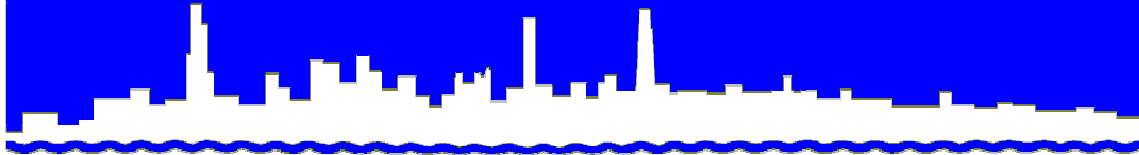


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 06-5

***RESULTS OF ACUTE WHOLE EFFLUENT TOXICITY (WET) TESTS
CONDUCTED ON FINAL EFFLUENT SAMPLES***

***LEMONT WATER RECLAMATION PLANT
LEMONT, ILLINOIS
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT NUMBER IL0028070***

JANUARY 2006

Metropolitan Water Reclamation District of Greater Chicago

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BIOMONITORING REPORT
2006

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Research and Development Department
Richard Lanyon, Director

January 2006

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Ms. Rhonda Griffith is acknowledged for typing this report.

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, ILLINOIS
NPDES PERMIT NUMBER IL0028070, DECEMBER 2005

Summary

Acute toxicity tests with the fathead minnow, *Pimephales promelas* (96-hour, static, renewal) and the water flea, *Ceriodaphnia dubia* (48-hour, static, non-renewal) were conducted on the samples of Lemont WRP final effluent collected on December 5-6, 2005. The results indicated that the tests were valid. No acute toxic effect on *Pimephales promelas* was observed. No acute toxic effect on *Ceriodaphnia dubia* was observed. Results of quality control acute toxicity tests with *Pimephales promelas* and *Ceriodaphnia dubia* using the reference toxicant sodium chloride (NaCl) fell within limits prescribed as acceptable by the United States Environmental Protection Agency (USEPA).

Sample Information

Five grab samples of final effluent were collected from the Lemont WRP. A grab sample was collected at 0600, 1200, 1800, and 2400 on Monday, 12/5/05 and 0600 on Tuesday, 12/6/05. The individual grab samples were stored on-site at 0.1-6°C in a refrigerator. These samples were received in the laboratory within 4 hours of the final grab sample collection. Sample temperatures at the time of receipt were below 9°C. The five grab samples were combined in the Laboratory to make a 24-hour composite sample. Samples were stored in the laboratory at 4 ± 1°C. Sample collection information is shown in Table 1.

Whole Effluent Toxicity (WET) Tests

Acute *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (*C. dubia*) WET tests were conducted on the Lemont WRP effluent samples collected on December 5-6, 2005.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

SAMPLE COLLECTION INFORMATION

Effluent Collection Point:	Lemont WRP Effluent Discharge Number 001
Effluent Collection Method:	Composite sample of five grab samples collected in a 24-h period
Effluent Water Collection Date and Sample Times:	December 5, 2005 0600, 1200, 1800, 2400 December 6, 2005 0600

Acute 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-02-012, Fifth Edition, October 2002. Fathead minnows were exposed to 6.25, 12.5, 25, 50, and 100 percent effluent concentrations for 96 hours. *C. dubia* were exposed to the same concentrations of effluent for 48 hours. The acute fathead minnow test was set up on December 6, 2005 and completed on December 10, 2005. The acute *C. dubia* test was set up on December 6, 2005 and completed on December 8, 2005. Hard synthetic water with selenium (HSW) was used as control and dilution water. Statistical analyses were performed using the CETIS™ Software program version 1.1.1 (Tidepool Scientific Software, California).

Concurrent reference toxicant tests (RTT) using sodium chloride (NaCl) were conducted, and HSW was used as control and dilution water. The control charts for the *C. dubia* and fathead minnow acute tests were prepared (Appendix DI and DII).

Analysts

Vince Billett (Laboratory Technician II) conducted the WET tests. Jon Yamanaka (Biologist I) entered the raw data in an Excel program. Jon Yamanaka, Geeta Rijal (Microbiologist III), and James Zmuda (Microbiologist IV) prepared this report.

Results

Results of the acute fathead minnow and *C. dubia* WET tests are shown in Tables 2 and 3, respectively. No acute toxicity to fathead minnows or *C. dubia* was observed. The HSW control met USEPA test acceptability criteria. Results of concurrent reference toxicant tests using sodium chloride (NaCl) were within the prescribed limits, i.e. within ± 2 standard deviations from the mean.

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TABLE 2

ACUTE FATHEAD MINNOW TEST RESULTS

96-h LC ₅₀	> 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

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ACUTE *C. DUBIA* TEST RESULTS

48-h LC ₅₀	>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

Tabulated summaries of the fathead minnow and *C. dubia* WET tests are presented in Appendices AI and AII, respectively. Raw data for the fathead minnow and *C. dubia* 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 fathead minnow and *C. dubia* concurrent reference toxicant tests are provided in Appendices DI and DII, respectively.

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 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).

Date

Richard Lanyon
Director
Research and Development

If you have any questions concerning this report, telephone Dr. James T. Zmuda, Microbiologist IV, at 708-588-4224.