


Bioassays of

# Cocoa Water Reclamation Facility

Cocoa, Brevard County, Florida

NPDES #FL0021521

Sampled 11/5/01

May 2002

**Biology Section**

**Division of Resource Assessment & Management**

Comprehensive Quality Assurance Plan #870346G

Bioassays of

# **Cocoa Water Reclamation Facility**

Cocoa, Brevard County, Florida

NPDES #FL0021521

**Biology Section**
**Bureau of Laboratories**
**May 2002**

## Introduction

Cocoa Water Reclamation Facility (a.k.a. Jerry Sellers Water Reclamation Facility), 375 North Cocoa Boulevard County, Brevard Florida, NPDES #FL0021521, tests performed on 6 to 8 November 2001.

This domestic wastewater treatment plant has a design flow of 4.5 MGD and an annual average daily flow of 0.31 MGD. The wastewater treatment system uses a modified-Bardenpho® system that includes manual and mechanical influent screening, grit removal, odor control, dual fermentation basins, dual anoxic basins, three aeration basins, dual secondary anoxic basins, reaeration basin, dual secondary clarifiers, chemical feed facilities, flash mixers and flocculation, dual automatic backwash filters, dual chlorination basins, and dechlorination using sulfur dioxide gas. The method of disinfection was changed from chlorine gas to sodium hypochlorite in March of 2000. The residuals are aerobically digested and de-watered with a belt-press.

After treatment the effluent is periodically discharged during wet weather through Outfall D001 into the Class III marine waters of the Indian River Lagoon. Discharge through Outfall D001 during the last two years had been less than the 2184 hours permitted due to the high use of the facility's public access reclaimed water system R001 (facility summary provided by John B. Bowles, FDEP, Orlando).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

## Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent collected from this facility. The test species used for these bioassays were the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyrprinella leedsi*. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. Further chemical analyses were performed on the sample, and several metals, an herbicide, and a pesticide were identified (Table 2).

## Conclusion

The sample of effluent collected from this facility on November 5, 2001, did not show acute toxicity to either test species within 48 hours.

**Table 1.** Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Cocoa Water Reclamation Facility (a.k.a. Jerry Sellers WRF), 375 North Cocoa Boulevard, Cocoa, Brevard County, Florida, NPDES# FL0021521 performed from 6 to 8 November 2001.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | **Cocoa WRF (Jerry Sellers WRF)** | | **NPDES #** | **FL0021521** | Facility Type: | **Water Reclamation Facility** | **Analysts:** Della Parker-Hanson, Joshua Ayres, Marshall Faircloth |
| Location: | 375 North Cocoa Boulevard | | Contact/District: | Phil Kane/ Central | | | |
| County: | Brevard | | Test type: | static acute screen | | | |
| Sample Collection Date: | 11/5/01 | Time: 0945 | # tests: | 2 | Receiving Water: | Indian River Lagoon | |
| Test Beginning Date: | 11/6/01 | Time: 1300 | Chlorination Type: | chlorinated | | | |
| Test Ending Date: | 11/8/01 | Time: 1350 | | sample collected after dechlorination | | **Page 1 of 1** | **Reviewer:** David Whiting |

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[A] | | | Dissolved Oxygen | | | Conductivity Uncorrected ì mhos/cm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | Volume(mL) | 0 hr | 24 hr | 48 hr | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 48 hour |
| Control A | 0/20 | 5 | 5 | 5 | 8.2 | - | 8.3 | 23.0 | - | 24.6 | 7.9 | - | 7.7 | 165 | 200 |
| Control B | 0/20 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.6 | - | - | 7.6 | - | 185 |
| Control C | 0/20 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.4 | - | - | 7.6 | - | 180 |
| Control D | 0/20 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.1 | - | - | 7.6 | - | 190 |
| 100% A | 20/0 | 5 | 5 | 5 | 7.3 | - | 8.4 | 25.7 | - | 24.5 | 6.8 | - | 7.7 | 765 | 865 |
| 100% B | 20/0 | 5 | 5 | 4 | - | - | 8.4 | - | - | 24.4 | - | - | 7.7 | - | 880 |
| 100% C | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.3 | - | - | 7.7 | - | 845 |
| 100% D | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 24.0 | - | - | 7.7 | - | 865 |

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-25.2 °C.
Incubator #2 temperature range for the test period was 25.0-26.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 9 days

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[B] | | | Dissolved Oxygen | | | Conductivity Uncorrected ì mhos/cm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | Volume(mL) | 0 hr | 24 hr | 48 hr | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 24 hour | 48 hour | 0 hour | 48 hour |
| Control A | 0/500 | 5 | 5 | 5 | 7.8 | 8.5 | 8.6 | 23.7 | 24.7 | 24.4 | 7.4 | 7.5 | 7.5 | 260 | 325 |
| Control B | 0/500 | 5 | 5 | 5 | 7.8 | 8.5 | 8.6 | 23.5 | 24.4 | 24.5 | 7.4 | 7.3 | 7.5 | 260 | 330 |
| Control C | 0/500 | 5 | 5 | 5 | 7.8 | 8.5 | 8.6 | 23.5 | 24.4 | 24.3 | 7.4 | 7.1 | 7.5 | 265 | 310 |
| Cotnrol D | 0/500 | 5 | 5 | 5 | 7.8 | 8.5 | 8.6 | 23.5 | 24.6 | 24.3 | 7.4 | 7.1 | 7.6 | 265 | 315 |
| 100% A | 500/0 | 5 | 5 | 5 | 7.3 | 8.1 | 8.3 | 25.7 | 24.6 | 24.3 | 6.8 | 6.9 | 7.5 | 785 | 915 |
| 100% B | 500/0 | 5 | 5 | 5 | 7.3 | 8.1 | 8.3 | 25.9 | 24.9 | 24.4 | 6.7 | 6.9 | 7.5 | 815 | 920 |
| 100 % C | 500/0 | 5 | 5 | 5 | 7.3 | 8.1 | 8.3 | 26.0 | 24.7 | 24.7 | 6.6 | 6.9 | 7.3 | 820 | 930 |
| 100% D | 500/0 | 5 | 4 | 4 | 7.3 | 8.1 | 8.3 | 26.1 | 24.3 | 24.6 | 6.5 | 6.9 | 7.2 | 825 | 970 |

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-25.2°C.
Incubator #3 temperature range for the test period was 24.5-25.5°C.

| **Data Transcription Verification** | |
|---|---|
| date: | 1/17/02 |
| by: | Cathy Oaks<br>Della Parker-Hanson |

| **LIMS** | |
|---|---|
| Job number: | TLH-2001-11-06-06 |
| Sample number: | 558601 |

| **Total Residual CL2** | mg/L | Method |
|---|---|---|
| Field: | <0.01 | - |
| Lab: | <0.03 | Hach |

| **Ammonia** | Total (mg/L) | Unionized (mg/L) |
|---|---|---|
| Control water (fish): | <0.017 | <0.017 |
| Control water (water flea): | <0.017 | <0.017 |
| 100% Sample: | <0.017 | <0.017 |

| **Alk & Hardness** | Alkalinity (mg/L) | Hardness (mg/L) |
|---|---|---|
| Control water (fish): | 148 | 144 |
| Control water (water flea): | 78 | 81 |
| 100% Sample: | 93 | 139 |

**Table 2. Results of chemical analyses on the effluent from Cocoa Water Reclamation Facility (a.k.a. Jerry Sellers WRF) sampled on November 5, 2001.**

### Metals

| | | | |
|---|---|---|---|
| Calcium | 41.9 | mg/L | |
| Copper | 2.17 | µg/L | |
| Iron | 41 | µg/L | I |
| Magnesium | 7.5 | mg/L | |
| Selenium | 0.57 | µg/L | I |
| Silver | 0.023 | µg/L | I |

### Pesticides and Herbicides

| | | | |
|---|---|---|---|
| Atrazine | 0.058 | µg/L | I |
| Fonofos | 0.12 | µg/L | I |

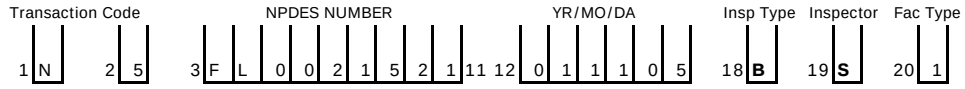
### Base, Neutral, & Acid Extractable Organics

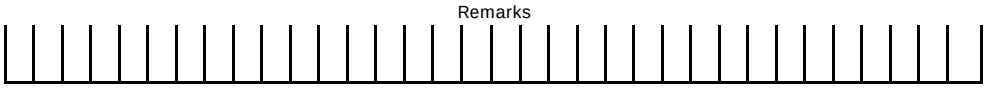
None detected

[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

**The Bioassay of Cocoa Water Reclamation Facility (a.k.a Jerry Sellers WRF) effluent sampled on November 5, 2001, NPDES #FL0021521.**

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)




**The Priority Pollutants Analysis for Bioassay of Cocoa Water Reclamation Facility (a.k.a Jerry Sellers WRF) effluent sampled on November 5, 2001, NPDES #FL0021521.**

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

