

Protecting Our Water Environment



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

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

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EA Engineering, Science, and Technology, Inc., PBC*

This report contains 8 pages plus 2 attachments

Michael K. Chanov II
Laboratory Director

19 February 2021

Date

EA Project Number 70019.TOX



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

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

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

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>
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)**

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
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

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT1-026)</u>
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

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

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

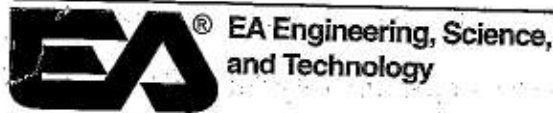
<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	100
12.5	100	100
25	100	95
50	100	100
100	90	85

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

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
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)



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



Sample Shipped By: (circle) UPS Other: _____
 Fed. Ex. _____
 Tracking #: ~~1Z2744740390509106~~
1Z2744740198874586

Client: MWRING Project No.: 4682-126-1
 NPDES Number: IL0028088 Client Purchase Order Number: 3111991
 City/State Collected: Stoke, 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		
<u>AT1-026</u>		<input checked="" type="checkbox"/>	<u>1/19/21 0600</u>	<u>1/20/21 0600</u>	<u>Obtain WSP End Effluent outfall # 001</u>	<u>1 gallon</u>

Sampled By: <u>Mr. Kelly</u>	Date/Time: <u>1/20/21 0900</u>	Received By: <u>Lisa Boyle</u>	Date/Time: <u>1/21/21 1025</u>
Sampler's Printed Name: <u>Nick Kollias</u>	Title: <u>Aquatic Biologist</u>	Relinquished By: _____	Date/Time: _____
Relinquished By: <u>Mr. Kelly</u>	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



**SAMPLE CHECK-IN
FOR TESTING**

Client: MWRD

EA Accession Number: ATI-026

Parameter	Acceptable Range	Measurement *	Meter	Date	Time	Initials
Temperature (°C)	≤4	0.6	T-22	6/21/21	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: <u>Water flea</u>	Adults Isolated (Time, Date): <u>1630 1/20/21</u>
Scientific Name: <u>C. dubia</u>	Neonates Pulled & Fed (Time, Date): <u>1040 1/21/21</u>
Lot Number: <u>N/A</u>	Acclimation: <u><24hrs</u> Age: <u><24 hrs</u>
Source: <u>EA</u>	Culture Water (T/S): <u>24.2</u> °C <u>0</u> ppt

TEST INITIATION

<u>Date</u>	<u>Time</u>	<u>Initials</u>	<u>Activity</u>
<u>1/21/21</u>	<u>1108</u>	<u>LAD</u>	<u>Dilutions Made</u>
↓	↓	↓	<u>Test Vessels Filled</u>
	<u>1153</u>	<u>LAD</u>	<u>Organisms Transferred</u>
↓	<u>1204</u>	<u>AB</u>	<u>Head Counts</u>

TEST SET-UP

Sample Number: AT1-026

Dilution Number: LDL-039

<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 TEST ORGANISM: C. dubia Beginning Date: 1/21/21 Time: 1153
 Client: MWRD Common Name: Water flea Ending Date: 1/23/21 Time: 1156
 QC Test Number: TN-21-033 Scientific Name: C. dubia TEST TYPE: Static / Flowthrough Renewal / Non-renewal
 Test Material: Effluent TARGET VALUES: Temp: 25±1 °C DO: >4.0 mg/L Test Container: 30 ml cup
 Accession Number: AT1-036 pH: 6.0 - 9.0 Salinity: 0 ppt Test Volume: 15 ml
 Dilution Water: Mod.Hard Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc Test Duration: 48 hrs
 Accession Number: LD1-039

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			
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	470	453
	B	5	5	5																
	C	5	5	5																
	D	5	5	5																
Meter Number																				
Time		1004	1140	1150		1081	1079	1080		1081	1079	1080		1081	1079	1080		1081	1079	1080
Initials		JK	UPD	JK		1077	1151	1015		1077	1151	1015		1077	1151	1015		1077	1151	1015
						1070	1070	1070		1070	1070	1070		1070	1070	1070		1070	1070	1070



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX
 Client: MWRD
 QC Test Number: IN-21-033
 Test Material: Effluent
 Accession Number: AT-026
 Dilution Water: Mod Hard
 Accession Number: W1-039

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: 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	
25%	A	5	5	5	5	5	25.2	24.5	25.4			7.7	8.2	8.4			8.2	8.0	8.6			513	548	545			
	B	5	5	5	5	5																					
	C	5	5	5	5	5																					
	D	5	5	5	5	5																					
50%	A	5	5	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	5	5																					
	C	5	5	5	5	5																					
	D	5	5	5	5	5																					
100%	A	5	5	5	5	5	25.2	24.6	26.2			7.6	8.0	8.3			8.2	7.9	8.4			1052	1165	1126			
	B	5	5	5	5	5																					
	C	5	5	5	5	5																					
	D	5	5	5	5	5																					
Meter Number																											
Time		1142	1142	1142	1142	1142	680	680	680	680	680	681	679	680			681	679	680			681	679	680			
Initials		MS	LAD	M	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	LAD	TP	



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	JA
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				
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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:	<u>Fathead minnow</u>	Adults Isolated (Time, Date):	
Scientific Name:	<u>P. promelas</u>	Neonates Pulled & Fed (Time, Date):	<u>6 AM 1/21/21</u>
Lot Number:	<u>FH1 - 1/18-19</u>	Acclimation:	<u><24 hrs</u> Age: <u>23</u> days
Source:	<u>EA</u>	Culture Water (T/S):	<u>25.9</u> °C <u>0</u> ppt

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
<u>1/21/21</u>	<u>1115</u>	<u>LAD</u>	Dilutions Made	Control	0ml	500ml
	↓	↓		6.25%	31.25ml	↓
	↓	↓	Test Vessels Filled	12.5%	62.5ml	
	↓	↓		25%	125ml	
	↓	↓	Organisms Transferred	50%	250ml	
	↓	↓		100%	500ml	
	<u>1303</u>	<u>LAD</u>	Organisms Transferred			
	<u>1510</u>	<u>TP</u>	Head Counts			

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING							
DILUTION PREPARATION					FEEDING		
Day	Date	Time	Initials	Sample / Diluent	Day	Time, Initials, Amount	Time, Initials, Amount
0	<u>1/21/21</u>	<u>1115</u>	<u>LAD</u>	<u>AT1-026</u> <u>CD1-039</u>	0		<u>3 drops</u> <u>1615 TP</u>
1					1		<u>3</u> <u>1607 LAD drops</u>
2	<u>1/23/21</u>	<u>1022</u>	<u>TP</u>	<u>AT1-026</u> <u>CD1-037</u>	2		<u>3 drops</u> <u>1600 TP</u>
3					3		<u>3 drops</u> <u>1800 AT</u>
4					4		
5					5		
6					6		



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019.TOX TEST ORGANISM: Fathhead minnow Beginning Date: 1/21/21 Time: 1303
 Client: MWRD Common Name: P. promelas Ending Date: 1/25/21 Time: 1700
 QC Test Number: TN-21-034 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: AT1-026 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: LD1-40039 Photoperiod: 16 L, 8 d Light Intensity: 50-100 fc Test Duration: 96 hrs

⑤000 1/21/21

Concentration	Rep	Number of Live Organisms	Temperature (°C)			pH			Dissolved Oxygen (mg/L)			Conductivity (µS/cm) Salinity (ppt)						
			24	48	72	96	24	48	72	96	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	7.8	353	357	344	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	373	393	380	388	
	B																	
12.5%	A		25.5	25.4	25.5	25.4	7.6	8.2	7.9	7.9	7.6	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	8.3	7.8	526	519	524	516	
	B																	
50%	A		25.5	25.7	25.9	25.9	7.7	8.0	7.8	7.7	7.6	8.0	7.8	716	713	707	706	
	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	1064	1019	1056	1051	
	B																	
Meter Number			681	680	681	681	681	680	681	681	681	680	681	681	680	681	681	
Time			303	1026	110	1055	1303	1026	110	1055	1303	1026	110	1055	1303	1026	110	1055
Initials			UPD	TP	SR	PA	UPD	TP	SR	PA	UPD	TP	SR	PA	UPD	TP	SR	PA



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	11/21/21	1511	TP
1	17	11/22/21	1304	LAO
2	17	11/23/21	1027	TP
3	17	1/24/21	1207	AT
4	17	1/25/21	1038	AT
5				
6				
7				
8				
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29				
30				



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:

Date	Sample #	ON AIR			OFF AIR		
		Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
12/21	ATI-026	10.3	1043	WFD	8.2	1053	WFD
1123/21	ATI-026	9.1	0816	TR	8.2	0826	TR

ATTACHMENT II

Report Quality Assurance Record
(2 pages)



REPORT QUALITY ASSURANCE RECORD

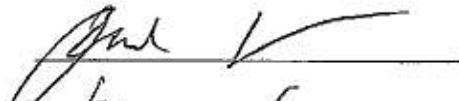



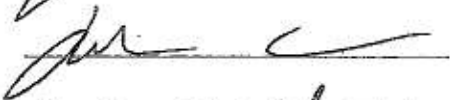
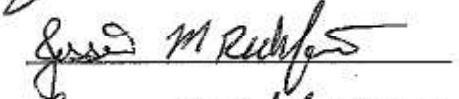



Client: MWRD

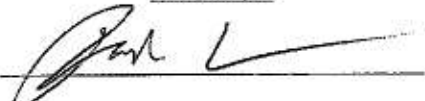
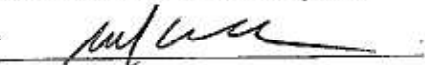

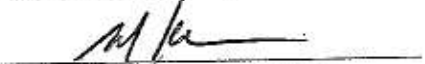
Project Number: 70019.TOX

Author: Rachael Brooks

EA Report Number: 8978

REPORT CHECKLIST

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

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.		<u>2/10/2021</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
		<u>2/9/2021</u>
	PROJECT MANAGER	DATE
		<u>2/4/2021</u>
	QUALITY CONTROL OFFICER	DATE
		<u>2/9/2021</u>
	SENIOR TECHNICAL OFFICER	DATE