

Arkansas Analytical, Inc.

Toxicity Test Results
AECC – Magnet Cove Plant
Second Quarter 2019
AFIN #30-00337

Pimephales promelas, Acute Toxicity, EPA-821-R-02-012, October 2002

Daphnia pulex, Acute Toxicity, EPA-821-R-02-012, October 2002

Prepared for: **Mr. John Morgan**
AECC – Magnet Cove
410 Henderson
Malvern, AR 72104

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K1904002

Monday, April 22, 2019

Plant Location

The facility is located 6.5 miles North of Malvern and 2.3 miles South of Magnet Cove near Highway 270 in Section 28, Township 3 South, Range 17 West in Hot Spring County, Arkansas.

Test Method

EPA Method 821-R-02-012, October 2002 *Pimephales promelas* 48 survival test

- Test chambers: 500 ml plastic cups
- Test solution volume: 250 milliliters
- Number of test organisms per chamber: 10
- Number of replicates per concentration: 5
- Test temperature: 25°C ± 1°C
- Test concentrations: 0%, 5%, 7%, 10%, 13%, 17%
- Dilution water: Soft synthetic
- No deviation from the method

EPA Method 821-R-02-012, October 2002 *Daphnia pulex* 48 survival test

- Test chambers: 30 ml plastic cups
- Test solution volume: 15 milliliters
- Number of test organisms per chamber: 8
- Number of replicates per concentration: 5
- Test temperature: 25°C ± 1°C
- Test concentrations: 0%, 5%, 7%, 10%, 13%, 17%
- Dilution water: Soft synthetic
- No deviation from the method

Reference Toxicant Data

	<i>Pimephales promelas</i>	<i>Daphnia pulex</i>
Reference Toxicant: Potassium Chloride	3/27-29/19	3/27-29/19
LC50, ppm	1176	707
NOEC, ppm	500	500
Dilution water used:	Moderately Hard	Moderately Hard
Physical, chemical methods used:	821-R-02-012	821-R-02-012

Summary of Results

Magnet Cove

<i>Daphnia pulex</i>		<i>Pimephales promelas</i>	
NOEC Survival Parameter: TOM3D	17%	NOEC Survival Parameter: TOM6C	17%
LC50, ppm	NA	LC50, ppm	NA
Coefficient of Variation Parameter: TQM3D	0%	Coefficient of Variation Parameter: TQM6C	4.56%
Statistical comparison to control Parameter: TEM3D	Pass	Statistical comparison to control Parameter: TEM36C	Pass

Conclusion

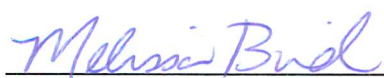
Pimephales promelas, (Method 821-R-02-012, October 2002): The permit issued to Magnet Cove, specifies that the **critical dilution is 13% effluent**. The effluent samples **did not** exhibit lethal effects at the critical dilution, and, as such, **passed**.

Daphnia pulex, (Method 821-R-02-012, October 2002): The permit issued to Magnet Cove, specifies that the **critical dilution is 13% effluent**. The effluent samples **did not** exhibit lethal effects at the critical dilution, and, as such, **passed**.

Biomonitoring Analysts:

Melissa Bird, Emily Nichols

Reviewed by:



Melissa Bird

Appendices

Appendix A.....Chains of custody

Appendix B.....Fathead minnow data & statistics

Appendix C.....*Daphnia pulex* data & statistics

Appendix D.....Water chemistry data

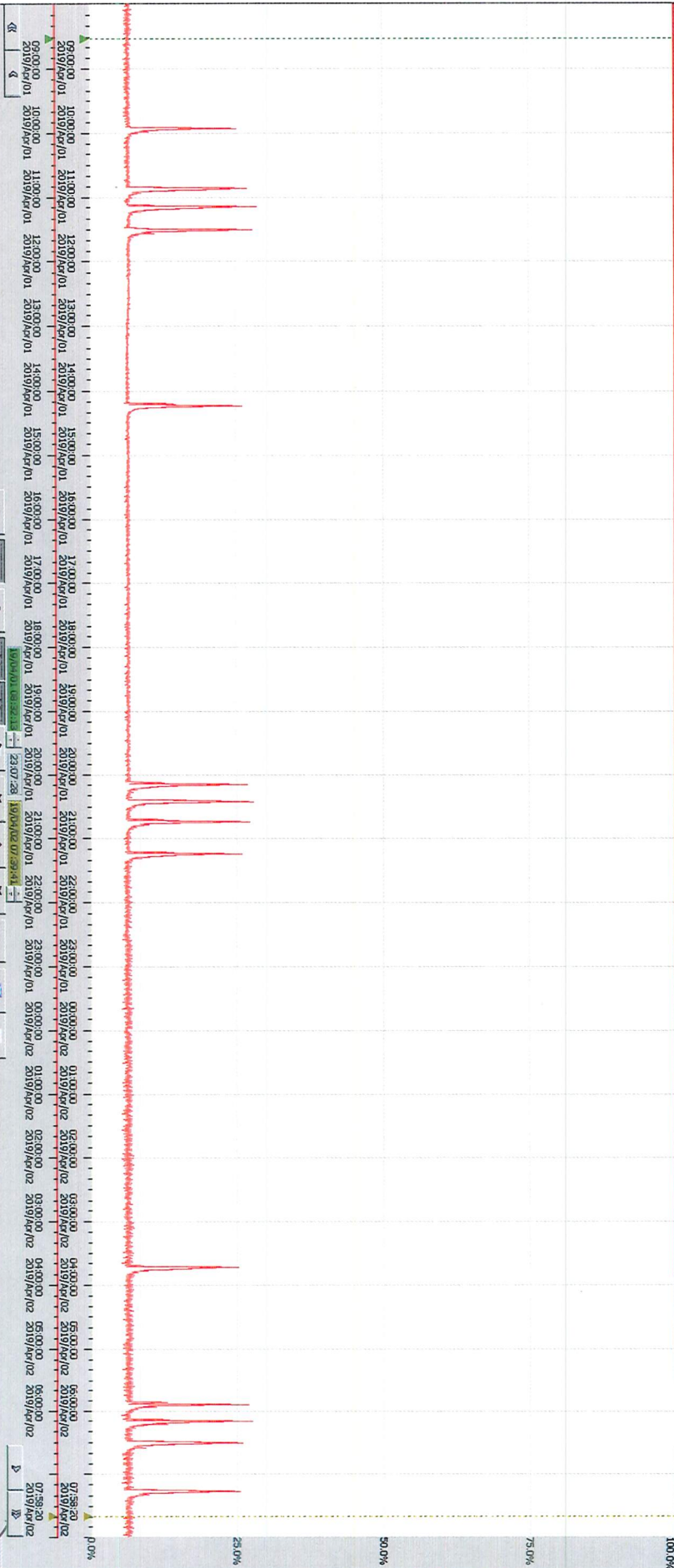
Appendix E.....Reference toxicant control charts



8100 National Dr.
 Little Rock, AR 72209
 PHONE: 501-455-3233
 FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		Project Description		Turnaround Time		Preservation Codes:	
AECC - Magnet Cove Plant 410 Henderson Rd. Malvern, AR 72109		Acute Toxicity		1 Day (100%) 2 Day (50%) 3 Day (25%)	1. Cool, 6 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2		4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12
Attn: Tracy Boisdrengnien		Reporting Information Telephone: 501-467-3232 FAX: 501-467-3233		Routine		TEST PARAMETERS	
Email: Tracy.Boisdrenghien@aecc.com; john.mehlin@aecc.com; john.morgan@aecc.com		Preservative Code: 1		Bottle Type Code: P		Bottle Type Code: G = Glass; P = Plastic V = Sputum; A = Amber	
Sampler(s) Signature: <i>Tracy Boisdrengnien</i>		Sampler(s) Printed: <i>Tracy Boisdrengnien</i>		SAMPLE IDENTIFICATION / DESCRIPTION		Acute Biomonitoring	
Field Number	SAMPLE COLLECTION Dates	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	
	4-2-19	0809-1709		X	24	Water	
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		Date/Time	
<i>Tracy Boisdrengnien</i>		4-2-19		<i>Amanda Johnson</i>		1340	
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		Date/Time	
<i>Tracy Boisdrengnien</i>		4-2-19		<i>Amanda Johnson</i>		1340	
SAMPLE CONDITION UPON RECEIPT IN LAB				REMARKS / SAMPLE COMMENTS			
1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. CONTAINERS CORRECT: <input type="checkbox"/> Yes <input type="checkbox"/> No 3. COC/LABELS AGREE: <input type="checkbox"/> Yes <input type="checkbox"/> No 4. RECEIVED ON ICE: <input type="checkbox"/> Yes <input type="checkbox"/> No 5. TEMPERATURE ON RECEIPT: <u>1</u> °C 6. TEMPERATURE GUN ID: HHT# <u>2</u>				Arkansas Analytical Work Order Number: <u>K1904002</u> <u>A</u>			
FOR COMPLETION BY LAB ONLY							



TIME	VALUE	UNIT
09:00:00	25.00	%
10:00:00	25.00	%
11:00:00	25.00	%
12:00:00	25.00	%
13:00:00	25.00	%
14:00:00	25.00	%
15:00:00	25.00	%
16:00:00	25.00	%
17:00:00	25.00	%
18:00:00	25.00	%
19:00:00	25.00	%
20:00:00	25.00	%
21:00:00	25.00	%
22:00:00	25.00	%
23:00:00	25.00	%
00:00:00	25.00	%
01:00:00	25.00	%
02:00:00	25.00	%
03:00:00	25.00	%
04:00:00	25.00	%
05:00:00	25.00	%
06:00:00	25.00	%
07:58:20	25.00	%

TAG COLOR		SIGNAL TAG		DESIGNATION		RANGE LOW		RANGE HI		CLASSK 1		CLASSK 2		Y DIFF		UNIT		LAST	
19GMA98CF1011XQ01		CMB EFF MIX/MTR CMB.F		19GMA98CF1011XQ01		0.0000		1500		94.4272		65.7630		6.6423 GM				61.1791	
TAG COLOR		SIGNAL TAG		DESIGNATION		RANGE LOW		RANGE HI		CLASSK 1		CLASSK 2		Y DIFF		UNIT		LAST	
19GMA98CF1011XQ01		CMB EFF MIX/MTR CMB.F		19GMA98CF1011XQ01		0.0000		1500		94.4272		65.7630		6.6423 GM				61.1791	

WASTE WATER EFFLUENT-10GMB10EJ100	WASTE WATER EFFLUENT
Trend Display 19GMA98CF1011XQ01	en
15/01/16	Drawn By
	Checked By
	Editor
	Standard
Change	Date

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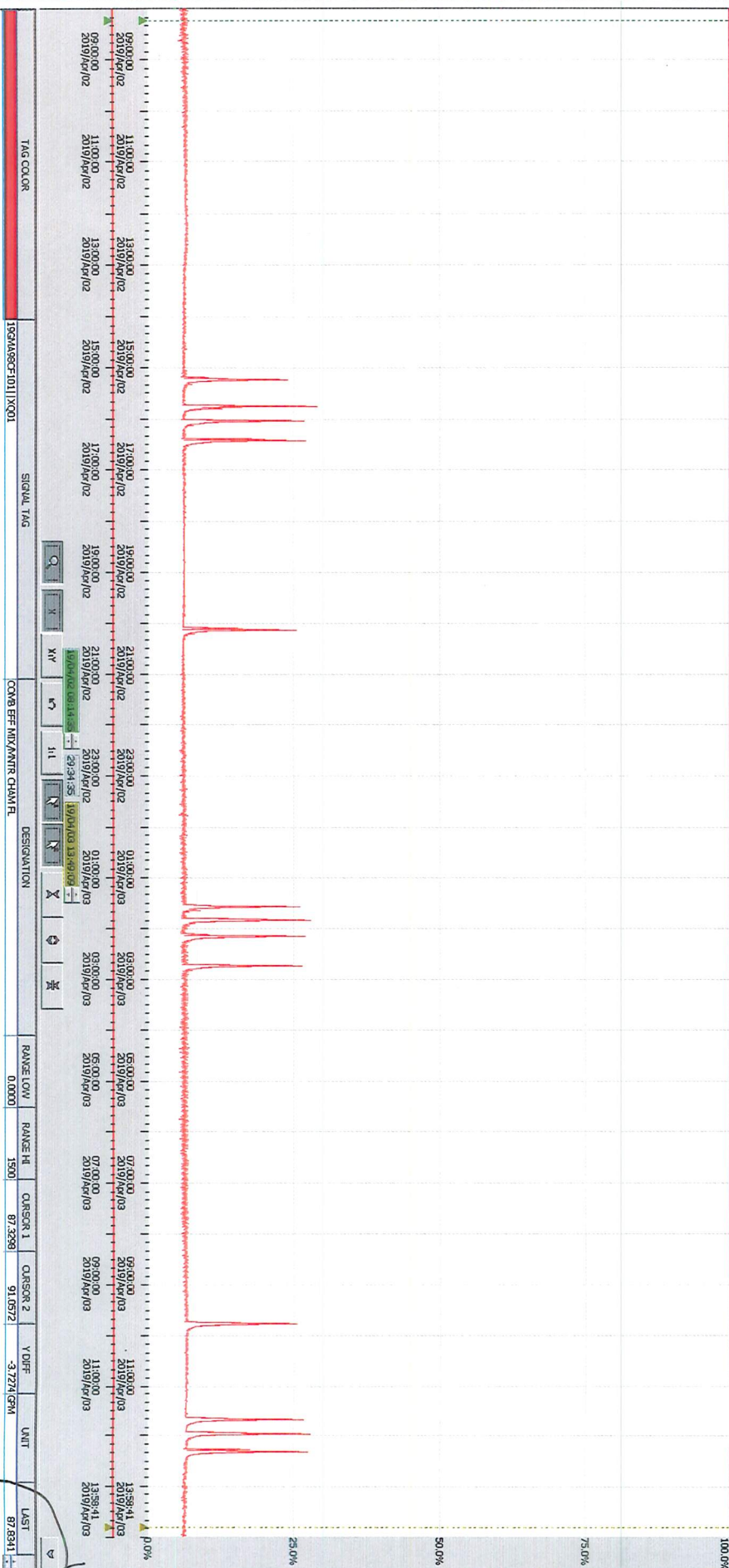
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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		Project Description		Turnaround Time		Preservation Codes:			
AEECC - Magnet Cove Plant		Acute Toxicity		1 Day (100%) 2 Day (50%) 3 Day (25%)		1. Cool, 6 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12			
410 Henderson Rd. Malvern, AR 72109		Reporting Information		Routine		TEST PARAMETERS			
Attn: Tracy Boisdrenghtien		Telephone: 501-467-3232 Fax: 501-467-3233		Preservative Code: 1		Bottle Type Code			
Email: Tracy.Boisdrenghtien@aeecc.com; John.Mehlin@aeecc.com; John.Morgan@aeecc.com		Bottle Type:		P		G = Glass; P = Plastic V = Septum; A = Amber			
Sampler(s) Signature: <i>Tracy Boisdrenghtien</i>		Sampler(s) Printed: <i>Clint Jones</i>		Acute Biomonitoring		Arkansas Analytical Work Order Number: <i>K1904002</i>			
Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	IDENTIFICATION/ DESCRIPTION	SAMPLE	
	4-2-3-19	1005-0905		X	24	Water	Outfall 001	X	
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		Date/Time		REMARKS / SAMPLE COMMENTS	
				<i>Tracy Boisdrenghtien</i>		4-3-19 / 1400			
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		Date/Time			
<i>Tracy Boisdrenghtien</i>		4-3-19 / 1455		<i>John Mehlin</i>					
SAMPLE CONDITION UPON RECEIPT IN LAB				FOR COMPLETION BY LAB ONLY					
1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				2. CONTAINERS CORRECT: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
3. COC/LABELS AGREE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				4. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
5. TEMPERATURE ON RECEIPT: <i>6</i> °C				6. TEMPERATURE GUN ID: <i>HHT# 2</i>					



TAG COLOR	SIGNAL TAG	DESIGNATION	RANGE LOW	RANGE HI	CLASS. 1	CLASS. 2	Y.DIF.	UNIT	LAST
19GMA9CF1011XC01	CONG EFF MIX/MATR CHAM.F		0.0000	1500	87.298	91.6572	-3.724	GM	87.8241

State	Change	Date	Editor	Standard	Date	Drawn By	Checked By
					15/01/16		

WASTE WATER EFFLUENT-10GBB10EJ100

Trend Display 19GMA9CF1011XC01

on

WASTE WATER EFFLUENT

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MARSHNEY CONE

CETIS Summary Report

Report Date: 22 Apr-19 10:52 (p 1 of 1)
 Test Code: K1904002FH | 16-8069-9643

Fathead Minnow 48-h Acute Survival Test

Arkansas Analytical, Inc.

Batch ID: 07-1797-6159	Test Type: Survival (48h)	Analyst: Melissa Bird
Start Date: 03 Apr-19 13:43	Protocol: EPA/821/R-02-012 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Apr-19 13:15	Species: Pimephales promelas	Brine: Not Applicable
Duration: 48h	Source: Aquatox, AR	Age: 8 d
Sample ID: 06-3283-9363	Code: K1904002FH	Client: Magnet Cove
Sample Date: 02 Apr-19 07:09	Material: Industrial Effluent	Project: WET Quarterly Compliance Test (2Q)
Receipt Date: 02 Apr-19 13:40	Source: Magnet Cove (AR0049611)	
Sample Age: 31h (1 °C)	Station:	

Comments:
 All samples received on ice.

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1904002B	03 Apr-19 09:05	03 Apr-19 14:55	04 Apr-19 00:00	6

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
08-2915-9298	48h Survival Rate	Steel Many-One Rank Sum Test	17	> 17	n/a	5.882	4.41%

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
5		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%
7		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%
10		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%
13		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	0.00%
17		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.04%

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	0.9000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000
7		1.0000	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000	1.0000
13		1.0000	1.0000	1.0000	1.0000	0.9000
17		1.0000	1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	10/10	10/10	9/10	10/10	10/10
5		10/10	10/10	10/10	10/10	10/10
7		10/10	10/10	10/10	10/10	10/10
10		10/10	10/10	10/10	10/10	10/10
13		10/10	10/10	10/10	10/10	9/10
17		10/10	10/10	10/10	10/10	10/10

CETIS Summary Report

Report Date: 22 Apr-19 10:55 (p 1 of 1)
 Test Code: K1904002DP | 06-0284-9972

Daphnia pulex 48-h Acute Survival Test Arkansas Analytical, Inc.

Batch ID: 19-4352-7464	Test Type: Survival (48h)	Analyst: Melissa Bird
Start Date: 03 Apr-19 10:15	Protocol: EPA/821/R-02-012 (2002)	Diluent: Soft Synthetic Water
Ending Date: 05 Apr-19 09:01	Species: Daphnia pulex	Brine: Not Applicable
Duration: 47h	Source: In-House Culture	Age: <24
Sample ID: 18-7040-6256	Code: K1904002DP	Client: Magnet Cove
Sample Date: 02 Apr-19 07:09	Material: Industrial Effluent	Project: WET Quarterly Compliance Test (2Q)
Receipt Date: 02 Apr-19 13:40	Source: Magnet Cove (AR0049611)	
Sample Age: 27h (1 °C)	Station:	

Comments:
 All samples received on ice.

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K1904002B	03 Apr-19 09:05	03 Apr-19 14:55	04 Apr-19 00:00	6

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
21-0369-2233	48h Survival Rate	Steel Many-One Rank Sum Test	17	> 17	n/a	5.882	n/a

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Decision
				Lower	Upper	Overlap	
21-0369-2233	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
5		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
7		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
13		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
17		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000
7		1.0000	1.0000	1.0000	1.0000	1.0000
10		1.0000	1.0000	1.0000	1.0000	1.0000
13		1.0000	1.0000	1.0000	1.0000	1.0000
17		1.0000	1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	D	8/8	8/8	8/8	8/8	8/8
5		8/8	8/8	8/8	8/8	8/8
7		8/8	8/8	8/8	8/8	8/8
10		8/8	8/8	8/8	8/8	8/8
13		8/8	8/8	8/8	8/8	8/8
17		8/8	8/8	8/8	8/8	8/8

Biomonitoring Report
Acute 24/48 Hour Static Test

Lab Number: K1904002	Test Organism: <i>P. promelas</i>
Client: Magnet Cove	Age of Organism: 8d
Date/ Time Started: 4/3/19 / 1343	Source of Organism: Aquatox
Date/ Time Ended: 4/5/19 / 1315	Dilution Water: SS 010 / SS 011

Conc.	Rep #	# Live Organisms			pH/Temp.		Dissolved O ₂ mg/L		Alkalinity mg/L		Hardness mg/L		Conductivity		T Res Cl mg/L	
		0 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr
0%	A	10	10	10	8.9/8.7	8.2/8.0	8.9/4.2	8.7/7.8	30	40	48	48	171	188	40.05	40.05
	B	10	10	10	22/25	23/25										
	C	10	10	9												
	D	10	10	10												
	E	10	10	10												
5%	A	10	10	10	8.1/8.6	8.0/8.1	8.8/7.8	8.6/7.8								
	B	10	10	10	22/25	23/25										
	C	10	10	10												
	D	10	10	10												
	E	10	10	10												
7%	A	10	10	10	8.1/8.3	8.3/8.1	8.8/7.2	8.6/7.8								
	B	10	10	10	22/25	23/25										
	C	10	10	10												
	D	10	10	10												
	E	10	10	10												
10%	A	10	10	10	8.1/8.5	8.1/8.0	8.9/7.2	8.6/7.7	100% concentration							
	B	10	10	10	22/25	23/25			96	84	142	116	341	345	40.05	40.05
	C	10	10	10												
	D	10	10	10												
	E	10	10	9												
13%	A	10	10	10	8.1/8.6	8.2/8.0	8.9/7.1	8.4/7.4								
	B	10	10	10	22/25	23/25										
	C	10	10	10												
	D	10	10	10												
	E	10	10	9												
17%	A	10	10	10	8.1/8.5	8.0/8.1	8.9/7.2	8.6/7.4								
	B	10	10	10	21/25	23/25										
	C	10	10	10												
	D	10	10	10												
	E	10	10	10												

Biomonitoring Report
Acute 24/48 Hour Static Test

Lab Number: K1904002	Test Organism: <i>D. pulex</i>
Client: Magnet Cove	Age of Organism: 27d
Date/ Time Started: 4-3-19/1015	Source of Organism: in-house culture
Date/ Time Ended: 4-5-19/0901	Dilution Water: SS010/SS011

Conc.	Rep #	# Live Organisms			pH/Temp.		Dissolved O ₂ mg/L		Alkalinity mg/L		Hardness mg/L		Conductivity		T Res Cl mg/L	
		0 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr	24 hr	48 hr
0%	A	8	8	8	8.3 9.2	8.2 8.2	8.4 8.3	8.7 8.5	SS010	SS011	SS010	SS011	SS010	SS011	SS010	SS011
	B	↓	↓	↓	22 25	23 25			30	40	48	48	171	188	60.05	60.05
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												
5%	A	8	8	8	8.1 8.9	8.0 8.4	8.8 8.3	8.6 8.2								
	B	↓	↓	↓	22 25	23 25										
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												
7%	A	8	8	8	8.1 8.8	8.3 8.2	8.8 8.3	8.6 8.2								
	B	↓	↓	↓	22 25	23 25										
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												
10%	A	8	8	8	8.1 8.7	8.1 8.2	8.9 8.2	8.6 8.1	96	84	142	116	341	345	60.05	60.05
	B	↓	↓	↓	22 25	23 25										
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												
13%	A	8	8	8	8.1 8.7	8.2 8.1	8.9 8.2	8.6 8.2								
	B	↓	↓	↓	22 25	23 25										
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												
17%	A	8	8	8	8.1 8.7	8.0 8.1	8.9 8.2	8.6 8.3								
	B	↓	↓	↓	21 25	23 25										
	C	↓	↓	↓												
	D	↓	↓	↓												
	E	↓	↓	↓												

