# Florida

## Department of Environmental Protection

Bioassays of

**Florida State Hospital Wastewater Treatment Plant**

Chattahoochee, Gadsden County, Florida

NPDES #FL0031402

Sampled 12/6/93

**February 1994**

**Biology Section**
**Division of Technical Services**

Bioassays of

# Florida State Hospital Wastewater Treatment Plant

Chattahoochee, Gadsden County, Florida

NPDES #FL0031402

**Biology Section**
**Bureau of Laboratories**
**February 1994**

## Introduction

Florida State Hospital WWTP, Chattahoochee, Gadsden County, Florida, NPDES #FL0031402, tests performed on 7 to 9 December, 1993.

This wastewater treatment plant is located on U.S. Highway 90 in Chattahoochee. It has a design flow of 1.3 MGD and discharges an average flow of 0.383 MGD to Mosquito Creek, a tributary of the Apalachicola River. Treatment of wastewater consists of primary clarification, biological treatment using activated sludge, secondary clarification, chlorination, and dechlorination with sulfur dioxide prior to discharge (facility summary provided by D. Gorres, FDEP Pensacola).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition (EPA/600/4-90/027).

## Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi* (formerly *Notropis leedsi*). The test results did not indicate toxicity. No mortality occurred in either test.

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample and several metals were identified (Table 2). Pesticides and organics were not detected.

## Conclusion

The sample of effluent from this facility, collected on 6 December, 1993, did not show toxicity.

**Table 1. Concentration series and volumes used for the 48-hour static acute screening toxicity bioassays of the Florida State Hospital WWTP effluent performed on 07 to 09 December, 1993.**

*Ceriodaphnia dubia* (water flea)

| Concentration | Dilution Water | Sample | Total Volume |
|---|---|---|---|
| Control | 20 mL | 0 mL | 20 mL |
| 100 % | 0 mL | 20 mL | 20 mL |

*Cyprinella leedsi* (bannerfin shiner, formerly *Notropis leedsi*)

| Concentration | Dilution Water | Sample | Total Volume |
|---|---|---|---|
| Control | 500 mL | 0 mL | 500 mL |
| 100 % | 0 mL | 500 mL | 500 mL |

Table 2. Results of chemical analyses on the effluent from Florida State Hospital WWTP, sampled on 6 December, 1993.

## Metals

| | | |
|---|---|---|
| Calcium | 33 | mg/L |
| Copper | 6 | µg/L [I] |
| Iron | 65 | µg/L |
| Magnesium | 7.5 | mg/L |
| Zinc | 28 | µg/L |

## Pesticides & Herbicides

None Detected

## Base-Neutral & Acid Extractables

None Detected

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

**Table 3.** Data recorded during the 48-hour static acute screening bioassays of a sample of effluent from the Florida State Hospital WWTP, Chattahoochee, Gadsden County, Florida, NPDES# FL0031402, performed on 7 to 9 December, 1993.

| | | | | | |
|---|---|---|---|---|---|
| Facility: | Florida State Hospital WWTP | | NPDES # | FL0031402 | Facility Type: Wastewater Treatment Plant |
| Location: | Chattahoochee | | Contact/District: | Glenn Butts/NW | |
| County: | Gadsden | | Test type: | static acute screen | |
| Sample Collection Date: | 12/6/93 | Time: 1050 | # tests: | 2 | Receiving Water: Mosquito Creek to Apalachicola River |
| Test Beginning Date: | 12/7/93 | Time: 1130 | Chlorination Type: | Sample collected after dechlorination | |
| Test Ending Date: | 12/9/93 | Time: 1130 | | | Page 1 of 1 |

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

| | SURVIVAL | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 24 hr | Live at 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 | 5 | 5 | 5 | 8.2 | - | 8.0 | 22.3 | - | 24.0 | 8.7 | - | 8.0 | 170 | 180 |
| Control | 5 | 5 | 5 | - | - | 8.0 | - | - | 24.0 | - | - | 8.0 | - | 180 |
| Control | 5 | 5 | 5 | - | - | 8.1 | - | - | 24.0 | - | - | 8.0 | - | 180 |
| Control | 5 | 5 | 5 | - | - | 8.1 | - | - | 24.0 | - | - | 8.0 | - | 190 |
| 100% | 5 | 5 | 5 | 7.5 | - | 8.3 | 23.3 | - | 24.0 | 8.4 | - | 8.0 | 450 | 455 |
| 100% | 5 | 5 | 5 | - | - | 8.3 | - | - | 24.0 | - | - | 8.0 | - | 475 |
| 100% | 5 | 5 | 5 | - | - | 8.3 | - | - | 24.1 | - | - | 8.0 | - | 455 |
| 100% | 5 | 5 | 5 | - | - | 8.3 | - | - | 24.1 | - | - | 8.0 | - | 475 |

Organism: ***Cyprinella leedsi*** Age: 11 days

| | SURVIVAL | | | pH | | | Temperature | | | Dissolved Oxygen | | | Conductivity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentrations | # at 0 hr | Live at 24 hr | Live at 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 | 5 | 5 | 5 | 7.8 | 8.2 | 8.2 | 25.5 | 22.5 | 22.3 | 8.2 | 8.7 | 8.3 | 255 | 240 |
| Control | 5 | 5 | 5 | 7.8 | 8.2 | 8.2 | - | - | 22.3 | 8.2 | 8.8 | 8.3 | 255 | 240 |
| 100% | 5 | 5 | 5 | 7.4 | 7.9 | 8.0 | 25.8 | 22.6 | 22.3 | 8.5 | 8.6 | 8.3 | 500 | 565 |
| 100% | 5 | 5 | 5 | 7.4 | 7.9 | 8.0 | - | - | 22.3 | 8.5 | 8.6 | 8.2 | 500 | 570 |

| Total Residual Cl2 | mg/L | Method |
|---|---|---|
| Field: | < 0.01 | DR-100 |
| Lab: | < 0.03 | DR-100 |

| Ammonia | Total (mg/L) | Unionized (mg/L) |
|---|---|---|
| Control Water (fish): | <0.017 | 0.00 |
| 20% Dilute Mineral Water (cladocerans): | <0.017 | 0.00 |
| 100% Sample: | <0.017 | 0.00 |

| Alk & Hardness | Alkalinity (mg/L) | Hardness (mg/L) |
|---|---|---|
| Control Water (fish): | 125 | 120 |
| 20% Dilute Mineral Water (cladocerans): | 70 | 80 |
| 100% Sample: | 115 | 120 |

| Salinity | (ppt) |
|---|---|
| Control Water: | 0 |
| 100% Sample: | 0 |

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida State Hospital
Location:
County: Gadsden
Contact/District: Chem Lab/NW
NPDES Permit #: FL0031402 Outfall #:
Lims 93DEC0609 66807

Sample Collection: Date 12/2/93 Time 1050
Test Beginning: Date 12/7/93 Time 1130
Test Ending: Date 12/9/93 Time 1130
Organism Batch #: 1211 Diluent Batch #: 32
Organism Age: <24 hrs
*Test Organism:* Ceriodaphnia dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

| | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>9.0 @ 9.0 | 21.8 @ 21.8 | 8.5 @ 23.4 | 970 @ 1,000<br>9320 @ 10,000 @ 23.0°C |
| 24 hr | 7.0 @ 7.0<br>9.0 @ 9.0 | 21.3 @ 21.4 | 8.8 @ 21.5 | 969 @ 1,000<br>9320 @ 10,000 @ 23.0°C |
| 48 hr | 7.0 @ 7.0<br>9.0 @ 9.0 | 24.0 @ 24.1 | 8.6 @ 23.0 | 970 @ 1,000<br>9320 @ 10,000 @ 23.0 °C |

| Conc. | Chamber # | Number Live 0 hr | Number Live 24 h | Number Live 48 h | pH 0 hr | pH 24 h | pH 48 h | Temperature (°C) 0 hr | Temperature (°C) 24 h | Temperature (°C) 48 h | D.O. (mg/L) 0 hr | D.O. (mg/L) 24 h | D.O. (mg/L) 48 h | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr | 24 h | 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | A | 5 | 5 | 5 | 8.2 | | 8.0 | 22.3 | | 24.0 | 8.4 | | 8.0 | 170 | | 180 |
| Control | B | 5 | 5 | 5 | | | 8.0 | | | 24.0 | | | 8.0 | | | 180 |
| Control | C | 5 | 5 | 5 | | | 8.1 | | | 24.0 | | | 8.0 | | | 180 |
| Control | D | 5 | 5 | 5 | | | 8.1 | | | 24.0 | | | 8.0 | | | 190 |
| 100% | A | 5 | 5 | 5 | 7.5 | | 8.3 | 23.3 | | 24.0 | 8.4 | | 8.0 | 450 | | 455 |
| 100% | B | 5 | 5 | 5 | | | 8.3 | | | 24.0 | | | 8.0 | | | 475 |
| 100% | C | 5 | 5 | 5 | | | 8.3 | | | 24.1 | | | 8.0 | | | 455 |
| 100% | D | 5 | 5 | 5 | | | 8.3 | | | 24.1 | | | 8.0 | | | 475 |
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| Measured/Loaded by: | | TM | MF | MC | MF | | TM | MF | | TM | MC | | TM | MF | | TM |
| Recorded by: | | TM | MF | TM | TM | | TR | TM | | TR | TM | | TR | TM | | TR |

Investigators' Signatures

Tina Mikulski
Marshall Faircloth
Robin C. Rader

Reviewer

form updated 7/8/93

| | Salt Water/ (Well Water) | 20% Min Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Total Residual Cl2: | | | <0.01 | DR-100 | GB |
| Lab Total Residual Cl2: | <0.03 | <0.03 | <0.03 | DR-100 | TM |
| Alkalinity: | 125 | 70 | 115 | Hach | TM |
| Hardness: | 120 | 80 | 120 | Hach | TM |
| Total Ammonia: | <0.017 | <0.017 | <0.017 | orion | MF |

Ammonia Meter #98136 Ammonia Meter Slope: -55.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Florida State Hospital
Location:
County: Gadsden
Contact/District: Glen Butts / NW
NPDES Permit #: FL00 31402 Outfall #:

Sample Collection: Date 12/6/93 Time 1050
Test Beginning: Date 12/7/93 Time 1130
Test Ending: Date 12/9/93 Time 1130
Organism Batch #: 51 Diluent Batch #: well
Organism Age: 11 days old
*Test Organism:* Cyprinella leedsi

Lims 93 DEC 06 09 66807

Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

| | pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm |
|---|---|---|---|---|
| meter # | 7851 | 90H018262 | 90H018262 | G9005749 |
| 0 hr | 7.0 @ 7.0<br>9.0 @ 10 | 21.8 @ 21.8 | 8.5 @ 23.4 | 970 @ 1,000<br>9320 @ 10,000 @ 23.0°C |
| 24 hr | 7.0 @ 7.0<br>9.0 @ 9.0 | 21.3 @ 21.4 | 8.8 @ 21.5 | 969 @ 1,000<br>9330 @ 10,000 @ 23.0°C |
| 48 hr | 7.0 @ 7.0<br>9.0 @ 9.0 | 24.0 @ 24.1 | 8.6 @ 23.0 | 970 @ 1,000<br>9320 @ 10,000 @ 23.0°C |

| Conc. | Chamber # | Number Live 0 hr | Number Live 24 h | Number Live 48 h | pH 0 hr | pH 24 h | pH 48 h | Temperature (°C) 0 hr | Temperature (°C) 24 h | Temperature (°C) 48 h | D.O. (mg/L) 0 hr | D.O. (mg/L) 24 h | D.O. (mg/L) 48 h | UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr | 24 h | 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control A | 3166 | 5 | 5 | 5 | 7.8 | 8.1 | 8.2 | 25.5 | 22.5 | 22.3 | 8.2 | 8.7 | 8.3 | 255 | 240 | 240 |
| Control B | 77 | 5 | 5 | 5 | 7.8 | 8.2 | 8.2 | | | 22.3 | 8.2 | 8.8 | 8.3 | 255 | 240 | 240 |
| 100% A | 22 | 5 | 5 | 5 | 7.4 | 7.9 | 8.0 | 25.8 | 22.6 | 22.3 | 8.5 | 8.6 | 8.3 | 500 | 470 | 565 |
| 100% B | 163 | 5 | 5 | 5 | 7.4 | 7.9 | 8.0 | | | 22.3 | 8.5 | 8.6 | 8.2 | 500 | 470 | 570 |
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| Measured/Loaded by: | | TM | MF | TM | MF | MF | TM | MF | MF | TM | MF | MF | TM | MF | MF | TM |
| Recorded by: | | TM | MF | TM | TM | MF | TR | TM | MF | TR | TM | MF | TR | TM | MF | TR |

Investigators' Signatures

Tina Mikulski
Marshall Faircloth
Tobin C. Rader

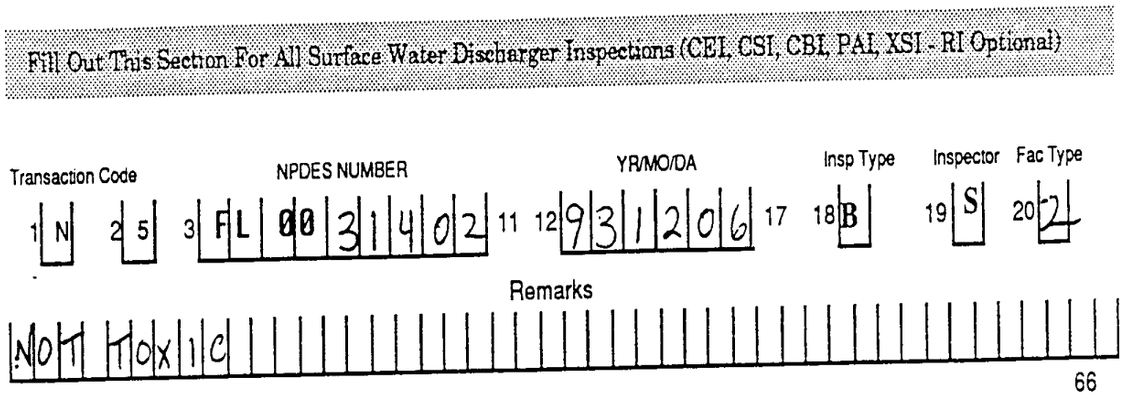
Reviewer

form updated 7/8/93

| | Salt Water/ Well Water | 20% Min Water | Sample | Method | Measured by |
|---|---|---|---|---|---|
| Field Total Residual Cl2: | | | <0.01 | DR 100 | GB |
| Lab Total Residual Cl2: | <0.03 | <0.03 | <0.03 | DR-100 | TM |
| Alkalinity: | 125 | 70 | 115 | Hach | TM |
| Hardness: | 120 | 80 | 120 | Hach | TM |
| Total Ammonia: | <0.017 | <0.017 | <0.017 | Orion | MF |

Ammonia Meter #98136 Ammonia Meter Slope: -55.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of Florida State Hospital effluent sampled on December 6, 1993, NPDES #FL0031402.




The Priority Pollutants Analyses for the Bioassay of Florida State Hospital effluent sampled on December 6, 1993, NPDES #FL0031402.

