report Date: 27 Feb-18 09:15 (p 1 of 1)
Test Code: 1803072B.H | 10-0425-9666

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Mar-18 Species: Haliotis rufescens
End Date: 08 Mar-18 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 05 Mar-18 Material: Stormwater Monitoring Sample

Sample Code: 1494FE1A
Sample Source: WPD
Sample Station: RW-SMB-3

Dissolved Oxygen-mg/L					
Conc-%	Code	Reading 1	Reading 2		
0	D	7.35	7.72		
100		8.16	7.65		
Measure Time:		1020	1011		
Instrument ID:		#2	#3		
Analyst:		RO	RO		
pH					
Conc-%	Code	Reading 1	Reading 2		
0	D	8.19	8.18		
100		8.33	8.16		
Measure Time:		1020	1011		
Instrument ID:		#3	#3		
Analyst:		RO	RO		
Salinity-ppt					
Conc-%	Code	Reading 1	Reading 2		
0	D	33	32		
100		34	33		
Measure Time:		1020	1011		
Instrument ID:		#3	#3		
Analyst:		RO	RO		
Temperature-°C					
Conc-%	Code	Reading 1	Reading 2	Reading 3	
0	D	14.9	15.1	15.2	
100		15.2	15.1	15.2	
Measure Time:		1020	918	1011	
Instrument ID:		#3	#3	#3	
Analyst:		RO	RO	RO	

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: TIWRP, Stormwater

TEST START DATE: March 6, 2018

Batch #: 180215

TEST ID: 1803RT2A.H, 1803042A.H, 1803072A.H, 1803072B.H

TIME SPAWNING START: 900

Number of abalone

Gonad index

Temperature

Males 3 2 2 2
Females 3 3 2 2
126
316

2,25
2,15

15° C
15° C

Time

Male

Female

Male Female Temperature

Temperature

Beginning of spawning treatment: 1020 | 925 10316

Taken out of H2O2:

1256 | 1256 1156

First male abalone spawn:

1310

15° C

15° C

First female abalone spawn:

1256

15° C

15° C

Fertilization start:

1321

15° C

15° C

Fertilization completed:

1336

15° C

15° C

Fertilized eggs density count:

Mean 209 eggs 0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml

836 eggs / 0.3 ml / beaker = 2786.66 ml/test per beaker

Temperature of embryos:

14.9° C

Temperature of test containers:

14.3° C

Time embryos added to test chambers (TEST START): 1321 1429

① 123 10316
1256 10316
0.4 ml
0.3 ml

125 eggs / 0.3 ml = 209 eggs / 0.5 ml

② 125 eggs / 0.3 ml

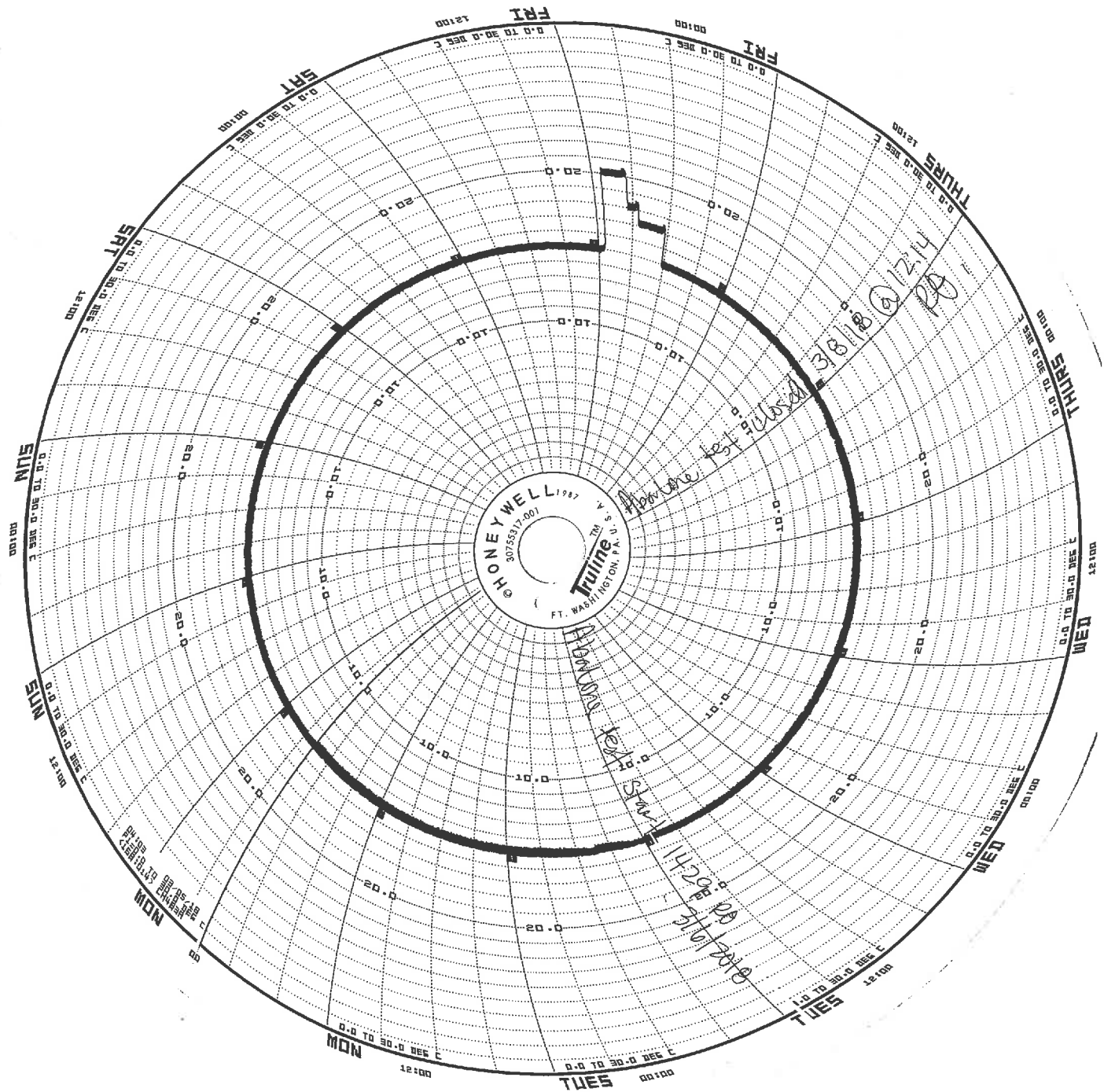
③ 118 eggs / 0.3 ml

④ 128 eggs / 0.3 ml

⑤ 132 eggs / 0.3 ml

TEST CLOSING
DATE: 3/8/2018

TIME: 12:14 RE



ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT
TOXICITY TESTING REPORT

SAMPLE DATE: March 14, 2018

TEST DATE: March 14, 2018

TEST NUMBER: 1803RT2B.H

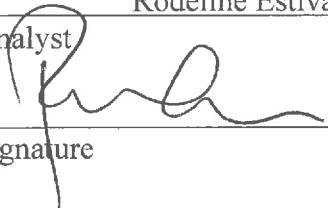
TEST MATERIAL: Zinc Sulfate

TEST SPECIES: *Haliotis rufescens*

PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic


RESULT NOEC: 32 µg/L
IC25: 49.3 µg/L

Rodeline Estiva
Analyst


Signature

Water Biologist II
Title

March 28, 2018
Date

Rea Crinklaw
Supervisor


Signature

Water Biologist III
Title

4/6/18
Date

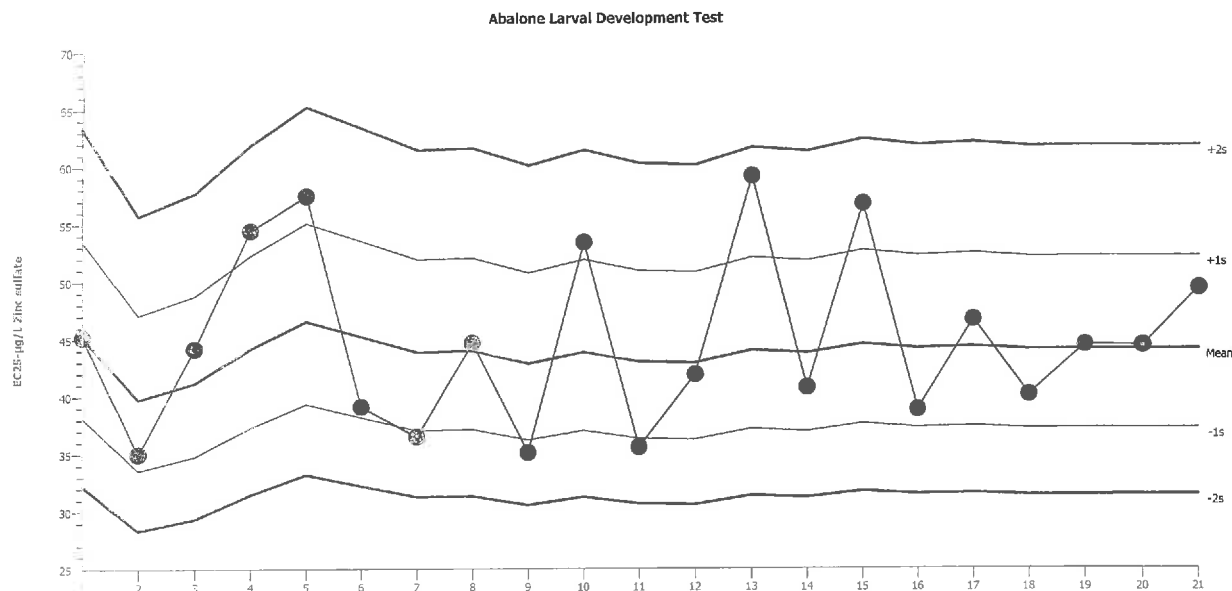
Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Test Type: Development
Protocol: EPA/600/R-95/136 (1995)

Organism: *Haliotis rufescens* (Red Abalone)
Endpoint: Development Rate

Material: Zinc sulfate
Source: Reference Toxicant-REF



Mean: 44.04

Count: 20

-1s Warning Limit: 37.2

-2s Action Limit: 31.42

Sigma: N/A

CV: 18.40%

+1s Warning Limit: 52.14

+2s Action Limit: 61.73

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2016	Mar	23	45.17	1.138	0.1511			11-2760-5170	19-5054-9005
2		Apr	5	34.99	-9.049	-1.363	(-)		11-1215-1162	19-2219-9156
3		May	10	44.15	0.1184	0.01591			12-0215-4193	05-1895-1744
4		Jun	7	54.44	10.41	1.257	(+)		14-4930-2277	18-7876-8418
5		Jul	12	57.45	13.42	1.576	(+)		12-3983-3660	00-3100-6703
6		Aug	9	39.08	-4.952	-0.7067			07-0065-4337	08-5146-6340
7		Sep	6	36.49	-7.542	-1.113	(-)		05-8092-4057	09-1753-9978
8		Oct	4	44.63	0.5943	0.07942			15-2271-0521	06-3374-6293
9		Nov	8	35.1	-8.94	-1.344	(-)		09-7023-1451	03-4792-9290
10			22	53.38	9.344	1.14	(+)		08-9314-9192	01-4922-1660
11		Dec	6	35.56	-8.479	-1.267	(-)		10-6522-7040	06-3190-7076
12			17	41.86	-2.175	-0.3001			10-6343-8866	05-4689-7562
13	2017	Jan	10	59.13	15.1	1.746	(+)		05-1541-3436	10-3097-1924
14		Feb	7	40.72	-3.32	-0.4643			15-3118-9322	17-3000-4025
15		Mar	14	56.7	12.67	1.498	(+)		17-3868-2242	09-6891-6373
16		May	16	38.78	-5.253	-0.7525			12-3329-2288	20-2046-6316
17		Jun	13	46.62	2.585	0.3379			05-5108-7222	07-7978-0762
18		Jul	18	40.08	-3.96	-0.5582			19-1777-5893	05-8217-6902
19		Aug	15	44.4	0.3616	0.04845			14-8277-9368	10-0777-5321
20	2018	Mar	6	44.33	0.2957	0.03965			12-9060-7895	08-5208-8675
21			14	49.33	5.292	0.6723			07-5721-1012	07-9641-6990

CETIS Summary Report

 Report Date: 28 Mar-18 10:43 (p 1 of 1)
 Test Code: 1803RT2B.H | 07-5721-1012

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Batch ID:	05-3695-8369	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	14 Mar-18 14:05	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	16 Mar-18 12:53	Species:	Haliotis rufescens	Brine:	
Duration:	47h	Source:	Cultured Abalone	Age:	
Sample ID:	18-6453-3151	Code:	7518659F	Client:	Watershed Protection Division
Sample Date:	14 Mar-18 07:30	Material:	Zinc sulfate	Project:	MS4
Receive Date:	14 Mar-18 07:30	Source:	Reference Toxicant		
Sample Age:	7h	Station:			
Batch Note: Batch 1055 HBN43547					

Sample Note: Ideal concentration-response relationship. RE 3/27/2018

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-0528-0374	Development Rate	32	56	42.33	7.41%		Steel Many-One Rank Test
11-8891-3138		32	56	42.33	5.07%		Bonferroni Adj t Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
07-9641-6990	Development Rate	EC5	33.48	27.97	35.4		Linear Interpolation (ICPIN)
		EC10	36.9	34	38.87		
		EC15	40.66	37.65	43.29		
		EC20	44.79	41.5	47.81		
		EC25	49.33	45.43	53.56		
		EC40	60.22	57.77	62.46		
		EC50	65.64	63.39	67.68		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-9641-6990	Development Rate	Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria
09-0528-0374	Development Rate	Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria
11-8891-3138	Development Rate	Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria
09-0528-0374	Development Rate	NOEL	32	NL - 56	No	Passes Acceptability Criteria
11-8891-3138	Development Rate	NOEL	32	NL - 56	No	Passes Acceptability Criteria
09-0528-0374	Development Rate	PMSD	0.07406	0.038 - 0.16	No	Passes Acceptability Criteria
11-8891-3138	Development Rate	PMSD	0.05066	0.038 - 0.16	No	Passes Acceptability Criteria

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9338	0.9282	0.9393	0.9182	0.9554	0.006613	0.01479	1.58%	0.0%
10		5	0.9404	0.9304	0.9503	0.91	0.9725	0.0119	0.02661	2.83%	-0.71%
18		5	0.9503	0.9402	0.9604	0.9174	0.9903	0.0121	0.02705	2.85%	-1.77%
32		5	0.917	0.9055	0.9285	0.8843	0.9524	0.01376	0.03077	3.36%	1.8%
56		4	0.6434	0.6292	0.6577	0.6038	0.6842	0.01908	0.03817	5.93%	31.09%
100		5	0.009152	0.004915	0.01339	0	0.02778	0.005074	0.01135	124.0%	99.02%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9182	0.9554	0.9231	0.9406	0.9316
10		0.9182	0.91	0.96	0.9725	0.9412
18		0.9397	0.9903	0.9439	0.96	0.9174
32		0.9524	0.8843	0.9455	0.8922	0.9107
56		0.619		0.6842	0.6667	0.6038
100		0.008547	0	0.009434	0.02778	0

CETIS Analytical Report

Report Date: 28 Mar-18 10:43 (p 1 of 4)
 Test Code: 1803RT2B.H | 07-5721-1012

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 09-0528-0374	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 12:18	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 05-3895-8369	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 14 Mar-18 14:05	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Mar-18 12:53	Species: Haliotis rufescens	Brine:
Duration: 47h	Source: Cultured Abalone	Age:
Sample ID: 19-8453-3151	Code: 7518659F	Client: Watershed Protection Division
Sample Date: 14 Mar-18 07:30	Material: Zinc sulfate	Project: MS4
Receive Date: 14 Mar-18 07:30	Source: Reference Toxicant	
Sample Age: 7n	Station:	

Batch Note: Batch 1055 HBN43547

Sample Note: Ideal concentration-response relationship. RE 3/27/2018

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	32	56	42.33		7.41%

Steel Many-One Rank Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water	10		29.5	16	8	1	0.9290	Non-Significant Effect
	18		32	16	8	0	0.9821	Non-Significant Effect
	32		23	16	8	0	0.4415	Non-Significant Effect
	56*		15	16	8	0	0.0191	Significant Effect
	100*		15	16	8	0	0.0191	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria
NOEL	32	NL - 56	No	Passes Acceptability Criteria
PMSD	0.07406	0.038 - 0.16	No	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	3.598	2.908	0.0011	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.231246	1.246249	5	200.2	<0.0001	Significant Effect
Error	0.1493892	0.006224549	24			
Total	6.380635	1.252474	29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	10.9	15.09	0.0534	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8941	0.9031	0.0060	Non-normal Distribution

CETIS Analytical Report

Report Date: 28 Mar-18 10:43 (p 2 of 4)
Test Code: 1803RT2B.H | 07-5721-1012

Apolone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 09-0528-0374
Analyzed: 21 Mar-18 12:18
Endpoint: Development Rate
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.1
Official Results: Yes

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9338	0.9281	0.9394	0.9182	0.9554	0.006612	0.01479	1.58%	0.0%
10		5	0.9404	0.9302	0.9505	0.91	0.9725	0.0119	0.02661	2.83%	-0.71%
18		5	0.9503	0.94	0.9606	0.9174	0.9903	0.0121	0.02705	2.85%	-1.77%
32		5	0.917	0.9053	0.9287	0.8843	0.9524	0.01376	0.03077	3.36%	1.8%
56		5	0.5801	0.5248	0.6354	0.3267	0.6842	0.06504	0.1454	25.07%	37.88%
100		5	0.009152	0.004836	0.01347	0	0.02778	0.005074	0.01135	124.0%	99.02%

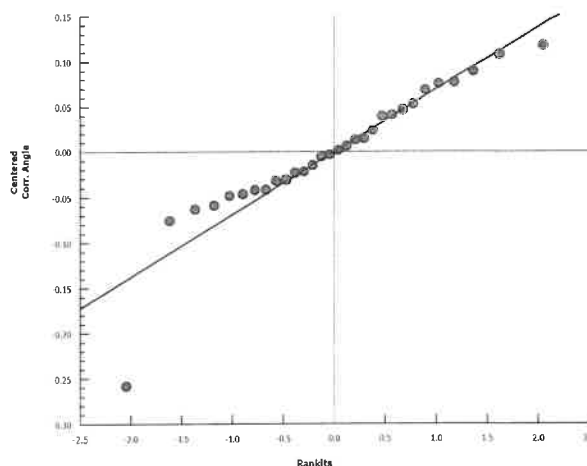
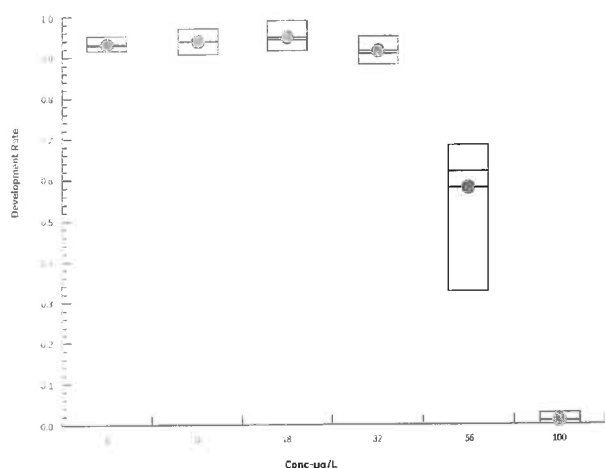
Angular (Corrected) Transformed Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.312	1.3	1.324	1.281	1.358	0.01373	0.03071	2.34%	0.0%
10		5	1.329	1.307	1.351	1.266	1.404	0.02606	0.05826	4.38%	-1.33%
18		5	1.355	1.327	1.383	1.279	1.472	0.03259	0.07287	5.38%	-3.29%
32		5	1.283	1.261	1.305	1.224	1.351	0.02575	0.05757	4.49%	2.23%
56		5	0.8667	0.8102	0.9231	0.6085	0.9741	0.06638	0.1484	17.13%	33.93%
100		5	0.09104	0.07257	0.1095	0.04881	0.1674	0.02171	0.04854	53.32%	93.06%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9182	0.9554	0.9231	0.9406	0.9316
10		0.9182	0.91	0.96	0.9725	0.9412
18		0.9397	0.9903	0.9439	0.96	0.9174
32		0.9524	0.8843	0.9455	0.8922	0.9107
56		0.619	0.3267	0.6842	0.6667	0.6038
100		0.008547	0	0.009434	0.02778	0

Graphics



CETIS Analytical Report

 Report Date: 28 Mar-18 10:43 (p 3 of 4)
 Test Code: 1803RT2B.H | 07-5721-1012

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 11-8891-3138	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 12:18	Analysis: Parametric-Multiple Comparison	Official Results: Yes
Batch ID: 16-3895-0383	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 14 Mar-18 14:05	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Mar-18 12:53	Species: Haliotis rufescens	Brine:
Duration: 47h	Source: Cultured Abalone	Age:
Sample ID: 19-3463-3151	Code: 7518659F	Client: Watershed Protection Division
Sample Date: 14 Mar-18 07:30	Material: Zinc sulfate	Project: MS4
Receive Date: 14 Mar-18 07:30	Source: Reference Toxicant	
Sample Age: 7h	Station:	

Batch Note: Batch 1055 HBN43547

Sample Note: Ideal concentration-response relationship. RE 3/27/2018

Data Transform	Zeta	Air Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	32	56	42.33		5.07%

Bonferroni Adj t Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		10	-0.5134	2.5	8	0.08473	1.0000	Non-Significant Effect
		18	-1.275	2.5	8	0.08473	1.0000	Non-Significant Effect
		32	0.8618	2.5	8	0.08473	0.9942	Non-Significant Effect
		56*	10.59	2.5	7	0.08986	<0.0001	Significant Effect
		100*	36.02	2.5	8	0.08473	<0.0001	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria
NOEL	32	NL - 56	No	Passes Acceptability Criteria
PMSD	0.05066	0.038 - 0.16	No	Passes Acceptability Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.122467	1.224493	5	426.4	<0.0001	Significant Effect
Error	0.0660477	0.002871639	23			
Total	6.188515	1.227365	28			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	3.005	15.09	0.6993	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9566	0.9004	0.2702	Normal Distribution

CETIS Analytical Report

Report Date: 28 Mar-18 10:43 (p 4 of 4)
Test Code: 1803RT2B.H | 07-5721-1012

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 11-8891-3138
Analyzed: 21 Mar-18 12:18
Endpoint: Development Rate
Analysis: Parametric-Multiple Comparison

CETIS Version: CETISv1.8.1
Official Results: Yes

Development Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9338	0.9281	0.9394	0.9182	0.9554	0.006612	0.01479	1.58%	0.0%
10		5	0.9404	0.9302	0.9505	0.91	0.9725	0.0119	0.02561	2.83%	-0.71%
18		5	0.9503	0.94	0.9606	0.9174	0.9903	0.0121	0.02705	2.85%	-1.77%
32		5	0.917	0.9053	0.9287	0.8843	0.9524	0.01376	0.03077	3.36%	1.8%
56		4	0.6434	0.6289	0.6579	0.6038	0.6842	0.01908	0.03817	5.93%	31.09%
100		5	0.009152	0.004836	0.01347	0	0.02778	0.005074	0.01135	124.0%	99.02%

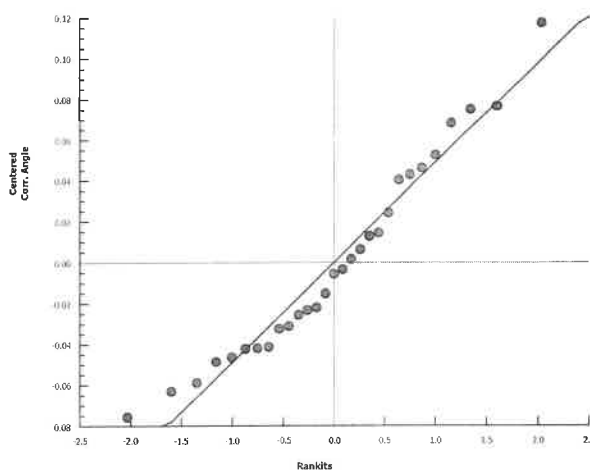
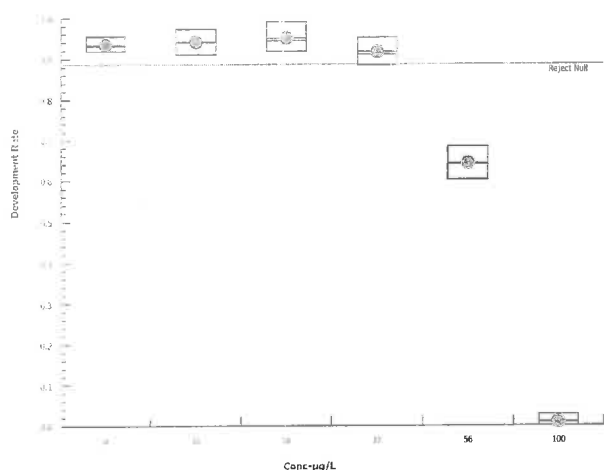
Angular (Corrected) Transformed Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.312	1.3	1.324	1.281	1.358	0.01373	0.03071	2.34%	0.0%
10		5	1.329	1.307	1.351	1.266	1.404	0.02606	0.05826	4.38%	-1.33%
18		5	1.355	1.327	1.383	1.279	1.472	0.03259	0.07287	5.38%	-3.29%
32		5	1.283	1.261	1.305	1.224	1.351	0.02575	0.05757	4.49%	2.23%
56		4	0.9312	0.916	0.9464	0.8899	0.9741	0.01995	0.0399	4.29%	29.01%
100		5	0.09104	0.07257	0.1095	0.04881	0.1674	0.02171	0.04354	53.32%	93.06%

Development Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9182	0.9554	0.9231	0.9406	0.9316
10		0.9182	0.91	0.96	0.9725	0.9412
18		0.9397	0.9903	0.9439	0.96	0.9174
32		0.9524	0.8843	0.9455	0.8922	0.9107
56		0.619	Outlier	0.6842	0.6667	0.6038
100		0.008547	0	0.009434	0.02778	0

Graphics



Ideal concentration-response relationship.

RO 3/28/2018

CETIS Analytical Report

Report Date: 28 Mar-18 10:43 (p 1 of 2)
Test Code: 1803RT2B.H | 07-5721-1012

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 07-9641-6990	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 12:19	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 05-0695-0369	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 14 Mar-18 14:05	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Mar-18 12:53	Species: Haliotis rufescens	Brine:
Duration: 47h	Source: Cultured Abalone	Age:
Sample ID: 19-0453-3151	Code: 7518659F	Client: Watershed Protection Division
Sample Date: 14 Mar-18 07:30	Material: Zinc sulfate	Project: MS4
Receive Date: 14 Mar-18 07:30	Source: Reference Toxicant	
Sample Age: 7h	Station:	

Batch Note: Batch 1055 HBN43547

Sample Note: Ideal concentration-response relationship. RE 3/27/2018

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1.677E+09	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9338	0.8 - NL	Yes	Passes Acceptability Criteria

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.41	2.893	0.3282	No Outliers Detected

Point Estimates

Level	pg/L	95% LCL	95% UCL
EC5	33.48	27.97	35.4
EC10	36.9	34	38.87
EC15	40.66	37.65	43.29
EC20	44.79	41.5	47.81
EC25	49.33	45.43	53.56
EC40	60.22	57.77	62.46
EC50	65.64	63.39	67.68

Development Rate Summary

Calculated Variate(A/B)

Conc-μg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	5	0.9338	0.9182	0.9554	0.006612	0.01479	1.58%	0.0%	508	544
10		5	0.9404	0.91	0.9725	0.0119	0.02661	2.83%	-0.71%	514	546
18		5	0.9503	0.9174	0.9903	0.0121	0.02705	2.85%	-1.77%	508	535
32		5	0.917	0.8843	0.9524	0.01376	0.03077	3.36%	1.8%	504	550
56		4	0.6434	0.6038	0.6842	0.01908	0.03817	5.93%	31.09%	277	430
100		5	0.009152	0	0.02778	0.005074	0.01135	124.0%	99.02%	5	540

Development Rate Detail

Conc-μg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9182	0.9554	0.9231	0.9406	0.9316
10		0.9182	0.91	0.96	0.9725	0.9412
18		0.9397	0.9903	0.9439	0.96	0.9174
32		0.9524	0.8843	0.9455	0.8922	0.9107
56		0.619	0.6842	0.6667	0.6038	
100		0.008547	0	0.009434	0.02778	0

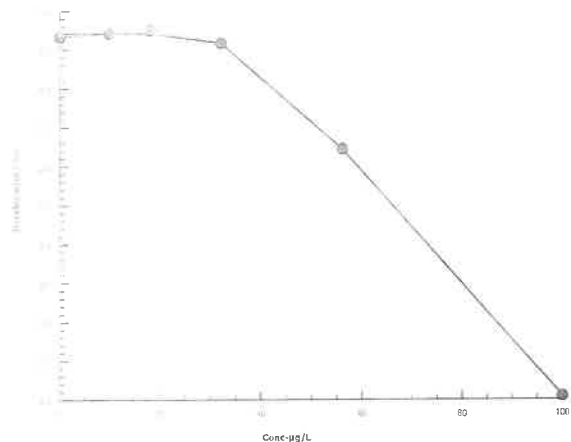
Abaotone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 07-9641-6990 Endpoint: Development Rate
 Analyzed: 21 Mar-18 12:19 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
 Official Results: Yes

Graphs



CETIS Test Data Worksheet



Report Date: 07 Mar-18 14:47 (p 1 of 1)
Test Code: 07-5721-1012/1803RT2B.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 14 Mar-18 1405145 Species: Haliotis rufescens
End Date: 16 Mar-18 1253 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 15 Mar-18 730 Material: Zinc sulfate

Sample Code: 7518659F
Sample Source: Reference Toxicant
Sample Station:

Conc-µg/L	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	27	110	101	
0	D	2	22	112	107	
0	D	3	13	104	96	
0	D	4	20	101	95	
0	D	5	11	117	109	
10		1	24	116	101	
10		2	17	100	91	
10		3	5	125	120	
10		4	26	116	109	
10		5	6	102	96	3/21/18 #Counted = 109 #normal = 106
18		1	21	116	109	
18		2	18	103	102	
18		3	19	107	101	
18		4	15	100	96	
18		5	28	109	100	
32		1	2	105	100	
32		2	4	121	107	
32		3	25	110	104	
32		4	8	102	91	
32		5	1	112	102	
56		1	10	105	65	
56		2	30	101	33	
56		3	7	114	78	
56		4	14	105	70	
56		5	12	106	64	
100		1	16	117	1	
100		2	29	104	0	
100		3	23	106	1	
100		4	8	108	3	
100		5	3	105	0	

Set up @ 8:10 PM, 3/14/18

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 14 Mar-18 Species: Haliotis rufescens
End Date: 16 Mar-18 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 13 Mar-18 Material: Zinc sulfate

Sample Code: 7518659F
Sample Source: Reference Toxicant
Sample Station:

Dissolved Oxygen-mg/L 3/14 3/16

Conc-µg/L	Code	Reading 1	Reading 2
0	D	8.38	8.03
10		8.32	7.97
18		8.27	7.97
32		8.26	7.97
56		8.22	7.95
100		8.23	7.95
Measure Time:		9:00	10:38
Instrument ID:		#3	#3
Analyst:		RA	RA

pH 3/14 3/16

Conc-µg/L	Code	Reading 1	Reading 2
0	D	7.96	7.92
10		7.95	7.91
18		7.95	7.91
32		7.95	7.91
56		7.94	7.91
100		7.94	7.91
Measure Time:		9:00	10:38
Instrument ID:		#4 #2	#2
Analyst:		RA	RA

RE 3/14

Salinity-ppt 3/14 3/16

Conc-µg/L	Code	Reading 1	Reading 2
0	D	33	33
10		33	33
18		33	33
32		33	33
56		33	33
100		32	33
Measure Time:		9:00	10:38
Instrument ID:		#4	#4
Analyst:		RA	RA

Temperature-°C 3/14 3/15 3/16

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3
0	D	14.8	14.9	14.8
10		14.9	14.8	14.8
18		15.0	14.8	14.9
32		15.0	14.9	14.9
56		15.1	14.9	14.9
100		15.1	14.9	15.0
Measure Time:		9:00	13:37	10:38
Instrument ID:		#2	#2	#2
Analyst:		RA	RA	RA

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: Stormwater

TEST START DATE: March 14, 2018

Batch #: 180215

TEST ID: 1803RT2B.H, 1803072C.H, 1803072D.H

TIME SPAWNING START: 915

	Number of abalone	Gonad index	Temperature
5 Males	<u>3</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u>	¹⁸⁵ 3114 <u>2125</u>	<u>15°</u> C
Females	<u>3</u> <u>3</u> <u>2</u> <u>2</u>	<u>2150</u>	<u>15°</u> C

	Time	Male Temperature	Female Temperature
	Male Female		
Beginning of spawning treatment:	1034 937	<u>15°</u> C	<u>15°</u> C
Taken out of H2O2:	1243 1211		
First male abalone spawn:	1252	<u>15°</u> C	<u>15°</u> C
First female abalone spawn:	1253	<u>15°</u> C	<u>15°</u> C
Fertilization start:	1315	<u>15°</u> C	<u>15°</u> C
Fertilization completed:	1330	<u>15°</u> C	<u>15°</u> C

Fertilized eggs density count:

Mean 165 eggs / 0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml
~~660 eggs/2ml/beaker~~ ml/test per beaker

Temperature of embryos:

Temperature of test containers:

Time embryos added to test chambers (TEST START): 131405

¹⁸⁵
3114/18

① 91 eggs/0.3ml

② 107 eggs/0.3ml

③ 102 eggs/0.3ml

④ 98 eggs/0.3ml

⑤ 100 eggs/0.3ml

Ave = $99 \text{ eggs} / 0.3 \text{ ml} = 165 \text{ eggs} / 0.5 \text{ ml}$

TEST CLOSING

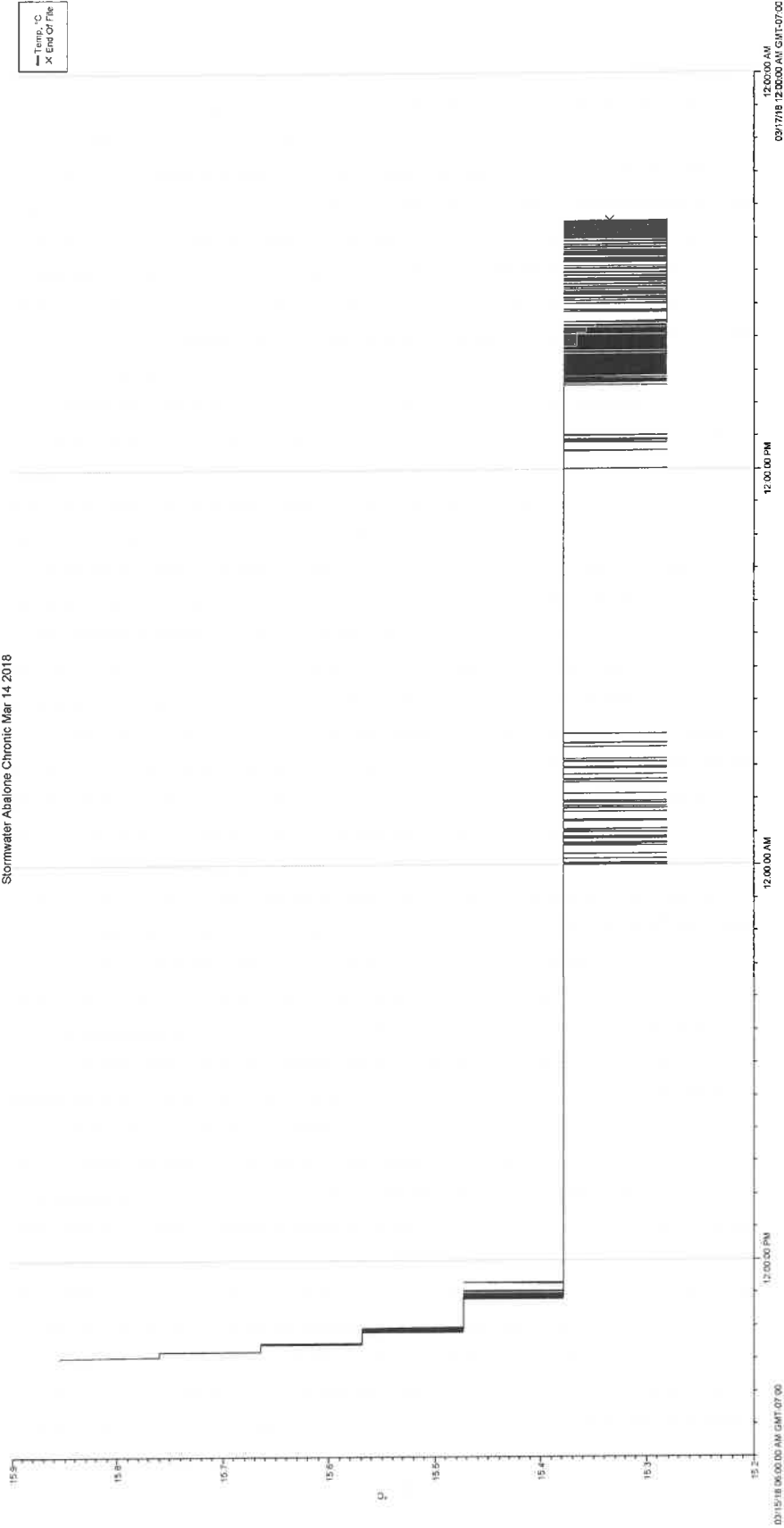
DATE:

3/16/2018

TIME:

12:53 PD

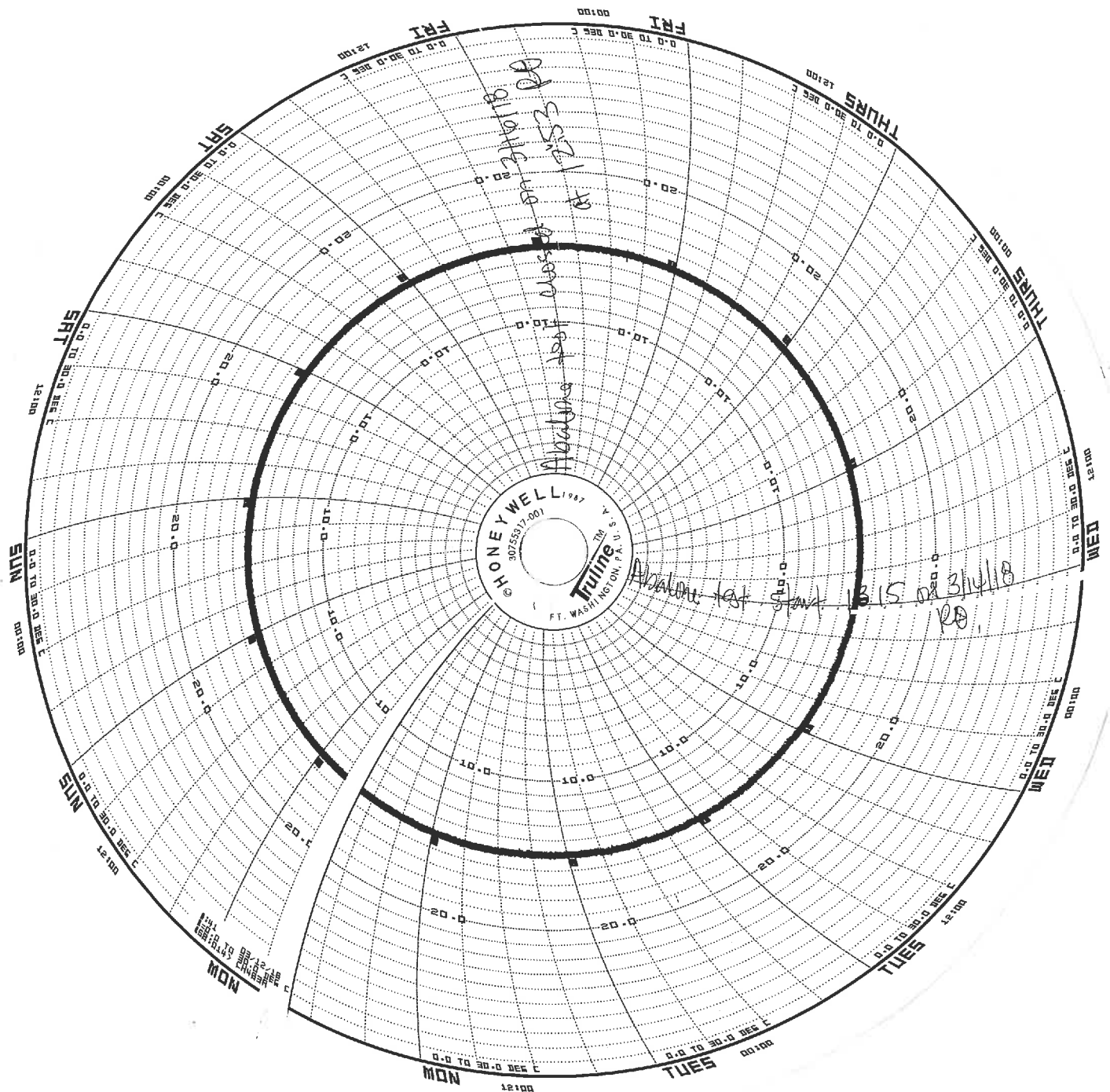
Stormwater Abalone Chronic Mar 14, 2018



Abalone Chronic Toxicity Test

Test start: Tuesday, March 14, 2018

Test end: Thursday, March 16, 2018



Abalone Chronic Toxicity Test

Test start: Tuesday, March 14, 2018

Test end: Thursday, March 16, 2018

RT - 1803 RT 2B.H

SMB 1 - 1803072C.H

SMB 3 - ~~1803072D.H~~ 1803072D.H
RE 3/28/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: March 13, 2018

TEST DATE: March 14, 2018

TEST NUMBER: 1803072D.H

TEST MATERIAL: Station RW-SMB-3

TEST SPECIES: *Haliotis rufescens*

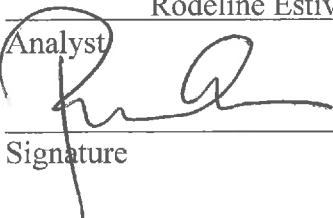
PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1803RT2B.H

RESULT: PASS

% Effect = -4.37 %


Rodeline Estiva
Analyst


Signature

Water Biologist II
Title

MARCH 29, 2018

Date

Rea Crinklaw
Supervisor


Signature

Water Biologist III
Title

4/6/18

Date

CETIS Summary Report

Report Date: 27 Mar-18 12:39 (p 1 of 1)
 Test Code: 1803072D.H | 12-1729-2035

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Batch ID:	05-3895-8369	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	14 Mar-18 14:05	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	16 Mar-18 12:53	Species:	Haliotis rufescens	Brine:	
Duration:	47h	Source:	Cultured Abalone	Age:	
Sample ID:	08-1850-2546	Code:	2330616	Client:	Watershed Protection Division
Sample Date:	13 Mar-18 08:11	Material:	Stormwater Monitoring Sample	Project:	MS4
Receive Date:	13 Mar-18 13:20	Source:	WPD (WATERSHED)		
Sample Age:	30h (12.1 °C)	Station:	RW-SMB-3		

Batch Note: Batch 1055 HBN43547

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-8540-5765	Development Rate	100	>100	N/A	N/A	1	TST-Welch's t Test

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-8540-5765	Development Rate	Control Resp	0.9243	0.8 - NL	Yes	Passes Acceptability Criteria

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9243	0.9202	0.9283	0.9135	0.9364	0.004824	0.01079	1.17%	0.0%
100		5	0.9647	0.9617	0.9676	0.9528	0.972	0.003515	0.00786	0.81%	-4.37%

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9138	0.9135	0.9339	0.9238	0.9364
100		0.9717	0.9643	0.9528	0.972	0.9626

CETIS Analytical Report

Report Date: 27 Mar-18 12:39 (p 1 of 2)
Test Code: 1803072D.H | 12-1729-2035

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 02-8540-5765	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 14:02	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes
Batch ID: 05-3895-8369	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 14 Mar-18 14:05	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Mar-18 12:53	Species: Haliotis rufescens	Brine:
Duration: 47h	Source: Cultured Abalone	Age:
Sample ID: 08-1850-2546	Code: 2330616	Client: Watershed Protection Division
Sample Date: 13 Mar-18 08:11	Material: Stormwater Monitoring Sample	Project: MS4
Receive Date: 13 Mar-18 13:20	Source: WPD (WATERSHED)	
Sample Age: 30h (12.1 °C)	Station: RW-SMB-3	

Batch Note: Batch 1055 HBN43547

Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes development rate endpoint

TST-Welch's t Test

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		100*	35.58	1.895	7		<0.0001	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9243	0.8 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	1.575	2.29	0.9705	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0202876	0.0202876	1	47.3	0.0001	Significant Effect
Error	0.003431347	0.0004289184	8			
Total	0.02371895	0.02071652	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.046	23.15	0.9660	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9011	0.7411	0.2251	Normal Distribution

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9243	0.9202	0.9284	0.9135	0.9364	0.004825	0.01079	1.17%	0.0%
100		5	0.9647	0.9617	0.9677	0.9528	0.972	0.003515	0.007859	0.81%	-4.37%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.293	1.285	1.3	1.272	1.316	0.009156	0.02047	1.58%	0.0%
100		5	1.383	1.375	1.391	1.352	1.403	0.009366	0.02094	1.52%	-6.97%

CETIS Analytical Report

Report Date: 27 Mar-18 12:39 (p 2 of 2)
Test Code: 1803072D.H | 12-1729-2035

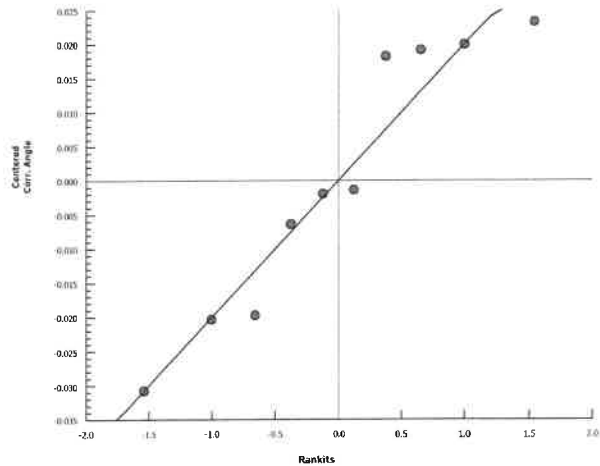
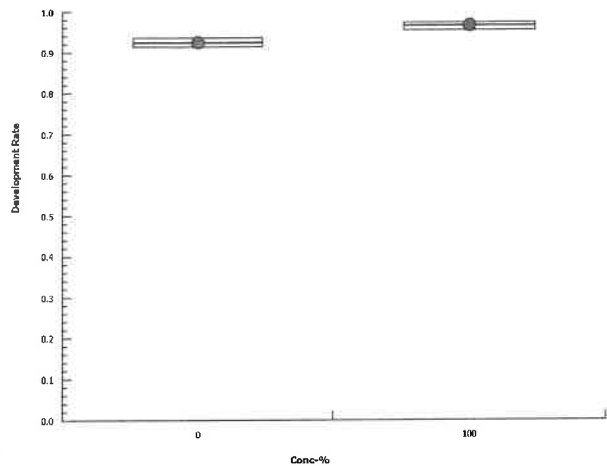
Abalone Larval Development Test Hyperion Treatment Plant Laboratory

Analysis ID: 02-8540-5765	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 14:02	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9138	0.9135	0.9339	0.9238	0.9364
100		0.9717	0.9643	0.9528	0.972	0.9626

Graphics



CETIS Test Data Worksheet

SMB-3

Report Date: 07 Mar-18 14:48 (p 1 of 1)
Test Code: 12-1729-2035/1803072D.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 14 Mar-18 **1405** Species: *Haliotis rufescens*
End Date: 16 Mar-18 **1253** Protocol: EPA/600/R-95/136 (1995)
Sample Date: 13 Mar-18 **811** Material: Stormwater Monitoring Sample

Sample Code: 30C95B92
Sample Source: WPD
Sample Station: RW-SMB-3

Conc-%	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	8	116	106	
0	D	2	10	104	95	
0	D	3	4	121	113	
0	D	4	5	105	97	
0	D	5	7	110	103	
100		1	12	106	103	
100		2	2	112	108	
100		3	6	106	101	
100		4	14	107	104	
100		5	13	107	103	

Sample arrived 3/13/18 @ 13:20, 2330616, (T=12.1°C)

Set-up @ 10:20. PD 3/14/18

CETIS Measurement Worksheet

SMB 3

Report Date: 07 Mar-18 14:48 (p 1 of 1)
Test Code: 1803072D.H | 12-1729-2035

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Start Date: 14 Mar-18 Species: *Haliotis rufescens*
End Date: 16 Mar-18 Protocol: EPA/600/R-95/136 (1995)
Sample Date: 13 Mar-18 Material: Stormwater Monitoring Sample

Sample Code: 30C95B92
Sample Source: WPD
Sample Station: RW-SMB-3

Dissolved Oxygen-mg/L				
Conc-%	Code	Reading 1	Reading 2	
0	D	8.33	7.96	
100		8.53	7.85	
Measure Time:		1021	1042	
Instrument ID:		#3	#3	
Analyst:		RE	RE	

pH				
Conc-%	Code	Reading 1	Reading 2	
0	D	7.95	7.90	
100		8.06	7.90	
Measure Time:		1021	1042	
Instrument ID:		#2	#2	
Analyst:		RE	RE	

Salinity-ppt				
Conc-%	Code	Reading 1	Reading 2	
0	D	33	33	
100		33	34	
Measure Time:		1021	1042	
Instrument ID:		#4	#4	
Analyst:		RE	RE	

Temperature-°C					
Conc-%	Code	Reading 1	Reading 2	Reading 3	
0	D	14.9	14.9	15.0	
100		15.5	14.9	15.0	
Measure Time:		1021	1330	1042	
Instrument ID:		#2	#2	#2	
Analyst:		RE	RE	RE	

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: Stormwater

TEST START DATE: March 14, 2018

Batch #: 180215

TEST ID: 1803RT2B.H, 1803072C.H, 1803072D.H

TIME SPAWNING START: 915

Number of abalone		Gonad index	Temperature	
5 Males	<u>3</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u>	^{RE} 3/14 <u>2.75</u>	<u>15°</u>	C
Females	<u>3</u> <u>3</u> <u>2</u> <u>2</u>	<u>2.50</u>	<u>15°</u>	C

	Time	Male Temperature	Female Temperature
Beginning of spawning treatment:	Male <u>1034</u> Female <u>937</u>	<u>15°</u>	<u>15°</u>
Taken out of H2O2:	<u>1243</u> <u>1211</u>		
First male abalone spawn:	<u>1252</u>	<u>15°</u>	<u>15°</u>
First female abalone spawn:	<u>1253</u>	<u>15°</u>	<u>15°</u>
Fertilization start:	<u>1315</u>	<u>15°</u>	<u>15°</u>
Fertilization completed:	<u>1330</u>	<u>15°</u>	<u>15°</u>

Fertilized eggs density count:

Mean 165 eggs / 0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml

660 eggs / 2 ml / beaker = 330 ml/test per beaker

Temperature of embryos:

Temperature of test containers:

Time embryos added to test chambers (TEST START): 131405

^{RE}
3/14/18

① 91 eggs / 0.3 ml } Ave = 99 eggs / 0.3 ml = 165 eggs / 0.5 ml

② 107 eggs / 0.3 ml

③ 102 eggs / 0.3 ml

④ 98 eggs / 0.3 ml

⑤ 100 eggs / 0.3 ml

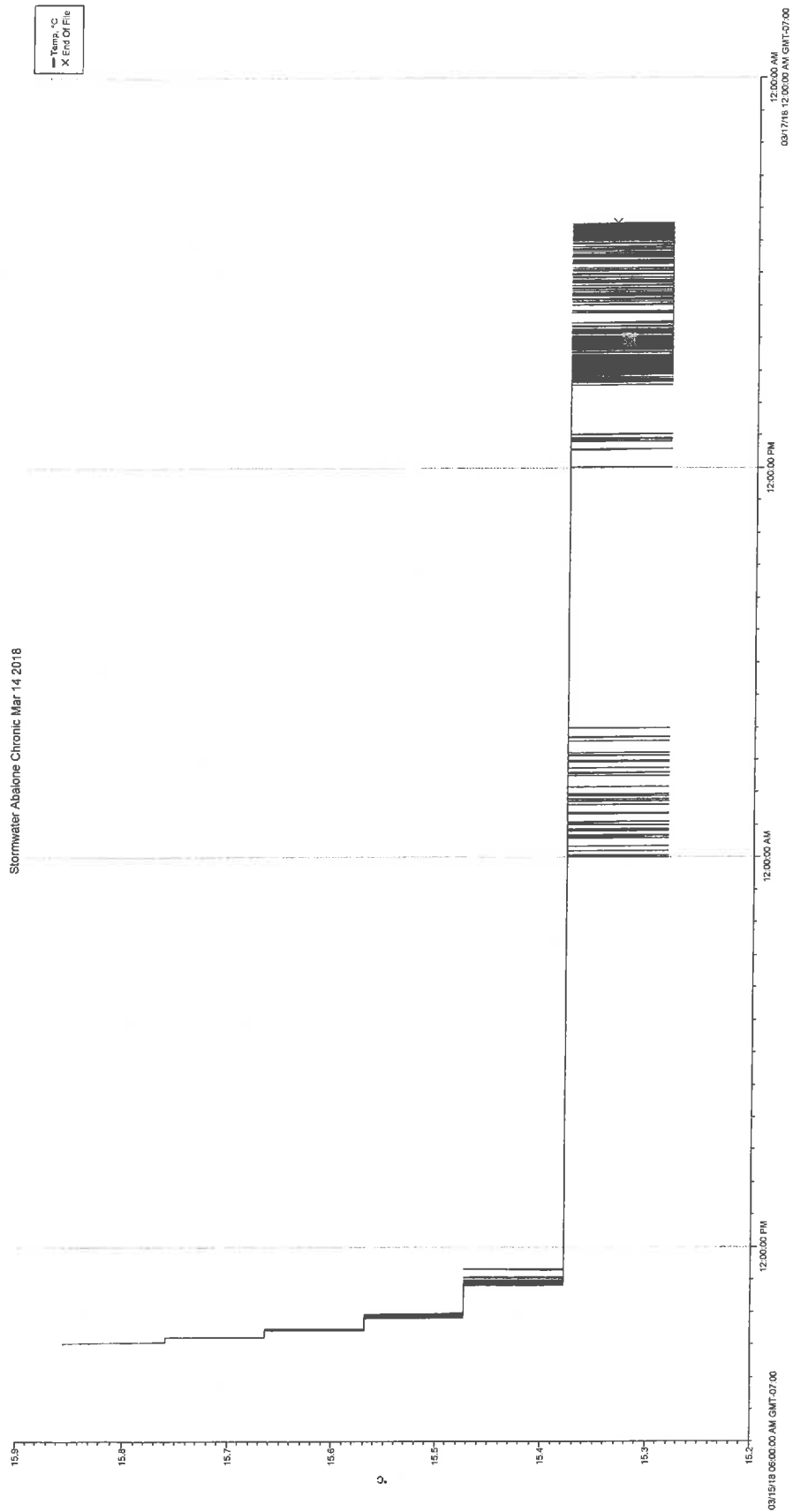
TEST CLOSING

DATE:

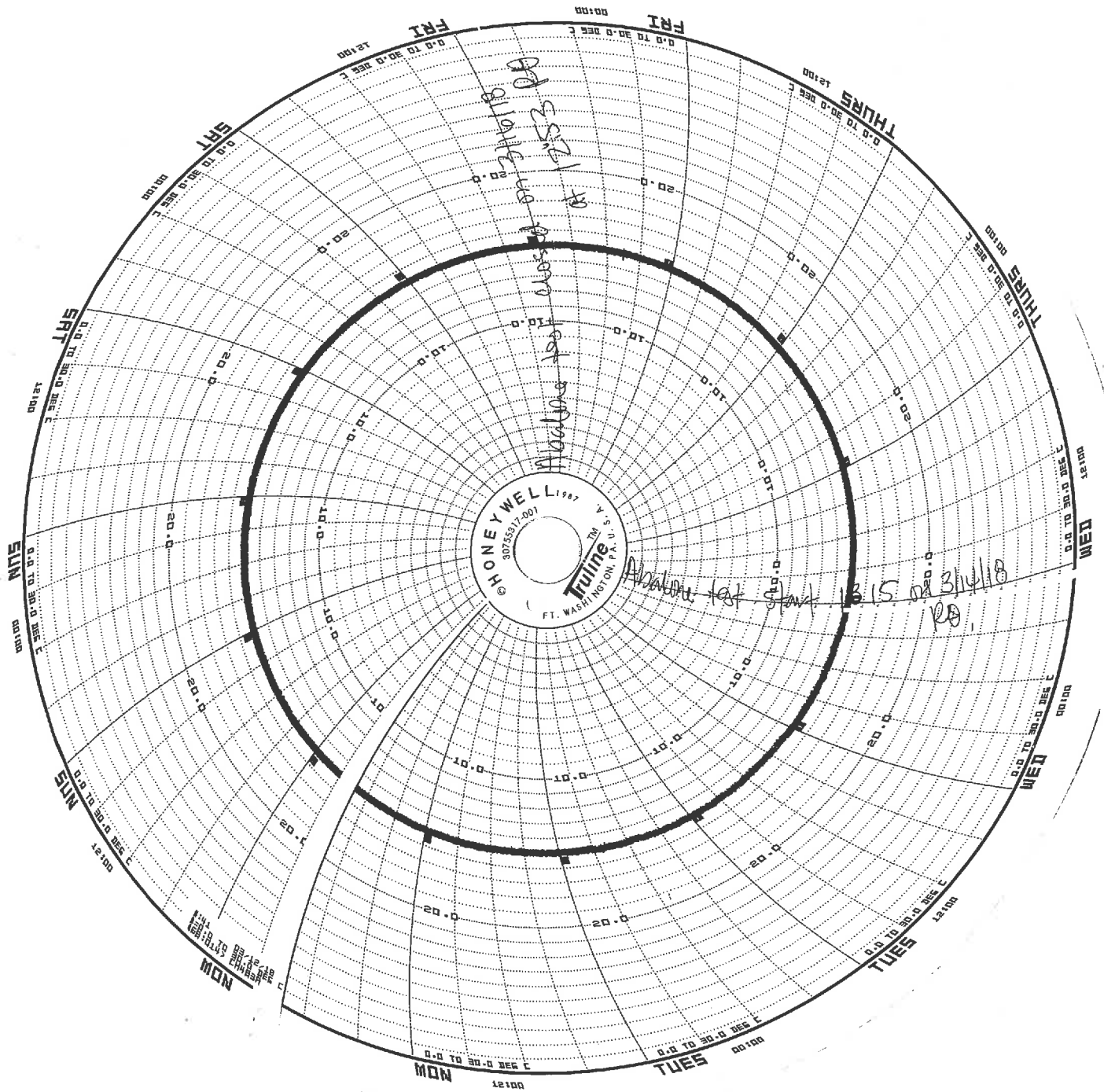
3/16/2018

TIME:

1253 ^{RE}



Abalone Chronic Toxicity Test
Test start: Tuesday, March 14, 2018
Test end: Thursday, March 16, 2018



Abalone Chronic Toxicity Test

Test start: Tuesday, March 14, 2018

Test end: Thursday, March 16, 2018

RT - 1803 RT 2B.H

SMB 1 - 1803072C.H

SMB 3 - ~~1803072A.H~~ 1803072D.H
RE 3/28/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: March 13, 2018

TEST DATE: March 14, 2018

TEST NUMBER: 1803072C.H

TEST MATERIAL: Station RW-SMB-1

TEST SPECIES: *Haliotis rufescens*

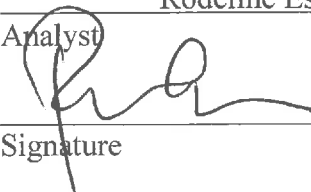
PROTOCOL: EPA/600/R-95/136

TEST TYPE: Chronic


REFERENCE TOXICANT TEST: 1803RT2B.H

RESULT: PASS

% Effect = -2.37 %

Analyst Rodeline Estiva

Signature

Title Water Biologist II
March 28, 2018
Date

Supervisor Rea Crinklaw

Signature

Title Water Biologist III
4/6/18
Date

CETIS Summary Report

Report Date: 27 Mar-18 12:38 (p 1 of 1)
 Test Code: 1803072C.H | 04-9080-3596

Abalone Larval Development Test				Hyperion Treatment Plant Laboratory	
Batch ID:	05-3895-8369	Test Type:	Development	Analyst:	Rodeline Estiva
Start Date:	14 Mar-18 14:05	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	16 Mar-18 12:53	Species:	Haliotis rufescens	Brine:	
Duration:	47h	Source:	Cultured Abalone	Age:	
Sample ID:	17-7587-2270	Code:	2330618	Client:	Watershed Protection Division
Sample Date:	13 Mar-18 08:48	Material:	Stormwater Monitoring Sample	Project:	MS4
Receive Date:	13 Mar-18 13:20	Source:	WPD (WATERSHED)		
Sample Age:	29h (13.5 °C)	Station:	RW-SMB-1		
Batch Note:	Batch 1055 HBN43547				

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-2692-5111	Development Rate	100	>100	N/A	N/A	1	TST-Welch's t Test

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
00-2692-5111	Development Rate	Control Resp	0.9243	0.8 - NL	Yes	Passes Acceptability Criteria	

Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9243	0.9202	0.9283	0.9135	0.9364	0.004824	0.01079	1.17%	0.0%
100		5	0.9461	0.9376	0.9547	0.9217	0.9771	0.01026	0.02294	2.42%	-2.37%

Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9138	0.9135	0.9339	0.9238	0.9364
100		0.9217	0.9612	0.9421	0.9286	0.9771

CETIS Analytical Report

Report Date: 27 Mar-18 12:38 (p 1 of 2)
 Test Code: 1803072C.H | 04-9080-3596

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

Analysis ID: 00-2692-5111	Endpoint: Development Rate	CETIS Version: CETISv1.8.1
Analyzed: 21 Mar-18 14:01	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes
Batch ID: 05-3895-8369	Test Type: Development	Analyst: Rodeline Estiva
Start Date: 14 Mar-18 14:05	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 16 Mar-18 12:53	Species: Haliotis rufescens	Brine:
Duration: 47h	Source: Cultured Abalone	Age:
Sample ID: 17-7587-2270	Code: 2330618	Client: Watershed Protection Division
Sample Date: 13 Mar-18 08:48	Material: Stormwater Monitoring Sample	Project: MS4
Receive Date: 13 Mar-18 13:20	Source: WPD (WATERSHED)	
Sample Age: 29h (13.5 °C)	Station: RW-SMB-1	

Batch Note: Batch 1055 HBN43547

Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes development rate endpoint

TST-Welch's t Test

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Dilution Water		100*	14.75	2.132	4		<0.0001	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.9243	0.8 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	2.006	2.29	0.2285	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.005956097	0.005956097	1	3.543	0.0966	Non-Significant Effect
Error	0.01345045	0.001681307	8			
Total	0.01940655	0.007637403	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	7.021	23.15	0.0855	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9619	0.7411	0.8070	Normal Distribution

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	0.9243	0.9202	0.9284	0.9135	0.9364	0.004825	0.01079	1.17%	0.0%
100		5	0.9461	0.9374	0.9549	0.9217	0.9771	0.01026	0.02294	2.42%	-2.37%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	5	1.293	1.285	1.3	1.272	1.316	0.009156	0.02047	1.58%	0.0%
100		5	1.341	1.321	1.362	1.287	1.419	0.02426	0.05425	4.05%	-3.78%

CETIS Analytical Report

Report Date: 27 Mar-18 12:38 (p 2 of 2)
 Test Code: 1803072C.H | 04-9080-3596

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

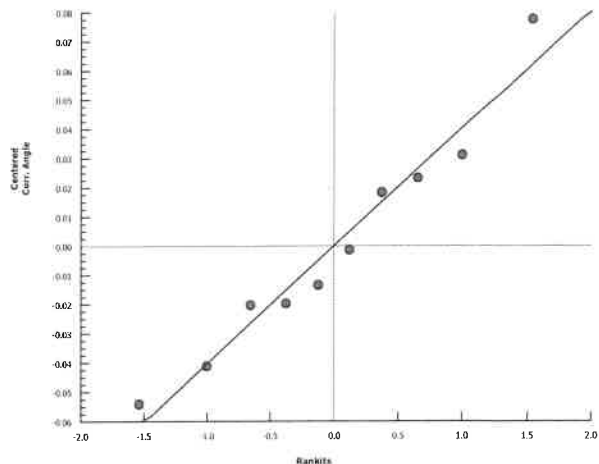
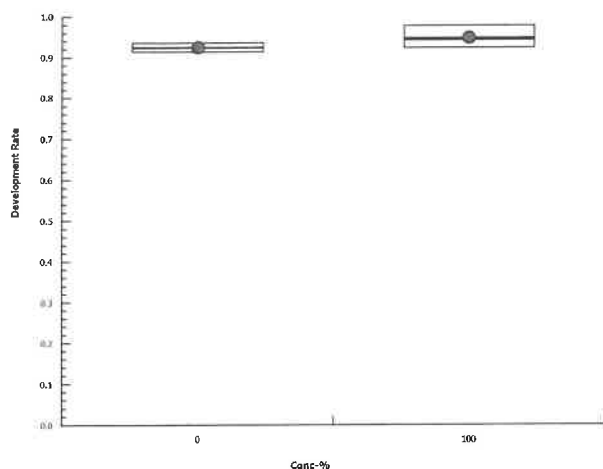
Analysis ID: 00-2692-5111 Endpoint: Development Rate
 Analyzed: 21 Mar-18 14:01 Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
 Official Results: Yes

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Dilution Water	0.9138	0.9135	0.9339	0.9238	0.9364
100		0.9217	0.9612	0.9421	0.9286	0.9771

Graphics



CETIS Test Data Worksheet

SMB 1

 Report Date: 07 Mar-18 14:47 (p 1 of 1)
 Test Code: 04-9080-3596/1803072C.H

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

 Start Date: 14 Mar-18 ¹⁴⁰⁵
 End Date: 16 Mar-18 ¹²⁵³
 Sample Date: 13 Mar-18 ⁸⁴⁸
 Species: Haliotis rufescens
 Protocol: EPA/600/R-95/136 (1995)
 Material: Stormwater Monitoring Sample

 Sample Code: 69D9A90E
 Sample Source: WPD
 Sample Station: RW-SMB-1

Conc-%	Code	Rep	Pos	# Counted	# Normal	Notes
0	D	1	8	116	106	
0	D	2	10	104	95	
0	D	3	4	121	113	
0	D	4	5	105	97	
0	D	5	7	110	103	
100	^{re} 3/21/18	1	11	105 115	106	# Counted = 115 # normal = 106
100		2	1	103	99	
100		3	15	121	114	
100		4	9	112	104	
100		5	3	131	128	

Sample arrived 3/13/18 @ 13:20, 23306/8, (T=13.5°C)

Batch 1055 HBN 43547

Set-up @ 10:15. PD 3/14/18

CETIS Measurement Worksheet

SMB-1

 Report Date: 07 Mar-18 14:47 (p 1 of 1)
 Test Code: 1803072C.H | 04-9080-3596

Abalone Larval Development Test

Hyperion Treatment Plant Laboratory

 Start Date: 14 Mar-18 Species: Haliotis rufescens
 End Date: 16 Mar-18 Protocol: EPA/600/R-95/136 (1995)
 Sample Date: 13 Mar-18 Material: Stormwater Monitoring Sample

 Sample Code: 69D9A90E
 Sample Source: WPD
 Sample Station: RW-SMB-1

Dissolved Oxygen-mg/L 3/14 3/16			
Conc-%	Code	Reading 1	Reading 2
0	D	8.33	7.96
100		8.45	7.84
Measure Time:		1020	1040
Instrument ID:		#3	#3
Analyst:		RA	RA

pH 3/14 3/16			
Conc-%	Code	Reading 1	Reading 2
0	D	7.95	7.90
100		8.02	7.89
Measure Time:		1020	1040
Instrument ID:		#2	#2
Analyst:		RA	RA

Salinity-ppt 3/14 3/16			
Conc-%	Code	Reading 1	Reading 2
0	D	33	33
100		33	34
Measure Time:		1020	1040
Instrument ID:		#4	#4
Analyst:		RA	RA

Temperature-°C 3/14 3/15 3/16				
Conc-%	Code	Reading 1	Reading 2	Reading 3
0	D	14.9	14.9	15.0
100		15.3	14.9	15.0
Measure Time:		1020	1330	1040
Instrument ID:		#2	#2	#2
Analyst:		RA	RA	RA

ABALONE SPAWNING WORKSHEET

TYPE OF EFFLUENT: Stormwater

TEST START DATE: March 14, 2018

Batch #: 180215

TEST ID: 1803RT2B.H, 1803072C.H, 1803072D.H

TIME SPAWNING START: 915

Number of abalone		Gonad index	Temperature	
5	Males <u>3</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u>	¹⁸⁵ 3114 <u>275</u>	<u>15°</u>	C
	Females <u>3</u> <u>3</u> <u>2</u> <u>2</u>	<u>250</u>	<u>15°</u>	C

	Time	Male Temperature	Female Temperature
	Male Female		
Beginning of spawning treatment:	1034 937	<u>15°</u>	<u>15°</u> C
Taken out of H2O2:	1243 1211		
First male abalone spawn:	1252	<u>15°</u>	<u>15°</u> C
First female abalone spawn:	1253	<u>15°</u>	<u>15°</u> C
Fertilization start:	1315	<u>15°</u>	<u>15°</u> C
Fertilization completed:	1330	<u>15°</u>	<u>15°</u> C

Fertilized eggs density count:

Mean 165 eggs/0.5 ml

Add 1000 embryos/test container divided by the number of embryos/ml
ml/test per beaker

660 eggs/2ml/beaker

Temperature of embryos:

Temperature of test containers:

Time embryos added to test chambers (TEST START): 131405

14.7° C

14.4° C

¹⁸⁵
3114/118

① 91 eggs/0.3ml
 ② 107 eggs/0.3ml
 ③ 102 eggs/0.3ml
 ④ 98 eggs/0.3ml
 ⑤ 100 eggs/0.3ml

Ave = $\frac{99 \text{ eggs}}{0.3 \text{ ml}} = 165 \text{ egg}/0.5 \text{ ml}$

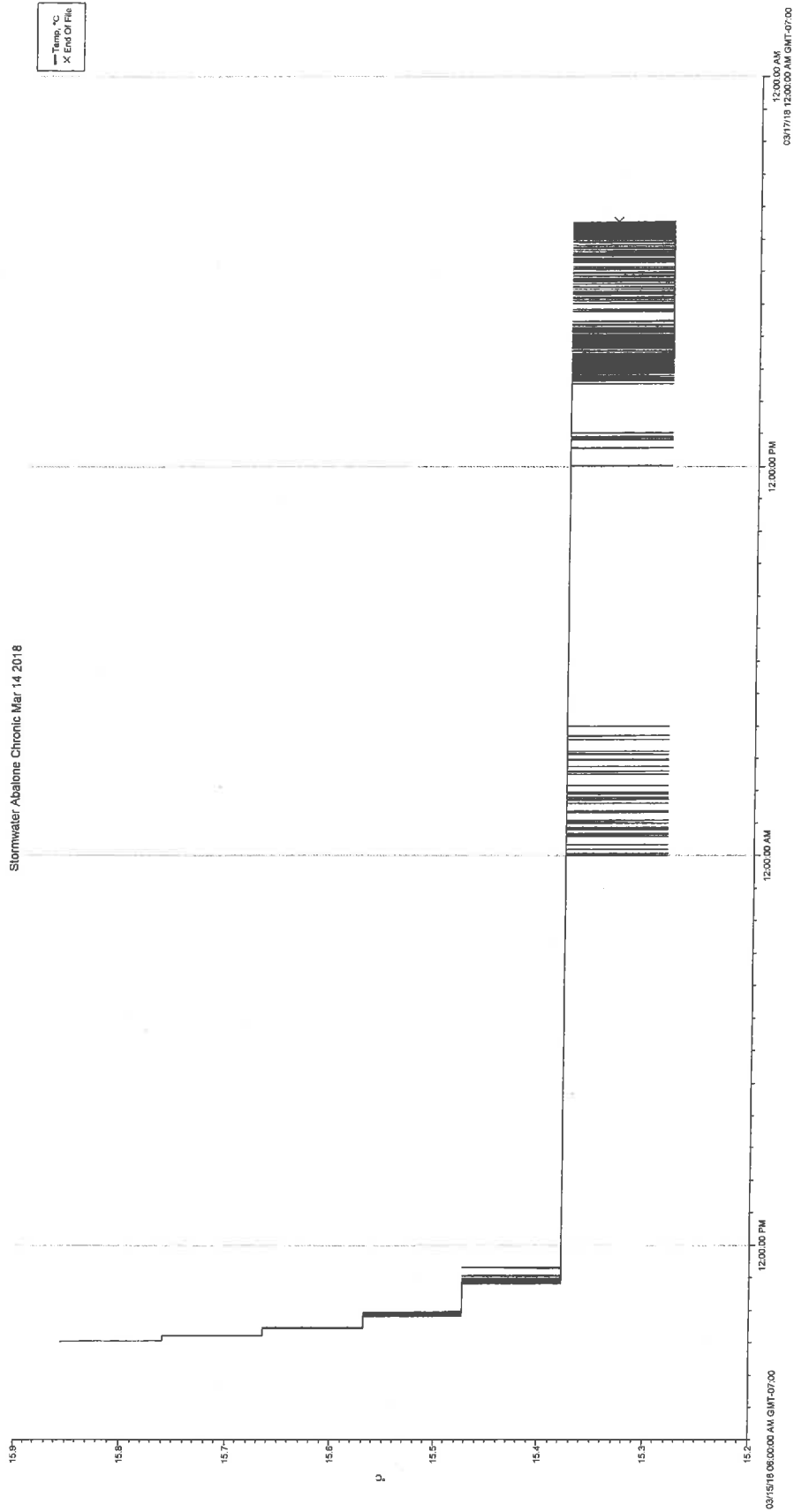
TEST CLOSING

DATE:

3/16/2018

TIME:

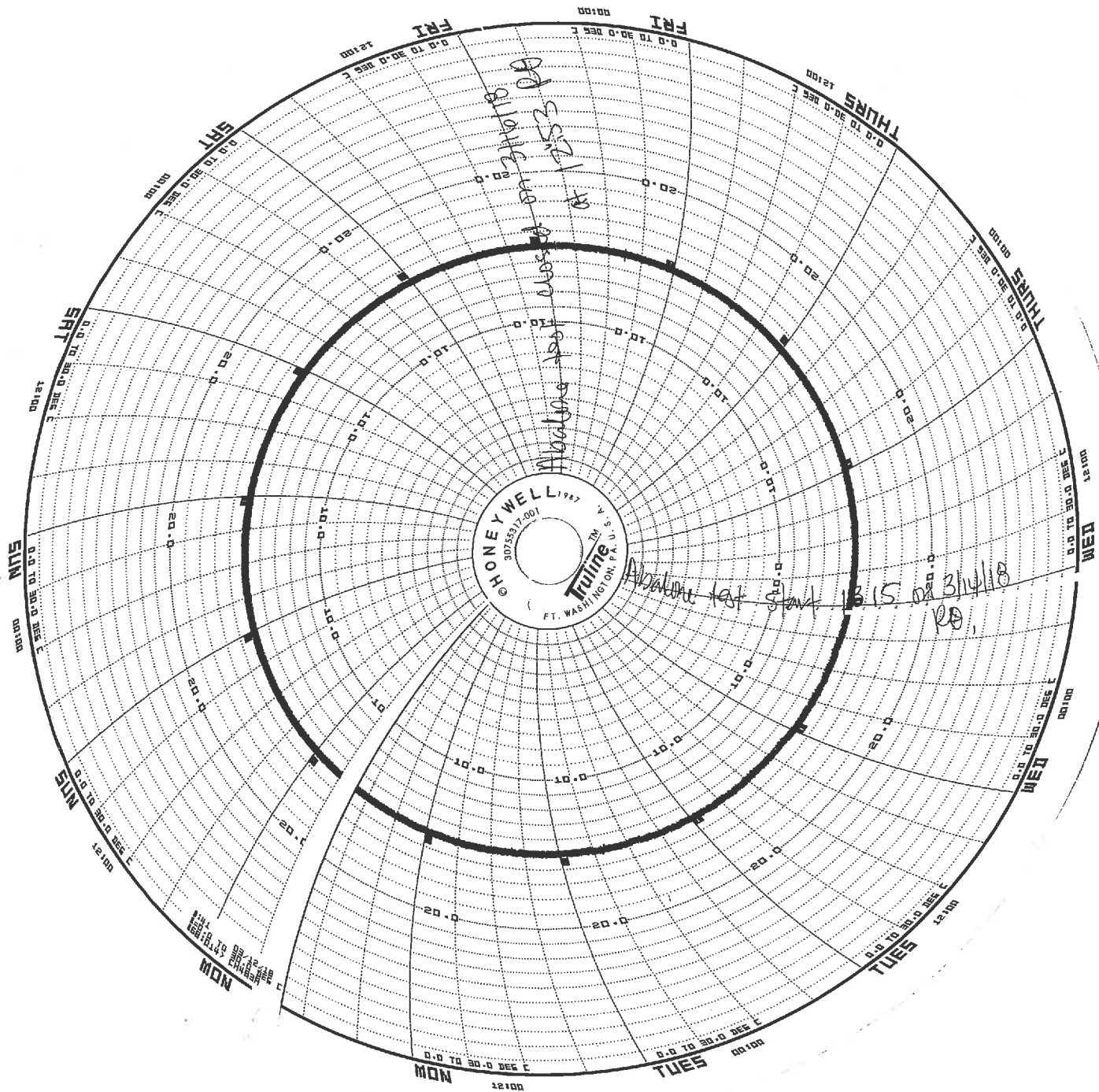
12:53 18



Abalone Chronic Toxicity Test

Test start: Tuesday, March 14, 2018

Test end: Thursday, March 16, 2018



Abalone Chronic Toxicity Test

Test start: Tuesday, March 14, 2018

Test end: Thursday, March 16, 2018

RT - 1803RT2B.H

SMB1 - 1803072C.H

SMB3 - ~~1803072D.H~~ 1803072D.H
 RE 3/28/2018