

02/07/2023

Osceola Water Department  
Mr. Brandon Haynes  
PO Box 443  
Osceola, AR 72370

Ref: Analytical Testing  
Report Number: 23-018-0394  
Client Project Description: Bioassay

AR0021580 – Qtr 1

Dear Mr. Brandon Haynes

The results of this WET (Whole Effluent Toxicity) test are acceptable according to test review criteria. There were no significant deficiencies found in sample handling, test performance, or reporting. The test results are within the limits established by your NPDES permit and were entered into the permittee's records in the database.

Results:	<i>Daphnia pulex</i>	NOEL = 0.23 %	CV = 5.73 %
	Fathead minnow	NOEL = 0.23 %	CV = 5.73 %

Permit Limit: Critical Dilution = 0.17 %  
Maximum Coefficient of Variation (CV) < 40 %

EPA Methods: 2021.0 *Daphnia pulex* Acute Toxicity  
2000.0 *Pimephales promelas* Acute Toxicity

All statistical interpretations generated by CETIS - Comprehensive Environmental Toxicity Information System (v.1.9.1.4). CETIS created by Tidepool Scientific Software

Respectfully,



Blake Smith  
Lab Supervisor

# CETIS Test Evaluation Report

**Report Date:** 07 Feb-23 15:06 ( 1 of 1)  
**Test Code:** 23-018-0394-dp | 17-9155-8536

**Facility:** Osceola Water Department  
**Sample Site:**  
**Sample Code:** 23-018-0394  
**Sample Date:** 17 Jan-23 08:00  
**Sample Age:** 32h (1.7 °C)  
**Project:** WET Quarterly Compliance Test (1Q)

**Test Name:** Daphnia pulex 48-h Acute Survival Test  
**Organism:** Daphnia pulex (Water Flea)  
**Protocol:** EPA/821/R-02-012 (2002)  
**Start Date:** 18 Jan-23 15:38  
**End Date:** 20 Jan-23 15:52  
**Duration:** 48h **Organism Age:** <24

**Permittee:** Osceola Water Department  
**Address:** 303 W. Hale  
 PO Box 443  
 Osceola, AR 72370  
**Contact:** Mr. Brandon Haynes  
**Phone:** 870-563-2628  
**Email:** bhaynes58@yahoo.com

**Laboratory:** Waypoint Analytical Tennessee , LLC.  
**Address:** 2790 Whitten Road  
 Memphis, TN 38133  
**Contact:** Mrs. Blake Smith, Lab Supervisor  
**Phone:** 901-271-5200, 901-213-2440(fax)  
**Email:** Bsmith@wpacorp.com

**Comments:**

**Acute Toxicity Evaluation**

Endpoint	Criteria	Conc-%	IWC	Decision	Method
48h Survival Rate	NOEL/LOEL	0.23/>0.23	0.17	Passes IWC	Steel Many-One Rank Sum Test

**Test Acceptability Criteria**

Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
			Lower	Upper		
48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Acceptability Criteria

**48h Survival Rate Data Summary**

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	R	5	1	1	1	1	1	0	0	0.00%	0.0%
0.07		5	1	1	1	1	1	0	0	0.00%	0.0%
0.1		5	0.975	0.9545	0.9955	0.875	1	0.025	0.0559	5.73%	2.5%
0.13		5	1	1	1	1	1	0	0	0.00%	0.0%
0.17		5	0.975	0.9545	0.9955	0.875	1	0.025	0.0559	5.73%	2.5%
0.23		5	1	1	1	1	1	0	0	0.00%	0.0%

# CETIS Summary Report

Report Date: 07 Feb-23 15:06 (p 1 of 1)  
 Test Code: 23-018-0394-dp | 17-9155-8536

## Daphnia pulex 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

<b>Batch ID:</b> 02-9606-0709	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b> Ivey E. Moffett
<b>Start Date:</b> 18 Jan-23 15:38	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Diluent:</b> 20% DMW
<b>Ending Date:</b> 20 Jan-23 15:52	<b>Species:</b> Daphnia pulex	<b>Brine:</b> Not Applicable
<b>Duration:</b> 48h	<b>Source:</b> In-House Culture	<b>Age:</b> <24
<b>Sample ID:</b> 06-0349-2450	<b>Code:</b> 23-018-0394	<b>Client:</b> Osceola Water Department
<b>Sample Date:</b> 17 Jan-23 08:00	<b>Material:</b> POTW Effluent	<b>Project:</b> WET Quarterly Compliance Test (1Q)
<b>Receipt Date:</b> 18 Jan-23 13:10	<b>Source:</b> Osceola Water Department (AR0021580)	
<b>Sample Age:</b> 32h (1.7 °C)	<b>Station:</b>	

### Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	23-018-0394	18 Jan-23 08:00	18 Jan-23 13:10	19 Jan-23 00:00	1.7

### Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
08-1428-4839	48h Survival Rate	Steel Many-One Rank Sum Test	0.23	> 0.23	n/a	434.8	6.15%

### Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
08-1428-4839	48h Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Acceptability Criteria

### 48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	R	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
0	L	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
0.07		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
0.1		5	0.9750	0.9056	1.0000	0.8750	1.0000	0.0250	0.0559	5.73%	2.50%
0.13		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
0.17		5	0.9750	0.9056	1.0000	0.8750	1.0000	0.0250	0.0559	5.73%	2.50%
0.23		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	R	1.0000	1.0000	1.0000	1.0000	1.0000
0	L	1.0000	1.0000	1.0000	1.0000	1.0000
0.07		1.0000	1.0000	1.0000	1.0000	1.0000
0.1		1.0000	1.0000	1.0000	0.8750	1.0000
0.13		1.0000	1.0000	1.0000	1.0000	1.0000
0.17		1.0000	0.8750	1.0000	1.0000	1.0000
0.23		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	R	8/8	8/8	8/8	8/8	7/7
0	L	8/8	8/8	8/8	8/8	8/8
0.07		8/8	8/8	8/8	8/8	8/8
0.1		8/8	7/7	8/8	7/8	8/8
0.13		7/7	8/8	8/8	8/8	8/8
0.17		8/8	7/8	8/8	8/8	8/8
0.23		8/8	8/8	8/8	8/8	8/8

# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 1 of 3)  
Test Code: 23-018-0394-dp | 17-9155-8536

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## Daphnia pulex 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

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<b>Batch ID:</b> 02-9606-0709	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b> Ivey E. Moffett
<b>Start Date:</b> 18 Jan-23 15:38	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Diluent:</b> 20% DMW
<b>Ending Date:</b> 20 Jan-23 15:52	<b>Species:</b> Daphnia pulex	<b>Brine:</b> Not Applicable
<b>Duration:</b> 48h	<b>Source:</b> In-House Culture	<b>Age:</b> <24

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<b>Sample ID:</b> 06-0349-2450	<b>Code:</b> 23-018-0394	<b>Client:</b> Osceola Water Department
<b>Sample Date:</b> 17 Jan-23 08:00	<b>Material:</b> POTW Effluent	<b>Project:</b> WET Quarterly Compliance Test (1Q)
<b>Receipt Date:</b> 18 Jan-23 13:10	<b>Source:</b> Osceola Water Department (AR0021580)	
<b>Sample Age:</b> 32h (1.7 °C)	<b>Station:</b>	

# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 2 of 3)  
Test Code: 23-018-0394-dp | 17-9155-8536

## Daphnia pulex 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

### Total Residual Chlorine-mg/L

Conc-%	Code	1	2
0	R	0	0
0	L	0	0
0.07			
0.1			
0.13			
0.17			
0.23		1	1

### Conductivity-µS/cm

Conc-%	Code	1	2
0	R	353.4	355.9
0	L	182	182.7
0.07			
0.1			
0.13			
0.17			
0.23		480	485.6

### Final Dissolved Oxygen-mg/L

Conc-%	Code	1	2
0	R	9.5	9.7
0	L	8.9	8.7
0.07		9.5	9.5
0.1		9.6	9.5
0.13		9.6	9.7
0.17		9.7	9.7
0.23		9.6	9.8

### Initial Dissolved Oxygen-mg/L

Conc-%	Code	1	2
0	R	10.5	9.4
0	L	10.1	9
0.07		10.3	10.1
0.1		10.4	10.3
0.13		9.8	10.3
0.17		9.8	10.4
0.23		9.8	10.7

### Final pH-Units

Conc-%	Code	1	2
0	R	8.3	8.3
0	L	8.1	8
0.07		8.3	8.2
0.1		8.3	8.3
0.13		8.3	8.2
0.17		8	8.2
0.23		8.2	8.4

# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 3 of 3)  
Test Code: 23-018-0394-dp | 17-9155-8536

## Daphnia pulex 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

### Initial pH-Units

Conc-%	Code	1	2
0	R	8	8.2
0	L	8	8.2
0.07		8	8.2
0.1		7.9	8.1
0.13		7.7	8
0.17		7.7	8
0.23		7.9	8

### Final Temperature-°C

Conc-%	Code	1	2
0	R	23.4	23.2
0	L	23.4	23
0.07		24.1	23
0.1		24.2	23.1
0.13		24	23
0.17		24.1	23
0.23		23.9	23

### Initial Temperature-°C

Conc-%	Code	1	2
0	R	25.8	24.2
0	L	25.1	24.1
0.07		26	24.1
0.1		25.9	24.2
0.13		26	24.6
0.17		26.1	25.1
0.23		25.9	25

# CETIS Test Evaluation Report

**Report Date:** 07 Feb-23 15:06 ( 1 of 1 )  
**Test Code:** 23-018-0394-fh | 16-2670-7401

**Facility:** Osceola Water Department  
**Sample Site:**  
**Sample Code:** 23-018-0394  
**Sample Date:** 17 Jan-23 08:00  
**Sample Age:** 31h (1.7 °C)  
**Project:** WET Quarterly Compliance Test (1Q)

**Test Name:** Fathead Minnow 48-h Acute Survival Test  
**Organism:** Pimephales promelas (Fathead Minnow)  
**Protocol:** EPA/821/R-02-012 (2002)  
**Start Date:** 18 Jan-23 15:20  
**End Date:** 20 Jan-23 15:58  
**Duration:** 49h **Organism Age:** <24

**Permittee:** Osceola Water Department  
**Address:** 303 W. Hale  
 PO Box 443  
 Osceola, AR 72370  
**Contact:** Mr. Brandon Haynes  
**Phone:** 870-563-2628  
**Email:** bhaynes58@yahoo.com

**Laboratory:** Waypoint Analytical Tennessee , LLC.  
**Address:** 2790 Whitten Road  
 Memphis, TN 38133  
**Contact:** Mrs. Blake Smith, Lab Supervisor  
**Phone:** 901-271-5200, 901-213-2440(fax)  
**Email:** Bsmith@wpacorp.com

**Comments:**

**Acute Toxicity Evaluation**

Endpoint	Criteria	Conc-%	IWC	Decision	Method
48h Survival Rate	NOEL/LOEL	0.23/>0.23	0.17	Passes IWC	Steel Many-One Rank Sum Test

**Test Acceptability Criteria**

Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
			Lower	Upper		
48h Survival Rate	Control Resp	0.975	0.9	>>	Yes	Passes Acceptability Criteria

**48h Survival Rate Data Summary**

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	R	5	0.975	0.9545	0.9955	0.875	1	0.025	0.0559	5.73%	0.0%
0.07		5	0.95	0.909	0.991	0.75	1	0.05	0.1118	11.77%	2.56%
0.1		5	1	1	1	1	1	0	0	0.00%	-2.56%
0.13		5	1	1	1	1	1	0	0	0.00%	-2.56%
0.17		5	1	1	1	1	1	0	0	0.00%	-2.56%
0.23		5	1	1	1	1	1	0	0	0.00%	-2.56%

# CETIS Summary Report

Report Date: 07 Feb-23 15:06 (p 1 of 1)  
 Test Code: 23-018-0394-fh | 16-2670-7401

## Fathead Minnow 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

<b>Batch ID:</b> 17-7462-6586	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b> Ivey E. Moffett
<b>Start Date:</b> 18 Jan-23 15:20	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Diluent:</b> 20% DMW
<b>Ending Date:</b> 20 Jan-23 15:58	<b>Species:</b> Pimephales promelas	<b>Brine:</b> Not Applicable
<b>Duration:</b> 49h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b> <24
<b>Sample ID:</b> 06-0349-2450	<b>Code:</b> 23-018-0394	<b>Client:</b> Osceola Water Department
<b>Sample Date:</b> 17 Jan-23 08:00	<b>Material:</b> POTW Effluent	<b>Project:</b> WET Quarterly Compliance Test (1Q)
<b>Receipt Date:</b> 18 Jan-23 13:10	<b>Source:</b> Osceola Water Department (AR0021580)	
<b>Sample Age:</b> 31h (1.7 °C)	<b>Station:</b>	

### Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	23-018-0394	18 Jan-23 08:00	18 Jan-23 13:10	19 Jan-23 00:00	1.7

### Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD ✓
00-9933-9100	48h Survival Rate	Steel Many-One Rank Sum Test	0.23	> 0.23	n/a	434.8	7.67%

### Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
00-9933-9100	48h Survival Rate	Control Resp	0.975	0.9	>>	Yes	Passes Acceptability Criteria

### 48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	R	5	0.9750	0.9056	1.0000	0.8750	1.0000	0.0250	0.0559	5.73%	0.00%
0	L	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
0.07		5	0.9500	0.8112	1.0000	0.7500	1.0000	0.0500	0.1118	11.77%	2.56%
0.1		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
0.13		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
0.17		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
0.23		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%

### 48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	R	1.0000	1.0000	1.0000	1.0000	0.8750
0	L	1.0000	1.0000	1.0000	1.0000	1.0000
0.07		0.7500	1.0000	1.0000	1.0000	1.0000
0.1		1.0000	1.0000	1.0000	1.0000	1.0000
0.13		1.0000	1.0000	1.0000	1.0000	1.0000
0.17		1.0000	1.0000	1.0000	1.0000	1.0000
0.23		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	R	8/8	8/8	8/8	8/8	7/8
0	L	8/8	8/8	8/8	8/8	8/8
0.07		6/8	8/8	8/8	8/8	8/8
0.1		8/8	7/7	8/8	8/8	8/8
0.13		7/7	8/8	8/8	8/8	8/8
0.17		8/8	8/8	8/8	8/8	8/8
0.23		8/8	8/8	8/8	8/8	8/8



# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 1 of 3)  
Test Code: 23-018-0394-fh | 16-2670-7401

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## Fathead Minnow 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

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<b>Batch ID:</b> 17-7462-6586	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b> Ivey E. Moffett
<b>Start Date:</b> 18 Jan-23 15:20	<b>Protocol:</b> EPA/821/R-02-012 (2002)	<b>Diluent:</b> 20% DMW
<b>Ending Date:</b> 20 Jan-23 15:58	<b>Species:</b> Pimephales promelas	<b>Brine:</b> Not Applicable
<b>Duration:</b> 49h	<b>Source:</b> Aquatic Biosystems, CO	<b>Age:</b> <24

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<b>Sample ID:</b> 06-0349-2450	<b>Code:</b> 23-018-0394	<b>Client:</b> Osceola Water Department
<b>Sample Date:</b> 17 Jan-23 08:00	<b>Material:</b> POTW Effluent	<b>Project:</b> WET Quarterly Compliance Test (1Q)
<b>Receipt Date:</b> 18 Jan-23 13:10	<b>Source:</b> Osceola Water Department (AR0021580)	
<b>Sample Age:</b> 31h (1.7 °C)	<b>Station:</b>	

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# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 2 of 3)  
 Test Code: 23-018-0394-fh | 16-2670-7401

## Fathead Minnow 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

### Total Residual Chlorine-mg/L

Conc-%	Code	1	2
0	R	0	0
0	L	0	0
0.07			
0.1			
0.13			
0.17			
0.23		1	1

### Conductivity-µS/cm

Conc-%	Code	1	2
0	R	353.4	355.9
0	L	182	182.7
0.07			
0.1			
0.13			
0.17			
0.23		480	485.6

### Final Dissolved Oxygen-mg/L

Conc-%	Code	1	2
0	R	8.5	9.6
0	L	8.9	8.4
0.07		8.5	9.9
0.1		8.5	9.8
0.13		8.6	9.7
0.17		8.6	9.6
0.23		8.6	9.6

### Initial Dissolved Oxygen-mg/L

Conc-%	Code	1	2
0	R	10.5	9.4
0	L	10.1	9
0.07		10.3	10.1
0.1		10.4	10.3
0.13		9.8	10.3
0.17		9.8	10.4
0.23		9.8	10.7

### Final pH-Units

Conc-%	Code	1	2
0	R	8.1	8.2
0	L	8.1	8.1
0.07		8.1	8.2
0.1		8	8.2
0.13		8	8.2
0.17		8.1	8.2
0.23		8	8.1

# CETIS Measurement Report

Report Date: 07 Feb-23 15:06 (p 3 of 3)  
Test Code: 23-018-0394-fh | 16-2670-7401

## Fathead Minnow 48-h Acute Survival Test

Waypoint Analytical Tennessee, LLC.

### Initial pH-Units

Conc-%	Code	1	2
0	R	8	8.2
0	L	8	8.2
0.07		8	8.2
0.1		7.9	8.1
0.13		7.7	8
0.17		7.7	8
0.23		7.9	8

### Final Temperature-°C

Conc-%	Code	1	2
0	R	24.3	23.6
0	L	24.2	23.7
0.07		24.4	24
0.1		24.5	23.9
0.13		24.4	23.8
0.17		24.1	23.6
0.23		24.2	24

### Initial Temperature-°C

Conc-%	Code	1	2
0	R	25.8	24.2
0	L	25.1	24.1
0.07		26	24.1
0.1		25.9	24.2
0.13		26	24.6
0.17		26.1	25.1
0.23		25.9	25

Additional Toxicity Test Information

1. Methods/Instrumentation used in chemical analysis:
  - Dissolved oxygen, DM 4: (SM 4500-O G-2016)
  - pH, PH 21: (SM 4500-H + B-2011)
  - Temperature, T148 & T124
  - Conductivity, C 2: (SM 2510 B-2011)
  - Alkalinity: (SM 2320 B-2011)
  - Hardness: (EPA 200.7 / SM 2340 B-2011)
  - Total Residual Chlorine: (SM 4500-CL G-2011)
    - Reported value of “0” indicates result below detection limit of 0.02 mg/L
    - Reported value of “1” indicates result above detection limit of 0.02mg/L
  - EPA Acute Manual Edition and Date: EPA-821-R-02-012, OCT 2002 (Fifth edition)
  - EPA Chronic Manual Edition and Date: EPA-821-R-02-013, OCT 2002 (Fourth edition)
2. Laboratory
  - Incubator Temperature: 25± 1°C
    - Incubator ID: BIO Thermometer ID: 120554
  - Sample Temperature: 25± 3°C
    - Sample Temperatures are read after the organisms have been transferred and counted.
      - Depending on temperature of laboratory and time spent on organisms the temperature of the sample may drop below limits. However, the organisms are maintained at 25± 3°C
  - Light Cycle: 16 hours light/ 8 hours dark
  - Light intensity: 50-100 foot-candles, average
  - Control (Dilution) Water: Dilute mineral water made with 20 % Perrier in Nanopure (20%DMW)
    - Maintained in the incubator at 25± 1°C
  - Pretreatment: none
3. Method 2021.0 *Daphnia pulex* Acute Toxicity Testing
  - Test chambers: 30 mL disposable plastic beakers
  - Volume per chamber: 25 mL
  - Number of organisms per chamber: 8
  - Number of replicates: 5
  - Food: *Daphnia pulex* are fed 0.15mL *Raphidocelis subcapitata* (Algae) and YTC solution while holding prior to testing.
  - Acclimation of organisms: In house cultures are raised at 25°C. Purchased organisms are allowed to reach 25°C prior to use.
4. Method 2000.0 *Pimephales promelas* (Fathead minnow) Acute Toxicity Testing
  - Test chambers: 20 oz. Disposable plastic cups
  - Volume per chamber: 250 mL
  - Average number of organisms per chamber: 8
  - Number of replicates per concentration: 5
  - Food: Fathead minnows are fed 0.15mL *Artemia* brine shrimp hatched in laboratory during holding, prior to test twice daily
  - Acclimation of organisms: Dilution water is added until organisms are contained in a culture media that consists of 80% dilution water. Organisms are allowed to reach 25°C prior to use.
5. Reference Toxicity
  - Reference toxicity tests are performed monthly on each method performed by the laboratory.
  - Potassium Chloride is used as the reference toxicity chemical for vertebrate species
  - Current chemical ID: CS 6169894
  - Sodium Chloride is used as the reference toxicity chemical for invertebrate species
  - Current chemical ID: CS 6171713
6. Indicate below any other relevant information that may aid in the evaluation of this report. Include any deviations from EPA methodology that were necessary for these tests as well as any sample manipulations which were performed, such as aeration, dechlorination with sodium thiosulfate, etc. and the justification for such manipulations or deviations. Attach additional pages as needed.
  - None

03334

Osceola Water Department  
 Mr. Brandon Haynes  
 303 W. Hale  
 Osceola , AR 72370

Project Bioassay  
 Information :

Report Date : 02/07/2023

Report Number : **23-018-0394**

**REPORT OF ANALYSIS**

Received : 01/18/2023

Lab No : **94783**

Matrix: **Aqueous**

Sample ID : **Outfall 001 - Composite 1/16-17/23**

Sampled: **1/17/2023 8:00**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO <sub>3</sub> )	<b>143</b>	mg/L	1	1	01/24/23 10:20	DAS	2320B-2011
Calcium	<b>23.5</b>	mg/L	0.100	1	01/27/23 04:13	JTR	EPA-200.7
Hardness as CaCO <sub>3</sub> (SM-2340B)	<b>81.0</b>	mg/L	0.100	1	01/27/23 04:13		EPA-200.7
Magnesium	<b>5.43</b>	mg/L	0.100	1	01/27/23 04:13	JTR	EPA-200.7

Lab No : **94784**

Matrix: **Aqueous**

Sample ID : **Outfall 001 - Composite 1/17-18/23**

Sampled: **1/18/2023 8:10**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO <sub>3</sub> )	<b>144</b>	mg/L	1	1	01/24/23 10:20	DAS	2320B-2011
Calcium	<b>23.8</b>	mg/L	0.100	1	01/27/23 04:19	JTR	EPA-200.7
Hardness as CaCO <sub>3</sub> (SM-2340B)	<b>82.6</b>	mg/L	0.100	1	01/27/23 04:19		EPA-200.7
Magnesium	<b>5.63</b>	mg/L	0.100	1	01/27/23 04:19	JTR	EPA-200.7

Lab No : **94785**

Matrix: **Aqueous**

Sample ID : **Receiving Water**

Sampled: **1/18/2023 9:30**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Alkalinity (as CaCO <sub>3</sub> )	<b>106</b>	mg/L	1	1	01/24/23 10:20	DAS	2320B-2011
Calcium	<b>37.6</b>	mg/L	0.100	1	01/27/23 04:24	JTR	EPA-200.7
Hardness as CaCO <sub>3</sub> (SM-2340B)	<b>138</b>	mg/L	0.100	1	01/27/23 04:24		EPA-200.7
Magnesium	<b>10.8</b>	mg/L	0.100	1	01/27/23 04:24	JTR	EPA-200.7

**Qualifiers/  
Definitions**

DF Dilution Factor  
 MQL Method Quantitation Limit

L Limit Exceeded

<b>Kit ID:</b>	200224
<b>Initiated By:</b>	Sydney Andres
<b>Initiated Date:</b>	1/6/2023
<b>Project Comment</b>	Bioassay

### CHAIN-OF-CUSTODY



23-018-0394  
 03334  
 01-18-2023  
 13:50:45

Osceola Water Department  
 Bioassay

<b>Company Name</b>	<b>Company Number</b>	<b>Client Project Manager/Contact</b>	<b>Purchase Order Number</b>
Osceola Water Department	03334	Brandon Haynes Osceola Water Dept.	472329
<b>Site Name</b>	<b>Project Number</b>	<input type="checkbox"/> RUSH – Additional charges apply <input type="checkbox"/> Special Detection Limits(s) Date Results Needed	<b>Method of Shipment</b>
QTR 1 Bioassay 01/16-18/2023			<input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Courier <input type="checkbox"/> Client Drop Off Other
<b>LIMS Project ID</b>	<b>Project Manager Phone #</b>	<b>Project Manager Email</b>	<b>Site/Facility ID #</b>
Osceola Water - Bioassay	(870) 563-2628	bhaynes58@yahoo.com	

Date	Time	Sample ID	Matrix	Grab/Comp	# of Cont	Container Type	Preservation	Analyses
1/10/23 1/17/23	8:00 AM	Outfall 001 - Composite 1	Aqueous	C	1	Plastic - Pint	HNO3 - Nitric Acid	hardness
1/17/23 1/18/23	8:00 AM	Outfall 001 - Composite 2	Aqueous	C	1	Plastic - Pint	HNO3 - Nitric Acid	hardness
1/10/23 1/17/23	8:00 AM	Outfall 001 - Composite 1	Aqueous	C	1	Plastic - Pint	NONE	Alkalinity
1/17/23 1/18/23	8:00 AM	Outfall 001 - Composite 2	Aqueous	C	1	Plastic - Pint	NONE	Alkalinity
1/10/23 1/17/23	8:00 AM	Outfall 001 - Composite 1	Aqueous	C	1	Plastic - Quart	NONE	48 hr bioassay - renewal
1/17/23 1/18/23	8:00 AM	Outfall 001 - Composite 2	Aqueous	C	1	Plastic - Quart	NONE	48 hr bioassay - renewal
1/18/23	9:30 AM	River Water	Aqueous	C	1	Plastic - Pint	HNO3 - Nitric Acid	hardness
1/18/23	9:30 AM	river water	Aqueous	C	1	Plastic - Pint	NONE	Alkalinity

<b>For Laboratory Use Only</b>		<b>Sampled by (Name - Print)</b>	<b>Client Remarks/Comments</b>		
<b>Ice</b>	<b>Custody Seals</b>	Brandon Haynes			
Y/N	Y/N				
<b>Blank/Cooler Temp</b>	<b>Lab Comments</b>				
1.7 °C	T-100				
		<b>Relinquished by: (SIGNATURE)</b>	<b>Date Time</b>	<b>Received by: (SIGNATURE)</b>	<b>Date Time</b>
		<i>[Signature]</i>	1/18/23	<i>[Signature]</i>	1/18/23 0940
		<b>Relinquished by: (SIGNATURE)</b>	<b>Date Time</b>	<b>Received by: (SIGNATURE)</b>	<b>Date Time</b>
		<i>[Signature]</i>	1/18/23 1310	<i>[Signature]</i>	1/18/23 1310

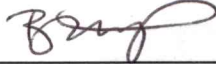



<b>Kit ID:</b>	200224
<b>Initiated By:</b>	Sydney Andres
<b>Initiated Date:</b>	1/6/2023
<b>Project Comment</b>	Bioassay

**CHAIN-OF-CUSTODY**



23-018-0394  
 03334  
 01-18-2023  
 13:50:45  
 Osceola Water Department  
 Bioassay

<b>Company Name</b> Osceola Water Department		<b>Company Number</b> 03334		<b>Client Project Manager/Contact</b> Brandon Hayes Osceola Water Dept.		<b>Purchase Order Number</b> 472329		
<b>Site Name</b> QTR 1 Bioassay 01/16-18/2023		<b>Project Number</b>		<input type="checkbox"/> RUSH - Additional charges apply <input type="checkbox"/> Special Detection Limits(s) Date Results Needed		<b>Method of Shipment</b> <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Courier <input type="checkbox"/> Client Drop Off Other		
<b>LIMS Project ID</b> Osceola Water - Bioassay		<b>Project Manager Phone #</b> (870) 563-2628		<b>Project Manager Email</b> bhaynes5@yahoo.com		<b>Site/Facility ID #</b>		
Date	Time	Sample ID	Matrix	Grab/Comp	# of Cont	Container Type	Preservation	Analyses
1/18/23	9:30 AM	river water	Aqueous	C	4	Plastic - Gallon	NONE	dilution water

For Laboratory Use Only			Sampled by (Name - Print)	Client Remarks/Comments			
Ice	Custody	Lab Comments	Brandon Hayes				
Seals			Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time	
Q/N	Y/N			1/18/23		1/18/23	0940
Blank/Cooler Temp			Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time	
7-100			Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time	
1.7 ca				1/18/23 1310		1/18/23 1310	

Waypoint Analytical, LLC.

48 HOUR RENEWAL DAILY READINGS SHEET

SAMPLE ID: Osceola  
 REPORT #: 23.018.0394  
 DATE START: 1/18/23

pH	DAY 1		DAY 2		AFTER - DAY 1	AFTER - DAY 2	AFTER - DAY 1	AFTER - DAY 2
	INITIAL	INITIAL	Daphnia pulex	Daphnia pulex	Fathead Minnow	Fathead Minnow	Fathead Minnow	Fathead Minnow
CONTROL	8.0	8.2	8.1	8.0	8.1	8.1	8.1	8.1
R	8.0	8.2	8.3	8.3	8.1	8.2	8.2	8.2
1	8.0	8.2	8.3	8.2	8.1	8.2	8.2	8.2
2	7.9	8.1	8.3	8.3	8.0	8.2	8.2	8.2
3	7.7	8.0	8.3	8.2	8.0	8.2	8.2	8.2
4	7.7	8.0	8.0	8.2	8.1	8.2	8.2	8.2
5	7.9	8.0	8.2	8.4	8.0	8.1	8.1	8.1
DO mg/L	INITIAL		INITIAL		Daphnia pulex	Daphnia pulex	Fathead Minnow	Fathead Minnow
CONTROL	10.1	9.0	8.9	8.7	8.9	8.4	8.9	8.4
R	10.5	9.4	9.5	9.7	8.5	9.6	8.5	9.6
1	10.3	10.1	9.5	9.5	8.5	9.9	8.5	9.9
2	10.4	10.3	9.6	9.5	8.5	9.8	8.5	9.8
3	9.8	10.3	9.6	9.7	8.6	9.7	8.6	9.7
4	9.8	10.4	9.7	9.7	8.6	9.6	8.6	9.6
5	9.8	10.7	9.6	9.8	8.6	9.6	8.6	9.6
TEMP. (C°)	INITIAL		INITIAL		Daphnia pulex	Daphnia pulex	Fathead Minnow	Fathead Minnow
CONTROL	25.1	24.1	23.4	23.0	24.2	23.7	24.2	23.7
R	25.8	24.2	23.4	23.2	24.3	23.6	24.3	23.6
1	26.0	24.1	24.1	23.0	24.4	24.0	24.4	24.0
2	25.9	24.2	24.2	23.1	24.5	23.9	24.5	23.9
3	26.0	24.6	24.0	23.0	24.4	23.8	24.4	23.8
4	26.1	25.1	24.1	23.0	24.1	23.6	24.1	23.6
5	25.9	25.0	23.9	23.0	24.2	24.0	24.2	24.0
ANALYST:	UR	UR	UR	UR	IM	UR	IM	UR
DATE:	1/18/23	1/19/23	1/19/23	1/20/23	1/19/23	1/20/23	1/19/23	1/20/23

	CONDUCTIVITY (micromhos)		CHLORINE mg/L		DL = 0.02 mg/L
	DAY 1	DAY 2	DAY 1	DAY 2	22 DAY 1 DPD Cl2 Reagent ID
CONTROL	182.0	182.7	20.02	20.02	23-REAG-6296
Rec. Stream	353.4	355.9	20.02	20.02	IM DAY 2 DPD Cl2 Reagent ID
EFFLUENT	480.0	485.6	20.02	20.02	23-REAG-6296
ANALYST:	IM	UR	IM	UR	22
DATE:	1/18/23	1/19/23	1/18/23	1/19/23	

Meter	ID
pH	PH 21
Conductivity	C 2
DO	DM 4
Temp.	T148

Tests are maintained at 25 ± 1 ° C / Incubator ID: BIO / Therm. ID: 120554  
 Samples stored in fridge at 0-6 ° C / Fridge ID: R6 / Therm. ID: T123  
 Samples warmed in waterbath then maintained in Bio2 until use / Waterbath Therm. ID: T124  
 Bio2 Therm. ID: T113  
**Comments / Observations:**



48 HOUR SURVIVAL DATA SHEET (5 replicates)

SAMPLE ID: Oscocla  
 REPORT #: 23-018-0394  
 TEST START - DATE/TIME: 1/18/23 1538 ANALYST: IM  
 TEST END - DATE/TIME: 1/20/23 1552 ANALYST: IM  
 TEST TYPE: RENEWAL

CONC. (% EFF)	REP NO.	NO. OF SURVIVORS		
		HOUR		
		0	24	48
CONTROL	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	<del>8</del> 7	<del>8</del> 7	8
RECEIVING STREAM	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	7	7	7
0.07	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.1	A	8	8	8
	B	<del>8</del> 7	7	7
	C	8	8	8
	D	8	8	7
	E	8	8	8
0.13	A	<del>8</del> 7	7	7
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.17	A	8	8	8
	B	8	8	7
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.23	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
ANALYST:		IM	IM	IM
DATE:		1/18/23	1/19/23	1/20/23

TEST ORGANISM: Daphnia pulex  
 ORGANISM RN: 23-REAG-0011

WAYPOINT ANALYTICAL, LLC.  
 TEST TRACEABILITY RECORD  
48 HOUR DAPHNIA PULEX

SAMPLE ID: Osceola REPORT # 23-018-0394

DATE START: 1/18/23 DATE END: 1/20/23

DAPHNIA PULEX REFERENCE # : 23-REAG-0011

REFERENCE NUMBERS

PARAMETER	DATE	INITIALS	TEST DAY	CONTROL WATER	ALGAE	YCT
ACUTE	<u>1/18/23</u>	<u>Im</u>	0	<u>23-REAG-0371</u>	<u>23-REAG-0222</u>	<u>23-REAG-0223</u>
	<u>1/19/23</u>	<u>UR</u>	24 HRS	<u>23-REAG-0387</u>	<u>23-REAG-0222</u>	<u>23-REAG-0223</u>

TEST DAY	SAMPLE LAB ID:	RECEIVING STREAM LAB ID:
0	<u>L94783</u>	<u>L94785</u>
24 HRS	<u>L94784</u>	<u>L94785</u>

COMMENTS: Organisms are fed 0.15 mL Algae and YCT while holding prior to test set up.  
 YCT is filtered with 60-micron mesh to removed additional debris  
 Test conducted at 25 ± 1°C Incubator ID: BIO / Thermometer ID: 120554

ANALYST COMMENTS:

Waypoint Analytical, LLC.

48 HOUR SURVIVAL DATA SHEET (5 replicates)

SAMPLE ID: Osceola  
 REPORT #: 23-018-0394  
 TEST START - DATE/TIME: 1/18/23 15:20 ANALYST: IM  
 TEST END - DATE/TIME: 1/20/23 1558 ANALYST: IM  
 TEST TYPE: RENEWAL

CONC. (% EFF)	REP NO.	NO. OF SURVIVORS		
		HOUR		
		0	24	48
CONTROL	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
RECEIVING STREAM	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	7
0.07	A	8	8	6
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.1	A	8	8	8
	B	8 <sup>u</sup> 7	7	7
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.13	A	8 <sup>u</sup> 7	7	7
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.17	A	8	8	8
	B	8	8	8
	C	8	8	8
	D	8	8	8
	E	8	8	8
0.23	A	8	8	8
	B	8	8	8
	C	8	6	8
	D	8	8	8
	E	8	8	8
ANALYST:		IM	UR	IM
DATE:		1/18/23	1/19/23	1/20/23

TEST ORGANISM: Fathead minnow  
 ORGANISM RN: 23-REAG- 0395

WAYPOINT ANALYTICAL, LLC.  
 TEST TRACEABILITY RECORD  
48 HOUR FATHEAD MINNOW

SAMPLE ID: Osceola REPORT # 23-018-0394

DATE START: 1/18/23 DATE END: 1/20/23

FATHEAD MINNOW REFERENCE # 23-REAG-0395

REFERENCE NUMBERS

PARAMETER	DATE	INITIALS	TEST DAY	CONTROL WATER	SAMPLE LAB ID:	RECEIVING STREAM:
ACUTE	1/18/23	lm	0	23-REAG-0371	L94783	L94785
	1/19/23	UR	24 HRS	23-REAG-0387	L94784	L94785

(if applicable)

COMMENTS: Fathead minnows are fed 0.15 mL Artemia brine shrimp x2 daily while holding prior to test set up.  
 Test conducted at 25 ± 1°C Incubator ID: BIO / Thermometer ID: 120554

ANALYST COMMENTS: