

Bioassays of

Cocoa Beach Water Reclamation Facility

Brevard County

NPDES #FL0021105

Sampled May 16, 2005

July 2005

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Quality Manual No. 870346G
NELAC Certification No. E31780

Cocoa Beach Water Reclamation Facility, 1600 Minuteman Causeway, Cocoa Beach, Brevard County, Florida, NPDES #FL0021105. Effluent samples for this facility were collected on May 16, 2005.

Introduction

The Cocoa Beach Water Reclamation Facility is a domestic wastewater treatment plant. The facility has design flows of 6.0 million gallons per day (MGD) through outfall D-001, 6.0 MGD through outfall D-002, and 4.0 MGD through reuse system R-001. The annual average daily flows (AADF) (May 2004 - April 2005) for D-001, D-002 and R-001 were respectively, 0.2669 MGD, 0.3435 MGD, and 3.803 MGD. Discharge from the facility through D-001 and D-002 is intermittent, limited to wet weather. The D-001 discharge is authorized for a maximum of 91 days per year. The D-002 discharge is authorized for 30 days per year as part of the 91 days allowed for discharge from D-001. The wastewater treatment process includes manual and mechanical screening, grit removal, anoxic/oxic biological treatment, clarification, chemical feed facilities, tertiary filtration, chlorination (with sodium hypochlorite), dechlorination (with sulfur dioxide) and aerobic digestion of residuals. Residuals are dewatered and disposed of in a landfill. Treated effluent discharged through D-001 flows through a series of five (5) golf course lakes prior to discharging through a rectangular weir (approximate location latitude 28º 19' 00" N and longitude 80º 38' 57" W) into the Class III marine waters of the Banana River. Treated effluent discharged through D-002 is discharged through a concrete structure (approximate location latitude 28º 19' 35" N and longitude 80º 37' 57" W) directly into a tributary canal of the Banana River.

Effluent reuse consists of a slow-rate public access system (R-001), consisting of public access irrigation of commercial areas and residential lawns, road medians, landscaped areas and golf courses within the City of Cocoa Beach and Patrick Air Force Base. The reuse system can be supplemented with 0.75 MGD of reclaimed water from the City of Cape Canaveral. The public access reuse system includes two 1.5 million gallon (MG) and one 6.0 MG reclaimed water storage tanks at the plant, one 5 MG off-site reclaimed water storage tank, and a 6.0 MG reject water storage tank that can also be used for reclaimed water.

The facility is not under an Administrative Order or a Consent Order. The facility has no mixing zones. Within the past year no plant upsets were reported and there was only one permit violation (October, 2004, total residual chlorine for disinfection reported as 0.4 mg/L, permit limit minimum - 1.0 mg/L). Discharge Monitoring Reports (DMR) from 1997 to 2004 show that the annual average daily flow and the annual loading rates for total phosphorus, total nitrogen, and total suspended solids are decreasing; however, annual loading rates for carbonaceous bio-chemical oxygen demand ($CBOD_5$) have increased (facility information provided by David Smicherko of FDEP Central District and Shannon Gunnoe of FDEP Tallahassee).

Methods

Samples were collected from the EFD-1 NPDES sampling point (located in the effluent discharge pipe to D-001 and D-002 after dechlorination but prior to either outfall) by Phil Kane, Steve Kent, and Art Torvela (FDEP Central District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOP's are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

The 96-hour acute definitive toxicity tests and algal growth potential test were performed following internal DEP SOP's TA07_01,TA07_02, and TA08_01 through TA08_07. All internal DEP SOP's are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

An additional AGP test was performed on a salinity adjusted aliquot of sample since the receiving water is classified as Class III marine. An aliquot of the AGP sample was salinity adjusted from 0.89 parts per thousand (ppth) to 7 ppth for the additional test.

Toxicity Test Results

Tests were performed May 17 - 21, 2005.

Ceriodaphnia dubia 96-hr acute definitive bioassay –	LC_{50} > 100%, 0% mortality in 100% sample at 96 hours
Cyprinella leedsi 96-hr acute definitive bioassay –	LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

The bioassay samples were not acutely toxic to the test organisms.

See Appendix 1 for bioassay bench sheets.

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 139 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Shultz (1987) found that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited. The predicted AGP based on inorganic nitrogen concentrations was 192 (±20%) mg dry wt/L (Table 1; Miller et al. 1978).

In the salinity adjusted aliquot of effluent, AGP was 91.9 mg dry wt/L of *Dunaliella tertiolecta.* Raschke and Shultz found that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication with Ron Raschke USEPA Region 4 1987).

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine (TRC) and total ammonia were not detected in the bioassay sample in the laboratory. TRC was detected in the effluent sample in the field at 0.01 mg/L. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.057 mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was ≤0.02 mg/L.

Selenium was detected in the effluent at levels that comply with Class III fresh water quality criteria. Atrazine, copper, silver, and zinc were detected between the laboratory minimum detection limits (MDL) and practical quantitation limits (PQL). The effluent aluminum concentration (4,390 µg/L) and the effluent iron concentration (4,660 µg/L) exceeded the Class III marine water quality criteria of ≤ 1,500 µg/L for aluminum (62-302.530(2), F.A.C.) and ≤ 300 µg/L for iron (62-302.530(39), F.A.C.).

See Table 2 for results of analytes detected in the effluent, and corresponding limits.

See Appendix 2 for a complete list of chemical analyses performed.

Conclusion

The effluent sample collected from EFD-1 for this facility on May 16, 2005, was not acutely toxic to either test species during the 96-hour definitive bioassays. The effluent AGP results greatly exceeded the "problem” threshold for both fresh and marine receiving waters. The effluent concentrations of aluminum and iron exceeded Class III marine water quality standards.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Table 1. Measured and predicted algal growth potential (AGP; mg dry wt/L) for total soluble nitrogen (TSIN) and total nitrogen (TN) limitation of Pseudokirchneriella subcapitata, *the AGP (salt adjusted) for* Duneliella tertiolecta, *and N:P ratios for the sample collected from Cocoa Beach WRF on May 16, 2005.*

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	AGP (salt adjusted)	Inorganic N:P ratio	Total N:P ratio
Effluent Samples	139	192.17 ± 38.434	239.4 ± 47.88	91.9	7.78	8.66

Table 2. Effluent limits, Class III marine criteria and chemical data for samples collected from Cocoa Beach WRF on May 16, 2005.

Cocoa Beach Water Reclamation Facility NPDES # FL0021105	Class III Marine Stds	Effluent Limits	Effluent Samples
Organic Constituents (µg/L)			
Atrazine	-	-	0.11 I
Metals (µg/L unless otherwise noted)			
Aluminum	≤ 1,500	-	4,390
Arsenic	≤ 50	-	4 U
Cadmium	≤ 9.3	-	0.3 U
Calcium (mg/L)	-	-	77.3
Chromium-III	-	-	2 U
Copper	≤ 3.7	-	1.5 I
Iron	≤ 300	-	4,660
Lead	≤ 8.5	-	0.27 U
Magnesium (mg/L)	-	-	29.1
Nickel	≤ 8.3	-	2 U
Selenium	≤ 71	-	2.1
Silver	≤ 2.3	-	0.042 I
Zinc	≤ 86	-	6.6 I
Nutrients (mg/L)			
Ortho-phosphate	-	-	0.72
Total Phosphorus	-	≤ 8 s	0.81
Ammonia	-	-	0.057 A
Unionized Ammonia	-	-	< 0.02 c
Nitrate+Nitrite	-	-	5
Total Kjeldahl Nitrogen	-	-	1.3
Organic Nitrogen	-	-	1.24 c
Total Nitrogen	-	≤ 24 s	6.3 c
General Physical and Chemical Parameters			
Cyanide (µg/L)	≤ 1	≤ 1 s	na
Dissolved Oxygen (mg/L)	≥ 4	≥ 4.0 s	6.8
pH (S.U.)	6.5-8.5	6.0-8.5 s	7.1
Conductivity (umhos/cm)	-	-	1,850
Temperature (C)	-	-	27.1
CBOD (mg/L)	-	≤ 40 s	1.7 I
BOD (mg/L)	-	-	1.3 I
Hardness (mg/L)	-	-	312.9 c
Total Suspended solids (mg/L)	-	≤ 40 s	na
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	0.01

Value exceeds the Class III Marine Water Quality Criteria (62-302, F.A.C.) and/or Effluent Limits

c - calculated value

s - Single sample

na - an analysis was not performed for this analyte

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

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

U - Material analyzed for but not detected; value reported is the minimum detection limit

FDEP Biology Section - Acute Definitive Bioassay Bench Sheets

Facility: Cocoa Beach WRF
Address: 11000 Minuteman Causeway
City: Cocoa Beach County: Brevard
Contact/District: Phil Kane / Central District
NPDES Permit #: FL 0021105
LIMS Job #: TLH-2005-05-17-23 LIMS Sample #: 8306633

Sample Collection: Date: 5-16-05 Time: 0930
Hold Time Start: Date: 5-16-05 Time: 0930
SOP# 07_01/_02

Comments:

Lims Data Entry: 5-27-05 mf Data Entry Verification: 5-27-05 SP

Instructions (for below): Circle appropriate wording. If yes is circled complete blanks.

Test Type: Definitive
Static / (Static Renewal) / Flow-through
Test Duration: 48 (96) Hours.
Light Intensity : 50 - 100 ft. candles.
Photoperiod : 16 hours light 8 hours dark.
Initial sample handling:

Test 1 validation: Test 1: SOP TA 07-01
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation: Test 2: SOP TA 07_02
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

PH adjustment : yes (no) Initial pH NaOH N HCl N Drops mL Final pH
Aeration : yes (no) Initial DO: mg/L Final DO: mg/L Duration: minutes Rate: ~ bubbles/min
Salinity adjusted (Test 1): yes (no) Initial Salinity: Final Salinity: Salts Hypersaline brine
Salinity adjusted (Test 2): yes (no) Initial Salinity: Final Salinity: Salts Hypersaline brine
Dechlorination: yes (no) mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC

Temperature Range °C
Incubator # 3 Range 24.2-24.7
Room B246: 236243-2
Waterbath: N/A

Sample Validation:
Temperature: Shipped ≤6°C (Yes) No Hand Delivered: Cooling (received °C < collected °C) Yes No
Holding Time: ≤36 Hours (Yes) No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures
Sarah Pritchard
Marshall Faircloth
Aimee Daniels
Dalmin Mcdaniel
Vicki Wetterhoff
REVIEWER

Water Quality Parameters	20% DMW	Well Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Moderately Hard Water	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	N/A	N/A	N/A	N/A	N/A	0.01	←	P. Kane	MF
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03				<0.03	HACH	DN	SP
Alkalinity (mg/L as $CaCO_3$):	95	135				121	HACH	SP	MF
Hardness (mg/L as $CaCO_3$):	105	134				301	HACH	SP	MF
Total Ammonia (mg/L as N):	<0.017	<0.017				<0.017	DENVER	DN	SP
Salinity (ppt):	<1	<1				<1	YSI / Mettler	MF	SP

V 1.3 5/19/05

Appendix 1. Bench Sheets (continued)

FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 8360633 Test #: 1 Test Started: Date 5-17-05 Time: 1430
Organism: C. dubia Test Ended: Date 5/21/05 Time: 1400
Organism Batch: 15-05 Diluent/ Batch: DMW / 14-05
Organism Age: <24 hrs Food: YCT *R. subcapitata* *Artemia*
Chamber Size 30 mL Batch: 2-05 1-05
Test Volume 20 mL Feeding: Prior to test - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	4[D]	4
	D	D	5	5	5	5	5	5
6.25%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
12.5%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
25%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
50%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
100%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5

Organisms loaded by: SP Checked by: [redacted] SP JD DN DN DN
Loading Verified by: JD (initials)
Comments:

m = missing d = dead BR = before renewal AR = after renewal
Test Results:
% mortality in 100% sample Ø
LC_{50}: >100% If Calculated: 95% CI _____ Method: _____ V 2.0 4/12/05
Screening Tests: Report LC50 as >100%, =100%, or <100%.
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

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Appendix 1. Bench Sheets (continued)

FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 836633 Test #: 2 Test Started: Date 5-17-05 Time: 1430
Organism: C. leedsi Test Ended: Date 5/21/05 Time: 1330
Organism Batch: 13-05 Diluent/ Batch: Well / NA
Organism Age: 11 days Food: YCT *P. subcapitata* Artemia
Chamber Size 1000 mL Batch: ____ ____ 351384256B
Test Volume 500 mL Feeding: Prior to test (Prior to renewal) Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	C1	5	5	5	5	5	5
	B	C2	5	5	5	5	5	4 1D
	C	C3	5	5	5	5	5	5
	D	C4	5	5	5	5	5	5
6.25%	A	C5	5	4 1D	4	4	4	4
	B	C6	5	5	5	5	5	5
	C	C7	5	5	5	5	5	5
	D	C8	5	@4 5	5	5	5	5
12.50 %	A	C9	5	5	5	5	5	5
	B	C10	5	5	5	5	5	5
	C	C11	5	5	5	5	5	5
	D	C12	5	5	5	5	5	5
25 %	A	C13	5	5	5	5	5	5
	B	C14	5	5	5	4 1D	4	4
	C	C15	5	5	5	5	5	5
	D	C16	5	4 1D	4	2 2D	2	2
50 %	A	C17	5	5	5	5	5	4 1D
	B	C18	5	5	5	5	5	5
	C	C19	5	4 1D	4	4	4	3 1D
	D	C20	5	5	5	4 1D	4	4
100 %	A	C21	5	5	5	5	5	5
	B	C22	5	5	5	5	5	5
	C	C23	5	5	5	5	5	5
	D	C24	5	5	5	5	5	5
Organisms loaded by: JD		Checked by:	JD	JD	JD	JD	JD	DN
Loading Verified by:		(initials)						

Comments:

m = missing d = dead BR = before renewal AR = after renewal
Test Results:
% mortality in 100% sample Ø
LC_{50}: >100% If Calculated: 95% CI ____ Method: ____
Screening Tests: Report LC50 as >100%, =100%, or <100%.
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

@ transcription error S.D.

Bioassay Parameters

LIMS Sample # : 8360635 **Test # :** 1 **of** 2

TEST SOP: TA07_ 01 **Test Species:** ~~Ceriodaphnia dubia~~ *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

V.1 2/24/04

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	A		B
pH (S.U.)	8.1		8.2	8.1		8.1
Temperature °C	24.6		24.9	24.7		25.1
Dissolved Oxygen mg/L	7.2		7.6	7.6		7.5
Conductivity ~~µmhos~~ mmhos	1815		230	180		190
(initials) Measured by:	JD		DN	DN		DN
(initials) Recorded by:	JD		DN MF	DN MF		DN

Comments: 24 hour Parameters not taken on C. dubia test

Concentration 6.25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	A		B
pH (S.U.)	8.1		8.3	8.1		8.3
Temperature °C	24.7		24.5	25.2		24.7
Dissolved Oxygen mg/L	7.2		7.6	7.5		7.6
Conductivity ~~µmhos~~ mmhos	290		380	255		290
(initials) Measured by:	JD		DN	DN		DN
(initials) Recorded by:	JD		DN MF	DN MF		DN

Comments:

Concentration 12.5%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	mf A		B
pH (S.U.)	8.0		8.3	8.0		8.3
Temperature °C	24.6		24.5	24.7		24.4
Dissolved Oxygen mg/L	7.2		7.5	7.5		7.7
Conductivity ~~µmhos~~ mmhos	400		505	395		475
(initials) Measured by:	JD		DN	DN		DN
(initials) Recorded by:	JD		DN MF	DN MF		DN

Comments:

Concentration 25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	A		B
pH (S.U.)	7.9		8.3	7.8		8.3
Temperature °C	24.5		24.7	24.5		24.4
Dissolved Oxygen mg/L	7.0		7.5	7.5		7.7
Conductivity ~~µmhos~~ mmhos	615		745	605		745
(initials) Measured by:	JD		DN	DN		DN
(initials) Recorded by:	JD		DN MF	DN MF		DN

Comments:

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V.1 2/24/04

Bioassay Parameters

LIMS Sample # : 836033 **Test # :** 1 of 2

TEST SOP: TA07_ 02 **Test Species:** ~~Ceriodaphnia dubia~~ ~~Cyprinella leedsi~~ ~~Pimephales promelas~~ ~~Americamysis bahia~~ ~~Menidia beryllina~~ Other:_____

V.1 2/24/04

Concentration 50%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	A		B
pH (S.U.)	7.6		8.3	7.6		8.3
Temperature °C	24.4		24.7	24.8		24.8
Dissolved Oxygen mg/L	7.2		7.5	7.5		7.7
Conductivity ~~µmhos~~ mmhos	1020 ~~1015~~ 1.02		1255	1025		1180
(initials) Measured by:	JO		DN	DN		DN
(initials) Recorded by:	JO		DN MF	DN MF		DN

Comments: (B) wrong place

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		A	A		B
pH (S.U.)	7.3		8.4	7.3		8.4
Temperature °C	24.5		24.8	24.5		24.8
Dissolved Oxygen mg/L	~~7.5~~ 7.5 (B)		7.5	7.4		~~7.5~~ 7.7 DN
Conductivity ~~µmhos~~ mmhos	1755 ~~2.96~~ (B)		2070	1770		2130
(initials) Measured by:	JO		DN	DN		DN
(initials) Recorded by:	JO		DN MF	DN MF		DN

Comments: (B) wrong pH (B) human/glove error (C) entry error DN

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

V.1 2/24/04

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Bioassay Parameters

LIMS Sample # : 836633 Test # : 2 of 2

TEST SOP: TA07_02_ Test Species: *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas*
Americamysis bahia *Menidia beryllina* Other:_____

V.1 2/24/04

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.7	7.5	8.4	7.9	8.1	8.3
Temperature °C	24.2	24.2	24.4	25.1	24.5	24.2
Dissolved Oxygen mg/L	7.4	7.2	7.4	7.6	7.2	7.4
Conductivity (µmhos) mmhos	265	270	275	270	265	275
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments:

Concentration 6.25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.7	7.5	8.4	8.0	8.1	8.2
Temperature °C	24.5	24.3	24.3	25.1	25.3	24.7
Dissolved Oxygen mg/L	7.5	7.2	7.4	7.6	7.0	6.9
Conductivity µmhos mmhos	350	390	390	365	390	365
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments:

Concentration 12.5%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.7	7.2	8.3	8.0	8.0	8.2
Temperature °C	24.5	24.0	24.0	25.0	24.8	24.0
Dissolved Oxygen mg/L	6.8	7.1	7.5	7.6	6.0	6.8
Conductivity µmhos mmhos	390	430	515	445	515	475
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments:

Concentration 25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.6	7.2	8.4	7.7	7.9	8.2
Temperature °C	24.6	24.0	24.0	24.8	25.2	24.0
Dissolved Oxygen mg/L	7.2	7.1	7.5	7.6	6.1	6.9
Conductivity (µmhos) mmhos	565	600	735	(1) 730	725	650
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments: (1) 2nd measurement = 730 µmhos DN.

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V.1 2/24/04

Bioassay Parameters

LIMS Sample # : 836633 **Test # :** 2 **of** 2

TEST SOP: TA07_ 02 **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

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Concentration 50%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.5	7.2	8.3	7.7	7.9	8.0
Temperature °C	24.6	24.0	24.0	24.7	25.0	24.3
Dissolved Oxygen mg/L	6.7	7.1	7.6 (A) 7.4 DN	7.6	6.2	6.7
Conductivity (µmhos) mmhos	915	1000	1089	960	995	1130
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments:

(A) Entry error, 1st measurements for C7x. and 6 25%. DN 5/19/05.

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.3	7.3	8.2	7.3	7.8	8.0
Temperature °C	24.5	24.2	24.0	24.3	24.0	24.6
Dissolved Oxygen mg/L	6.4	6.9	7.6 7.4 DN	6.6	6.7	6.7
Conductivity (µmhos) mmhos	1715	1765	1825	1795	1815	1905
(initials) Measured by:	JD	JD	JD / DN	DN	JD	DN
(initials) Recorded by:	JD	JD	JD / DN	DN	DN	DN

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

V.1 2/24/04

Appendix 2. Chemical Analyses performed on the effluent from the Cocoa Beach Water Reclamation Facility Outfall D-001, sampled on May 16, 2005.

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 9:30	COCO	Bio-AGP/LimNut	Algal Growth Potential	139	mg DryWt/L		0.3	0.9
5/16/2005 9:30	COCO	Bio-AGP/LimNut	Algal Growth Potential-Salinity Adjusted	91.9	mg DryWt/L		0.3	0.9
5/16/2005 9:30	COCO	Bio-BOD	Biochemical Oxygen Demand-5 Day	1.3	mg/L	I		
5/16/2005 9:30	COCO	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.7	mg/L	I		
5/16/2005 9:30	COCO	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/16/2005 9:30	COCO	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
5/16/2005 9:30	COCO	Bio-Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	LC50	L		
5/16/2005 9:30	COCO	Bio-Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	LC50	L		
5/16/2005 9:30	COCO	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/16/2005 9:30	COCO	BNA-Water	2,4-Dinitrophenol	14	ug/L	UJ	14	57
5/16/2005 9:30	COCO	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	UJ	2.9	11
5/16/2005 9:30	COCO	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	UJ	38	150
5/16/2005 9:30	COCO	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	UJ	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/16/2005 9:30	COCO	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/16/2005 9:30	COCO	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Benzidine	95	ug/L	UJ	95	380
5/16/2005 9:30	COCO	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	UJ	2.9	11

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 9:30	COCO	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/16/2005 9:30	COCO	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
5/16/2005 9:30	COCO	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/16/2005 9:30	COCO	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/16/2005 9:30	COCO	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/16/2005 9:30	COCO	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/16/2005 9:30	COCO	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
5/16/2005 9:30	COCO	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
5/16/2005 9:30	COCO	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/16/2005 9:30	COCO	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/16/2005 9:30	COCO	BNA-Water	Hexachloroethane	2.9	ug/L	UJ	2.9	11
5/16/2005 9:30	COCO	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/16/2005 9:30	COCO	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/16/2005 9:30	COCO	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	UJ	1.9	7.6
5/16/2005 9:30	COCO	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
5/16/2005 9:30	COCO	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
5/16/2005 9:30	COCO	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Phenol	0.95	ug/L	UJ	0.95	3.8
5/16/2005 9:30	COCO	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
5/16/2005 10:00	COCO BLK	BNA-Water	2,4-Dinitrophenol	14	ug/L	UJ	14	57
5/16/2005 10:00	COCO BLK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 10:00	COCO BLK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	UJ	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	UJ	38	150
5/16/2005 10:00	COCO BLK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	UJ	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
5/16/2005 10:00	COCO BLK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
5/16/2005 10:00	COCO BLK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Benzidine	95	ug/L	UJ	95	380
5/16/2005 10:00	COCO BLK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	UJ	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
5/16/2005 10:00	COCO BLK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
5/16/2005 10:00	COCO BLK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
5/16/2005 10:00	COCO BLK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
5/16/2005 10:00	COCO BLK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
5/16/2005 10:00	COCO BLK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
5/16/2005 10:00	COCO BLK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
5/16/2005 10:00	COCO BLK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 10:00	COCO BLK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
5/16/2005 10:00	COCO BLK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Hexachloroethane	2.9	ug/L	UJ	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
5/16/2005 10:00	COCO BLK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
5/16/2005 10:00	COCO BLK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	UJ	1.9	7.6
5/16/2005 10:00	COCO BLK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
5/16/2005 10:00	COCO BLK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Phenol	0.95	ug/L	UJ	0.95	3.8
5/16/2005 10:00	COCO BLK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
5/16/2005 9:30	COCO	GC-Water	Alachlor	0.6	ug/L	U	0.6	2.4
5/16/2005 9:30	COCO	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Atrazine	0.11	ug/L	I	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
5/16/2005 9:30	COCO	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
5/16/2005 9:30	COCO	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Diazinon	0.05	ug/L	UJ	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
5/16/2005 9:30	COCO	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Malathion	0.15	ug/L	UJ	0.15	0.6
5/16/2005 9:30	COCO	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
5/16/2005 9:30	COCO	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
5/16/2005 9:30	COCO	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
5/16/2005 9:30	COCO	GC-Water	Naled	0.8	ug/L	U	0.8	3.2
5/16/2005 9:30	COCO	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
5/16/2005 9:30	COCO	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
5/16/2005 9:30	COCO	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
5/16/2005 9:30	COCO	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
5/16/2005 9:30	COCO	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
5/16/2005 10:00	COCO BLK	GC-Water	Alachlor	0.57	ug/L	U	0.57	2.3
5/16/2005 10:00	COCO BLK	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.19

Appendix 2. Chemical Analyses (continued)

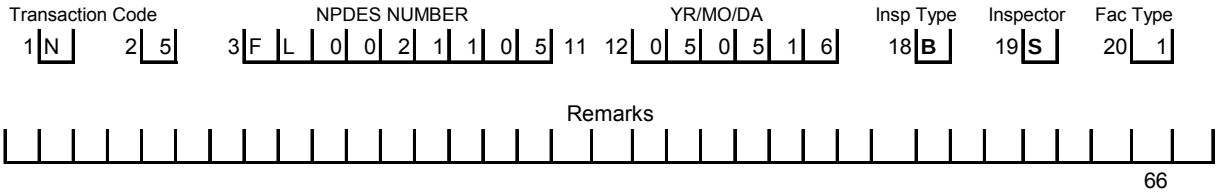
Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 10:00	COCO BLK	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
5/16/2005 10:00	COCO BLK	GC-Water	Butylate	0.19	ug/L	U	0.19	0.76
5/16/2005 10:00	COCO BLK	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Chlorpyrifos Methyl	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Diazinon	0.048	ug/L	UJ	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Ethion	0.048	ug/L	U	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Ethoprop	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
5/16/2005 10:00	COCO BLK	GC-Water	Fonofos	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Hexazinone	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Malathion	0.14	ug/L	UJ	0.14	0.56
5/16/2005 10:00	COCO BLK	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
5/16/2005 10:00	COCO BLK	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.9
5/16/2005 10:00	COCO BLK	GC-Water	Metribuzin	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Mevinphos	0.19	ug/L	U	0.19	0.76
5/16/2005 10:00	COCO BLK	GC-Water	Naled	0.76	ug/L	U	0.76	3
5/16/2005 10:00	COCO BLK	GC-Water	Norflurazon	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
5/16/2005 10:00	COCO BLK	GC-Water	Parathion Methyl	0.095	ug/L	U	0.095	0.38
5/16/2005 10:00	COCO BLK	GC-Water	Phorate	0.048	ug/L	U	0.048	0.19
5/16/2005 10:00	COCO BLK	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
5/16/2005 10:00	COCO BLK	GC-Water	Simazine	0.048	ug/L	U	0.048	0.19
5/16/2005 9:30	COCO	Metals-Water	Aluminum	4.39E+03	ug/L		5	20
5/16/2005 9:30	COCO	Metals-Water	Arsenic	4	ug/L	U	4	16
5/16/2005 9:30	COCO	Metals-Water	Cadmium	0.3	ug/L	U	0.3	1.2
5/16/2005 9:30	COCO	Metals-Water	Calcium	77.3	mg/L		0.05	0.2
5/16/2005 9:30	COCO	Metals-Water	Chromium	2	ug/L	U	2	8
5/16/2005 9:30	COCO	Metals-Water	Copper	1.5	ug/L	I	0.5	2
5/16/2005 9:30	COCO	Metals-Water	Iron	4.66E+03	ug/L		10	40
5/16/2005 9:30	COCO	Metals-Water	Lead	0.27	ug/L	U	0.27	1.1
5/16/2005 9:30	COCO	Metals-Water	Magnesium	29.1	mg/L		0.01	0.04
5/16/2005 9:30	COCO	Metals-Water	Nickel	2	ug/L	U	2	8
5/16/2005 9:30	COCO	Metals-Water	Selenium	2.1	ug/L		0.5	2
5/16/2005 9:30	COCO	Metals-Water	Silver	0.042	ug/L	I	0.025	0.1
5/16/2005 9:30	COCO	Metals-Water	Zinc	6.6	ug/L	I	3	12
5/16/2005 10:00	COCO BLK	Metals-Water	Aluminum	5	ug/L	U	5	20
5/16/2005 10:00	COCO BLK	Metals-Water	Arsenic	6	ug/L	U	6	24
5/16/2005 10:00	COCO BLK	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
5/16/2005 10:00	COCO BLK	Metals-Water	Calcium	0.075	mg/L	U	0.075	0.3
5/16/2005 10:00	COCO BLK	Metals-Water	Chromium	2	ug/L	U	2	8
5/16/2005 10:00	COCO BLK	Metals-Water	Copper	0.5	ug/L	U	0.5	2
5/16/2005 10:00	COCO BLK	Metals-Water	Iron	10	ug/L	U	10	40
5/16/2005 10:00	COCO BLK	Metals-Water	Lead	0.075	ug/L	U	0.075	0.3

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
5/16/2005 10:00	COCO BLK	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
5/16/2005 10:00	COCO BLK	Metals-Water	Nickel	2	ug/L	U	2	8
5/16/2005 10:00	COCO BLK	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
5/16/2005 10:00	COCO BLK	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
5/16/2005 10:00	COCO BLK	Metals-Water	Zinc	3	ug/L	U	3	12
5/16/2005 9:30	COCO	Nutrients-Liquid	Ammonia-N	0.057	mg N/L	A	0.01	0.02
5/16/2005 9:30	COCO	Nutrients-Liquid	Cyanide	0.005	mg CN/L	U	0.005	0.02
5/16/2005 9:30	COCO	Nutrients-Liquid	Kjeldahl Nitrogen	1.3	mg N/L		0.06	0.2
5/16/2005 9:30	COCO	Nutrients-Liquid	NO2NO3-N	5	mg N/L		0.04	0.1
5/16/2005 9:30	COCO	Nutrients-Liquid	O-Phosphate-P	0.72	mg P/L		0.08	0.2
5/16/2005 9:30	COCO	Nutrients-Liquid	Total-P	0.81	mg P/L		0.02	0.06
5/16/2005 9:30	COCO	Nutrients-Liquid	Turbidity	0.6	NTU		0.05	0.05
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	Cyanide	0.005	mg CN/L	U	0.005	0.02
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	Kjeldahl Nitrogen	0.06	mg N/L	U	0.06	0.2
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	NO2NO3-N	0.067	mg N/L		0.004	0.01
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
5/16/2005 10:00	COCO BLK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06

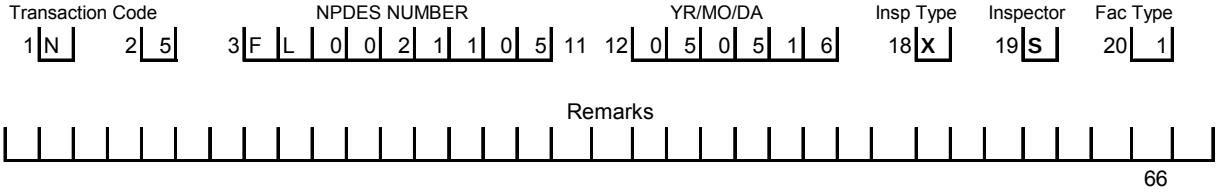
The Bioassay of Cocoa Beach WRF effluent sampled on May 16, 2005, NPDES #FL0021105.

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



The Bioassay of Cocoa Beach WRF effluent sampled on May 16, 2005, NPDES #FL0021105.

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



The Bioassay of Cocoa Beach WRF effluent sampled on May 16, 2005, NPDES #FL0021105.

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

