

Biological Assessment of

Lansing Smith Electric Generating Plant

Bay County

NPDES #FL0002208

Sampled 13-14 November 1990

April 1991

Biology Section
Division of Administrative and Technical Services

Introduction

The Lansing Smith Power Plant, is a coal fired steam-electricity generating facility (350 MW total capacity) located in Panama City, Bay County, Florida. Boiler blowdown, air preheater wash, bottom ash, fly ash, pyrites sluice, coal yard sumps, and other minor process streams are discharged to an ash pond located on the east side of Alligator Bayou. Overflow from the ash pond and main condenser cooling water (outfall #001) are discharged into Warren Bayou and then to West Bay via a 10,200 ft. canal (see map in Appendix).

This study was conducted in November 1990, when the generating capacity of the plant was extremely low. Because the difference in water temperature between the intake, Alligator Bayou, and the Warren Bayou thermal discharge was only 3 °C, thermal effects of the biota would not be expected to be as significant as during periods of peak summer usage. It is possible that environmental impact may occur in Alligator Bayou and North Bay due to barge traffic, ash pond leachate, and coal pile runoff.

In November, 1985, the DER Biology Section performed a static acute bioassay on a sample of cooling water using *Mysidopsis bahia* as the test organism. No toxicity was found in the effluent at that time (FDER 1985a).

Methods

The focus of this investigation was to determine the discharger's effects on the receiving waters. A comparison of biological community health was made between a reference site (located in the North Bay, near the intake at Alligator Bayou) and a test site (the area down gradient of the facility's Warren Bayou discharge) (see diagram in Appendix). A habitat assessment was performed *in situ* to establish comparability between sites. Supplemental physical/chemical data were also collected on the two sites. An acute screening toxicity bioassay, using *Mysidopsis bahia* as the test organism, was performed on an effluent sample (Peltier and Weber 1985, FDER 1985b). The effluent was analyzed for organic constituents (base neutrals, acid extractables, and pesticide extractables), metals, and nutrients. Methods used for all chemical analyses are on file at the Tallahassee DER Chemistry Laboratory.

Benthic macroinvertebrate communities were evaluated at reference and test sites. Collection methods consisted of three ponar dredges per site (Ross 1990). Algal Growth Potential tests, using *Duneliella tertiolecta* as the test organism, followed EPA (1974).

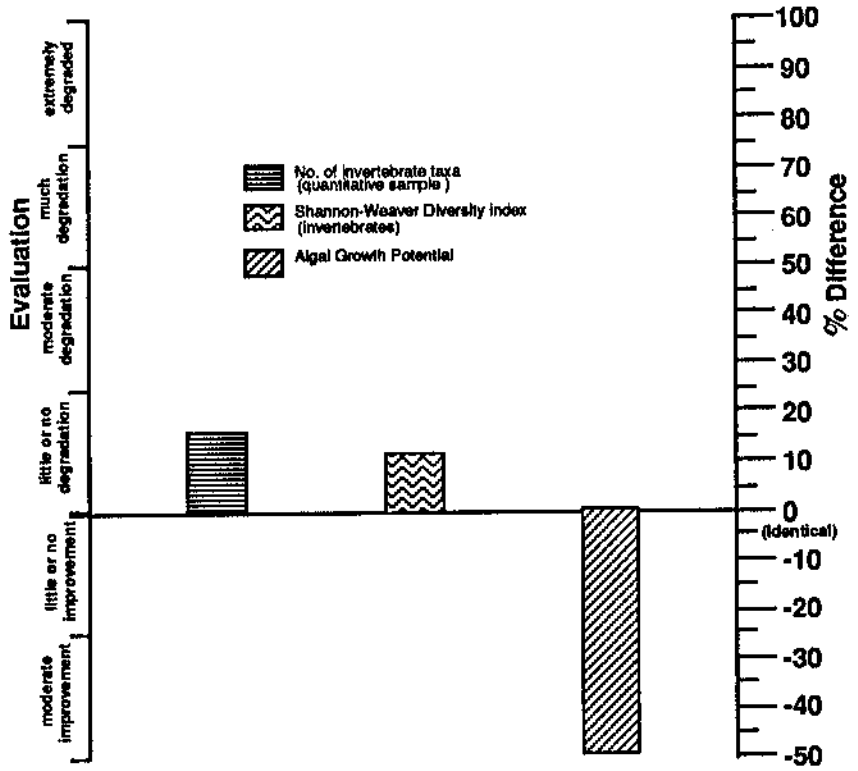
Explanation of Measurements of Community Health

Several different measurements of macroinvertebrate community health have been employed. Many of these, such as the number of taxa and the Shannon-Weaver Diversity Index, are well known. Others are briefly explained here. Czekanowski's Similarity Index is a multivariate ordination procedure which compares organism abundance and taxonomic structure between sites. The determination of the Quantitative Stability Index (for taxonomic % composition) is a two step process. First, the relative proportions of major taxonomic groups are calculated for each site. Then, the lesser of the two percentages for each discrete taxonomic group is totaled. A QSI (% composition) of 100% means that the two sites being compared are identical.

For graphical purposes, the percent differences between the reference and test sites involving the number of taxa and the diversity index are measured as the reference site minus test site divided by the reference site. The percent difference be-

Major characteristics of community structure of control and test sites.

	Reference Site	Test Site
Macroinvertebrate Quantitative(ponar dredge)		
Number of Taxa	30	25
Shannon-Weaver Diversity	4.3	3.8
% Malacostraca	41.5	66.2
% Gastropoda	17.9	8.6
%Polychaeta	22.5	9.3
% Pelycepoda	12.4	2.6
% Nemertea	3.4	0.7
% Cumacea	0	4.0
% Other	2.2	8.6
Algal Growth Potential (mg dry wt/l)	.67	.34



Effect of discharge on receiving stream
(measured as difference between control and test sites).

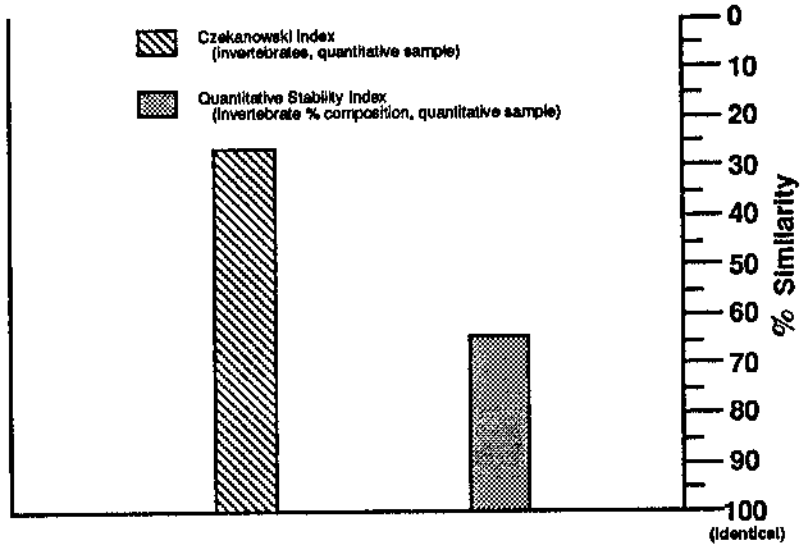
tween sites involving algal growth potential is measured as the test site minus reference site divided by the reference site.

The following personnel were involved in this investigation: district biologist, Glenn Butts (DER, Northwest District) and Lyn Burton, Russel Frydenborg, Kathleen Lurding, and Sandra McClure (Tallahassee Biology Laboratory).

Results and Discussion

Habitat quality at the test site (Habitat Score = 76) was better than that of the reference site (Habitat Score = 61, Appendix). Additionally, the substrate type at the test site had a greater amount of sand, while more organic muck was found at the reference site. The pH at both sites was identical (7.8), and salinity was only slightly higher at the test site. Dissolved oxygen was lower below the point of discharge, but was still adequate (6.4 and 7.2 mg/l at test and reference sites, respectively). The lower D.O. at the test site was probably a function of temperature, which was about 3 °C higher there. The combined observations regarding habitat indicate that both areas could support well balanced macroinvertebrate communities.

The sample of cooling water was not toxic to the shrimp, *Mysidopsis bahia*. Only one organism died in the 48 hour static acute toxicity test (Appendix). No organic constituents were detected in the effluent sample Appendix). The following metals were found: aluminum (51 µg/l), barium (8 µg/l), calcium (301 mg/l), iron (76 µg/l), magnesium (1150 mg/l), potassium (450 mg/l), sodium (9110 mg/l), and strontium (5660 µg/l) (Appendix). None of these values are considered harmful to the biota in marine environments. Likewise, the nutrients analyzed for in the effluent were either undetected or below quantitation limits (Appendix). As expected from the low nutrient concentrations, algal growth potential was low at both sites.



Effect of discharge on receiving stream
(measured as similarity between control and test sites).

Measures of macroinvertebrate health indicated that the discharge was causing little or no degradation to the receiving water community (see Table and Figures). The upper left figure on page 2 indicates the degree of difference between the reference and test sites. Larger differences (higher percentages) correspond with greater degrees of degradation. Negative values mean that the test site is better than the control.

Species richness and Shannon-Weaver diversity were slightly lower at the test site, but these differences were not great enough to indicate stressed conditions. A higher percentage of malacostracans was found at the test site. As some members of this group are considered to be sensitive epifauna, this finding also indicates that the test site was not stressed. The lower right figure on page 2 summarizes similarities between the sites. Smaller similarities (lower percentages) generally correspond with greater degradation. The two sites were moderately similar with respect to percent composition of dominant taxa, but Czekanowski's Index indicated greater differences.

Algal growth potential decreased by 49% at the test site. Although this degree of change often indicates improvement, both of the dry weight values were too low to demonstrate enrichment.

Conclusions

The cooling water discharge collected from Lansing Smith Electric Generating Plant was found to have no negative effects on the receiving waters, which supported healthy benthic macroinvertebrate communities. The effluent was not acutely toxic, nor were deleterious levels of priority pollutants or metals found.

Literature Cited

Environmental Protection Agency. 1974. Marine algal assay procedure: Bottle test. Nat'l Environ. Res. Center, Office of Res. and Dev., U.S. EPA, Corvallis, Oregon. 43 p.

Florida Department of Environmental Regulation. 1985a. Bioassay of the Lansing Smith Power Plant, Panama City, Bay County, Florida. Biology Section, FDER. 8 p.

Florida Department of Environmental Regulation. 1985b. Quality assurance manual for performing acute toxicity tests. 2nd edition. Fla. Dept. Environmental Regulation, Biology Section, Tallahassee. 53 pp.

Peltier, W. H. and C. I. Weber. 1985. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms. 3rd edition. EPA/600/4-85/013. U. S. EPA, Cincinnati, Ohio. 216 pp.

Ross, L. T. 1990. Methods for aquatic biology. Fla. Dept. Environ. Reg. Tech. Ser. 10(1): 1-47.

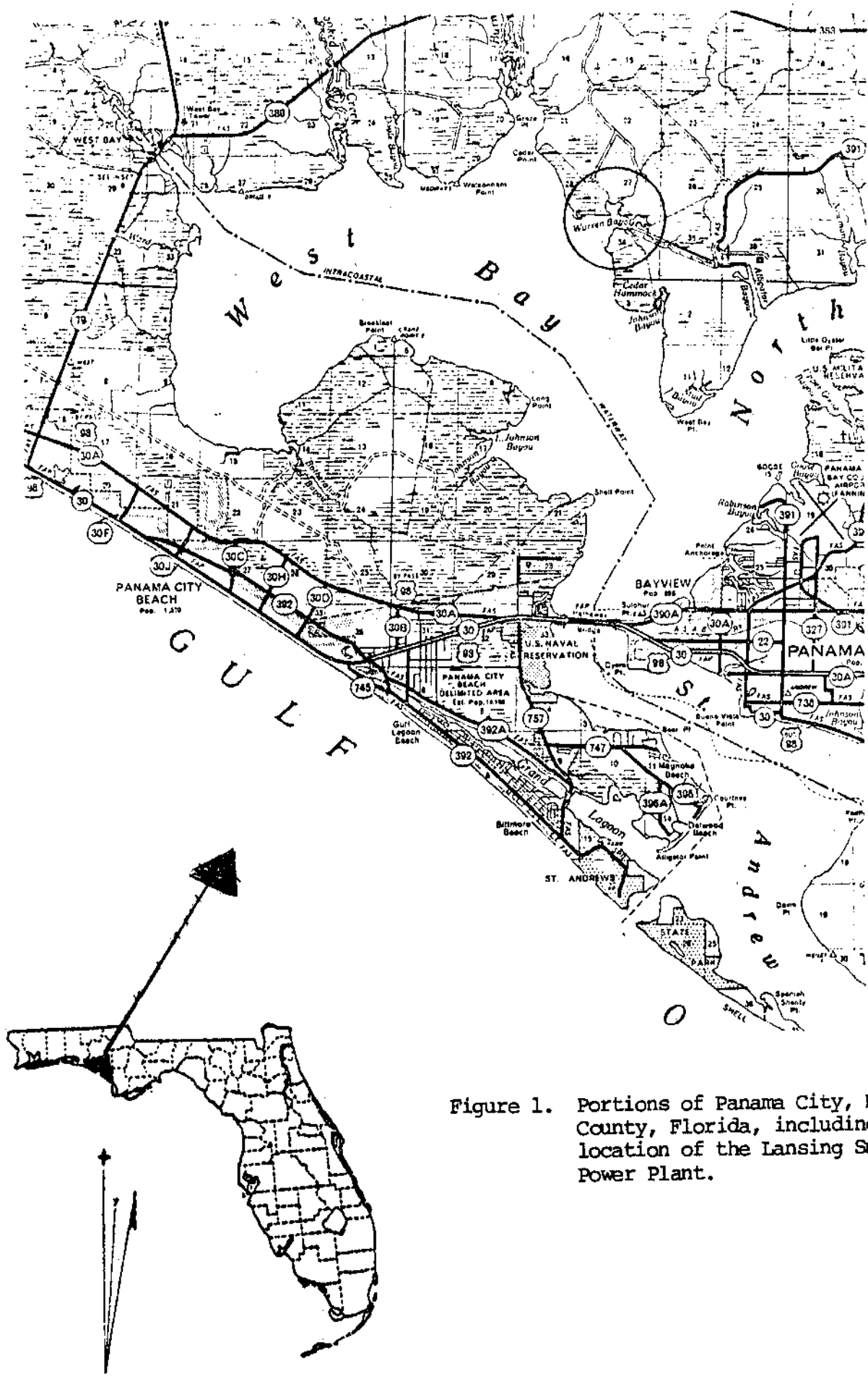
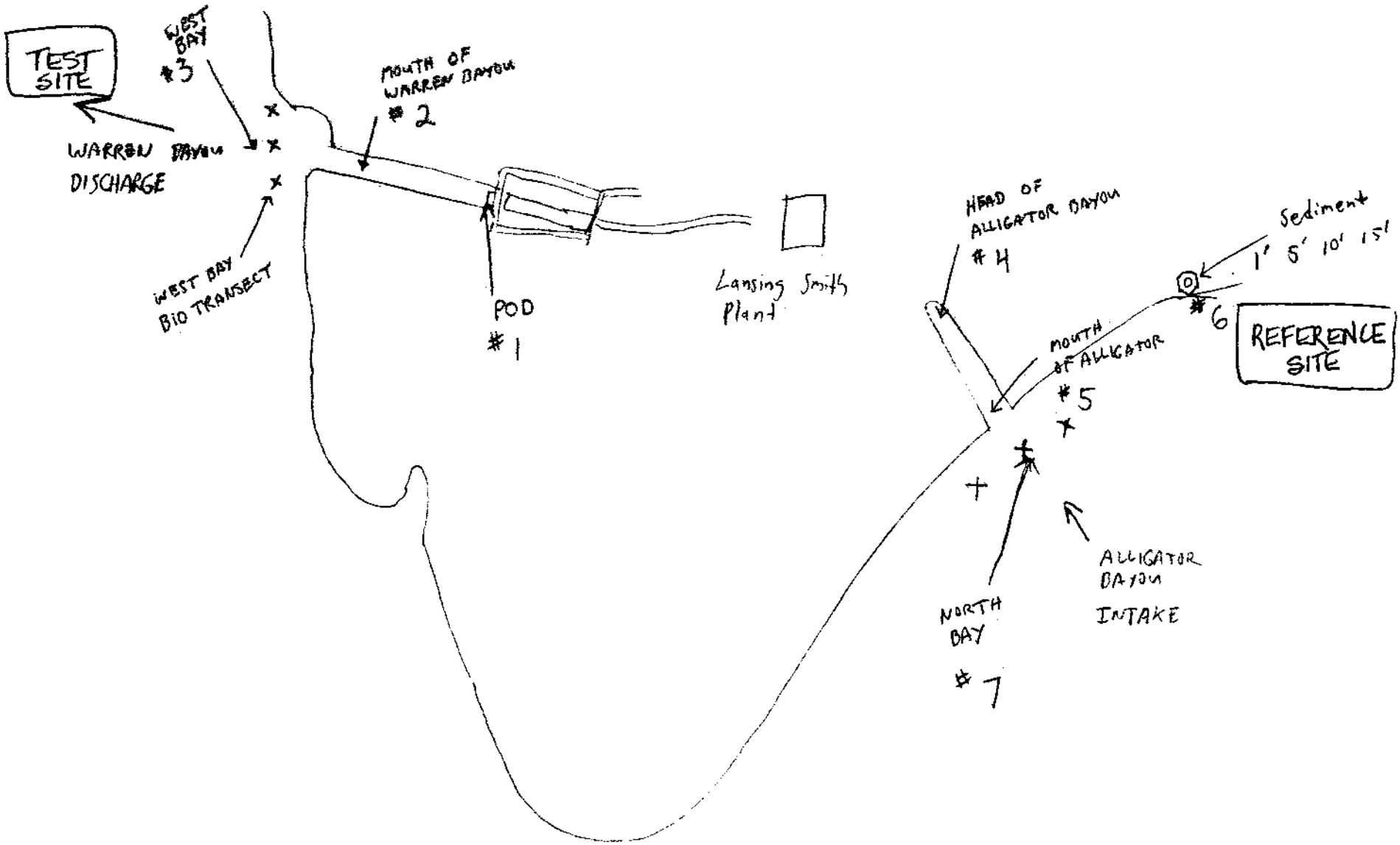


Figure 1. Portions of Panama City, Bay County, Florida, including location of the Lansing Smith Power Plant.


TEST SITE
WEST BAY #3
MOUTH OF WARREN BAYOU #2
WARREN BAYOU DISCHARGE
WEST BAY BIO TRANSECT
POD #1
Lansing Smith Plant
HEAD OF ALLIGATOR BAYOU #4
Sediment
1' 5' 10' 15'
6
REFERENCE SITE
MOUTH OF ALLIGATOR #5
NORTH BAY #7
ALLIGATOR BAYOU INTAKE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDER NW DIST	STORET STATION NUMBER: 32.03.0H12	DATE (M/D/Y): 11-14-90	RECEIVING BODY OF WATER: NORTH BAY OFF ALLIGATOR BAYOU

REMARKS:	LOCATION: PANAMA CITY, BAY CO. LANING SMITH SURVEY	FIELD ID/NAME: # 6 REFERENCE

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 6	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 35	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 3	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 7	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 7	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 61

COMMENTS: INTAKE SIDE, ALTERED BAYOU FROM ASH POND, COAL PILE, BARGE DOCKS + CHANNEL DREDGING. ABOVE SCORE IS FROM BAY TRANSECT NEAR MOUTH OF ALLIGATOR BAYOU

ANALYSIS DATE:	ANALYST:	SIGNATURE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
MARINE BENTHIC HABITAT ASSESSMENT FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDER NW DIST	STORET STATION NUMBER: 32.03.0029	DATE (M/D/Y): 11-13-90	RECEIVING BODY OF WATER: WEST BAY OFF WARREN BAYOU

REMARKS:	LOCATION: PANAMA CITY, BAY CO. LANSING SMITH SURVEY	FIELD ID/NAME: #3 TEST

Habitat Parameter / score	Excellent	Good	Fair	Poor
Littoral Alterations 9	None—Unaltered shoreline. **9-10 points**	Mostly natural shoreline, but with occasional riprap. **6-8 points**	Shoreline consisting mostly of riprap and vertical seawalls. **3-5 points**	Shoreline consisting almost entirely of vertical seawalls. **0-2 points**
Community Types Observed 40	At least four communities observed from the following list: mangrove swamp, marsh, oyster bar, grass bed, reef, saltern, natural beach, or tidal creek. **38-50 points**	Two or three communities observed from those listed. **26-37 points**	One community observed from those listed. **13-25 points**	No communities observed from those listed. **0-12 points**
Tidal Fluctuation 3	>0.75 m. **4-5 points**	0.5 - 0.75 m. **3 points**	0.25 - 0.5 m. **2 points**	<0.25 m. **0-1 point**
Freshwater Discharges/ Alterations 7	Only natural runoff.. **9-10 points**	Mostly natural runoff, but with a few, small stormwater sources. **6-8 points**	Considerable stormwater discharge from local roads, parking lots, etc. **3-5 points**	Extensive manmade discharges, especially from canals draining large tracts of land. **0-2 points**
Flow and Wave Action 7	Light to moderate wave action present except under the harshest weather conditions. Flow unrestricted by manmade structures. **9-10 points**	—	—	Heavy wave action sometimes present even during average weather conditions, or flow restricted by manmade structures so that velocities are very high. **0-2 points**
Sediment Type 10	Combination of sand, gravel, and shell. **12-15 points**	Primarily sand, with small areas of mud. **8-11 points**	Mixture of sand and mud, or well-aerated mud only. **4-7 points**	Anaerobic mud. **0-3 points**

TOTAL SCORE 76

COMMENTS: THERMAL DISCHARGE SIDE. TRANSECT IN BAY ACROSS MOUTH OF WARREN BAYOU. THERMAL DISCHARGE IS MAIN ENVIRONMENTAL VARIABLE. MARIFARMS AQUACULTURE IS OUT

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-13-90	Glenn Butts	Glenn L. Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDER NW DIST	STORET STATION NUMBER: 32.03.0H12	DATE (M/D/Y): 11-14-90	RECEIVING BODY OF WATER: NORTH BAY OFF ALLIGATOR BAYOU

REMARKS:	LOCATION: PANAMA CITY, BAY CO. LANSING SMITH SURVEY	FIELD ID/NAME: # 6 REFERENCE

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
20	5	10		5	60	

Local Watershed Erosion (check box): None ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☐ Obvious sources ☒

Point-Source Pollution (list location and describe): ASH POND LEACHATE, COAL PILE RUNOFF, BARGE DOCKS, CHANNEL DREDGING, BARGE TRAFFIC

Estimated Stream Width (range, m):		Estimated Stream Depth (range, m):		yes
High Water Mark (m above bed):		Velocity (range, m/s):		Impounded ☐ Channelized ☐

Canopy Cover % (check box): Open: ☒ Lightly Shaded: ☐ Moderately Shaded: ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ H_2S

Sediment Oils: Absent: ☐ Slight: ☒ Moderate: ☐ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☒ Sand: ☒ Shell: ☒ Other: ☐ Grass beds

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell	20	Coarse Organic Debris:	
Sand:	20	Mud/Muck (organic):	60

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):	Secchi Depth (m):	2.8
Top	20.47	7.21	pH (SU):	7.82
Mid-depth			Conductivity (µmho/cm):	42,100
Bottom			Other Parameters: ORP. 250, Sal 27.6	

Stream Type (check box): Blackwater: ☐ Deep Aquifer Fed: ☐ Surficial Aquifer Fed: ☐ Alluvial: ☐ Other: ☐

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): Slick: ☐ Sheen: ☐ Globs: ☐ None: ☒

Clarity (check box): Clear: ☒ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☐ Other: ☒ Bay

Weather Conditions: Clear & Cool, Low power usage

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☐	☐	☒	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

ANALYSIS DATE: 11-14-90	ANALYST: Glenn Butts	SIGNATURE: Glenn L. Butts

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD DATA SHEET

SUBMITTING AGENCY CODE: 8010 / SUBMITTING AGENCY NAME: FDER NW DIST	STORET STATION NUMBER: 32.03.0029	DATE (M/D/Y): 11-13-90	RECEIVING BODY OF WATER: WEST BAY OFF WARREN BAYOU
REMARKS:	LOCATION: PANAMA CITY, BAY COUNTY LANSING SMITH SURVEY		FIELD ID/NAME: # 3 TEST

RIPARIAN ZONE/INSTREAM FEATURES

Predominant Surrounding Land-Use (specify relative percent in each category):

Forest	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other
40	5	10	5	10	30	

Local Watershed Erosion (check box): None ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Some potential sources ☒ Obvious sources ☐

Point-Source Pollution (list location and describe): THERMAL DISCHARGE, OLD MARIFARMS LOCATION

Estimated Stream Width (range, m):		Estimated Stream Depth (range, m):		yes
High Water Mark (m above bed):		Velocity (range, m/s):		Impounded ☐ Channelized ☐

Canopy Cover % (check box): Open: ☒ Lightly Shaded: ☐ Moderately Shaded: ☐ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposits: Sludge: ☐ Paper Fiber: ☐ Mud: ☐ Sand: ☒ Shell: ☒ Other: ☐ Grass beds

Substrate Types (estimated % surface coverage):

Limestone:		Sand/Silt/Clay Mix:	10
Consolidated Clay:		Clay/Silt (inorganic):	
Gravel/Shell	20	Coarse Organic Debris:	
Sand:	60	Mud/Muck (organic):	10

WATER QUALITY

	Temp. (°C):	D.O. (mg/l):		
Top	23.42	6.36	Secchi Depth (m):	1.4
Mid-depth			pH (SU):	7.94
Bottom			Conductivity (µmho/cm):	45,300
			Other Parameters:	Sal 29.4

Stream Type (check box): Blackwater: ☐ Deep Aquifer Fed: ☐ Surficial Aquifer Fed: ☐ Alluvial: ☐ Other: ☐ _____

Water Odors (check box): Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐ _____

Water Surface Oils (check box): Slick: ☐ Sheen: ☐ Globs: ☐ None: ☒

Clarity (check box): Clear: ☒ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☒ Other: ☐ Bay

Weather Conditions: Clear, Cool

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☐	☐	☐	☒
Iron/sulfur Bacteria	☒	☐	☐	☐

ANALYSIS DATE:	ANALYST:	SIGNATURE:
11-13-90	Glenn Butts	Glenn L. Butts

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Smith Elec. Gen Plant
Address/City: Pensacola
County: Bay
Contact/District: Glenn Butts
NPDES Permit #: FL0002267 **Outfall #:** 001

Sample Collection: Date 11-13-90 Time 1200
Test Beginning: Date 11-14-90 Time 1100
Test Ending: Date 11-16-90 Time 1100
Test Organism: Mysidopsis bahia
Life Stage/Age: < 7 days

Test Number: 1 of 1 **Test Type:** Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: Effluent Salinity 16 ‰
Cond. 42000 micromho at 23°C

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	969,707	8.4@24°	1338@23.5°	22.6@22
24 hr	707;969	8.8@22°	1351@23.3°	22.8°@23.
48 hr	707;969	8.8@22°	1350@23.3°	22.0°@23.

		Number Live			DO (mg/l)			pH			Temp. (°C)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	39	5	5	5	5.4	6.7	8.7	8.2	8.1	8.2	23.7	21.5	21.3	28xx	28xx	27800
"	15	5	5	5	5.5	6.7	8.7	8.2	8.2	8.2	23.5	21.5	21.3	28000	28xx	28300
100%	57	5	5	4	7.4	6.7	8.1	8.0	8.0	7.9	21.4	21.3	21.5	43xx	45300	45300
"	92	5	5	5	7.5	6.3	8.0	8.1	7.9	7.9	21.3	21.3	21.5	42800	45300	45500
Measured/Loaded by:		MF	SMC	LB	LB	SMC	LB	LB	SMC	LB	LB	SMC	LB	LB	SMC	LB
Recorded by:		MF	SMC	SMC	LB	SMC	LB	LB	SMC	LB	LB	SMC	LB	LB	SMC	LB

Investigators' Signatures

Marshall Faircloth
Lynn Burton
Sandy McClure

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:			0.0	HACH	RBF
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia meter slope:

Sample Number: 90-NOV-14-20-01 Sample Status: Authorized by Liang T. Lin
Sample Location: Lansing Smith Thermal Discharge Matrix: Effluent
Field ID: #1 Storet Station Number:
Date/Time Collected: 13-NOV-1990 11:49:26.61
Comments:

Sample Number: 90-NOV-14-20-01 Test status: Authorized by Laura Harrison
Analysis Id: W-BNA Analysis Description: base-neutral-acid water analysis

Storet Number	Analyte	Result	Units
34205	Acenaphthene	10 U	ug/L
34200	Acenaphthylene	10 U	ug/L
39330	Aldrin	10 U	ug/L
34220	Anthracene	10 U	ug/L
34526	Benzo(a)anthracene	10 U	ug/L
34230	Benzo(b)fluoranthene	10 U	ug/L
34242	Benzo(k)fluoranthene	10 U	ug/L
34247	Benzo(a)pyrene	10 U	ug/L
34521	Benzo(g,h,i)perylene	15 U	ug/L
34292	Benzyl butyl phthalate	10 U	ug/L
	a-BHC	10 U	ug/L
39337	b-BHC	10 U	ug/L
39340	d-BHC	10 U	ug/L
	g-BHC	10 U	ug/L
39120	Benzidine	10 U	ug/L
34273	Bis(2-chloroethyl)ether	10 U	ug/L
34278	Bis(2-chloroethoxy)methane	15 U	ug/L
34283	Bis(2-chloroisopropyl)ether	15 U	ug/L
39100	Bis(2-ethylhexyl)phthalate	10 U	ug/L
34636	4-Bromophenyl phenyl ether	10 U	ug/L
34581	2-Chloronaphthalene	10 U	ug/L
34641	4-Chlorophenyl phenyl ether	10 U	ug/L
34320	Chrysene	10 U	ug/L
39310	4,4'-DDD	10 U	ug/L
39320	4,4'-DDE	10 U	ug/L
39300	4,4'-DDT	10 U	ug/L
34556	Dibenzo(a,h)anthracene	15 U	ug/L
39110	Di-n-butyl phthalate	10 U	ug/L
34536	1,2-Dichlorobenzene	10 U	ug/L
34566	1,3-Dichlorobenzene	10 U	ug/L
34571	1,4-Dichlorobenzene	10 U	ug/L
34631	3,3'-Dichlorobenzidine	10 U	ug/L
39380	Dieldrin	10 U	ug/L
34336	Diethylphthalate	10 U	ug/L
34341	Dimethylphthalate	10 U	ug/L
34611	2,4-Dinitrotoluene	10 U	ug/L
34626	2,6-Dinitrotoluene	10 U	ug/L
34596	Di-n-octyl phthalate	10 U	ug/L
34361	Endosulfan-I	10 U	ug/L

Continued

A - Value reported is the mean of two or more determinations
E - Scientific notation
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the minimum detection limit
N/A - Not applicable NR - Not requested

Cont. from previous page for Sample Number: 90-NOV-14-20-01 Analysis [illegible]: W-BNA

34356	Endosulfan-II	10 U	ug/L
34351	Endosulfan-sulfate	10 U	ug/L
39390	Endrin	10 U	ug/L
34366	Endrin-aldehyde	10 U	ug/L
34376	Fluoranthene	10 U	ug/L
34381	Fluorene	10 U	ug/L
39410	Heptachlor	10 U	ug/L
39420	Heptachlor-epoxide	10 U	ug/L
39700	Hexachlorobenzene	15 U	ug/L
34391	Hexachlorobutadiene	10 U	ug/L
34396	Hexachloroethane	60 U	ug/L
34386	Hexachlorocyclypentadiene	10 U	ug/L
34403	Indeno(1,2,3-cd)pyrene	10 U	ug/L
34408	Isophorone	10 U	ug/L
34696	Naphthalene	10 U	ug/L
34447	Nitrobenzene	10 U	ug/L
34438	N-Nitrosodimethylamine	50 U	ug/L
34428	N-Nitrosodi-n-propylamine	10 U	ug/L
34433	N-Nitrosodiphenylamine	15 U	ug/L
34671	PCB-1016	10 U	ug/L
39488	PCB-1221	10 U	ug/L
39492	PCB-1232	10 U	ug/L
39496	PCB-1242	10 U	ug/L
39500	PCB-1248	10 U	ug/L
39504	PCB-1254	10 U	ug/L
39508	PCB-1260	10 U	ug/L
	PCB-1262	10 U	ug/L
34461	Phenanthrene	10 U	ug/L
34469	Pyrene	10 U	ug/L
39400	Toxaphene	10 U	ug/L
34551	1,2,4-Trichlorobenzene	10 U	ug/L
34462	4-Chloro-3-methyl phenol	15 U	ug/L
34586	2-Chlorophenol	15 U	ug/L
34601	2,4-Dichlorophenol	15 U	ug/L
34606	2,4-Dimethylphenol	15 U	ug/L
34616	2,4-Dinitrophenol	30 U	ug/L
34657	2-Methyl-4,6-dinitrophenol	30 U	ug/L
34591	2-Nitrophenol	15 U	ug/L
34646	4-Nitrophenol	50 U	ug/L
39032	Pentachlorophenol	15 U	ug/L
34694	Phenol	15 U	ug/L
34621	2,4,6-Trichlorophenol	15 U	ug/L

Comments (1): Traces of aliphatic compounds.
(2):
(3):
(4):
(5):
(6):

End of Report

A - Value reported is the mean of two or more determinations
E - Scientific notation
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-NOV-19-09-01 Sample Status: Authorized by Tim Fitzpatrick
Sample Location: Lansing Smith Thermal Discharge Matrix: Effluent
Field ID: #1 Storet Station Number:
Date/Time Collected: 13-NOV-1990 11:47:54.02
Comments:

Sample Number: 90-NOV-19-09-01 Test status: Authorized by Tim Fitzpatrick
Analysis Id: W-ICP-23 Analysis Description: ICP multielement analysis for water samples

Storet Number	Analyte	Result	Units
01106	Aluminum	51	ug/L
01002	Arsenic	50 U	ug/L
01097	Antimony	15 U	ug/L
01007	Barium	8	ug/L
01012	Beryllium	0.5 U	ug/L
01027	Cadmium	6 T	ug/L
00916	Calcium	301	mg/L
01034	Chromium	10 U	ug/L
01037	Cobalt	3 U	ug/L
01042	Copper	5 U	ug/L
01045	Iron	76	ug/L
01051	Lead	15 U	ug/L
00927	Magnesium	1150	mg/L
01055	Manganese	50 U	ug/L
01067	Nickel	10 U	ug/L
00937	Potassium	450	mg/L
01147	Selenium	30 U	ug/L
01077	Silver	3 U	ug/L
00929	Sodium	9110 J	mg/L
01082	Strontium	5660	ug/L
01059	Thallium	50 U	ug/L
01087	Vanadium	5 U	ug/L
01092	Zinc	5 U	ug/L
	Comment	NONE	

A - Value reported is the mean of two or more determinations
E - Scientific notation
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Sample Number: 90-NOV-14-19-01 Sample Status: Authorized by Yuh-Hsu Pan
Sample Location: Lansinig Smith Thermal Discharge Matrix: Effluent
Field ID: #1 Storet Station Number:
Date/Time Collected: 13-NOV-1990 11:49:15.08
Comments:

Sample Number: 90-NOV-14-19-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NH3 Analysis Description: Analysis for ammonia in water

Storet Number	Analyte	Result	Units
00610	Ammonia-N	0.010 U	mg N/L

Sample Number: 90-NOV-14-19-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-NO2NO3 Analysis Description: Analysis for nitrite+nitrate in water

Storet Number	Analyte	Result	Units
00630	NO2NO3-N	0.020 T	mg N/L

Sample Number: 90-NOV-14-19-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TKN Analysis Description: TKN for water sample

Storet Number	Analyte	Result	Units
00625	N KJEL TOT	0.020 U	mg N/L

Sample Number: 90-NOV-14-19-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TOC Analysis Description: Total organic carbon

Storet Number	Analyte	Result	Units
00680	TOC	1	mg C/L

Sample Number: 90-NOV-14-19-01 Test status: Authorized by Yuh-Hsu Pan
Analysis Id: W-TP Analysis Description: Analysis for total phosphorus in water

Storet Number	Analyte	Result	Units
00665	Total-P	0.021 T	mg P/L

A - Value reported is the mean of two or more determinations
E - Scientific notation
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Not analyzed for this compound
T - Value reported is less than the practice quantiation limit
U - Material was analyzed for but not detected; The value reported is the mimimum detection limit
N/A - Not applicable NR - Not requested

Benthic Macroinvertebrate taxa list for Lansing Smith Electric Generating Plant, Bay County, Florida, collected via ponar dredge at the point of discharge and at a nearby reference site.

	Reference Site	Test Site
Caprellidae		
Caprella sp.	–	+
Cumacea		
Oxyurostylis smithi	–	+
Decopoda		
Callinectes sapidus	+	–
Hippolyte pleuracantha	–	+
Echinodermata		
Undetermined Ophiuroidea species	–	+
Gastropoda		
Bittium varium	+	–
Caecum sp.	+	–
Crepidula fornicata	+	+
Crepidula maculosa	+	–
Mitrella lunata	+	+
Nassarius vibex	+	–
Urosalpinx tampaensis	+	+
Ampelisca abdita	–	+
Malacostraca		
Ampelisca verrilli	+	–
Cymadusa compta	+	+
Edotea triloba	–	+
Erichsonella floridana	+	+
Lembos species 1	+	+
Lembos species 2	+	+
Leucothoe spinicarpa	–	+
Mellita nitida	+	+
Mysidopsis bahia	–	+
Undetermined Malacostraca sp.	+	–
Undetermined Sphaeromidae	+	–
Nemertea		
Cerebractulus lacteus	+	–
Tetrastemma candidum	+	+
Pelecypoda		
Amygdalum papyria	–	+
Anomalocardia cuneimeris	–	+
Chione sp.	+	–
c.f. *Mysella planulata*	–	+
Parastarte triquetra	+	–
Platyhelminthes		
Stylochus ellipticus	+	–
Polychaeta		
Aricidea sp.	+	–

Ceratonereis longicirrata	+	+
Glycera sp.	–	+
Laeonereis culveri	+	–
Leitoscoloplos fragilis	+	–
Nereis pelagica	+	+
Prionospio cristata	+	–
Prionospio heterobranchia	+	–
Prionospio (Minuspio) sp.	+	–
Scoloplos sp.	+	–
Sipuncula		
Phascolion sp.	–	+
Tanaidae		
Leptochelia c.f. *rapax*	–	+
Total	30	25

Department of Environmental Regulation

Results of Fifth Year Inspections

Discharger: **Lansing Smith Electric Generating Plant**
County: **Bay**
NPDES Number: **FL0002208**
State Permit Expiration Date:

Toxics Sampling Inspection (XSI)	
Date Sampled:	November 13-14, 1990
Results:	No deleterious levels of priority pollutants found.

Compliance Biomonitoring Inspection (CBI)	
Date Sampled:	November 13-14, 1990
Results:	No toxicity observed.

Impact Bioassessment Inspection (IBI)	
Date Sampled:	November 13-14, 1990
Results:	Biological communities in receiving waters were healthy.

Water Quality Inspection (WQI)	
Date Sampled:	November 13-14, 1990
Results:	Nutrients were below detection limits.

These fifth year inspections provide the necessary information to evaluate the facility's impact on its receiving waters and to provide specific recommendations for renewal.