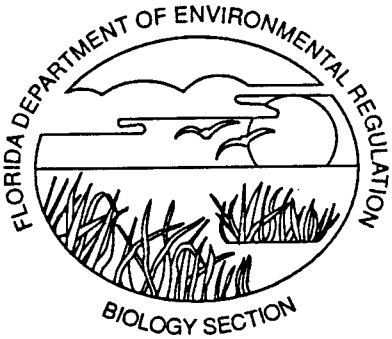


Bioassays of

Fiesta Village Sewage Treatment Plant

Fort Myers, Lee County, Florida

NPDES #FL0030317

Sampled 5/16/88

September 20, 1988

Biology Section
Division of Administrative and Technical Services

Bioassays of

Fiesta Village Sewage Treatment Plant

Fort Myers, Lee County, Florida

NPDES #FL0030317

Biology Section
Bureau of Laboratories
September 20, 1988

Executive Summary

Fiesta Village STP, Fort Myers, Lee County, Florida, NPDES #FL0030317, on 17 to 19 May, 1988.

The sample of recovered water from the Fiesta Village STP was not toxic to the water fleas, *Ceriodaphnia dubia* and *Daphnia pulex*, nor to the fish, *Notropis leedsi*. The sample was toxic to the Microtox® assay organism, *Photobacterium phosphoreum*, producing an EC_{50} of 166.0%.

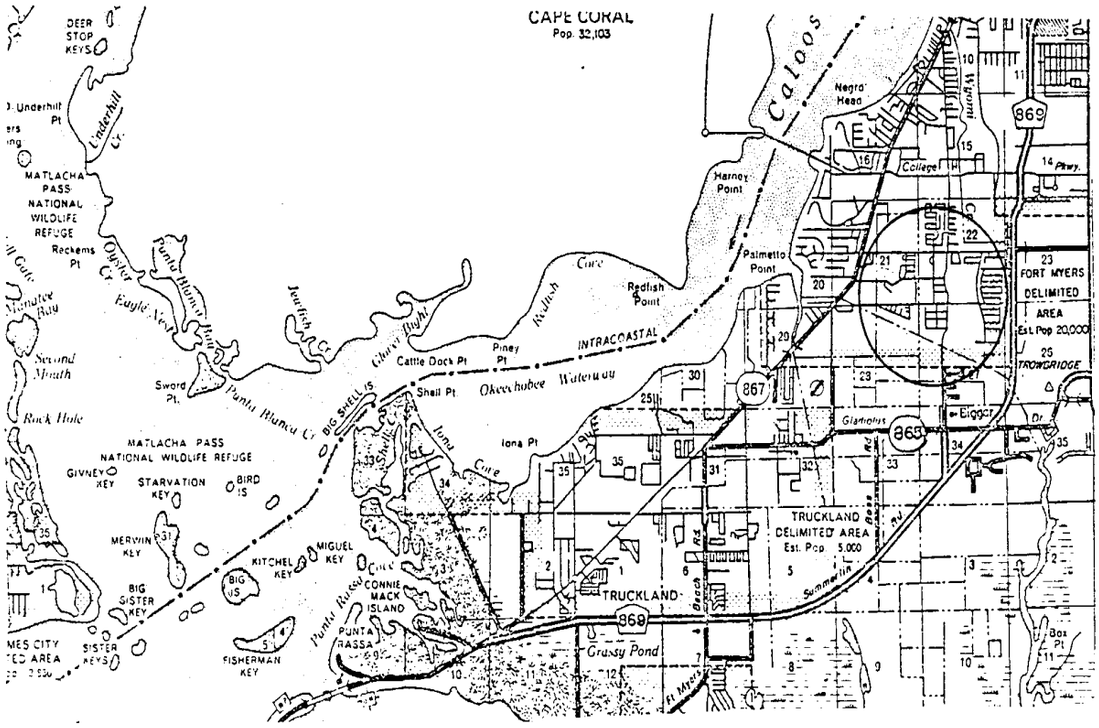
The field measurement for the total residual chlorine indicated a concentration of 2.3 mg/l, whereas, the lab measurement indicated no total residual chlorine. This may be the result of the sample being taken at the location where dechlorination by SO_2 injection occurs.

Chemical analyses were performed on the sample because of the scheduled Compliance Screening Toxic Review. The analyses revealed the presence of three unidentified components sensitive to ECD (Electron Capture Detectors) and one unidentified component sensitive to NPD (Nitrogen Phosphorus Detectors). The metal zinc was also detected (18.0 µg/l).

Introduction

The Fiesta Village STP is located at 1366 San Sousi Drive, Fort Myers, Lee County, Florida (Figure 1). This facility serves a population of 21,045 and has an average daily flow of 1.57 MGD with a design flow of 2.5 MGD. The facility is an advanced wastewater treatment plant. The treatment consists partly of activated sludge with extended aeration and with chemical removal of nitrogen and phosphorus. The facility has had an SO_2 injection (dechlorination) system in operation since January 1, 1988. The facility discharges through Outfall #001 to the Caloosahatchee River.

In order to determine the existence and extent of toxicity of the discharge from this facility the Biology Section performed three acute toxicity bioassays and one Microtox® assay on a sample from this facility. The results of those tests are presented in this report. Those involved in performing the tests and in preparation of this report were: J. M. Faircloth, L. A. Williams, and S. H. Wolfe.



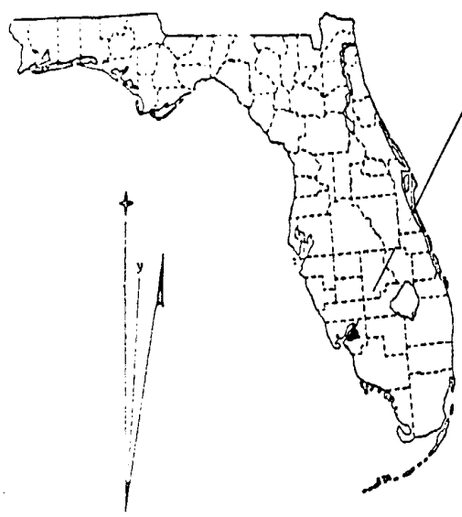


Figure 1. Portion of Lee County, Florida, including generalized location of Fiesta Village STP.

Methods and Materials

Test methods used to conduct these static bioassays are extensively described by Peltier and Weber (1985) and the FDER Biology Scction (1985). The organisms selected for this study include a species recommended by Peltier and Weber (1985), the U.S. EPA (1978), and the FDER Biology Section (1985). Additionally, the Biology Section maintains cultures of several species of organisms indigenous to the State of Florida. One of these indigenous species was also selected for testing. Life histories of these test organisms and maintenance procedures used to culture them are detailed below.

The Microtox® assay was run according to the manufacturer's protocol described in the Microtox® System Operating Manual (Beckman 1982).

1. History and Maintenance of Bioassay Organisms

Daphnia pulex (water flea)—A breeding culture of *Daphnia pulex* was obtained from the EPA laboratory in Athens, Georgia, in June, 1987. This culture has been maintained since its arrival in 2 1/2 gallon all-glass aquaria, filled with unchlorinated DER well water, under a 16:8 hour light-dark cycle. Organisms are fed a liquified blend of Purina Trout Chow® and Cerophyl® twice daily, once daily on weekends, and are kept at a constant temperature of 22 ±2 °C. The aquaria are cleaned weekly by siphoning off half the water along with the detritus and excess organisms, and then refilling with fresh aerated well water. Additional measures are taken and/or new cultures started in the event of abnormal circumstances such as: declining populations, ephippia formation, or excessive fungal or bacterial growth.

Ceriodaphnia dubia (water flea)—A breeding culture of *Ceriodaphnia dubia* was obtained from the EPA laboratory in Athens, Georgia, in June, 1985. The culture is maintained in 2-1/2 gallon all-glass aquaria, filled with unchlorinated DER well water, under a 16:8 hour light-dark cycle. Organisms are fed a liquified blend of Purina Trout Chow®, Cerophyl® and Fleischmann's® yeast twice daily, once daily on weekends, and are kept at a constant temperature of 26 ±2 °C. The aquaria are cleaned weekly by siphoning off half the water along with the detritus and excess organisms, and then refilling with fresh aerated well water. Additional measures are taken and/or new cultures started in the event of abnormal circumstances such as: declining populations, ephippia formation, or excessive fungal or bacterial growth.

Notropis leedsi (bannerfin shiner)—Approximately 40 adult bannerfin shiners were obtained from an indigenous population in the upper Suwannee River during October, 1981. The breeding stock is maintained in 125 gallon all-glass aquaria equipped with a flow-through water exchange system. Water for this system is unchlorinated and is pumped from the DER deep well. The bannerfin shiners are reared at 22 ±2 °C under a 16:8 hour light-dark cycle and are fed Aquarian® flake food and frozen *Artemia* (brine shrimp) twice daily, and once daily on weekends. Breeding and egg hatching are encouraged at 25 °C. The eggs are laid between stacked red ceramic tiles separated by a 3mm bead of silicone. Most of the eggs adhere to the tiles and are easily removed to heated, aerated hatching tanks. The narrow space between the tiles eliminates egg predation by adult fish. New hatching tanks are started regularly to segregate fry into even age groups. Newly hatched fry are fed a liquefied blend of Purina Trout Chow® and Cerophyl® twice daily. After one week, feeding is augmented with newly hatched Artemia nauplii and finely crushed Aquarian® flake food. The fish used were 28 days old when the test commenced.

Photobacterium phosphoreum, a luminescent marine bacterium, is maintained as a freeze-dried culture, purchased from Microbics Corporation. Lot number M-606 was used in this assay. Immediately prior to the assay, the culture is rehydrated with 1.0 ml of specially purified water (Microtox Reconstitution Solution).

2. Standard Reference Toxicity Assays

To ensure the uniform sensitivity of these test organisms to toxic substances, the Biology Section conducts monthly standard reference toxicant bioassays using sodium lauryl sulfate as the reference toxicant.

3. Test Methods

Methods used to perform acute toxicity bioassays are described by Peltier and Weber (1985) and the FDER Biology Section (1985). Some of the methods described below are more specific than those of Peltier and Weber. These will be noted in more detail.

Sampling Methods and Test Dates

Three separate 48-hr acute toxicity bioassays and one Microtox® assay were performed on a sample from the Fiesta Village STP facility. The tests were performed from 1015 hours on 17 May to 1015 hours on 19 May, 1988.

Separate samples were obtained for chemical and biological testing. Samples for metal analyses were preserved with $HN0_3$. Samples for organic chemical analyses and for the bioassays were unpreserved. The samples were collected by Ms. Heather Stafford of the FDER's South Florida District office, using standard wastewater sampling procedures. The samples were iced and transported to the DER laboratory in Tallahassee for analyses within 24 hours of collection.

Test Temperature

Upon arrival of the iced (4 °C) bioassay samples in the Tallahassee laboratory, the containers were placed in warm water and the temperature of the samples allowed to rise to 20 ± 2 °C. Although this temperature may be different than the temperature of the sample during collection, it is the temperature range to which the test organisms are acclimatized and is the range recommended in the above referenced bioassay protocols. This avoids stress caused by exposure to unusually cold or warm samples.

Method

Freshwater for diluting the water samples being tested was obtained from the same DER deep well that is used to culture the test organisms. The concentration series selected for this study is given in Table 1.

Two replicates of the control and each test concentration were used in bioassays with the water fleas, *Ceriodaphnia dubia* and *Daphnia pulex*. Flint glass jars of either 60 ml (for *C. dubia*) or 250 ml (for *D. pulex*) capacity were used as test chambers, and either 50 ml or 200 ml, respectively, of the appropriate test concentration was placed in each chamber. *Ceriodaphnia* were siphoned into a large culture dish and neonates were transferred by glass pipette. Ten were loaded per chamber, resulting in 20 per test concentration. *Daphnia* were siphoned into a stainless steel screen chamber placed into a large culture dish to isolate the proper size and age organisms (neonates). Then the screen chamber along with any retained adults were removed. The neonates remaining were then captured by glass pipette,

examined for injury, and loaded 10 per chamber, resulting in 20 per test concentration. The water fleas were not fed during these tests].

Two replicates of each concentration and a control were used for the *Notropis leedsi* (bannerfin shiner) bioassay. The fish were transferred individually or by twos using a pipette into wide mouth quart jars containing 500 ml each of the appropriate test concentration. Five were loaded per chamber, resulting in 10 per concentration. Fish were not fed during this test.

Test Parameters

Dissolved oxygen (YSI Model 57 oxygen meter), pH (Corning Model 7 pH meter with Fisher Accuphast® combination electrode), temperature (NBS calibrated glass thermometer), and the number of live organisms were recorded for each test concentration at 0 hours, 24 hours, and 48 hours. Total alkalinity and total hardness (measured as $CaCO_3$ using Hach Chemical Company reagents) were recorded at the beginning of the test for the controls and the 100% reclaimed water concentration. The specific conductance (YSI Model 33 S-C-T meter) of each test concentration was recorded at the beginning and end of the test. All instruments were calibrated before use according to manufacturer's recommendations. Ammonia concentrations, including the total and unionized fraction (expressed in mg/l as N and as NH_3, respectively), were recorded in the controls and the 100% reclaimed water test concentration at the beginning of the test. Total ammonia concentrations were determined using an Orion specific ion probe and an Orion Ionalyzer®. The unionized fraction was then calculated based on the total ammonia concentration and the pH, temperature, and salinity of the sample. These values were recorded on the bioassay data forms and are presented in Table 2.

Microtox® Test

Upon receipt at the DER laboratory, a 20 ml subsample was collected for Microtox® analysis. The sample was adjusted to 2% salinity with reagent grade dry sodium chloride to maintain the osmotic balance of the test bacterium during the assay. Four two-fold dilutions were made of the test sample resulting in a test range of 97%, 49.5%, 24.75%, 12.38%, and 0%. An incubation temperature of 15 °C was maintained throughout the assay. Ten µl of bacterial suspension was added to each of the 1.0 ml test dilutions. Light output (luminescence) was read after 5 and 15 minutes incubation, using the Microtox® analyzer and recorded on a Perkin-Elmer strip chart recorder. In the presence of a toxicant, the luminescence of the test organisms will decrease. In the presence of a stimulant, the luminescence will increase. Toxicity is calculated as a function of the light lost in the test sample, normalized to the control, and is reported as the effective concentration at which a 50% reduction, of light output is determined in 15 minutes (EC_{50}). Results are given in Table 3.

Results and Discussion

The water sample taken from Outfall #001 of the Fiesta Village STP was not toxic to the bioassay test organisms, *Ceriodaphnia dubia*, *Daphnia pulex*, and *Notropis leedsi*. The sample was toxic to the Microtox® assay organism, *Photobacterium phosphoreum*, producing an EC_{50} of 166.0%.

There was no total residual chlorine detected in the sample in the laboratory, although 2.3 mg/l of total residual chlorine was reported during field measurements. This may have been the result of the sample being taken at the point of SO_2 injection by the dechlorination system. Total ammonia (0.145 mg/l) and unionized ammonia (0.000 mg/l) concentrations were negligible.

Chemical analyses indicated three unidentified components sensitive to ECD and one unidentified component sensitive to NPD in the organics sample and 18.0 µg/l of zinc in the metals sample (Table 4). The cause of the toxicity to the Microtox® assay organism, *P. phosphoreum* was not determined.

Table 1. Concentration Series and Volumes Used for These Static Bioassays.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	50.0 ml	0.0 ml	50 ml
30.0%	35.0 ml	15.0 ml	50 ml
60.0%	20.0 ml	30.0 ml	50 ml
100.0%	0.0 ml	50.0 ml	50 ml

Daphnia pulex (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	200.0 ml	0.0 ml	200 ml
30.0%	140.0 ml	60.0 ml	200 ml
60.0%	80.0 ml	120.0 ml	200 ml
100.0%	0.0 ml	200.0 ml	200 ml

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 ml	0 ml	500 ml
30.0%	350 ml	150 ml	500 ml
60.0%	200 ml	300 ml	500 ml
100.0%	0 ml	500 ml	500 ml

Table 2. Data recorded during the 48 hour acute toxicity bioassay of the sample from the Fiesta Village Sewage Treatment Plant, Fort Myers, Lee County, Florida, NPDES #FL0030317 on 17 to 19 March, 1988.

Facility:	Fiesta Village STP			NPDES # FL0030317		Facility Type:	Municipal
Location:	Lee County			Contact/District: H.S. tafford			Private
Sample Collection Date:	5/16/88	Time:	1030	Test type: Static Screening			
Test Beginning Date:	5/17/88	Time:	1015	# tests: 3		Receiving Water:	Caloosahatchee River
Test Ending Date:	5/19/88	Time:	1015	Chlorination Type: post chlorination			

Parameter	
Total Residual Cl2:	0
Method:	Hach
By:	RBF
Salinity:	0.5

Ammonia:	Control Water	100% Sample
Unionized NH3:	0.00	0.00
Total NH3:	0	0.145

Organism: ***Ceriodaphnia dubia*** Age/Life stage: Neonates
LC50: Binomial: Moving Average: Probit:

Concentrations	SURVIVAL # at 0 hour	Live at 24 hr	Live at 48 hr	Dissolved Oxygen 0 hour	24 hour	48 hour	pH 0 hour	24 hour	48 hour	Temperature 0 hour	24 hour	48 hour	Conductivity 0 hour	48 hour
Control	10	10	10	9.0	8.8	8.4	8.0	7.9	8.0	19.5	19.1	20.3	-	-
Control	10	10	10	9.0	8.8	8.3	8.0	7.9	8.1	-	-	-	-	-
30%	10	10	10	9.0	8.8	8.4	7.7	7.9	8.0	19.3	19.1	20.1	-	-
30%	10	10	10	9.0	8.8	8.4	7.7	7.9	8.0	-	-	-	-	-
60%	10	10	10	8.8	8.8	8.3	7.5	7.8	8.0	19.3	19.1	20.1	-	-
60%	10	10	10	8.8	8.8	8.3	7.5	7.8	8.0	-	-	-	-	-
100%	10	10	10	8.5	8.8	8.4	7.2	7.7	7.9	19.3	19.1	20.0	-	-
100%	10	10	10	8.5	8.8	8.5	7.2	7.7	7.9	-	-	-	-	-

	Control water	100% sample
Alkalinity:	118	56
Hardness:	120	155

Organism: ***Daphnia pulex*** Age/Life stage: Neonates
LC50: Binomial: Moving Average: Probit:

Concentrations	SURVIVAL # at 0 hour	Live at 24 hr	Live at 48 hr	Dissolved Oxygen 0 hour	24 hour	48 hour	pH 0 hour	24 hour	48 hour	Temperature 0 hour	24 hour	48 hour	Conductivity 0 hour	48 hour
Control	10	10	10	9.0	8.9	8.4	8.0	8.0	8.1	19.7	19.2	20.1	-	-
Control	10	10	10	9.0	8.9	8.4	8.0	8.0	8.1	-	-	-	198	210
30%	10	10	10	8.9	8.8	8.4	7.7	7.8	8.0	19.7	19.0	19.9	-	-
30%	10	10	10	8.8	8.8	8.4	7.7	7.8	8.0	-	-	-	382	385
60%	10	10	10	8.6	8.6	8.3	7.3	7.7	7.9	19.6	18.9	19.9	-	-
60%	10	10	10	8.6	8.6	8.3	7.3	77.0	7.9	-	-	-	620	600
100%	10	10	10	8.2	8.5	8.3	6.9	7.5	7.8	19.7	19.1	19.9	-	-
100%	10	9	9	8.3	8.5	8.6	6.9	7.5	7.8	-	-	-	880	850

	Control water	100% sample
Alkalinity:	118	56
Hardness:	120	155

Organism: ***Notropis leedsi*** Age/Life stage: 28 days old
LC50: Binomial: Moving Average: Probit:

Concentrations	SURVIVAL # at 0 hour	Live at 24 hr	Live at 48 hr	Dissolved Oxygen 0 hour	24 hour	48 hour	pH 0 hour	24 hour	48 hour	Temperature 0 hour	24 hour	48 hour	Conductivity 0 hour	48 hour
Control	5	5	5	8.4	7.7	7.0	7.5	7.5	7.7	21.3	19.4	20.3	-	-
Control	5	5	5	8.5	7.7	7.0	7.5	7.6	7.7	-	-	-	215	210
30%	5	5	5	8.5	7.6	7.2	7.3	7.5	7.6	20.8	19.1	20.0	-	-
30%	5	5	5	8.5	7.6	7.2	7.3	7.5	7.6	-	-	-	398	395
60%	5	5	5	8.4	6.9	6.9	7.1	7.3	7.6	20.4	19.0	19.9	-	-
60%	5	5	5	8.4	7.4	7.2	7.1	7.3	7.6	-	-	-	650	610
100%	5	5	5	8.2	7.2	7.2	6.8	7.1	7.5	20.0	19.0	19.9	-	-
100%	5	5	5	8.2	7.0	7.0	6.8	7.1	7.5	-	-	-	890	890

	Control water	100% sample
Alkalinity:	118	56
Hardness:	125	155

Table 3. Microtox test results , Fiesta Village STP, S. Fort Meyers, Lee County, NPDES#FL0025984 on 5/17/88.

Microtox Test Culture lot # M-606

Final Reclaimed Water

% Sample	Post-chlorination	
	5-min	15-min
0	95	56
0	94	55
0	79	46
12.38	75	46
12.38	84	52
12.38	84	53
24.75	80	50
24.75	76	47
24.75	73	46
49.5	63	40
49.5	71	45
49.5	71	46
99	53	34
99	47	30
99	55	34

EC-50 Non-chlorinated (15 minute , 15 degree C) = 166.0%

EC50 (15 minute, 15 degrees C) is calculated using the Data Reduction Computer Program developed by Microbics Corporation for the Sharp Model EL-5100 (Microbics) Systems Operating Manual, 1982.

Table 4. Chemical components detected in the sample from the Fiesta Village STP.

Organics	
Acid Extractables	None Detected
Base Neutral Extractables	None Detected
Pesticide Extractables	Three unidentified components sensitive to ECD and one unidentified component sensitive to NPD.
Metals	
Zinc	18.0 µg/l

Literature Cited

Beckman Instruments, Inc. 1982. Microtox system operating manual.

Florida Department of Environmental Regulation. 1985. Quality assurance manual for performing acute toxicity tests (Second Edition). Biology Section, Tallahassee.

Peltier, W. and C. I. Weber. 1985. Methods for measuring the acute toxicity of effluents to aquatic organisms (Third Edition). Environmental Research Laboratory. Athens, Georgia. EPA-600/4-85-012. 217 p.

U.S. Environmental Protection Agency. 1978. Bioassay procedures for the Ocean Disposal Permit Program. Environmental Research Laboratory. Gulf Breeze, Florida. EPA-600/9-78-010. 121 p.

Field Lab, STP
1366 Simcoe Street, Peterborough
Station Location: H.S. Stp'd
Effluent Serial Number: 84
Test Sample Number: F 2 0 6 3 - 3 1 7 2

1.3 CST Aluminum
Test Type: Static Renewal / Continuous (Spring) Conventional
Fish:

Start: S 19 88 1030
Renewal: S 20 88 1015
Test Ending Date: S 21 88 Time: 1015
Test Organism: Oncorhynchus kisutch
Species/Life Stage: Nauplii

Conc. or %	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH 0	24	48	72	96	Temperature °C 0	24	48	72	96	0	24	48	72	96
Control	36	10	10	10			9.0	8.8	8.4			8.0	7.9	8.0			19.5	17.1	20.3							
Control	36A	10	10	10			9.0	8.8	8.3			8.0	7.9	8.1												
30%	236	10	10	10			9.0	8.8	8.4			7.7	7.9	8.0			19.3	19.1	20.1							
30%	44	10	10	10			9.0	8.8	8.4			7.7	7.9	8.0												
60%	63	10	10	10			8.8	8.8	8.3			7.5	7.8	8.0			19.3	19.1	20.1							
60%	44	10	10	10			8.9	8.8	8.3			7.5	7.8	8.0												
100%	88	10	10	10			8.5	8.8	8.4			7.2	7.7	7.9			19.3	19.1	20.0							
100%	47	10	10	10			8.5	8.8	8.5			7.2	7.7	7.9												
Initial of Investigator		MF	MF	MF			MF	MF	MF			MF	MF	MF			MF	MF	MF							

Alkalinity/Hardness (mg/l as $CaCO_3$)
Control Water: 118/120
100% Sample: 54/155
Other:
Measured by: SW

Ammonia unionized/total (mg/l as NH_3/N)
Hour 0

	U	T
Control Water:		0.0
100% Sample:		0.145
Other:		

Hour 0
Control Water:
100% Sample:
Other:
Measured by: MF

Signatures:

Instrument Calibrations:

	pH Meter:	DO Meter:	S-C-T Meter:
0 Hours	7.0, 9.9	9.2 @ 20°C	Held, 31 @ 30
24 Hours	7.0, 9.9	9.2 @ 20°C	
48 Hours		9.0 @ 20°C	11.4, 10, 31 @ 30
72 Hours			
96 Hours			

Remarks: Ohaus, 12.0 @ 20.0°C
48hr Cond 1300 @ 21.2°C

Total Residual Chlorine:
Field data: 2.3 Method:
Lab: 0 Method: Hach
Lab: Method:

De-chlorinated:
Measurements by:

Sample was taken at end of contact chamber after 15 min of contact time. Location is outside SO_2 injection for de-chlorination source
Reviewed by:
Date: 9/11/88

Industry/Toxicant: Fiesta Village STP
Address: 1366 San Luis Rey S. Fort Myers
Contact/District: H.S. Stafford
Effluent Serial Number: 001
NPDES Permit Number: FL0030317

BIOASSAY DATA FORM

Test Number: 2 of 3
Test Type: Static Renewal, (Screening) Conventional
Other:

Sample Collection: Date 5-16-88 Time 1030
Test Beginning: Date 5-17-88 Time 1015
Test Ending: Date 5-19-88 Time 1015
Test Organism: Daphnia Pulex
Age/Life Stage: Neonate

Conc. or %	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	24	48	72	96	pH 0	24	48	72	96	Temperature °C 0	24	48	72	96	Conductivity 0	24	48	72	96
Control	25	10	10	10			9.0	8.9	8.4			8.0	8.0	8.1			19.7	19.2	20.1							
Control	131	10	10	10			9.0	8.9	8.4			8.0	8.0	8.1								198		210		
30%	67	10	10	10			8.9	8.8	8.4			7.7	7.8	8.0			19.7	19.0	19.9							
30%	49	10	10	10			8.8	8.8	8.4			7.7	7.8	8.0								382		385		
60%	59	10	10	10			8.6	8.6	8.3			7.3	7.7	7.9			19.6	18.9	19.9							
60%	114	10	10	10			8.6	8.6	8.3			7.3	7.7	7.9								620		600		
100%	2	10	10	10			8.2	8.5	8.3			6.9	7.5	7.8			19.7	19.1	19.9							
100%	111	10	9	9			8.3	8.5	8.3			6.9	7.5	7.8								880		850		
Initial of Investigator		MF	MF	MF			MF	MF	MF			MF	MF				MF	MF	MF			MF				

Alkalinity/Hardness (mg/l as $CaCO_3$)
Control Water: 118/120
100% Sample: 52/1575
Other:
Measured by: SLO

Ammonia unionized/total (mg/l as NH_3/N)
Hour 0
Control Water:
100% Sample:
Other:
Hour 0
Measured by: MF

	U	T
	0.0	
	0.145	

Signatures:

Instrument Calibrations:

	pH Meter	D.O. Meter:	S.C. Meter
0 Hours			
24 Hours			
48 Hours			
72 Hours			
96 Hours			

Total Residual Chlorine:
Field data: 2.3 Method:
Lab: 0 Method: HACH
Lab: Method:

Dechlorinated:
Comments by:

Reviewed by:
Date: 9/16/88

Fiesta Village SH
1366 San Leandro Blvd. San Lorenzo
H.S. Stanford
Effluent Serial Number: 001
NPDES Permit Number: CA0030317

Test Number: 33
Test Type: (Definitive) (Screening) (Chronic)

5-4-88 Time 1050
5-7-88 Time 1015
Test Initiated Date: 5-15-88 Time 1015
Test Organism: Mysidopsis bahia
Age/Life Stage: 2-5 days old

Concentration or Control	Test Container Number	Number of Live Organisms 0	24	48	72	96	Dissolved Oxygen (mg/l) 0	0	24	48	96	pH 0	24	48	72	96	Temperature °C 0	24	48	72	96	Conductivity 0	24	48	72	96
Control	15	5	5	5			9.0	8.4	7.7	7.0		7.5	7.5	7.7			21.3	19.4	20.3			215	SW			
Control	11	5	5	5			9.0	8.5	7.7	7.0		7.5	7.6	7.7								215		210		
30%	25	5	5	5			8.9	8.5	7.6	7.2		7.3	7.5	7.6			20.3	19.1	20.0							
30%	26	5	5	5			8.8	8.5	7.6	7.2		7.3	7.6	7.6								398		395		
60%	5	5	5	5			8.6	8.4	6.9	6.9		7.1	7.3	7.6			20.4	19.0	19.9							
60%	66	5	5	5			8.6	8.4	7.4	7.2		7.1	7.3	7.6								650		610		
100%	52	5	5	5			8.2	8.2	7.2	7.2		6.8	7.1	7.5			20.0	19.0	19.9							
100%	6	5	5	5			8.3	8.2	7.0	7.0		6.8	7.1	7.5								590		590		
							SW																			
Initial of Investigator		SW	MF	MF				MF	MF	MF		MF	MF	X			MF	MF	MF			MF		MF		

Alkalinity/Hardness (mg/l as $CaCO_3$)

Control Water: 118/135
100% Sample: ~~137~~ 54/151
Other:
Measured by: SW

Ammonia unionized/total (mg/l as NH_3/N)

Hour 0

	U	T
Control Water:	0	0.0
100% Sample:		0.145
Other:		

Hour 0

Control Water:
100% Sample:
Other:
Measured by: MF

Salinity 0.5

Signatures: Marie Finfrock

Instrument Calibrations:

	pH Meter:	DO Meter:	S-C-T Meter:
0 Hours			
24 Hours			
48 Hours			
72 Hours			
96 Hours			

Remarks:

Total Residual Chlorine:

Field data: 2.3 Method: -
Lab: 0 Method: HACH
Lab: Method:

De-chlorinated:
Measurements by:

Reviewed by:

Date: 9-16-88

C90

MICROTOX™ Data Reduction Sheet

SOURCE: Fiesta Village STP

GRAPH CALC EC 50 (15 MIN, 15 °C) = >100 (%SAMPLE) mg/L

SAMPLE DATA:

SAMPLE TYPE (EFFLUENT, LEACHATE, ETC.): effluent - (LAW) ~~FIELD~~ Cl2 no res Cl

DATE ASSAYED: 5-17-88 TIME: 9:30 AM

VISUAL COLOR: none CORRECTION REQUIRED: YES (NO)

VISUAL TURBIDITY: none SEPARATION REQUIRED: YES (NO)

INITIAL pH: pH ADJUSTED TO: WITH:

OSMOTICALLY ADJUSTED WITH: MOAS (DRY NaCl) OTHER

PRIMARY DILUTION OF SAMPLE: none

OPERATOR: Leslie Williams REAGENT VIAL LOT NO. M-606

REMARKS:

MICROTOX™ 99% TEST

SAMPLE CUVETTE	% SAMPLE	READINGS 5 MIN	READINGS 15 MIN	Γ5	Γ15	NOTES
A1	0	95	56	X	X	
B1		94	55			
C1		79	46			
A2	12.38	75	46	.103	.040	
B2		84	52			
C2		84	53			
A3	24.75	80	50	.170	.098	
B3		76	47			
C3		73	46			
A4	49.5	63	40	.307	.198	
B4		71	45			
C4		71	46			
A5	99	53	34	.729	.554	
B5		47	30			
C5		55	37			
EC_{50} (MIN, °C)				150.9	166.0	

REVIEWED BY:

DATE: 9/16/88