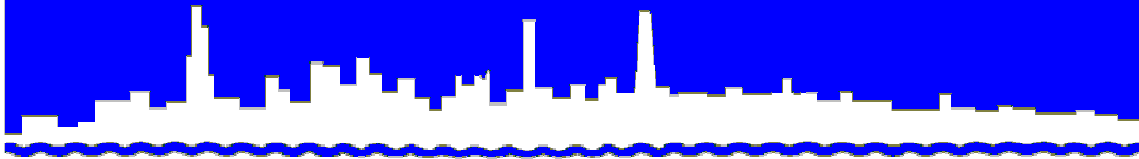


*Protecting Our Water Environment*



***Metropolitan Water Reclamation District of Greater Chicago***

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

***REPORT NO. 08-63***

***BIOMONITORING REPORT  
2008***

***CHRONIC WHOLE EFFLUENT TOXICITY TEST RESULTS  
FOR THE HANOVER PARK WATER RECLAMATION PLANT  
HANOVER PARK, ILLINOIS***

***NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER IL0036137, SEPTEMBER 2008***

***NOVEMBER 2008***

**Metropolitan Water Reclamation District of Greater Chicago**

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312-751-5600

Louis Kollias, P.E., BCEE  
*Director of Research and Development*  
312-751-5190

November 13, 2008

Mr. Roger Calloway  
Environmental Specialist  
Compliance Assurance Section - 19  
Illinois Environmental Protection Agency  
1021 North Grand Avenue  
Springfield, IL 62794-9276

Dear Mr. Calloway:

Subject: Biomonitoring Report for 2008 – Chronic Whole Effluent Toxicity Test Results for the Hanover Park Water Reclamation Plant, Hanover Park, Illinois, National Pollutant Discharge Elimination System Permit Number IL0036137, September 2008

The subject biomonitoring report is submitted in compliance with the National Pollutant Discharge Elimination System Permit Number IL0036137, Special Condition 11.

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 Dr. Geeta Rijal, Microbiologist IV, at 708-588-4224.

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:GR:ss  
Enclosures  
cc w/enc: Jamjun/Gronski/Grabis/Granato  
Lazicki/O'Connor/Rijal/Glymph  
Yamanaka  
cc: Cohen (Transmittal letter and report title page)

**Metropolitan Water Reclamation District of Greater Chicago**

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BIOMONITORING REPORT  
2008

CHRONIC WHOLE EFFLUENT TOXICITY TEST RESULTS  
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Research and Development Department  
Louis Kollias, Director

NOVEMBER 2008

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## **ACKNOWLEDGEMENTS**

Ms. Susan M. Schaefer 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.

CHRONIC WHOLE EFFLUENT TOXICITY TEST RESULTS FOR THE  
HANOVER PARK WATER RECLAMATION PLANT, HANOVER PARK, ILLINOIS  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
PERMIT NUMBER IL0036137, SEPTEMBER 2008

## Summary

The chronic toxicity test with *Pimephales promelas* (*P. promelas*) (7-day, static, renewal), was conducted on samples of Hanover Park Water Reclamation Plant (WRP) final effluent collected September 8-13, 2008. The results indicated that the test was valid. No toxic effect on *P. promelas* larval survival or growth was observed. Results of the quality control chronic toxicity test with *P. promelas* using the reference toxicant sodium chloride (NaCl) fell within control chart limits prescribed as acceptable by the United States Environmental Protection Agency (USEPA).

The chronic toxicity test with *Ceriodaphnia dubia* (*C. dubia*) (7-day, static, renewal) was conducted on samples of the Hanover Park WRP final effluent collected September 8-13, 2008. The results indicated that the test was valid. No toxic effect on *C. dubia* survival or reproduction was observed. Results of the quality control chronic 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 Hanover Park WRP final effluent collected on September 8 through September 13, 2008 for the chronic toxicity tests. 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 11°C. Samples were stored in the laboratory at 4 ± 1°C. Sample collection information is shown in Table 1.

## Whole Effluent Toxicity Tests

The chronic toxicity tests with *P. promelas* and *C. dubia* were conducted on the Hanover Park WRP effluent samples collected September 8 through September 13, 2008. Chronic Whole Effluent Toxicity (WET) test methods and procedures were followed in accordance with *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, EPA 821/R-02/013, Fourth Edition, October 2002. *P. promelas* were exposed to 12.5, 25, 50, 75, and 100 percent concentration of final effluent for seven days. *C. dubia* were exposed to the same concentrations of effluent for seven days.



TABLE 1: SAMPLE COLLECTION INFORMATION

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Effluent Collection Point:	Hanover Park Water Reclamation Plant Effluent Discharge
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Effluent Collection Method:	Three 24-hour composite samples. Five 2 1/2 gallon grab samples collected over a 24-hour period were combined to make each 24-hour composite sample. The individual grab samples were collected at 6-hour intervals.
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Effluent Collection Times and Dates:

First Sample Set:	0600 September 8, 2008 1200 September 8, 2008 1800 September 8, 2008 2400 September 8, 2008 0600 September 9, 2008
Second Sample Set:	0600 September 10, 2008 1200 September 10, 2008 1800 September 10, 2008 2400 September 10, 2008 0600 September 11, 2008
Third Sample Set:	0600 September 12, 2008 1200 September 12, 2008 1800 September 12, 2008 2400 September 12, 2008 0600 September 13, 2008

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The chronic fathead minnow test (*P. promelas*) was set up on 09/10/08 and completed on 09/17/08. The chronic *C. dubia* test was set up on 09/10/08 and completed on 09/17/08. Hard synthetic water (HSW) with selenium was used as control and dilution water for both test species. The laboratory controls met USEPA test acceptability criteria for both test species. Statistical analyses were performed using the CETIS™ Software program version 1.6.3 revE (Tidepool Scientific Software, California).

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

## Analysts

WET tests were conducted by G. V. Billett (Laboratory Technician II), Hema Shukla (Laboratory Technician II), and Jon Yamanaka (Biologist I). Jon Yamanaka entered the raw data in an Excel and CETIS™ program. Jon Yamanaka, Auralene Glymph (Microbiologist III), and Geeta Rijal (Microbiologist IV) prepared this report.

## Results

Results of the chronic *P. promelas* WET test are shown in [Table 2](#). The *P. promelas* test indicated a valid test. No toxic effect on *P. promelas* larval survival or growth was observed. The HSW control water met the test acceptability criteria (>90% survival) for the *P. promelas* test. Results of the quality control chronic 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 chronic *C. dubia* WET test are shown in [Table 3](#). The *C. dubia* test indicated a valid test. No toxic effect on *C. dubia* survival or reproduction was observed. The HSW control water met the test acceptability criteria (>90% survival) for the *C. dubia* test. Results of the quality control chronic 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 chronic 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* monthly reference toxicant tests are provided in [Appendices DI](#) and [DII](#), respectively.

TABLE 2: CHRONIC *PIMEPHALES PROMELAS* TEST RESULTS

Chronic Test Parameters	Results
NOEC <sup>1</sup> Value (Survival)	100%
NOEC Value (Growth)	100%
IC <sub>25</sub> (Growth)	>100%
Minimum Significant Difference (MSD) <sup>2</sup> : <i>P. promelas</i> (Survival)	7.81% ( $\alpha=0.05$ )
Minimum Significant Difference (MSD) <sup>2</sup> : <i>P. promelas</i> (Growth)	15.2% ( $\alpha=0.05$ )
Toxicity Observed	No
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

<sup>1</sup>No observed effect concentration

<sup>2</sup>Passes MSD test acceptability criteria (12-30%)

TABLE 3: CHRONIC *CERIODAPHNIA DUBIA* TEST RESULTS

Chronic Test Parameters	Results
NOEC <sup>1</sup> Value (Survival)	100%
NOEC Value (Reproduction)	100%
IC <sub>25</sub> (Growth)	>100%
Minimum Significant Difference (MSD) <sup>2</sup> : <i>C. dubia</i> (Survival)	31.2% ( $\alpha=0.05$ )
Minimum Significant Difference (MSD) <sup>2</sup> : <i>C. dubia</i> (Reproduction)	15.6% ( $\alpha=0.05$ )
Toxicity Observed	No
Valid Test	Yes
Concurrent Reference Toxicant Test in Control	Yes

<sup>1</sup>No observed effect concentration

<sup>2</sup>Passes MSD test acceptability criteria (13-47%)

**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).

\_\_\_\_\_  
Date

\_\_\_\_\_  
Louis Kollias  
Director  
Research and Development

If you have any questions concerning this report, please contact Dr. Geeta Rijal, Microbiologist IV, at 708-588-4224.