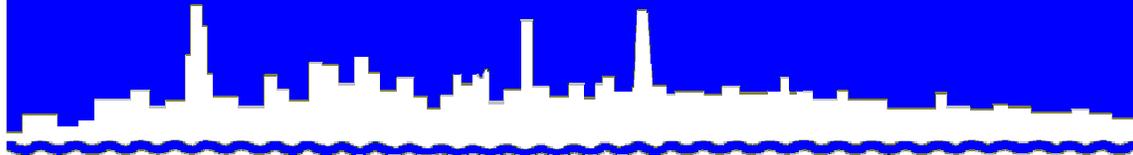


*Protecting Our Water Environment*



**Metropolitan Water Reclamation District of Greater Chicago**

***MONITORING AND RESEARCH  
DEPARTMENT***

***REPORT NO. 12-15***

***BIOMONITORING REPORT  
2012***

***ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS  
FOR THE LEMONT WATER RECLAMATION PLANT,  
LEMONT, ILLINOIS  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER IL0028070, APRIL 2012***

***MAY 2012***

May 25, 2012

Mr. Brian Koch  
WPC # 15  
Illinois Environmental Protection Agency  
1021 North Grand Avenue  
P.O. Box 19276  
Springfield, IL 62794-9276

Dear Mr. Koch:

Subject: Biomonitoring Report for 2012 – Acute Whole Effluent Toxicity Test Results for the Lemont Water Reclamation Plant, Lemont, Illinois, National Pollutant Discharge Elimination System Permit Number IL0028070, April 2012

The subject Biomonitoring Report is submitted in compliance with the National Pollutant Discharge Elimination System Permit Number IL0028070, Special Condition 12.

The subject report includes copies of all bench sheets, chain-of-custody forms, sample receipt and preparation forms, hard copies of computer generated statistical analyses, control charts, and a certification of accuracy statement.

If you have any questions concerning this report, please contact Ms. Jennifer Wasik, Supervising Aquatic Biologist, at (708) 588-4060.

Very truly yours,

Thomas C. Granato, Ph.D.  
Director  
Monitoring and Research

TCG:JW:ps  
Enclosures

cc: B. Perkovich/C. O'Connor  
cc (w/o enclosures): M. Sharma/A. Gronski

**Metropolitan Water Reclamation District of Greater Chicago**

100 East Erie Street

Chicago, IL 60611-2803

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**BIOMONITORING REPORT  
2012**

**ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS  
FOR THE LEMONT WATER RECLAMATION PLANT  
LEMONT, ILLINOIS**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER IL0028070, APRIL 2012**

**Monitoring and Research Department  
Thomas C. Granato, Director**

**MAY 2012**

## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iii
ACKNOWLEDGMENTS	iv
DISCLAIMER	iv
ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS FOR THE LEMONT WATER RECLAMATION PLANT, LEMONT, ILLINOIS, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NUMBER IL0028070, APRIL 2012	1
Summary	1
Sample Information	1
Whole Effluent Toxicity Tests	1
Analysts	3
Results	3
CERTIFICATION OF ACCURACY	6
APPENDICES	
AI    Summary of Acute Whole Effluent Toxicity Test Results <i>Pimephales promelas</i> CETIS Test Summary and Measurement Report	AI-1
AII   Summary of Acute Whole Effluent Toxicity Test Results <i>Ceriodaphnia dubia</i> CETIS Test Summary and Measurement Report	AII-1
BI    Raw Data for <i>Pimephales promelas</i> Whole Effluent Toxicity Test Conducted on the Lemont Water Reclamation Plant Final Effluent Collected April 16 Through April 17, 2012	BI-1
BII   Raw Data for <i>Ceriodaphnia dubia</i> Whole Effluent Toxicity Test Conducted on the Lemont Water Reclamation Plant Final Effluent Collected April 16 Through April 17, 2012	BII-1

## TABLE OF CONTENTS (Continued)

CI	Chain-of-Custody for Whole Effluent Toxicity Test Conducted on the Lemont Water Reclamation Plant Final Effluent Collected April 16 Through April 17, 2012	CI-1
DI	Quality Assurance for the <i>Pimephales promelas</i> Whole Effluent Toxicity Test: Raw Data and Statistical Calculations for the Concurrent Reference Toxicant Test, Control Chart, and Culture Data	DI-1
DII	Quality Assurance for the <i>Ceriodaphnia dubia</i> Whole Effluent Toxicity Test: Raw Data and Statistical Calculations for the Concurrent Reference Toxicant Test, Control Chart, and Culture Data	DII-1

## LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Sample Collection Information	2
2	Acute <i>Pimephales promelas</i> Test Results	4
3	Acute <i>Ceriodaphnia dubia</i> Test Results	5

## **ACKNOWLEDGMENTS**

Special thanks are extended to Section 124 Analytical Microbiology and Biomonitoring staff and Section 126 Aquatic Ecology and Water Quality staff for their assistance in maintaining the test culture organisms. We thank Ms. Colleen Joyce and Mr. Panu Lansiri for conducting the toxicity tests.

Thanks are also extended to Mr. Nicholas Kollias and Mr. Justin Vick for preparing the report.

Special thanks are due to Ms. Pamela Slaby for formatting, editing, and preparing this report for print.

## **DISCLAIMER**

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

# ACUTE WHOLE EFFLUENT TOXICITY TEST RESULTS FOR THE LEMONT WATER RECLAMATION PLANT, LEMONT, ILLINOIS

## NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NUMBER IL0028070, APRIL 2012

### Summary

The acute toxicity test with *Pimephales promelas* (*P. promelas*) (96-hour, static, renewal), was conducted on samples of the Lemont Water Reclamation Plant (WRP) final effluent collected April 16 through April 17, 2012. The results indicated that the test was valid. No acute toxic effect on *P. promelas* was observed. Results of the quality control acute toxicity test with *P. promelas* using the reference toxicant sodium chloride (NaCl) fell within limits prescribed as acceptable by the United States Environmental Protection Agency (USEPA).

The acute toxicity test with *Ceriodaphnia dubia* (*C. dubia*) (48-hour, static, non-renewal) was conducted on samples of the Lemont WRP final effluent collected April 16 through April 17, 2012. The results indicated that the test was valid. No acute toxic effect on *C. dubia* was observed. Results of the quality control acute toxicity test with *C. dubia* using the reference toxicant NaCl fell within limits prescribed as acceptable by the USEPA.

### Sample Information

Tests were performed using 24-hour composite samples of the Lemont WRP final effluent collected on April 16 through April 17, 2012, for the acute toxicity tests. The individual grab samples were stored on site at 0.1–6°C in a refrigerator. Sample temperatures at the time of receipt were less than or equal to 7.9°C. Samples were stored in a dedicated refrigerator in the Biomonitoring Laboratory at 0.1–6°C. Sample collection information is shown in Table 1.

### Whole Effluent Toxicity Tests

The acute toxicity tests with *P. promelas* and *C. dubia* were conducted on the Lemont WRP effluent samples collected April 16 through April 17, 2012. Acute Whole Effluent Toxicity (WET) test methods and procedures were followed in accordance with *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, EPA/821-R-02-12, Fifth Edition, October 2002. *P. promelas* were exposed to 6.25, 12.5, 25, 50 and 100 percent concentration of final effluent for 96 hours. *C. dubia* were exposed to the same final effluent concentrations for 48 hours.

TABLE 1: SAMPLE COLLECTION INFORMATION

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Effluent Collection Point:	Lemont Water Reclamation Plant Effluent Discharge Number 001	
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Effluent Collection Method:	Five 2-1/2 gallon grab samples collected over a 24-hour period were combined to make a 24-hour composite sample. The individual grab samples were collected at 6-hour intervals.	
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Effluent Collection Times and Dates:	0600	April 16, 2012
	1200	April 16, 2012
	1800	April 16, 2012
	2400	April 16, 2012
	0600	April 17, 2012

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The acute fathead minnow test (*P. promelas*) was set up on April 17, 2012, and completed on April 21, 2012. The acute *C. dubia* test was set up on April 17, 2012, and completed on April 19, 2012. Hard synthetic water with selenium (HSW) was used as control and dilution water for both test species.

Statistical analyses were performed using the Comprehensive Environmental Toxicity Information System (CETIS) software program, version 1.7.0 (Tidepool Scientific Software, California).

Concurrent reference toxicant tests (RTT) using NaCl were conducted, and the control charts for the *P. promelas* and *C. dubia* acute RTT were prepared.

## **Analysts**

WET tests were conducted by Ms. Colleen Joyce (Laboratory Technician II) and Mr. Panu Lansiri (Laboratory Technician I). Mr. Nicholas Kollias (Assistant Aquatic Biologist) entered the raw data in an Excel and CETIS program. Mr. Nicholas Kollias prepared this report.

## **Results**

Results of the acute *P. promelas* WET test are shown in [Table 2](#). The *P. promelas* test results indicated a valid test. No acute toxicity to *P. promelas* was observed. The HSW control water met the test acceptability criteria for the *P. promelas* test. Results of the quality control acute toxicity test with *P. promelas* using the RTT fell within limits prescribed as acceptable by the USEPA, i.e. within  $\pm 2$  standard deviations from the mean.

Results of the acute *C. dubia* WET test are shown in [Table 3](#). The *C. dubia* test results indicated a valid test. No acute toxicity to *C. dubia* was observed. The HSW control water met the test acceptability criteria for the *C. dubia* test. Results of the quality control, acute toxicity test with *C. dubia* using the RTT fell within limits prescribed as acceptable by USEPA, i.e. within  $\pm 2$  standard deviations from the mean.

The WET test results indicated the absence of acute toxicity to *P. promelas* and *C. dubia*. Tabulated summaries of the *P. promelas* and *C. dubia* WET tests are presented in [Appendices AI](#) and [AII](#), respectively. Raw data for the *P. promelas* and *C. dubia* WET tests are presented in [Appendices BI](#) and [BII](#), respectively. Chain-of-Custody documentation is provided in [Appendix CI](#). Raw data, statistical calculations, culture data, and control charts for the *P. promelas* and *C. dubia* concurrent RTT are provided in [Appendices DI](#) and [DII](#), respectively.

TABLE 2: ACUTE *PIMEPHALES PROMELAS* TEST RESULTS

Acute Test Parameters	Results
96-h LC <sub>50</sub>	>100%
Toxicity Observed	No
Mean Percent Survival in Laboratory Water Control (HSW)	100%
Mean Percent Survival in 100% Final Effluent	100%
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

TABLE 3: ACUTE *CERIODAPHNIA DUBIA* TEST RESULTS

Acute Test Parameters	Results
48-h LC <sub>50</sub>	>100%
Toxicity Observed	No
Mean Percent Survival in Laboratory Water Control (HSW)	100%
Mean Percent Survival in 100% Final Effluent	100%
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

## CERTIFICATION OF ACCURACY

I certify under penalty of law that this document and all appendices were prepared under my supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering data, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations 40 C.F.R. 122.22 (d).

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Date

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Thomas C. Granato, Ph.D.  
Director  
Monitoring and Research

If you have any questions concerning this report, please contact Ms. Jennifer Wasik, Supervising Aquatic Biologist, at 708-588-4060.