


Bioassays of

# Bay County Regional Wastewater Treatment Plant

Panama City, Bay County, Florida

NPDES #FL0002631

Sampled 8/9/99

April 2000

**Biology Section**

**Division of Administrative & Technical Services**

Comprehensive Quality Assurance Plan #870346G

Bioassays of

# Bay County Regional Wastewater Treatment Plant

Panama City, Bay County, Florida

NPDES #FL0002631

**Biology Section**
**Bureau of Laboratories**
**April 2000**

## Introduction

Bay County Regional WWTP, Panama City Beach, Bay County, Florida, NPDES #FL0002631, tests performed from August 10 to12, 1999.

This wastewater treatment plant, also known as Bay County WWTF #1, is located at Military Point, on Tyndall AFB, Panama City. The facility has a design flow of 37.0 MGD and an annual mean flow of 29.8 MGD. Approximately 80% of the design flow is reserved for industrial wastewater and 20% of the design flow is reserved for domestic wastewater. This facility, a 69-acre aerated lagoon, provides final secondary treatment to wastewater from six separate upstream plants. Four of the six contributors are domestic sources (Bay County WWTF #2, City of Lynn Haven WWTP, Millville WWTP, and Tyndall AFB WWTF), and two are industrial sources (Stone Container, and Arizona Chemical Company). Wastewater is aerated in the stabilization basin prior to discharge to St. Andrew Bay. Accumulated sludge is removed from the lagoon basin for land application (facility summary provided by Steven Kelly, FDEP, Panama City).

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 from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity (Table 1).

Total residual chlorine was not detected in the sample. Total and unionized ammonia concentrations were 4.215 mg/L and 0.34 mg/L, respectively. Further chemical analyses were performed on the sample and several metals were identified. Oil and Grease were also found in the sample (Table 2).

## Conclusion

The sample of effluent collected from this facility on August 9, 1999, did not show toxicity.

**Table 1.** Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Bay County Regional WWTP, Panama City, Bay County, Florida, NPDES# FL0002631, performed from 10 to 12 August, 1999.

| | | | | | |
|---|---|---|---|---|---|
| Facility: | **Bay County Regional WWTP** | | **NPDES #** | **FL0002631** | Facility Type: **Wastewater Treatment Plant** |
| Location: | Tyndall AFB, Panama City | | Contact/District: | Glenn Butts/Northwest | |
| County: | Bay | | Test type: | static acute screen | |
| Sample Collection Date: | 8/9/1999 | Time: 1105 | # tests: | 2 | Receiving Water: St. Andrew Bay |
| Test Beginning Date: | 8/10/1999 | Time: 1500 | Chlorination Type: | Not chlorinated | |
| Test Ending Date: | 8/12/1999 | Time: 1510 | | | **Page 1 of 1** |

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

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[A] | | | Dissolved Oxygen | | | Conductivity Uncorrected µmhos/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 | 8.0 | - | 8.0 | 24.2 | - | 25.3 | 7.8 | - | 8.0 | 170 | 185 |
| Control B | 0/20 | 5 | 5 | 5 | - | - | 8.0 | - | - | 25.2 | - | - | 8.0 | - | 180 |
| Control C | 0/20 | 5 | 5 | 5 | - | - | 8.0 | - | - | 25.0 | - | - | 8.1 | - | 180 |
| Control D | 0/20 | 5 | 5 | 5 | - | - | 8.0 | - | - | 25.0 | - | - | 8.1 | - | 190 |
| 100% A | 20/0 | 5 | 5 | 5 | 8.0 | - | 8.3 | 24.9 | - | 25.4 | 7.2 | - | 7.5 | 1950 | 2120 |
| 100% B | 20/0 | 5 | 5 | 5 | - | - | 8.3 | - | - | 25.3 | - | - | 7.5 | - | 2110 |
| 100% C | 20/0 | 5 | 5 | 5 | - | - | 8.3 | - | - | 25.3 | - | - | 7.6 | - | 2100 |
| 100% D | 20/0 | 5 | 5 | 5 | - | - | 8.4 | - | - | 25.2 | - | - | 7.6 | - | 2210 |

[A] Temperature of test incubator and temperature of room were continously recorded on a strip chart recorder.
Incubator #2 temperature range for the test period was 24.5-26.0°C.
Room temperature range for the test period was 24.5-27.0 °C.

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

| | Sample/Diluent | SURVIVAL # Alive | | | pH | | | Temperature[B] | | | Dissolved Oxygen | | | Conductivity Uncorrected µmhos/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 | 7.6 | 8.2 | 8.1 | 25.2 | 25.5 | 24.9 | 7.8 | 7.2 | 7.6 | 255 | 250 |
| Control B | 0/500 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 25.0 | 25.2 | 7.8 | 7.4 | 7.4 | 255 | 260 |
| Control C | 0/500 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 24.7 | 25.2 | 7.7 | 7.6 | 7.4 | 250 | 260 |
| Control D | 0/500 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 24.6 | 25.2 | 7.8 | 7.7 | 7.5 | 255 | 270 |
| 100% A | 500/0 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.3 | 24.8 | 24.2 | 7.5 | 6.5 | 6.8 | 1970 | 2080 |
| 100% B | 500/0 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.7 | 25.4 | 7.5 | 6.5 | 6.1 | 2040 | 2150 |
| 100% C | 500/0 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.5 | 25.2 | 7.4 | 6.5 | 6.2 | 2030 | 2130 |
| 100% D | 500/0 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.1 | 25.2 | 7.5 | 6.4 | 6.0 | 2040 | 2160 |

[B] Temperature of test incubator and temperature of room were continously recorded on a strip chart recorder.
Incubator #3 temperature range for the test period was 25.0-25.52 °C.
Room temperature range for the test period was 24.5-27.0 °C.

| **Total Residual CL2** | mg/L | Method |
|---|---|---|
| Field: | not measured | |
| Lab: | <0.03 | DR-100 |

| **Ammonia** | Total (mg/L) | Unionized (mg/L) |
|---|---|---|
| Control Water (fish): | < 0.017 | <0.017 |
| 20% Dilute Mineral Water (cladocerans): | < 0.017 | <0.017 |
| 100% Sample: | 4.215 | 0.34 |

| **Alk & Hardness** | Alkalinity (mg/L) | Hardness (mg/L) |
|---|---|---|
| Control Water (fish): | 130 | 130 |
| 20% Dilute Mineral Water (cladocerans): | 75 | 85 |
| 100% Sample: | 265 | 268 |

| **Salinity[C]** | (ppt) |
|---|---|
| Control Water: | <1 |
| 100% Sample: | <1 |

[C] Salinity based on conductivity and temperature measurements.

**Table 2. Results of chemical analyses on the effluent from the Bay County Regional Wastewater Treatment Plant sampled on August 9, 1999.**

### Metals

| | | |
|---|---|---|
| Aluminum | 1720 | µg/L[A] |
| Arsenic | 12 | µg/L[I] |
| Cadmium | 0.133 | µg/L[I] |
| Calcium | 78.1 | mg/L[A] |
| Chromium | 2.5 | µg/L[A] |
| Copper | 3.91 | µg/L[A] |
| Iron | 360 | µg/L[A] |
| Magnesium | 13.7 | mg/L[A] |
| Nickel | 7.6 | µg/L[A] |
| Silver | 0.0681 | µg/L[I] |
| Zinc | 16 | µg/L[I] |

### Pesticides and Herbicides

none detected

### Base, Neutral, & Acid Extractable Organics

none detected

### Oil and Grease

| | | |
|---|---|---|
| Oil and Grease | 5.0 | mg/L[K] |

A Value reported is the mean of two or more determinations.

I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

K Actual value is known to be less than value given.

# FDEP Biology Section — Acute Bioassay Bench Sheet

**Sample Source:** Bay Co. WWTP
**County:** BAY
**Contact / District:** Northwest
**NPDES Permit #:** FL0002631
**LIMS Sample #:** 400547 **LIMS Job #:** TLH-1999-08-10-15
sample log 8/13/99 dw/mf

**Sample Collection:** Date 8/9/99 Time 1105
**Test Beginning:** Date 8/10/99 Time 1500
**Test Ending:** Date 8/12/99 Time 1510
**Organism Batch #:** 60 **Diluent Batch #:** well
**Organism Age:** 11 days SRT toxicant batch #: —
*Test organism:* Cyprinella leedsi

Remarks:

**Test Type:** Screening | Definitive
(Static) | Static Renewal | Flow-through
**Test Number:** 2 of 2

| 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) (µmhos/cm) 0 hr | UNCORRECTED Cond. (µmhos/cm) 24 h | UNCORRECTED Cond. (µmhos/cm) 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ctl A | A9 | 5 | 5 | 5 | 7.6 | 8.2 | 8.1 | 25.2 | 25.5 | 24.9 | 7.8 | 7.2 | 7.6 | 255 | 250 | 250 |
| Ctl B | A10 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 25.0 | 25.2 | 7.8 | 7.4 | 7.4 | 255 | 250 | 260 |
| Ctl C | A11 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 24.7 | 25.2 | 7.7 | 7.6 | 7.4 | 250 | 255 | 260 |
| Ctl D | A12 | 5 | 5 | 5 | 7.6 | 8.2 | 8.2 | 25.1 | 24.6 | 25.2 | 7.8 | 7.7 | 7.5 | 255 | 260 | 270 |
| 100% A | A13 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.3 | 24.8 | 24.2 | 7.5 | 6.5 | 6.8 | 1970 | 1980 | 2080 |
| 100% B | A14 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.7 | 25.4 | 7.5 | 6.5 | 6.1 | 2040 | 2020 | 2150 |
| 100% C | A15 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.5 | 25.2 | 7.4 | 6.5 | 6.2 | 2030 | 2040 | 2130 |
| 100% D | A16 | 5 | 5 | 5 | 8.0 | 8.1 | 8.1 | 25.1 | 24.1 | 25.2 | 7.5 | 6.4 | 6.0 | 2040 | 2030 | 2160 |
| measured by: (Lead) | | DW | SG | CH | MF | CH | CH | MF | CH | CH | MF | CH | CH | MF | CH | CH |
| recorded by: | | CH | SG | CH | CH | SG | CH | CH | SG | CH | CH | SG | CH | CH | SG | CH |

Investigators' Signatures

Temperature Range °C
Incubator # 3 25.0-25.5°C
Room 24.5-27.0°C

| Water Quality Parameters | Salt Water / Well Water | 20% Min Water | Sample | Method | Measured by | Verified by |
|---|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | not measured | | | |
| Lab Total Residual Cl2 (mg/L): | | | <0.03 | DR-100 | DW | MF |
| Alkalinity (mg/L as $CaCO_3$): | | | 265 | Hach | CH | MF |
| Hardness (mg/L as $CaCO_3$): | | | 268 | Hach | CH | MF |
| Total ammonia (mg/L as N): | | | 4.215 | Darwin | MF | |
| Salinity: | | | <1 | YCT | CH | MF |

reviewer form updated 3/3/99

# FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bay Co. WWTP
County: BAY
Contact / District: / Northwest
NPDES Permit #: FL0002631
LIMS Sample #: 400547 LIMS Job #: TLH-19990810-15
sample log 8/18/99 DW/MF
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 1 of 2

Sample Collection: Date 8/9/99 Time 1105
Test Beginning: Date 8/10/99 Time 1500
Test Ending: Date 8/12/99 Time 1510
Organism Batch #: 39 Diluent Batch #: 33
Organism Age: <24hr SRT toxicant batch #: —

Test organism: Ceriodaphnia dubia

Remarks: Sample aerated for 30 min, DO after aeration 7.7; DO before aeration 2.7

| 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) 0 hr | UNCORRECTED Cond. (mmhos/cm) 24 h | UNCORRECTED Cond. (mmhos/cm) 48 h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTL | A | 5 | 5 | 5 | 8.0 | | 8.0 | 24.2 | | 25.3 | 7.8 | | 8.0 | 170 | | 185 |
| CTL | B | 5 | 5 | 5 | | | 8.0 | | | 25.2 | | | 8.0 | | | 180 |
| CTL | C | 5 | 5 | 5 | | | 8.0 | | | 25.0 | | | 7.1 | | | 180 |
| CTL | D | 5 | 5 | 5 | | | 8.0 | | | 25.0 | | | 8.1 | | | 190 |
| 100% | A | 5 | 5 | 5 | 8.0 | | 8.3 | 24.9 | | 25.4 | 7.2 | | 7.5 | 1950 | | 2120 |
| 100% | B | 5 | 5 | 5 | | | 8.3 | | | 25.3 | | | 7.5 | | | 2110 |
| 100% | C | 5 | 5 | 5 | | | 8.3 | | | 25.3 | | | 7.6 | | | 2110 |
| 100% | D | 5 | 5 | 5 | | | 8.4 | | | 25.2 | | | 7.6 | | | 2210 |
| measured by: | | MF | MF | SH | CH | | MF | CH | | MF | CH | | | CH | | MF |
| recorded by: | | MF | MF | SH | MF | | SH | MF | | SH | MF | | | MF | | SH |

Investigators' Signatures

Marshall Fairchild

Courtney Heard

Shannon Gerardi

reviewer

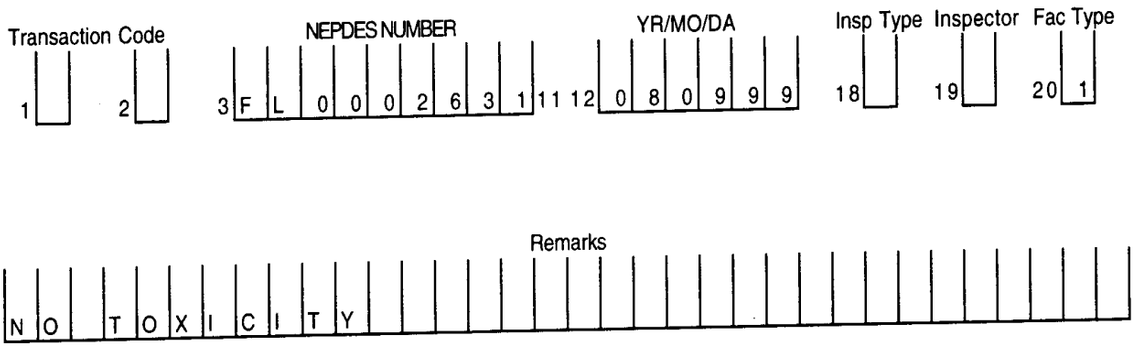
form updated 3/3/99

Temperature Range °C
Incubator # 2 24.5-26.0°C
Room 24.5 - 27.0°C

| | Salt Water / Well Water | Water Quality Parameters: 20% Min Water | Sample | Method | Measured by | Verified by |
|---|---|---|---|---|---|---|
| Field Total Residual Cl2 (mg/L): | | | NOT measured | | | |
| Lab Total Residual Cl2 (mg/L): | | <0.03 | <0.03 | DR-180 | DW | MF |
| Alkalinity (mg/L as $CaCO_3$): | | 75 | 265 | Hach | CH | MF |
| Hardness (mg/L as $CaCO_3$): | | 85 | 268 | Hach | CH | MF |
| Total ammonia (mg/L as N): | | <0.017 | 4.215 | Denver | MF | |
| Salinity: | | 0 | <1 | YCT | CH | MF |

**The Bioassay of the Bay County Regional WWTP effluent sampled on August 9, 1999, NPDES #FL0002631.**

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




**The Priority Pollutants Analysis for Bioassay of the Bay County Regional WWTP effluent sampled on August 9, 1999, NPDES #FL0002631.**

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

