

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 18-07

***RESULTS OF ACUTE TOXICITY TESTING WITH Ceriodaphnia dubia
AND Pimephales promelas ON A FEBRUARY 2018 EFFLUENT
SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT
(MWRD)***

March 2018

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 FEBRUARY 2018 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

By

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

Protecting Our Water Environment

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

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

March 9, 2017

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 2018 – Acute Toxicity Test Results for the Stickney Water Reclamation Plant, National Pollutant Discharge Elimination System Permit Number IL0028053

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 IL0028053, Special Condition 10. The report covers the monitoring done for samples collected in the tenth 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 Ms. Jennifer Wasik, Principal Environmental Scientist, at (708) 588-4063.

Very truly yours,

Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:JW:NK:lf

Enclosures

cc: E. Podczerwinski/J. Murray
F. Costa/S. Carmody/H. Zhang
J. Wasik/N. Kollias



RESULTS OF ACUTE TOXICITY TESTING
WITH *Ceriodaphnia dubia* AND *Pimephales promelas*
ON A FEBRUARY 2018 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.

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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

2 March 2018

Date

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 Stickney Water Reclamation Plant in Cicero, Illinois. The effluent composite sample was collected on 4-5 February 2018. 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 IL0028053.

This toxicity testing was conducted following EA's standard operating procedures (EA 2013) which are in accordance with US EPA guidance (US EPA 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 (US EPA 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 4-5 February 2018 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 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 were acceptable, with a 48-hour LC50 of 1,912 mg/L NaCl, and acceptable control chart limits of 1,454-2,245 mg/L NaCl. The results of the *P. promelas* reference toxicant test were acceptable, with a 48-hour LC50 of 1,030 mg/L KCl, and acceptable control chart limits of 913-1,351 mg/L KCl.

REFERENCES

- EA. 2013. 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., 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-04**

Acute assay with water flea (*Ceriodaphnia dubia*)

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

Permit Number: **IL0028053**

Receiving Water: **Chicago Sanitary and Ship Canal**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT8-095

Collection Time and Date: 0600, 4-5 February 2018

Receipt Time and Date: 1004, 6 February 2018

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

EA Test Number: **TN-18-097**

Test Initiation Time and Date: 1131, 6 February 2018

Test Completion Time and Date: 1114, 8 February 2018

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 #F120-04 (Received 6/13/16)

EA Test Number: RT-18-039

Test Date and Time: 0948, 21 February 2018 to 1048, 23 February 2018

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,912 mg/L NaCl

Laboratory control chart acceptability range for 48-hour LC50: 1,454-2,245 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: *Ceriodaphnia dubia* (water flea)
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 4-5 February 2018
 EA Test Number: TN-18-097

<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 – 24.8
pH:	7.8 – 8.5
Dissolved Oxygen (mg/L):	8.3 – 8.6
Conductivity (µS/cm):	328 – 1,475

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT8-095)</u>
Temperature (°C):	1.4
pH:	7.8
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	116
Hardness (mg/L as CaCO ₃):	220
Conductivity (µS/cm):	1,268

SUMMARY OF SAMPLE/TEST INFORMATION

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

Test Procedure: **EA Protocol FH-AC-04**

Acute assay with fathead minnows (*Pimephales promelas*)

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

Permit Number: **IL0028053**

Receiving Water: **Chicago Sanitary and Ship Canal**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT8-095

Collection Time and Date: 0600, 4-5 February 2018

Receipt Time and Date: 1004, 6 February 2018

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

EA Test Number: **TN-18-098**

Test Initiation Time and Date: 1141, 6 February 2018

Test Completion Time and Date: 1047, 10 February 2018

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: FH8-2/3-4

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 #C583408 (Received 5/22/16)

EA Test Number: RT-18-036

Test Date and Time: 1016, 21 February 2018 to 1106, 23 February 2018

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,030 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 913-1,351 mg/L KCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: ***Pimephales promelas* (fathead minnow)**
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 4-5 February 2018
 EA Test Number: TN-18-098

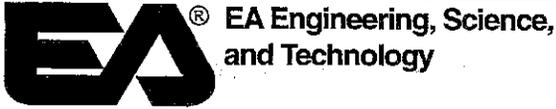
<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	95
12.5	100	95
25	95	95
50	100	100
100	100	95

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

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.0 – 25.8
pH:	7.7 – 8.3
Dissolved Oxygen (mg/L):	7.4 – 8.5
Conductivity (µS/cm):	328 – 1,372

ATTACHMENT I

Data Sheets
(16 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 #: 122886829490991454

Client: MWRD61C Project No.: _____
 NPDES Number: IL 0029053 Client Purchase Order Number: 8009002
 City/State Collected: Cicero, 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		
AT8-095		✓	2/4/18 0600	2/5/18 0600	St. Johns River Effluent ^{outfall 001}	1 Gal

Sampled By: <i>Nick Kollias</i>	Date/Time 2/5/18 0900	Received By:	Date/Time
Sampler's Printed Name: <i>Nick Kollias</i>	Title: <i>Aquatic Biologist</i>	Relinquished By:	Date/Time
Relinquished By: <i>[Signature]</i>	Date/Time 2/5/18 0900	Received By Laboratory: <i>[Signature]</i>	Date/Time 2/6/18 1004

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

Sample Collection Parameters

Visual Description: *clear green*
 Temperature (°C): *5.2*
 pH: *7.03*
 TRC (mg/L): *0 mg/L*
 Other: _____



SAMPLE CHECK-IN FOR TESTING

Client: MWRD

EA Accession Number: ATS - 095

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	1.4	2/6/18	1004	MM
Is ice present?	—	✓			
pH	6.0-9.0	7.8			
TRC (mg/L)	<0.01	<0.01			
Visual Description	—	slight yellow			

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✓)	Date	Time	Initials
Ammonia (preserve aliquot)	—				
Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Salinity (ppt)	—				



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-097

TEST ORGANISM INFORMATION

Common Name: <u>Water flea</u>	Adults Isolated (Time, Date): <u>2/6/18 0000</u>
Scientific Name: <u>C. dubia</u>	Neonates Pulled & Fed (Time, Date): <u>2/6/18 0927</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>24.0</u> °C <u>0</u> ppt

TEST INITIATION

Date	Time	Initials	Activity
2/6/18	1120	MS	Dilutions Made
↓	↓	↓	Test Vessels Filled
↓	1131	↓	Organisms Transferred
↓	1429	AB	Head Counts

TEST SET-UP

Sample Number: AT8-095

Dilution Number: LD8-081

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: 70005.15 TEST ORGANISM: Water flea Beginning Date: 2/6/18 Time: 1131
 Client: MWRD Common Name: Water flea Ending Date: 2/8/18 Time: 1114
 QC Test Number: TN-18-097 Scientific Name: C. dubia TEST TYPE: Static / Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: ATS-095 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: LD8-081 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) Salinity (ppt)					
		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	24.3	24.0	24.0	8.3	8.5	8.2	8.5	8.4	8.0	328	372	424					
	B	5	5	5	5																		
	C	5	5	5	5																		
	D	5	5	5	5																		
6.25%	A	5	5	5	5	5	24.4	24.0	24.0	8.2	8.5	8.2	8.4	8.5	8.6	386	398	427					
	B	5	5	5	5																		
	C	5	5	5	5																		
	D	5	5	5	5																		
12.5%	A	5	5	5	5	5	24.7	24.4	24.0	8.1	8.5	8.2	8.4	8.4	8.5	448	457	482					
	B	5	5	5	5																		
	C	5	5	5	5																		
	D	5	5	5	5																		
Meter Number						678	678	676	678	678	678	678	678	678	678	678	678	678	678	678	678	678	
Time		1429	1125	1114		1123	1116	0940	1123	1116	0940	1123	1116	0940	1123	1116	0940	1123	1116	0940	1123	1116	
Initials		QCB	MS	MS		MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15 TEST ORGANISM: Water flea Beginning Date: 2/6/18 Time: 1131
 Client: MWRD Common Name: C. dubia Ending Date: 2/8/18 Time: 1114
 QC Test Number: TN-18-0917 Scientific Name: C. dubia TEST TYPE: Static / Flowthrough
 Test Material: Effluent Renewal / Non-renewal
 Accession Number: ATB-015 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: LOS-081 Photoperiod: 16L, 8d Light Intensity: 50 - 100 fc Test Duration: 48 hrs

TARGET VALUES

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	
25%	A	5	5	5	5	5	24.8	24.5	24.0	8.1	8.4	8.1	8.3	8.5	8.5	504	580	610				
	B	5	5	5	5																	
	C	5	5	5	5																	
	D	5	5	5	5																	
50%	A	5	5	5	5	5	24.8	24.4	24.0	8.0	8.3	8.1	8.3	8.5	8.5	804	829	897				
	B	5	5	5	5																	
	C	5	5	5	5																	
	D	5	5	5	5																	
100%	A	5	5	5	5	5	24.7	24.4	24.0	7.8	8.2	8.0	8.3	8.5	8.5	1270	1362	1475				
	B	5	5	5	5																	
	C	5	5	5	5																	
	D	5	5	5	5																	
Meter Number																						
Time		1429	1125	1114			078	078	078	078	078	078	078	078	078	078	078	078	078	078	078	
Initials		EB	MS	MS			MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN- 18-097

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: 70005.15

Client: MWRD

QC Test Number: TN-18-097

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-097

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: 70005.15

Client: MWRD

QC Test Number: TN-18-098

TEST ORGANISM INFORMATION			
Common Name: <u>Fathead minnow</u>	Adults Isolated (Time, Date): _____		
Scientific Name: <u>P. promelas</u>	Neonates Pulled & Fed (Time, Date): _____		
Lot Number: <u>FH8-2/3-4</u>	Acclimation: <u><24 hrs</u>	Age: <u>2-3 days</u>	
Source: <u>EA</u>	Culture Water (T/S): <u>24.6</u> °C <u>0</u> ppt		

TEST SET-UP							
TEST INITIATION				CONCENTRATION SERIES			
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume	
<u>2/6/18</u>	<u>1120</u>	<u>MJ</u>	Dilutions Made	Control	0ml	500ml	
↓	↓	↓	Test Vessels Filled	6.25%	31.25ml	↓	
	<u>1141</u>		Organisms Transferred	12.5%	62.5ml		
				25%	125ml		
				50%	250ml		
	<u>1410</u>	<u>CB</u>	Head Counts	100%	500ml		
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	<u>2/6/18</u>	<u>1120</u>	<u>MJ</u>	<u>AT8-095</u> <u>LD8-081</u>	0			
1					1			
2	<u>2/8/18</u>	<u>0955</u>	<u>MJ</u>	<u>AT8-095</u> <u>LD8-082</u>	2			
3					3			
4					4			
5					5			
6					6			



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15 TEST ORGANISM: P. promelas Beginning Date: 2/6/18 Time: 11:41
 Client: MWRD Common Name: Fathead minnow Ending Date: 2/10/18 Time: 10:47
 QC Test Number: TN-18-098 Scientific Name: P. promelas TEST TYPE: Static / Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: ATB-095 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: LD8-081 Photoperiod: 16L, 8d 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) Salinity (ppt)						
			24	48	72	96	24	48	72	96	24	48	72	96				
Control	A		24.0	24.0	24.2	24.1	8.3	7.8	8.3	8.1	8.2	8.1	7.4	8.1	343	379	365	385
	B																	
6.25%	A		25.1	24.8	25.2	25.0	8.2	7.8	8.2	8.1	8.4	8.5	7.5	7.8	391	405	416	424
	B																	
12.5%	A		25.0	25.1	25.3	25.2	8.2	7.8	8.1	8.1	8.0	8.3	7.7	7.7	451	471	473	478
	B																	
25%	A		25.1	25.0	24.7	25.4	8.1	7.7	8.1	8.1	8.2	7.7	7.7	7.5	504	584	604	624
	B																	
50%	A		25.0	25.3	24.5	25.4	8.0	7.7	8.0	8.0	8.3	7.9	8.1	7.6	803	828	841	849
	B																	
100%	A		24.7	25.0	24.9	25.4	8.2	7.7	7.9	7.9	8.1	7.8	8.5	7.5	1301	1372	1331	1331
	B																	
Meter Number			079	079	079	079	079	079	079	079	079	079	079	079	079	079	079	079
Time			0853	0912	0843	1046	0912	0843	1046	0853	0912	0843	1046	0853	0912	0843	1046	1046
Initials			EB	MS	MS	MS	EB	MS	MS	EB	MS	MS	MS	EB	MS	MS	MS	MS



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-098

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



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-098

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



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-098

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-18-098/097

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
2/6/18	ATS-095	10.1	1036	MM	8.5	1046	CB
2/8/18	ATS-095	9.8	0903	MT	8.5	0913	MT

ATTACHMENT II

Report Quality Assurance Record
(2 pages)



REPORT QUALITY ASSURANCE RECORD

Client: MWRD Project Number: 70005.15
 Author: Michael Channer EA Report Number: 7683

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>2/13/18</u>
2. Samples prepared and processed according to study plan requirements.	<u>[Signature]</u>	<u>2/13/18</u>
3. Data collected using calibrated instruments and equipment.	<u>[Signature]</u>	<u>2/13/18</u>
4. Calculations checked:		
- Hand calculations checked	<u>[Signature]</u>	<u>2/13/18</u>
- Documented and verified statistical procedure used.	<u>[Signature]</u>	<u>2/13/18</u>
5. Data input/statistical analyses complete and correct.	<u>[Signature]</u>	<u>3/1/18</u>
6. Reported results and facts checked against original sources.	<u>[Signature]</u>	<u>3/1/18</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>[Signature]</u>	<u>3/1/18</u>
8. Results reviewed for compliance with study plan requirements.	<u>[Signature]</u>	<u>2/13/18</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>[Signature]</u>	<u>3/2/18</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
	<u>[Signature]</u>	<u>3/2/18</u>
	PROJECT MANAGER	DATE
	<u>[Signature]</u>	<u>3/1/18</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>3/1/18</u>
	SENIOR TECHNICAL REVIEWER	DATE