

Effluent Quality Assessment

CITGO Petroleum Corporation

Hillsborough County

NPDES #FLS000531

Sampled September 15, 2009

January 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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CITGO Petroleum Corporation Bulk Storage Terminal, 801 McCloskey Boulevard, Tampa, Hillsborough County, Florida, 33605. NPDES #FLS000531. Effluent samples for bioassay and chemical analyses for this facility were collected on September 15, 2009.

Introduction

CITGO Petroleum Corporation Bulk Storage Terminal is a bulk petroleum storage facility. It stores gasoline and diesel fuel and loads these petroleum products into trucks for distribution to retail stations. The facility has no Administrative Orders, Consent Orders or Mixing Zones. There have been reported permit violations for pH (daily limit 6.5 - 8.5 SU; value 6.29 SU) and dissolved oxygen (daily limit ≥ 5.0 mg/L; value 4.14 mg/L) within the past year. (See Appendix F for detailed facility information provided by Jason Cohen of FDEP Southwest District.)

Methods

Samples for bioassay, algal growth potential (AGP) and chemical analyses were collected from the EFF-3 NPDES sampling point for Outfall D-003, by Peter Wenner and Jason Cohen (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: **http://www.floridadep.org/labs/qa/sops.htm**.

See Appendix A for the completed chain of custody forms.

The freshwater acute screening toxicity tests and the algal growth potential tests were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

An aliquot of the AGP sample was salinity adjusted to meet the minimum salinity requirements of the test species for the marine AGP test.

Results and Discussion

Toxicity Test Results

Tests performed September 16-18, 2009.

Ceriodaphnia dubia **48**-hour acute definitive bioassay – LC_{50} > 100%, 0% mortality in 100% sample at 48 hours

Cyprinella leedsi **48**-hour acute definitive bioassay – LC_{50} > 100%, 0% mortality in 100% sample at 48 hours

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

See Appendix B for bioassay bench sheets. See Appendix C for results of the last 20 standard reference toxicant (SRT) tests and the bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix D for test organism receipts.

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 2.18 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) found that AGP values above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The ratio of inorganic nitrogen to ortho-phosphate (16.5:1) suggests that the effluent is co-limited by both nitrogen and phosphorus; whereas, the ratio of total nitrogen to total phosphorus (2.5:1) suggests that the effluent is nitrogen limited (Miller et al., 1978). To determine

actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed.

The Algal Growth Potential (AGP) of the salinity adjusted aliquot of effluent was 3.0 U (U - material analyzed for but not detected; value reported is the method detection limit) mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz found that AGP values above 10.0 mg dry wt/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al., FDEP, with Ron Raschke USEPA Region 4 1987).

See Tables 1a and 1b for AGP results.

Chemistry Results

Total residual chlorine and total ammonia were not detected in the bioassay sample in the bioassay laboratory. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.017 IJ (I – The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit; J – Estimated value.) mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg N/L.

Bromacil, aluminum, arsenic, cadmium, chromium, lead, nickel and selenium were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Effluent copper (9.96 µg/L), iron (440 µg/L) and zinc (131 µg/L) violated criterion for Class III marine waters, respectively, for copper (≤ 3.7 µg/L; 62-302.530(23), F.A.C.), iron (≤ 300 µg/L; 62-302.530(38), F.A.C.), and zinc (≤ 86 µg/L; 62-302.530(70), F.A.C.). Microbiological samples were not collected.

See Table 2 for results of analytes detected in the effluent, and corresponding limits. See Appendix E for a complete list of chemical analyses performed.

Conclusion

The effluent samples collected from the EFF-3 NPDES sampling point for Outfall D-001 for this facility on September 15, 2009, were not acutely toxic to either test species. The effluent AGP result was less than the "problem” threshold for marine receiving waters. Effluent copper (9.96 µg/L), iron (440 µg/L) and zinc (131 µg/L) violated criterion for Class III marine waters, respectively, for copper (≤ 3.7 µg/L; 62-302.530(23), F.A.C.), iron (≤ 300 µg/L; 62-302.530(38), F.A.C.), and zinc (≤ 86 µg/L; 62-302.530(70), F.A.C.). Other measured effluent water quality components did not violate water quality criteria or permit limits.

Literature Cited

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 1a. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), orthophosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus for samples collected from the CITGO Petroleum Corporation on September 15, 2009.

CITGO Petroleum Corporation							
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent D-003	2.18	2.5 ± 0.5	1.7 ± 0.3	27.3 ± 5.5	107.5 ± 21.5	16.5	2.9

Table 1b. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the CITGO Petroleum Corporation on September 15, 2009.

CITGO Petroleum Corporation			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent* D-003	3.0 U	16.5	2.9

* - sample salinity adjusted to 7ppt

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical data for samples collected from the CITGO Petroleum Corporation facility on September 15, 2009.

CITGO Petroleum Corporation NPDES# FLS000531	Class III Criteria	Effluent Limits	Effluent D-003	
Organic Constituents (µg/L)				
Bromacil	-	-	2.4	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	510	A
Arsenic	≤ 50	Report	1.41	A
Cadmium	≤ 8.8	-	0.28	A
Calcium (mg/L)	-	-	100	A
Chromium-III	-	-	2	A
Copper	≤ 3.7	Report	9.96	A
Iron	≤ 300	Report	440	A
Lead	≤ 8.5	Report	7.61	A
Magnesium (mg/L)	-	-	3.32	A
Mercury	≤ 0.025	Report	0.12	U
Nickel	≤ 8.3	Report	1.6	A
Selenium	≤ 71	-	1.74	A
Silver	≤ 2.3	Report	0.025	U
Zinc	≤ 86	-	131	A
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.004	I
Total Phosphorus	-	-	0.25	
Total Ammonia	-	-	0.017	IJ
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.049	F
Total Kjeldahl Nitrogen	-	-	0.67	
Organic Nitrogen	-	-	0.653	c
Total Nitrogen	-	-	0.719	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	≥ 5.0 s	6.9	
pH (SU)	6.5 - 8.5	6.5 - 8.5	8.3	
Conductivity (µmhos/cm)	-	-	582	
Temperature (°C)	-	-	26.6	
Sample Depth (m)	-	-	0.2	
Total Residual Chlorine (mg/L)	≤ 0.01	-	0.03	UQ£
Chlorophyll *a* (µg/L) - Corrected	-	-	1.7	I
Phaeophytin (µg/L)	-	-	0.96	I
Total Suspended Solids (mg/L)	-	Report	20	
Oils and Greases (mg/L)	≤ 5.0	≤ 5.0 s	1.4	U
Flow (MGD)	-	Report	0.185	a
Hardness (mg $CaCO_3$)	-	-	263.37	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
s - Single sample
A - Value reported is the mean of two or more determinations
F - Analyte was detected in both sample and field blank (0.004 I mg/L)
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
£ - Analyses performed in bioassay laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2009-08-31-28
Citgo Petroleum Corporation

Customer: SW-DIST
Project ID: FYI5
PMAS: 1143

Event ID *

Requester: Jennifer Paris
Field Report Prepared By:
Collected By: P. WENNER; J COHEN
Send Final Report To Ilia.Balcom
Sampling Agency: FDEP SWD

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
38027	D-003	☐ Comp ☑ Grab	Date 9/15/09 Time 940	Date Time	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 6.87	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc) FRESH	Temp (C) 26.57	pH 8.25	Sample Depth ☑ m ☐ ft 0.2	☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm) 0.28 / 582	NPDES Number
	Latitude N 27 ° 55 ' 57.3 "	Longitude W 82 ° 26 ' 41.6 "	Comments Received 3 BNA bottles only. AB 9/16/09		

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
38028	BLANK	☐ Comp ☑ Grab	Date 9/15/09 Time 1010	Date Time	D
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc) LAB DI WATER	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
☆		☐ Comp ☐ Grab	Date 9/15/09 Time 940	Date Time	
	Field ID TRIP - Blank	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc) T-BLK	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Eastern Central	Collection (end) Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab	Date Time	Date Time	
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments 2 Bleissy Reed in FL by JD. 10:21 9/16/09		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	9/15/09 1300	FED Ex	AB	9-16-09 0930				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

☆ Last row filled by Amzad 09/16/09

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Citgo Petroleum Corporation

Address: 801 McCloskey Boulevard, Tampa, Fl. 33605

City: Tampa County: Hillsborough

Contact/District: P Wenner / Southwest

NPDES Permit #: FL FLS 000531

LIMS Job #: TLH-2009-09-1616 LIMS Sample #: 1215335

Lims Data Entry: MF 9-18-09 Data Entry Verification: 9-18-09 JD

Sample Collection: Date: 9.15.09 Time: 10:30

Hold Time Start: Date: 9.15.09 Time: 10'30

Comments:

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

Test Type: Screen

Static / Static Renewal / Flow-through

Test Duration: 48 96 Hours.

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

(√one)

Test 1 incubated in: ☑ Incubator #: 2 ☐ Waterbath #:_____

Test 2 incubated in: ☑ Incubator #: 2 ☐ Waterbath #:_____

Initial sample handling:

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: _____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C: (If used)

Incubator # 2 min 25.0 max 26.0 mean 25.5

Incubator # ____ min._____ max._____ mean_____

Waterbath # ____ min._____ max._____ mean_____

Room B246 min. 25.2 max 25.8 mean 25.5

Sample Validation:

Temperature: Shipped ≤6°C Yes No — IF 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)

Batch #	9.11.09	9.15.09							
Water Quality Parameters	20% DMW 9-14-09	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A		Not Measured	MF	
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03					<0.03	JD	MF
Alkalinity (mg/L as $CaCO_3$):	75	146					53	BA	JD
Hardness (mg/L as $CaCO_3$):	84	141					260	BA	JD
Total Ammonia (mg/L as N):	<0.017	not measured					not measured	MF	JD
Conductivity: (µmhos) mmhos	215	276					554	JD	MF
Salinity (ppth):	—	—					—	JD	—

Investigators' Signatures

James Daniels

Chelsea Ford

Marshall Fairbanks

Brian Allen

Lolita C. Wolfe

REVIEWER

V 1.6 7/8/0

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1215335 Test #: 1/2 SOP#:TA 07 01 Test Started: Date 9/16.09 Time: 12.30

Organism/Batch/Age: C.dubia / 33-09 / <24 hrs Test Ended: Date 9/18.09 Time: 1300

Chamber/Test Volume: 30 / 20 ml Diluent/ Batch: DMW / 9.14.09 Test Duration: (48) hr 96 hr

Food/Batch: [X] YCT 7.15.09 [X] P.sub 7.23.09

[ ] Artemia Lot#____ Batch #: 0hr____ 24hr____ 48hr____ 72hr____

Feeding: [X] Prior to Test [ ] Prior to Renewal [✓] 0 hr [ ] 24 hr [ ] 48 hr [ ] 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
	A	A	5	5	5			
Ctrl	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
	A	A	5	5	5			
100%	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
Loaded/Verified by: [illegible] / BA	Checked by:		[illegible]	[illegible]	[illegible]			

m = missing d = dead BR/AR = Before/After Renewal

Comments:

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 0% LC50: >100%

If Calculated: 95% CI____ Method____

V 2.3 7/15/2008

Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1215335 Test #: 2/2 SOP#:TA 07 02 Test Started: Date 9/16/09 Time: 1200
Organism/Batch/Age: C.dubia / 9/15/09 / 1 Days Test Ended: Date 9/18/09 Time: 1255
Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: Well / 9/15/09 Test Duration: 48 hr 96 hr
Food/Batch: ☐ YCT ☐ P.sub
☒ Artemia Lot# 38438 Batch #: 0hr 122-09 24hr 48hr 72hr
Feeding: ☒ Prior to Test ☐ Prior to Renewal ☒ 0 hr ☐ 24 hr ☐ 48 hr ☐ 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	D9	5	5	5			
	B	D10	5	5	5			
	C	D11	5	5	5			
	D	D12	5	5	5			
100%	A	D13	5	5	5			
	B	D14	5	5	5			
	C	D15	5	5	5			
	D	D16	5	5	5			

Loaded/Verified by: [illegible] Checked by: [illegible]
m = missing d = dead BR/AR = Before/After Renewal
Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 0% LC50: >100%
If Calculated: 95% CI_____ Method_____
Comments:
V 2.3 7/15/2008
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1215335 Test #: 1 of 2

TEST SOP #: TA07_01 Test Species: [X] *Ceriodaphnia dubia* [ ] *Cyprinella leedsi* [ ] *Pimephales promelas*

Test aerated: yes (no) (circle one) Check 1: [ ] *Americamysis bahia* [ ] *Menidia beryllina* [ ] Other:

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	8.1		7.9			
Temperature °C	24.5		24.0			
Dissolved Oxygen mg/L aerate if < 4	7.8		7.2			
Conductivity (µmhos) mmhos	215		257			
Salinity ppth	—		—			
(initials) Measured by:	cf		JS			
(initials) Recorded by:	cf		JS			

Comments:

Concentration 10%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	8.0		7.8			
Temperature °C	24.9		24.1			
Dissolved Oxygen mg/L aerate if < 4	7.5		7.4			
Conductivity (µmhos) mmhos	569		634			
Salinity ppth	—		—			
(initials) Measured by:	cf		JS			
(initials) Recorded by:	cf		JS			

Comments:

Salinity only needs measuring if saltwater.

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 aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(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 aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:		000040				

Comments:

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 12/5335 Test #: 2 of 2

TEST SOP #: TA07_02 Test Species: ☐ *Ceriodaphnia dubia* ☒ *Cyprinella leedsi* ☐ *Pimephales promelas*

Test aerated: yes no (circle one) Check 1: ☐ *Americamysis bahia* ☐ *Menidia beryllina* ☐ Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.7	7.8	8.1			
Temperature °C	24.5	24.1	24.1			
Dissolved Oxygen mg/L aerate if < 4	7.7	6.7	7.0			
Conductivity (µmhos) mmhos	276	289	299			
Salinity ppth	—	—	—			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.5	7.7	7.9			
Temperature °C	24.8	24.1	24.0			
Dissolved Oxygen mg/L aerate if < 4	7.4	6.6	7.0			
Conductivity (µmhos) mmhos	554	559	574			
Salinity ppth	—	—	—			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Salinity only needs measuring if saltwater.

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 aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(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 aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Appendix B. (continued)

Bioassay Instrument ID

Test ID: Citgo Petroleum Corp. Dates: September 16-18, 2009

METER / DEVICE	ID	SOP	Parameter	Method	√used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	√
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	√
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	SM 2510 B	√
			Salinity	SM 2520 B	√
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	√
Thermometer (DO probe)	YSI 5750 SN 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	√
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	√
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	√
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	√
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.
Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

Entered by SD 10.20.09

V 1.1 6/12/08 MF

000042

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Appendix C. SRT Bench Sheets and Statistical Analysis

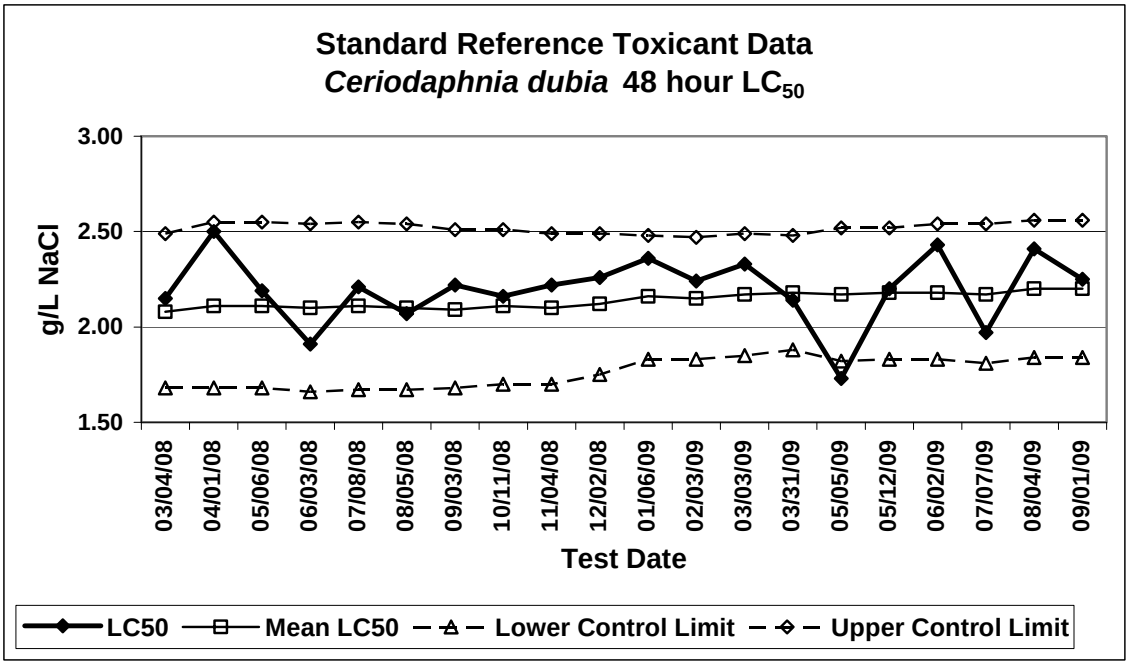
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
03/04/08	2.15	2.08	0.20	1.68	2.49
04/01/08	2.50	2.11	0.22	1.68	2.55
05/06/08	2.19	2.11	0.22	1.68	2.55
06/03/08	1.91	2.10	0.22	1.66	2.54
07/08/08	2.21	2.11	0.22	1.67	2.55
08/05/08	2.07	2.10	0.22	1.67	2.54
09/03/08	2.22	2.09	0.21	1.68	2.51
10/11/08	2.16	2.11	0.20	1.70	2.51
11/04/08	2.22	2.10	0.20	1.70	2.49
12/02/08	2.26	2.12	0.19	1.75	2.49
01/06/09	2.36	2.16	0.16	1.83	2.48
02/03/09	2.24	2.15	0.16	1.83	2.47
03/03/09	2.33	2.17	0.16	1.85	2.49
03/31/09	2.14	2.18	0.15	1.88	2.48
05/05/09	1.73	2.17	0.18	1.82	2.52
05/12/09	2.20	2.18	0.17	1.83	2.52
06/02/09	2.43	2.18	0.18	1.83	2.54
07/07/09	1.97	2.17	0.18	1.81	2.54
08/04/09	2.41	2.20	0.18	1.84	2.56
09/01/09	2.25	2.20	0.18	1.84	2.56

Means are of the last 20 SRT tests.
Lower Control Limit = mean - 2 * Std Dev
Upper Control Limit = mean + 2 * Std Dev

CV = 8.22
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

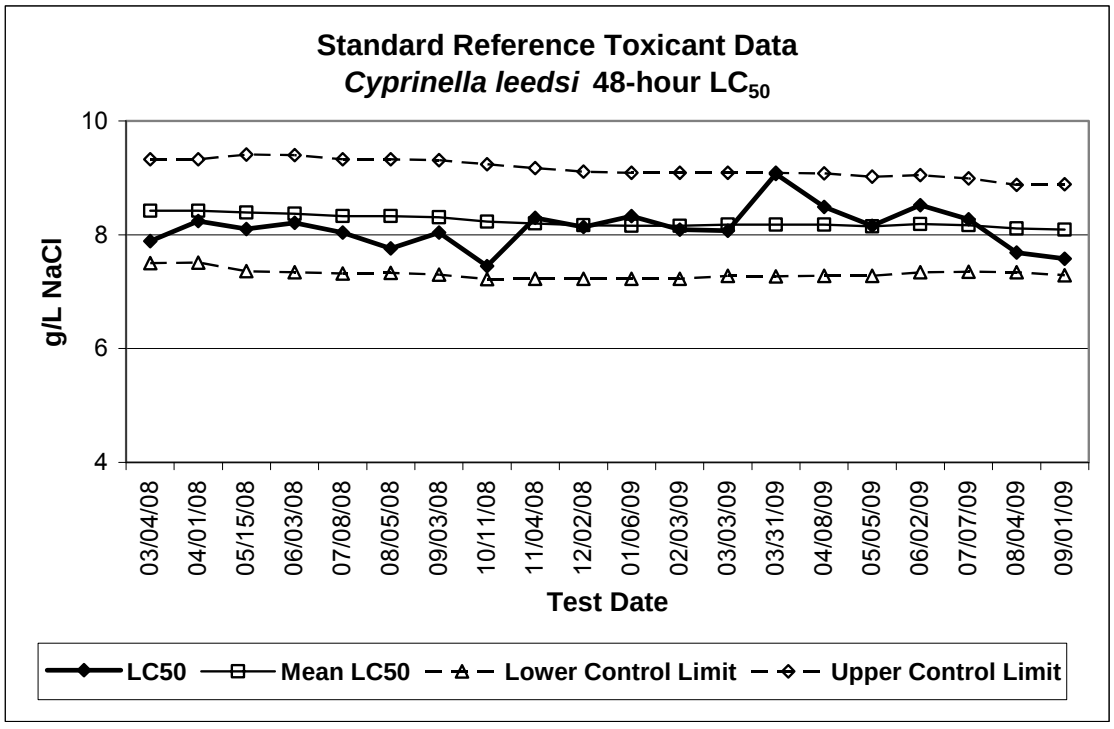
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
03/04/08	7.89	8.42	0.46	7.50	9.33
04/01/08	8.24	8.42	0.45	7.51	9.33
05/15/08	8.1	8.39	0.51	7.36	9.41
06/03/08	8.21	8.37	0.51	7.34	9.40
07/08/08	8.04	8.33	0.50	7.32	9.33
08/05/08	7.76	8.33	0.50	7.33	9.33
09/03/08	8.04	8.31	0.50	7.30	9.31
10/11/08	7.45	8.23	0.51	7.22	9.24
11/04/08	8.3	8.20	0.48	7.23	9.17
12/02/08	8.14	8.17	0.47	7.23	9.11
01/06/09	8.33	8.16	0.47	7.23	9.09
02/03/09	8.09	8.16	0.47	7.23	9.09
03/03/09	8.07	8.18	0.45	7.28	9.09
03/31/09	9.07	8.18	0.45	7.27	9.09
04/08/09	8.49	8.18	0.45	7.28	9.08
05/05/09	8.16	8.15	0.43	7.28	9.02
06/02/09	8.52	8.19	0.43	7.34	9.05
07/07/09	8.27	8.17	0.41	7.35	8.99
08/04/09	7.69	8.11	0.38	7.34	8.88
09/01/09	7.58	8.09	0.40	7.29	8.89

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 4.94
EPA reference 75th quartile CV = 19%



Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
☐ *Americamysis bahia* Method 2007.0 TA07.03 ☐ *Menidia Beryllina* Method 2006.0 TA07.04 ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01 ☐ *Cyprinella leedsi* Method 2000.0 TA07.02 ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☐ renewal
Test Page 1 of 2

Diluent/ Batch #: DMW 1.8.15.09
Toxicant/ Batch#: NaCl 15.3109
Organism Batch: 31.09 Age: <24hr
Test Beginning: Date: 9.1.09 Time: 12:00
Test Ending: Date: 9.5.09 Time: 1200

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	BA
Alkalinity (mg/L as $CaCO_3$):	77	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	85	TA06_09	BA
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: µmhos (mmhos)	0.174	TA06_25	BA
Salinity (ppth):	<1	TA06_25	BA

Food:	Batch
☑ YCT	7.15.09
☑ *P. subcapitata*	2.13.09
☐ Artemia Lot #	—

Artemia Batch:
0 hr:
24 hr:
48 hr:
72 hr:

Chamber size: 30 mL
Test volume: 20 mL per replicate

Concentrations prepared by: BA
Temperature Range °C:(if used)
Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min. 24.5 max. 25.3 mean 24.4
Light Intensity: 50-100 Ft. candles
Waterbath # ___ min. ____ max. ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark
Room B246 min. 24.4 max. 25.7 mean 25.3

Feeding: √as needed
☑ Before test
☐ 0 hr
☐ 24 hr
☑ 48 hr
☐ 72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

Concentration µg/L mg/L ‰	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	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
1.5	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	~~5~~ 5d	5
	C	C	5	5	5	4 1M	4	4
	D	D	5	5	5	5	5	5
2.0	A	A	5	5	5	1 4D	1	1
	B	B	5	5	5	3 1D	3	3
	C	C	5	5	4 1D	1 3D (A)	1	1
	D	D	5	5	5	3 2D	3	1 2D
2.5	A	A	5	3 2D	0 3D	—		
	B	B	5	3 2D	1 2D	0 1D		
	C	C	5	4 1D	1 3D	0 1D		
	D	D	5	5	0 5D	—		
3.0	A	A	5	1 4D	0 1D	—		
	B	B	5	1 4D	0 1D	—		
	C	C	5	3 2D	0 3D	—		
	D	D	5	4 1D	0 4D	—		
4.0	A	A	5	0 5D	—	—		
	B	B	5	0 5D	—	—		
	C	C	5	0 5D	—	—		
	D	D	5	2 3D	0 2D	—		
Organisms loaded by: BA	Checked by:		BA	CF	CF			
Loading Verified by:								

m = missing d = dead BR = before renewal hr = hour AR = after renewal

H. azteca

0 hr	Alk	Hrd
Well		
100%		

96 hr	Alk	Hrd
Well		
100%		

Comments: (A) Count is a 1 with 3 dead. CF

Investigators' Signatures

James Daniels
Bruce Ab...
Chris Fr...
Marshall Fairbanks
Reviewer: Walter C. Wolfe

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 2.25	2.17	2.34
96 hour: 1.85	1.74	1.96

2533

Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012 except *H. azteca*

Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 9.1.09 Time: 12,00
Test Ending: Date: 9.5.09 Time: 12.00

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (C)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	M	0 hr	7.9	24.2	7.5	0.174	—
	—	24 hr	—	—	—	2.94	—
	A	48 hr BR	7.8	24.0	7.0	0.198	
	M	48 hr AR	7.9	24.2	7.8	0.181	
		72 hr	—	—	—	—	—
	m	96 hr	7.8	24.2	7.8	0.274	
1.5	M	0 hr	7.9	24.3	7.6	2.94	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.8	24.0	7.1	3.28	
	M	48 hr AR	8.0	24.4	7.7	2.91	
		72 hr					
	m	96 hr	7.8	24.1	7.9	3.19	
2.0	M	0 hr	7.9	24.3	7.8	3.95	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.8	24.0	7.0	4.44	
	M	48 hr AR	8.0	24.5	7.7	3.93	
		72 hr					
	m	96 hr	7.8	24.0	7.9	4.66	
2.5	M	0 hr	7.9	24.2	7.8	4.78	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.8	24.0	7.2	5.34	
	M	48 hr AR	8.1	24.3	7.6	4.77	
	B	72 hr	8.0	24.4	7.8	4.87	
		96 hr					
3.0	M	0 hr	7.9	24.2	7.8	5.68	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.9	24.0	7.2	6.45	
		48 hr AR					
		72 hr					
		96 hr					
4.0	M	0 hr	7.9	24.0	7.8	7.44	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.9	24.0	7.3	7.87	
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures

Measured by:
- 0 hr: BA
- 24 hr: —
- 48 hr BR: BA
- 48 hr AR: BA
- 72 hr: BA
- 96 hr: BA

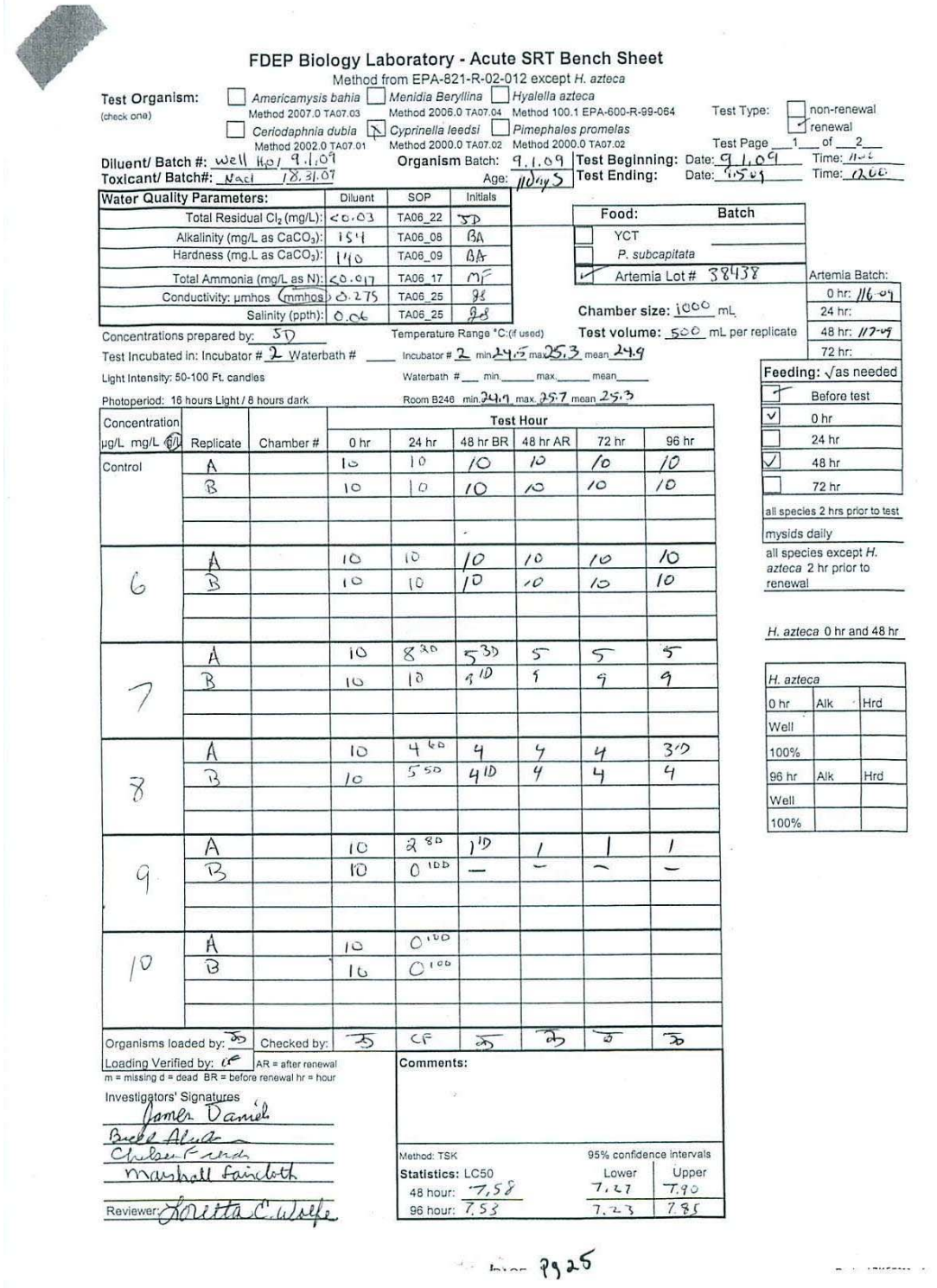
Measure/record salinity for marine tests

Comments: 72 hr parameters taken after 2.5 sample when all organisms dead. BA 9.4.09

Reviewed By: Loretta C. Wolf

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Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☒ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal

Test Page 1 of 2

Diluent/ Batch #: well H2O / 9.1.09
Toxicant/ Batch#: NaCl / 8.31.07
Organism Batch: 9.1.09 Age: 10dy 5
Test Beginning: Date: 9.1.09 Time: 1100
Test Ending: Date: 9.15.09 Time: 1200

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	SD
Alkalinity (mg/L as $CaCO_3$):	154	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	140	TA06_09	BA
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: µmhos (mmhos)	0.275	TA06_25	JS
Salinity (ppth):	0.06	TA06_25	JS

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☑ Artemia Lot #	38438

Artemia Batch:
0 hr: 116-09
24 hr:
48 hr: 117-09
72 hr:

Chamber size: 1000 mL
Test volume: 500 mL per replicate

Concentrations prepared by: SD
Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 24.5 max 25.3 mean 24.9
Light Intensity: 50-100 Ft. candles Waterbath # ___ min.____ max.____ mean____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 24.9 max 25.7 mean 25.3

Temperature Range °C:(if used)

Feeding: √as needed

☑	Before test
☑	0 hr
☐	24 hr
☑	48 hr
☐	72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

Concentration µg/L mg/L (B/L)	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A		10	10	10	10	10	10
	B		10	10	10	10	10	10
6	A		10	10	10	10	10	10
	B		10	10	10	10	10	10
7	A		10	8 3D	5 3D	5	5	5
	B		10	10	9 1D	9	9	9
8	A		10	4 6D	4	4	4	3 1D
	B		10	5 5D	4 1D	4	4	4
9	A		10	2 8D	1 1D	1	1	1
	B		10	0 10D	—	—	—	—
10	A		10	0 10D				
	B		10	0 10D				
Organisms loaded by: SD		Checked by:	JS	CF	JS	JS	JS	JS

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Loading Verified by: CF AR = after renewal
m = missing d = dead BR = before renewal hr = hour

Comments:

Investigators' Signatures
James Daniel
Becki Alva
Chelsea Finch
Marshall Faircloth
Reviewer: Loretta C. Wolfe

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour:	7.27	7.90
96 hour: 7.53	7.23	7.85

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters
Methods from EPA-821-R-02-012 except *H. azteca*
Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☒ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 9.1.09 Time: 1100
Test Ending: Date: 9.5.09 Time: 1202
Test Type: ☐ non-renewal ☐ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L %	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	7.9	24.8	8.2	0.275	0.06
	B	24 hr	8.0	24.2	7.8	0.276	
	A	48 hr BR	8.1	25.0	7.8	0.328	
	A	48 hr AR	8.1	23.9	7.9	0.329	
	B	72 hr	7.4	24.8	6.8	0.503	
	A	96 hr	7.9	24.6	7.7	0.350	
6	A	0 hr	7.9	25.2	8.2	10.96	6.11
	B	24 hr	7.9	24.2	7.6	10.8	
	A	48 hr BR	8.1	24.2	7.8	10.5	
	A	48 hr AR	8.0	23.9	7.9	10.4	
	B	72 hr	7.8	24.7	6.6	10.9	
	A	96 hr	8.0	24.1	7.3	11.0	
7	A	0 hr	7.9	25.4	8.2	12.81	7.32
	B	24 hr	7.9	24.1	7.5	12.5	
	A	48 hr BR	8.1	24.0	7.5	12.8	
	A	48 hr AR	8.0	23.9	7.8	12.9	
	B	72 hr	7.9	24.7	6.7	13.1	
	A	96 hr	8.1	24.1	7.3	13.2	
8	A	0 hr	7.9	25.4	8.0	14.54	8.41
	B	24 hr	7.9	24.0	7.5	14.3	
	A	48 hr BR	8.1	24.0	7.3	14.5	
	A	48 hr AR	8.0	23.9	7.7	14.3	
	B	72 hr	8.0	24.5	6.8	14.1	
	A	96 hr	8.1	24.2	7.2	14.7	
9	A	0 hr	7.9	25.4	8.2	16.03	9.33
	B	24 hr	8.0	24.0	7.5	15.9	
	A	48 hr BR	8.1	24.0	7.4	16.0	
	A	48 hr AR	8.0	23.9	7.7	4 ~~14.3~~ 16.0	
	A	72 hr	8.0	24.5	6.8	16.4	
	A	96 hr	8.1	24.3	7.0	16.6	
10	A	0 hr	7.9	25.6	8.0	17.78	10.45
	B	24 hr	8.0	24.0	7.5	17.5	
		48 hr BR	—	~~24.0~~ 4	~~7.6~~ 4	—	—
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Becca Abadie
Chelsea Friend
Jana Dand
Marshall Faircloth

Measured by:
0 hr:
24 hr:
48 hr BR:
48 hr AR:
72 hr:
96 hr:

Measure/record salinity for marine tests

Comments:

Reviewed By: Loretta C. Wolfe

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Appendix C. (continued)
***Ceriodaphnia dubia* Acute Standard Reference Toxicant Test**

DATE: 9-1-09 DURATION: 48 h TOXICANT: NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/l)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	1
2.50	20	18
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 2.25**
95% LOWER CONFIDENCE: 2.17
95% UPPER CONFIDENCE: 2.34

***Cyprinella leedsi* Acute Standard Reference Toxicant Test**

DATE: 9-1-09 DURATION: 48 h TOXICANT: NaCl
SPECIES: *Cyprinella leedsi*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
6.00	20	0
7.00	20	6
8.00	20	12
9.00	20	19
10.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 7.58**
95% LOWER CONFIDENCE: 7.27
95% UPPER CONFIDENCE: 7.90

Appendix C. (continued)

FDEP Biology Laboratory - Bioassay Instrument Identification

Test ID: Acute SRTs SRT Dates: September 1 - 5, 2009

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	√
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H^+	√
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	SM 2510 B	√
			Salinity	SM 2520 B	√
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	√
Thermometer (DO probe)	YSI 5750 SN 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	√
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	√
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	√
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	√
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	√
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	√

SM-2530B modified to allow use electronic and non-mercury filled thermometers.
Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

Comments: Entered by M. Faircloth 12/17/2009

V 1.4 8/21/08 BA

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 8/31/09

Shipped to: FDEP

P.O. No:

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	MS090827	25°C	8.0 s.u	20 ‰
Menidia beryllina	150	12 DAYS	SS090819	25°C	8.0 s.u.	20 ‰
						Hardness
Cyprinella leedsi	250	10 DAYS	CL090821	25°C	7.8 s.u.	80 mg/L
Pimephales promelas	150	8 DAYS	FM090823	25°C	7.8 s.u.	80 mg/L

Packed by: ✓

Shipped Via: Fed Ex

Notes:

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 9/14/09

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia						
Menidia beryllina						
						Hardness
Cyprinella leedsi	100	10 DAYS	CL090904	25°C	7.8 s.u.	80 mg/L
Pimephales promelas						

Packed by: _____

Shipped Via: FedEx

Notes: _____

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix E. Chemical Analyses performed on the effluent from the CITGO Petroleum Corporation Facility Outfall D-003, sampled on September 15, 2009.

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/15/2009 9:40	Effluent D-003	AGP/LN	Algal Growth Potential	2.18		mg DryWt/L	0.3	0.9
9/15/2009 9:40	Effluent D-003	AGP/LN	Algal Growth Potential-Salinity Adjusted	3	U	mg DryWt/L	3	3
9/15/2009 9:40	Effluent D-003	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.96	I	ug/L	0.4	1.2
9/15/2009 9:40	Effluent D-003	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.7	I	ug/L	0.55	1.7
9/15/2009 9:40	Effluent D-003	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
9/15/2009 9:40	Effluent D-003	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50		
9/15/2009 9:40	Effluent D-003	Metals	Mercury	0.12	U	ug/L	0.12	0.5
9/15/2009 9:40	Effluent D-003	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/15/2009 9:40	Effluent D-003	Metals	Nickel	1.6	A	ug/L	0.25	1
9/15/2009 9:40	Effluent D-003	Metals	Iron	440	A	ug/L	30	120
9/15/2009 9:40	Effluent D-003	Metals	Zinc	131	A	ug/L	5	20
9/15/2009 9:40	Effluent D-003	Metals	Selenium	1.74	A	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Metals	Cadmium	0.28	A	ug/L	0.03	0.12
9/15/2009 9:40	Effluent D-003	Metals	Magnesium	3.32	A	mg/L	0.04	0.16
9/15/2009 9:40	Effluent D-003	Metals	Arsenic	1.41	A	ug/L	0.25	1
9/15/2009 9:40	Effluent D-003	Metals	Copper	9.96	A	ug/L	0.5	0.5
9/15/2009 9:40	Effluent D-003	Metals	Aluminum	510	A	ug/L	60	240
9/15/2009 9:40	Effluent D-003	Metals	Calcium	100	A	mg/L	0.075	0.3
9/15/2009 9:40	Effluent D-003	Metals	Chromium	2	A	ug/L	0.3	1.2
9/15/2009 9:40	Effluent D-003	Metals	Lead	7.61	A	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Nutrients	Total-P	0.25		mg P/L	0.02	0.05
9/15/2009 9:40	Effluent D-003	Nutrients	O-Phosphate-P	0.004	I	mg P/L	0.004	0.01
9/15/2009 9:40	Effluent D-003	Nutrients	NO2NO3-N	0.049		mg N/L	0.004	0.01
9/15/2009 9:40	Effluent D-003	Nutrients	Kjeldahl Nitrogen	0.67		mg N/L	0.08	0.2
9/15/2009 9:40	Effluent D-003	Nutrients	Ammonia-N	0.017	IJ	mg N/L	0.01	0.02
9/15/2009 9:40	Effluent D-003	Nutrients	TSS	20		mg/L	4	16
9/15/2009 9:40	Effluent D-003	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
9/15/2009 9:40	Effluent D-003	Pesticides	Bromacil	2.4		ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Phorate	0.05	UJ	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/15/2009 9:40	Effluent D-003	Pesticides	DDT-p,p'	0.03	UJ	ug/L	0.03	0.12
9/15/2009 9:40	Effluent D-003	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
9/15/2009 9:40	Effluent D-003	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Naled	0.8	UJ	ug/L	0.8	3.2
9/15/2009 9:40	Effluent D-003	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
9/15/2009 9:40	Effluent D-003	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Ethoprop	0.1	UJ	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
9/15/2009 9:40	Effluent D-003	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Metalaxyl	0.25	UJ	ug/L	0.25	1
9/15/2009 9:40	Effluent D-003	Pesticides	Mevinphos	0.2	UJ	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
9/15/2009 9:40	Effluent D-003	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
9/15/2009 9:40	Effluent D-003	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
9/15/2009 9:40	Effluent D-003	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
9/15/2009 9:40	Effluent D-003	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Effluent D-003	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
9/15/2009 9:40	Effluent D-003	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
9/15/2009 9:40	Effluent D-003	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
9/15/2009 9:40	Effluent D-003	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/15/2009 9:40	Effluent D-003	Pesticides	Azinphos Methyl	0.2	UJ	ug/L	0.2	0.8
9/15/2009 9:40	Effluent D-003	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
9/15/2009 9:40	Effluent D-003	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
9/15/2009 9:40	Effluent D-003	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
9/15/2009 9:40	Effluent D-003	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Fluoranthene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzo(k)fluoranthene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Anthracene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Acenaphthylene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Acenaphthene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Pyrene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzo(a)anthracene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Butyl benzyl phthalate	4.7	U	ug/L	4.7	19
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Hexachloroethane	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzo(b)fluoranthene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Di-n-butyl phthalate	4.7	U	ug/L	4.7	19
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Fluorene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Pentachlorophenol	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Ethylbenzene	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzidine	95	U	ug/L	95	380
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.95	U	ug/L	0.95	3.8

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Hexachlorobutadiene	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	UJ	ug/L	38	150
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Chrysene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzene	0.2	U	ug/L	0.2	1
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Dimethyl phthalate	9.5	U	ug/L	9.5	38
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Naphthalene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Benzo(a)pyrene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Phenanthrene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8	U	ug/L	2.8	11
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	Toluene	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
9/15/2009 9:40	Effluent D-003	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
9/15/2009 9:40	Effluent D-003	Field Parameter	Dissolved Oxygen	6.87		mg/L		
9/15/2009 9:40	Effluent D-003	Field Parameter	Sample Depth	0.2		m		
9/15/2009 9:40	Effluent D-003	Field Parameter	Specific Conductance	582		umhos/cm		
9/15/2009 9:40	Effluent D-003	Field Parameter	pH	8.25				
9/15/2009 9:40	Effluent D-003	Field Parameter	Temperature	26.57		C		
9/15/2009 10:10	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/15/2009 10:10	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
9/15/2009 10:10	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
9/15/2009 10:10	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
9/15/2009 10:10	Blank	Metals	Mercury	0.12	U	ug/L	0.12	0.5
9/15/2009 10:10	Blank	Metals	Zinc	5	U	ug/L	5	20
9/15/2009 10:10	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
9/15/2009 10:10	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
9/15/2009 10:10	Blank	Metals	Iron	30	U	ug/L	30	120
9/15/2009 10:10	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
9/15/2009 10:10	Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
9/15/2009 10:10	Blank	Metals	Copper	0.5	U	ug/L	0.5	0.5
9/15/2009 10:10	Blank	Metals	Aluminum	60	U	ug/L	60	240
9/15/2009 10:10	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
9/15/2009 10:10	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
9/15/2009 10:10	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
9/15/2009 10:10	Blank	Nutrients	NO2NO3-N	0.004	I	mg N/L	0.004	0.01
9/15/2009 10:10	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
9/15/2009 10:10	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
9/15/2009 10:10	Blank	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
9/15/2009 10:10	Blank	Priority Organic Pollutants	Benzene	0.2	U	ug/L	0.2	1
9/15/2009 10:10	Blank	Priority Organic Pollutants	Toluene	0.5	U	ug/L	0.5	2
9/15/2009 10:10	Blank	Priority Organic Pollutants	Ethylbenzene	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Trip Blank	Priority Organic Pollutants	Toluene	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Trip Blank	Priority Organic Pollutants	Ethylbenzene	0.5	U	ug/L	0.5	2
9/15/2009 9:40	Trip Blank	Priority Organic Pollutants	Benzene	0.2	U	ug/L	0.2	1

Appendix F. Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Jason Cohen Jason.Cohen@dep.state.fl.us	**Contact Number:** 813-632-7600 x429
Facility Name (as it appears on permit): CITGO Petroleum Corporation	**Former Names:**
NPDES Permit Number: FLS000531	**Permit Expiration Date:** **June 7, 2010**
Physical Address: 801 McCloskey Boulevard Tampa, Fl 33605	
District: Southwest	**County:** **Hillsborough**
Function of Facility: This is a bulk petroleum storage terminal. It stores gasoline and diesel fuel and loads these petroleum products into tank trucks for distribution to retail stations.	
Facility Type: **Minor**	**Permitted Capacity (MGD):** **Report**
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **(07/08-06/09)** **D-001 0.216 MGD** **D-002 0.214 MGD** **D-003 0.185 MGD**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☐ **Continuous** ☒ **Intermittent** ☐ **Seasonal** ☒ **Rainfall Dependent** ☐ **Other, please specify**	

Appendix F. (continued)

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):

Sample Point	Description of Monitoring Location
EFF-1	End of Outfall D-001 discharge pipe prior to discharge to receiving waters.
EFF-2	End of Outfall D-002 discharge pipe prior to discharge to receiving waters.
EFF-3	End of Outfall D-003 discharge pipe prior to discharge to receiving waters.

Description of Permitted Outfall(s):

Surface Water Discharge:

An existing storm water discharge to Sparkman Channel (Class III marine waters), D-001. The Outfall D-001 point of discharge is located approximately at latitude 27° 56' 08" N, longitude 82° 26' 32" W.

An existing storm water discharge to McKay Bay (Class III marine waters), D-002. The Outfall D-002 point of discharge is located approximately at latitude 27° 56' 05" N, longitude 82° 26' 27" W.

An existing storm water discharge to Sparkman Channel (Class III Marine waters), D-003. The Outfall D-003 point of discharge is located approximately at latitude 27° 56' 02" N, longitude 82° 26' 36" W.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):

The wastewater generated from this facility consists of storm water runoff from secondary containment diked drains. The storm water is routed into a storm water collection system prior to discharge off-site into Sparkman Channel via Outfalls D-001 and D-003, and McKay Bay via Outfall D-002 (Class III marine waters). Discharges through these outfalls are accomplished by manually opening a normally closed and locked valve. Product tank bottom water, truck loading rack wash water, wastewater from the truck fueling area, and any other petroleum contaminated wastewater is hauled off-site for treatment and disposal in accordance with relevant regulations.

The facility is not authorized to discharge hydrostatic test water via Outfalls D-001 and D-003 into Sparkman channel or via Outfall D-002 into McKay Bay. If hydrostatic testing is conducted, the facility must haul the water off-site for treatment and disposal in accordance with relevant regulations.

Appendix F. (continued)

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Monthly Total	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Points
Flow (MGD)		Report	--	Per Discharge	Calculated	EFF-1, EFF-2 and EFF-3
Flow, Total (MGAL)	Report			Monthly	Calculated	EFF-1, EFF-2 and EFF-3
Oil and Grease (MG/L)	--	5.0	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
pH (SU)	--	8.5	6.5	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Oxygen, Dissolved (DO) (MG/L)	--	--	5.0	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Solids, Total Suspended (MG/L)	--	Report		Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Copper, Total Recoverable (UG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Iron, Total Recoverable (MG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Lead, Total Recoverable (UG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Arsenic, Total Recoverable (UG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Mercury, Total Recoverable (UG/L)		Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Points
Nickel, Total Recoverable (UG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Zinc, Total Recoverable (UG/L)	--	Report*	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Benzene,Ethylbenzene, Toluene,Xylene Comb (UG/L)	--	200.0	--	Monthly, When Discharging	Grab	EFF-1, EFF-2 and EFF-3
Whole Effluent Toxicity (Acute)	See Permit Condition I.A.3					EFF-1, EFF-2 and EFF-3

* Reporting for these parameters may be deleted following Department approval if they are not detected in the first four analyses.

Appendix F. (continued)

PART I: Continued	
Receiving Waters: D-001, D003 Sparkman Channel D-002 McKay Bay: this information copied directly from the permit, but based on the facility aerial it appears that D-002 drains to Sparkman Channel as well.	**Classification (indicate whether fresh or marine):** **Both are Class III Marine**

Appendix F. (continued)

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

3. The permittee shall comply with the following whole effluent toxicity testing requirements and initiate the series of tests described below with the first discharge following permit issuance, to evaluate acute whole effluent toxicity of the discharge from outfalls D-001, D-002 and D-003.

(1.) Effluent limitation

a. An LC_{50} of less than 50% in a 100% effluent in any "routine" test shall constitute a violation of these permit conditions, and Rule 62-302.200(1), Rule 62-302.500(1)(a) 4 and Rule 62-4.244(3)(a), F.A.C.

b. If a toxicity failure is found in a "routine" test, the permittee shall meet with the Department within 30 days of the report following the failed test to identify corrective actions necessary to remedy the observed acute toxicity violation.

(2.) Monitoring frequency

a. The toxicity tests will not exceed one routine test per outfall quarterly until four consecutive and passing tests are completed. In the event dry weather limits the number of tests during a given year, test results from four non-consecutive quarters will fulfill the testing requirement. Upon the completion of four valid and passing tests at each outfall that exhibit no unacceptable toxicity the permittee may reduce the monitoring to annually.

(3.) Routine Test Requirements

a. The permittee shall conduct 96-hour acute static renewal, multi-concentration toxicity tests using the daphnid, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, concurrently. All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-R-02-012, or the most current edition. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

b. The control water and dilution water used will be moderately hard water as described in EPA-821-R-02-012, Table 7, or the most current edition.

c. All "routine" tests shall be conducted using a control (0% effluent) and the following test concentrations: 100%, 50%, 25%, 12.5% and 6.25% final effluent.

(4.) Sampling Requirements

a. All tests shall be conducted on a single grab sample collected at each outfall as soon as practical during a discharge event and analyzed separately.

(5.) Quality Assurance Requirements

a. A standard reference toxicant (SRT) quality assurance (QA) acute toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or no greater than 30 days before the date of the "routine" test. The SRT-QA data shall be submitted with the discharge monitoring report (DMR) data. A test will be considered valid only if the control mortality does not exceed 10% for either test species.

b. If the mortality in the control (0% effluent) exceeds 10% for either species in any test, the test(s) for that species (including the control) shall be repeated.

c. If, in any separate grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the test fails. This failure constitutes an acute toxicity violation.

d. "Routine" tests shall be evaluated for acceptability based on the concentration-response relationship, as required and described by EPA-821-R-02-012, Section 12.2.6.2.

(6.) Reporting Requirements

a. Results from "routine" tests shall be reported on the Discharge Monitoring Report (DMR) as follows: For each test required, the calculated LC50 value should be entered on the DMR for each test species.

b. A bioassay laboratory report for the routine test shall be prepared according to EPA-821-R-02-012, Section 12, Report Preparation and Test Review (or the most current edition) and mailed to the Department at the address below within 30 days of the completion of the valid "routine" test.

Florida Department of Environmental Protection
Southwest District Office
Industrial Wastewater Program
Attention: Compliance/Enforcement
3804 Coconut Palm Drive
Tampa, Florida 33619-1352

(7.) Companion Chemistry Testing Requirements

A sample of sufficient size for chemistry analyses shall be taken concurrently with each bioassay sample. Only in the event that unacceptable acute toxicity (an LC50 of less than 100%) is found in any "routine" test shall the following companion chemistry sample be run. Chemistry analyses shall include, but not limited to, the following parameters: arsenic, lead, copper, iron, mercury, nickel, oil and grease, zinc and base neutral and acids (BNAs). The Department reserves the right to request additional analyses as deemed warranted. In the event of any parameter exceeds its water quality criterion, the permittee must also contact the Department immediately at (813) 744-6100 for guidance.

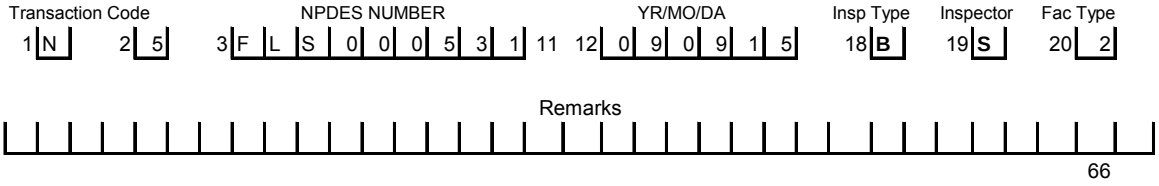
Appendix F. (continued)

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):			
Facility Mixing Zone Details (if applicable):			
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:			
Date	Parameter and Units	Limit	Result
6/30/2005 **7/31/2005**	**Lead (µg/L)**	**0**	**D-001 (223); D-002 (201)** **D-001 (150); D-002 (316)**
2/28/2009	**pH (S.U.)**	**6.5 (minimum)**	**D-001 (6.29)**
6/30/2009	**D.O. (mg/L)**	**5.0 (minimum)**	**D-001 (4.16)**
Describe previous FYI and WQBEL study:			
Describe previous or current Enforcement Actions (including WLs):			
Describe any violations or problems noted in previous inspection:			
Discuss whether DMR trends within previous five years are improving or declining:			
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):			

Appendix G. EPA End Sheet

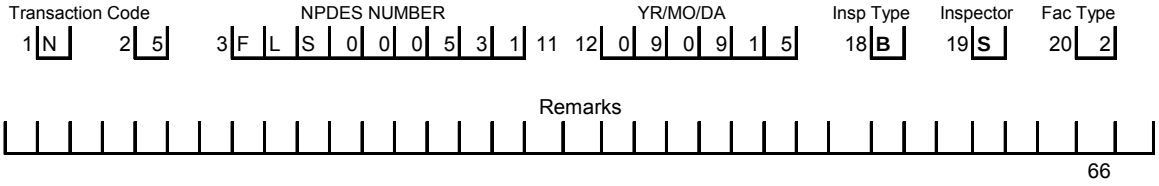
The Bioassay of the CITGO Petroleum Corporation effluent sampled on September 15, 2009. NPDES #FLS000531.

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



The Priority Pollutants Analysis of the CITGO Petroleum Corporation effluent sampled on September 15, 2009. NPDES #FLS000531.

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



Biological Analyses of the CITGO Petroleum Corporation effluent sampled on September 15, 2009. NPDES #FLS000531.

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

