

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 21-37

***RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia*
AND *Pimephales promelas* ON AN AUGUST 2021 EFFLUENT SAMPLE
FROM THE CALUMET 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 AN AUGUST 2021 EFFLUENT SAMPLE FROM THE CALUMET 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. Podczewski, Director**

September 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

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

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September 17, 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
Calumet Water Reclamation Plant, National Pollutant Discharge
Elimination System Permit Number IL0028061

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 IL0028061, Special Condition 10. The report covers the monitoring done for samples collected in the eleventh 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:mb
Enclosure
cc: E. Podczewinski/J. Murray
P. Connolly/H. Zhang
T. Minarik/N. Kollias
Via electronic mail



RESULTS OF ACUTE TOXICITY TESTING
WITH *Ceriodaphnia dubia* AND *Pimephales promelas*
ON AN AUGUST 2021 EFFLUENT SAMPLE FROM THE
CALUMET 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.

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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 written over a horizontal line.

Michael K. Chanov II
Laboratory Director

10 September 2021

Date

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 Calumet Water Reclamation Plant in Chicago, Illinois. The effluent composite sample was collected on 9-10 August 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 IL0028061.

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 9-10 August 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 95 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 1,912 mg/L NaCl, and acceptable control chart limits of 1,623-2,264 mg/L NaCl. The results of the *P. promelas* reference toxicant test was acceptable, with a 48-hour LC50 of 1,139 mg/L KCl, and acceptable control chart limits of 563-1,230 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: **IL0028061**

Receiving Water: **Little Calumet River**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-499**

Collection Time and Date: 0600, 9 August 2021 to 0600, 10 August 2021

Receipt Time and Date: 0931, 11 August 2021

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

EA Test Number: **TN-21-445**

Test Initiation Time and Date: 1215, 11 August 2021

Test Completion Time and Date: 1122, 13 August 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-21-139

Test Date and Time: 1147, 12 August 2021 to 1140, 14 August 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,913 mg/L NaCl

Laboratory control chart acceptability range for 48-hour LC50: 1,623-2,264 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: ***Ceriodaphnia dubia* (water flea)**
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 9-10 August 2021
 EA Test Number: TN-21-445

Test Concentration (percent effluent)	48-Hour Survival (percent)
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)**

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.3 – 25.7
pH:	7.8 – 8.3
Dissolved Oxygen (mg/L):	7.6 – 8.4
Conductivity (µS/cm):	327 – 1,042

Water Quality Parameters Measured on Sample Upon Receipt	Outfall 001 (AT1-499)
Temperature (°C):	1.5
pH:	7.8
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	132
Hardness (mg/L as CaCO ₃):	240
Conductivity (µS/cm):	1,011

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: **IL0028061**

Receiving Water: **Little Calumet River**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-499**

Collection Time and Date: 0600, 9 August 2021 to 0600, 10 August 2021

Receipt Time and Date: 0931, 11 August 2021

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

EA Test Number: **TN-21-444**

Test Initiation Time and Date: 1220, 11 August 2021

Test Completion Time and Date: 1139, 15 August 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: FH1-8/6-7

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 Chemicals Lot#19430079 (Received 10/20/20)

EA Test Number: RT-21-137

Test Date and Time: 1354, 12 August 2021 to 1330, 14 August 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,139 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 563-1,230 mg/L KCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: ***Pimephales promelas* (fathead minnow)**
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 9-10 August 2021
 EA Test Number: TN-21-444

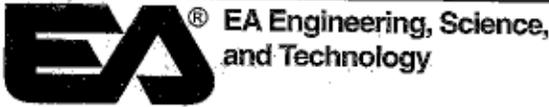
<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	100
12.5	100	100
25	100	95
50	100	100
100	100	100

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

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.5 – 26.0
pH:	7.7 – 8.4
Dissolved Oxygen (mg/L):	7.1 – 8.4
Conductivity (µS/cm):	309 – 1,000

ATTACHMENT I

Data Sheets
(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 #: 1Z 274 474 84 9303 10 18

Client: MWARD GC Project No.: 4652-126-1
 NPDES Number: IL0028061 Client Purchase Order Number: 3111991
 City/State Collected: Chicago, 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		
ATI-499		✓	8/9/21 0600	8/10/21 0600	Calumet WRP Final Effluent	1 gallon

Sampled By: <i>Paula Brinkman</i>	Date/Time 8/10/21 0848	Received By:	Date/Time
Sampler's Printed Name: Paula Brinkman LOR	Title: SERT	Relinquished By:	Date/Time
Relinquished By: <i>Paula Brinkman</i>	Date/Time 8/16/21 0905	Received By Laboratory: <i>Paula Brinkman</i>	Date/Time 8-11-21 0931

Was Sample Chilled During Collection? Yes / No

Comments:

Sample Collection Parameters

Visual Description: clear, green
 Temperature (°C): 12.3
 pH: 7.15
 TRC (mg/L): 0
 Other:



SAMPLE CHECK-IN
FOR TESTING

Client: MWRD

EA Accession Number: AT1-499

Parameter	Acceptable Range	Measurement*	Meter	Date	Time	Initials
Temperature (°C)	≤4	1.5	T-21	8/14/21	0935	WAD
Is ice present?	--	yes	N/A	↓	↓	↓
pH	6.0-9.0	7.8	681	↓	↓	↓
TRC (mg/L)	<0.01	<0.01	AT-01	↓	↓	↓
Visual Description	--	light tan	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- 21-445

⑥ UFD 8/31/21

TEST ORGANISM INFORMATION		10
Common Name: <u>Water flea</u>	Adults Isolated (Time, Date): <u>8/11/21</u>	<u>1550</u>
Scientific Name: <u>C. dubia</u>	Neonates Pulled & Fed (Time, Date): <u>8/12/21</u>	<u>0826</u>
Lot Number: <u>N/A</u>	Acclimation: <u><24hrs</u>	Age: <u>"</u> <u><24 hrs</u>
Source: <u>EA</u>	Culture Water (T/S): <u>24.9</u> °C	<u>0</u> ppt

TEST INITIATION			
Date	Time	Initials	Activity
<u>8/11/21</u>	<u>1059</u>	<u>UFD</u>	Dilutions Made
<u>↓</u>	<u>↓</u>	<u>↓</u>	Test Vessels Filled
	<u>1215</u>	<u>TP</u>	Organisms Transferred
<u>↓</u>	<u>1306</u>	<u>UFD</u>	Head Counts

TEST SET-UP		
Sample Number: <u>ATL-499</u>		
Dilution Number: <u>LD1-508</u>		
Test Concentration	Volume Test Material	Final Volume
Control	0 ml	200 ml
6.25%	12.5 ml	<u>↓</u>
12.5%	25 ml	
25%	50 ml	
50%	100 ml	
100%	200 ml	



ACUTE TOXICITY TEST DATA SHEET

603 AP 8/11/21

Project Number: 70019_TOX
 Client: MWRD
 QC Test Number: TN-21-445
 Test Material: Effluent
 Accession Number: AT-499A
 Dilution Water: Mod Hard
 Accession Number: LD1-508

TEST ORGANISM: Water flea
 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: 8/10/21 Time: 12:15
 Ending Date: 8/13/21 Time: 11:22
 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	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96							
Control	A	5	5	5	5	25.3	25.0	24.3		8.3	8.2	8.1		8.4	8.2	8.4		327	342	356							
	B	5	5	5	5																						
	C	5	5	5	5																						
	D	5	5	5	5																						
6.25%	A	5	5	5	5	25.6	25.3	24.9		8.3	8.2	8.1		8.2	8.4	8.4		428	375	380							
	B	5	5	5	5																						
	C	5	5	5	5																						
	D	5	5	5	5																						
12.5%	A	5	5	5	5	25.5	25.7	25.5		8.2	8.2	8.1		8.1	8.2	8.3		407	419	422							
	B	5	5	5	5																						
	C	5	5	5	5																						
	D	5	5	5	5																						
Meter Number																											
Time	12:00	13:05	11:22																								
Initials	WPD	AY	TP	MT	AY	TP	681	680	680	1155	1317	1107	681	680	680	1155	1317	1107	681	680	680	1155	1312	1107	MT	AY	TP



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX TEST ORGANISM: C. dubia Beginning Date: 8/11/21 Time: 1215
 Client: MWRD Common Name: Water flea Ending Date: 8/13/21 Time: 1122
 QC Test Number: TN-21-445 Scientific Name: C. dubia TEST TYPE: Static Flowthrough Renewal / Non-renewal
 Test Material: Effluent TARGET VALUES
 Accession Number: AT-499 Temp: 25±1 °C DO: >4.0 mg/L Test Container: 30 ml cup
 Dilution Water: Mod Hard pH: 6.0-9.0 Salinity: 0 ppt Test Volume: 15 ml
 Accession Number: WD-502 Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc 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	5	25.5	25.4	25.7		8.1	8.2	8.0		8.2	8.1	8.2		492	505	509			
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
50%	A	5	5	5	5	5	25.5	25.4	25.7		8.0	8.1	8.0		8.2	7.6	8.2		669	684	695			
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
100%	A	5	5	5	5	5	25.5	25.4	25.7		7.8	8.1	8.0		8.2	7.7	8.2		1000	1040	1042			
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
Meter Number																								
Time	1300	1305	1422																					
Initials	WPD	BT	TP	MT	BT	TP	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS	GS		



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-445

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-445

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- 21-445

Day	Testing Location	Date	Time	Initials
0	56B	8/11/21	1310	UAD
1	56B	8/12/21	1315	AD
2	56B	8/13/21	1125	TD
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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27				
28				
29				
30				



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-445

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- 444

TEST ORGANISM INFORMATION

Common Name: Fathead minnow Adults Isolated (Time, Date): _____
 Scientific Name: P. promelas Neonates Pulled & Fed (Time, Date): _____
 Lot Number: FH-816-7 Acclimation: <24 hrs Age: 4-5 days
 Source: GA Culture Water (T/S): 25.3 °C 0 ppt

TEST SET-UP

TEST INITIATION

CONCENTRATION SERIES

Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
8/11/21	1059	UAD	Dilutions Made	Control	0 ml	500 ml
				6.25%	31.25 ml	↓
				12.5%	62.5 ml	
			Test Vessels Filled	25%	125 ml	
				50%	250 ml	
			Organisms Transferred	100%	500 ml	
	1220	TP				
	1544	UAD	Head Counts			

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

FEEDING

Day	Date	Time	Initials	Sample / Diluent	Food: Artemia	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	8/11/21	1059	UAD	ATI-499 LDI-508				
1								
2	8/11/21	1015	TP	ATI-499 LDI-516			MT 0835 3 drops	
3								
4								
5								
6								



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019.TOX TEST ORGANISM 8/11/21 Beginning Date: 8/11/21 Time: 10:30
 Client: MWRD Common Name: Fathead minnow Ending Date: 8/15/21 Time: 11:39
 QC Test Number: TN-21-444 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES Renewal Non-renewal
 Accession Number: AT1-499 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: W1-508 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		25.4	24.6	25.9	24.5	8.1	7.9	8.0	8.4	7.8	8.0	7.4	8.0	320	332	321	327
	B																	
6.25%	A		25.7	25.4	25.8	24.9	8.1	7.9	8.0	8.4	7.7	8.0	7.5	8.2	364	368	323	366
	B																	
12.5%	A		26.0	25.8	26.0	25.8	8.0	7.9	8.0	8.2	7.5	8.0	7.3	7.8	406	407	401	404
	B																	
25%	A		26.0	25.7	25.9	25.9	8.0	7.9	7.9	8.2	7.5	7.9	7.3	7.6	488	489	493	493
	B														491			
50%	A		25.9	25.8	26.0	25.9	8.0	8.0	7.9	8.1	7.4	7.8	7.2	7.4	664	667	669	671
	B																	
100%	A		26.0	25.8	26.0	26.0	7.9	7.9	7.9	8.0	7.3	7.6	7.1	7.4	987	989	994	996
	B																	
Meter Number			680	680	680	680	680	680	680	680	680	680	680	680	680	680	680	680
Time			1000	1104	1010	1015	1000	1044	1010	1125	1000	1044	1010	1125	1000	1104	1010	1125
Initials			AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT

(6)
 7/8 8/11/21



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-444

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-444

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- 21-444

Day	Testing Location	Date	Time	Initials
0	SSA	8/11/21	1200	MT
1	SSA	8/12/21	1000	AT
2	SSA	8/13/21	1135	TP
3	SSA	8/14/21	1130	UPD
4	SSA	8/15/21	1139	AT
5				
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TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-444

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

ATTACHMENT II

Report Quality Assurance Record
(2 pages)



REPORT QUALITY ASSURANCE RECORD

Client: MWRD Project Number: 70019.TOX
 Author: Rachael Brooks EA Report Number: 8617

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>Rachael Brooks</u>	<u>8/16/21</u>
2. Samples prepared and processed according to study plan requirements.	<u>Rachael Brooks</u>	<u>8/16/21</u>
3. Data collected using calibrated instruments and equipment.	<u>Rachael Brooks</u>	<u>8/16/21</u>
4. Calculations checked: - Hand calculations checked - Documented and verified statistical procedure used.	<u>Rachael Brooks</u>	<u>8/16/21</u>
	<u>Rachael Brooks</u>	<u>8/16/21</u>
5. Data input/statistical analyses complete and correct.	<u>Jessie M Reddy</u>	<u>8/30/2021</u>
6. Reported results and facts checked against original sources.	<u>Jessie M Reddy</u>	<u>8/30/2021</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>Jessie M Reddy</u>	<u>8/30/2021</u>
8. Results reviewed for compliance with study plan requirements.	<u>Rachael Brooks</u>	<u>8/16/21</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>Rachael Brooks</u>	<u>9/10/21</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:	<u>[Signature]</u>	<u>9/10/21</u>
	PROJECT MANAGER	DATE
	<u>Jessie M Reddy</u>	<u>8/30/2021</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>9/10/21</u>
	SENIOR TECHNICAL OFFICER	DATE