Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 21-08

RESULTS OF ACUTE TOXICITY TESTING WITH Ceriodaphnia dubia AND Pimephales promelas ON A JANUARY 2021 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

February 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 JANUARY 2021 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

By

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

Monitoring and Research Department
Edward W. Podczerwinski, Director

February 2021

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

CECIL LUE-HING RESEARCH AND DEVELOPMENT COMPLEX
6001 WEST PERSHING ROAD CICERO, ILLINOIS 60804-4112

February 26, 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 eighteenth 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

Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:TM:NK:lf
Enclosures
cc: E. Podczerwinski/J. Murray
A. Poonsapaya/H. Zhang
T. Minarik/N. Kollias

RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON A JANUARY 2021 EFFLUENT SAMPLE FROM 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 contains 8 pages plus 2 attachments

Michael K. Chanov II
Laboratory Director

19 February 2021
Date

EA Project Number 70019.TOX

ACCREDITED IN ACCORDANCE WITH nelac ID# E87550

EA Report Number 8478

INTRODUCTION

At the request of Metropolitan Water Reclamation District (MWRD), EA Engineering, Science, and Technology performed acute toxicity testing on composite samples of Outfall 001 final effluent from MWRD's O'Brien Water Reclamation Plant in Skokie, Illinois. The effluent composite sample was collected on 19-20 January 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 10 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 19-20 January 2021 Outfall 001 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 95 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 85 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 were acceptable, with a 48-hour LC50 of 1,980 mg/L NaCl, and acceptable control chart limits of 1,677-2,150 mg/L NaCl. The results of the *P. promelas* reference toxicant test were acceptable, with a 48-hour LC50 of 919 mg/L KCl, and acceptable control chart limits of 629-1,257 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: AT1-026

Collection Time and Date: 0600, 19 January 2021 to 0600, 20 January 2021
Receipt Time and Date: 1025, 21 January 2021

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

EA Test Number: **TN-21-033**

Test Initiation Time and Date: 1153, 21 January 2021
Test Completion Time and Date: 1156, 23 January 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-21-011
Test Date and Time: 1135, 7 January 2021 to 1123, 9 January 2021
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 1,980 mg/L NaCl
Laboratory control chart acceptability range for 48-hour LC50: 1,677-2,150 mg/L NaCl

Test Species:	***Ceriodaphnia dubia* (water flea)**
Sample Description:	Outfall 001 Final Effluent – MWRD
Sample Date:	19-20 January 2021
EA Test Number:	TN-21-033

Test Concentration (percent effluent)	48-Hour Survival (percent)
Lab Control	95
6.25	100
12.5	100
25	100
50	100
100	100

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

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.0 – 25.7
pH:	7.6 – 8.5
Dissolved Oxygen (mg/L):	7.9 – 8.7
Conductivity (µS/cm):	341 – 1,165

Water Quality Parameters Measured on Sample Upon Receipt	Outfall 001 (AT1-026)
Temperature (°C):	0.6
pH:	8.1
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as $CaCO_3$):	150
Hardness (mg/L as $CaCO_3$):	200
Conductivity (µS/cm):	1,080

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: AT1-026

Collection Time and Date: 0600, 19 January 2021 to 0600, 20 January 2021
Receipt Time and Date: 1025, 21 January 2021

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

EA Test Number: **TN-21-034**

Test Initiation Time and Date: 1303, 21 January 2021
Test Completion Time and Date: 1204, 25 January 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: FH1-1/18-19
Source: EA's Culture Facility (Hunt Valley, Maryland)
Age: 2-3 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-21-013
Test Date and Time: 1519, 7 January 2021 to 1430, 9 January 2021
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 919 mg/L KCl
Laboratory control chart acceptability range for 48-hour LC50: 629-1,257 mg/L KCl

Test Species: ***Pimephales promelas*** **(fathead minnow)**

Sample Description: Outfall 001 Final Effluent – MWRD

Sample Date: 19-20 January 2021

EA Test Number: TN-21-034

Test Concentration (percent effluent)	48-Hour Survival (percent)	96-Hour Survival (percent)
Lab Control	100	100
6.25	100	100
12.5	100	100
25	100	95
50	100	100
100	90	85

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

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.3 – 25.8
pH:	7.6 – 8.5
Dissolved Oxygen (mg/L):	7.4 – 8.5
Conductivity (µS/cm):	332 – 1,064

ATTACHMENT I

Data Sheets
(18 pages)

Chain-of-Custody Record

EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory
231 Schilling Circle
[illegible] Valley, Maryland 21031
[illegible]ephone: 410-584-7000
Fax: 410-584-1057

Client: MWRDGC Project No.: 4682 - 126 - 1

NPDES Number: IL 0028088 Client Purchase Order Number: 311991

City/State Collected: Skokie, IL

Sample Shipped By: (circle)
Fed. Ex. (UPS) Other: _____
Tracking #: ~~1Z2744740390509106~~
1Z 274 474 01 9887 4586

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection Start Date/Time	Collection End Date/Time	Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
ATI-0236		✓	1/19/21 0600	1/20/21 0600	OBrien WRP Final Effluent outfall # 001	1 gallon

Sampled By:	Date/Time	Received By:	Date/Time
[signature]	1/20/21 0900	[signature]	1/21/21 1025
Sampler's Printed Name: Nick Kollias	Title: Aquatic Biologist	Relinquished By:	Date/Time
Relinquished By: [signature]	Date/Time	Received By Laboratory	Date/Time

Was Sample Chilled During Collection? (Yes) / No

Comments:

Sample Collection Parameters

Visual Description: Clear, Green
Temperature (°C): 7.4
pH: 7.17
TRC (mg/L): 0
Cl:

White-Report Production
EA 0534 F&B Rev.11/16

Yellow-Laboratory

Pink-Client/Sampler

SAMPLE CHECK-IN
FOR TESTING

Client: MWRD

EA Accession Number: ATI-0246

Parameter	Acceptable Range	Measurement *	Meter	Date	Time	Initials
Temperature (°C)	≤4	0.6	T-22	1/21/21	1031	JA/LAO
Is ice present?	---	Yes	N/A	↓	↓	↓
pH	6.0-9.0	8.1	679			
TRC (mg/L)	<0.01	<0.01	AT-01			
Visual Description	---	Yellowish tint	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**
Salinity (ppt)	--					

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-033

TEST ORGANISM INFORMATION

Common Name: Water flea

Scientific Name: *C. dubia*

Lot Number: N/A

Source: EA

Adults Isolated (Time, Date): 1630 1/20/21

Neonates Pulled & Fed (Time, Date): 1040 1/21/21

Acclimation: <24hrs Age: <24 hrs

Culture Water (T/S): 24.2 °C 0 ppt

TEST INITIATION

Date	Time	Initials	Activity
1/21/21	1108	LAD	Dilutions Made
	1153	LAD	Test Vessels Filled
	1204	AP	Organisms Transferred
			Head Counts

TEST SET-UP

Sample Number: ATI- 026

Dilution Number: 401 - 039

Test Concentration	Volume Test Material	Final Volume
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- 21-033
Test Material: Effluent
Accession Number: AT1-026
Dilution Water: Mod Hard
Accession Number: 401-039

TEST ORGANISM
Common Name: Water flea
Scientific Name: *C.dubia*

TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 *l*, 8 *d*
DO: ≥4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 1/21/21 Time: 1153
Ending Date: 1/23/21 Time: 1156
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) Salinity (ppt)				
		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	5	5	5			25.7	24.0	24.2			7.7	8.3	8.5			8.7	8.4	8.6			341	463	405		
	B	5	4	4																						
	C	5	5	5																						
	D	5	5	5																						
6.25%	A	5	5	5			25.4	24.0	24.7			7.7	8.3	8.5			8.3	8.2	8.6			385	439	413		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
12.5%	A	5	5	5			25.3	24.2	25.3			7.7	8.2	8.5			8.2	8.2	8.6			429	476	453		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							681	679	680			681	679	680			681	679	680			681	679	680		
Time		1204	1142	1156			1127	1151	1015			1127	1151	105			1127	1151	1015			1127	1151	1015		
Initials		JAT	LAO				LAO	LAO	TP			LAO	LAO	TP			LAO	LAO	TP			LAO	LAO	TP		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 X
Magna/pulex: 2021.0
Fathead: 2000.0
Trout: 2019.0
Americamysis: 2007.0
Cyprinodon: 2004.0
Menidia: 2006.0
OTHER:

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
Client: MWRD
QC Test Number: TN- 21-033
Test Material: Effluent
Accession Number: AT1-026
Dilution Water: Mod Hard
Accession Number: 601-039

TEST ORGANISM
Common Name: Water flea
Scientific Name: *C.dubia*

TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 *l*, 8 *d*
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 11/21/21 Time: 1153
Ending Date: 11/23/21 Time: 1156
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) Salinity (ppt)				
		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
25%	A	5	5	5			25.2	24.5	25.4			7.7	8.2	8.4			8.2	8.0	8.6			513	568	545		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
50%	A	5	5	5			25.2	24.6	25.4			7.7	8.1	8.3			8.2	8.0	8.5			690	760	732		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
100%	A	5	5	5			25.2	24.6	25.2			7.6	8.0	8.3			8.2	7.9	8.4			1052	1165	1126		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							681	679	680			681	679	680			681	679	680			681	679	680		
Time		1204	1142	1150			1127	1151	1015			1127	1151	1015			1127	1151	1015			1127	1151	1015		
Initials		JK	LAD	M			LAD	LAD	TP			LAD	LAD	TP			LAD	LAD	TP			LAD	LAD	TP		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 X
Magna/pulex: 2021.0
Fathead: 2000.0
Trout: 2019.0
Americamysis: 2007.0
Cyprinodon: 2004.0
Menidia: 2006.0
OTHER:

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-033

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-033

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 - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-033

Day	Testing Location	Date	Time	Initials
0	17	1/21/21	1205	MT
1	17	1/22/21	1306	JR
2	17	1/23/21	1016	TO
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-033

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- 21-034

TEST ORGANISM INFORMATION

Common Name: Fathead minnow

Scientific Name: *P. promelas*

Lot Number: FHM - 1/18-19

Source: EA

Adults Isolated (Time, Date): _____

Neonates Pulled & Fed (Time, Date): (b) 1/20/21

Acclimation: <24 hrs Age: 23 ½ days

Culture Water (T/S): 25.9 °C 0 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
1/21/21	1115	LAD	Dilutions Made
			Test Vessels Filled
	1303	LAD	Organisms Transferred
	1510	TP	Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Control	0ml	500ml
6.25%	31.25ml	
12.5%	62.5ml	
25%	125ml	
50%	250ml	
100%	500ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	1/21/21	1115	LAD	ATI-026 / CDI-039
1				
2	112312.	1022	TP	ATI-026 / CDI-037
3				
4				
5				
6				

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			3drops 1615 TP
1			1607 LAD 3drops
2			3drops 1600 TP
3			3drops 1000 AT
4			
5			
6			

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
Client: MWRD
QC Test Number: TN- 21-034
Test Material: Effluent
Accession Number: ATI-026
Dilution Water: Mod Hard
Accession Number: LDI-039

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: *P. promelas*
TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 l, 8 d
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 1/21/21 Time: 1303
Ending Date: 1/25/21 Time: 1204
TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Test Container: 1 L Beaker
Test Volume: 250 ml
Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					(Conductivity (µS/cm)) Salinity (ppt)				
		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	24.9		24.4			7.8		8.5			8.5		8.4			345		332		
	B	10	10	10	10	10																				
6.25%	A	10	10	10	10	10	24.8		24.6			7.8		8.4			8.3		8.4			380		376		
	B	10	10	10	10	10																				
12.5%	A	10	10	10	10	10	24.8		24.7			7.8		8.4			8.2		8.3			437		420		
	B	10	10	10	10	10																				
25%	A	10	10	10	10	9	24.9		24.7			7.8		8.3			8.1		8.3			516		509		
	B	10	10	10	10	10																				
50%	A	10	10	10	10	10	24.9		24.6			7.7		8.3			8.1		8.3			708		693		
	B	10	10	10	10	10																				
100%	A	10	9	8	7	7	24.8		24.3			7.7		8.2			8.2		8.3			1104		1041		
	B	10	10	10	10	10																				
Meter Number							681		680			1081		680			681		680			681		680		
Time		1510	1257	1245	1207	1204	1263		1023			1263		1023			1263		1023			1203		1023		
Initials		TP	LHD	AM	AM	AM	LHD		TP			LHD		TP			LHD		TP			LHD		TP		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Fathead: 2000.0 X
Magna/mulex: 2021.0 Trout: 2019.0
Americamysis: 2007.0 Menidia: 2006.0
Cyprinodon: 2004.0 OTHER:

ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019.TOX
Client: MWRD
QC Test Number: TN- 21- 034
Test Material: Effluent
Accession Number: AT1-026
Dilution Water: Mod Hard
Accession Number: LD1-~~10~~039
LD 1/21/21

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: *P. promelas*

TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 *l*, 8 *d*
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 1/21/21 Time: 1303
Ending Date: 1/25/21 Time: 1004
TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Test Container: 1 L Beaker
Test Volume: 250 ml
Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms 0	24	48	72	96	Temperature (°C) 24	48	72	96	pH 24	48	72	96	Dissolved Oxygen (mg/L) 0	24	48	72	96	Conductivity (µS/cm) Salinity (ppt) 0	24	48	72	96
Control	A						25.3	24.5	24.3	25.5	7.7	8.4	8.1	8.1		7.7	8.3	8.3	7.8		353	357	349	352
	B																							
6.25%	A						25.3	25.2	25.0	25.5	7.6	8.3	8.0	7.9		7.7	7.9	8.1	7.8		393	393	386	388
	B																							
12.5%	A						25.5	25.4	25.5	25.6	7.6	8.2	7.9	7.9		7.6	8.0	8.0	7.8		439	435	432	431
	B																							
25%	A						25.4	25.7	25.0	25.8	7.6	8.1	7.9	7.8		7.6	7.6	8.3	7.8		526	519	524	516
	B																							
50%	A						25.5	25.7	25.4	25.3	7.7	8.6	7.8	7.7		7.6	7.7	8.0	7.8		716	713	707	708
	B																							
100%	A						25.4	25.8	25.3	25.6	7.8	8.0	7.8	7.7		7.4	7.5	8.0	7.6		1064	1049	1056	1051
	B																							
Meter Number							681	680	681	681	681	680	681	681		681	680	681	681		681	680	681	681
Time							1303	1026	1110	1055	1303	1026	1110	1055		1303	1026	1110	1055		1303	1026	1110	1055
Initials							LAD	TP	JR	AM	LAD	TP	JR	AM		LAD	TP	JR	AM		LAD	TP	JR	AM

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-034

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-034

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

TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-034

Day	Testing Location	Date	Time	Initials
0	17	1121121	1511	TP
1	17	1/22/21	1304	LAD
2	17	1/23/21	1027	TP
3	17	1/24/21	1207	AT
4	17	1/25/21	1058	AT
5				
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TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-034

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- 21-033, 034

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

		ON AIR			OFF AIR		
Date	Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
1-21-21	ATI- 026	10.3	1043	LMD	8.2	1053	LMD
1123121	ATI -026	9.1	0816	TP	8.2	0826	TP

ATTACHMENT II

Report Quality Assurance Record
(2 pages)

REPORT QUALITY ASSURANCE RECORD

Client: MWRD

Project Number: 70019.TOX

Author: Rachael Brooks

EA Report Number: 8478

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.		1/25/2021
2. Samples prepared and processed according to study plan requirements.		1/25/2021
3. Data collected using calibrated instruments and equipment.		1/25/2021
4. Calculations checked:		
- Hand calculations checked		1/25/2021
- Documented and verified statistical procedure used.		1/25/2021
5. Data input/statistical analyses complete and correct.	Jessa M Redlefsen	2/4/2021
6. Reported results and facts checked against original sources.	Jessa M Redlefsen	2/4/2021
7. Data presented in figures and tables correct and in agreement with text.	Jessa M Redlefsen	2/4/2021
8. Results reviewed for compliance with study plan requirements.		1/25/2021

	AUTHOR	DATE
9. Commentary reviewed and resolved.		2/10/2021

10. All study plan and quality assurance/control requirements have been met and the report is approved:

PROJECT MANAGER		2/9/2021 DATE
QUALITY CONTROL OFFICER	Jessa M Redlefsen	2/4/2021 DATE
SENIOR TECHNICAL OFFICER		2/9/2021 DATE