

Bioassays of

Hastings Water Treatment Plant

St. Johns County

NPDES #FL0169226

Sampled September 12, 2005

November 2005

Biology Section
Bureau of Laboratories
Division of Resource Assessment and Management

Quality Manual No. 870346G
NELAC Certification No. E31780

Hastings Water Treatment Plant, Dancy Avenue, Hastings, St. Johns County, Florida, NPDES #FL0169226. Effluent samples for this facility were collected on September 12, 2005.

Introduction

The Hastings Water Treatment Plant uses reverse osmosis (RO) for the production of drinking water. The facility has a permitted maximum flow of 0.087 million gallons per day (MGD). The annual average daily flow from September 1, 2004, through August 31, 2005, was 0.027 MGD. Reverse osmosis reject water (RO concentrate) is treated by aeration. Treated concentrate is discharged through a 10.16 cm (4 in) force main to outfall D-001 (located at approximately latitude 29º43'45"N. longitude 81º29'15"W) to Deep Creek, a Class III fresh surface water.

The facility has mixing zones for unionized ammonia, specific conductance, silver, combined radium 226 and 228, chronic toxicity, and gross alpha. The mixing zone for specific conductance, silver, and chronic toxicity extends for a radius of 1.52 m (5.0 ft) from the diffuser discharge port, the mixing zone for unionized ammonia extends 3.05 m (10.0 ft) from the diffuser discharge port, and the mixing zone for combined radium 226 and 228 and gross alpha extends for a radius of 3.41 m (11.2 ft) from the diffuser discharge.

Bioassays and chemical analyses conducted on samples collected from the discharge point of the facility on February 22, 2000, did not show toxicity to the waterflea, *Ceriodaphnia dubia,* or the fish, *Pimephales promelas,* and did not exceed water quality standards (facility information provided by Chet McGhee of FDEP Northeast District).

Methods

Samples were collected from the EFF-01 NPDES sampling point for Outfall D-001 by Chet McGhee (FDEP Northeast 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 48-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOP's TA07_03, TA07_04, and TA08_01 through TA08_09. All internal DEP SOP's are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp. While the 48-hour acute screening toxicity test does not reflect the permit required conditions, the Department uses it to provide reasonable assurance that the facility does not adversely affect waters of the state.

The bioassay sample salinity was adjusted from 2.5 parts per thousand (ppth) to approximately 19.8 ppth using artificial sea salts per permit conditions for chronic tests. The salt control was prepared by diluting 20 ppth artificial seawater to approximately 2.5 ppth salinity and then adding artificial sea salts to increase the salinity to approximately 19.8 ppth. The algal growth potential sample salinity was adjusted from 2.28 ppth to 7.10 ppth.

Toxicity Test Results

Tests were performed September 13 - 15, 2005.

Americamysis bahia 48-hour acute screening bioassay –	LC_{50} > 100%, 25% mortality* in 100% sample at 48 hours
Menidia beryllina 48-hour acute screening bioassay –	LC_{50} > 100%, 0% mortality* in 100% sample at 48 hours

The bioassay samples showed a low level of acute toxicity the *Americamysis bahia* test organisms but were not acutely toxic to the *Menidia beryllina* test organisms.

The chemistry results confirmed that the ion makeup of the sample was not in seawater proportions and that the apparent 2.5 ppth salinity of the sample was due to elevated levels of groundwater ions. The observed mortality in the *A. bahia* test is due, at least in part, to the seawater-ion imbalance of the sample. Previous research conducted by the FDEP Biology Section demonstrated that *A. bahia* is much more sensitive to seawater-ion imbalances than is *M. beryllina* (FDEP, 1995). Effluent calcium concentration was 512 mg/L at 2.5 ppth salinity (salinity based on conductivity and temperature), which is 1,613% greater than the normal concentration for calcium in seawater of this salinity. Effluent magnesium concentration was measured at 302 mg/L at 2.5 ppth salinity, which is 229% greater than the normal concentration for magnesium in seawater of this salinity. As tested at a salinity of 19.8 ppth, the calcium concentration was 202% greater than normal and the magnesium concentration was 77% greater than normal. The elevated calcium and magnesium concentrations are two sources of toxicity in this sample, but other unidentified sources of toxicity cannot be ruled out without performing the major seawater-ion imbalance toxicity testing protocols cited above.

See Appendix 1 for bioassay bench sheets.

*NOTE: In a 48-hour acute screening test of 100% effluent, mortality of <20% provides reasonable assurance that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1)(a)4, F.A.C.). Mortality between 20-50% mortality indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% provides reasonable assurance that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3)(a), F.A.C.).

Algal Growth Potential

The effluent Algal Growth Potential (AGP) was 0.550 mg dry wt/L of the salt-water species *Dunaliella tertiolecta.* This value is between the laboratory method detection limit (MDL) and practical quantitation limit (PQL) of 0.300 and 0.900 mg dry wt/L, respectively. 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). Due to the apparent salinity of the sample, an AGP test with the freshwater species, *Pseudokirchneriella subcapitata*, was not performed. However, an inference can be made that the freshwater problem threshold of 5 mg dry wt/L (Raschke and Schultz, 1987) would not have been exceeded. The analytical chemistry suggests that the effluent is phosphorus-limited. Total phosphorus was not detected in the effluent sample; therefore, neither AGP predictions nor nitrogen to phosphorus ratios are calculable.

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine was not detected in the bioassay sample in the laboratory. Total ammonia was detected at a concentration of 1.25 mg/L in the bioassay sample in the laboratory. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.9 mg/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Iron was detected in the effluent at levels that comply with Class III fresh water quality criteria. Aluminum and arsenic were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The effluent combined radium 226 and 228 concentration (10.5 pCi/L) exceeded the Class III fresh water quality criterion of ≤ 5 pCi/L (62-302.530(58), F.A.C.), but did not exceed the permit limit of ≤ 12.2 pCi/L. The effluent's conductivity (4,863 µmhos/cm)

exceeded the Class III fresh water quality criterion of ≤ 1,275 µmhos/cm (62-302.530(23), F.A.C.), but did not exceed the permit limit of ≤ 5,089 µmhos/cm.

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 Outfall D-001 for this facility on September 12, 2005, was acutely toxic the *Americamysis bahia* test organisms but was not acutely toxic to the *Menidia beryllina* test species during the acute screen 48-hour bioassays. The observed toxicity was attributed at least in part to the sea-water ion imbalance in the sample. The saltwater AGP result for the effluent suggests that AGP would likely be less than the "problem" threshold for fresh receiving waters. The effluent's conductivity and combined radium 226 and 228 concentration exceeded their respective Class III fresh water quality criteria but neither exceeded their respective permitted limit.

Literature Cited

FDEP. 1995. Protocols for determining Major-Seawater-Ion Toxicity in Membrane-Technology Water-Treatment Concentrate. Biology and Chemistry Section, FDEP Bureau of Laboratories, Tallahassee, Florida. 99 pp.

Table 1. Measured algal growth potential (AGP; mg dry wt/L) of Dunaliella tertiolecta *and ratio of total soluble inorganic nitrigen to ortho-phosphate for samples collected from Hastings Water Treatment Plant on September 12, 2005.*

Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent Samples	0.55 IV	158.7	Not Applicable*

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

V - Analyte was detected in both sample and method blank

* - Total phosphorus were not detected in the analytical chemistry sample, so the total N:P ratio could not be calculated.

Table 2. Effluent limits, Class III Freshwater Criteria, and chemical data for samples collected from Hastings Water Treatment Plant on September 12, 2005.

Hastings Water Treatment Plant NPDES# FL0169226	Class III Freshwater Stds	Effluent Limits	Effluent Samples
Metals (µg/L unless otherwise noted)			
Aluminum	-	-	7.6 If
Arsenic	≤ 50	-	5.2 I
Cadmium	≤ 3.4 b	-	0.05 U
Calcium (mg/L)	-	-	512
Chromium-III	≤ 268.2 b	-	2 U
Copper	≤ 30.5 b	-	5 U
Iron	≤ 1,000	-	45
Lead	≤ 18.6 b	-	0.075 U
Magnesium (mg/L)	-	-	302
Nickel	≤ 168.5 b	-	2 U
Selenium	≤ 5	-	0.5 U
Silver	≤ 0.07	≤ 0.286	0.025 U
Zinc	≤ 387.8 b	-	3 U
Nutrients (mg/L)			
Ortho-phosphate	-	-	0.006 I
Total Phosphorus	-	-	0.02 U
Ammonia	-	Report	0.9 A
Unionized Ammonia	≤ 0.02	≤ 0.16	< 0.02 c
Nitrate+Nitrite	-	-	0.052
Total Kjeldahl Nitrogen	-	-	1.3
Organic Nitrogen	-	-	0.4 c
Total Nitrogen	-	Report	1.35 c
General Physical and Chemical Parameters			
Hydrogen Sulfide (mg/L)	-	Report	-
Sulfide (mg/L)	-	-	0.05 U
Alpha, Gross (pCi/L)	≤ 15	≤ 104.7	28.7
Alpha-Counting Error (pCi/L)	-	-	9
Radium 226 (pCi/L)	-	-	9.3
Radium 226-Counting Error (pCi/L)	-	-	0.5
Radium 228 (pCi/L)	-	-	1.2
Radium 228-Counting Error (pCi/L)	-	-	0.6
Radium 226+228 (pCi/L)	≤ 5	≤ 12.2	10.5 c
Dissolved Oxygen (mg/L)	≥ 5	≥ 5	7.4
pH (S.U.)	6.0-8.5	6.0-8.5	7.4
Conductivity (umhos/cm)	≤ 1,275	≤ 5,089	4,863
Temperature (C)	-	Report	27.7
Flow (MGD AADF)	-	≤ 0.087	0.027a
Hardness (mg/L)	-	-	2,522.1 c

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

a - Annual average

b - Value is calculated based on hardness

c - Calculated value

f - Aluminum was detected in the field blank at a concentration of 9.7 µg/L

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 Bioassay Bench Sheets

Facility: Hastings WTP

Address: Dairy Avenue.

City: HASTINGS County: St. Johns

Contact/District: CHET McGhee / Northeast District

NPDES Permit #: FL 0169226

LIMS Job #: TLH-2005-09-13-56 LIMS Sample #: 8163512

Lims Data Entry: mf 9/23/05 Data Entry Verification: 9/25/05 SP

Sample Collection: Date: 9-12-05 Time: 1312

Hold time Start: Date: 9-12-05 Time: 1312

Comments: Sample Salinity adjusted with artificial seaSalts from 2.5 parts per thousand (ppth) to ~ 19.8 ppth. Salt control prepared by diluting 20 ppth ASW to ~ 2.5 ppth salinity then adding seaSalts to increase salinity to approximately 19.8 ppth. mf 9-13-05
Parameters of Salt adjusted sample
Alkalinity → 295 mg/L as $CaCO_3$
Chlorine → 0.035 mg/L (artifact of unfiltered sample)
Ammonia → 1.365 mg/L
Acute tests were run at ~ 20 ppth because permit requires the chronic test to be run at 20 ppth. mf 9/21/05

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

Test Type: (Screening) 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 TA07_ 03

Control survival ≥90%: (Yes) No

Temperature Range ≤3°C: (Yes) No

Test 2 validation: Test 2: SOP TA07_ 04

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: 2.5 Final Salinity: ~19.8 (Salts) Hypersaline brine

Salinity adjusted (Test 2) (yes) no Initial Salinity: 2.5 Final Salinity: ~19.8 (Salts) Hypersaline brine

Dechlorination: yes (no) mL of 0.025N Sodium thiosulfate per liter of sample. Final TRC

Temperature Range °C

Incubator # 3 Range 241-244

Room B246: 236-237

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

Eric Lee

James Dinish

Nicole Wallendorf

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	not measured	-	SP	
Lab Total Residual Cl2 (mg/l)			<0.03	<0.03		<0.03	HACH	EL	SP
Alkalinity (mg/L as $CaCO_3$)			173	173		281.5	HACH	EL	MF
Hardness (mg/L as $CaCO_3$)			—	—		—	HACH	—	—
Total Ammonia (mg/L as N)			<0.034	<0.034		1.25	DENVER	mf	SP
Salinity (ppth)			~19.8	~19.8		2.5	YSI (Mettler)	JD	mf

V 1 6 7/1/05

Appendix 1. Bench Sheets (continued)

FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 863392 Test #: 1 Test Started: Date 9-13-05 Time: 13:15
Organism: A.bahia Test Ended: Date 9-15-05 Time: 1300
Organism Batch: 26-05 Diluent/ Batch: ASW / 12-05
Organism Age: 4 days Food: YCT *P. subcapitata* *Artemia*
Chamber Size 1000 mL Batch: - - 35138425GF
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	F1	5	5	5			
	B	F2	5	5	5			
	C	F3	5	5	4 1D			
	D	F4	5	5	5			
100%	A	F5	5	3 2D	2 1D			
	B	F6	5	5	5			
	C	F7	5	4 1D	4			
	D	F8	5	4 1D	4			
Salt ctrl	A	C13	5	4 1D	4			
	B	C14	5	4 1D	4			
	C	C15	5	5	5			
	D	C16	5	5	5			
Organisms loaded by: JD		Checked by:	[redacted]	JD	JD			

Loading verified at 0 hours by: MF (initials)

Comments:

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

Test Results:

% mortality in 100% sample 25

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).

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Appendix 1. Bench Sheets (continued)

FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 863392 Test #: 2 Test Started: Date 9-13-05 Time: 13:15
Organism: M. beryllina Test Ended: Date 9-15-05 Time: 1300
Organism Batch: 22-05 Diluent/ Batch: ASW / 12-05
Organism Age: 10 days Food: YCT *P. subcapitata* *Artemia*
Chamber Size 1000 mL Batch: - - 35138435GR
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	F17	5	5	5			
	B	F18	5	5	5			
	C	F19	5	5	5			
	D	F20	5	5	5			
100%	A	F21	5	5	5			
	B	F22	5	5	5			
	C	F23	5	5	5			
	D	F24	5	5	5			
Salt Ctrl	A	C21	5	5	5			
	B	C22	5	5	5			
	C	C23	5	5	5			
	D	C24	5	5	5			
Organisms loaded by: JD		Checked by:	[redacted]	JD	JD			

Loading verified at 0 hours by: MF (initials)

Comments:

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

Test Results:

% mortality in 100% sample 0

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).

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Bioassay Parameters

LIMS Sample # : 863392 Test # : 1 of 2

TEST SOP: TA07_03 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			
pH (S.U.)	8.3	8.3	8.0			
Temperature °C	24.4	24.7	25.0			
Dissolved Oxygen mg/L	5.9	5.7	5.0			
Conductivity µmhos ~~mmhos~~	31.4	32.3	33.7			
(initials) Measured by:	JD	SP	SP			
(initials) Recorded by:	JD	SP	SP			

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.)	8.1	8.2	8.2			
Temperature °C	24.8	24.2	24.3			
Dissolved Oxygen mg/L	6.3	5.7	4.6			
Conductivity µmhos ~~mmhos~~	32.7	32.4	33.5			
(initials) Measured by:	JD	SP	SP			
(initials) Recorded by:	JD	SP	SP			

Comments:

Concentration Salt ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.3	8.2	8.2			
Temperature °C	24.7	24.6	24.8			
Dissolved Oxygen mg/L	6.3	5.2	4.1			
Conductivity µmhos ~~mmhos~~	31.9	32.8	33.3			
(initials) Measured by:	JD	SP	SP			
(initials) Recorded by:	JD	SP	SP			

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:

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Bioassay Parameters

LIMS Sample # : 803392 **Test # :** 2 **of** 2

TEST SOP: TA07_ 04 **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			
pH (S.U.)	8.3	8.2	8.0			
Temperature °C	24.9	24.0	25.3			
Dissolved Oxygen mg/L	6.1	6.1	5.4			
Conductivity µmhos (mmhos)	31.7	32.5	33.9			
(initials) Measured by:	JD	[illegible]	[illegible]			
(initials) Recorded by:	JD	[illegible]	[illegible]			

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.)	8.3	8.2	8.2			
Temperature °C	25.1	24.7	25.2			
Dissolved Oxygen mg/L	6.3	5.8	4.9			
Conductivity µmhos (mmhos)	32.0	32.8	33.0			
(initials) Measured by:	JD	[illegible]	[illegible]			
(initials) Recorded by:	JD	[illegible]	[illegible]			

Comments:

Concentration Salt Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.1	8.3	8.0	[illegible]		
Temperature °C	25.1	24.0	25.4			
Dissolved Oxygen mg/L	6.3	6.1	5.4			
Conductivity µmhos (mmhos)	32.2	32.5	32.7			
(initials) Measured by:	JD	[illegible]	[illegible]			
(initials) Recorded by:	JD	[illegible]	[illegible]			

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:

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Appendix 2. Chemical Analyses performed on the effluent from the Hastings Water Treatment Plant Outfall D-001, sampled on September 12, 2005.

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 12:55	HASTING RO D001	Bio-AGP/LimNut	Algal Growth Potential	0.55	mg DryWt/L	IV	0.3	0.9
9/12/2005 12:55	HASTING RO D001	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
9/12/2005 12:55	HASTING RO D001	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
9/12/2005 12:55	HASTING RO D001	Bio-Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	LC50	L		
9/12/2005 12:55	HASTING RO D001	Bio-Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	LC50	L		
9/12/2005 12:55	HASTING RO D001	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
9/12/2005 12:55	HASTING RO D001	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
9/12/2005 12:55	HASTING RO D001	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
9/12/2005 12:55	HASTING RO D001	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzidine	95	ug/L	U	95	380
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
9/12/2005 12:55	HASTING RO D001	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
9/12/2005 12:55	HASTING RO D001	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Diethyl phthalate	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
9/12/2005 12:55	HASTING RO D001	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
9/12/2005 12:55	HASTING RO D001	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
9/12/2005 12:55	HASTING RO D001	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
9/12/2005 12:55	HASTING RO D001	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
9/12/2005 12:55	HASTING RO D001	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
9/12/2005 12:55	HASTING RO D001	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
9/12/2005 12:55	HASTING RO D001	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 12:55	HASTING RO D001	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
9/12/2005 12:55	HASTING RO D001	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
9/12/2005 12:55	HASTING RO D001	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
9/12/2005 12:55	HASTING RO D001	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
9/12/2005 13:12	BLANK	BNA-Water	1,2,4-Trichlorobenzene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	1,2-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	1,3-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	1,4-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2,4,6-Trichlorophenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2,4-Dichlorophenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2,4-Dimethylphenol	53	ug/L	U	53	210
9/12/2005 13:12	BLANK	BNA-Water	2,4-Dinitrophenol	16	ug/L	U	16	64
9/12/2005 13:12	BLANK	BNA-Water	2,4-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2,6-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2-Chloronaphthalene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2-Chlorophenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	2-Nitrophenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	3,3'-Dichlorobenzidine	43	ug/L	U	43	170
9/12/2005 13:12	BLANK	BNA-Water	4,4'-DDD	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	4,4'-DDE	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	4,4'-DDT	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	4-Bromophenyl phenyl ether	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	4-Chloro-3-methylphenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	4-Chlorophenyl phenyl ether	2.1	ug/L	U	2.1	8.5
9/12/2005 13:12	BLANK	BNA-Water	4-Nitrophenol	16	ug/L	U	16	64
9/12/2005 13:12	BLANK	BNA-Water	Acenaphthene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Acenaphthylene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Aldrin	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	alpha-BHC	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Anthracene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Benzidine	110	ug/L	U	110	430
9/12/2005 13:12	BLANK	BNA-Water	Benzo(a)anthracene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Benzo(a)pyrene	1.1	ug/L	U	1.1	4.3

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 13:12	BLANK	BNA-Water	Benzo(b)fluoranthene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Benzo(g,h,i)perylene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Benzo(k)fluoranthene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	beta-BHC	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Bis(2-chloroethoxy)methane	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Bis(2-chloroethyl)ether	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	16	ug/L	U	16	64
9/12/2005 13:12	BLANK	BNA-Water	Butyl benzyl phthalate	5.3	ug/L	U	5.3	21
9/12/2005 13:12	BLANK	BNA-Water	Chrysene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	delta-BHC	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Dibenzo(a,h)anthracene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Dieldrin	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Diethyl phthalate	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Dimethyl phthalate	53	ug/L	U	53	210
9/12/2005 13:12	BLANK	BNA-Water	Di-n-butyl phthalate	5.3	ug/L	U	5.3	21
9/12/2005 13:12	BLANK	BNA-Water	Di-n-octyl phthalate	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Endosulfan I	4.3	ug/L	U	4.3	17
9/12/2005 13:12	BLANK	BNA-Water	Endosulfan II	4.3	ug/L	U	4.3	17
9/12/2005 13:12	BLANK	BNA-Water	Endosulfan sulfate	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Endrin	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Endrin aldehyde	4.3	ug/L	U	4.3	17
9/12/2005 13:12	BLANK	BNA-Water	Fluoranthene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Fluorene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	gamma-BHC	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Heptachlor	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Heptachlor epoxide	1.6	ug/L	U	1.6	6.4
9/12/2005 13:12	BLANK	BNA-Water	Hexachlorobenzene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Hexachlorobutadiene	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Hexachlorocyclopentadiene	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Hexachloroethane	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Isophorone	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Naphthalene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Nitrobenzene	2.1	ug/L	U	2.1	8.5
9/12/2005 13:12	BLANK	BNA-Water	N-Nitrosodimethylamine	2.1	ug/L	U	2.1	8.5

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 13:12	BLANK	BNA-Water	N-Nitrosodi-n-propylamine	2.1	ug/L	U	2.1	8.5
9/12/2005 13:12	BLANK	BNA-Water	N-Nitrosodiphenylamine	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Pentachlorophenol	3.2	ug/L	U	3.2	13
9/12/2005 13:12	BLANK	BNA-Water	Phenanthrene	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Phenol	1.1	ug/L	U	1.1	4.3
9/12/2005 13:12	BLANK	BNA-Water	Pyrene	1.1	ug/L	U	1.1	4.3
9/12/2005 12:55	HASTING RO D001	GC-Water	Alachlor	0.59	ug/L	U	0.59	2.4
9/12/2005 12:55	HASTING RO D001	GC-Water	Ametryn	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Atrazine	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Azinphos Methyl	0.2	ug/L	U	0.2	0.8
9/12/2005 12:55	HASTING RO D001	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
9/12/2005 12:55	HASTING RO D001	GC-Water	Butylate	0.2	ug/L	UJ	0.2	0.8
9/12/2005 12:55	HASTING RO D001	GC-Water	Chlorpyrifos Ethyl	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Chlorpyrifos Methyl	0.098	ug/L	U	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Diazinon	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Ethion	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Ethoprop	0.098	ug/L	UJ	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
9/12/2005 12:55	HASTING RO D001	GC-Water	Fonofos	0.098	ug/L	U	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Hexazinone	0.098	ug/L	U	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Malathion	0.15	ug/L	UJ	0.15	0.6
9/12/2005 12:55	HASTING RO D001	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
9/12/2005 12:55	HASTING RO D001	GC-Water	Metolachlor	0.49	ug/L	U	0.49	2
9/12/2005 12:55	HASTING RO D001	GC-Water	Metribuzin	0.098	ug/L	U	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
9/12/2005 12:55	HASTING RO D001	GC-Water	Naled	0.78	ug/L	UJ	0.78	3.1
9/12/2005 12:55	HASTING RO D001	GC-Water	Norflurazon	0.15	ug/L	UJ	0.15	0.6
9/12/2005 12:55	HASTING RO D001	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
9/12/2005 12:55	HASTING RO D001	GC-Water	Parathion Methyl	0.098	ug/L	U	0.098	0.39
9/12/2005 12:55	HASTING RO D001	GC-Water	Phorate	0.049	ug/L	U	0.049	0.2
9/12/2005 12:55	HASTING RO D001	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
9/12/2005 12:55	HASTING RO D001	GC-Water	Simazine	0.049	ug/L	U	0.049	0.2
9/12/2005 13:12	BLANK	GC-Water	Alachlor	0.62	ug/L	U	0.62	2.5
9/12/2005 13:12	BLANK	GC-Water	Ametryn	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Atrazine	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Azinphos Methyl	0.21	ug/L	U	0.21	0.84

Appendix 2. Chemical Analyses (continued)

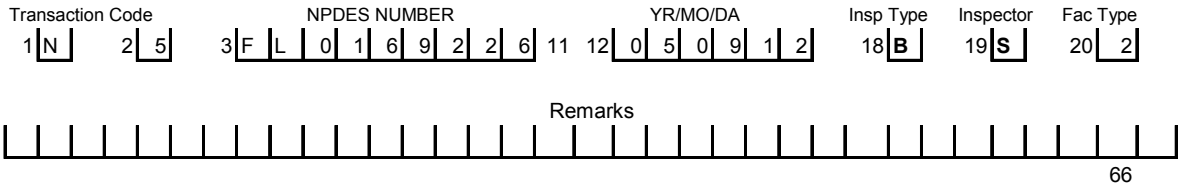
Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 13:12	BLANK	GC-Water	Bromacil	0.21	ug/L	U	0.21	0.84
9/12/2005 13:12	BLANK	GC-Water	Butylate	0.21	ug/L	UJ	0.21	0.84
9/12/2005 13:12	BLANK	GC-Water	Chlorpyrifos Ethyl	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Diazinon	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Ethion	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Ethoprop	0.1	ug/L	UJ	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Fenamiphos	0.21	ug/L	U	0.21	0.84
9/12/2005 13:12	BLANK	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Malathion	0.15	ug/L	UJ	0.15	0.6
9/12/2005 13:12	BLANK	GC-Water	Metalaxyl	0.26	ug/L	U	0.26	1
9/12/2005 13:12	BLANK	GC-Water	Metolachlor	0.52	ug/L	U	0.52	2.1
9/12/2005 13:12	BLANK	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Mevinphos	0.21	ug/L	U	0.21	0.84
9/12/2005 13:12	BLANK	GC-Water	Naled	0.82	ug/L	UJ	0.82	3.3
9/12/2005 13:12	BLANK	GC-Water	Norflurazon	0.15	ug/L	UJ	0.15	0.6
9/12/2005 13:12	BLANK	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
9/12/2005 13:12	BLANK	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
9/12/2005 13:12	BLANK	GC-Water	Phorate	0.052	ug/L	U	0.052	0.21
9/12/2005 13:12	BLANK	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
9/12/2005 13:12	BLANK	GC-Water	Simazine	0.052	ug/L	U	0.052	0.21
9/12/2005 12:55	HASTING RO D001	Metals-Water	Aluminum	7.6	ug/L	I	5	20
9/12/2005 12:55	HASTING RO D001	Metals-Water	Arsenic	5.2	ug/L	I	4	16
9/12/2005 12:55	HASTING RO D001	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
9/12/2005 12:55	HASTING RO D001	Metals-Water	Calcium	512	mg/L		0.25	1
9/12/2005 12:55	HASTING RO D001	Metals-Water	Chromium	2	ug/L	U	2	8
9/12/2005 12:55	HASTING RO D001	Metals-Water	Copper	5	ug/L	U	5	20
9/12/2005 12:55	HASTING RO D001	Metals-Water	Iron	45	ug/L		10	40
9/12/2005 12:55	HASTING RO D001	Metals-Water	Lead	0.075	ug/L	U	0.075	0.3
9/12/2005 12:55	HASTING RO D001	Metals-Water	Magnesium	302	mg/L		0.05	0.2
9/12/2005 12:55	HASTING RO D001	Metals-Water	Nickel	2	ug/L	U	2	8
9/12/2005 12:55	HASTING RO D001	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
9/12/2005 12:55	HASTING RO D001	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
9/12/2005 12:55	HASTING RO D001	Metals-Water	Zinc	3	ug/L	U	3	12
9/12/2005 13:12	BLANK	Metals-Water	Aluminum	9.7	ug/L	I	5	20

Appendix 2. Chemical Analyses (continued)

Date Sampled	Field ID	Analysis	Component	Result	Units	Remark	MDL	PQL
9/12/2005 13:12	BLANK	Metals-Water	Arsenic	4	ug/L	U	4	16
9/12/2005 13:12	BLANK	Metals-Water	Cadmium	0.05	ug/L	U	0.05	0.2
9/12/2005 13:12	BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
9/12/2005 13:12	BLANK	Metals-Water	Chromium	2	ug/L	U	2	8
9/12/2005 13:12	BLANK	Metals-Water	Copper	0.5	ug/L	U	0.5	2
9/12/2005 13:12	BLANK	Metals-Water	Iron	10	ug/L	U	10	40
9/12/2005 13:12	BLANK	Metals-Water	Lead	0.075	ug/L	U	0.075	0.3
9/12/2005 13:12	BLANK	Metals-Water	Magnesium	0.01	mg/L	U	0.01	0.04
9/12/2005 13:12	BLANK	Metals-Water	Nickel	2	ug/L	U	2	8
9/12/2005 13:12	BLANK	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
9/12/2005 13:12	BLANK	Metals-Water	Silver	0.025	ug/L	U	0.025	0.1
9/12/2005 13:12	BLANK	Metals-Water	Zinc	3	ug/L	U	3	12
9/12/2005 12:55	HASTING RO D001	Nutrients-Liquid	Ammonia-N	0.9	mg N/L	A	0.2	0.4
9/12/2005 12:55	HASTING RO D001	Nutrients-Liquid	Kjeldahl Nitrogen	1.3	mg N/L		0.12	0.4
9/12/2005 12:55	HASTING RO D001	Nutrients-Liquid	NO2NO3-N	0.052	mg N/L		0.004	0.01
9/12/2005 12:55	HASTING RO D001	Nutrients-Liquid	O-Phosphate-P	0.006	mg P/L	I	0.004	0.01
9/12/2005 12:55	HASTING RO D001	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
9/19/2005 13:30	HASTING RO D001	Nutrients-Liquid	Sulfide	0.05	mg S/L	U	0.05	0.2
9/12/2005 13:12	BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
9/12/2005 13:12	BLANK	Nutrients-Liquid	Kjeldahl Nitrogen	0.06	mg N/L	U	0.06	0.2
9/12/2005 13:12	BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
9/12/2005 13:12	BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
9/19/2005 13:32	BLANK	Nutrients-Liquid	Sulfide	0.05	mg S/L	U	0.05	0.2
9/12/2005 13:12	BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
9/12/2005 12:55	HASTING RO D001	Overflow	Alpha, Total	28.7	pCi/L			
9/12/2005 12:55	HASTING RO D001	Overflow	Alpha-Counting Error	9	pCi/L			
9/12/2005 12:55	HASTING RO D001	Overflow	Radium 226	9.3	pCi/L			
9/12/2005 12:55	HASTING RO D001	Overflow	Radium 226-Counting Error	0.5	pCi/L			
9/12/2005 12:55	HASTING RO D001	Overflow	Radium 228	1.2	pCi/L			
9/12/2005 12:55	HASTING RO D001	Overflow	Radium 228-Counting Error	0.6	pCi/L			
9/12/2005 13:12	BLANK	Overflow	Alpha, Total	0.8	pCi/L	U		
9/12/2005 13:12	BLANK	Overflow	Alpha-Counting Error	0.4	pCi/L			
9/12/2005 13:12	BLANK	Overflow	Radium 226	0.1	pCi/L			
9/12/2005 13:12	BLANK	Overflow	Radium 226-Counting Error	0.1	pCi/L			
9/12/2005 13:12	BLANK	Overflow	Radium 228	0.9	pCi/L	U		
9/12/2005 13:12	BLANK	Overflow	Radium 228-Counting Error	0.6	pCi/L			

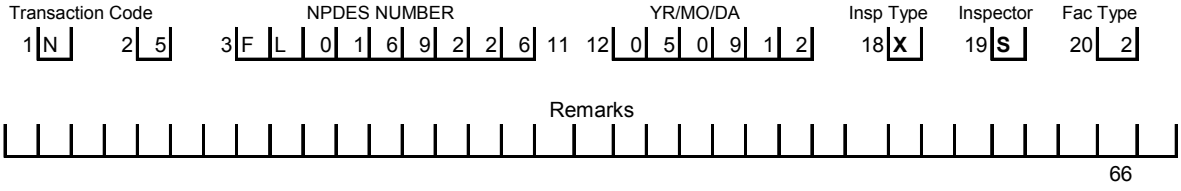
The Bioassay of Hastings Water Treatment Plant effluent sampled on September 12, 2005. NPDES #FL0169226.

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



The Priority Pollutants Analysis of Hastings Water Treatment Plant effluent sampled on September 12, 2005. NPDES #FL0169226.

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



Biological Analyses of Hastings Water Treatment Plant effluent sampled on September 12, 2005. NPDES #FL0169226.

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

