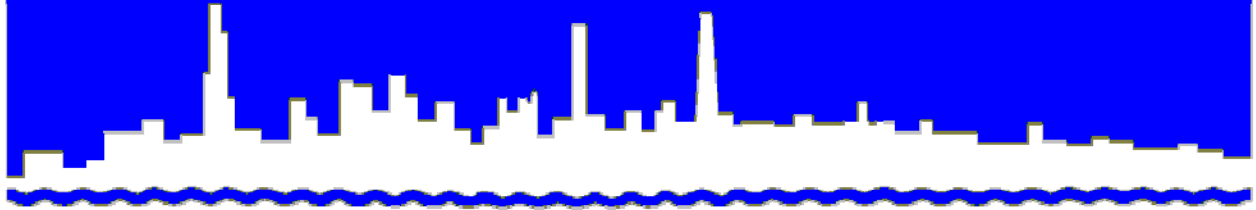


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 21-36

***RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia*
AND *Pimephales promelas* ON A JULY 2021 EFFLUENT SAMPLE
FROM THE TERRENCE J. O'BRIEN WATER RECLAMATION PLANT
OF THE METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO***

September 2021

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 (312) 751-5600

RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON A JULY 2021 EFFLUENT SAMPLE FROM THE TERRENCE J. O'BRIEN WATER RECLAMATION PLANT OF THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

By

**EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031**

**Monitoring and Research Department
Edward W. Podczerwinski, Director**

September 2021

Protecting Our Water Environment

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Edward W. Podczewinski, P.E.
Director of Monitoring and Research

September 7, 2021

Illinois Environmental Protection Agency
Compliance Assurance Section CAS # 19
1021 North Grand Avenue
P.O. Box 19276
Springfield, IL 62794-9276

Subject: Biomonitoring Report for 2021 – Acute Toxicity Test Results for the O’Brien Water Reclamation Plant, National Pollutant Discharge Elimination System Permit Number IL0028088

The subject Biomonitoring Report including Acute Whole Effluent Toxicity test results for *Pimephales promelas* and *Ceriodaphnia dubia* is submitted in compliance with National Pollutant Discharge Elimination System Permit Number IL0028088, Special Condition 9. The report covers the monitoring done for samples collected in the twelfth month before the expiration of the permit.

The subject report prepared by EA Engineering, Science, and Technology, Inc., PBC includes copies of all bench sheets, chain-of-custody forms, sample receipt, preparation forms, summary of final results and test information, and quality assurance record.

If you have any questions concerning this report, please contact Mr. Thomas Minarik, Principal Environmental Scientist, at (708) 588-4223.

Very truly yours,



Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:TM:NK:mb
Enclosures
cc: E. Podczewinski/J. Murray
A. Poonsapaya/H. Zhang
T. Minarik/N. Kollias
Via electronic mail



RESULTS OF ACUTE TOXICITY TESTING WITH
Ceriodaphnia dubia AND *Pimephales promelas*
ON A JULY 2021 EFFLUENT SAMPLE FROM THE
TERRENCE J. O'BRIEN WATER RECLAMATION PLANT OF THE
METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

Prepared for:

Metropolitan Water Reclamation District of Greater Chicago
6001 W. Pershing Road
Cicero, Illinois 60804

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions, please contact Michael Chanov
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

*This report shall not be reproduced, except in full, without written approval of
EA Engineering, Science, and Technology, Inc., PBC*

This report contains 8 pages plus 2 attachments

A handwritten signature in black ink, appearing to read 'Michael K. Chanov II', is positioned above a horizontal line.

Michael K. Chanov II
Laboratory Director

31 August 2021

Date

EA Project Number 70019.TOX



EA Report Number 8595

INTRODUCTION

At the request of Metropolitan Water Reclamation District (MWRD), EA Engineering, Science, and Technology performed acute toxicity testing on a composite sample of Outfall 001 final effluent from MWRD's O'Brien Water Reclamation Plant in Skokie, Illinois. The effluent composite sample was collected on 12-13 July 2021. The test organisms, *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow), were exposed to 100, 50, 25, 12.5 and 6.25 percent effluent, and a laboratory water control. The objective of this study was to assess the acute lethality of the effluent sample to the test species, expressed as a 48-hour (*C. dubia*), or 96-hour (*P. promelas*) median lethal concentration (LC50). This toxicity testing was conducted under the Section 9 biomonitoring requirements of Metropolitan Water Reclamation District's discharge permit number IL0028088.

This toxicity testing was conducted following EA's standard operating procedures (EA 2018) which are in accordance with US EPA guidance (2002). The results of the acute toxicity tests were analyzed using the ToxCalc statistical software package (Version 5.0, Tidepool Scientific Software) and followed US EPA guidance (2002). Summaries of sample and test information are presented on pages 5-6 for *C. dubia* and on pages 7-8 for *P. promelas*. Copies of raw data sheets and statistics are included in Attachment I. The Report Quality Assurance Record is included as Attachment II.

SUMMARY OF RESULTS

The results of the acute toxicity tests indicated that the 12-13 July 2021 Outfall 001 final effluent sample was not acutely toxic to *Ceriodaphnia dubia* or *Pimephales promelas*. The results of these toxicity tests comply with current NELAC standards.

The results of the *C. dubia* acute toxicity test are presented on page 6. After 48 hours, there was 100 percent survival in all of the effluent concentrations and 100 percent survival in the dilution water control. The 48-hour *C. dubia* LC50 for this test was >100 percent effluent (<1.0 TU_a). In the *P. promelas* acute toxicity test (page 8), at the end of 96 hours there was a minimum of 90 percent survival in all of the effluent concentrations. The laboratory control had 100 percent survival. The resulting 96-hour LC50 for *P. promelas* was >100 percent effluent (<1.0 TU_a).

In conformance with EA's quality assurance/quality control program, monthly reference toxicant tests using sodium chloride (NaCl) and potassium chloride (KCl) were performed on the in-house cultured test species. The results of the *C. dubia* reference toxicant test was acceptable, with a 48-hour LC50 of 1,847 mg/L NaCl, and acceptable control chart limits of 1,632-2,268 mg/L NaCl. The results of the *P. promelas* reference toxicant test was acceptable, with a 48-hour LC50 of 936 mg/L KCl, and acceptable control chart limits of 563-1,237 mg/L KCl.

REFERENCES

- EA. 2018. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., PBC, Hunt Valley, Maryland.
- US EPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

SUMMARY OF SAMPLE/TEST INFORMATION

Test: ***Ceriodaphnia dubia* 48-hour static acute toxicity test**

Test Procedure: **EA Protocol CD-AC-05**

Acute assay with water flea (*Ceriodaphnia dubia*)

Client Name: **Metropolitan Water Reclamation District (MWRD)**

Permit Number: **IL0028088**

Receiving Water: **North Shore Channel**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-423**

Collection Time and Date: 0600, 12 July 2021 to 0600, 13 July 2021

Receipt Time and Date: 0926, 14 July 2021

Dilution Water Description: **Moderately hard synthetic freshwater**

EA Test Number: **TN-21-400**

Test Initiation Time and Date: 1145, 14 July 2021

Test Completion Time and Date: 1118, 16 July 2021

Number of Replicates: **4**

Number of Organisms Per Replicate: **5**

Test Chamber: **30 ml cup**

Volume per Test Chamber: **15 ml**

Feeding: **None**

Organism Lot Information

Lot Number: N/A

Source: EA's Culture Facility (Hunt Valley, Maryland)

Age: <24 hours old

Reference Toxicant Test Information

Reference Toxicant: Sodium chloride (NaCl)

Reference Toxicant Information: Lab Chem Lot#F214-24 (Received 9/7/16)

EA Test Number: RT-21-118

Test Date and Time: 1406, 28 July 2021 to 1346, 30 July 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,847 mg/L NaCl

Laboratory control chart acceptability range for 48-hour LC50: 1,632-2,268 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: *Ceriodaphnia dubia* (water flea)
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 12-13 July 2021
 EA Test Number: TN-21-400

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>
Lab Control	100
6.25	100
12.5	100
25	100
50	100
100	100

48-Hour LC50 (percent effluent): **>100 (TU_a <1.0)**

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.0 – 25.5
pH:	7.6 – 8.2
Dissolved Oxygen (mg/L):	8.0 – 9.0
Conductivity (µS/cm):	321 – 967

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT1-423)</u>
Temperature (°C):	1.2
pH:	7.7
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	122
Hardness (mg/L as CaCO ₃):	192
Conductivity (µS/cm):	891

SUMMARY OF SAMPLE/TEST INFORMATION

Test: ***Pimephales promelas* 96-hour static renewal acute toxicity test**

Test Procedure: **EA Protocol FH-AC-05**

Acute assay with fathead minnows (*Pimephales promelas*)

Client Name: **Metropolitan Water Reclamation District (MWRD)**

Permit Number: **IL0028088**

Receiving Water: **North Shore Channel**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-423**

Collection Time and Date: 0600, 12 July 2021 to 0600, 13 July 2021

Receipt Time and Date: 0926, 14 July 2021

Dilution Water Description: **Moderately hard synthetic freshwater**

EA Test Number: **TN-21-401**

Test Initiation Time and Date: 1140, 14 July 2021

Test Completion Time and Date: 1126, 18 July 2021

Number of Replicates: **2**

Number of Organisms Per Replicate: **10**

Test Chamber: **1-L beaker**

Volume per Test Chamber: **250 ml**

Feeding: **0.2 mL *Artemia* nauplii at 48 hours**

Organism Lot Information

Lot Number: FH1-7/9-10

Source: EA's Culture Facility (Hunt Valley, Maryland)

Age: 4-5 days old (hatched within a 24-hour period)

Reference Toxicant Test Information

Reference Toxicant: Potassium chloride (KCl)

Reference Toxicant Information: GFS Lot #19430079 (Received 10/20/20)

EA Test Number: RT-21-120

Test Date and Time: 1419, 28 July 2021 to 1356, 30 July 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 936 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 563-1,237 mg/L KCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: ***Pimephales promelas* (fathead minnow)**
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 12-13 July 2021
 EA Test Number: TN-21-401

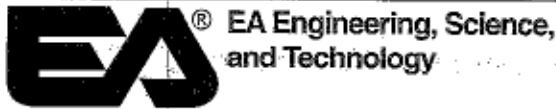
<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	100
12.5	100	100
25	100	100
50	100	100
100	90	90

96-Hour LC50 (percent effluent): **>100 (TU_a <1.0)**

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.6 – 25.6
pH:	7.6 – 8.2
Dissolved Oxygen (mg/L):	7.2 – 8.7
Conductivity (µS/cm):	321 – 912

ATTACHMENT I

Data Sheets and Statistical Analysis
(18 pages)



EA Ecotoxicology Laboratory
 231 Schilling Circle
 Hunt Valley, Maryland 21031
 Telephone: 410-584-7000
 Fax: 410-584-1057



Sample Shipped By: (circle)
 Fed. Ex. UPS Other: _____
 Tracking #: 1Z2744748491626317

Client: MWRDGC Project No.: 4652-126-1
 NPDES Number: IL0028088 Client Purchase Order Number: 311191
 City/State Collected: Skokie, IL

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection		Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
			Start Date/Time	End Date/Time		
AT1-423		✓	7/12/21 0600	7/13/21 0600	OWRP Final Effluent outfall #001	1 gallon

Sampled By: <u>Paula Brinkman Lane</u>	Date/Time <u>07/13/21 0853</u>	Received By:	Date/Time
Sampler's Printed Name: <u>Paula Brinkman Lane</u>	Title: <u>Senior Env. Res. Tech</u>	Relinquished By:	Date/Time
Relinquished By: <u>Paula Brinkman Lane</u>	Date/Time <u>7/13/21 0900</u>	Received By Laboratory: <u>Senior Env. Res. Tech</u>	Date/Time <u>7/14/2021 0926</u>

Was Sample Chilled During Collection? Yes / No _____ Comments: _____

Sample Collection Parameters
 Visual Description:
 Temperature (°C): 20.3
 pH: 7.36
 TRC (mg/L): 0
 Other:



**SAMPLE CHECK-IN
FOR TESTING**

Client: MWRD

EA Accession Number: ATI-423

Parameter	Acceptable Range	Measurement*	Meter	Date	Time	Initials
Temperature (°C)	≤4	1.2	T-23	7/14/21	0926	JR
Is ice present?	--	yes	N/A	↓	↓	↓
pH	6.0-9.0	7.7	680	↓	↓	↓
TRC (mg/L)	<0.01	<0.01	AT-01	↓	↓	↓
Visual Description	--	Slight yellow	N/A	↓	↓	↓

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✓)	Meter	Date	Time	Initials
Ammonia (preserve aliquot)	--		N/A			

Parameter	Acceptable Range	Measurement*	Meter	Date	Time	Initials
Dissolved Oxygen (mg/L)	--					
Salinity (ppt)	--					



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-400

TEST ORGANISM INFORMATION

Common Name: Water flea Adults Isolated (Time, Date): 7/13/21 1602
 Scientific Name: C. dubia Neonates Pulled & Fed (Time, Date): 7/14/21 0830
 Lot Number: N/A Acclimation: <24hrs Age: <24 hrs
 Source: EA Culture Water (T/S): 24.7 °C 0 ppt

TEST INITIATION

<u>Date</u>	<u>Time</u>	<u>Initials</u>	<u>Activity</u>
<u>7/14/21</u>	<u>1108</u>	<u>CAF</u>	Dilutions Made
↓	<u>1123</u>	↓	Test Vessels Filled
	<u>1145</u>		Organisms Transferred
	<u>1150</u>	<u>TR</u>	Head Counts

TEST SET-UP

Sample Number: AT1-423

Dilution Number: LD1-422

<u>Test Concentration</u>	<u>Volume Test Material</u>	<u>Final Volume</u>
Control	0 ml	200 ml ↓
6.25%	12.5 ml	
12.5%	25 ml	
25%	50 ml	
50%	100 ml	
100%	200 ml	



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
 Client: MWRD
 QC Test Number: TN-21-400
 Test Material: Effluent
 Accession Number: AT-423
 Dilution Water: Mod Hard
 Accession Number: LD-422

TEST ORGANISM
 Common Name: Water flea
 Scientific Name: C. dubia
 TARGET VALUES
 Temp: 25±1 °C DO: ≥4.0 mg/L
 pH: 6.0-9.0 Salinity: 0 ppt
 Photoperiod: 16L, 8d Light Intensity: 50-100 fc
 Beginning Date: 7/14/21 Time: 1145
 Ending Date: 7/16/21 Time: 1118
 TEST TYPE: Static Flowthrough
 Renewal / Non-renewal
 Test Container: 30 ml cup
 Test Volume: 15 ml
 Test Duration: 48 hrs

Concentration	Rep	Number of Live Organisms				Temperature (°C)				pH				Dissolved Oxygen (mg/L)				Conductivity (µS/cm)						
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
Control	A	5	5	5	5	5	25.5	24.0	25.0		7.9	7.8	8.0		8.7	9.0	8.0		331	346	358			
	B	5	5	5	5	5																		
	C	5	5	5	5	5																		
	D	5	5	5	5	5																		
6.25%	A	5	5	5	5	5	25.4	24.0	25.3		7.8	7.8	8.1		8.6	8.9	8.1		355	372	372			
	B	5	5	5	5	5																		
	C	5	5	5	5	5																		
	D	5	5	5	5	5																		
12.5%	A	5	5	5	5	5	25.4	24.8	25.5		7.8	7.8	8.1		8.5	8.5	8.1		289	460	407			
	B	5	5	5	5	5																		
	C	5	5	5	5	5																		
	D	5	5	5	5	5																		
Meter Number		080	1080	681																				
Time	1150	1114	1118			080	1080	681		080	680	681		080	680	681		080	680	681				
Initials	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	JR	

(b) UFB 7/14/21



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX
 Client: MWRD
 QC Test Number: TN-21-400
 Test Material: Effluent
 Accession Number: AT1-423
 Dilution Water: Mod Hard
 Accession Number: LD1-422

TEST ORGANISM
 Common Name: Water flea
 Scientific Name: C. dubia
 TARGET VALUES
 Temp: 25±1 °C DO: >4.0 mg/L
 pH: 6.0-9.0 Salinity: 0 ppt
 Photoperiod: 16L, 8d Light Intensity: 50-100 fc
 Beginning Date: 7/14/21 Time: 1145
 Ending Date: 7/16/21 Time: 1118
 TEST TYPE: Static Flowthrough
 Renewal / Non-renewal
 Test Container: 30 ml cup
 Test Volume: 15 ml
 Test Duration: 48 hrs

Concentration	Rep	Number of Live Organisms				Temperature (°C)				pH				Dissolved Oxygen (mg/L)				Conductivity (µS/cm)						
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96			
25%	A	5	5	5	5	24.7	24.9	25.5			7.8	7.7	8.1			8.4	8.1			408	488	486		
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
50%	A	5	5	5	5	25.1	24.7	25.3			7.7	7.7	8.2			8.3	8.4	8.1		611	636	635		
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
100%	A	5	5	5	5	25.1	24.6	25.3			7.4	7.6	8.2			8.3	8.4	8.0		962	955	967		
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
Meter Number																								
Time		1150	1114	1118		1080	6:30	6:31		6:00	6:30	6:31		6:00	6:30	6:31		6:00	6:30	6:31		6:00	6:30	6:31
Initials		TB	AS	AT		1113	1102	108A		1113	1102	108A		1113	1102	108A		1113	1102	108A		1113	1102	108A
						1150	JA	AT		1150	JA	AT		1150	JA	AT		1150	JA	AT		1150	JA	AT



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-400

5	4	1	3	6	2
1	5	3	2	4	6
6	2	4	1	5	3
4	1	2	6	3	5



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-400

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-400

Day	Testing Location	Date	Time	Initials
0	54	7/14/21	1155	P
1	54	7/15/21	1115	JA
2	54	7/16/21	1030	BJ
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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28				
29				
30				



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-400

Correction Explanations

- (a) Technician Error-Mathematical
- (b) Technician Error-Manual Data Recording
- (c) Technician Error-Head Count Observation
- (d) Technician Error-Overwrite
- (e) Technician Error-Missing Data
- (f) Technician Error-Lost Organism
- (g) Technician Error-Transcription Error
- (h) Technician Error-Other:
- (i) Meter Malfunction



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-401

TEST ORGANISM INFORMATION

Common Name: Fathead minnow Adults Isolated (Time, Date): _____
 Scientific Name: P. promelas Neonates Pulled & Fed (Time, Date): 4-5
 Lot Number: FH1-719-10 Acclimation: <24 hrs Age: 28 days
 Source: EA Culture Water (T/S): 23.9 °C 0 ppt

⑤ ASB 7/28/21

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
7/14/21 ↓	1108	UAD	Dilutions Made	Control	0 ml	500 ml ↓
	1123	↓	Test Vessels Filled	6.25%	31.25 ml	
				12.5%	62.5 ml	
	1140	TP	Organisms Transferred	25%	125 ml	
				50%	250 ml	
1146	ASB	Head Counts	100%	500 ml		

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING			
Day	Date	Time	Initials	Sample / Diluent	Food: <i>Artemia</i>			
					Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	7/14/21	1108	UAD	ATL-423 DL-422	0			
1					1			
2	7/16/21	1007	ASB	ATL-423 DL-422	2		UAD ATL 0835 3 drops	
3					3			
4					4			
5					5			
6					6			



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX TEST ORGANISM: 7/14/21 Beginning Date: 7/14/21 Time: 1140
 Client: MWRD Common Name: Fathead minnow Ending Date: 7/18/21 Time: 1126
 QC Test Number: TN-21-401 Scientific Name: *P. promelas* TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal Non-renewal
 Accession Number: AT-423 Temp: 25±1 °C DO: >4.0 mg/L Test Container: 1 L Beaker
 Dilution Water: Mod Hard pH: 6.0 - 9.0 Salinity: 0 ppt Test Volume: 250 ml
 Accession Number: U01-422 Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm)									
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96					
Control	A	10	10	10	10	10	25.5	7.9	8.0	8.3	8.7	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3				
	B	10	10	10	10	10	24.8	7.9	8.0	8.3	8.7	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3					
6.25%	A	10	10	10	10	10	25.4	7.9	8.0	8.3	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6					
	B	10	10	10	10	10	25.2	7.9	8.0	8.3	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6					
12.5%	A	10	10	10	10	10	25.4	7.9	8.0	8.3	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5					
	B	10	10	10	10	10	25.4	7.9	8.0	8.3	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5					
25%	A	10	10	10	10	10	24.7	7.9	8.0	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4					
	B	10	10	10	10	10	25.4	7.9	8.0	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4					
50%	A	10	10	10	10	10	25.1	7.7	8.1	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3					
	B	10	10	10	10	10	25.4	7.7	8.1	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3					
100%	A	10	10	9	9	9	25.1	7.4	8.1	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3					
	B	10	10	9	9	9	25.2	7.4	8.1	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3					
Meter Number		980															681														
Time		1146	1109	1114	1050	1020	1113	AD								680	681	680	681	680	681	680	681	680	681	680	681				
Initials		AT	JA	AT	TP	JK	AD	AD								AD	AT	AD	AT	AD	AT	AD	AT	AD	AT	AD	AT	AD			



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019_TOX TEST ORGANISM: 7/14/24 Beginning Date: 7/14/24 Time: 1146
 Client: MWRD Common Name: Fathead minnow Ending Date: 7/18/24 Time: 1126
 QC Test Number: TN-21-401 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal Non-renewal
 Accession Number: AT1-423 Temp: 25±1 °C DO: >4.0 mg/L Test Container: 1 L Beaker
 Dilution Water: Mod Hard pH: 6.0 - 9.0 Salinity: 0 ppt Test Volume: 250 ml
 Accession Number: U01-422 Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms	Temperature (°C)			pH			Dissolved Oxygen (mg/L)			Conductivity (µS/cm)						
			24	48	72	96	24	48	72	96	24	48	72	96				
Control	A																	
	B																	
6.25%	A		24.6	24.9	25.5	25.9	7.9	7.9	7.8	8.0	8.5	7.7	7.2	7.8	328	325	335	335
	B																	
12.5%	A		24.7	25.5	25.6	25.9	7.8	7.9	7.7	8.1	8.5	7.6	7.3	7.7	321	359	366	369
	B																	
25%	A		24.6	25.6	25.6	25.9	7.8	7.9	7.7	8.0	8.4	7.6	7.5	7.8	397	392	400	377
	B																	
50%	A		24.8	25.9	25.5	25.5	7.8	8.0	7.7	8.0	8.2	7.6	7.5	7.6	470	465	475	471
	B																	
100%	A		25.1	25.9	25.6	25.6	7.8	8.1	7.6	8.0	8.2	7.6	7.5	7.5	617	610	622	618
	B																	
Meter Number			680	681	680	680	680	681	680	680	680	681	680	680	680	681	680	680
Time			1107	0830	1013	0900	1107	0830	1013	0900	1107	0830	1013	0900	1107	0830	1013	0900
Initials			JA	AT	TC	AT	JA	AT	TC	AT	JA	AT	TC	AT	JA	AT	TC	AT



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-401

5	4	1	3	6	2
1	5	3	2	4	6



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-401

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-401

Day	Testing Location	Date	Time	Initials
0	54	7/14/21	1145	JK
1	54	7/15/21	1109	JK
2	58 54	7/16/21	0827	AK
3	54	7/17/21	1615	JK
4	54	7/18/21	0900	JK
5				
6				
7				
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29				
30				

JK 7/16/21



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-401

Correction Explanations

- (a) Technician Error-Mathematical
- (b) Technician Error-Manual Data Recording
- (c) Technician Error-Head Count Observation
- (d) Technician Error-Overwrite
- (e) Technician Error-Missing Data
- (f) Technician Error-Lost Organism
- (g) Technician Error-Transcription Error
- (h) Technician Error-Other:
- (i) Meter Malfunction



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-400,401

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

Date	Sample #	ON AIR				OFF AIR			
		Initial DO (mg/L)	Time	Meter	Initials	Final DO (mg/L)	Time	Meter	Initials
7/14/2021	ATI-423	12.2	0956	681	JR	8.5	1006	681	JR
7/16/21	ATI-423	9.7	0756	680	TD	8.1	0806	680	TD

ATTACHMENT II

Report Quality Assurance Record
(2 pages)



REPORT QUALITY ASSURANCE RECORD

Client: MWRD Project Number: 70019.TOX
 Author: Rachael Brooks EA Report Number: 8595

REPORT CHECKLIST

<u>QA/QC ITEM</u>	<u>REVIEWER</u>	<u>DATE</u>
1. Samples collected, transported, and received according to study plan requirements.	<u>[Signature]</u>	<u>7/19/21</u>
2. Samples prepared and processed according to study plan requirements.	<u>[Signature]</u>	<u>7/19/21</u>
3. Data collected using calibrated instruments and equipment.	<u>[Signature]</u>	<u>7/19/21</u>
4. Calculations checked: - Hand calculations checked - Documented and verified statistical procedure used.	<u>[Signature]</u>	<u>7/19/21</u>
	<u>[Signature]</u>	<u>7/19/21</u>
5. Data input/statistical analyses complete and correct.	<u>[Signature]</u>	<u>7/27/2021</u>
6. Reported results and facts checked against original sources.	<u>[Signature]</u>	<u>7/27/2021</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>[Signature]</u>	<u>7/27/2021</u>
8. Results reviewed for compliance with study plan requirements.	<u>[Signature]</u>	<u>7/19/21</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>[Signature]</u>	<u>7/30/21</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved.	<u>[Signature]</u>	<u>7/20/21</u>
	PROJECT MANAGER	DATE
	<u>[Signature]</u>	<u>7/27/2021</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>7/20/21</u>
	SENIOR TECHNICAL OFFICER	DATE