TECHNICAL MEMORANDUM
WRE # 356

SURFACE WATER QUALITY MONITORING NETWORK
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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By

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INTRODUCTION

The South Florida Water Management District (District) has the responsibility to manage water and related resources for the benefit of the public and in keeping with the needs of the region. The key elements of its mission are:

1. Protection and Enhancement of the Environment,
2. Water Supply,
3. Flood Protection and
4. Water Quality Protection.

The District uses various approaches to protect water quality. These approaches range from monitoring, testing and researching those water quality parameters related to the District's operations, land management activities, and regulatory functions. To meet the demands of these functions, the District collects and maintains an extensive database of surface water quality and hydrologic information in the Department of Water Resources Evaluation (WRE).

Three goals for Environmental Service programs administered by WRE are:

1. To provide water quality data and evaluations from a network of sampling stations to support water resource management decision-making;
2. To optimize the efficiency of data collection monitoring networks, and ensure data accuracy through rigorous quality control; and,
3. To develop and maintain a water quality database to provide efficient data access.

To address these goals, (40) major water quality monitoring programs are currently managed by the Water Quality Monitoring Division (WQMD), as well as other agencies, and some through contractual agreements. These programs encompass a wide variety of south Florida ecosystems, land uses and hydrologic systems. Monitoring points include lakes, rivers, canals, wetlands, dairies, the intracoastal waterway, estuaries, rainfall, and water control structures. Due to the dynamics of surface water flow in south Florida, the data from one monitoring program often augments data from another. Often data collected from routine monitoring programs are used to supplement more specific water quality studies.

PURPOSE AND SCOPE

This report presents the objectives and purpose of each monitoring program, the location of the monitoring sites, the types of parameters tested, the period of record, the frequencies of sampling, and basic statistics for some parameters. Other sources of information on these monitoring programs are listed at the end of each chapter under 'District Publications'.

There are 40 major water quality monitoring programs that incorporate 991 sampling locations. Depending on the specific program and/or parameter, the sampling frequencies range from weekly to biannually. In addition, some sampling is done only during storm events. The parameters analyzed include basic inorganics (nutrients, cations, anions and metals), organics (e.g. pesticides and the degradation products, base neutral/acid extractable, and purgeable compounds), and physical parameters such as (temperature, dissolved oxygen, pH, specific conductance, etc.).

The District follows strict QA/QC (Quality Assurance / Quality Control) procedures approved by the Florida Department of Environmental Protection (FDEP) for both the field and laboratory

work. Any contractual laboratory has to have an FDEP approved laboratory QA Plan, and be certified by the department of Health and Rehabilitative Services.

The programs presented in this document directly support the following legislative acts, permits, agreements, and any other legal requirements:

1. Surface Water Improvement and Management (SWIM) Act of 1987.

2. Permits issued by the Florida Department of Environmental Protection(FDEP), and the Environmental Protection Agency(EPA).

3. Memorandum of Agreement (MOA) between the Everglades National Park (PARK), the District, and the United States Army Corps of Engineers(COE).

4. MOA's between the District and the Miccosukee and Seminole Indian Tribes of Florida.

5. MOA between the District, the United States Department of Agriculture, and the Environmental Protection Agency.

The areal extent of the surface water quality monitoring programs maintained by the District are shown in Figure 1. The 40 individual monitoring programs are grouped together under 24 main networks; 22 are geographic areas, and the other two; The Pesticide and Atmospheric Deposition monitoring programs are District wide. These networks are:

1. Upper Kissimmee Chain of Lakes and Tributaries
   a. Upper Kissimmee River Chain of Lakes
   b. Tributaries of the Upper Kissimmee

2. Kissimmee River
   a. Kissimmee River
   b. Tributaries of the Kissimmee River

3. Arbuckle Creek

4. Lake Istokpoga

5. Lower Kissimmee River Basin

6. Taylor Creek/Nubbin Slough

7. Indian River Lagoon

8. St. Lucie Estuary

9. Upper and Lower East Coast

10. Works of the District Compliance Monitoring

11. Lake Okeechobee
    a. Inflows and Outflows
    b. Limnetic and Littoral Zones

12. Caloosahatchee River

13. Everglades Nutient Removal

14. Holey Land
    a. Permitted Inflows and Outflows
    b. Interior Marsh Sites

15. Everglades Protection Area

16. Big Cypress Seminole Indian Reservation

17. Water Conservation Areas Inflows and Outflows

18. Biscayne Bay Monitoring

19. Everglades National Park
    a. Inflows and Outflows
    b. Interior Monitoring

20. Routine Pesticide Monitoring Network

21. Precipitation Monitoring Network

22. Manatee Bay/Long Sound

23. South Florida Estuarine Monitoring Network

24. Big Cypress National Perserve

This report is an update to Technical Memorandum of the same title from June 1994 and provides basic information to researchers, consultants, and other persons regarding the availability of routine water quality data in the District's database. Because of the dynamic nature of monitoring programs, updates of this document will be done periodically. The location of the water quality stations are mapped, and the available data are summarized in table format. This allows data users to choose appropriate identification numbers and request any or all of the water quality data available for a given period or area. The time frame used in this publication is, whenever the program and monitoring locations were first sampled until September 30, 1996.

REPORT FORMAT

The report describes the purpose and scope of the surface water quality monitoring programs in geographic sequence from north to south, as shown in Figure 1. This is followed by tables 1,2, and 3 that list the parameters analyzed.

The subsequent sections provide details on each monitoring program. Following the discussion on each sampling program is a figure of sampling stations. Tables list the station identification number, latitude and longitude, a description of the site location (including location from a District structure), the period of record, types of parameters analyzed, and sample collection method. Other tables contain basic statistics on data for each monitoring location.

The data provide important sources of information for preparation of management plans required by SWIM Act's and other mandated or legal requirements. District publications resulting from these intensive monitoring programs are at the end of each section. The reader should refer to these publications for interpretations, analyses, and evaluations of the water quality data.

The appendix contains a list of the abbreviations and their descriptions, and a cross reference guide for sampling station names and project codes.

DATA AVAILABILITY

Data can be obtained either by using a modem or internet to access the Water Quality and Hydrologic databases via REMO, or sending in a written request. For more information about either of these contact Angela Chong at the address below or call at 561-687-6514.

Water Resources Evaluation Department
South Florida Water Management District
P. O. Box 24680
West Palm Beach, FL 33416-4680

Written requests should include the following information:

1. Requestor's name, address, and phone number.
2. Station identification or area of concern.
3. Period of record desired.
4. Parameters or parameter groups desired.
5. A brief explanation of how the data will be used (for documentation purposes).

The District may assess a charge for providing data to the public in keeping with the Public Records Act (Section 119.085FS) and the Electronic Record Keeping Rule (1B-26.033FAC).

ACKNOWLEDGEMENTS

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2. Janet Wise for creating the maps;

3. District field staff who collected the samples for the monitoring programs documented in this report; and,

4. District laboratory staff who analyze the water samples collected from all the different monitoring programs.

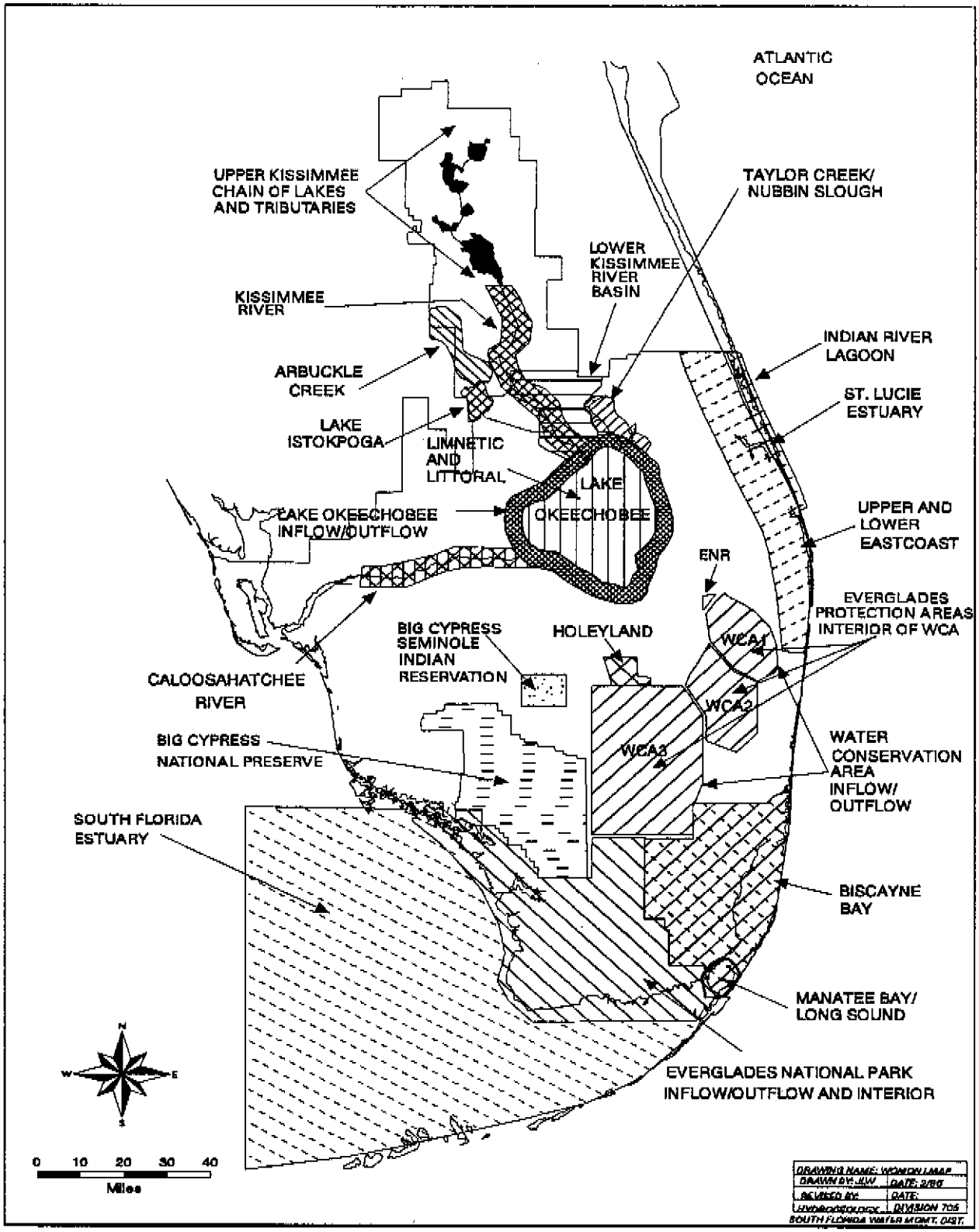

FIGURE 1. Water Quality Monitoring Programs

TABLE 1. LIST OF PARAMETERS AND UNITS BY MAJOR GROUPINGS

PHYSICAL/CHEMICAL	UNITS
Temperature	C
Dissolved Oxygen	mg/L
Specific Conductance	umhos/cm
pH	pH units
Turbidity	NTU
Color	Color units
Total Suspended Solids	mg/L
Total Dissolved Suspended Solids	mg/L
Secchi	meters
Salinity	PPT
Photosynthetically Active Radiation(PAR)	umol s-1 m-2 per microamp

NUTRIENTS	UNITS
Nitrite	mg/L
Nitrate	mg/L
NOx	mg/L
Ammonia	mg/L
Inorganic Nitrogen	mg/L
Organic Nitrogen	mg/L
Total Nitrogen	mg/L
Total Kjeldahl Nitrogen	mg/L
Ortho Phosphorus	mg/L
Total Phosphorus	mg/L
Inorganic Phosphate Fractioning	mg/L
Organic Phosphate Fractioning	mg/L
Hydrolyzable Phosphate	mg/L
Alkaline Phosphatase(APA)	nmo/min-m

MAJOR IONS	UNITS
Alkalinity	mg/L
Chloride	mg/L
Silica	mg/L
Sulfate	mg/L
Sodium	mg/L
Potassium	mg/L
Calcium	mg/L
Magnesium	mg/L

TRACE METALS	UNITS
Total Aluminum	µg/L
Total Manganese	µg/L
Total Mercury	µg/L
Total Cadmium	µg/L
Total Copper	µg/L
Total Zinc	µg/L
Total Arsenic	µg/L
Total Lead	mg/L
Total Iron	µg/L
Methyl Mercury	µg/L
Chromium VI	µg/L
Chromium III	µg/L

OTHER	UNITS
Chlorophyll	
Carotenoid	mg/m^3
Chlorophyll a	mg/m^3
Chlorophyll a2	mg/m^3
Chlorophyll b	mg/m^3
Chlorophyll c	mg/m^3
Pheophytin a	mg/m^3
Total Coliform	cfu/100ml
Fecal Coliform	cfu/100ml
Heterotrophic Plate Count	cfu/100ml
Fecal Streptococci	cfu/100ml
Fecal Coliform Most Probable Number(FCMPN)	mpn/100ml
Total Coliform Most probable Number(TCMPN)	mpn/100ml
Dissolved Inorganic carbon(DIC)	mg/L
Dissolved organic Carbon(DOC)	mg/L
Total Inorganic carbon(TIC)	mg/L
Total Organic carbon(TOC)	mg/L

- = No Units

TABLE 2. PESTICIDES ANALYZED IN SURFACE WATER AND SEDIMENT SAMPLES**

2,4-D	ethion
2,4,5-T	ethoprop
2,4,5-TP (Silvex)	ethylene thiourea*
acephate*	fenamiphos (nemacur)
alachlor	fonophos (dyfonate
aldicarb	gamma BHC (lindane)
aldrin	glyphosate*
alpha BHC	heptachlor
alpha endosulfan	heptachlor epoxide
ametryn	hexazinone*
atrazine	linuron
azinphos methyl (guthion)	malathion
benomyl	metalaxyl*
beta endosulfan	methamidaphos
beta BHC	methomyl
bromacil	methoxychlor
butylate*	metolachlor
carbaryl	metribuzin
carbofuran	mevinphos
carbophenothion (trithion)	mirex
chlordane	monocrotophos (azodrin)
chloropyrifos ethyl	naled
chloropyrifos methyl	norflurazon*
chlorothalonil	oxamyl
delta BHC	paraquat
demeton	parathion ethyl
diazinon	parathion methyl
dicofol (kelthane)	phorate
dieldrin	p,p'-DDD
dimethoate*	p,p'-DDE
diquat	p,p'-DDT
disulfoton	prometryn
diuron	simazine
endosulfan sulfate	toxaphene
endrin	trifluralin
endrin aldehyde	zinc phosphide*

* = Analyzed Only in Surface Water
** = Units are ug/l for water samples and ug/kg for sediment samples

TABLE 3. PRIORITY POLLUTANTS ANALYZED IN WATER AND SEDIMENT*

Base Neutral and Acid Extractable Compounds

acenaphthene	hexachlorobenzene
acenaphthylene	hexachlorobutadiene
anthracene	hexachloroethane
benzo(a)anthracene	indeno(1,2,3-cd)pyrene
benzo(b)fluoranthene	isophorone
benzo(k)fluoranthene	naphthalene
benzo(a)pyrene	nitrobenzene
benzo(g,h,i)perylene	n-nitrosodi-n-propylamine
bis(2-chloroethyl)ether	phenanthrene
bis(2-chloroethoxy)methane	pyrene
bis(2-ethylhexyl)phthalate	1,2,4-trichlorobenzene
bis(2-chloroisopropyl)ether	4-chloro-3-methylphenol
4-bromophenyl-phenyl-ether	2-chlorophenol
2-chloronaphthalene	2,4-dichlorophenol
4-chlorophenyl-phenyl ether	2,4-dimethylphenol
chrysene	2,4-dinitrophenol
dibenz(a,h)anthracene	2-methyl-4,6-dinitrophenol
di-n-butylphthalate	2-nitrophenol
1,3-dichlorobenzene	4-nitrophenol
1,2-dichlorobenzene	pentachlorophenol
1,4-dichlorobenzene	phenol
3,3'-dichlorobenzidine	2,4,6-trichlorophenol
diethyl phthalate	benzidine
dimethyl phthalate	hexachlorocyclopentadiene
2,4-dinitrotoluene	n-nitrosodimethylamine
2,6-dinitrotoluene	n-nitrosodiphenylamine
di-n-octylphthalate	1,2-diphenylhydrazine
fluoranthene	2,3,7,8-TCDD
fluorene	

Organochlorine Pesticides and PCB's

aldrin	PCB-1221
beta BHC	PCB-1232
delta BHC	PCB-1242
chlordane	PCB-1248
p,p'-DDD	PCB-1254
p,p'-DDE	PCB-1260
p,p'-DDT	toxaphene
dieldrin	endrin
endosulfan sulfate	alpha BHC
endrin aldehyde	gamma BHC
heptachlor	endosulfan alpha (I)
heptachlor epoxide	endosulfan beta (II)
PCB-1016	

* = Units are ug/l for water samples and ug/kg for sediment samples

TABLE 3(Continued). PRIORITY POLLUTANTS ANALYZED IN WATER AND SEDIMENT*

Purgeables	
acrolein	1,1-dichloroethene
acrylonitrile	trans-1,2-dichloroethylene
benzene	1,2-dichloropropane
bromodichloromethane	cis-1,3-dichloropropene
bromoform	trans-1,3-dichloropropene
bromomethane	ethyl benzene
carbon tetrachloride	methylene chloride
chlorobenzene	1,1,2,2-tetrachloroethane
chloroethane	tetrachloroethylene
2-chloroethylvinyl ether	toluene
chloroform	1,1,1-trichloroethane
chloromethane	1,1,2-trichloroethane
dibromochloromethane	trichloroethene
1,2-dichlorobenzene	trichlorofluoromethane
1,3-dichlorobenzene	vinyl chloride
1,4-dichlorobenzene	cis-1,2-dichloroethylene
1,1-dichloroethane	o-chlorotoluene
1,2-dichloroethane	

Metals
mercury
antimony
beryllium
chromium
copper
nickel
zinc
aluminum
iron
arsenic
cadmium
lead
selenium
silver
thallium
Total Organic Carbon **
Particle Size **
CaCO3 analysis **

* = Units are ug/l for water samples and ug/kg for sediment samples

** = Analyzed for only in sediment samples.

SECTION 1

UPPER KISSIMMEE RIVER CHAIN OF LAKES AND TRIBUTARIES PROJECT CODES: UKCL and TUK

Purpose and Scope

The Upper Kissimmee Chain of Lakes and Tributaries water quality monitoring program includes five major lakes and three tributaries in the Kissimmee Chain: East Lake Tohopekaliga, Lake Tohopekaliga, Lake Cypress, Lake Hatchineha, Lake Kissimmee, Boggy Creek, Reedy Creek, and Shingle Creek. The water quality monitoring program provides a water quality and nutrient loading data base for:

1. Applying eutrophication models to develop and refine nutrient loading targets for the five major lakes in the chain;

2. Determining the long and short term trends necessary to determine the effectiveness of basin management, and identifying potential problem areas in terms of water quality degradation and nutrient loadings;

3. Assessing the in-lake effects of basin management plan implementations and lake draw downs; and

4. Investigating the relationship between the lakes in the chain and the impact on downstream water bodies.

The program began in 1981 with 40 water quality monitoring sits. In June 1985 the program was reduced to 13 key locations for long term monitoring, and in 1991 the number of stations was increased to 16.

Sampling Locations and Descriptions

The locations of the 16 sites monitored under these programs are shown in Figure 2. Table 4 lists all station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 5 contain statistics for each monitoring location.

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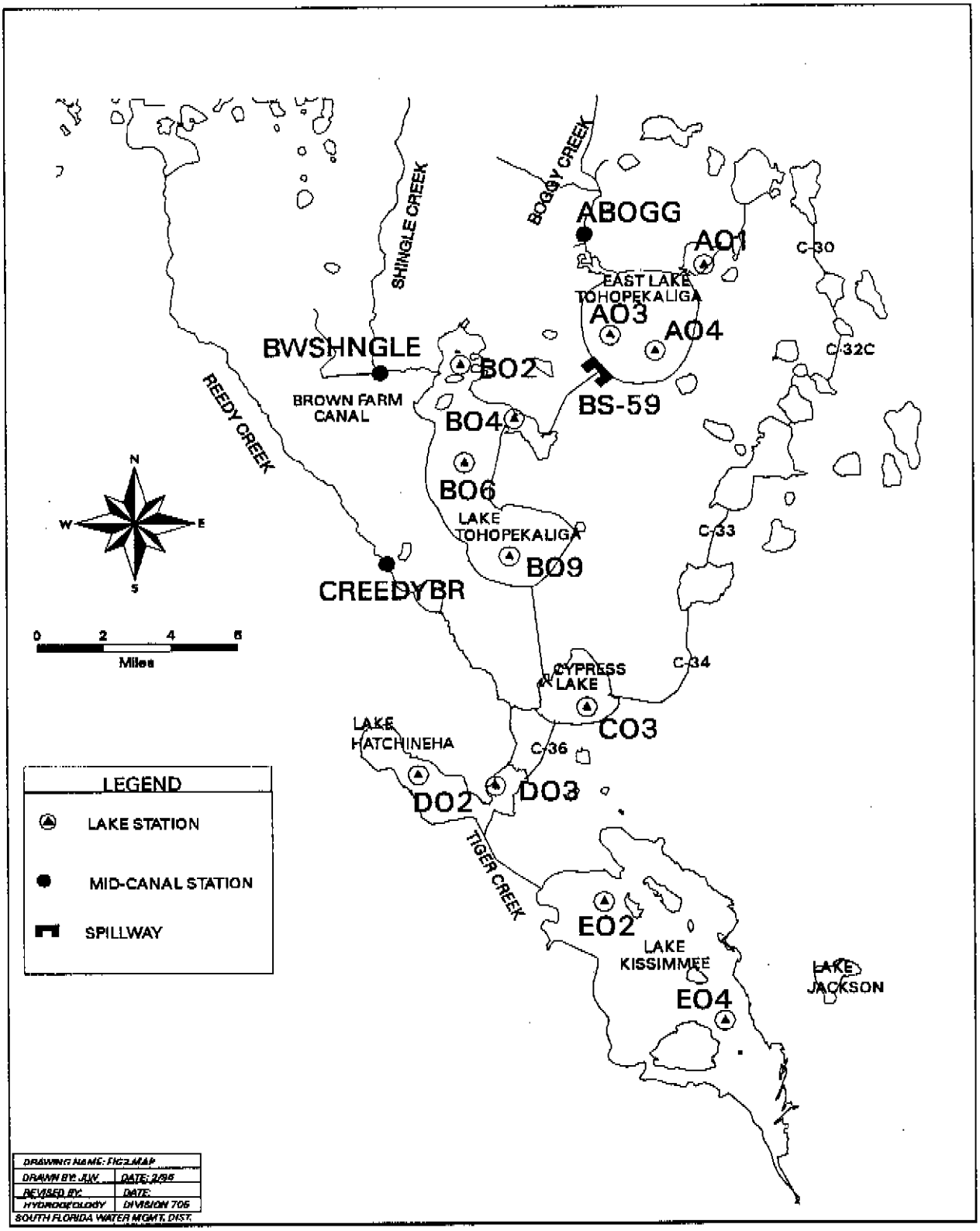

FIGURE 2. Location of Sampling Stations for the Upper Kissimmee River Chain of Lakes and Tributaries Water Quality Monitoring program.

TABLE 4. Summary of Sampling Station Locations and Frequency of Collection for Upper Kissimmee River Chain of Lakes and Tributaries Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	US/DS	G/A
E02	275601	811806	At channel marker No.9 at the north end of Lake Kissimmee.	1981 - P	M	M	QTR	-	G
E04	275301	811312	At channel marker No.7 on the east side of Lake Kissimmee.	1981 - P	M	M	QTR	-	G
D02	280056	812441	In the middle of Lake Hatchineha.	1981 - P	M	M	QTR	-	G
D03	280023	812153	Southeast portion of Lake Hatchineha at channel marker No. 13.	1981 - P	M	M	QTR	-	G
C03	280325	811850	Near the south end of Lake Cypress.	1981 - P	M	M	QTR	-	G
B02	281531	812321	North end of Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
B04	281348	812128	Near the east side of Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
B06	281123	812245	Taken from the middle of Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
B09	280844	812128	Near the south end of Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
BS-59	281558	811835	S-59 which is an outflow structure located at the south end of East Lake Tohopekaliga.	81-84/90-P	M	M	QTR	US	G
A01	281945	811437	Middle of Fells Cove near the north east side of Lake Tohopekaliga.	81-84/90-P	M	M	QTR	-	G
A03	281676	811770	1.0 mile out from the north west side of Lake Tohopekaliga.	81-84/90-P	M	M	QTR	-	G
A04	281927	811422	1.0 mile out from the boat ramp in St.Cloud, in East Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
ABOGG	282051	811911	Taken in Ramada Campground at Boggy Creek off State Road 5 upstream of the discharge point to East Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G
BWSHNGLE	281600	812617	Taken from the bridge over Shingle Creek at State Road 531 upstream of the discharge point to Lake Tohopekaliga.	1981 - P	M	M	QTR	-	G

TABLE 4 (Continued). Summary of Sampling Station Locations and Frequency of Collection for Upper Kissimmee River Chain of Lakes and Tributaries Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	US/DS	G/A
CREEDYBR	280859	812628	Taken from the bridge over Reedy Creek at State Road 531 upstream of the discharge point to Lakes Hatchineha and Cypress.	1985 - P	M	M	QTR	-	G

TABLE 5. Statistics on Select Parameters for the Upper Kissimmee River Change of Lakes and tributaries Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
A01	0.0110	0.0278	0.1940	0.0020	0.0063	0.0340	0.4000	1.0939	1.9700	0.0040	0.0521	0.1400
A03	0.0080	0.0220	0.0440	0.0020	0.0068	0.1870	0.1000	0.7928	2.3500	0.0040	0.0194	0.1640
A04	0.0050	0.0244	0.0550	0.0020	0.0055	0.0360	0.0001	0.8981	13.3100	0.0040	0.0166	0.1860
B02	0.0230	0.1760	0.7030	0.0040	0.0985	0.6040	0.5400	1.4221	4.7600	0.0040	0.0538	0.3480
B04	0.0070	0.0723	0.4230	0.0020	0.0169	0.2140	0.0001	1.1259	6.3300	0.0040	0.0182	0.2100
B06	0.0190	0.1204	0.7820	0.0010	0.0292	0.5410	0.5000	1.5709	4.1000	0.0040	0.0142	0.1670
B09	0.0190	0.1361	0.8400	0.0010	0.0215	0.1980	0.5100	1.8621	10.5000	0.0040	0.0099	0.1300
C03	0.0260	0.0965	0.3280	0.0020	0.0110	0.0800	0.5100	1.6215	9.0300	0.0040	0.0304	0.4240
D02	0.0130	0.0505	0.1600	0.0010	0.0117	0.0820	0.0001	1.3704	6.6300	0.0040	0.0459	0.3520
D03	0.0120	0.0778	0.2660	0.0010	0.0149	0.1080	0.0002	1.5682	6.6200	0.0040	0.0331	0.4190
E02	0.0180	0.0622	0.2960	0.0010	0.0077	0.0670	0.0002	1.3884	4.8300	0.0040	0.0241	0.2640
E04	0.0130	0.0442	0.1380	0.0010	0.0063	0.0730	0.0001	1.3448	2.6800	0.0040	0.0229	0.2340
BS-59	0.0080	0.0307	0.1410	0.0030	0.0064	0.0560	0.0001	0.8622	2.7000	0.0040	0.0199	0.1490
ABOGG	0.0300	0.0854	0.2620	0.0040	0.0532	0.2200	0.3800	0.8049	3.8900	0.0040	0.0313	0.1980
BWSHNGLE	0.0310	0.1713	0.6030	0.0100	0.1309	0.5500	0.0001	1.1829	3.1300	0.0040	0.1332	1.3170
CREEDYBR	0.0130	0.0840	1.1200	0.0040	0.0394	0.7710	0.5300	2.0129	6.8900	0.0040	0.0341	0.2320

SECTION 2

KISSIMMEE RIVER
PROJECT CODES: V, KREA, and TFWQ

Purpose and Scope

The Kissimmee River (C-38) water quality monitoring program extends along the river from the source at the southern end of Lake Kissimmee to the outfall at Lake Okeechobee. The water quality monitoring program established in 1972 provides a water quality and nutrient loading data base for:

1. Determining loadings to Lake Okeechobee from the Kissimmee River;

2. Determining the effectiveness of the lower Kissimmee River Best Management Practices in improving water quality along the river;

3. Implementing Lake Okeechobee Technical Advisory Committee's (LOTAC)'s recommendation for a comprehensive monitoring and research plan as described in the Department of Environmental Regulation's "Lake Okeechobee Monitoring and Research Plan";

4. Determining long and short term trends associated with the Kissimmee River restoration project;

5. Determining long and short term trends necessary to identify potential problem areas in terms of water quality degradation;

6. Assessing tributary and basin loading and concentration inputs to Lake Okeechobee which include the following:

   a) Providing levels of Total Phosphorus at the inflows to Lake Okeechobee to compare with the 0.18 mg/l total phosphorus SWIM standard for the basin loading calculations.

   b) Providing data that will delineate the relative importance of tributary loading within the basin, to the basin, and to the whole basin output.

   c) Providing data that will help evaluate the efficacy of the Kissimmee River Restoration Project.

7. Developing basin and spatial scale models used to predict changes in loads to Lake Okeechobee as a function of land use. This includes:

   a) Providing data for determining statistical or mechanistic relationships between rainfall, land use (or land type), and nutrient runoff into streams.

   b) Providing data to help identify the reason for high episodic phosphorus events.

Sampling Locations and Descriptions

The location of the 35 sites monitored under these programs are shown on Figure 3. One sample is collected at each of the six structures on the Kissimmee River, and 29 samples are collected either in the major tributaries or in the river located in pools A through D of the Kissimmee River. Table 6 lists all station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 7 contain statistics for each monitoring location. Project TFWQ is a compliance monitoring program which will end in February 1998.

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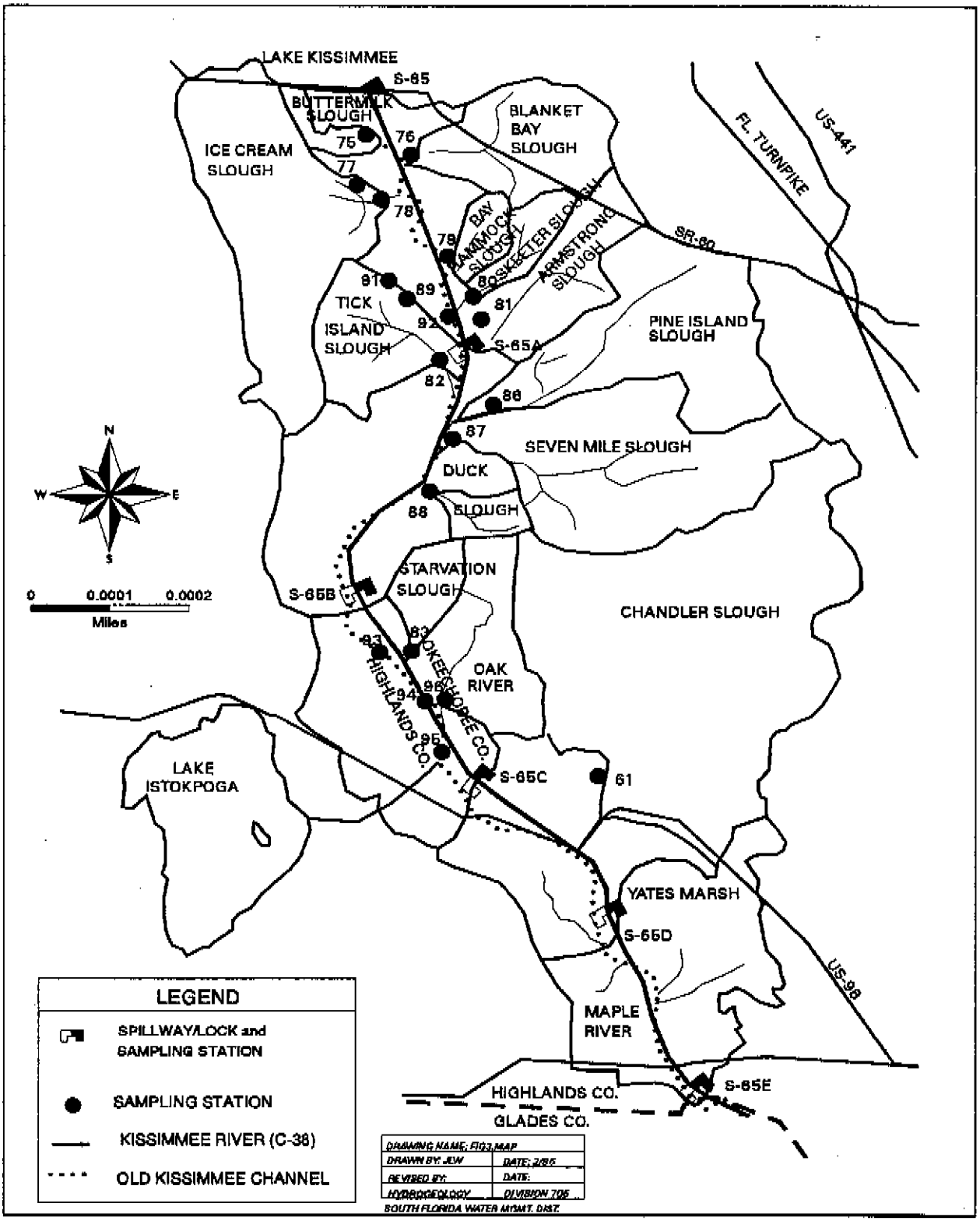

FIGURE 3. Location of Sampling Stations for the Kissimmee River Water Quality Monitoring Program

TABLE 6. Summary of Sampling Station Locations and Frequency of Collection for the Kissimmee River Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	Por	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
S65	274820	811201	A large gate and boat lock structure located on the Kissimmee River (C-38) by State Road 60 at the south end of Lake Kissimmee. The water flows in a southerly direction through this structure. The automatic sampler collects daily composites.	1973 - P	BW	BW/W	BA	BA	US	G/A
S65A	273944	810803	A large gate and boat lock structure located on the Kissimmee River 10.5 miles south of S-65. The water flows southward through this structure. The automatic sampler collects daily composites.	1973 - P	BW	BW/W	BA	BA	US	G/A
S65B	273003	811144	A large gate and boat lock structure located on the Kissimmee River 12 miles south of S-65A. The water flows southward through this structure. The automatic sampler collects daily composites.	1973 - P	BW	BW/W	BA	BA	US	G/A
S65C	272401	810657	A large gate and boat lock structure located on the Kissimmee River nine miles south of S-65B. The water flows southward through this structure.	1973 - P	BW	BW	BA	BA	US	G
S65D	271845	810120	A large gate and boat lock structure located on the Kissimmee River nine miles south of S-65C. The water flows southward through this structure.	1973 - P	BW	BW	BA	BA	US	G
S65E	271335	805742	This is the largest of the six structures on the Kissimmee River. It is also a large gate and boatlock structure that is located 7 1/2 miles south of S-65D, and 8 miles north of Lake Okeechobee. The water flows southward through this structure into Lake Okeechobee.	1973 - P	BW	BW	BA	BA	US	G

TABLE 6 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Kissimmee River Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	Por	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
KREA 61	272121	810149	Chandler Slough located just north of the railroad bridge in Pool D.	1986 - p	M	M	-	-	-	G
KREA 75	274650	811122	Buttermilk Slough located just north of the River Ranch Resort in Pool A.	1986 - P	M	M	QTR	-	-	G
KREA 76	274559	811019	Blanket Bay Slough in Pool A.	1986 - P	M	M	QTR	-	-	G
KREA 77*	274443	811039	River Ranch South just north of Ice Cream Slough (KREA 78) in Pool A.	1986 - P	BW	BW	-	-	-	G
KREA 78	274434	811023	Ice Cream Slough located in Pool A.	1986 - P	M	M	QTR	-	-	G
KREA 79	274302	810842	Bay Hammock Oxbow	86-91,96-P	M	M	QTR			G
KREA 80	274107	810835	Skeeter Slough located approximately 1/2 mile north of S-65A in Pool A.	1986 - P	M	M	QTR	-	-	G
KREA 81	273958	810804	Armstrong Slough located just north of S-65A in Pool A.	1986 - P	M	M	QTR	-	-	G
KREA 82	273856	810826	Located in Pool B at Tick Island Slough just north of S-65B.	1986 - P	M	M	QTR	-	-	G
KREA 83	272742	810905	Starvation Slough	86-89,96-P	M	M	QTR			G
KREA 86	273629	810842	Located in Pool B, at Pine Island Slough upstream. Sample site is north of the third weir structure.	1986 - P	M	M	QTR	-	-	G

* Discontinued in 1996

TABLE 6 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Kissimmee River Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	Por	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
KREA 87	273552	810834	Downstream area of Pine Island Slough located in Pool B.	1986 - P	M	M	QTR	-	-	G
KREA 88	273453	811036	Located in Pool B at Dark Hammock Slough. Sample tributary is located just south of the second weir structure.	1986 - P	M	M	QTR	-	-	G
KREA 89	274330	810945	At the gated structure in Rattlesnake Slough located in Pool A.	1987 - P	M	M	QTR	-	-	G
KREA91	274324	811003	Rattlesnake Oxbow	1996 - P	M	M	QTR	-	-	G
KREA92	274026	810843	Camp Hammock Oxbow	1996 - P	M	M	QTR	-	-	G
KREA93	272741	811016	Hickory Hammock Oxbow	1996 - P	M	M	QTR	-	-	G
KREA94	272655	810907	Micco Bluff Run	1996 - P	M	M	QTR	-	-	G
KREA95	272454	810133	Istokpoga Oxbow	1996 - P	M	M	QTR	-	-	G
KREA96	272655	810851	Oak Creek	1996 - P	M	M	QTR	-	-	G
KREA97	274501	811037	River Ranch Oxbow	1996 - P	M	M	QTR	-	-	G
TFWQ01*	273223	811208	Mid C-38 canal at boay upstream of weir 3.	1994 - P	QTR	QTR	-	-	-	G
TFWQ01A	273228	811205	Mid C-38 canal upstream of remnant river channel adjacent to the demo weir.	1994 - P	QTR	QTR	-	-	-	G
TFWQ01B	273202	811211	Mid C-38 canal downstream of weir at northern boundary of mixing zone.	1994 - P	QTR	QTR	-	-	-	G
TFWQ01C	273102	811202	Mid C-38 canal immediately upstream of test fill plug.	1994 - P	QTR	QTR	-	-	-	G
TFWQ02	273119	811238	Mid channel of old river run at Governors Tree.	1994 - P	QTR	QTR	-	-	-	G
TFWQ03	273055	811211	Mid C-38 canal at buoy upstream of S65B.	1994 - P	QTR	QTR	-	-	-	G

TABLE 6 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Kissimmee River Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	Por	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
TFWQ04	273040	811156	Mid channel of old river run north of test fill plug.	1994 - P	QTR	QTR	-	-	-	G
TFWQ05	273009	811146	Mid C-38 canal at S65B.	1994 - P	QTR	QTR	-	-	-	G
TFWQ06	272957	811140	Mid C-38 canal downstream of S65B, outside of mixing zone.	1994 - P	QTR	QTR	-	-	-	G

* Discontinued in 1994

TABLE 7. Statistics on Select Parameters for the Kissimmee River Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
S65	0.0040	0.0521	0.6990	0.0010	0.0108	0.4880	0.0001	1.2845	3.5000	0.0030	0.0339	0.9260
S65A	0.0100	0.0516	0.3330	0.0010	0.0152	0.2430	0.0001	1.2886	4.3100	0.0040	0.0565	0.9370
S65B	0.0100	0.0510	0.2780	0.0020	0.0141	0.1500	0.0001	1.2978	3.4700	0.0040	0.0665	2.3110
S65C	0.0020	0.0527	1.4180	0.0010	0.0166	0.1250	0.0001	1.2902	3.7700	0.0040	0.0800	1.5000
S65D	0.0200	0.0765	0.3740	0.0020	0.0373	0.2350	0.0001	1.3381	9.4000	0.0040	0.0852	1.5260
S65E	0.0250	0.0974	0.5000	0.0020	0.0547	0.3730	0.0001	1.3412	5.6100	0.0040	0.0995	1.3690
KREA 61	0.0590	0.2472	0.9260	0.0280	0.2035	0.6880	0.5000	1.3038	4.8100	0.0040	0.0136	0.4780
KREA 75	0.0130	0.0525	0.1520	0.0040	0.0127	0.0690	0.8770	1.5534	2.5900	0.0040	0.0317	1.1850
KREA 76	0.0210	0.3634	1.4930	0.0040	0.2829	1.1790	0.0001	1.6584	13.0400	0.0040	0.0248	0.6540
KREA 77	0.0210	0.0829	1.0810	0.0010	0.0350	0.9240	0.0002	1.1822	1.9700	0.0040	0.0120	0.1340
KREA 78	0.0090	0.0437	0.1630	0.0040	0.0142	0.1050	0.0001	0.9865	1.9600	0.0040	0.0148	0.0790
KREA 79	0.0180	0.0467	0.1710	0.0040	0.0106	0.0670	0.0001	1.2516	2.4700	0.0040	0.0115	0.0880
KREA 80	0.0040	0.0599	0.2820	0.0010	0.0214	0.1550	0.0001	1.2180	3.1900	0.0040	0.0185	0.1260
KREA 81	0.0040	0.0787	0.3220	0.0040	0.0398	0.2630	0.0001	1.1346	2.5500	0.0040	0.0292	0.5140
KREA 82	0.0040	0.0487	0.1200	0.0030	0.0095	0.0330	0.5100	1.4096	3.3400	0.0040	0.0330	0.3760
KREA 83	0.0220	0.0669	0.4350	0.0040	0.0165	0.0490	0.6500	1.7328	6.6600	0.0040	0.0390	0.3000
KREA 86	0.0110	0.0461	1.0130	0.0010	0.0112	0.3450	0.0002	1.3510	3.8200	0.0040	0.0276	0.5570
KREA 87	0.0150	0.0439	0.1130	0.0040	0.0081	0.0400	0.6600	1.5685	5.0700	0.0040	0.0174	0.1610
KREA 88	0.0210	0.0541	0.2110	0.0040	0.0181	0.1610	0.0001	1.2362	3.6700	0.0040	0.0581	1.6720
KREA 89	0.0060	0.0457	0.1790	0.0040	0.0154	0.0580	0.0001	1.2731	2.5300	0.0040	0.0108	0.4110
KREA 91	0.0300	0.0480	0.0660	0.0040	0.0125	0.0210	0.5040	0.5725	0.6410	0.0040	0.0095	0.0150
KREA 92	0.0870	0.0870	0.0870	0.0060	0.0060	0.0060	1.4000	1.4000	1.4000	0.0130	0.0130	0.0130
KREA 93	0.0510	0.0510	0.0510	0.0160	0.0160	0.0160	1.2200	1.2200	1.2200	0.0410	0.0410	0.0410
KREA 94	0.0720	0.0720	0.0720	0.0180	0.0180	0.0180	-	-	-	-	-	-
KREA 95	0.0510	0.0510	0.0510	0.0180	0.0180	0.0180	0.9510	0.9510	0.9510	0.0570	0.0570	0.0570
KREA 96	0.1050	0.1505	0.1960	0.1690	0.1690	0.1690	1.4600	1.4600	1.4600	0.0440	0.0440	0.0440
SITE1	0.0590	0.0716	0.1310	0.0260	0.0260	0.0260	1.7200	1.7200	1.7200	0.0160	0.0160	0.0160
SITE2	0.0530	0.0617	0.0700	0.0220	0.0220	0.0220	2.4900	2.4900	2.4900	0.0110	0.0110	0.0110
SITE3	0.0570	0.0607	0.0660	0.0140	0.0140	0.0140	1.8600	1.8600	1.8600	0.0080	0.0080	0.0080

TABLE 7. Statistics on Select Parameters for the Kissimmee River Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
TFWQ01	0.0250	0.0428	0.0980	0.0090	0.0192	0.0350	1.1300	1.5452	2.0700	0.0040	0.0994	0.2600
TFWQ01A	0.0250	0.0454	0.0790	0.0040	0.0085	0.0260	0.7210	1.0545	1.7700	0.0040	0.0673	0.7930
TFWQ01B	0.0250	0.0460	0.0840	0.0040	0.0091	0.0270	0.7920	1.0873	1.8900	0.0040	0.0703	0.7630
TFWQ01C	0.0260	0.0455	0.0820	0.0040	0.0096	0.0270	0.0001	1.1049	6.4400	0.0040	0.0563	0.2720
TFWQ02	0.0240	0.0434	0.0850	0.0040	0.0123	0.0280	0.0001	1.2138	2.3800	0.0040	0.0812	1.1270
TFWQ03	0.0240	0.0444	0.1290	0.0040	0.0129	0.0320	0.0001	1.2244	2.3800	0.0040	0.0679	0.5830
TFWQ04	0.0250	0.0441	0.0890	0.0040	0.0127	0.0300	0.6970	1.2192	2.6700	0.0040	0.0647	0.2440
TFWQ05	0.0260	0.0427	0.0940	0.0040	0.0126	0.0260	0.0001	1.2003	2.3200	0.0040	0.0591	0.2330
TFWQ06	0.0230	0.0465	0.0730	0.0040	0.0140	0.1710	0.6000	1.0648	1.8400	0.0040	0.0507	0.1430

SECTION 3

ARBUCKLE CREEK
PROJECT CODE: ARCK

Purpose and Scope

The Arbuckle Creek basin water quality monitoring program encompasses an area characterized by beef, intensive dairy cattle, and citrus operations. The basin is located in Highlands and Polk Counties. Water quality monitoring stations have been sampled since 1988.

The objectives of this program are:

1. Monitoring water quality in support of the FDEP's Dairy Rule by providing nutrient concentrations at the dairy outflows and providing information to evaluate the effectiveness of dairy BMP's.

2. Assessing tributary, basin loading, and concentration inputs to Lake Okeechobee. The data will delineate the relative importance of tributary loading within the basin, and to the whole basin output.

3. Developing basin and spatial scale models to predict changes in loads to Lake Okeechobee as a function of land use including the following:

   a) Providing data for determining statistical or mechanistic relationships between rainfall, land use (or land type), and nutrient runoff into streams.

   b) Providing data to help identify the cause of high episodic phosphorus events.

Data generated from this program also support the Lake Istokpoga water quality monitoring program and is integral in development of the Lake Okeechobee Water Quality Management Plan as required by the state's Surface Water Improvement and Management Legislation of 1987.

Sampling Locations and Descriptions

The locations of the 8 sites monitored under this program are shown in Figure 4. Table 8 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 9 contain statistics for each monitoring location.

District Publications

None.

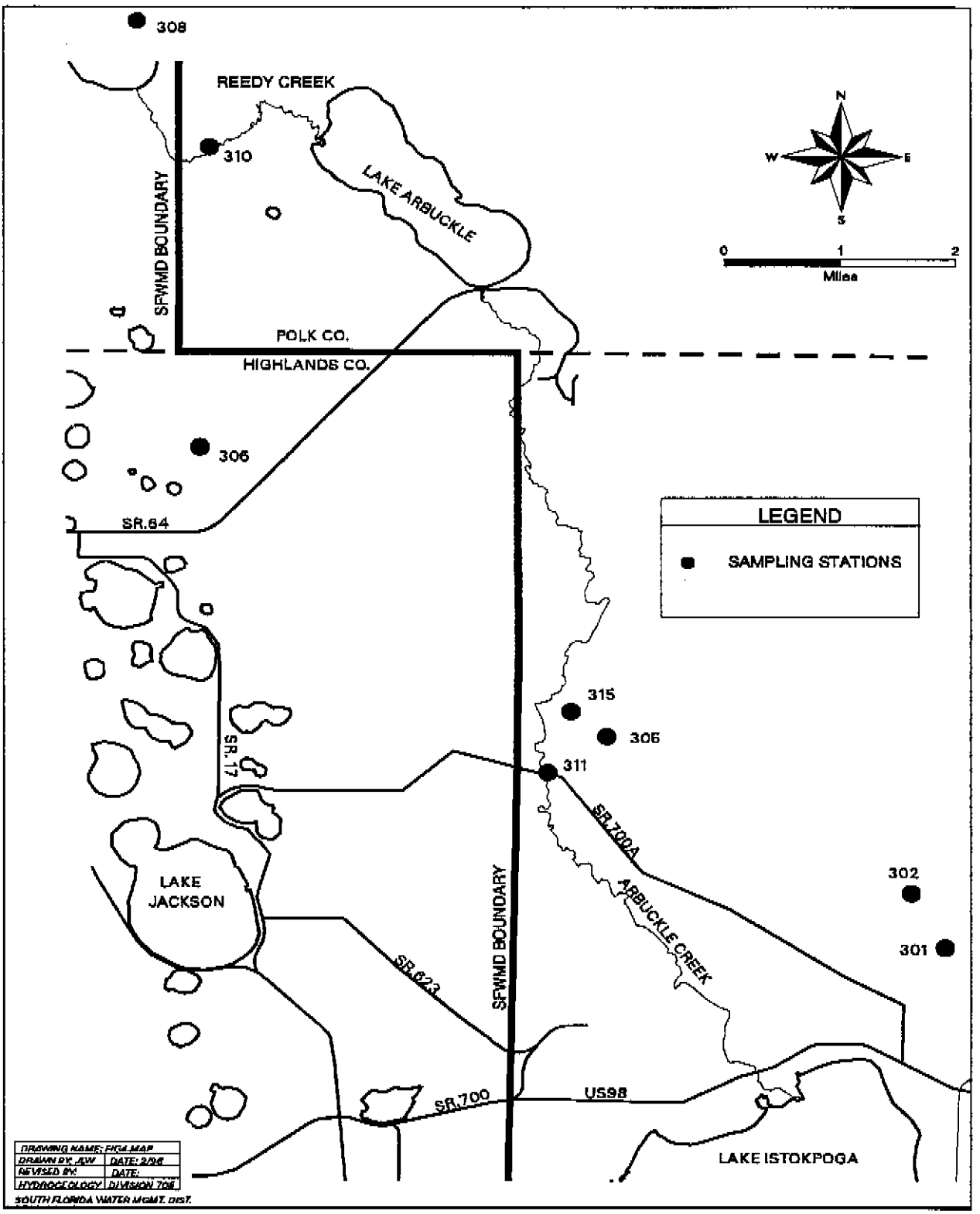

FIGURE 4. Location of Sampling Stations for the Arbuckle Creek Water Quality Monitoring Program

TABLE 8. Summary of Sampling Locations and Frequency of Collection for the Arbuckle Creek Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
ARCK 301	272840	811440	Bishop Dairy outfall culvert at Bishop Dairy Road.	1988-P	BW	BW	G
ARCK 302	272934	811514	Bishop Dairy outfall culvert at Scrubpens Road.	1988-P	BW	BW	G
ARCK 305	273175	812030	Triple G Dairy east outfall on Sandford Harts Ranch.	1988-P	BW	BW	G
ARCK 306	273670	812693	Dressel Dairy outfall on Old Bombing Range Road.	1988-P	BW	BW	G
ARCK 308	274430	812839	In Reedy Creek at School Bus Road bridge.	1989-P	BW	BW	G
ARCK 310	274175	812685	C&C Dairy outfall where it enters Reedy Creek.	1988-P	BW	BW	G
ARCK 311	273137	812132	State Road 700A bridge (Arbuckle Creek Road) over Arbuckle Creek.	1989-P	BW	BW	G
ARCK 315	273241	812107	Triple G Dairy spray field outfall where it enters Arbuckle Creek.	1992-P	BW	BW	G

TABLE 9. **Statistics on Select Parameters for the Arbuckel Creek Water Quality Monitoring Program for Period of Record**

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
ARCK 301	0.0040	3.1884	9.3050	0.0010	3.4515	8.7370	0.5300	3.4295	10.3500	0.0100	0.8396	9.6630
ARCK 302	0.0180	0.2418	3.1350	0.0100	0.1860	2.4400	0.9900	1.6035	3.8600	0.0040	0.0090	0.0210
ARCK 305	0.3890	4.4684	11.3600	0.0012	5.1147	10.2850	0.0005	6.1903	16.9900	0.0040	0.0168	0.1750
ARCK 306	0.0890	0.7594	2.9250	0.1050	0.6872	2.0910	0.0007	4.8969	16.6900	0.0040	1.7576	7.6950
ARCK 308	0.0280	0.0698	0.2200	0.0010	0.0265	0.1520	0.0001	1.4090	2.3400	0.0890	0.5267	1.1480
ARCK 310	0.3790	5.8636	9.9400	6.0200	7.4667	9.6250	4.4600	9.9800	16.6700	0.0250	0.3933	1.0260
ARCK 311	0.0100	0.0868	0.3580	0.0040	0.0522	0.3030	0.0001	1.1450	7.6200	0.0040	0.1922	6.3820
ARCK 315	0.0160	0.5340	2.8390	0.0040	0.1250	0.2460	0.7700	0.9700	1.1700	0.0040	0.0065	0.0090

SECTION 4

LAKE ISTOKPOGA MONITORING PROGRAM
PROJECT CODE: ISTO

Purpose and Scope

The Lake Istokpoga water quality monitoring program encompasses the major inflow and outflow points to the lake as well as in-lake monitoring. The water quality monitoring program provides a water quality and nutrient loading data base for:

1. Consolidating information from all previous publications to establish historical trends;

2. Determining long and short term trends to identify potential problem areas of water quality degradation and nutrient loadings;

3. Producing a nutrient budget for the lake;

4. Note changes in water quality after herbicide treatments to the lake (Pre-treatment 1988, Post-treatment 1989 to present); and

5. Establishing acceptable nutrient loading limits using eutrophication models.

Water quality monitoring began in February 1988. Nutrient loadings are calculated by combining nutrient concentrations with flow data obtained at the major inflow and outflow points to the lake. These data can indicate trends in water quality and allow for better management of the system to monitor for environmental enhancement or degradation. Values that deviate significantly from established criteria may signal a concern requiring immediate attention.

Sampling Locations and Descriptions

The locations of the 12 sites monitored under this program are shown on Figure 5. Table 10 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the samples are collected upstream or downstream, and type of sample collection. Table 11 contain statistics for each monitoring location.

District Publications

Milleson,J.F. (1978). Limnological Investigations of Seven Lakes in the Istokpoga Drainage Basin. SFWMD, Tech. pub. No. 78-1. (DRE 83)

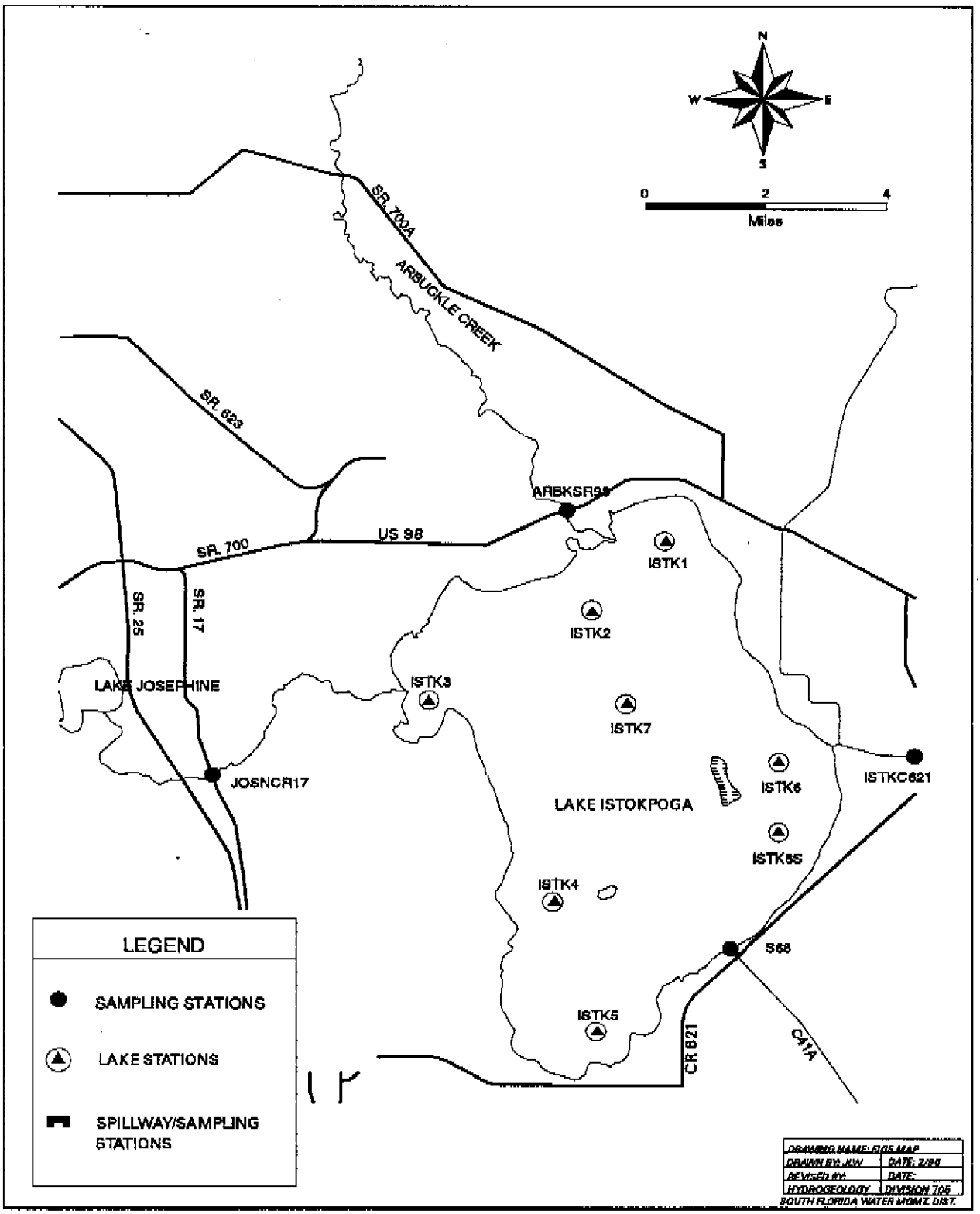

FIGURE 5. Location of Sampling Stations for the Lake Istokpoga Water Quality Monitoring Program.

TABLE 10. Summary of Sampling Station Locations and Frequency of Collection for the Lake Istokpoga Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Chlorophyll	US/DS	G/A
ISTK1	272603	811620	In Lake Istokpoga due east of the entrance to Arbuckle Creek, and half way to the eastern shore.	1988-P	BM	BM	Q	BM	-	G
ISTK2	272500	811730	In Lake Istokpoga north of Little Grassy Island half way to the edge of cattails.	1988-P	BM	BM	Q	BM	-	G
ISTK3	272338	812007	In Lake Istokpoga 0.25 miles due east from the entrance to Josephine Creek.	1988-P	BM	BM	Q	BM	-	G
ISTK4	272034	811807	In Lake Istokpoga half way between Bumblebee Island and the western shore.	1988-P	BM	BM	Q	BM	-	G
ISTK5	271835	811725	In Lake Istokpoga 0.5 miles out from the southern end of the lake.	1988-P	BM	BM	Q	BM	-	G
ISTK6	272242	811428	In Lake Istokpoga half way between Istokpoga Canal and Big Island.	1988-P	BM	BM	Q	BM	-	G
ISTK6S	272142	811428	In Lake Istokpoga one mile due south of ISTK6. Half way between Big Island and the eastern shore.	1990-P	BM	BM	Q	BM	-	G
ISTK7	272335	811657	In the middle of Lake Istokpoga half way between Big Island and Little Grassy Island.	1988-P	BM	BM	Q	BM	-	G
S68	271944	811508	Taken at the outflow structure from Lake Istokpoga (S-68). Located on the southeast side of the lake on County Road 621 and the C-41A canal.	1988-P	BM	BM	Q	-	US	G

TABLE 10 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lake Istokpoga Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Chlorophyll	US/DS	G/A
JOSNCR17	272225	812336	Taken from the bridge over Josephine Creek at State Road 17.	1988-P	BM	BM	Q	-	-	G
ISTKC621	272248	811224	Taken at the bridge on the Istokpoga Canal and County Road 621.	1988-P	BM	BM	Q	-	-	G
ARBKSR98	272633	811752	Taken from the bridge over Arbuckle Creek at State Road 98.	1988-P	BM	BM	Q	-	-	G

TABLE 11. Statistics on Select Parameters for the Lake Istokpoga Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
ARBKSR98	0.0210	0.0935	0.4100	0.0040	0.0577	0.3650	0.0001	1.1325	2.2300	0.0050	0.1981	0.8010
ISTK1	0.0090	0.0720	0.3500	0.0040	0.0312	0.1580	0.0001	1.0276	3.4700	0.0040	0.0486	0.2940
ISTK2	0.0270	0.0612	0.1530	0.0040	0.0213	0.3400	0.0001	0.9791	1.8000	0.0040	0.0406	0.2180
ISTK3	0.0190	0.0423	0.1220	0.0040	0.0074	0.0390	0.0001	0.9696	2.2100	0.0040	0.1091	0.4490
ISTK4	0.0160	0.0375	0.0690	0.0010	0.0057	0.0280	0.0001	0.9251	4.2300	0.0040	0.0079	0.0380
ISTK5	0.0110	0.0362	0.1060	0.0010	0.0055	0.0500	0.0001	0.8808	1.9500	0.0040	0.0106	0.1050
ISTK6	0.0100	0.0457	0.2110	0.0010	0.0100	0.1140	0.0001	0.9115	1.6300	0.0040	0.0137	0.1420
ISTK6S	0.0100	0.0354	0.0860	0.0010	0.0054	0.0180	0.0001	0.8925	1.4900	0.0040	0.0086	0.0690
ISTK7	0.0170	0.0536	0.2040	0.0040	0.0153	0.1060	0.5000	0.9660	1.8100	0.0040	0.0273	0.1570
ISTKC621	0.0220	0.0849	0.4690	0.0010	0.0336	0.3240	0.5000	1.1850	2.8200	0.0040	0.0141	0.0740
JOSNCR17	0.0100	0.0434	0.0850	0.0040	0.0159	0.0320	0.6600	1.1085	2.4200	0.0630	0.4274	1.7290
S68	0.0080	0.0297	0.0570	0.0030	0.0053	0.0520	0.0001	0.8568	1.7200	0.0040	0.0078	0.0360

SECTION 5

LOWER KISSIMMEE RIVER BASIN
PROJECT CODE: KREA and LKR

Purpose and Scope

The Lower Kissimmee River Basin water quality monitoring program encompasses an area characterized by beef and intensive dairy cattle operations. Water quality monitoring stations have been established at locations throughout the Kissimmee River basin in Okeechobee and Highlands Counties.

The objectives of the program are as follows:

1. Monitoring water quality in support of the FDEP's Dairy Rule by providing nutrient concentration measurements at the dairy outflows, and information to evaluate the effectiveness of dairy BMP's and the Dairy Buy-out program.

2. Assessing tributary, basin loading, and concentration inputs to Lake Okeechobee which include the following:

   a) Providing concentration measurements from inflows to Lake Okeechobee to compare with the 0.18 mg/l total phosphorus SWIM standard, and for use in basin loading calculations.

   b) Providing data that will delineate the relative importance of tributary loading within the basin to the whole basin output.

   c) Providing concentration measurements that will help evaluate the efficacy of the Kissimmee River restoration project.

3. Developing basin and spatial scale models to predict changes in loads to Lake Okeechobee as a function of land use which includes:

   a) Providing data for determining statistical or mechanistic relationships between rainfall, land use (or land type), and nutrient runoff.

   b) Providing data to help identify the reason for high episodic phosphorus events.

Data generated by this program serve two additional purposes:

i) To provide a data base in support of SFWMD funded contractual research with the University of Florida Institute of Food and Agricultural Sciences to evaluate the physical, chemical, and biological conditions and processes that govern phosphorus uptake, release, and movement through the soils in the basin; and

ii) To fulfill the commitment by the District to provide water quality sampling and analysis support for the $1.25 million federal Rural Clean Water Program (RCWP) grant for cost sharing of BMP implementation. The RCWP is administered by the United States Department of Agriculture and the Environmental Protection Agency.

Data gathered under this program are also integral in development of the Lake Okeechobee Water Quality Management Plan as required by the State's Surface Water Improvement and Management (SWIM) legislation of 1987.

Sampling Location and Description

The locations of the 46 sites monitored under this program are shown in Figure 6. Table 12 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 13 contain statistics for each monitoring location.

District Publications

Federico, A. (1983). Water Quality Characteristics of the Lower Kissimmee River Basin, Florida. SFWMD, Tech. Pub. 82-3. (DRE 154)

Goldstein, A. (1980). Upland Detention/Retention Demonstration Project 3rd Annual report to the Coordinating Council on the Restoration of the Kissimmee River Valley and Taylor Creek Nubbin Slough Basin. SFWMD, Tech. Memo. July 1980. (DRE 104)

Goldstein, A. (1982). Upland Detention/Retention Demonstration Project fourth Annual Report to the Kissimmee River Coordinating Council. SFWMD, Tech. Memo. Dec.1982. (DRE 149)

Goldstein, A. (1983). Engineering, Hydro and Water Quality Analysis of Detention/Retention Sites, Fourth Annual Report from SFWMD to the Coordinating Council on the Restoration of the Kissimmee River and Taylor Creek/Nubbin Slough Basin Detention/Retention Demo Project. SFWMD, Report Dec. 1983. (DRE 168)

Goldstein, A. (1986). Upland Detention/Retention Demonstration Final Report. Impacts of Agricultural Land Use on Water Quality and Utilization of Wetlands for Detention/Retention in the Kissimmee River Basin. SFWMD, Tech. Pub. 86-2. (DRE 222)

Lake Okeechobee SWIM Plan, (1989), Planning Department, SFWMD.

Miami, Civil Engineering Dept. (1973). Kissimmee River Basin Water Quality University of Miami Model Study. Report July 1973. (DRE 28)

Resource Planning Department Staff, (1974). Report on Progress of Hydrologic, Water Quality and Land Use Studies in the Kissimmee River Watershed and Lake Okeechobee. SFWMD, Report April 1974. (DRE 32)

Storch, W. (1975). Lake Okeechobee Kissimmee Basin Water Quality Information (combined with Lake Okeechobee Proposals for Management Actions). SFWMD, Report March 1975. (DRE 45)

Gunsalus, B., E.G. Flaig, G. Ritter, (1992). Efectiveness of Agricultiral Best management Practices Implemented in the Taylor Creek/Nubbin Slough Watershed and the Lower Kissimmee River Basins. SFWMD. September, 1992 Manuscript. (DOR 108)

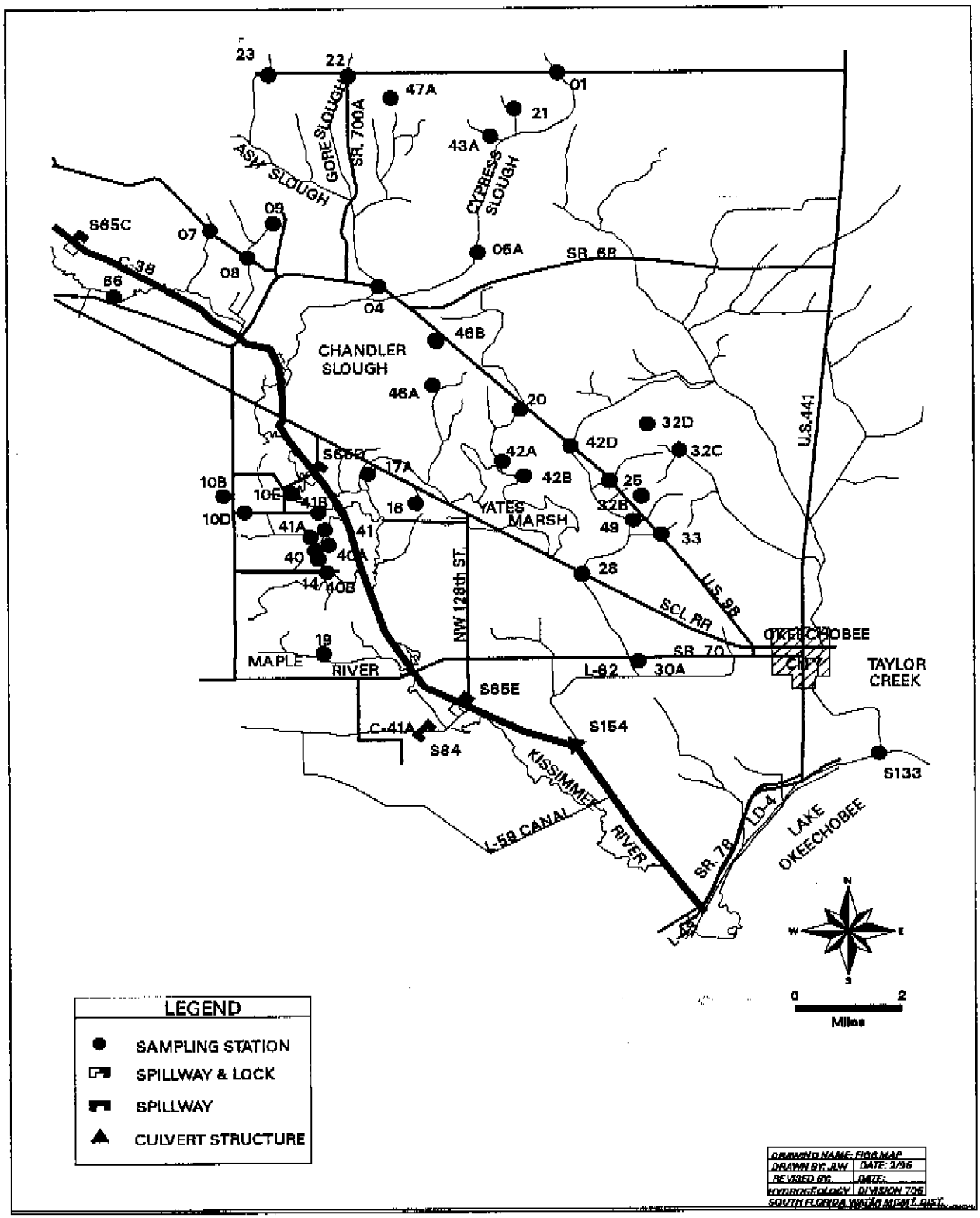

FIGURE 6. Location of Sampling Station for the Lower Kissimmee River Basin Water Quality Monitoring Program

TABLE 12. Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
KREA 01	272736	805523	On N.W. 240th Street (Eagle Island Road). The samples are collected from the north side of the bridge at Fish Slough.	1986 - P	BW	BW	-	G
KREA 04	272258	805928	From Chandler Slough bridge on State Road 98 near Fort Bassinger.	1986 - P	BW	BW	-	G
KREA 06A	272350	805725	Off N.W. 144th Avenue (Lamb Island Road) on the Watford Beef Ranch at Cypress Slough.	1986 - P	BW	BW	-	G
KREA 07	272420	810347	Go 1.9 miles on NW 160th Drive (Micco Bluff Road) just west of Larson Dairy at the culverts draining under NW 160th Drive (Ash Slough).	1986 - P	BW	BW	-	G
KREA 08	272344	810254	Go 1.2 miles on NW 160th Drive just east of Larson Dairy at the culverts draining under NW 160th Drive (Ash Slough).	1986 - P	BW	BW	-	G
KREA 09	272432	810217	Off of NW 203rd Avenue (Old Peavine Trail). The sample is collected on the north side of the culvert at Ash Slough.	1986 - P	M	M	-	G
KREA 10B	271807	810320	Butler Dairy's spray field off C-721 at culvert under the spray field road which drains the spray field storm water retention pond runoff.	1988 - P	BW	BW	-	G
KREA 10D	271756	810302	At a set of three culverts on Boat Ramp Road just off County Road 721 which collects the outfall from Butler Dairy #1 outer outfall.	1991 - P	BW	BW	-	G

TABLE 12 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
KREA 10E	271820	810152	Culvert at the end of Silver Creek Lane off Boat Ramp Road, and collects outer pasture outfall from Butler Dairy #1.	1991 - P	BW	BW	-	G
KREA 14	271651	810114	Oscar Clemons outfall culvert at pump off Larson Dairy Road	1986 - P	BW	BW	-	G
KREA 16	271808	805855	Go 1.6 miles on NW 56th Street southwest of Rucks Dairy. The sample is collected from a culvert on the south side of the road.	1986 - P	BW	BW	-	G
KREA 17A	271845	810005	On the access road to the Baptist Children's Home (Yates Marsh).	1987 - P	BW	BW	-	G
KREA 19	271442	810110	Maple River off HWY 70 west at Queen Bee Farms.	1986 - P	BW	BW	-	G
KREA 20	272020	805628	State Road 98 approximately 1/2 mile west of Flying "G" Dairy. Sample is collected on the south side of the bridge (Sandfly Gully).	1987 - P	M	M	-	G
KREA 21	272705	805630	W.S. Rucks dairy outfall flume at Cypress Slough.	1987 - P	BW	BW	-	G
KREA 22	272754	810027	Gore Slough at corner of N.W. 240th ST. and C700A.	1987 - P	M	M	-	G
KREA 23	272755	810242	Ash Slough at Viking property weir.	1987 - P	M	M	-	G
KREA 25	271926	805513	S.E. of Flying G Dairy at HWY 98 in Turkey Slough.	1987 - P	BW	BW	-	G
KREA 28	271630	805555	Popash Slough at SCL RR Bridge off Mitchel Road	1987 - P	M	M	-	G
KREA 30A	271432	805341	Culverts draining Popash Slough into the L-62 canal off C-70A.	1989 - P	BW	BW	US	G
KREA 32B	271815	805335	Off State Road 98 at last entrance gate to Dry Lake Dairy #1. Sample is collected from culvert under dirt road which is the runoff from Dry Lake Dairy #1.	1988 - P	BW	BW	-	G
KREA 32C	271917	805241	Off State Road 98 on the east property line of Dry Lake Dairy and collects outer pasture runoff from Dry Lake Dairy #2 as it flows into Wolf Creek.	1991 - P	BW	BW	-	G

TABLE 12 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
KREA 32D	271954	805326	Off State Road 98 on the north property line of Dry Lake Dairy collects oncoming water from Rofra Dairy.	1991 - P	BW	BW	-	G
KREA 33	271722	805309	On State Road 98. Sample is collected just south of the entrance to Dry Lake Dairy #2.	1986 - P	BW	BW	-	G
KREA 40	271705	810121	North of Larson Dairy Road. Sampled at the flume that catches the outfall for Larson Dairy #2.	1987 - P	W	W	DS	G
KREA 40A	271715	810105	North of Larson Dairy Road sample is collected at a ditch downstream of, and perpendicular to the flume outfall ditch, and also catches outfall from Larson Dairy #2.	1991 - P	BW	BW	-	G
KREA 40B	271633	810104	At the end of Larson Dairy Road at the entrance to Clemons property. The site collects runoff from Larson Dairy #2 outer pasture.	1991 - P	BW	BW	-	G
KREA 41	271732	810108	Off Boat Ramp Road. Sample catches the outfall for Butler Dairy #2.	1987 - P	BW	BW	-	G
KREA 41A	271726	810119	On Butler Dairy #2 just south of KREA 41. Ditch parallels the boundary between Butler Dairy #2 and Larson Dairy #2.	1987 - P	BW	BW	-	G
KREA 41B	271755	810118	East of Butler Dairy #2 on the culvert at the corner of Boat Ramp Road and Sheridan Palms Lane and collects runoff from barn #2.	1991 - P	BW	BW	-	G

TABLE 12 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
KREA 42A	271904	805654	East of KREA 42 on Flying "G" Dairy at culvert which drains the first spray field.	1990 - P	BW	BW	-	G
KREA 42B	271847	805621	South of KREA 42 on Flying "G" Dairy at culvert which drains the spray field.	1990 - P	BW	BW	-	G
KREA 42D	271925	805515	On State Road 98 at the east property line of Flying "G" Dairy, and collects from the dairy.	1991 - P	BW	BW	-	G
KREA 43A	272530	815740	Southeast corner of C & M Dairy off northwest 240th street (Eagle Island Road).	1987 - P	BW	BW	-	G
KREA 44	272302	805920	Off of Lamb Island Road. This sample is collected at the culvert that drains Lamb Island Dairy into Cypress Slough.	1987 - P	BW	BW	-	G
KREA 44C	272302	805915	South of Lamb Island Road, site collects runoff from Lamb Island Dairy (Ferrell) Spray field.	1991 - P	BW	BW	-	G
KREA 46A	272050	805830	On C. Williamson Dairy off State Road 98. Sample is collected at culvert through which drains runoff from the dairy's stormwater retention pond.	1989 - P	BW	BW	-	G

TABLE 12 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
KREA 46B	272150	805825	On State Road 98 just north of C. Williamson Dairy. Sample is taken at culvert which collects outfall from the dairy.	1990 - P	BW	BW	-	G
KREA 47A	272720	805927	South of Eagle Island Dairy off northwest 240th street (Eagle Island Road). Sample is taken at culvert which collects outfall from the dairy's storm water retention pond.	1990 - P	BW	BW	-	G
KREA 49	271745	805345	Dry Lake Dairies #1 and 2 outfall located on State Road 98 approximately 200 yards north of the entrance to Dry Lake #2.	1987 - P	BW	BW	-	G
KREA 66	272252	810604	Off State Road 98 at Four-E's Campground.	1986 - P	BW	BW	-	G
S65C	272401	810657	A large gate and boat lock structure located on the Kissimmee River nine miles south of S-65BB. The automatic sampler collects daily composites.	1987 - P	W	W	US	A
S65D	271845	810120	A large gate and boat lock structure located on the Kissimmee River nine miles south of S-65C. The automatic sampler collects daily composites.	1987 - P	W	W	US	A

TABLE 12 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lower Kissimmee River Basin Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	US/DS	G/A
S65E	271335	805742	This is the largest of the six gate and boat lock structures on the Kissimmee River located 7 1/2 miles south of S-65D, and 8 miles north of Lake Okeechobee. The automatic sampler collects daily composites.	1987 - P	W	W	US	A
S154	271241	805506	A small gate type structure located on the north side of the Kissimmee River about half way between Lake Okeechobee and S-65E. This structure allows water to flow from the L-62 canal into C-38. The automatic sampler collects daily composites.	1987 - P	W	W	US	A/G
S191	271135	804535	A large gate type structure on the north side of Lake Okeechobee at Nubbin Slough. Water is released into Lake Okeechobee through this structure. The automatic sampler collects daily composites.	1987 - P	W	W	US	G/A

TABLE 13. Statistics on Select Parameters for the Lower Kissimmee River Basin Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
KREA 01	0.0040	0.1590	2.6500	0.0040	0.0957	0.6390	0.0002	1.5421	13.9700	0.0040	0.0285	0.3090
KREA 04	0.0300	0.2172	1.1910	0.0250	0.1569	0.9650	0.0001	1.4691	3.5400	0.0040	0.0280	0.6270
KREA 06A	0.0430	0.2600	2.8810	0.0330	0.2209	1.1250	0.0001	2.2083	94.6200	0.0040	0.0469	1.3680
KREA 07	0.1480	1.0429	5.4800	0.0800	0.9105	4.1500	0.0001	2.7625	15.0600	0.0040	0.0532	2.4310
KREA 08	0.3410	1.6324	13.5200	0.1780	1.2734	5.0950	0.0003	3.5147	16.0700	0.0040	0.3617	7.3490
KREA 09	0.0900	0.5268	1.8400	0.0001	0.3383	1.1750	0.5600	2.2660	10.9700	0.0040	0.0277	0.2670
KREA 10B	0.0730	0.5265	2.8450	0.0040	0.1821	1.0900	1.1300	3.4580	9.2400	0.0040	0.0551	1.5950
KREA 10D	0.0330	0.9105	8.1720	-	-	-	-	-	-	-	-	-
KREA 10E	0.1970	2.4744	13.4730	-	-	-	-	-	-	-	-	-
KREA 14	0.0001	0.6881	6.7400	0.0040	0.6348	3.0200	1.0400	2.1154	7.9500	0.0040	0.0165	0.0970
KREA 16	0.0002	1.4119	21.3800	0.0870	0.9658	3.9550	0.8600	2.6699	11.6900	0.0040	0.0371	0.3940
KREA 17A	0.0260	0.2157	3.6900	0.0040	0.1214	0.6130	0.0002	1.7709	8.6800	0.0040	0.0211	0.2480
KREA 19	0.0490	0.9087	4.0050	0.0070	0.6687	3.7350	0.0001	2.9593	52.5800	0.0040	0.5164	5.9670
KREA 20	0.5920	3.5621	9.1800	0.0003	3.2194	8.0300	0.0002	3.1922	11.6700	0.0040	0.0273	0.2530
KREA 21	0.0040	0.5293	6.9200	0.0100	0.5473	3.2200	0.0001	1.4497	6.5700	0.0040	0.0315	1.2510
KREA 22	0.0100	0.0643	1.3950	0.0010	0.0316	1.2270	0.0001	1.3699	8.9800	0.0040	0.0156	0.3740
KREA 23	0.0040	0.0321	0.2170	0.0030	0.0111	0.4350	0.0001	1.3208	4.0800	0.0040	0.0103	0.0600
KREA 25	0.0019	2.3460	35.8600	0.1430	1.7883	10.4500	0.0003	3.4240	49.5400	0.0040	0.0398	0.8450
KREA 28	0.0002	1.7055	7.6750	0.0002	1.5135	7.4690	0.0003	2.2099	9.4100	0.0040	0.0222	1.5380
KREA 30A	0.2210	1.2834	3.9450	0.0440	1.2116	3.7500	0.0002	1.9521	7.5300	0.0040	0.0355	0.2430
KREA 32B	0.0006	2.9211	15.4400	0.6850	3.0091	13.8300	0.0003	5.1050	23.8700	0.0040	0.2166	11.4460
KREA 32C	1.0920	2.5656	4.4980	3.1350	3.1350	3.1350	3.3200	3.3200	3.3200	0.0110	0.0110	0.0110
KREA 32D	0.8370	2.7866	6.5520	-	-	-	-	-	-	-	-	-
KREA 33	0.3740	4.7596	34.5400	0.0740	1.2218	2.9150	1.8200	5.2197	13.8600	0.0090	0.2829	5.0280
KREA 40	0.0280	1.3945	15.7400	0.0002	1.2393	11.4700	0.0003	4.2053	50.0600	0.0040	0.3398	4.3430
KREA 40A	0.0350	2.5427	21.3600	0.0040	0.7124	4.9100	0.7900	3.7879	20.3700	0.0040	0.1939	3.0290
KREA 40B	1.2730	7.6630	13.4720	6.0250	6.0250	6.0250	3.6700	3.6700	3.6700	0.0110	0.0110	0.0110
KREA 41	0.0015	16.3081	87.2400	0.5550	5.0575	9.5600	3.1300	17.5200	31.9100	0.0170	0.0735	0.1300
KREA 41A	0.0540	0.7700	6.5470	0.0320	0.7468	2.4750	0.0002	2.5343	9.8800	0.0040	0.0893	0.9030
KREA 41B	4.1530	7.6670	12.4200	-	-	-	-	-	-	-	-	-
KREA 42A	0.2460	2.9023	10.6920	1.1410	2.2816	3.7300	2.2000	3.7655	7.4700	0.0110	0.0449	0.3600

TABLE 13. Statistics on Select Parameters for the Lower Kissimmee River Basin Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
KREA 42B	0.1290	2.7713	11.3800	0.8350	1.9680	3.2850	0.0023	3.9452	9.6600	0.0090	0.0858	0.5570
KREA 42D	0.0004	1.1989	2.9600	-	-	-	-	-	-	-	-	-
KREA 43A	0.0890	1.2508	8.9200	0.0120	1.3163	8.0700	0.0002	1.8786	6.3500	0.0040	0.0962	1.3130
KREA 44	0.0004	10.0070	40.4750	2.3240	9.2741	22.9560	0.0010	8.8190	22.4200	0.0160	0.1667	1.1290
KREA 44C	0.0590	0.7343	14.7170	0.1850	0.1850	0.1850	1.9500	1.9500	1.9500	0.0150	0.0150	0.0150
KREA 46A	0.0040	1.0465	6.4300	0.1150	1.3384	6.2150	0.0002	2.1893	4.0100	0.0040	0.0111	0.0230
KREA 46B	0.0280	2.0163	6.8500	0.0040	2.2513	5.8650	0.9700	3.3655	7.2100	0.0090	0.0140	0.0220
KREA 47A	0.1250	0.5731	4.4250	0.0250	0.2584	0.4910	0.5100	1.5671	2.2000	0.0040	0.0180	0.0630
KREA 49	0.0007	6.3554	34.8200	1.3750	5.6813	10.6900	0.0004	6.3445	23.8900	0.0050	0.1151	2.5120
KREA 66	0.0170	0.0669	0.3770	0.0040	0.0253	0.2170	0.0001	1.1801	4.7100	0.0040	0.0371	0.2420
S154	0.0001	0.6982	2.9700	0.0001	0.5362	2.6050	0.0001	1.6735	4.9900	0.0040	0.0310	0.1910
S191	0.0580	0.5562	9.6500	0.0310	0.4562	1.0730	0.0001	1.7772	32.2000	0.0040	0.2304	0.8710
S65C	0.0060	0.0549	0.4200	0.0030	0.0196	0.1300	0.0001	1.0970	2.5100	0.0040	0.0486	0.2820
S65D	0.0040	0.0816	0.5020	0.0040	0.0413	0.3590	0.0001	1.1373	5.5100	0.0040	0.0551	0.2300
S65E	0.0110	0.1023	0.4410	0.0040	0.0612	0.3970	0.0001	1.1640	5.7600	0.0040	0.0719	0.2980

SECTION 6

TAYLOR CREEK NUBBIN SLOUGH
PROJECT CODE: TCNS

Purpose and Scope

The Taylor Creek/Nubbin Slough water quality monitoring program encompasses an area characterized by beef and intensive dairy cattle operations. The basin is located primarily in southeast and central Okeechobee County and parts of Martin County.

A water quality monitoring network has been sampled by SFWMD since 1979. This program was initiated as a means of identifying trends and quantifying changes in water quality due to changes in land use and/or implementation of BMPs on beef cattle ranches and dairy farms in the basin. This program is jointly funded by the state/federal Taylor Creek Headwaters/Rural Clean Waters Program. The program is part of the District's Lake Okeechobee Operating Permit, granted by the Florida Department of Environmental Protection.

It was recommended by the Kissimmee River Resource Planning Management (380), and the Lake Okeechobee Technical Advisory Committee to; identify trouble spots, inform individual landowners of the impacts of implementing BMPs to improve water quality, and to provide the state and federal agencies responsible for administering cost-share programs, a method of measuring the cost-effectiveness. The District intensified the monitoring effort in fiscal year 87/88, by approximately doubling the number of sampling sites. In fiscal year 91/92, the network design was again modified to provide more intensive and comprehensive monitoring.

The objectives of this program are:

1. Monitoring water quality in support of the FDEP's Dairy Rule, by providing chemistry data for the dairy outflows, and evaluating the effectiveness of dairy BMP's and the Dairy Buy-out program.

2. Assessing tributary, basin loading, and concentration inputs to Lake Okeechobee, including:

   a) Providing levels of total phosphorus at the inflows to Lake Okeechobee to compare with the 0.18 mg/l total phosphorus SWIM standard for the basin loading calculations.

   b) Providing data that will delineate the relative importance of tributary loading within the basin, to the whole basin output.

3. Developing basin and spatial scale models to predict changes in loads to Lake Okeechobee as a function of land use. This includes:

   a) Providing data for determining statistical or mechanistic relationships between rainfall, land use (or land type), and nutrient runoff into streams.

   b) Providing data to help identify the reason for high episodic phosphorus events.

This program fulfills the District's obligations to the Taylor Creek Headwaters and the Rural Clean Waters programs, also the legal obligations under the Lake Okeechobee Operating Permit. In addition, this program is integral in the development of the Lake Okeechobee Water Quality Management Plan as required by the state's SWIM legislation of 1987.

Sampling Location and Description

The locations of the 41 sites monitored under the Taylor Creek/ Nubbin Slough program are shown on Figure 7. Table 14 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 15 contain statistics for each monitoring location.

District Publications

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Goldstein, A. (1983). Engineering, Hydro and Water Quality Analysis of Detention/Retention Sites; Fourth Annual Report from SFWMD to the Coordinating Council on the Restoration of the Kissimmee River and Taylor Creek Nubbin Slough Basin Detention/Retention Demo Project. SFWMD, Report December 1983. (DRE 168)

Goldstein, A. (1986). Upland Detention/Retention Demonstration Final Report. Impacts of Agricultural Land Use on Water Quality and Utilization of Wetlands for Detention/Retention in the Kissimmee River Basin. SFWMD, Tech. Pub. 86-2. (DRE 222)

Lake Okeechobee SWIM Plan, (1989), Planning Department, SFWMD.

Ritter, G. J. and H. Allen, Jr. (1982). Taylor Creek Headwaters Project Phase 1 Report; Water Quality. SFWMD, Tech. Pub 82-8. (DRE 159)

Gunsalus, B., E.G. Flaig, G. Ritter, (1992). Effectiveness of Agricultural Best management Practices Implemented in the Taylor Creek/Nubbin Slough Watershed and the lower Kissimmee River Basin. SFWMD. September, 1992 Manuscript. (DOR 108)

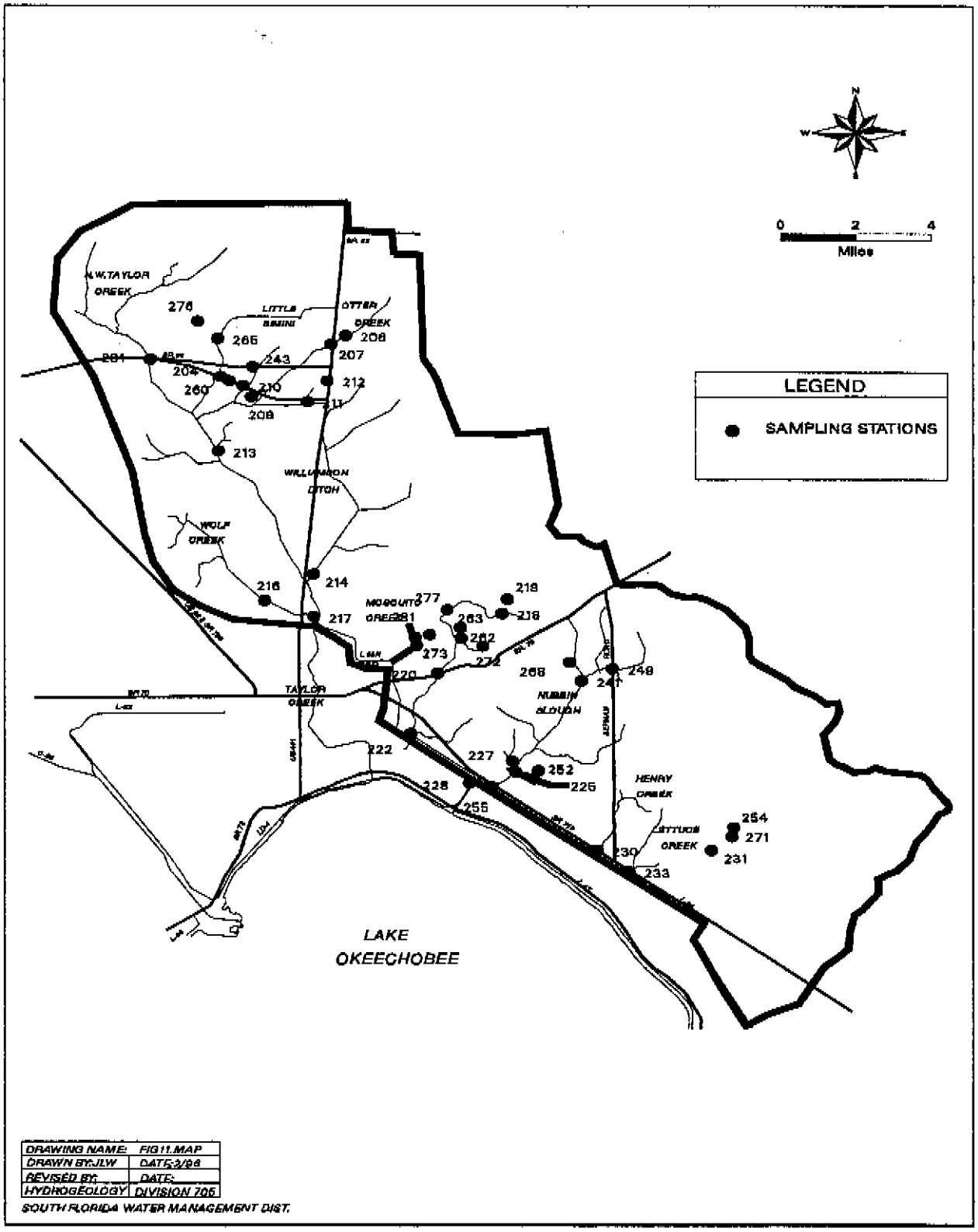

FIGURE 7. Location of Sampling Stations for the Taylor Creek / Nubbin Slough Water Quality Monitoring Program

TABLE 14. Summary of Sampling Station Locations and Frequency of Collection for the Taylor Creek Nubbin Slough Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
TCNS 201	272337	805340	On HWY 68. The samples are collected from the bridge over N.W. Taylor Creek at the U.S.G.S. stage station.	1979 - P	BW	BW	G
TCNS 204	272309	805151	On N.W. 144th Drive (Potter Road). The samples are collected from the bridge over Little Bimini.	1979 - P	BW	BW	G
TCNS 206	272415	804835	East of State Road 441 approximately 0.5 miles behind a FP&L substation at Remilu Ranch, and collects runoff from McArthur Dairy Barns #1 and #2. Sample is collected above weir on Otter Creek.	1989 - P	BW	BW	G
TCNS 207	272403	804858	100 yards west of State Road 441 at S-13B bridge over Otter Creek on Wilson Rucks property.	1979 - P	BW	BW	G
TCNS 209	272240	805046	West of State Road 441 on Potter Road. The samples are collected at two large culverts on Potter Road at Otter Creek.	1979 - P	BW	BW	G
TCNS 210	272300	805000	West of State Road 441 on Potter Road. The samples are collected at a tributary that runs across H & T Rucks Barn #3 at Potter Road.	1985 - P	BW	BW	G
TCNS 211	272228	804935	West of State Road 441 on Potter Road. The samples are collected at East Otter Creek and Potter Road at two large roadside culverts.	1979 - P	BW	BW	G
TCNS 212	272302	804904	At East Otter Creek, just off State Road 441 above Remilu Ranch.	1988 - P	M	M	G

TABLE 14 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Taylor Creek Nubbin Slough Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
TCNS 213	272108	805154	West of State Road 441 on State Road 68 at Flying "G" Ranch. The samples are collected approximately 3.5 miles south into Flying "G" Ranch directly below the confluence of Otter Creek, Little Bimini, and NW Taylor Creek.	1979 - P	BW	BW	G
TCNS 214	271804	804920	East of State Road 441 at Williamson Ditch at the Florida School for Boys. The samples are collected directly downstream of the treatment plant at the Boys School.	1979 - P	BW	BW	G
TCNS 217	271644	804926	East of State Road 441, off Cemetary Road. Sample is collected from the weir on Wolf Creek.	1988 - P	BW	BW	G
TCNS 218	271701	804459	Off State Road 70 on N.E. 80th Avenue at a county ditch above Larson Dairy #8.	1988 - P	M	M	G
TCNS 219	271734	804456	North of State Road 70 on N.E. 80th Avenue at Hales Farms runoff above Larson Dairies #5, 6, 7, and 8.	1988 - P	M	M	G
TCNS 220	271512	804613	On State Road 70 at Mosquito Creek. The samples are collected at the Mosquito Creek bridge.	1979 - P	M	M	G
TCNS 222	271413	804053	On State Road 710 and Mosquito Creek. The samples are collected at the Mosquito Creek bridge.	1979 - P	BW	BW	G
TCNS 225	271235	804412	Off State Road 710 and collects runoff from New Palm Dairy at culvert above Newcommer Dairy.	1988 - P	BW	BW	G

TABLE 14 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Taylor Creek Nubbin Slough Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
TCNS 227	271245	804410	At Red Top Dairy off State Road 710. The samples are collected at a surface water ditch approximately 1/2 mile north of ARS 14A that drains several hay pastures into Nubbin Slough.	1987 - P	BW	BW	G
TCNS 228	271213	804445	On State Road 710 and Nubbin Slough. The samples are collected at the Nubbin Slough bridge.	1979 - P	BW	BW	G
TCNS 230	271029	804207	On State Road 710 at Henry Creek. The samples are collected at the Henry Creek bridge.	1979 - P	BW	BW	G
TCNS 231	271028	803910	Off Martin Grade Road and collects runoff from Underhill Dairy.	1988 - P	BW	BW	G
TCNS 233	270956	804114	On State Road 710 at Lettuce Creek. The samples are collected at the Lettuce Creek bridge.	1979 - P	BW	BW	G
TCNS 241	271500	804230	Off Berman Road and collects runoff from Davie Dairy Barn #1 and #2 below the spray field.	1988 - P	BW	BW	G
TCNS 243	272325	805101	Off State Road 68 and is the upstream site of Otter Creek, above H.T. Rucks & Sons Dairy #3.	1988 - P	M	M	G

TABLE 14 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Taylor Creek Nubbin Slough Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
TCNS 249	271520	804142	On Berman Road approximately three miles south of State Road 70. The samples are collected at a culvert where Nubbin Slough crosses Berman Road.	1979 - P	M	M	G
TCNS 252	271237	804337	Off State Road 710 on New Palm Dairy. Sample is taken at tributary culvert above New Palm Dairy.	1988 - P	M	M	G
TCNS 254	271105	803835	Off Martin Grade in Martin County, and is the oncoming tributary north of the Underhill Dairy barn.	1991 - P	M	M	G
TCNS 255	271211	804448	Off State Road 710 and collects runoff from the cooling ponds of Newcomer Dairy going into Nubbin Slough.	1989 - P	BW	BW	G
TCNS 258	271102	804138	Off State Road 710 and collects runoff from Enrico Dairy as it flows into Henry Creek.	1989 - P	BW	BW	G
TCNS 260	272246	805056	The discharge from Rucks & Sons Dairy at Potter Road	1990 - P	BW	BW	G
TCNS 262	271605	804515	North of State Road 70 and collects runoff from Larson Dairy #7 at a culvert just south of Woody's Lane.	1990 - P	BW	BW	G
TCNS 263	271710	804515	North of State Road 70 and collects runoff from Larson Dairy #8 at a culvert just north of Woody's Lane.	1990 - P	BW	BW	G

TABLE 14 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Taylor Creek Nubbin Slough Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	G/A
TCNS 265	272410	805155	Off State Road 68 at the culvert on Rucks Dairy Road that collects the outfall H.T. Rucks and Sons Dairy #1.	1991 - P	BW	BW	G
TCNS 268	271530	804248	On Davie Dairy on the southeast property line and collects oncoming water to the Dairy from the Lou Cox property.	1991 - P	M	M	G
TCNS 271	271050	803838	Off Martin Grade Road along the Underhill Dairy access road and collects oncoming water to the dairy.	1991 - P	M	M	G
TCNS 272	271505	804625	The culvert north of Larson Dairy Barn #5 and collects oncoming water to Barn #5.	1992 - P	M	M	G
TCNS 273	271615	804625	At the outfall point at Larson Dairy Barn #5, at Mosquito Creek culvert on Woody's Lane.	1991 - P	BW	BW	G
TCNS 276	272438	805226	Off Calf Barn Road on the McArthur Dairy property and collects runoff from McArthur Dairy Barns #4 & #5.	1991 - P	BW	BW	G
TCNS 277	271655	804557	North of Larson Dairy Barn #8 and collects runoff from the south spray field.	1992 - P	BW	BW	G
TCNS 280	271557	804645	Larson Dairy #5 east spray field outlet at riser.	1994 - P	BW	BW	G
TCNS 281	271610	804647	Larson Dairy #5 west spray field at culvert across from entrance to barn.	1994 - P	BW	BW	G
TCNS 282	271637	804457	Larson Dairy #8 north spray field drainage ditch at last culvert.	1995 - P	BW	BW	G

TABLE 15. Statistics on Select Parameters for the Taylor Creek Nubbin Slough Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
TCNS 201	0.0090	0.4747	1.7350	0.1120	0.4040	1.3580	0.5000	1.3641	3.4900	0.0040	0.0594	0.3640
TCNS 204	0.0002	0.9476	5.5650	0.0970	0.9324	3.6350	0.0003	3.2607	8.8600	0.0040	1.3103	3.7250
TCNS 206	0.1150	1.4637	6.7860	0.0780	1.2950	4.1600	1.5700	4.8710	26.7700	0.0040	0.1363	0.9580
TCNS 207	0.0810	0.7921	5.8340	0.0540	0.6041	4.5350	0.0001	1.9934	22.0400	0.0040	0.1706	12.5670
TCNS 209	0.0001	0.7179	6.5400	0.0040	0.5377	3.2400	0.0001	1.7233	76.4600	0.0040	0.1783	3.5020
TCNS 210	0.0320	2.2384	16.5600	0.1850	1.6533	7.6120	0.0001	3.6120	17.2200	0.0050	0.0862	0.9050
TCNS 211	0.0280	0.3107	1.8840	0.0210	0.2307	1.3860	0.5000	1.3304	4.2800	0.0040	0.0195	0.2490
TCNS 212	0.0240	0.2174	2.2350	0.0040	0.1932	2.1110	0.0002	2.3181	15.0200	0.0040	0.0191	0.1470
TCNS 213	0.0390	0.5520	2.2020	0.0040	0.4519	2.3380	0.0001	1.5857	9.2700	0.0040	0.2275	2.5800
TCNS 214	0.0200	0.2485	2.0830	0.0040	0.1821	1.4520	0.0001	1.2020	4.7800	0.0040	0.0655	1.2430
TCNS 217	0.0670	0.5414	3.0450	0.0040	0.3958	2.3940	0.0002	1.7510	9.2800	0.0040	0.2540	2.5090
TCNS 218	0.0140	0.2900	2.4500	0.0010	0.1471	0.9520	0.0001	2.2491	9.1100	0.0040	0.0234	0.2990
TCNS 219	0.0120	0.3091	3.3450	0.0040	0.1709	1.1830	0.0001	2.3227	93.0500	0.0040	0.9064	91.2000
TCNS 220	0.2330	0.6484	3.0400	0.1860	0.5791	2.2850	0.0002	2.5354	5.7400	0.0040	0.5123	1.8710
TCNS 222	0.0790	0.6373	1.8290	0.0580	0.5692	1.9660	0.0001	1.8750	3.7100	0.0040	0.4524	1.7120
TCNS 225	0.0300	0.5976	6.5850	0.0340	1.3603	3.3100	0.5200	5.0227	15.8500	0.0040	0.0869	0.3700
TCNS 227	0.0370	0.6455	19.1000	0.0080	0.2144	1.8110	0.5100	2.3759	9.9000	0.0040	0.1315	1.8750
TCNS 228	0.0910	0.6666	6.6600	0.0490	0.4942	1.8160	0.0002	2.5756	18.8200	0.0060	0.5705	2.9520
TCNS 230	0.1390	0.5488	3.3400	0.0870	0.4696	3.1460	0.0001	1.8854	6.4200	0.0040	0.1293	0.7000
TCNS 231	0.1020	1.1355	13.9400	0.0540	1.1019	13.0540	0.7700	3.5911	45.4800	0.0040	0.0332	0.8110
TCNS 233	0.0690	0.4535	13.4600	0.0210	0.2894	1.1990	0.0001	1.7884	8.0600	0.0040	0.1299	0.9610
TCNS 241	0.0003	1.2587	6.0150	0.0001	1.2063	3.2630	0.9200	4.2523	24.4300	0.0060	0.9869	6.5370
TCNS 243	0.0130	0.2649	1.6400	0.0040	0.2360	1.1880	0.5900	3.7704	93.1300	0.0040	2.0364	91.6000
TCNS 249	0.0450	0.5175	2.0260	0.0270	0.4557	1.8530	0.0002	1.3148	3.7200	0.0040	0.0190	0.5000
TCNS 252	0.1560	0.8202	5.2000	0.0790	0.5615	2.0760	0.0001	2.7324	13.0700	0.0040	0.0387	0.1490
TCNS 254	0.1100	0.6720	2.8550	0.0850	0.5296	1.8380	0.8500	4.3945	51.7900	0.0040	1.1211	22.1700
TCNS 255	0.1440	2.6685	22.6200	0.2360	2.2431	4.1000	0.5200	4.3367	17.0300	0.0080	0.0796	0.4640
TCNS 258	0.1850	2.9359	11.4800	0.0800	4.8654	11.0650	1.9300	7.9062	19.2000	0.0040	0.1132	1.4900
TCNS 260	0.2470	2.8657	8.6650	0.0003	0.9826	2.6150	0.0002	2.2755	4.4900	0.0070	0.0302	0.1130
TCNS 262	0.0002	1.8775	5.7300	0.2870	1.9974	3.7100	1.9300	16.6189	81.3300	0.0080	0.0383	0.3120
TCNS 263	0.2090	1.2779	7.2400	0.1680	0.3997	3.3500	0.0001	1.8539	7.0900	0.0150	0.1327	0.5530

TABLE 15. Statistics on Select Parameters for the Taylor Creek Nubbin Slough Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
TCNS 265	0.0110	0.4429	2.2020	-	-	-	-	-	-	-	-	-
TCNS 268	0.0220	0.1765	1.0650	-	-	-	-	-	-	-	-	-
TCNS 271	0.0280	0.2816	2.0840	-	-	-	-	-	-	-	-	-
TCNS 272	0.1400	0.4490	2.2860	0.5430	0.5430	0.5430	1.4500	1.4500	1.4500	0.1350	0.1350	0.1350
TCNS 273	0.1810	0.5230	1.5530	-	-	-	-	-	-	-	-	-
TCNS 276	0.1800	0.7329	2.9300	-	-	-	-	-	-	-	-	-
TCNS 277	0.0330	1.6094	3.9320	1.4750	1.4750	1.4750	2.6300	2.6300	2.6300	0.0160	0.0160	0.0160
TCNS 280	0.0040	8.3698	14.3450	-	-	-	-	-	-	-	-	-
TCNS 281	0.1570	0.9995	3.7550	-	-	-	-	-	-	-	-	-
TCNS 282	0.9410	1.9743	4.0940	-	-	-	-	-	-	-	-	-

SECTION 7
INDIAN RIVER LAGOON
PROJECT CODE: IRL

Purpose and Scope

The Indian River Lagoon water quality monitoring program is a lagoon wide monitoring program that involves 5 agencies: South Florida Water Management District (SFWMD), St.Johns River Water Management District (SJRWMD), Volusia County, Brevard County, and Indian River County who took over the FDEP's responsibilities. The SFWMD jurisdiction encompasses a 40 mile stretch of the lagoon from Jupiter Inlet to the northern boundary of St. Lucie County. The water quality monitoring program was established to provide a water quality data base for:

1. Documenting known problem areas within the lagoon system, especially those that are located near urban areas and point source discharges;

2. Locating and reviewing existing stations monitored by state, regional and local environmental groups;

3. Locating and establishing monitoring stations in the lagoon and it's tributaries not currently being monitored;

4. Determining parameters that will best evaluate the water quality of the lagoon;

5. Establishing water quality assurance requirements for the field and laboratory; and

6. Documenting long term trends within the lagoon, especially in areas where good biological or water quality conditions currently exist.

This is a SWIM program that began in October, 1988. The collection and analysis of the samples were contracted out during the first two years of the study. In October 1990, the collection and analysis of the samples within the SFWMD boundaries were taken over by the SFWMD.

The data collected can indicate any changes in water quality, and allow for better management of the Indian River Lagoon for environmental enhancement, and prevention of any further degradation.

Sampling Locations and Descriptions

The locations of the 40 sites monitored under this program are shown in Figure 8. Table 16 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 17 contain statistics for each monitoring location.

District Publications

Indian River Lagoon SWIM Plan (1987), Planning Department, SFWMD.

Indian River Lagoon SWIM Plan (September 1994), SFWMD.

Moustafa, Z., B. Hammrick, Morton. (1996). Modeling Salinity Transport in the Indian River Lagoon. SFWMD. February, 1996 Manuscript. (DOR 237)

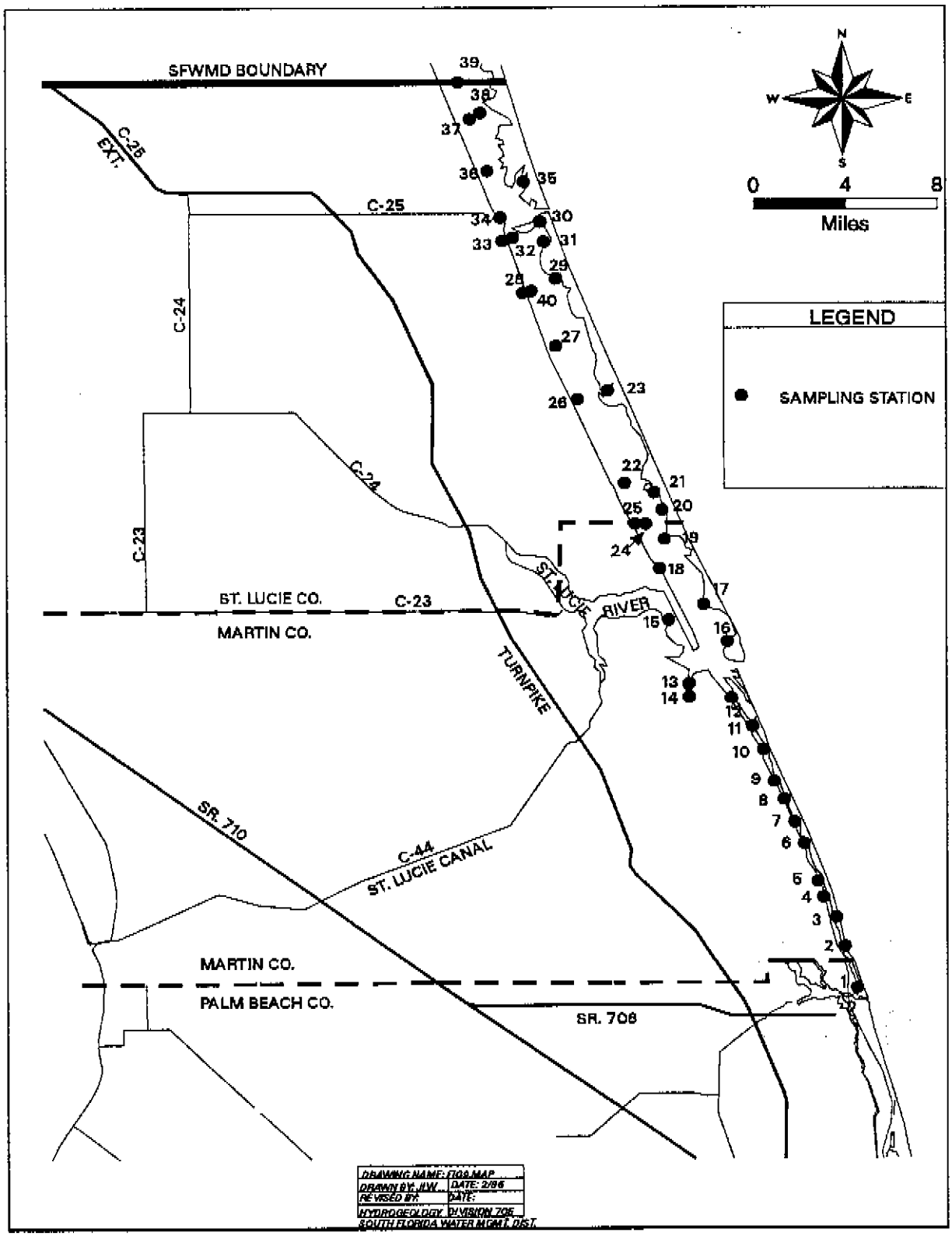

FIGURE 8. Location of Sampling Stations for the Indian River Lagoon Water Quality Monitoring Program

TABLE 16. Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL01	265726	800448	Indian River Lagoon in Martin County about 0.6 miles north of the Jupiter Inlet in the Intracoastal Waterway(ICWW) at channel marker #60.	1988 - P	QTR	QTR	QTR	QTR	G
IRL02	265843	800509	Indian River Lagoon in Martin County north of the Jupiter Inlet near Maxon Marina in the ICWW at channel marker #52.	1988 - P	QTR	QTR	QTR	QTR	G
IRL03	265939	800531	Indian River Lagoon in Martin County in the ICWW at channel marker #48.	1988 - P	QTR	QTR	QTR	QTR	G
IRL04	265957	800535	Indian River Lagoon in Martin County taken half way between channel Markers #42 and #44 in the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G
IRL05	270118	800611	Indian River Lagoon in Martin County taken at channel marker #41 in the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G
IRL06	270301	800648	Indian River Lagoon in Martin County taken approximately 50 yards out from the Jupiter Island Club docks.	1988 - P	QTR	QTR	QTR	QTR	G
IRL07	270350	800720	Indian River Lagoon in Martin County taken approximately 50 yards south of the State Road 707 bridge on the west side of the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL08	270448	800748	Indian River Lagoon in Martin County taken at the mouth of the cove on the west side if the Jupiter Narrows (ICWW) just south of channel marker #28.	1988 - P	QTR	QTR	QTR	QTR	G
IRL09	270540	800815	Indian River Lagoon in Martin County taken in the Jupiter Narrows at channel marker #24 adjacent to a series of seven canals.	1988 - P	QTR	QTR	QTR	QTR	G
IRL10	270645	800838	Indian River Lagoon in Martin County taken in the Pecks Lake portion of the ICWW at channel marker #19.	1988 - P	QTR	QTR	QTR	QTR	G
IRL11	270736	800903	Indian River Lagoon in Martin County taken at the north end of the Pecks Lake portion of the ICWW at channel marker #16.	1988 - P	QTR	QTR	QTR	QTR	G
IRL12	270850	800952	Indian River Lagoon in Martin County taken at channel marker #3, about 0.5 miles south of the St. Lucie Inlet in the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G
IRL13	270913	801150	Manatee Pocket in Martin County in the middle of the cove leading to Crooked Creek.	1988 - P	QTR	QTR	QTR	QTR	G
IRL14	270851	801140	Manatee Pocket in Martin County in front of the marina at the end of Manatee Pocket.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL15	271156	801228	In the middle of the St. Lucie River in Martin County under the A1A bridge.	1988 - P	QTR	QTR	QTR	QTR	G
IRL16	271057	801000	In Sailfish Point Marina in Martin County located just north of the St. Lucie Inlet. The sample is taken in the canal about 50 yards west of docks.	1988 - P	QTR	QTR	QTR	QTR	G
IRL17	271233	801106	Indian River Lagoon in Martin County by the Indian River Plantation Marina taken by marker #4. This is located just south of the A1A bridge, which is the first bridge north of the St. Lucie Inlet, on the east side of the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G
IRL18	271357	801302	Indian River Lagoon in Martin County at entrance Marker #10 to the Baily Boat Company Marina just north of the A1A bridge on the west side of the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G
IRL19	271510	801239	Indian River Lagoon in Martin County at entrance marker #12 to the boat docks just south of HWY 707A on the east side of the ICWW. Second bridge north of the St. Lucie Inlet.	1988 - P	QTR	QTR	QTR	QTR	G
IRL20	271605	801230	Indian River Lagoon in St. Lucie County in the middle of the Waveland Trailer Park canal on the east side of the ICWW just north of HWY 707A.	1988 - P	QTR	QTR	QTR	QTR	G
IRL21	271707	801305	Indian River Lagoon in St. Lucie County by the boat docks on the east side of Nettles Island Trailer Park, north of HWY 707A on the east side of the ICWW.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL22	271804	801431	Indian River Lagoon in St. Lucie County at channel marker #212 in the middle of the ICWW, north of Netiles Island.	1988 - P	QTR	QTR	QTR	QTR	G
IRL23	272057	801504	Indian River Lagoon in St. Lucie County in Big Mud Creek 50 yards out from Hutchinson Island Power Plant.	1988 - P	QTR	QTR	QTR	QTR	G
IRL24	271542	801346	Indian River Lagoon in Martin County taken approximately 0.5 miles north of HWY 707A near the east side of the ICWW in 2.0 meters of water. About 300 yards straight out from a house with a black roof.	1988 - P	QTR	QTR	QTR	QTR	G
IRL25	271540	801350	Indian River Lagoon in Martin County taken approximately 0.5 miles north of HWY 707A. This is a transect station to IRL24. This sample is collected about 100 yards west of IRL24 in 1.0 meters of water.	1988 - P	QTR	QTR	QTR	QTR	G
IRL26	272047	801634	Indian River Lagoon in St. Lucie County near the west side of the ICWW opposite the Hutchinson Island Power Plant, about 200 yards south of the power lines in 2.0 meters of water.	1988 - P	QTR	QTR	QTR	QTR	G
IRL27	272257	801710	Indian River Lagoon in St. Lucie County near channel marker #198 in 2.0 meters of water taken from the west side of the channel.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL28	272458	801828	Indian River Lagoon in St. Lucie County between channel markers #192 and #193 near the west side of the ICWW taken in 1.0 meter of water, straight out from the Virginia Avenue Canal discharge culverts in Ft. Pierce. This station is west of Hutchinson Island and is a transect station with IRL40.	1988 - P	QTR	QTR	QTR	QTR	G
IRL29	272531	801712	Indian River Lagoon in St. Lucie County off the south end of Hutchinson Island. The sample is collected in the middle of Bear Point Cove.	1988 - P	QTR	QTR	QTR	QTR	G
IRL30	272751	801746	Indian River Lagoon in St. Lucie County, just south of Ft. Pierce Inlet in Faber Cove on the east side of the ICWW. The sample is taken at the NO WAKE sign in the marina basin.	1988 - P	QTR	QTR	QTR	QTR	G
IRL31	272658	801727	Indian River Lagoon in St. Lucie County just south of Ft. Pierce Inlet out from the Jaycees Park in Jennings Cove.	1988 - P	QTR	QTR	QTR	QTR	G
IRL32	272719	801858	Indian River Lagoon in St. Lucie County just south of the Ft. Pierce Inlet at the City of Ft. Pierce waste water treatment plant. The sample is collected at the outfall point to the Indian River Lagoon.	1988 - P	QTR	QTR	QTR	QTR	G
IRL33	272705	801923	Indian River Lagoon in St. Lucie County just south of the Ft. Pierce Inlet on the west side of the ICWW at the entrance to Morris Creek in the middle of the marina by the power plant.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL34	272800	801940	Indian River Lagoon in St. Lucie County just north of the Ft. Pierce Inlet, on the east side of the ICWW between the two marinas at the entrance to Taylor Creek. Also known as the C-25 canal.	1988 - P	QTR	QTR	QTR	QTR	G
IRL35	272915	801825	Indian River Lagoon in St. Lucie County just north of the Ft. Pierce Cut, in front of the second of three canals on the east side of the cut.	1988 - P	QTR	QTR	QTR	QTR	G
IRL36	272923	801951	Indian River Lagoon in St. Lucie County just north of the Ft. Pierce Inlet in the ICWW at channel marker #176.	1988 - P	QTR	QTR	QTR	QTR	G
IRL37	273203	802049	Indian River Lagoon in St. Lucie County north of the Ft. Pierce Inlet, half way down the canal leading to the Harbor Branch Oceanographic Institute, where the concrete seawalls start.	1988 - P	QTR	QTR	QTR	QTR	G
IRL38	273222	802026	Indian River Lagoon in St. Lucie County north of the Ft. Pierce Inlet between the two spoil piles on the east side of the ICWW just north of the Harbor Branch canal.	1988 - P	QTR	QTR	QTR	QTR	G
IRL39	273313	802055	Indian River Lagoon in St. Lucie County north of the Harbor Branch canal, west of channel marker #169 in line with the spoil piles.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 16 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Indian River Lagoon Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	G/A
IRL40	272455	801834	Indian River Lagoon in St. Lucie County just south of the Ft. Pierce Inlet, out from the Virginia Avenue Canal discharge culverts, collected in 2.0 meters of water. This is a transect station with IRL28.	1988 - P	QTR	QTR	QTR	QTR	G

TABLE 17. Statistics on Select Parameters for the Indian River Lagoon Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
IRL01	0.0040	0.0184	0.0450	0.0040	0.0065	0.0160	0.5000	0.5537	0.9400	0.0040	0.0093	0.0310
IRL02	0.0040	0.0230	0.0580	0.0040	0.0074	0.0180	0.5000	0.5435	0.8700	0.0040	0.0103	0.0510
IRL03	0.0070	0.0262	0.0640	0.0040	0.0084	0.0280	0.5000	0.6268	2.3200	0.0040	0.0118	0.0630
IRL04	0.0140	0.0297	0.0610	0.0040	0.0090	0.0300	0.5000	0.5570	0.9050	0.0040	0.0132	0.0610
IRL05	0.0110	0.0315	0.0670	0.0040	0.0098	0.0350	0.0001	0.5170	0.7000	0.0040	0.0150	0.0620
IRL06	0.0150	0.0404	0.0740	0.0040	0.0150	0.0510	0.5000	0.5817	0.9090	0.0040	0.0199	0.0680
IRL07	0.0250	0.0509	0.0910	0.0040	0.0224	0.0670	0.5000	0.6026	0.9500	0.0040	0.0224	0.0670
IRL08	0.0220	0.0569	0.1150	0.0040	0.0272	0.0870	0.5000	0.6463	1.0300	0.0040	0.0242	0.0810
IRL09	0.0280	0.0643	0.1240	0.0040	0.0310	0.0930	0.5000	0.6728	1.1100	0.0040	0.0288	0.0910
IRL10	0.0260	0.0677	0.1430	0.0140	0.0377	0.1040	0.0001	0.6453	0.9100	0.0040	0.0290	0.1090
IRL11	0.0310	0.0791	0.1650	0.0070	0.0415	0.1220	0.5000	0.6885	1.1300	0.0040	0.0304	0.1240
IRL12	0.0270	0.0728	0.1570	0.0120	0.0418	0.1210	0.5000	0.6460	1.6100	0.0040	0.0289	0.1540
IRL13	0.0490	0.0973	0.2000	0.0150	0.0553	0.1370	0.5200	0.7858	1.7300	0.0040	0.0462	0.1870
IRL14	0.0440	0.1130	0.1700	0.0230	0.0616	0.1350	0.5300	0.9040	1.8900	0.0040	0.0628	0.4140
IRL15	0.0490	0.1408	0.4480	0.0230	0.0979	0.2330	0.5000	0.9282	2.5000	0.0040	0.0734	0.2760
IRL16	0.0210	0.0426	0.0730	0.0040	0.0217	0.0510	0.5000	0.5871	1.2400	0.0040	0.0114	0.0420
IRL17	0.0330	0.0671	0.1700	0.0050	0.0352	0.1260	0.5040	0.6438	1.2900	0.0040	0.0200	0.1110
IRL18	0.0120	0.0718	0.1850	0.0070	0.0300	0.0970	0.5000	0.9461	5.3100	0.0040	0.0209	0.0740
IRL19	0.0450	0.0675	0.1300	0.0090	0.0340	0.1010	0.5000	0.6251	1.3400	0.0040	0.0189	0.0990
IRL20	0.0450	0.0713	0.1330	0.0100	0.0374	0.0870	0.5040	0.7145	1.1500	0.0040	0.0244	0.1140
IRL21	0.0430	0.0715	0.1270	0.0070	0.0346	0.0830	0.5000	0.6843	1.0900	0.0040	0.0143	0.0920
IRL22	0.0400	0.0630	0.1150	0.0080	0.0300	0.0720	0.5000	0.6116	1.0600	0.0040	0.0164	0.0820
IRL23	0.0260	0.0626	0.1990	0.0040	0.0346	0.1640	0.5000	0.7240	1.2000	0.0040	0.0111	0.0380
IRL24	0.0440	0.0681	0.1020	0.0150	0.0283	0.0520	0.5000	0.7086	1.7200	0.0040	0.0170	0.1310
IRL25	0.0330	0.0638	0.1020	0.0110	0.0260	0.0450	0.5000	0.8382	3.8500	0.0040	0.0085	0.0470
IRL26	0.0360	0.0669	0.1590	0.0050	0.0248	0.0560	0.5000	0.7378	1.7500	0.0040	0.0114	0.0560
IRL27	0.0260	0.0600	0.1010	0.0100	0.0256	0.0560	0.5000	0.6860	1.3900	0.0040	0.0150	0.0720
IRL28	0.0200	0.0641	0.1900	0.0040	0.0129	0.0480	0.5000	0.7498	1.6300	0.0040	0.0108	0.0610
IRL29	0.0270	0.0488	0.1380	0.0040	0.0115	0.0370	0.5000	0.7270	1.2800	0.0040	0.0087	0.0370
IRL30	0.0250	0.0381	0.0810	0.0040	0.0098	0.0270	0.5000	0.6680	1.2700	0.0040	0.0061	0.0150
IRL31	0.0280	0.0380	0.0600	0.0040	0.0120	0.0330	0.5000	0.7377	2.4900	0.0040	0.0062	0.0270

TABLE 17. Statistics on Select Parameters for the Indian River Lagoon Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
IRL32	0.0200	0.0422	0.0780	0.0040	0.0138	0.0450	0.5000	0.7885	2.1100	0.0040	0.0117	0.0390
IRL33	0.0300	0.0499	0.0830	0.0040	0.0172	0.0380	0.5000	0.7206	1.7100	0.0040	0.0138	0.0650
IRL34	0.0410	0.0953	0.1930	0.0160	0.0518	0.1390	0.5170	0.8166	1.8100	0.0040	0.0641	0.1950
IRL35	0.0300	0.0497	0.1000	0.0040	0.0158	0.0360	0.5000	0.6616	1.2900	0.0040	0.0073	0.0180
IRL36	0.0250	0.0634	0.1480	0.0040	0.0244	0.0680	0.5040	0.7762	1.6400	0.0040	0.0137	0.0700
IRL37	0.0410	0.0759	0.1920	0.0040	0.0365	0.1060	0.5000	0.8523	2.8600	0.0040	0.0144	0.0620
IRL38	0.0320	0.0770	0.2440	0.0040	0.0321	0.1340	0.5040	0.7958	1.5000	0.0040	0.0142	0.0920
IRL39	0.0330	0.0783	0.1970	0.0040	0.0363	0.1240	0.5000	0.7837	1.6900	0.0040	0.0188	0.1100
IRL40	0.0300	0.0506	0.1000	0.0040	0.0154	0.0400	0.0001	0.5724	1.0500	0.0040	0.0109	0.0530

SECTION 8

ST. LUCIE ESTUARY
PROJECT CODE: SE

Purpose and Scope

The St. Lucie Estuary is a major coastal resource of east central Florida. It supports a variety of commercial and recreational activities, and provides an important habitat for many aquatic organisms. This estuary is located at the east end of the Okeechobee Waterway which crosses south central Florida. It also acts as a navigational channel and outlet for discharges of excess fresh water from Lake Okeechobee and the St. Lucie canal basin.

The St. Lucie Estuary surface water monitoring program is part of a Surface Water Improvement and Management (SWIM) program that began in 1989. The areas of interest are the St. Lucie Inlet and both the north and south forks of the St. Lucie River.

The water quality monitoring program provides a water quality data base for:

1. Documenting problem areas within the St. Lucie Estuary system, and especially those that may be related to point source discharges;

2. Locating and reviewing any existing stations and data that might exist and comparing the data;

3. Locating and establishing monitoring stations in the estuary not currently being monitored;

4. Determining parameters that will best evaluate the water quality of the estuary; and

5. Documenting long term trends within the estuary, especially in areas where good biological or water quality data currently exists.

The SE project began in October 1989. The collection and analysis of the samples were contracted to a private firm during the first year of the study. In October 1990 the collection and analysis of the samples was taken over by the SFWMD.

The data can indicate changes in water quality and allow for better management of the estuary for environmental enhancement and prevention of any further degradation.

Sampling Locations and Descriptions

The locations of the 10 sites monitored under this program are shown on Figure 9. Table 18 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 19 contain statistics for each monitoring location.

District Publications

Gove, C. (1989). Hydrodynamic and Salinity Analysis of a Proposed Navigation Channel in the St. Lucie Estuary. SFWMD, Special Report 6/89. (DRE 271)

Haunert, D. and R. Startzman, (1980). Some Seasonal Fisheries Trends and Effects of a 1000 cfs Fresh Water Discharge on the Fisheries and Macroinvertebrates in the St. Lucie Estuary, Florida; January 1980. SFWMD, Tech. Pub. 80-03. (DRE 109)

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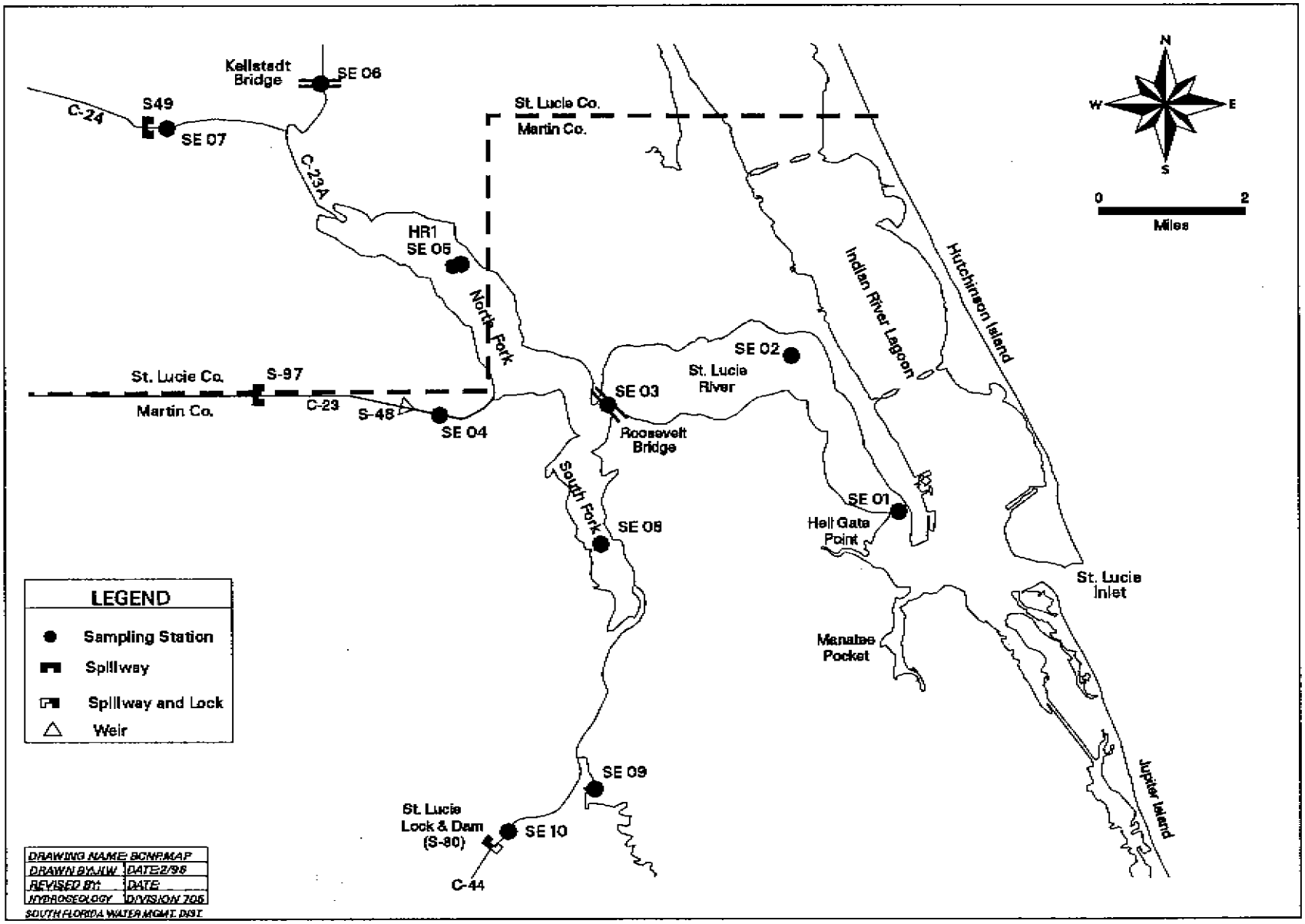

FIGURE 9. Location of Sampling Stations for the St. Lucie Estuary Water Quality Monitoring Program.

TABLE 18. Summary of Sampling Station Locations and Frequency of Collection for the St. Lucie Estuary Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	US/DS	G/A
SE 01	271048	801139	Out from Hell Gate Point near the mouth of the river, and collected from the middle of the river.	1990 - P	M	M	M	M	-	G
SE 02	271248	801254	At channel marker 21 out from Hoggs Cove north of the A1A bridge.	1990 - P	M	M	M	M	-	G
SE 03	271210	801533	Taken from the west side of the Roosevelt Bridge which is US1, and about 50 yards south of the channel.	1990 - P	M	M	M	M	-	G
SE 04	271205	801753	Taken below S48 in the C-23 canal, which is also called Bessy Creek.	1990 - P	M	M	M	M	DS	G
SE 05*	271271	801735	Taken in the middle of the river between Britt Creek on the east and Pendarvis Point on the west sides of the river. It is also near gauging station #4A.	90 - 96	M	M	M	M	-	G
SE 06	271617	801920	Taken from the south side of Kellstadt Bridge, which is up the north fork of thr river. It is about 1 mile north of where the C-24 canal enters the river.	1990 - P	M	M	M	M	-	G
SE 07	271540	802128	Taken below S-49 on the C-24 canal.	1990 - P	M	M	M	M	DS	G
SE 08	271026	801536	Taken from the south side of the Palm City bridge about 50 yards east of the main channel. The Palm City bridge crosses the south fork of the St. Lucie river.	1990 - P	M	M	M	M	-	G

* Station discontinued in 1996.

TABLE 18 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the St. Lucie Estuary Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	PAR	Chlorophyll	US/DS	G/A
SE 09	270724	801546	Taken from that portion of the south fork that branches off of the main channel leading to the St. Lucie Lock and Dam (S80). The south fork branches off the main channel about 2 miles east of S80.	1990 - P	M	M	M	M	-	G
SE 10	270646	801704	Taken below the St. Lucie Lock and Dam (S80).	1990 - P	M	M	M	M	DS	G
HR1	271340	801719	Telemetry station in the north fork of the St. Lucie River at gauging station 4A.	1994 - P	M	M	M	M	-	G

TABLE 19. Statistics on Select Parameters for the St. Lucie Estuary Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
HR1	0.0680	0.2055	0.4340	0.0260	0.1741	0.3990	0.5950	1.1894	2.0100	0.0040	0.0974	0.6760
SE 01	0.0080	0.1202	0.3960	0.0040	0.0884	0.3270	0.0001	0.8527	2.3400	0.0040	0.0670	0.3080
SE 02	0.0340	0.1463	0.4320	0.0110	0.1119	0.3680	0.5000	0.9749	2.6600	0.0040	0.0826	0.4030
SE 03	0.0600	0.1789	0.5430	0.0230	0.1396	0.4510	0.0001	1.0443	3.3700	0.0040	0.0958	0.6950
SE 04	0.0690	0.2488	0.7860	0.0430	0.1974	0.6120	0.0001	1.2202	2.8400	0.0040	0.0920	1.3340
SE 05	0.0650	0.1969	0.6170	0.0280	0.1571	0.5150	0.0001	1.1171	4.6800	0.0040	0.1044	3.5240
SE 06	0.1050	0.2255	0.4830	0.0560	0.1748	0.4470	0.5100	1.1492	2.6000	0.0040	0.1269	1.1270
SE 07	0.0600	0.2258	0.7790	0.0280	0.1651	0.6460	0.0001	1.1836	2.3900	0.0040	0.0748	1.5890
SE 08	0.0770	0.1793	0.4820	0.0360	0.1231	0.3050	0.0001	1.1850	2.0400	0.0040	0.1229	0.4680
SE 09	0.0720	0.1641	0.4400	0.0210	0.1155	0.3500	0.0001	1.1417	2.2700	0.0040	0.1084	0.4410
SE 10	0.0880	0.1838	0.4680	0.0320	0.1278	0.3700	0.7460	1.3046	2.3000	0.0040	0.1969	0.8140

SECTION 9

UPPER AND LOWER EAST COAST
PROJECT CODE: WQM

Purpose and Scope

The Upper and Lower East Coast water quality monitoring program was initiated in 1979 and includes the coastal portions of St. Lucie, Martin, and Palm Beach Counties. The water quality monitoring program provides a water quality and nutrient loading data base for:

1. Determining loadings to the Indian River Lagoon, St.Lucie Estuary, Loxahatchee River, and Lake Worth Lagoon;

2. Determining long and short term trends;

3. Identifying seasonal and discharge related water quality trends;

4. Calculating material loads, basin-wide areal export rates, and flow-weighted concentrations; and

5. Implementing LOTAC's recommendation for a comprehensive monitoring and research plan as described in the Department of Environmental Protection "Lake Okeechobee Monitoring and Research Plan."

Sampling Locations and Descriptions

The locations of the 10 sites monitored under this program are shown on Figure 10. Table 20 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 21 contain statistics for each monitoring location.

District Publications

Dickson, K. (1980). The SFWMD Water Quality Monitoring Network 1980 Annual Report. SFWMD, October 1980. (DRE 118)

Federico, A. (1983). Upper East Coast - Water Quality Studies. SFWMD, Tech. Pub. No. 83-1. (DRE 169)

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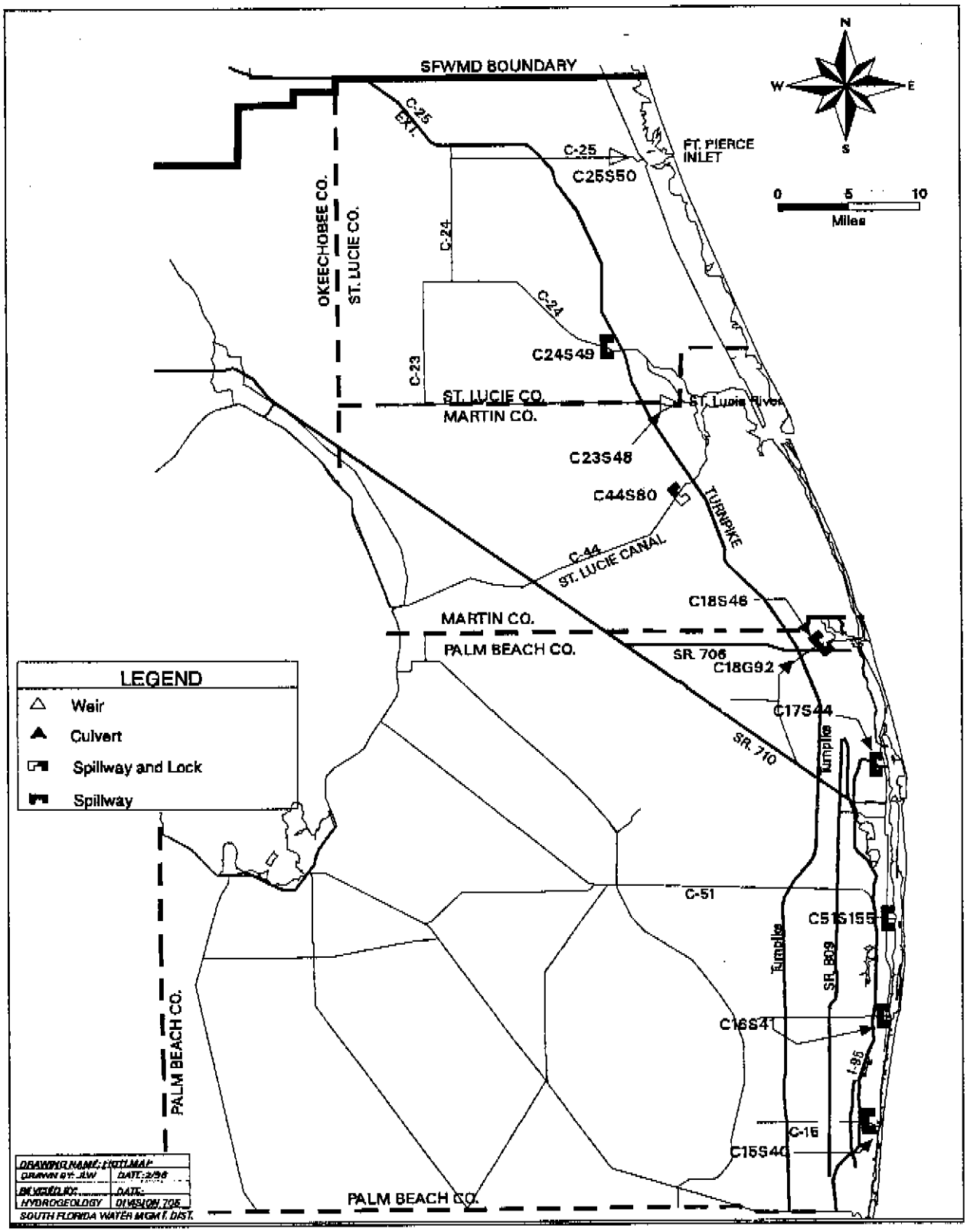

FIGURE 10. Location of Sampling Stations for the Upper and Lower East Coast Water Quality Monitoring Program.

TABLE 20. Summary of Sampling Station Locations and Frequency of Collection for the Upper and Lower East Coast Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
C15S40	262527	800428	S-40 is a spillway coastal structure on the C-15 canal. Water flows eastward through this structure.	1979 - P	M	M	QTR	BA	US	G
C15SR809*	262533	800720	From the bridge on State Road 809 at C-15. The water can flow east or west, depending on stage levels.	79 - 96	MF	MF	QTR	BA	-	G
C16S41	263236	800330	S-41 is a spillway coastal structure on the C-16 canal. Water flows eastward through this structure.	1979 - P	M	M	QTR	BA	US	G
C16SR809*	263226	800727	From the bridge on State Road 809 at C-16. The water can flow east or west, depending on stage levels.	79 - 96	MF	MF	QTR	BA	-	G
C51S155	263846	800325	S-155 is a spillway coastal structure on C-51 (West Palm Beach Canal). Water flows eastward through this structure.	1979 - P	M	M	QTR	BA	US	G
C17S44	264909	800459	S-44 is a spillway coastal structure on the C-17 canal. The water flows eastward through this structure.	1979 - P	M	M	QTR	BA	US	G

TABLE 20 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Upper and Lower East Coast Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
C17SR702*	264535	800515	A small weir structure located on C-17. The water flows northward toward S-44 into C-17 over this structure, and the water samples are collected from the 45th Street bridge upstream of weir.	79 - 96	MF	MF	QTR	BA	US	G
C18G92	265434	801033	G-92 is a small culvert type structure located on the C-18 canal. Water flows toward the north through this structure out of C-18.	1982 - P	MF	MF	QTR	BA	US	G
C18S46	265610	800833	S-46 is a spillway coastal structure on the C-18 canal about one mile east of the Florida Turnpike. The water flows northeast into the southwest fork of the Loxahatchee River.	1979 - P	M	M	QTR	BA	US	G
C18SR710*	265220	801451	A small weir structure located on C-18 at State Road 710. Water flows eastward over this structure.	79 - 96	MF	MF	QTR	BA	US	G
C44S80	270639	801706	S-80 is a large spillway and boat lock coastal structure located on the St. Lucie Canal and operated by the United States Army Corps of Engineers. The water flows northeast through this structure into the St. Lucie River.	1979 - P	M	M	QTR	BA	US	G
C23S48	271209	801805	S-48 is a large weir coastal structure located downstream of S-97 on C-23. The water flows eastward over this structure and into the St. Lucie River.	1979 - P	M	M/W	QTR	BA	US	G/A

TABLE 20 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Upper and Lower East Coast Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
C23S97*	271218	802027	S-97 is a spillway on the C-23 canal about 1/2 mile west of the turnpike. Water flows east through this structure.	79 - 96	MF	MF	QTR	BA	US	G
C24S49	271549	802131	S-49 is a spillway coastal structure located on the C-24 canal in Port St. Lucie. This structure is about 1/2 mile west of the turnpike. The water flows toward the east through this structure and into the St. Lucie River.	1979 - P	M	M/W	QTR	BA	US	G/A
C25S50	272818	802012	S-50 is a large coastal weir structure located on the C-25 canal near Ft. Pierce. This structure is downstream of S-99 and is a coastal structure. Water flows eastward over this structure.	1979 - P	M	M/W	QTR	BA	US	G/A
C25S99*	272820	802848	S-99 is a spillway on the C-25 canal near Ft. Pierce. The water flow at this point is toward the east.	79 - 96	MF	MF	QTR	BA	US	G

* Stations discontinued in 1996.

TABLE 21. Statistics on Select Parameters for the Upper and Lower East Coast Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
C15S40	0.0340	0.2073	0.7710	0.0040	0.1535	0.6130	0.0001	1.3780	5.4400	0.0040	0.2430	2.7390
C15SR809	0.0310	0.2802	1.3240	0.0020	0.1979	1.1900	0.0001	1.7972	6.2700	0.0040	0.3166	3.5920
C16S41	0.0300	0.1835	0.8100	0.0020	0.1251	0.5640	0.0001	1.3918	4.7400	0.0040	0.2028	2.0550
C16SR809	0.0690	0.3431	1.1450	0.0170	0.2571	0.9980	0.5500	1.6830	3.3700	0.0040	0.2402	1.4340
C17S44	0.0210	0.0726	0.2840	0.0020	0.0203	0.2130	0.0001	1.3775	6.6200	0.0040	0.1887	1.9800
C17SR702	0.0150	0.0821	0.5050	0.0020	0.0169	0.2280	0.4100	1.5270	4.8700	0.0040	0.1624	1.0550
C18G92	0.0100	0.0290	0.1450	0.0040	0.0083	0.0790	0.0001	0.9884	2.1500	0.0040	0.0469	0.7860
C18S46	0.0080	0.0403	0.2460	0.0020	0.0162	0.1380	0.0001	1.0537	2.9800	0.0040	0.0449	1.0530
C18SR710	0.0060	0.0338	0.2890	0.0020	0.0091	0.0830	0.0001	1.1873	4.2200	0.0040	0.0456	1.3650
C23S48	0.0330	0.2029	0.5820	0.0060	0.1462	0.5240	0.0001	1.3446	4.0400	0.0040	0.1449	1.2880
C23S97	0.0250	0.2292	0.6660	0.0040	0.1644	0.5120	0.5500	1.5632	4.9900	0.0040	0.1747	1.0830
C24S49	0.0470	0.2583	0.7740	0.0040	0.1887	0.6470	0.0003	1.5793	10.5000	0.0040	0.1325	1.6360
C25S50	0.0040	0.1058	1.0460	0.0020	0.0688	0.3130	0.0001	1.2121	2.6600	0.0040	0.1291	1.0710
C25S99	0.0090	0.1438	0.8900	0.0020	0.0959	0.7100	0.5100	1.5303	11.5000	0.0040	0.1373	1.2930
C44S80	0.0490	0.1306	0.3770	0.0050	0.0810	0.3420	0.0001	1.4826	6.1600	0.0040	0.2087	0.8220
C51S155	0.0290	0.1108	0.3840	0.0040	0.0589	0.1990	0.0001	1.5213	3.6900	0.0040	0.2447	1.7680

SECTION 10

WORKS OF THE DISTRICT PERMIT COMPLIANCE
PROJECT CODE: WOD

Purpose and Scope

The Works of the District Permit Compliance water quality monitoring program encompasses the Lake Okeechobee Drainage Basin. The water quality monitoring program was established by the Works of the District (WOD) Rule, Chapter 40E-61, F.A.C., for the purpose of:

1. Documenting permittee compliance with off site discharge total phosphorus concentration limitations established by the Lake Okeechobee SWIM Plan.

2. Each permitted parcel is evaluated for compliance with Rule 40E-61 Phosphorus concentration limitations.

Sampling Location and Descriptions

There are approximately 175 water quality monitoring stations which are sampled under the WOD Compliance program, however, this number will change continuously as the number of active permits change. The stations are located in Okeechobee, Highlands, Martin, and Glades counties.

Sample site locations are determined by the District's Regulation Department upon permit issuance.

A private laboratory is contracted to perform all analytical work.

Parameters and Sampling Frequencies

Water samples are collected biweekly at all active monitoring locations. Total phosphorus is the only parameter analyzed. Monitoring is performed for a minimum of 12 months. If the site is within compliance of the permit conditions after 12 months, the monitoring is discontinued. If the site exceeds permit conditions, monitoring is continued indefinitely.

District Publications

Albers, J., N. Aumen, J. Zhang,. (1995). Potential for Phosphorus Load Reduction in Diary Runoff in the Lake Okechobee Watershed, Florida. September 1995 Manuscript. (DOR 229)

SECTION 11

LAKE OKEECHOBEE MONITORING PROGRAMS
PROJECT CODE: X = INFLOWS/OUTFLOWS
PROJECT CODES: Y, YS, YGS, YN, YSRG, YNRG, and OLIT = LIMNETIC AND LITTORAL ZONES

Purpose and Scope

The Lake Okeechobee Inflows and Outflows water quality monitoring program encompasses the entire perimeter of Lake Okeechobee. The Lake Okeechobee Limnetic and Littoral Zones water quality monitoring program lies wholly within the confines of the Lake Okeechobee levee. The water quality monitoring programs were established to provide a water quality and nutrient loading data base for:

1. Complying with monitoring requirements of the Lake Okeechobee Operating Permit #50-0679349 issued by the Florida Department of Environmental Protection (FDEP);

2. Determining effectiveness of the implementation of basin management plans in reducing nutrient loadings into the lake as specified in the Surface Water Improvement and Management Act of 1987;

3. Implementing the Lake Okeechobee Technical Advisory Committee's recommendation for a comprehensive monitoring and research plan as described in FDEP's "Lake Okeechobee Monitoring and Research Plan";

4. Determining long and short term trends necessary to identify potential problem areas in terms of water quality degradation, nutrient loadings, and tracking eutrophication of the lake; and

5. Applying eutrophication models in order to verify and refine the nutrient load targets for the lake and rank its trophic status.

Water quality data from Lake Okeechobee are also used to support Lake Okeechobee management reports as required by the Surface Water Improvement Management (SWIM) Act. Evaluation of the data is then used for:

1. Assessing the impact of operating permit management implementations;

2. Verifying water quality models;

3. Examining differences in water quality between the limnetic and littoral zones;

4. Monitoring possible algal blooms in the limnetic and littoral zones; and

5. Providing water quality data in support of nutrient dynamics studies.

6. Monitor for changes in water quality following basin management strategies

Water quality data are also used to establish nutrient budgets for Lake Okeechobee. Nutrient loadings are calculated from nutrient concentrations and flow data from the various inflow/outflow stations.

Historical data collected between 1973 and 1979 provide baseline water quality data prior to implementation of water quality management plans. Comparison with recent sampling data can indicate changes in water quality and allow for better management of the system for environmental enhancement or prevention of degradation. Values that deviate significantly from established criteria may signal a situation requiring immediate attention.

Sampling Locations and Descriptions

The location of the 35 sites monitored under project "X", 17 for project "YSRG" and "YNRG", 11 for project "OLIT", 14 for project "YN", and the 15 for project "YS" are shown in Figures 11 and 12. Tables 22 and 23 list all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 24 contain statistics for each monitoring location.

District Publications

Davis, F. and M. Marshall, (1975). Chemical and Biological Investigations of Lake Okeechobee. January 1973 - June 1974 Interim Report. SFWMD, Tech. Pub. No.75-1. (DRE 54)

Dickson, K. G., A. Federico, J. Lutz. (1978). Water Quality in the Everglades Agricultural Area and its Impact on Lake Okeechobee. SFWMD, Tech. Pub. No. 78-3. (DRE 85)

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Pfeuffer, R. J. (1989). Lake Okeechobee Pesticide Monitoring Report,1987. SFWMD, March 1989 Tech. Memo. (DRE 269)

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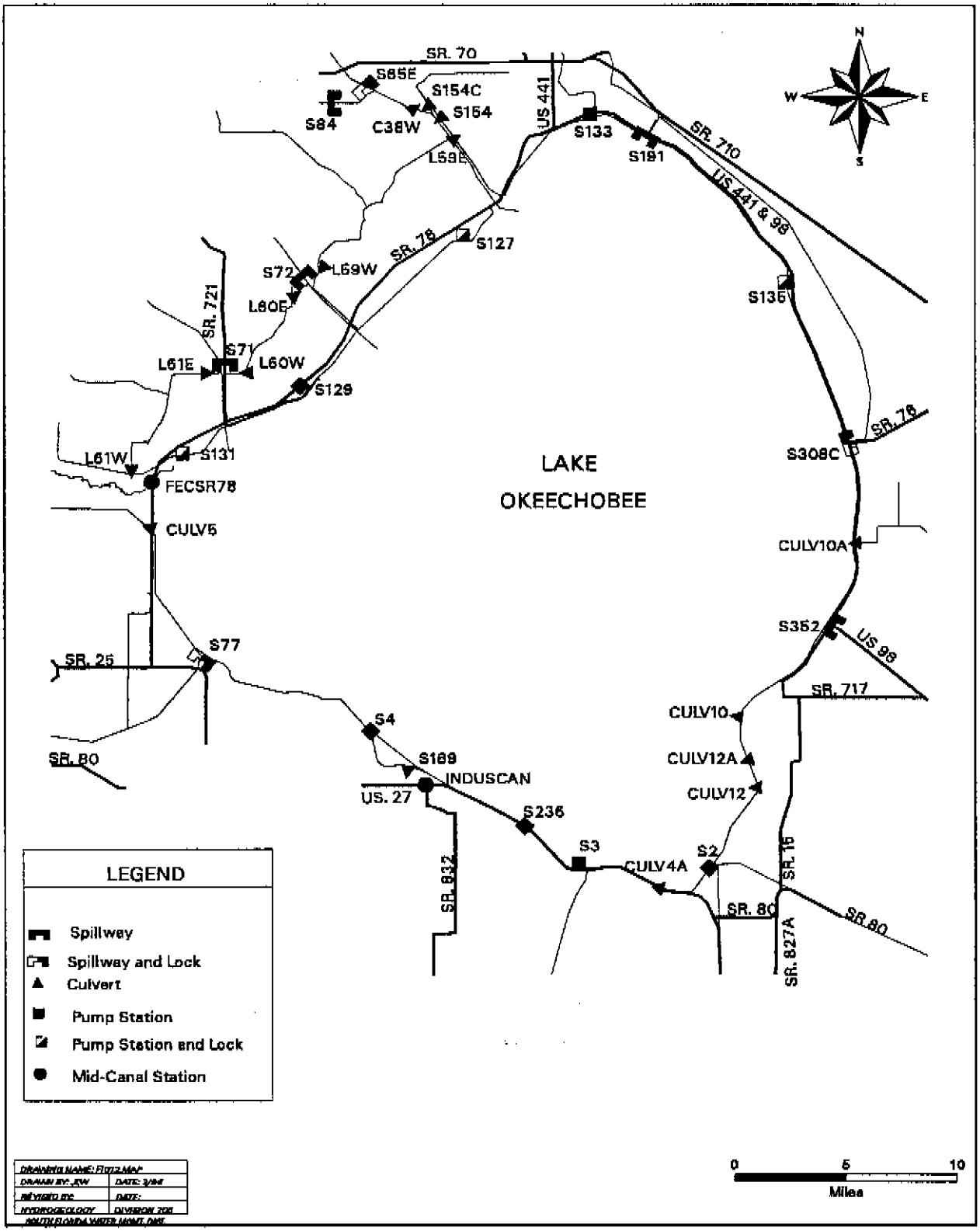

FIGURE 11. Location of Sampling Stations for the Lake Okeechobee Inflow / Outflow Water Quality Monitoring Program.

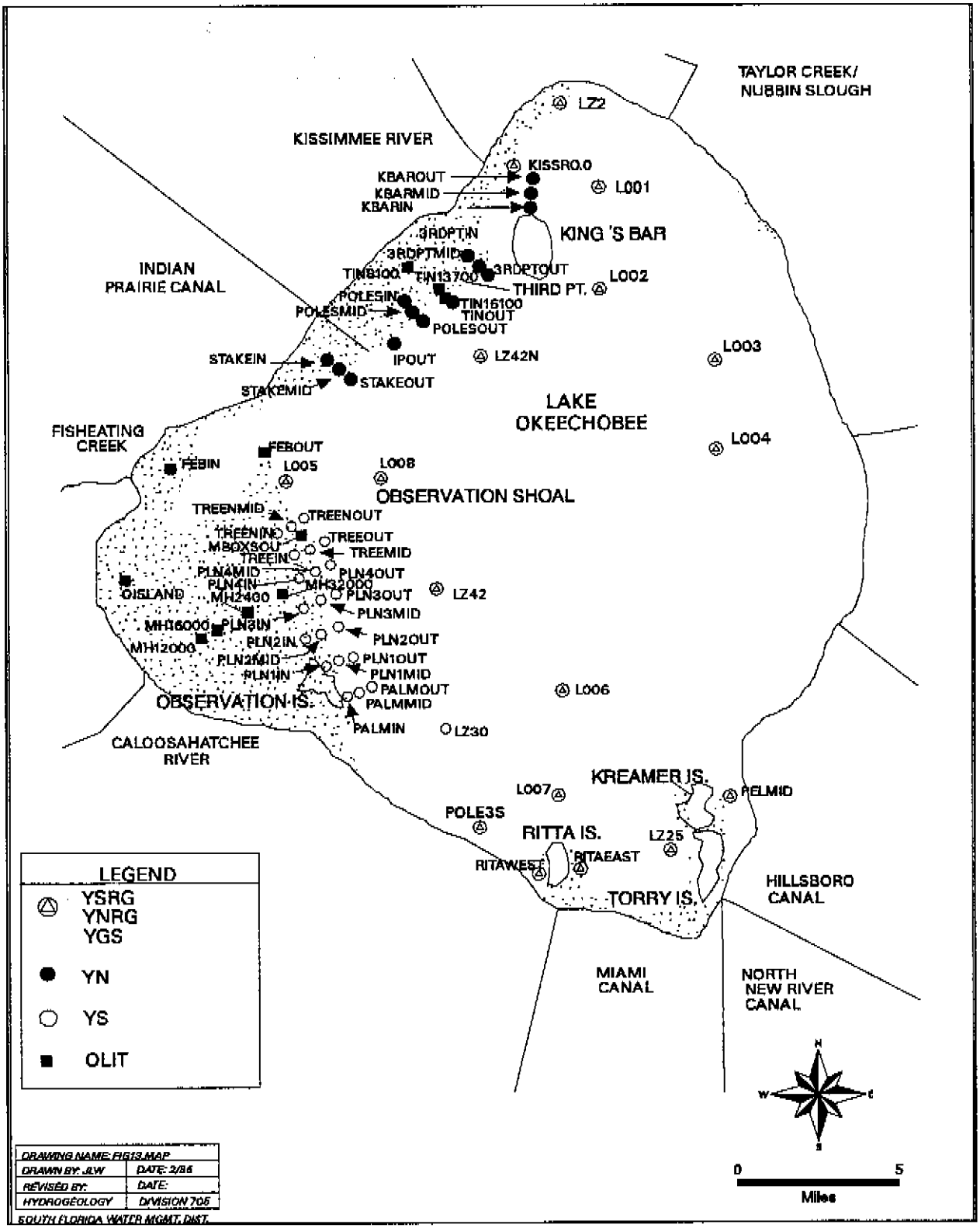

FIGURE 12. Location of Sampling Stations for the Lake Okeechobee Limnetic and Littoral Zone Water Quality Monitoring Program.

TABLE 22. Summary of Sampling Station Locations and Frequency of Collection for the Lake Okeechobee Inflow/Outflow Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
S2	264200	804259	A South Florida Water Management District (SFWMD or District) controlled water pumping station located on the south side of Lake Okeechobee near Belle Glade. It is at the confluence of the Hillsboro and North New River Canals, and pumps into Lake Okeechobee. When water is let out of the lake it discharges through S351 which is next to S2. When this occurrs the sample is collected from the canal side of S351,however, the station code is written as S2 with a discharge code of 3.	1973 - P	BWF/M	W/BWF/M	QTR	QTR	US/DS	G/A
S3	264155	804827	A District controlled water pumping station located on the south side of Lake Okeechobee at Lake Harbor. Water is pumped from the Miami Canal into Lake Okeechobee. When water is let out of the lake it discharges through S354 which is next to S3. When this occurrs the sample is collected from the canal side of S354, however, the station code is written as S3 with a discharge code of 3.	1973 - P	BWF/M	W/BWF/M	QTR	QTR	US/DS	G/A
S4	264722	805743	A District controlled water pumping station on C-20 near Clewiston that pumps water into Lake Okeechobee.	1976 - P	BWF/M	W/BWF/M	QTR	QTR	US	G
INDUSCAN	264514	805508	Water samples from this station are collected from the bridge over the Industrial Canal in Clewiston on County Road 832.	1982 - P	BWF/M	BWF/M	QTR	QTR	-	G
S77	265023	810518	A large spillway type structure and locks operated by the COE. It is located at the head of the Caloosahatchee River where water from Lake Okeechobee is discharged down the river.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
FECSR78	265744	810715	Water samples from this station are collected from the bridge on State Road 78 where it crosses Fisheating Creek. Water can flow towards Lake Okeechobee or water can flow west in this canal at this point depending on water stages.	1973 - P	BWF/M	BWF/M	QTR	QTR	-	G

TABLE 22 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lake Okeechobee Inflow/Outflow Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
S71	270201	811811	A spillway type structure and pump station located near the west side of Lake Okeechobee on Harney Pond Canal (C-41) about 1.5 miles northwest of State Road 78.	1973 - P	BW	BW	QTR	QTR	US	G
S72	270532	810023	A gate type structure located near the northwest side of Lake Okeechobee, in C-40 about two miles northwest of State Road 78.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
S65E	271335	805742	A large gate and boat lock structure on the Kissimmee River, 8 1/2 miles northwest of Lake Okeechobee. This is the southernmost structure on the Kissimmee River, and it discharges water into Lake Okeechobee.	1973 - P	QTR	QTR	QTR	QTR	US	G
S84	271250	805830	A gate type structure where C-41A intersects the Kissimmee River. Water flows into the Kissimmee River through this structure.	1973 - P	BW	BW	QTR	QTR	US	G
S191	271135	804535	A large gate type structure on the north side of Lake Okeechobee at Nubbin Slough. Water flows into the lake through this structure. Water samples are collected from the north side of this structure.	1973 - P	BW	BW	QTR	QTR	US	G
S308C	265904	803717	A COE gated structure and boat lock on the St. Lucie Canal (C-44) at Lake Okeechobee. Water can flow in or out of the lake through this structure. Water samples are collected from the lake side of this structure.	73-74/81-P	BWF/M	BWF/M	QTR	QTR	US	G

TABLE 22 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lake Okeechobee Inflow/Outflow Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
S352	265145	803755	S352(formerly HGS5) is a spillway gate structure operated by the United States Army Corps of Engineers (COE). S352 is on the east side of Lake Okeechobee near Canal Point. Water is released out of Lake Okeechobee through this structure, however, water can flow into the lake when lake levels are low. In 1989 the HGS5 structure was replaced and renamed S352.	1973 - P	BWF/M	BWF/M	QTR	QTR	DS	G/A
CULV4A	264056	804502	A small private pumping station on US-27, 2 1/2 miles west of Belle Glade that pumps water from the South Shore Drainage District into Lake Okeechobee via Culvert 4A. Water samples are collected from the upstream side of the pump. Water can gravity flow out of the Lake through this pump.	1979 - P	BWF/M	BWF/M	QTR	QTR	US	G
CULV10	264753	804146	There are four private pump stations associated with CULV10, CULV10A, CULV12, and CULV12A. These sites are located on the southeast side of Lake Okeechobee. The pumps belong to East Beach Water Control District, Closter Farms, East Shore Drainage District, and East Shore Water Control District. Water is pumped into Lake Okeechobee through these four structures. Water can also gravity flow out of the Lake through these pumps. Water samples are collected from the upstream side of each pump station.	1979 - P	BWF/M	BWF/M	QTR	QTR	US	G
CULV10A	265501	803650		1987 - P	BWF/M	BWF/M	QTR	QTR	US	G
CULV12	264455	804105		1979 - P	BWF/M	BWF/M	QTR	QTR	US	G
CULV12A	264634	804137		1979 - P	BWF/M	BWF/M	QTR	QTR	US	G
S127	270719	805346	A District controlled water pumping station and boat lock located on the Rim Canal on the northwest side of Lake Okeechobee. This station is located between C-40 and the Kissimmee River (C-38). Water is pumped through this structure into Lake Okeechobee. Water can also be allowed to gravity flow back through these pumps to let water out of the lake.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G

TABLE 22 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lake Okeechobee Inflow/Outflow Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
S129	270147	810006	A District controlled water pumping station located on the Rim Canal on the northwest side of Lake Okeechobee. This structure is between C-41 and Indian Prairie Canal (C-40). Water is pumped through this structure. Water can also be allowed to gravity flow back through these pumps to let water out of the lake.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
S131	265843	810526	A District controlled water pumping station and boat lock located on the west side of Lake Okeechobee, north of Fisheating Creek. Water is pumped into the lake through this structure. Water can also gravity flow back through these pumps to let water out of the lake.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
S133	271228	804802	A District controlled water pumping station on the north side of Lake Okeechobee near Taylor Creek. Water is pumped into Lake Okeechobee through this structure. Water can also be allowed to gravity flow back through these pumps to let water out of the lake.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
S135	270510	803941	A District controlled water pumping station and lock located on the northeast side of Lake Okeechobee. Water is pumped through the structure into Lake Okeechobee. Water can also be allowed to gravity flow back through these pumps to let water out of the lake.	1973 - P	BWF/M	BWF/M	QTR	QTR	US	G
S154	271241	805506	A small gate type structure located on the east side of the Kissimmee River about half way between Lake Okeechobee and S-65E. This structure allows water to flow from the L-62 canal into C-38.	1978 - P	BW	BW	QTR	QTR	US	G
S169	264545	815730	A spillway gate structure near the boat ramp and the S-310 boat locks in Clewiston. This structure lets water flow east or west depending on water stage.	1985 - P	BWF/M	BWF/M	QTR	QTR	US	G
S236	264340	805111	A small pumping station on US-27 between S-3 and Clewiston that pumps water from the South Florida Conservancy District into Lake Okeechobee.	1979 - P	BWF/M	BWF/M	QTR	QTR	US	G

TABLE 22 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Lake Okeechobee Inflow/Outflow Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
CULV5	265533	810722	A culvert and flap gate located on the west side of Lake Okeechobee near State Road 78, south of Fisheating Creek. The water samples are collected from the bridge on State Road 78.	1987,1989-P	BWF/M	BWF/M	QTR	QTR		G
L61W	265806	810811	A culvert located at the west end of the L-61 canal where it meets the L-50 canal.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
L61E	270158	810518	A culvert located at the east end of the L-61 canal immediately down stream of S-71 on Harney Pond canal.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
L60W	270157	810310	A culvert located at the west end of the L-60 canal immediately down stream of S-71 on the Harney Pond canal.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
L60E	270504	810128	A culvert located at the east end of the L-60 canal immediately down stream of S-72 on the Indian Prairie canal.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
L59W	270625	805958	A culvert located at the west end of the L-59 canal immediately down stream of S-72 on the Indian Prairie canal.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
L59E	271130	805412	A gated structure located at the east end of the L-59 canal at C-38.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
C38W	271159	805436	A gated structure located on the west side of C-38, three miles south of S-65E.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G
S154C	271237	805507	A gated structure located on the east side of C-38 next to S-154.	1987,1989-P	BWF/M	BWF/M	QTR	QTR	US	G

TABLE 23. Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
L001	270790	804730	North end of Lake Okeechobee 4 1/2 miles south of Taylor Creek Locks (S-193).	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L002	270450	804725	Army Corps of Engineers(COE) tower on the north end of Lake Okeechobee about 7 1/2 miles south of Taylor Creek Locks (S-193).	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L003	270250	804255	East side of Lake Okeechobee, west of Florida Power and Light Indian Town power plant smoke stacks.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L004	265870	804255	East side of Lake Okeechobee four miles due south of L003, west of the Port Mayaca bridge.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L005	265695	805783	COE tower on the west side of Lake Okeechobee, east of Fisheating Creek.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L006	264908	804684	COE tower at the south end of Lake Okeechobee.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L007	264620	804708	South end of Lake Okeechobee 3 1/4 miles south of L006.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
L008	265695	805350	L008 is about 4 1/2 miles due east of L005.	1972 - P	BW/M	BW/M	QTR	QTR	BW/M	G
LZ2	271140	804954	City of Okeechobee potable water supply intake in Lake Okeechobee on the north side of the lake.	1978 - P	BW/M	BW/M	QTR	QTR	BW/M	G
KISSR0.0	270803	805037	KISSR0.0 is at the mouth of the Kissimmee River near the north side of Lake Okeechobee.	1986 - P	BW/M	BW/M	QTR	QTR	BW/M	G
KBARIN	270748	805052	At the north end of Kings Bar in the marsh near the north side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G

TABLE 23 (Continued). Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
KBARMID	270802	805103	100 yards north of station KBARIN in the marsh near the north side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
KBAROUT	270821	805059	100 yards north of station KBARMID in the lake near the north side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
3RDPTIN	270414	805222	West of Kings Bar at Third Point in the marsh at the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
3RDPTMID	270394	805209	100 yards southeast of station 3RDPTIN in the marsh at the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
3RDPTOUT	270386	805193	100 yards southeast of station 3RDPTMID in the lake at the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
STAKEIN	270108	805652	1/2 mile southwest of Indian Prairie Canal (C-40) in the marsh on the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
STAKEMID	270100	805635	100 yards southeast of station STAKEIN in the marsh on the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
STAKEOUT	270097	805612	100 yards southeast of station STAKEMID in the lake on the northwest side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
TREEIN	265430	805863	On the east side of Observation Shoal out from a lone Cypress tree in the marsh near the west side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G

TABLE 23 (Continued). Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
TREEMID	265434	805873	100 yards northeast of station TREEIN in the marsh near the west side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
TREEOUT	265440	805836	100 yards northeast of station TREEMID in the lake near the west side of Lake Okeechobee.	1986 - P	TW	TW	QTR	QTR	TW	G
TREENOUT	265544	805861	One mile northwest of TREEOUT near Observation Shoal, 100 yards off shore.	1988 - P	TW	TW	QTR	QTR	TW	G
PALMIN	264955	805686	South end of Observation Island in the marsh on the west side of the Lake, one mile north of Uncle Joe's Pass.	1986 - P	QTR	QTR	QTR	QTR	QTR	G
PALMMID	264955	805673	100 yards east of station PALMIN in the marsh near the west side of Lake Okeechobee.	1986 - P	QTR	QTR	QTR	QTR	QTR	G
PALMOUT	264960	805659	100 yards east of station PALMMID in the lake near the west side of Lake Okeechobee.	1986 - P	QTR	QTR	QTR	QTR	QTR	G

TABLE 23 (Continued). Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
PLN1OUT	265062	805674	One mile northwest of PALMOUT, 100 yards off shore	1988 - P	QTR	QTR	QTR	QTR	QTR	G
PLN2IN	265170	805708	1 mile north west of PLN1IN in the marsh near the western side of Lake Okeechobee near Observation Island.	1988 - P	TW	TW	QTR	QTR	TW	G
PLN2MID	265167	805696	100 yards east of PLN2IN in the marsh near the western side of Lake Okeechobee.	1988 - P	TW	TW	QTR	QTR	TW	G
PLN2OUT	265177	805682	100 yards east of PLN2MID in the lake near the western side of Lake Okeechobee.	1988 - P	TW	TW	QTR	QTR	TW	G
PLN3OUT	265276	805719	One mile south of PLN4OUT	1988 - P	QTR	QTR	QTR	QTR	QTR	G
PLN4OUT	265378	805778	1.5 miles southeast of TREEOUT, just south of middle pole.	1988 - P	QTR	QTR	QTR	QTR	QTR	G

TABLE 23 (Continued). Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
LZ30	264822	805150	Potable water supply intake for the city of Clewiston in Lake Okeechobee near the southwest side of the lake.	1978 - P	BW/M	BW/M	QTR	QTR	BW/M	G
POLE3S	264419	805024	One mile west of Ritta Island and north of S-3.	1994 - P	BW/M	BW/M	QTR	QTR	BW/M	G
RITAWEST	264410	804941	West side of Rita Island near the south end of Lake Okeechobee.	1986 - P	BW/M	BW/M	QTR	QTR	BW/M	G
RITAEAST	264327	804737	East side of Rita Island at the northern most channel marker near the south end of Lake Okeechobee.	1986 - P	BW/M	BW/M	QTR	QTR	BW/M	G
LZ25	264452	804522	100 yards west of Torry Island in the lake near the south end of Lake Okeechobee.	1978 - P	BW/M	BW/M	QTR	QTR	BW/M	G
PELMID	264629	804257	Middle of Pelican Bay, which is east of Kreamer Island, near the south end of Lake Okeechobee.	1986 - P	BW/M	BW/M	QTR	QTR	BW/M	G
TINOUT	270353	805301	At stage recorder platform in Tin House Cove.	1988 - P	QTR	QTR	QTR	QTR	QTR	G
POLESIN	270292	805459	In the marsh about 2 miles north east of Indian Prairie Canal near the north west side of Lake Okeechobee.	1988 - P	TW	TW	QTR	QTR	TW	G
POLESMID	270287	805447	100 yards south east of POLESIN in the marsh near the north west side of Lake Okeechobee.	1988 - P	TW	TW	QTR	QTR	TW	G
POLESOUT	270281	805439	100 yards south east of POLESMID in the lake near the north west side of Lake Okeechobee.	1988 - P	TW	TW	QTR	QTR	TW	G
IPOUT	270185	805483	0.5 miles northeast of Indian Prairie Canal, 100 yards off shore.	1988 - P	QTR	QTR	QTR	QTR	QTR	G

TABLE 23 (Continued). Summary of Sampling Locations and Frequency of Collection for the Lake Okeechobee Limnetic and Littoral Zone Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chlorophylls	G/A
LZ42N	270256	805345	0.5 miles out from the littoral zone near the north west side of Lake Okeechobee.	1990 - P	BW/M	BW/M	QTR	QTR	BW/M	G
LZ42	265300	805500	2.5 miles out from the littoral zone near the south west side of Lake Okeechobee.	1990 - P	BW/M	BW/M	QTR	QTR	BW/M	G
LZ40	265408	804718	South central lake Okeechobee at instrument tower.	78-79,90,93-95,96-P	BW/M	BW/M	QTR	QTR	BW/M	G/A
TIN8100	270514	805415	Tin House Cove, in the littoral zone at stage guage platform, 8100 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
TIN13700	270426	805335	Tin House Cove, mid way through the littoral zone at stage guage platform, 13700 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
TIN16100	270407	805319	Tin House Cove, outter edge of littoral zone at stage guage platform, 16100 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
FEBOUT	265832	810032	Fisheating Bay outter station in open water.	1996 - P	M	M	M	-	M	G
FEBIN	265756	810417	Fisheating Bay in station in open water.	1996 - P	M	M	M	-	M	G
MBOXSOU	265427	815317	Unimpacted open water site southeast of the Monkey Box.	1996 - P	M	M	M	-	M	G
MH32000	265317	805950	Moore Haven transect, 32000 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
MH24000	265237	810111	Moore Haven transect, 24000 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
MH16000	265159	810225	Moore Haven transect, 16000 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
MH12000	265141	810304	Moore Haven transect, 12000 feet out from the rim canal.	1996 - P	M	M	M	-	M	G
OISLAND	265347	810603	Observation Island.	1996 - P	M	M	M	-	M	G

TABLE 24. Statistics on Select Parameters for the Lake Okeechobee Inflow/Outflow Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
C38W	0.0610	0.4019	0.9280	0.0040	0.1606	0.6460	0.0003	3.1012	10.0500	0.0040	0.0288	1.2090
CULV10	0.0190	0.2363	1.2720	0.0020	0.1339	0.8320	0.0003	4.5728	25.8900	0.0040	0.7377	16.1500
CULV10A	0.0190	0.1258	0.8220	0.0040	0.0541	0.7750	0.0002	2.2528	26.6000	0.0040	0.4069	21.4050
CULV12	0.0040	0.1181	0.4030	0.0020	0.0561	0.2730	0.0003	4.4496	24.2000	0.0040	1.1698	14.7320
CULV12A	0.0300	0.1939	0.9720	0.0020	0.1183	0.8120	0.0002	4.3852	16.9100	0.0040	0.3327	9.8770
CULV4A	0.0020	0.0775	0.2120	0.0020	0.0281	0.1490	0.8600	3.5799	20.1000	0.0040	0.5648	14.4200
CULV5	0.0120	0.0546	0.3960	0.0040	0.0128	0.1360	0.0003	1.6196	3.9500	0.0040	0.0274	0.3400
FECSR78	0.0260	0.1599	1.2800	0.0020	0.1021	1.0790	0.0001	1.7316	6.3600	0.0040	0.0438	1.8590
INDUSCAN	0.0340	0.1560	1.4460	0.0010	0.0881	1.3250	0.5100	2.8153	7.9700	0.0040	0.6795	4.2510
L59E	0.0400	0.2051	0.8050	0.0040	0.0905	0.3260	0.0001	2.2832	7.7100	0.0040	0.0557	0.9430
L59W	0.0500	0.1869	1.2870	0.0130	0.1266	0.8440	0.5100	1.6046	4.0700	0.0040	0.1013	0.7090
L60E	0.0500	0.1522	0.7280	0.0140	0.0899	0.3770	0.0001	1.5807	7.0900	0.0040	0.1107	0.6880
L60W	0.0380	0.1309	0.6400	0.0110	0.0856	0.4830	0.8270	1.9311	5.0100	0.0040	0.5622	3.2240
L61E	0.0330	0.1270	0.4060	0.0040	0.0746	0.3200	0.0001	1.7619	4.0600	0.0040	0.4112	1.8050
L61W	0.0320	0.0935	0.3100	0.0060	0.0347	0.1020	0.5000	1.5842	3.8400	0.0040	0.0515	0.9590
S127	0.0220	0.2510	0.8310	0.0030	0.1677	0.7120	0.0002	2.2101	6.9200	0.0040	0.0797	3.4220
S129	0.0250	0.1200	0.7680	0.0020	0.0610	0.4440	0.0002	1.8459	4.7600	0.0040	0.0488	1.4210
S131	0.0001	0.0954	0.5680	0.0020	0.0465	0.3950	0.0002	1.6919	4.1000	0.0040	0.0559	0.8060
S133	0.0310	0.2225	0.8800	0.0020	0.1352	0.6500	0.0001	1.9035	6.4000	0.0040	0.1240	4.0460
S135	0.0020	0.0896	1.1050	0.0020	0.0336	0.3040	0.0002	1.7624	7.9600	0.0040	0.0640	1.1220
S154	0.0510	0.6263	2.5900	0.0020	0.4722	2.3400	0.0002	1.9406	11.9600	0.0040	0.0431	0.6830
S154C	0.0290	0.2600	1.6420	0.0040	0.1869	1.4030	0.0001	1.3547	6.4500	0.0040	0.0383	0.8690
S169	0.0250	0.1133	0.8930	0.0020	0.0412	0.7060	0.0002	2.0776	6.1600	0.0040	0.2916	3.3360
S191	0.0100	0.7340	2.1080	0.0020	0.6099	1.4370	0.0001	2.0359	6.2400	0.0040	0.3954	4.9120
S2	0.0150	0.1330	0.8320	0.0020	0.0688	0.3960	0.0002	4.2848	18.7100	0.0002	1.3089	11.5590
S236	0.0250	0.0836	0.2940	0.0020	0.0277	0.1290	0.7300	4.0044	13.0800	0.0050	0.7184	8.6210
S3	0.0030	0.1029	1.1200	0.0010	0.0475	0.8800	0.0002	3.7269	13.0700	0.0002	1.5960	8.9870
S308C	0.0100	0.1403	0.4440	0.0020	0.0533	0.3450	0.0002	1.9060	7.1100	0.0040	0.2125	1.7190
S352	0.0580	0.1430	0.5690	0.0040	0.0635	0.5410	0.0002	2.0690	5.3200	0.0040	0.2726	1.5240
S4	0.0190	0.1762	1.4120	0.0020	0.1105	1.2470	0.0001	2.6395	21.2700	0.0040	0.3016	3.9830
S65E	0.0240	0.1035	0.4900	0.0020	0.0590	0.3610	0.0001	1.4574	4.4100	0.0040	0.0905	0.9110

TABLE 24. Statistics on Select Parameters for the Lake Okeechobee Inflow/Outflow Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
S71	0.0350	0.1712	0.7910	0.0020	0.1173	0.7560	0.0001	2.1488	7.4000	0.0040	0.5459	3.6030
S72	0.0180	0.1640	0.9170	0.0020	0.1046	0.7900	0.0001	1.9739	7.4000	0.0040	0.1592	1.2660
S77	0.0080	0.0833	0.5260	0.0020	0.0380	0.4700	0.0002	1.8243	7.7200	0.0040	0.0926	1.4720
S84	0.0090	0.0538	0.9100	0.0020	0.0220	0.3810	0.0001	1.2978	4.9000	0.0040	0.1025	1.2410

TABLE 25. Statistics on Select Parameters for the Lake Okeechobee Limnetic and Littoral Zone Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
3RDPTIN	0.0100	0.0773	0.6050	0.0040	0.0146	0.1630	0.5600	1.4433	4.2600	0.0040	0.0258	0.1580
3RDPTMID	0.0070	0.0550	0.1880	0.0040	0.0100	0.0640	0.0001	1.2999	2.1800	0.0040	0.0267	0.2310
3RDPTOUT	0.0080	0.0594	0.1580	0.0040	0.0114	0.0760	0.5500	1.3392	2.4300	0.0040	0.0257	0.2360
IPOUT	0.0270	0.0660	0.3050	0.0040	0.0080	0.0420	0.0002	1.3800	2.0300	0.0040	0.0186	0.1820
KBARIN	0.0110	0.0727	0.3750	0.0040	0.0177	0.1300	0.0001	1.3784	4.2100	0.0040	0.0256	0.2730
KBARMID	0.0100	0.0629	0.3260	0.0040	0.0185	0.2230	0.0001	1.2876	2.9800	0.0040	0.0341	0.2880
KBAROUT	0.0260	0.0813	0.3310	0.0040	0.0259	0.1950	0.0001	1.3568	2.8300	0.0040	0.0423	0.3400
KISSR0.0	0.0360	0.0968	0.2920	0.0040	0.0397	0.1890	0.0001	1.2998	2.4900	0.0040	0.0609	0.4240
L001	0.0190	0.0794	0.2460	0.0020	0.0188	0.1340	0.0001	1.5464	5.6800	0.0010	0.0777	0.5330
L002	0.0080	0.1940	10.1300	0.0020	0.0257	0.4040	0.0001	1.2854	8.9000	0.0010	0.1239	0.5750
L003	0.0140	0.0872	0.3020	0.0020	0.0226	0.0770	0.0002	1.6369	4.3600	0.0010	0.1346	0.9960
L004	0.0120	0.0925	0.2860	0.0020	0.0258	0.0850	0.0001	1.6336	3.6300	0.0010	0.1459	0.6350
L005	0.0040	0.2094	7.4900	0.0010	0.0127	0.1970	0.0001	2.4674	85.2000	0.0010	0.0660	1.2710
L006	0.0150	0.1193	0.6730	0.0010	0.0293	0.0990	0.0001	1.6754	8.8900	0.0010	0.1964	0.8370
L007	0.0100	0.0704	0.3650	0.0020	0.0227	0.0880	0.0001	1.5919	9.2400	0.0010	0.1551	0.6760
L008	0.0160	0.0867	0.2450	0.0020	0.0189	0.0970	0.2300	1.6854	4.0800	0.0010	0.1247	0.8970
LZ2	0.0200	0.0855	0.3450	0.0020	0.0220	0.2460	0.0002	1.4492	2.7200	0.0040	0.0380	0.3870
LZ25	0.0130	0.0688	0.3330	0.0020	0.0130	0.1210	0.5000	1.6111	8.9400	0.0040	0.0686	0.8080
LZ30	0.0130	0.0761	0.2440	0.0020	0.0219	0.0780	0.5200	1.4692	4.5900	0.0040	0.1254	0.5380
LZ40	0.0180	0.1531	1.3560	0.0020	0.0424	0.1340	0.0001	1.3125	4.5000	0.0040	0.1949	0.8310
LZ42	0.0260	0.0805	0.2420	0.0040	0.0195	0.0690	0.0001	1.3736	3.4100	0.0040	0.1172	0.5370
LZ42N	0.0220	0.0681	0.1600	0.0040	0.0141	0.1200	0.0001	1.3372	2.6200	0.0040	0.0460	0.3420
PALMIN	0.0040	0.0412	0.2530	0.0030	0.0068	0.0570	0.0001	1.4385	5.5200	0.0040	0.0178	0.2240
PALMMID	0.0080	0.0356	0.1390	0.0020	0.0063	0.0530	0.7200	1.4055	3.1000	0.0040	0.0143	0.2250
PALMOUT	0.0040	0.0404	0.1380	0.0010	0.0071	0.0620	0.0001	1.4876	4.6200	0.0040	0.0158	0.3980
PELMID	0.0120	0.0783	0.3050	0.0030	0.0218	0.0930	0.5150	1.5315	3.2300	0.0040	0.1347	1.0220
PLN1OUT	0.0050	0.0360	0.1390	0.0030	0.0056	0.0540	0.5000	1.4594	2.4400	0.0040	0.0108	0.2310
PLN2IN	0.0060	0.0616	0.3390	0.0020	0.0114	0.0900	0.0001	1.4801	3.4800	0.0040	0.0253	0.3960
PLN2MID	0.0120	0.0468	0.1690	0.0020	0.0063	0.0500	0.7200	1.5648	10.6000	0.0040	0.0217	0.4080
PLN2OUT	0.0100	0.0391	0.1490	0.0010	0.0064	0.0480	0.0001	1.4173	2.8500	0.0040	0.0164	0.3990
PLN3OUT	0.0080	0.0358	0.1590	0.0010	0.0061	0.0440	0.5000	1.3792	2.1600	0.0040	0.0117	0.2490
PLN4OUT	0.0120	0.0385	0.1440	0.0020	0.0056	0.0370	0.5000	1.4269	2.1900	0.0040	0.0133	0.3580

TABLE 25. Statistics on Select Parameters for the Lake Okeechobee Limnetic and Littoral Zone Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
POLE3S	0.0170	0.0714	0.1950	0.0040	0.0135	0.0560	0.9320	1.4773	2.4700	0.0040	0.0837	0.5500
POLESIN	0.0160	0.0804	0.3160	0.0040	0.0181	0.1870	0.0002	1.3749	3.7400	0.0040	0.0200	0.1420
POLESMID	0.0110	0.0550	0.1830	0.0040	0.0092	0.0670	0.0001	1.2705	2.6200	0.0040	0.0229	0.2140
POLESOUT	0.0200	0.0562	0.1840	0.0040	0.0096	0.1940	0.0002	1.3408	2.7000	0.0040	0.0161	0.2950
RITAEAST	0.0040	0.0426	0.1660	0.0030	0.0066	0.0550	0.0002	1.5199	3.4700	0.0040	0.0322	0.5990
RITAWEST	0.0040	0.0514	0.2000	0.0040	0.0079	0.0840	0.7000	1.5790	3.7600	0.0040	0.0385	1.2000
STAKEIN	0.0080	0.0490	0.2690	0.0040	0.0125	0.2920	0.0001	1.3326	3.1500	0.0040	0.0174	0.1830
STAKEMID	0.0070	0.0459	0.1880	0.0040	0.0101	0.2250	0.0001	1.3240	4.6200	0.0040	0.0211	0.2040
STAKEOUT	0.0140	0.0661	1.0600	0.0040	0.0168	1.1230	0.5000	1.4230	2.6500	0.0040	0.0231	0.3230
TINOUT	0.0120	0.0391	0.1420	0.0040	0.0069	0.0550	0.5900	1.3475	2.6600	0.0040	0.0119	0.1480
TREEIN	0.0140	0.0765	0.3560	0.0030	0.0178	0.1970	0.5000	1.6233	3.7000	0.0040	0.0256	0.4290
TREEMID	0.0150	0.0575	0.2540	0.0020	0.0090	0.0670	0.0001	1.5260	3.1900	0.0040	0.0236	0.4040
TREENOUT	0.0040	0.0410	0.1560	0.0020	0.0063	0.0390	0.0002	1.4719	2.7300	0.0040	0.0130	0.3370
TREEOUT	0.0100	0.0471	0.1560	0.0020	0.0088	0.0950	0.0001	1.5154	6.6000	0.0040	0.0232	0.3870
FEBIN	0.0480	0.1076	0.3600	0.0140	0.0491	0.1910	0.5150	1.1567	1.9500	0.0150	0.0406	0.1400
FEBOUT	0.0370	0.0778	0.1380	0.0040	0.0130	0.0310	1.0600	1.2233	1.5600	0.0110	0.0315	0.0850
MBOXSOU	0.0090	0.0180	0.0250	0.0040	0.0050	0.0080	0.5940	0.9112	1.2400	0.0150	0.0162	0.0200
MH12000	0.0050	0.0141	0.0300	0.0040	0.0044	0.0070	0.7480	1.1000	1.5900	0.0080	0.0233	0.0790
MH16000	0.0040	0.0099	0.0160	0.0040	0.0063	0.0180	0.7990	0.9704	1.2600	0.0060	0.0131	0.0150
MH24000	0.0070	0.0263	0.1090	0.0040	0.0046	0.0080	0.0001	0.8662	1.2300	0.0040	0.0129	0.0150
MH32000	0.0160	0.0219	0.0290	0.0040	0.0057	0.0140	0.9280	1.1006	1.2200	0.0150	0.0171	0.0270
OISLAND	0.0080	0.0311	0.0730	0.0040	0.0043	0.0050	0.7160	1.0596	1.5400	0.0080	0.0136	0.0160
TIN13700	0.0130	0.0250	0.0490	0.0040	0.0042	0.0050	0.5150	0.9471	1.3400	0.0040	0.0276	0.0660
TIN16100	0.0660	0.0907	0.1330	0.0040	0.0200	0.0490	0.5150	1.1702	1.8300	0.0150	0.0835	0.2830
TIN8100	0.0040	0.0111	0.0170	0.0040	0.0047	0.0070	0.8400	1.2114	1.4900	0.0080	0.0134	0.0150

SECTION 12

CALOOSAHATCHEE RIVER
PROJECT CODE: CR

Purpose and Scope

The Caloosahatchee River water quality monitoring program was established in 1979, and extends from Lake Okeechobee west to the coastal structure that releases fresh water to the Caloosahatchee Estuary. The water quality monitoring program provides a water quality and nutrient loading data base for:

1. Determining loadings to the Caloosahatchee River estuary;

2. Assessing potential downstream impacts on the Caloosahatchee River estuary.;

3. Implementing LOTAC's recommendation for a comprehensive monitoring and research plan as described in the Department of Environmental Protection "Lake Okeechobee Monitoring and Research Plan"; and

4. Determining long and short term trends necessary to identify potential problem areas in terms of water quality degradation and nutrient loadings.

Water quality data from the Caloosahatchee River are also used to determine the effect of Lake Okeechobee discharges and tributary impacts on the Caloosahatchee River.

Sampling Locations and Descriptions

The locations of the four sites monitored under this program are shown on Figure 13. Table 26 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 27 contain statistics for each monitoring location.

District Publications

Lake Okeechobee Monitoring and Research Plan, 1986, FDEP.

Miller, T. H., A. Federico, J. Milleson. (1982). A Survey of Water Quality Characteristics and Chlorophyll a Concentrations in the Caloosahatchee River System, Florida. July 1982. SFWMD, Tech. Pub. No. 82-4. (DRE 155)

Scarlatos, P. (1988). Caloosahatchee River Estuary Dynamics. SFWMD, Tech. Pub. No.88-7 . (DRE 256)

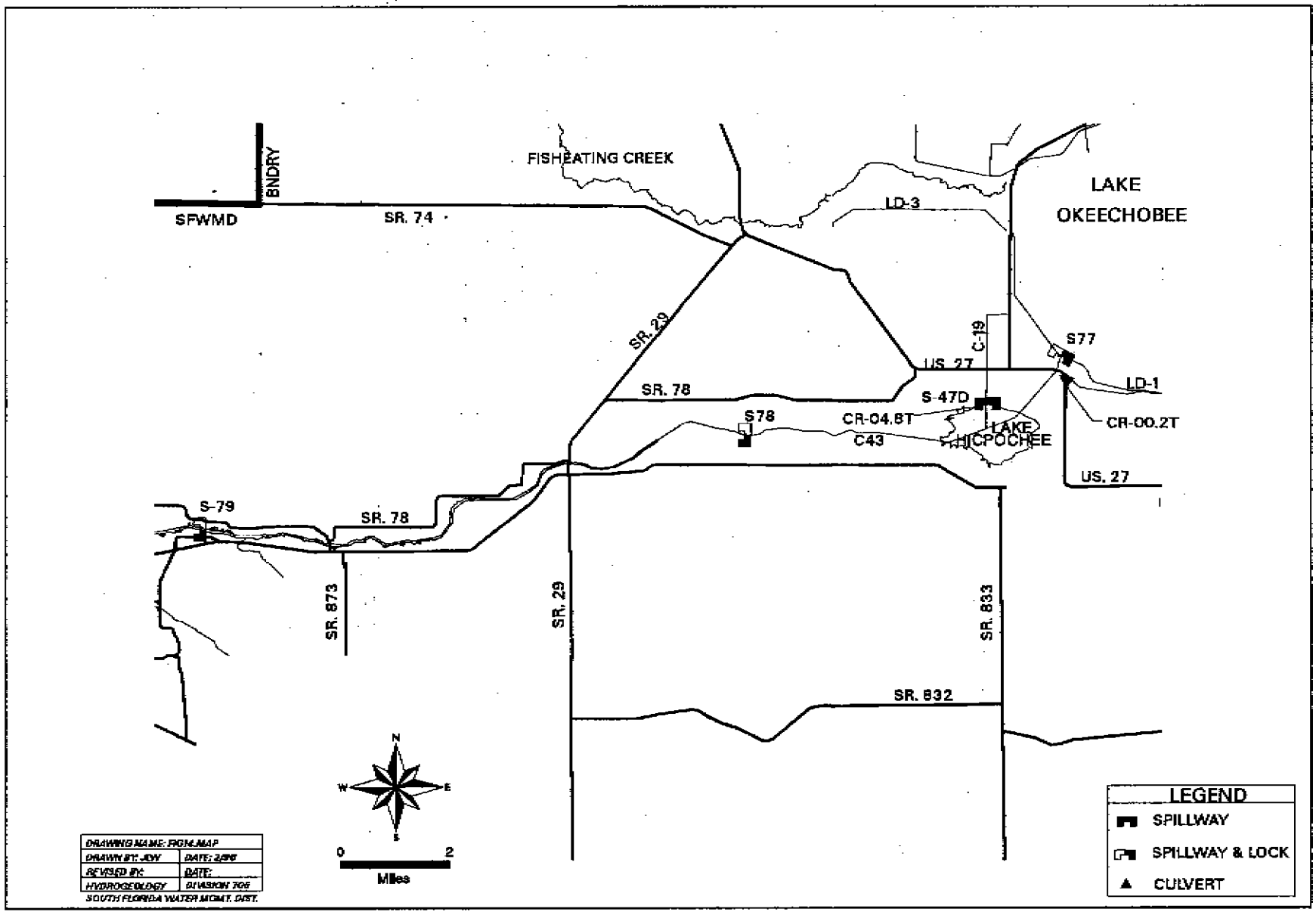

FIGURE 13. Location of Sampling Stations for the Caloosahatchee River Water Quality Monitoring Program

TABLE 26. Summary of Sampling Station Locations and Frequency of Collection for the Caloosahatchee River Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	G/A
CR-00.2T	265021	810509	A small culvert type structure (S-235) located near Moore Haven on the southwest side of Lake Okeechobee on LD-1 near S-77. Water flows westward through this structure into the Caloosahatchee River.	1979 - P	BM	BM	BM	BA	US	G
CR-04.8T	264834	810823	A small spillway gate structure (S-47D) located on C-19 south of US-27 and west of Moore Haven. The water flows southward through this structure and into the Caloosahatchee River.	1979 - P	BM	BM	BM	BA	US	G
S78	264722	811811	A large spillway gate and boat lock structure (Ortona Lock and Dam) located on the Caloosahatchee River operated by the United States Army Corps of Engineers (COE). Water flows toward the west through this structure.	1981 - P	BM	BM	BM	BA	US	G
S79	264314	814107	A large spillway gate and boat lock and coastal structure (W. P. Franklin Lock and Dam) located on the Caloosahatchee River operated by the COE. Water flows toward the west through this structure and is mixed with salt water on the downstream side of this structure.	1981 - P	BM	BM	BM	BA	US	G

TABLE 27. Statistics on Select Parameters for the Caloosahatchee River Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
CR-00.2T	0.0250	0.1412	0.4950	0.0020	0.0747	0.3350	0.0002	2.2953	6.0600	0.0010	0.2013	1.4480
CR-04.8T	0.0420	0.3309	1.7370	0.0020	0.2348	1.5400	0.0002	2.4731	8.8000	0.0040	0.1634	1.3600
S78	0.0390	0.1377	0.3390	0.0070	0.0859	0.3120	0.0001	1.6962	3.4600	0.0040	0.1532	1.0730
S79	0.0510	0.1425	0.4600	0.0180	0.0934	0.2380	0.5800	1.6780	5.1800	0.0040	0.2639	0.8160

SECTION 13

EVERGLADES NUTRIENT REMOVAL
PROJECT CODES: ENRR, ENRU, ENRP, ENRG

Purpose and Scope

The Everglades Nutrient Removal (ENR) Project is a "constructed", or man-made wetland designed to biologically remove phosphorus from agricultural runoff water before it enters the Arthur R. Marshall Loxahatchee National Wildlife Refuge, also known as Water Conservation Area 1.The total project size is 3,975 acres, with 3,680 acres of constructed wetlands.

The ENR Project is a crucial component of the Districts comprehensive Everglades restoration effort. The ENR project provides valuable information for the operation and management of the larger constructed wetlands, called Stormwater Treatment Areas (STAs). The 1993 Everglades Forever Act mandates that the District develop STA's as a method to restore the Everglades.

The objectives of the ENR Project are to reduce the phosphorus loads to Water Conservation Area 1, optimize STA operation for phosphorus removal, provide reasonable assurance to the Florida Department of Environmental Protection(FDEP) that the proposed conceptual design for STAs will meet the requirements of applicable Florida statutes, regulations, and standards, and provide cost avoidance.

The analysis of the water samples is split between the District, USGS, and private labs as follows:

USGS: Analyzes Total Kjeldahl Nitrogen, Total Phosphorus, Nitrate + Nitrite, and Ammonia for the internal marsh sites collected by an automatic sampler. And they analyze bi-weekly and monthly grab samples for all sites, except permit sites for; physical parameters, nutrients, ions, and metals.

Private: They analyze bi-weekly low level Total Suspended Solids on grab samples collected at all sites except permit sites, and Total and Methyl Mercury are analyzed for at some interior and levy sites, and at the permit sites bi-weekly and monthly.

FDEP: Analyzes quarterly grab samples at the permit sites for pesticides and priority pollutants.

SFWMD: Analyzes all remaining parameters listed in the permit, and those being collected for various research projects.

Sampling Locations and Descriptions

The locations of the 23 sites monitored under this program are shown in Figure 14. Table 28 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Table 29 contains statistics by parameter.

District Publications

Guardo, Fink, Fontaine, Newman, Bearzotti, Goforth, (1994). Large Scale constructed wetlands for nutrient removal from stormwater runoff: An Everglades Restoration project. SFWMD, June 1994 Manuscript (submitted). (DOR 174).

Guardo, Abtew, Obeysekera, Roy, (1994). The Everglades Nutrient Removal Project: Hydrology, Hydrodynamics, and Operation. SFWMD, April 1994 Manuscript (published). (DOR 149)

Koch, M.S., (1991). Soil and Surface Water Nutrients in the Everglades Nutrient Removal Project. SFWMD, Tech. Pub. No. 91-04. (DRE-302).

Newman, S., Redfield, G., (1992). The Florida Everglades Nutrient Removal Project: A Prototype for Stormwater Treatment Areas. SFWMD, August 1992 Manuscript. (DOR 104), presented at a workshop.

Newman, S., Roy, J. Obeysekera, J. (1993). The Everglades Nutrient Removal project. SFWMD. July 1993 Manuscript. (DOR 127)

Abtew, W., M. Chimmney, T. Kosier, S. Newman, J. Obeysekera, M. Guardo,. (1995). The Everglades Nutrient Removal Project: A Constructed Wetland Designed to Treat Agricultural Runoff/Drainage. SFWMD. May 1995 Manuscript. (DOR 214)

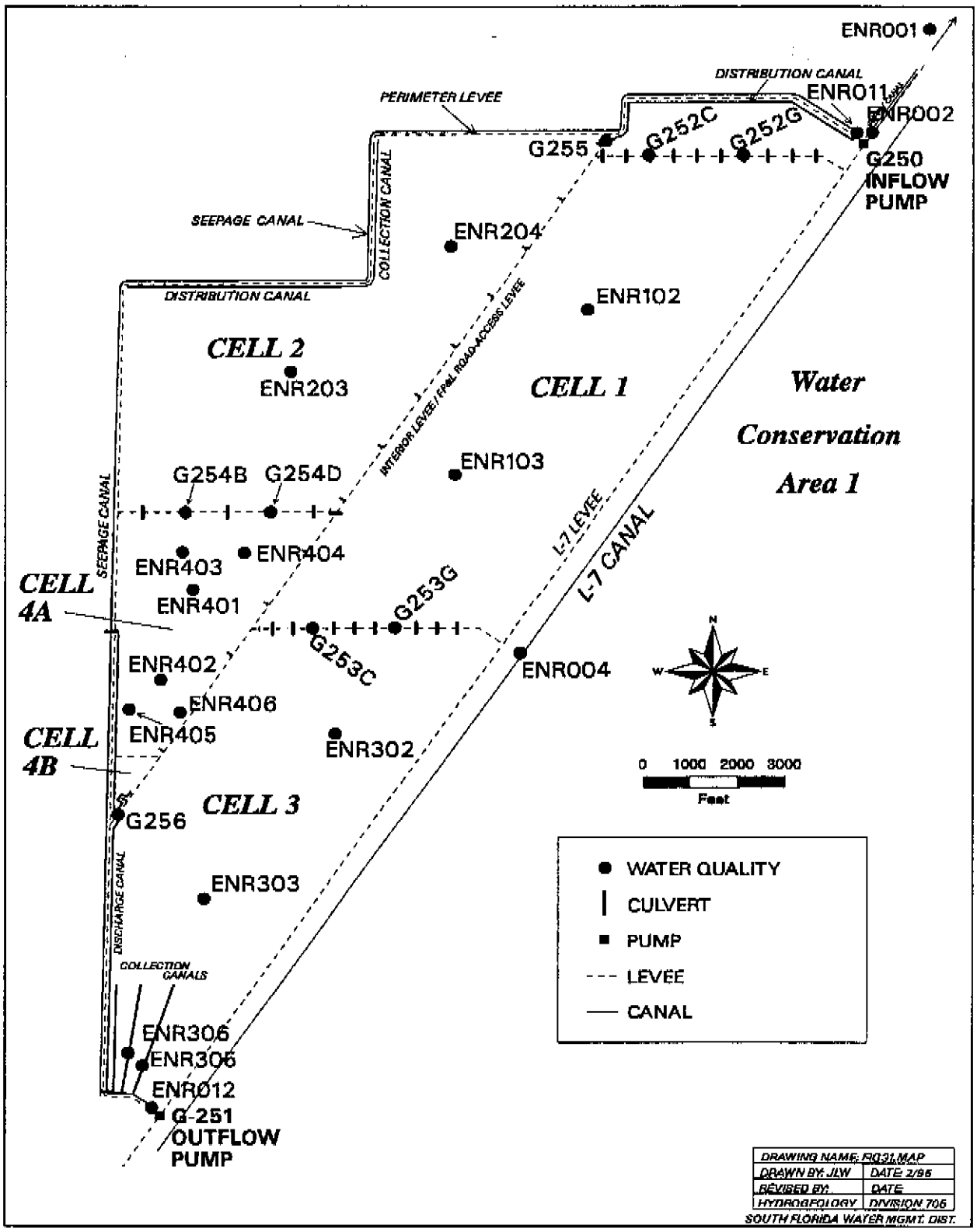

FIGURE 14. Location of Sampling Stations for the Everglades Nutrient Removal Water Quality Monitoring Program.

TABLE 28. Summary of Sampling Station Locations and Frequency of Collection for the Everglades Nutrient Removal Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals	Pesticides & Priority Pollutants	Total Coliform	US/DS	G/A
ENR001	264059	802235	Located in the head waters of the supply canal at the C-51 canal, which leads to the ENR project. This site is about 0.5 miles from pump station S5A and about 4.0 miles from the ENR project.	12/93 - P	BW	W/BW	BW	QTR				A/G
ENR002	263928	802345	Located at the inflow pump station to the ENR project. The inflow pump is located at the northeast corner of the ENR project. This is one of three permitted sites by FDEP.	12/93 - P	W	W/BW	W/BW	BW/ QTR	QTRH2O	BW	US	A/G
ENR004	263733	802508	Located in the L-7 canal about mid way between the inflow and outflow pumps. This is one of three permitted sites by FDEP.	3/94 - P	W	W/BW	W/BW	BW/ QTR	QTRH2O	BW		A/G
ENR011	263928	802349	Located in the seepage canal near the inflow pump(G-250).	12/93 - P	BW	W/BW	BW	QTR			US	A/G
ENR012	263553	802635	Located at the outflow pump station to the ENR project. The outflow pump is located at the south end of the ENR project. This is one of three permitted sites by FDEP.	12/93 - P	W	W/BW	W/BW	BW/ QTR	QTRH2O	BW	US	A/G
ENR102	263846	802450	Located in the north central portion of Cell 1.	4/94 - P	BW	W/BW	BW	BW				A/G
ENR103	263813	802522	Located in the south central portion of Cell 1.	4/94 - P	BW	W/BW	BW	BW				A/G
ENR203	263830	802557	Located in the south central portion of Cell 2.	4/94 -P	M	M	M	M				A/G
ENR204	263856	802528	Located in the north central portion of Cell 2.	4/94 - P	M	M	M	M				A/G
ENR302	263718	802551	Located in the north central portion of Cell 3.	4/94 - P	M	M	M	M				A/G

TABLE 28 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Everglades Nutrient Removal Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameter	Nutrient	Major Ions	Metals	Pesticides & Priority Pollutants	US/DS	G/A
ENR303	263640	802619	Located in the south central portion of Cell 3.	4/94 - P	M	M	M	M			A/G
ENR305	263605	802635	Located in the eastern most collection canal which leads to the outflow pumps(G-251).	6/94 - P	BW	W/BW	W/BW	QTR			A/G
ENR306	263605	802640	Located in the center collection canal which leads to the outflow pumps(G-251).	6/94 - P	BW	W/BW	BW	BW			A/G
ENR401	263747	802624	Located in the center of Cell 4.	4/94 - P	M	M	M	M			A/G
ENR402	263727	802632	Located in the south central portion of Cell 4.	4/94 - P	M	M	M	M			A/G
G252C	263923	802434	Located on the north side of the northern most levee in Cell 1. Water flows through culverts under this levee into Cell 1. This site is the western most site on this levee.	6/94 - P	BW	W/BW	BW	BW		US	A/G
G252G	263923	802412	Located on the north side of the northern most levee in Cell 1. Water flows through culverts under this levee into Cell 1. This site is the eastern most site on this levee.	6/94 - P	BW	W/BW	BW	BW		US	A/G
G253C	263738	802553	Located on the north side of the southern most levee in Cell 3. Water flows through culverts under this levee into Cell 3. This site is the western most site on this levee.	4/94 - P	BW	W/BW	BW	BW		US	A/G
G253G	263738	802534	Located on the north side of the southern most levee in Cell 3. Water flows through culverts under this levee into Cell 3. This site is the eastern most site on this levee.	6/94 - P	BW	W/BW	BW	BW		US	A/G
G254B	263840	802631	Located on the north side of the levee dividing Cell 2 and Cell 4. Water flows through culverts under this levee into Cell 4. This site is the western most site on this levee.	6/94 - P	BW	W/BW	BW	BW		US	A/G

TABLE 28 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Everglades Nutrient Removal Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameter	Nutrient	Major Ions	Metals	Pesticides & Priority Pollutants	US/D	G/A
G254D	263840	802601	Located on the north side of the levee dividing Cell 2 and Cell 4. Water flows through culverts under this levee into Cell 4. This site is the eastern most site on this levee.	6/94 - P	BW	W/BW	BW	BW		US	A/G
G255	263926	802447	Located close to pump station S7 just inside WCA2A	6/94 - P	BW	W/BW	BW	BW			A/G
G256	263657	802642	3.0 miles west of State Road 27 and east of Long Tree Island. The site is located in the northeast corner of WCA3A.	6/94 - P	BW	W/BW	BW	BW			A/G

TABLE 29. Statistics on Select Parameters for the Everglades Nutrient Removal Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
ENR001	0.0040	0.1166	0.5210	0.0040	0.0590	0.2850	1.0600	2.8481	5.4700	0.0240	0.3408	0.7930
ENR002	0.0080	0.0972	0.2910	0.0040	0.0420	0.2160	0.0002	2.9213	7.6500	0.0100	0.4742	3.3520
ENR004	0.0040	0.0863	0.5640	0.0040	0.0431	0.1530	0.5060	2.6293	8.4600	0.0040	0.3624	4.8300
ENR011	0.0100	0.0375	2.1880	0.0020	0.0058	0.0420	1.7700	3.3793	4.7100	0.0040	0.0341	0.0880
ENR012	0.0020	0.0301	0.6300	0.0040	0.0090	0.0500	0.0001	2.1102	3.8300	0.0040	0.0294	0.2070
ENR102	0.0200	0.1138	2.1000	0.0020	0.0283	0.0800	0.0003	1.8842	2.9600	0.0040	0.0245	0.1570
ENR103	0.0150	0.0764	0.5160	0.0020	0.0220	0.1530	1.2400	2.5592	3.4000	0.0040	0.0263	0.1660
ENR203	0.0040	0.0384	0.1420	0.0040	0.0121	0.0820	2.2800	3.1200	3.5500	0.0040	0.2101	1.9000
ENR204	0.0030	0.0386	0.2330	0.0040	0.0124	0.1100	2.1300	2.6100	3.3500	0.0060	0.0998	0.6830
ENR302	0.0010	0.0952	2.4000	0.0020	0.0106	0.0910	2.7900	3.2122	3.6700	0.0040	0.0600	0.2890
ENR303	0.0200	0.0853	0.4900	0.0020	0.0121	0.0720	2.4300	4.1733	5.4200	0.0040	0.0719	0.5900
ENR305	0.0100	0.0497	0.7800	0.0020	0.0133	0.0860	1.7300	1.8067	1.9100	0.0250	0.0690	0.1360
ENR306	0.0100	0.0380	0.7240	0.0020	0.0098	0.0770	1.4100	1.7225	2.2800	0.0100	0.0610	0.1700
ENR401	0.0100	0.0872	1.7000	0.0020	0.0148	0.1120	2.6800	4.3367	6.9200	0.0080	0.0250	0.0710
ENR402	0.0100	0.0686	0.9900	0.0020	0.0061	0.0370	0.0004	3.0401	4.7400	0.0040	0.0256	0.0600
G252C	0.0140	0.0932	1.9700	0.0040	0.0420	0.1580	1.2700	1.5650	1.9200	0.0370	0.2568	0.4040
G252G	0.0230	0.0789	0.1730	0.0040	0.0433	0.1210	0.8740	1.4685	1.9700	0.0540	0.2364	0.3600
G253C	0.0040	0.0509	0.1880	0.0040	0.0208	0.0930	1.5100	2.7240	3.8000	0.0060	0.1255	0.9760
G253G	0.0090	0.0401	0.2350	0.0020	0.0123	0.0740	0.9960	1.1965	1.3300	0.0400	0.0836	0.1360
G254B	0.0100	0.0415	0.1960	0.0030	0.0130	0.1220	0.0001	0.8167	1.3400	0.0040	0.0090	0.0150
G254D	0.0050	0.0516	0.3400	0.0040	0.0138	0.1140	0.5580	1.0827	1.3700	0.0040	0.0237	0.0580
G255	0.0120	0.0874	0.2100	0.0040	0.0477	0.1190	1.3800	2.5350	4.8000	0.1910	0.4065	0.8710
G256	0.0020	0.0284	0.1920	0.0020	0.0069	0.0340	0.5240	1.2410	2.0600	0.0090	0.0380	0.0760

SECTION 14

HOLEY LAND
PROJECT CODE: HOLY

Purpose and Scope

In 1983 a Memorandum of Agreement between the Florida Department of Environmental Regulation (FDEP), the Board of Trustees of the Internal Improvement Trust Fund (BTIITF), the South Florida Water Management District, and the Florida Game and Fresh Water Fish Commission (G&FWFC) was established to design and construct a restoration plan for the Holey Land and Rotenberger Tracts as well as a portion of the Seminole Indian Reservation.

In 1990 a Memorandum of Agreement between the SFWMD and G&FWFC was established to begin the monitoring of the Holey Land. The water quality monitoring program involves collecting data, and documenting conditions to better understand the hydrology and environmental resources in achieving the goals of the Holey Land Restoration Project.

Project HOLY was established specifically to meet the requirements of FDEP Permit #06 500809209.

Sampling Locations and Descriptions

The Holey Land monitoring program includes project "HOLY" which monitors seven surface water inflow and outflow structures and four interior sediment sites. The location of these stations are shown in Figure 15. Table 30 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 31 contain statistics for each monitoring location.

Parameter and Sampling Frequencies

Prior to July 1992 project HOLY was sampled weekly for total phosphorus only. The FDEP permit requires the District to monitor surface water on a quarterly basis, and sediment semi-annually.

District Publications

None

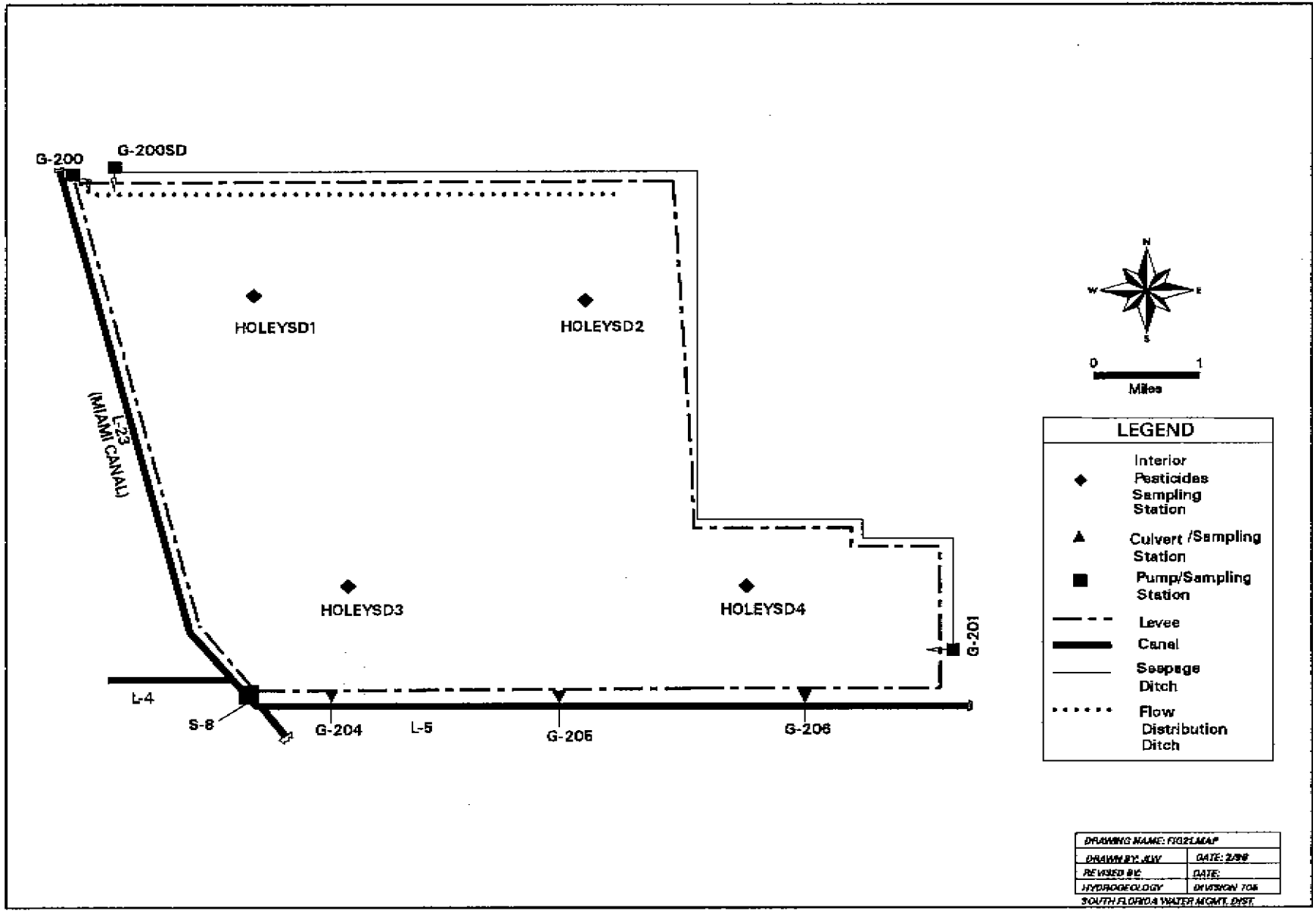

FIGURE 15. Location of Sampling Stations for the Holey Land Water Quality Monitoring Program.

TABLE 30. Summary of Sampling Station Locations and Frequency of Collection for the Holey Land Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals	Organic Priority Pollutants	US/DS	G/A
G200	262500	804700	This is a pump station located at the N.W. corner of the Holey Land. It pumps water from the Miami Canal (L-23) into the Holey Land.	1989 - P	QTR/BW/W	QTR/BW/W	QTR	QTR	QTR	US	G/A
G200SD	262500	804658	This is a pump station located at the N.W. corner of the Holey Land close to G200. It pumps water from the seepage ditch that runs along the north side of the Holey Land, back into the Holey Land.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
G201	262000	803800	This is a pump station located at the S.E. corner of the Holey Land. It pumps water from the seepage ditch which runs along the east side of the Holey Land, back into the Holey Land.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
G204	261954	804554	This is a set of culverts located on the L-5 levee near pump station S8. These culverts discharge water from the Holey Land into Water Conservation Area 3A.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
G205	261956	804300	This is a set of culverts located on the L-5 levee half way between pump station S8 and G201. These culverts discharge water from the Holey Land into Water Conservation Area 3A.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
G206	261958	803909	This is a set of culverts located on the L-5 levee near the S.E. corner of the Holey Land. These culverts discharge water from the Holey Land into Water Conservation Area 3A.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
S8	261953	804628	This is a District operated pump station. Water is pumped in a southerly direction down the Miami Canal.	1989 - P	QTR	QTR	QTR	QTR	QTR	US	G
HOLYSD1 *	262480	804650	Same location as HS9 in table 44	1989 - P	-	-	-	BA	BA	-	G

TABLE 30 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Holey Land Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals	Organic Priority Pollutants	US/DS	G/A
HOLYSD2 *	262480	804250	Same location as HS13 in table 44	1989 - P	-	-	-	BA	BA	-	G
HOLYSD3 *	262130	804450	Same location as HS29 in table 44	1989 - P	-	-	-	BA	BA	-	G
HOLYSD4 *	262130	804060	Same location as HS31 in table 44	1989 - P	-	-	-	BA	BA	-	G

* = Sediment sampling locations

TABLE 31. Statistics on Select Parameters for the Holy Land Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
G200	0.0050	0.0583	0.2370	0.0040	0.0312	0.1000	0.8500	2.7263	6.9900	0.0080	0.8936	4.5550
G200SD	0.0050	0.0135	0.0460	0.0040	0.0051	0.0150	1.2600	1.8537	3.0700	0.0080	0.1737	1.0680
G201	0.0040	0.0091	0.0210	0.0040	0.0050	0.0140	0.5400	1.4511	2.6600	0.0040	0.1204	1.0150
G204	0.0090	0.0522	0.3250	0.0040	0.0164	0.0690	0.8300	1.8533	3.5500	0.0040	0.0891	0.7070
G205	0.0100	0.0496	0.3940	0.0040	0.0219	0.2700	0.0001	1.7020	5.8100	0.0040	0.0456	0.4810
G206	0.0040	0.0277	0.3900	0.0040	0.0086	0.0750	0.5370	1.4361	3.1200	0.0040	0.0645	0.5110
S8	0.0130	0.0763	0.1910	0.0040	0.0414	0.1600	0.9500	2.3620	6.0600	0.0130	0.6195	3.2200

SECTION 15

EVERGLADES PROTECTION AREA
PROJECT CODE: EVPA

Purpose and Scope

The Everglades Protection Area Project (EVPA) consists of all three Water Conservation Areas (WCA1,2,&3), and is designed to monitor the physical, chemical and biological quality of the Everglades Protection Area. The water, sediment, and tissue quality data obtained under this program will be used to:

1. Evaluate water quality status and trends;

2. Assess compliance with federal and state water quality statutes, the Everglades Forever Act; and the Everglades Settlement Agreement;

3. Aid in the translation of narratives to numerical water quality criteria and in the development of site-specific alternative criteria;

4. Guide mid and long term resource management decision making to restore the ecological structure and function of the Everglades; and

5. Minimize the duplication effort between monitoring programs, ensure uniformity of monitoring methods and data interpretation, and provide a comprehensive framework for data interpretation.

The sampling of inflows, outflows, biological, sediments, organics, and rain within the EVPA are addressed in other sections of this publication.

Sample analyses for all parameters except Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC) are performed by USGS laboratory in Ocala under a contractual agreement. TOC and DOC are analyzed by SFWMD laboratory. Pesticides are analyzed by FDEP laboratory.

Sampling Locations and Descriptions

The locations of the 30 sites monitored under this program are shown in Figures 16, 17, and 18. Table 32 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the samples are collected up stream or down stream, and type of sample collection. Table 33 contains statistics by parameter.

District Publications

Gleason, P., (1974). Chemical Quality of Water in Conservation Area 2A and Associated Canals. SFWMD,Tech. Pub. No. 74-1. (DRE-39).

Jensen, Rutchey, Koch, Narumalani, (1994). Inland Wetland Change Detection in the Everglades water Conservation Area 2A Using a Time Series of Normalized Remotely sensed Data. SFWMD, Jan. 1994 Manuscript. (DOR-140).

Lin, S., Gregg, R./WR, (1988). Water Budget Analysis Water Conservation Area 1. SFWMD, Tech. Memo. 6/88. (DRE-245)

Lutz, J., (1977). Water Quality and Nutrient Loadings of the Major Inflows from the Everglades Agricultural Area to the Conservation Areas, Southeast Florida. SFWMD, Tech. Pub. No. 77-6. (DRE-78).

Pfeuffer, R.J., (1985). Pesticide Residue Monitoring in Sediment and Surface Water Bodies within the South Florida Water Management District. SFWMD, Tech. Pub. No. 85-2. (DRE-214).

Swift, D.R., (1981). Preliminary Investigation of Periphyton and Water Quality Relationships in the Everglades Water Conservation Areas. SFWMD, Tech. Pub. No. 81-5. (DRE-131).

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Water Chemistry Div., (1984). North New River Back pumping Water Quality Impact Study Report No.1, Preconstruction and Initial Operation. SFWMD, Tech. Memo. March 1984. (DRE-179).

Worth, D.F./ES, (1988). Environmental Response of WCA-2A to Reduction in Regulation Schedule and Marsh Draw down. SFWMD, Tech. Pub. No. 88-02. (DRE-250)

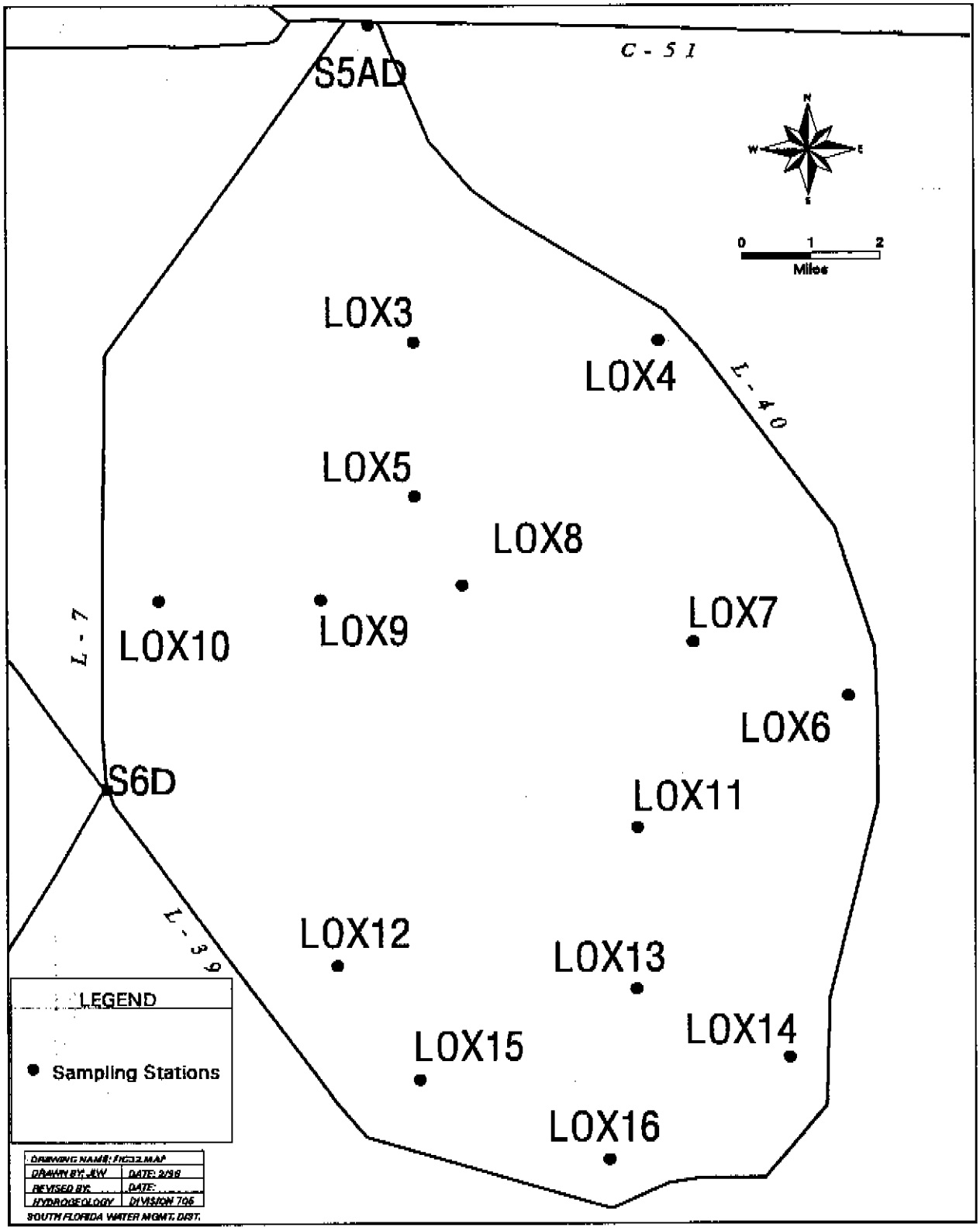

FIGURE 16. Location of Sampling Stations in WCA1 for the Everglades Protection Area Monitoring Program.

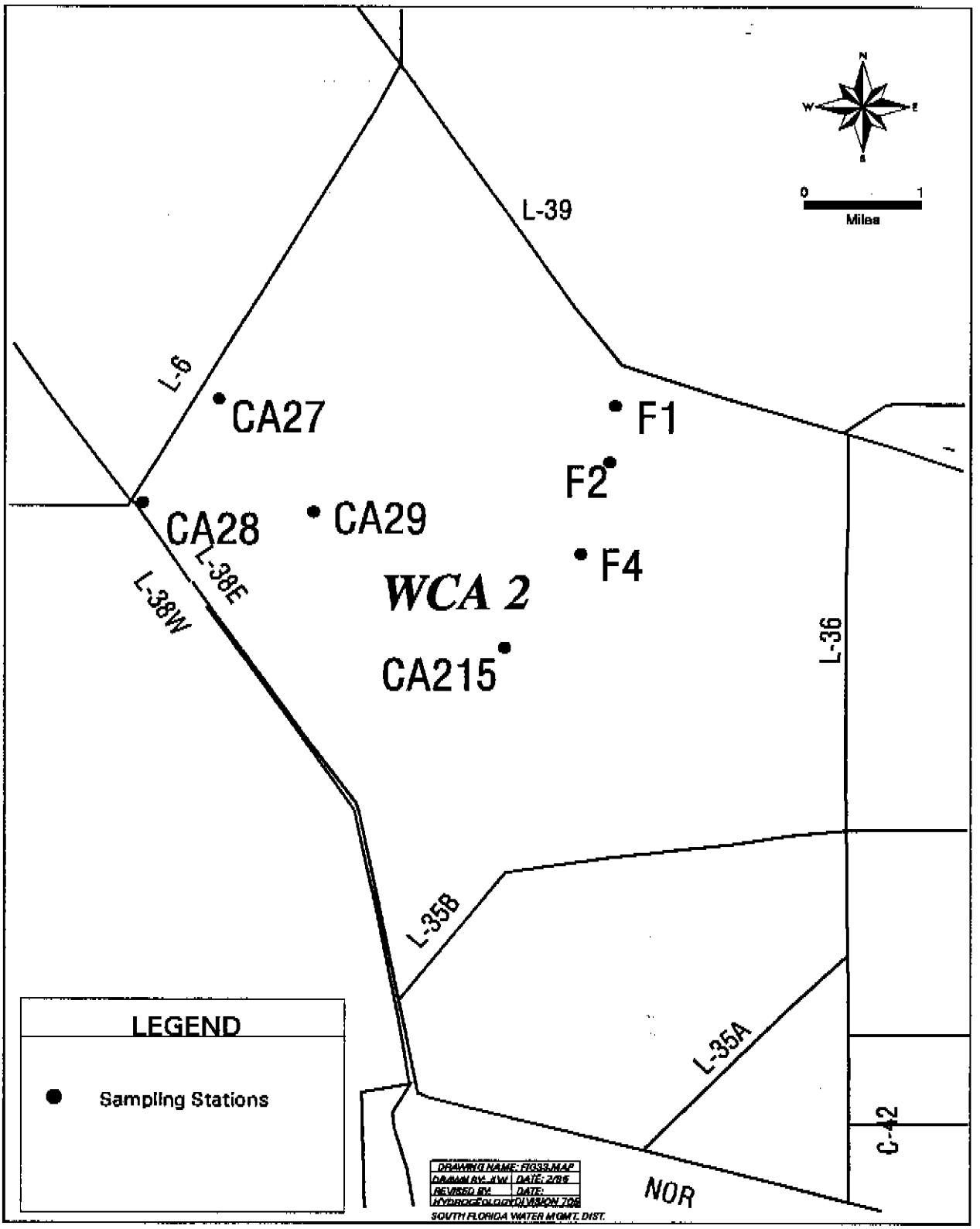

FIGURE 17. Location of Sampling Stations in WCA2 for the Everglades Protection Area Monitoring Program.

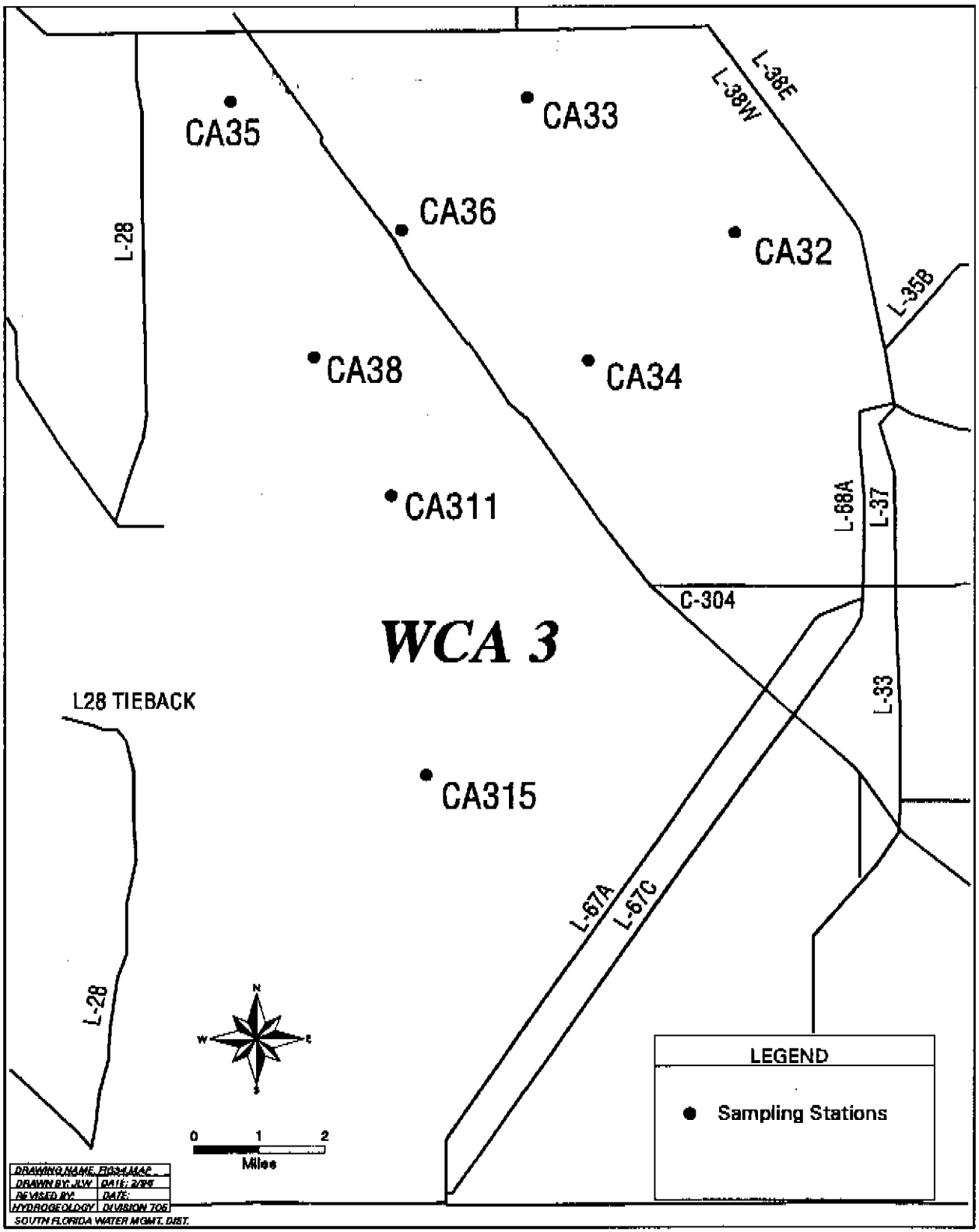

FIGURE 18. Location of Sampling Stations in WCA3 for the Everglades Protection Area Monitoring Program.

TABLE 32. Summary of Sampling Station Locations and Frequency of Collection for the Everglades Protection Area Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals	Pesticides	US/DS	G/A
LOX3	263545	802120	5 miles west of pump station L40-2. The site is located in the northern area of WCA1.	1/94 - P	M	M	M	QTR			G
LOX4	263545	801702	0.75 miles south of pump station L40-2. The site is located near the northeast side of WCA1.	1/94 - P	M	M	M	QTR			G
LOX5	263312	802120	3 miles south of LOX3. The site is located in the north central area of WCA1.	1/94 - P	M	M	M	QTR			G
LOX6	262950	801345	0.5 miles northwest of G94B. the site is located on the east side of WCA1.	2/94 - P	M	M	M	QTR			G
LOX7	263045	801628	5.5 miles south of L40-2. The site is located in the east central area of WCA1.	1/94 - P	M	M	M	QTR			G
LOX8	263312	801924	Located in the center of WCA1.	1/94 - P	M	M	M	QTR	ASED		G
LOX9	263129	802300	North Northeast of pump station S-6. The site is located in the western central area of WCA1.	1/94 - P	M	M	M	QTR			G
LOX10	263129	802551	0.5 miles east of the L-7 levee. The site is located on the west side of WCA1.	1/94 - P	M	M	M	QTR	ASED		G
LOX11	262740	801728	This site is located at gauging station #1-9 located in the southeast central portion of WCA1.	2/94 -P	M	M	M	QTR			G
LOX12	262525	802245	1.5 miles east of the L-39 levee and north of S10D. The site is located near the southwest side of WCA1.	1/94 - P	M	M	M	QTR			G
LOX13	262500	801730	0.2 miles west of Big Lake Tree Island and north of S-39. The site is located near the south side of WCA1.	1/94 - P	M	M	M	QTR			G
LOX14	262350	801450	1.0 miles northwest of G-94A. The site is located near the southeast corner of WCA1.	1/94 - P	M	M	M	QTR			G

TABLE 32 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Everglades Protection Area Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameter	Nutrient	Major Ions	Metals	Pesticides	US/D	G/A
LOX15	262215	802210	1.0 miles east of S10D. The site is located near the south end of WCA1.	1/94 - P	M	M	M	QTR			G
LOX16	262210	801800	1.3 miles north of S39 and northeast of S10A. The site is located at the south end of WCA1.	1/94 - P	M	M	M	QTR			G
S5AD	264101	802205	Downstream side of S5A, a District controlled water pumping station located at the northern most end of WCA1 near State Road 80. S5A pumps water from the EAA, L-8, and C-51 basins into WCA1.	1/94 - P	M	M	M	QTR		DS	G
S6D	262822	802650	Downstream side of S6, which is located about 16 miles southwest of S5A on the Hillsboro Canal at the intersections of the Hillsboro Canal(L-15), L-6, and L-7. Water is pumped in a southerly direction through this pump station down the Hillsboro Canal into WCA1.	1/94 - P	M	M	M	QTR		DS	G
F1	262153	802230	Transect site between S10C and S10D 1.0 miles south of the L-39 levee. The site is located near the northeast side of WCA2.	5/94 - P	BW	BW	BW	QTR	ASED		G
F2	262048	802237	Transect site between S10C and S10D 2.0 miles south of F1. The site is located near the northeast side of WCA2.	5/94 - P	BW	BW	BW	QTR			G
F4	261903	802313	Transect site between S10C and S10D 3.0 miles south of F2. The site is located near the northeast side of WCA2.	5/94 - P	BW	BW	BW	QTR			G
CA215	261716	802446	Transect site between S10C and S10D 5.0 miles south of F5. The site is located near the northeast side of WCA2.	5/94 - P	BW	BW	BW	QTR	ASED		G
CA29	261952	802836	3.5 miles east of pump station S7. The site is located in the western side of WCA2A.	7/94 - P	BW	BW	BW	QTR			G

TABLE 32 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Everglades Protection Area Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameter	Nutrient	Major Ions	Metals	Pesticides	US/D	G/A
CA27	262204	803040	About 3.0 miles northeast of S7. The site is located near the L-6 levee on the northwest side of WCA2A.	6/94 - P	BW	BW	BW	QTR			G
CA28	262003	803201	Located close to pump station S7 just inside WCA2A	6/94 - P	BW	BW	BW	QTR			G
CA32	261400	803131	3.0 miles west of State Road 27 and east of Long Tree Island. The site is located in the northeast corner of WCA3A.	7/94 - P	BW	BW	BW	QTR			G
CA33	261758	803753	At District gauge #3-2, which is located 2 miles east of the hunting camp and about 4 miles southeast of pump station S8. The site is located at the northern end of WCA3A.	5/94 - P	BW	BW	BW	QTR	ASED		G
CA34	261018	803602	2.0 miles northeast from the intersection of the Miami Canal and I-75(SR84), and west of the Lonesome Tree. The site is located in the central portion of WCA3A.	6/94 - P	BW	BW	BW	QTR			G
CA36	261407	804146	Located next to the Miami Canal about half way between pump station S8 and I-75(SR84). This site is located in the northern portion of WCA3A.	6/94 - P	BW	BW	BW	QTR			G
CA38	261025	804429	About 1.5 miles north of I-75(SR84) about half way between pump station S140 and the Miami Canal. This site is located in the northwest central portion of WCA3A.	6/94 - P	BW	BW	BW	QTR			G
CA311	260621	804206	About 2.5 miles south of I-75(SR84) about half way between pump station S140 and the Miami Canal. This site is located in the central portion of WCA3A.	6/94 - P	BW	BW	BW	QTR			G
CA315	255812	804103	Located about half way between the L-28 Tieback levee and the L-67A levee. This site is located in the south central portion of WCA3A.	6/94 - P	BW	BW	BW	QTR	ASED		G

TABLE 33. Statistics on Select Parameters for the Everglades Protection Area Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
CA215	0.0030	0.0014	0.3200	0.0010	0.0086	0.2440	1.7600	2.2475	2.5100	0.0020	0.0320	0.3170
CA27	0.0050	0.0125	0.0830	0.0010	0.0030	0.0300	0.7200	2.0260	2.9500	0.0020	0.0161	0.3660
CA28	0.0220	0.1118	0.4100	0.0020	0.0599	0.2050	0.0003	1.2129	2.5000	0.0001	0.0647	0.3350
CA29	0.0020	0.0089	0.0900	0.0020	0.0029	0.0200	0.6800	1.7583	3.0700	0.0020	0.0296	0.2090
CA311	0.0020	0.0061	0.0200	0.0010	0.0022	0.0060	0.7700	0.9967	1.2000	0.0020	0.0109	0.0700
CA315	0.0020	0.0068	0.0390	0.0010	0.0034	0.0620	0.7700	1.0422	1.2700	0.0020	0.0211	0.2270
CA32	0.0040	0.0102	0.0940	0.0010	0.0023	0.0070	0.8920	1.3205	1.9000	0.0020	0.0172	0.1770
CA33	0.0050	0.0140	0.0620	0.0010	0.0024	0.0090	1.2000	1.2967	1.4100	0.0020	0.0108	0.0940
CA34	0.0030	0.0100	0.0430	0.0010	0.0023	0.0060	0.6600	0.9888	1.4200	0.0020	0.0105	0.1380
CA36	0.0090	0.0278	0.1010	0.0010	0.0077	0.0850	1.5600	1.7375	1.9000	0.0020	0.0052	0.0250
CA38	0.0020	0.0106	0.1030	0.0010	0.0029	0.0400	0.5300	0.7007	0.9480	0.0020	0.0087	0.0800
LOX10	0.0040	0.0124	0.0430	0.0010	0.0094	0.1180	0.6800	0.9700	1.2600	0.0020	0.0187	0.1510
LOX11	0.0040	0.0083	0.0200	0.0010	0.0022	0.0070	0.5970	0.7135	0.8300	0.0020	0.0098	0.0300
LOX12	0.0040	0.0065	0.0180	0.0010	0.0021	0.0040	0.6400	0.7810	0.8530	0.0020	0.0547	0.4600
LOX13	0.0040	0.0078	0.0200	0.0010	0.0020	0.0040	0.0001	0.5640	0.9200	0.0001	0.0112	0.0470
LOX14	0.0040	0.0078	0.0200	0.0010	0.0022	0.0040	0.5230	0.5877	0.6800	0.0020	0.0119	0.0500
LOX15	0.0020	0.0079	0.0200	0.0010	0.0022	0.0040	0.6090	0.9697	1.2000	0.0020	0.0216	0.1000
LOX16	0.0040	0.0106	0.0780	0.0010	0.0023	0.0080	0.5700	1.0700	1.5700	0.0020	0.0742	1.0070
LOX3	0.0040	0.0117	0.0500	0.0010	0.0024	0.0050	0.8900	1.2633	1.5400	0.0020	0.0210	0.1290
LOX4	0.0050	0.0097	0.0230	0.0020	0.0023	0.0040	1.8000	2.1150	2.4300	0.0020	0.0077	0.0270
LOX5	0.0040	0.0111	0.0800	0.0010	0.0021	0.0040	0.8500	1.0375	1.2500	0.0020	0.0151	0.1030
LOX6	0.0040	0.0074	0.0200	0.0010	0.0021	0.0040	0.8340	0.9580	1.1000	0.0020	0.0042	0.0200
LOX7	0.0040	0.0072	0.0130	0.0010	0.0020	0.0040	1.0400	1.0400	1.0400	0.0020	0.0093	0.0390
LOX8	0.0040	0.0086	0.0330	0.0010	0.0114	0.1780	0.8800	0.9107	0.9400	0.0020	0.0195	0.1510
LOX9	0.0040	0.0094	0.0340	0.0010	0.0021	0.0040	0.8200	0.9300	1.0300	0.0020	0.0046	0.0180
S5AD	0.0400	0.0994	0.2500	0.0040	0.0583	0.1250	0.0002	1.7600	2.6200	0.0020	0.3007	1.1200
S6D	0.0200	0.0584	0.2100	0.0050	0.0460	0.1900	0.0004	1.7001	2.8000	0.0020	0.3343	1.9000

TABLE 33. Statistics on Select Parameters for the Everglades Protection Area Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
F1	0.0250	0.0998	0.9820	0.0020	0.0973	0.9600	0.0002	2.8620	6.4100	0.0020	0.0310	0.5400
F2	0.0170	0.0774	0.4520	0.0020	0.0554	0.3800	1.8500	2.4600	3.5600	0.0020	0.0441	0.5000
F4	0.0060	0.0154	0.1200	0.0010	0.0029	0.0200	1.6000	2.1080	2.9800	0.0020	0.0335	0.3340

SECTION 16

Big Cypress Seminole Indians
PROJECT CODE: SEMI

Purpose and Scope

The Big Cypress Seminole Indian Reservation is west of Water Conservation Area 3A. The monitoring is being done in response to an agreement between the District and the Seminole Indian Tribe of Florida. The monitoring covers the inflow points to the Big Cypress Seminole Indian reservation.

The objectives of this program are:

1. To determine the quality of water delivered to the Big Cypress Indian Reservation through the L-28 Borrow canal before and after the diversion of all or a portion of the C-139 Basin;

2. To determine the quality of water delivered to the Big Cypress Indian Reservation through the North and West Feeder Canals.

Sampling Locations and Descriptions

The locations of the 2 sites monitored under the SEMI project are shown in Figure 19. Table 34. lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the samples are collected upstream or downstream, and type of sample collection.

District Publications

None

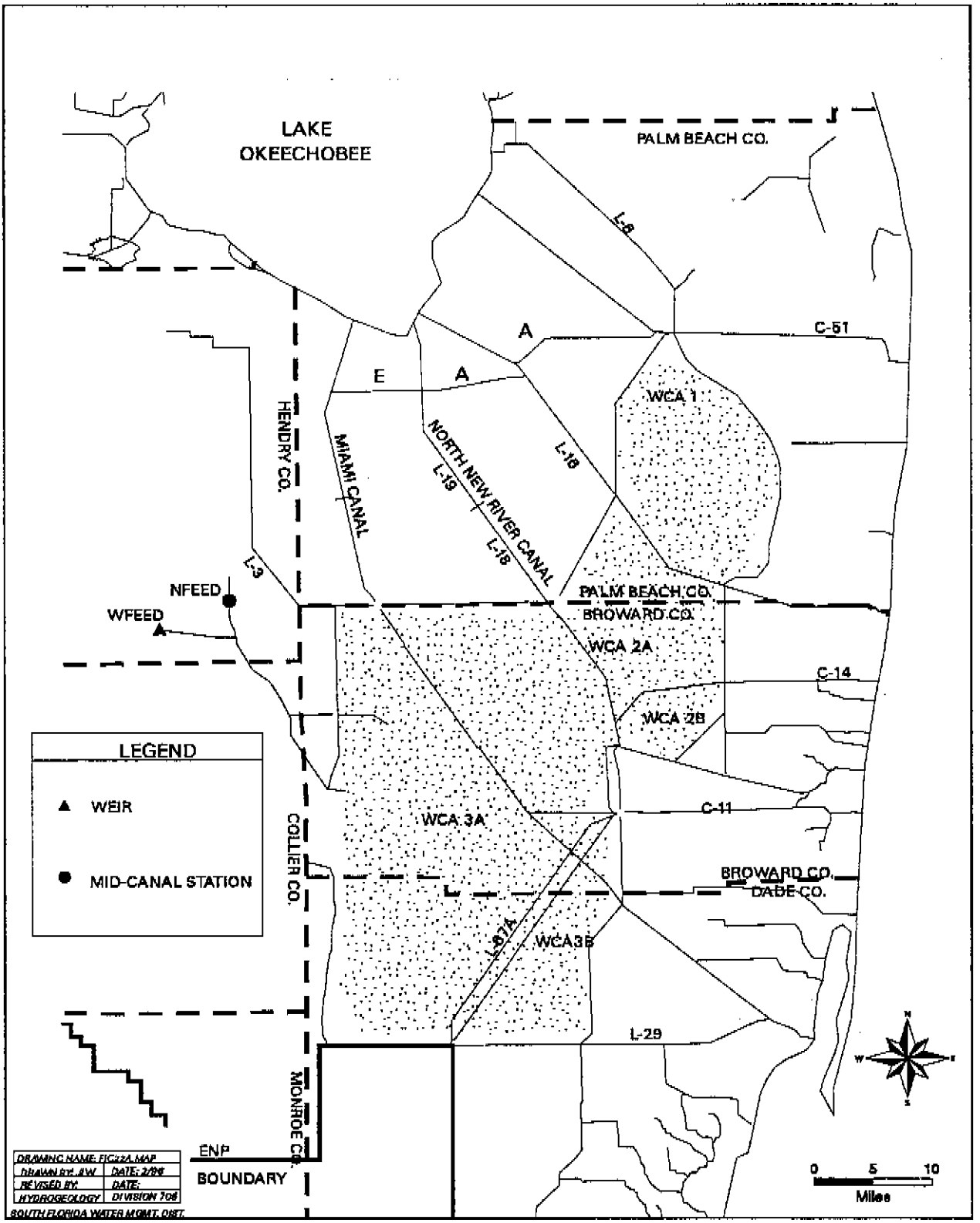

FIGURE 19. Location of Sampling Stations for the Big Cypress Seminole Indians Water Quality Monitoring program.

TABLE 34. Summary of Sampling Station Locations and Frequency of Collection for the Big Cypress Seminole Indians Water Quality Monitoring Programs

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals	US/DS	G/A
NFEED	262020	805446	A canal station situated on a platform on the west side of the North Feeder Canal, approximately two miles north of Snake Road, on the northern border of the Big Cypress Seminole Indian Reservation. Water flow is typically southward at this site, towards spillway S-190.	1996 - P	-	W	-	-		G/A
WFEED	261809	810428	A canal station situated on a platform on the south side of the West Feeder Canal, immediately upstream of the West Feeder Weir. The Weir is located on West Boundary Road, 5.6 miles west of Snake Road in the Big Cypress Seminole Indian Reservation. Water flow is eastward at this site, towards spillway S-190.	1996 - P	-	W	-	-		G/A

TABLE 35. Statistics on Select Parameters for the Big Cypress Seminole Indians Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
NFEED	0.0870	0.2539	1.2960	-	-	-	0.7130	1.8636	5.3300	0.0150	0.0301	0.0810
WFEED	0.0360	0.0610	0.1060	-	-	-	0.7370	1.3536	2.3300	0.0150	0.0294	0.0470

SECTION 17

WATER CONSERVATION AREA INFLOWS AND OUTFLOWS AND TAMIAMI BRIDGE CULVERTS

PROJECT CODES: CAMB, TAMB

Purpose and Scope

The Water Conservation Area (WCA) Inflows and Outflows, and the Tamiami Bridge Culverts water quality monitoring programs encompasses an area of over 1,300 square miles of Everglades marsh that receive waters from a variety of land uses, such as; agricultural, native and improved pastures, and urban and rural communities. The water quality monitoring program provides a water quality and nutrient loading data base for:

1. Complying with monitoring requirements of the Everglades National Park (TENP) Memorandum of Agreement (MOA) between the National Park Service, the South Florida Water Management District (SFWMD or District), and the United States Army Corps of Engineers (COE);

2. Implementing the Lake Okeechobee Technical Advisory Committee's (LOTAC)'s recommendation for a comprehensive monitoring and research plan as described in the Department of Environmental Protection's "Lake Okeechobee Monitoring and Research Plan";

3. Determining long and short term trends necessary to identify the downstream impacts of LOTAC's Surface Water Improvement and Management (SWIM) implementation plan for the Everglades Agricultural Area (EAA); and

4. Determining effectiveness of the implementation of basin management plans in reducing nutrient loadings to the WCA.

Water quality data are also used to establish nutrient budgets for the WCA. Monitoring of nutrients and other water quality parameters is important in the quantification of the effect of inflows on the ecology of the marsh. With the implementation of the SWIM Act, the data collected will be instrumental in evaluating downstream impacts of the Interim Action Plan and other possible management alternatives for the EAA.

These data can indicate trends in the changes in water quality, allow for better management of the system, and monitor for environmental enhancement or degradation. Values that deviate significantly from established criteria may signal a concern requiring immediate attention.

Sampling Locations and Descriptions

The locations of the (45) sites monitored under the CAMB program and the 20 sites monitored under project TAMB are shown in Figures 20 and 21. Table 35 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection for each program respectively. Table 36 contain statistics for each monitoring location for each program. In October 1996, upon approval of the Technical Oversite Committee(TOC), the TAMB sites were seperated out from the CAMB program, and reduced from 19 sites to 11. The parameter list and frequencies have been modified under the TAMB program. See table 35 for the modifications made to this program.

District Publications

Gleason, P. (1974). Chemical Quality of Water in Conservation Area 2A and Associated Canals. SFWMD,Tech. Pub. No. 74-1. (DRE 39)

Lutz, J. (1977). Water Quality and Nutrient Loadings of the Major Inflows from the Everglades Agricultural Area to the Conservation Areas, Southeast Florida. SFWMD, Tech. Pub. No. 77-6. (DRE 78)

Pfeuffer, R.J. (1985). Pesticide Residue Monitoring in Sediment and Surface Water Bodies within the South Florida Water Management District. SFWMD, Tech. Pub. No. 85-2. (DRE 214)

Swift, D.R. (1981). Preliminary Investigation of Periphyton and Water Quality Relationships in the Everglades Water Conservation Areas. SFWMD, Tech. Pub. No. 81-5. (DRE 131)

Swift, D.R. and R. Nicholas. (1987). Periphyton and Water Quality Relationships in the Everglades Water Conservation Areas. SFWMD, Tech. Pub. No. 87-2. (DRE 233)

Water Chemistry Div. (1984). North New River Backpumping Water Quality Impact Study Report No.1, Preconstruction and Initial Operation. SFWMD, Tech. Memo. March 1984. (DRE 179)

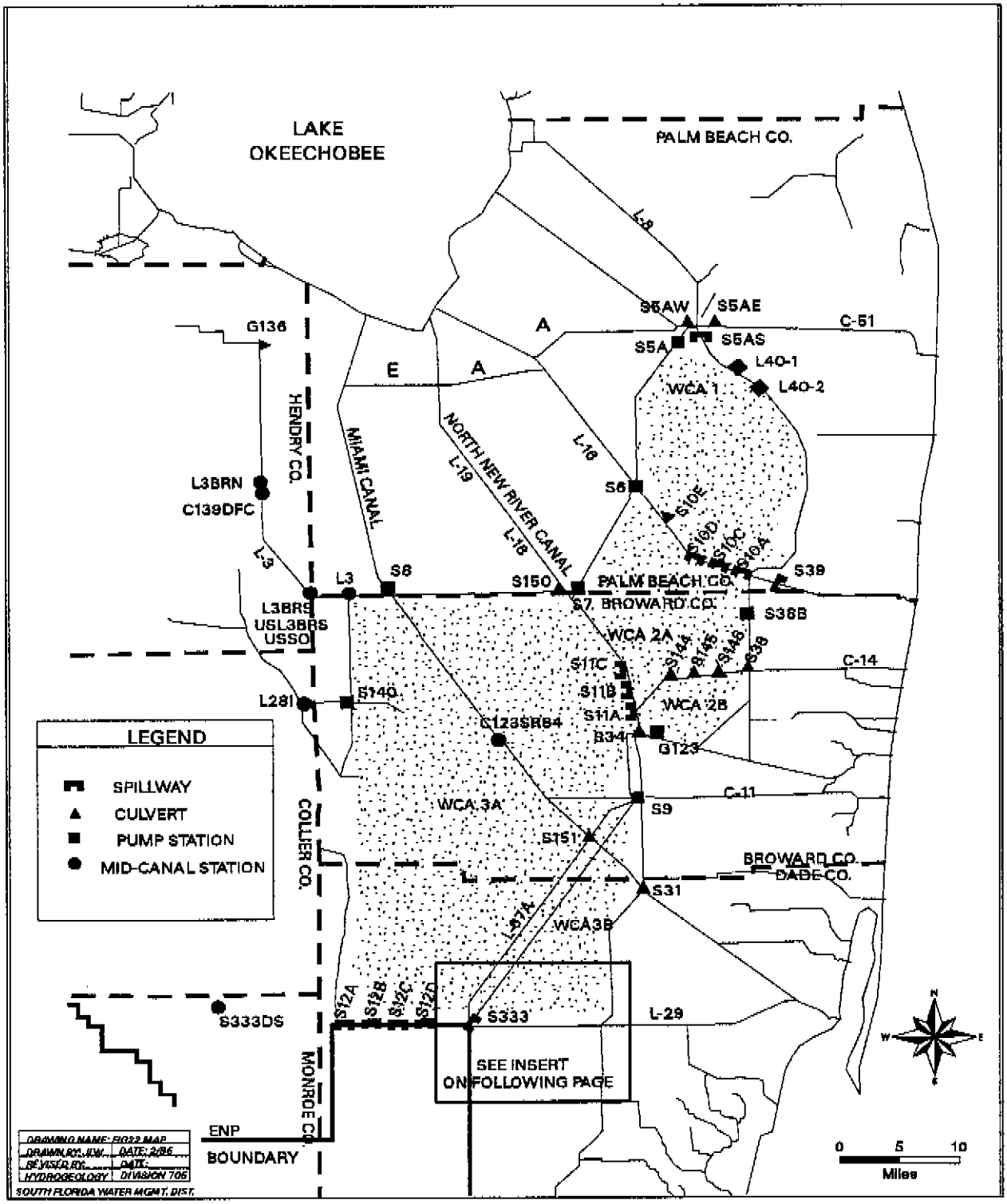

FIGURE 20. Location of Sampling Stations for the Water Conservation Areas Inflow / Outflow Water Quality Monitoring Program.

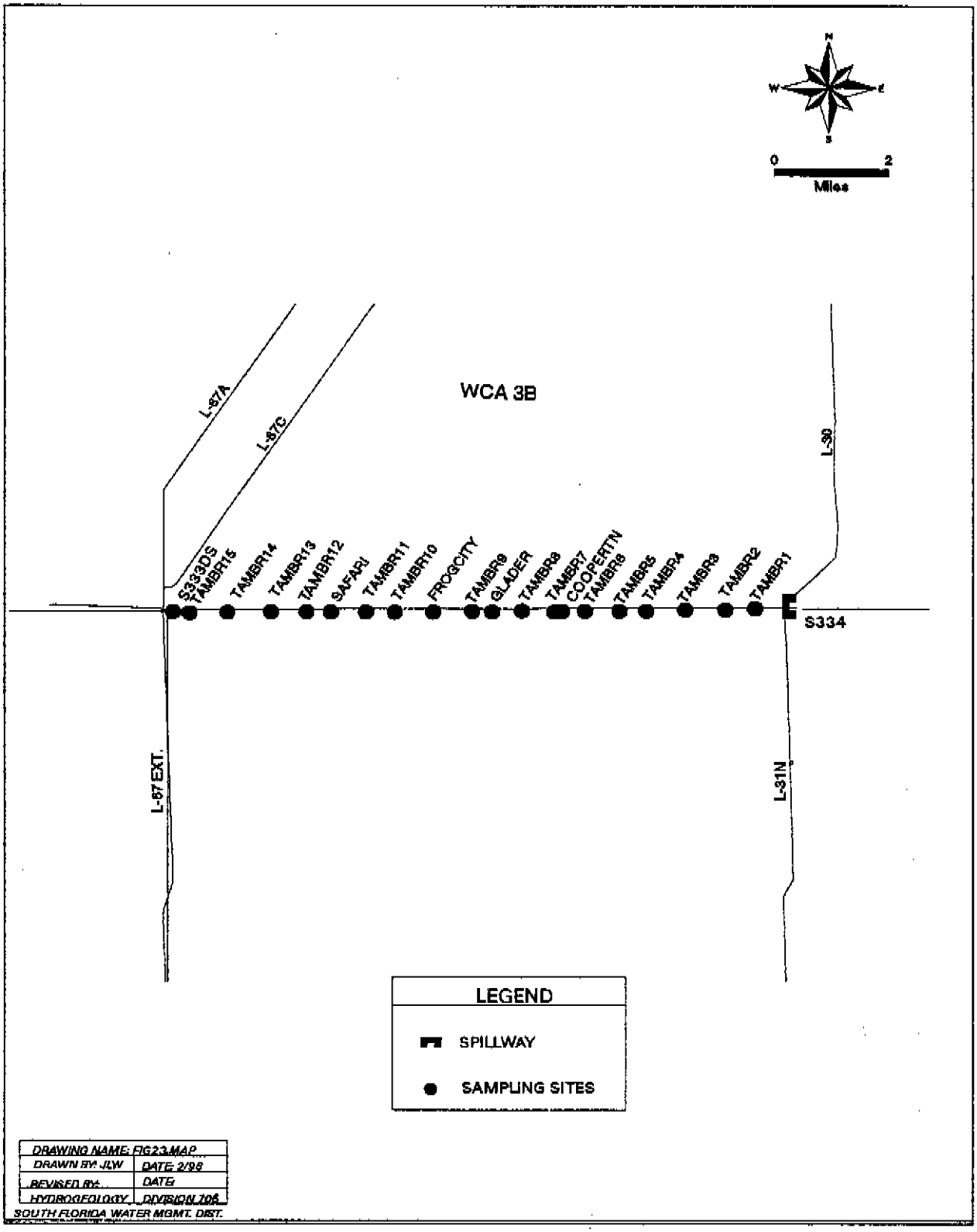

FIGURE 21. Location of Sampling Stations for the Tamiami Bridge Culverts Water Quality Monitoring Program.

TABLE 36. Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chl.	US/DS	G/A
S5A	264101	802205	A District controlled water pumping station located at the northern most end of WCA1 near State Road 80. S-5A pumps water from the EAA, L-8, and the C-51 basin into WCA1.	1974 - P	WF/M	WF/M	QTR	BA	M	US	G/A
S5AS	264101	802151	A gate type structure located at the north end of WCA1 near S-5A and State Road 80. Water flows out of WCA1 into the L-8 canal.	1979 - P	BWF	BWF	QTR	BA	-	US	G
S5AE	264104	802150	A small gate type structure located at the intersection of the C-51 and L-8 canal near S-5AS and State Road 80. Water can flow either east through this structure into the C-51 canal, or west into the L-8 canal.	1982 - P	BWF	BWF	QTR	BA	-	US	G
S5AW	264105	802153	A small gate type structure located at the intersection of the L-13 and L-8 canal near S-5AS and State Road 80. Water can flow either west through this structure into the L-13 canal, or east into the L-8 canal.	1991 - P	BWF	BWF	QTR	BA	-	US	G
S6	262822	802650	S-6 is located about 16 miles southwest of S-5A on the Hillsboro Canal at the intersection of Hillsboro Canal (L-15), L-6, L-39,and L-7. Water is pumped in a southerly direction through this pump station down the Hillsboro Canal into WCA1.	1974 - P	WF/M	WF/M	QTR	BA	-	US	G/A
S7	262007	803213	S-7 is located approximately 11 miles southwest of S-6 at the intersection of North New River Canal (L-18), L-5, and L-6, along US-27. Water is pumped in a southerly direction down the North New River Canal into WCA2. There is also a sluice gate that can be open to let water gravity flow northward.	1974 - P	WF/M	WF/M	QTR	BA	-	US	G/A
S8	261953	804628	S-8 is located about 15 miles west of S-7 at the intersection of Miami Canal (L-23), L-4, and L-5. Water is pumped in a southerly direction down the Miami Canal into WCA3. There is also a sluice gate that can be opened to let water gravity flow northward.	1973 - P	WF/M	WF/M	QTR	BA	-	US	G/A

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chl.	US/DS	G/A
S9	260340	802638	A District controlled water pumping station located along US-27 on the South New River Canal (C-11). Water is pumped from C-11 into WCA3.	1978 - P	BWF/M	W/BWF/M	QTR	BA	-	US	G/A
S10A	262133	801846	These are all gate type structures except S10E which are gated	1978 - P	BWF	BWF	QTR	BA	-	US	G
S10C	262216	802110	culverts. They are all located along L-39 between WCA1 and	1978 - P	BWF	BWF	QTR	BA	-	US	G
S10D	262317	802256	WCA2A on the Hillsboro Canal. S10A,S10C, and S10D are	1978 - P	BWF/M	BWF/M	QTR	BA	-	US	G
S10E	262733	802614	one, three, and six miles west of S-39 on L-39, respectively. S10E is about 1/4 mile south of S6 on L-39. Water flows from WCA1 into WCA2A through these structures.	1985 - P	BWF	BWF	QTR	BA	-	US	G
S11A	261036	802656	These are gate type structures located along US-27 beginning	1978 - P	BWF	BWF	QTR	BA	-	US	G
S11B	261208	802716	approximately two miles north of State Road 84, and are	1978 - P	BWF	BWF	QTR	BA	-	US	G
S11C	261345	802737	spaced approximately two miles apart. Water flows from WCA2A into WCA3A through these structures.	1978 - P	BWF/M	BWF/M	QTR	BA	-	US	G
S34	260858	802634	A small gate type structure located on the North New River Canal along US-27 about 1/4 mile north of State Road 84. Water flows in an easterly direction down the North New River Canal.	1978 - P	BWF	BWF	QTR	BA	-	US	G
S38	261344	801756	A small gate type structure located at the southeast corner of WCA2A at the intersection of L-36 and L-35B seven miles west of State Road 7, water flows eastward into C-14 canal.	1978 - P	BWF/M	BWF/M	QTR	BA	-	US	G
S38B	261700	801752	A set of four culverts under the L-36 levee half way between S-38 and S-39. The water samples are collected from the WCA-2A side of the culverts.	1990 - P	BWF	BWF	QTR/F	BA/F		DS	G
S39	262119	801752	A small gate type structure located at the south end of WCA1 at the intersection of L-36 L-39, and L-40 eight miles west of State Road 7, on the Hillsboro Canal. This is an outflow point from WCA1 where water flows eastward, down the Hillsboro Canal.	1978 - P	BWF/M	BWF/M	QTR	BA	-	US	G

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chl.	US/DS	G/A
S144	261304	802353	These are all single gated culverts located along L-35B which divides WCA2A from WCA2B. They are five, seven, and nine miles east of US-27, respectively. Water flows from WCA2A through these structures into WCA2B.	1978 - P	BWF	BWF	QTR	BA		US	G
S145	261317	802158		1978 - P	BWF/M	BWF/M	QTR	BA		US	G
S146	261330	802001		1978 - P	BWF	BWF	QTR	BA		US	G
S150	262004	803223	A series of gated culverts located west of S-7 across US-27. Water flows southward through this structure into WCA3A.	1978 - P	BWF/M	W/BWF/M	QTR	BA		US/DS	G/A
L3	261952	804956	A canal station located at the intersection of the L-4 and L-28 canals, approximately three miles west of pump station S-8. The water flows southward into WCA3A.	78 - 96	BWF/M	BWF/M	QTR	BA		-	G
L3BRN	262600	805650	This sample is collected from the Deer Fence Canal bridge on L-3, which is the third wooden bridge north along L-3. Water flows in a southerly direction at this point.	84 - 96	BWF/M	BWF/M	QTR	BA		-	G
L281	260954	804943	This water sample is collected from the bridge of State Road 84(I75) at the L-28 Interceptor Canal, about four miles west of pump station S-140. The water flow is toward the south at this point.	78 - 96	BWF	BWF	QTR	BA		-	G
S140	261017	804940	A District controlled water pumping station located at the west side of WCA3A on the L-28 canal near State Road 84(I75). Water is pumped eastward through this structure into WCA3A down C-60.	78 - 96	BWF/M	BWF/M	QTR	BA		US	G
S151	260040	803037	A series of gated culverts located in WCA3A at the intersection of L-67A and the Miami Canal. Water flows in a southeasterly direction through this structure, down the Miami Canal.	1978 - P	BWF/M	BWF/M	QTR	BA		US	G

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chl.	US/DS	G/A
S333	254542	804027	A gate type structure located at the southeast corner of WCA3A, 1/4 of a mile east of S-12D along US-41. The water flows eastward from WCA3A down the L-29 canal.	1978 - P	BWF/M	BWF/M	BWF/M	M	M	US	G
S12D	254542	804055	These are all gate type structures located along US-41 at the south end of WCA3A. They are 1/4, 2, 6, and 9 miles west of S-333, respectively. Water flows southward from WCA3A through these structures into the ENP.	1978 - P	BWF/M	BWF/M	BWF/M	M	M	US	G
S12C	254542	804338		1978 - P	BWF/M	BWF/M	BWF/M	M	M	US	G
S12B	254541	804611		1978 - P	BWF/M	BWF/M	BWF/M	M	M	US	G
S12A	254541	804917		1978 - P	BWF/M	BWF/M	BWF/M	M	M	US	G
G123	260859	802634	A District controlled water pumping station located on the North New River Canal along US-27 about 1/4 of a mile north of State Road 84. Water is pumped toward the north through this structure and then is released into WCA3A through S-142.	1982 - P	BWF	BWF	QTR/F	BA/F		US	G
S31	255633	802625	A series of gated culverts located on the east side of WCA3A on the Miami Canal near US-27. Water flows southeast through this structure down the Miami Canal.	1987 - P	BWF/M	BWF/M	QTR	BA		US	G
S190	261701	805805	A gate type structure located on the L-28 Intercepter Canal about 2 1/2 miles south of State Road 833 along the north feeder canal that lets water into the L-28 Intercepter Canal, which is located within the Big Cypress Seminole Indian Reservation.	87 - 96	BWF/M	BWF/M	QTR	BA		US	G
L3BRS	261950	805253	This water sample is collected from the Oil Well Bridge, which is located 6 1/2 miles west of pump station S-8 at the intersection of the L-3 and L-4 levees near the northwest corner of WCA3A.	87 - 96	BWF/M	BWF/M	QTR	BA		-	G

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	Chl.	US/DS	G/A
L40-1**	263629	801717	Pump stations on the NE side of WCA-1 owned and operated by the Acme Improvement District. L40-1 pumps water into WCA-1. L40-2 can pump water into WCA-1 or take water out of WCA-1 for irrigation.	78-80,89-P	BWF/M	BWF/M	QTR	BA	-	US	G
L40-2**	263535	801617		78-80,89-P	BWF/M	BWF/M	QTR	BA	-	US	G
C123SR84	260845	803758	This sample is collected from the Miami Canal where it crosses under State Road 84(I75). Water flows in a southerly direction at this point.	1988 - P	BWF/M	BWF/M	QTR	BA	-	-	G
C139DFC	262555	805648	A canal station situated on a platform on the east side of the L3 Canal, 100 yards south (downstream) of the Dear Fence Canal bridge.	1996 - P	BWF/M	W/BWF/M	QTR	BA	-	-	G/A
G136	263960	805658	A gated culvert structure located at the intersection of the L-1 and L-2 levees in Hendry Co. Water flows eastward through this structure.	1996 - P	BWF/M	W/BWF/M	QTR	BA	-	US	G/A
USL3BRS	261958	805258	A canal station situated on a platform on the west side of the L3 canal, approximately 200 yards north of Oil Well Bridge(L3BRS). Water flows southward at this site.	1996 - P	BWF/M	W/BWF/M	QTR	BA	-	-	G/A
USSO	261948	805255	A canal station situated on a platform on the west side of the L28 Borrow Canal, immediately downstream of a gated culvert operated by US Sugar Corp. This structure is located 50 yards west of Oil Well Bridge.	1996 - P	BWF/M	W/BWF/M	QTR	BA	-	DS	G/A
TAMBR6	254538	803317	Culvert under US Highway 41, 3.3 miles west of District spillway S-334.	1991 - P	BWF/M	BWF/M	QTR	BA	-	-	G
FROGCITY	254538	803550	Culvert under US Highway 41, 6.0 miles west of District spillway S-334.	1991 - P	BWF/M	BWF/M	QTR	BA	-	-	G

** As of February 1997 these sites will be re-named to: ACME1DS for L40-1, and G94D for L40-2.

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Total Phosphorus	G/A
TAMBR1	254538	803023	Culvert under US Highway 41, 0.3 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR2	254538	803053	Culvert under US Highway 41, 0.8 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR3	254538	803134	Culvert under US Highway 41, 1.5 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR4	254538	803215	Culvert under US Highway 41, 2.2 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR5	254538	803241	Culvert under US Highway 41, 2.7 miles west of District spillway S-334.	1991-P	BWF	BWF	G
COOPERTN	254538	803340	Culvert under US Highway 41, 3.7 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR7*	254538	803347	Culvert under US Highway 41, 3.85 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR8*	254538	803420	Culvert under US Highway 41, 4.4 miles west of District spillway S-334	91 - 96	WF	WF	G
GLADER	254538	803453	Culvert under US Highway 41, 5.0 miles west of District spillway S-334.	1991-P	BWF	BWF	G

* Discontinued in 1996.

TABLE 36 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Water Conservation Areas Inflows/Outflows Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Total Phosphorus	G/A
TAMBR9*	254538	803508	Culvert under US Highway 41, 5.3 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR10*	254538	803630	Culvert under US Highway 41, 6.7 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR11*	254538	803659	Culvert under US Highway 41, 7.2 miles west of District spillway S-334.	91 - 96	WF	WF	G
SAFARI	254538	803735	Culvert under US Highway 41, 7.9 miles west of District spillway S-334.	1991-P	BWF	BWF	G
TAMBR12*	254538	803800	Culvert under US Highway 41, 8.35 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR13*	254538	803836	Culvert under US Highway 41, 8.95 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR14*	254538	803920	Culvert under US Highway 41, 9.7 miles west of District spillway S-334.	91 - 96	WF	WF	G
TAMBR15*	254538	804004	Culvert under US Highway 41, 10.5 miles west of District spillway S-334.	91 - 96	WF	WF	G
S333DS	254542	804027	A gate type structure located at the southeast corner of WCA3A, 1/4 of a mile east of S-12D along US-41. The water flows eastward from WCA3A down the L-29 canal. Samples collected from the downstream side of structure.	1991 - P	BWF	BWF	G

* Discontinued in 1996.

TABLE 37. Statistics on Select Parameters for the Water Conservation Areas and Tamiami Bridge Culverts Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
C123SR84	0.0070	0.0465	0.2620	0.0040	0.0136	0.0670	0.0001	1.6018	5.3000	0.0040	0.1202	3.4470
C139DFC	0.0180	0.1376	1.1850	-	-	-	0.0002	1.5028	3.4700	0.0040	0.0655	0.3360
G123	0.0040	0.0195	0.0800	0.0040	0.0066	0.0720	0.0001	1.8220	3.0700	0.0040	0.0863	0.6000
G136	0.0110	0.0773	0.4150	0.0040	0.0429	0.2530	0.8550	1.7619	8.2000	0.0040	0.1205	0.9970
L28I	0.0120	0.0583	0.6660	0.0020	0.0237	0.4720	0.0001	1.3055	3.6200	0.0040	0.0369	0.8040
L3	0.0020	0.1101	0.8600	0.0020	0.0617	0.5860	0.0002	1.7062	5.9300	0.0040	0.1004	3.4470
L3BRN	0.0180	0.1136	0.4850	0.0040	0.0623	0.3790	0.5000	1.5372	3.0900	0.0040	0.0909	1.1910
L3BRS	0.0200	0.1203	0.5140	0.0040	0.0759	0.3590	0.6400	1.5147	7.5100	0.0040	0.1093	1.0280
L40-1	0.0110	0.0598	0.4100	0.0020	0.0224	0.2940	0.0002	2.8906	9.1700	0.0040	0.3423	4.2450
L40-2	0.0090	0.0815	0.3830	0.0020	0.0347	0.2250	0.0003	2.7025	9.3600	0.0040	0.3808	4.5710
S10A	0.0070	0.0559	0.1620	0.0020	0.0290	0.1580	0.0002	2.3554	11.5400	0.0040	0.3211	6.0430
S10C	0.0100	0.1095	3.4350	0.0020	0.0607	1.2900	0.6600	3.3530	22.8400	0.0040	0.5248	5.0830
S10D	0.0080	0.1095	1.3470	0.0020	0.0623	1.2740	0.0004	3.3100	14.7300	0.0040	0.5316	6.3300
S10E	0.0320	0.1073	0.4930	0.0040	0.0582	0.3520	0.8400	3.0486	7.6700	0.0040	0.4528	3.2270
S11A	0.0030	0.0258	0.1920	0.0020	0.0099	0.1630	0.0001	2.1375	6.2900	0.0040	0.1163	1.4600
S11B	0.0020	0.0454	0.4460	0.0020	0.0235	0.4120	0.0002	2.3953	6.2300	0.0040	0.2815	3.1850
S11C	0.0070	0.0540	0.5560	0.0020	0.0254	0.3450	0.0001	2.3700	6.9600	0.0040	0.3026	4.4050
S12A	0.0020	0.0154	0.2530	0.0020	0.0051	0.0720	0.0001	1.4505	7.8500	0.0040	0.0253	0.4950
S12B	0.0020	0.0150	0.5930	0.0020	0.0050	0.0570	0.0001	1.4701	5.5300	0.0040	0.0399	1.5410
S12C	0.0020	0.0137	0.1420	0.0020	0.0052	0.0680	0.0002	1.6049	9.1300	0.0040	0.0600	2.0910
S12D	0.0020	0.0144	0.1320	0.0020	0.0051	0.0610	0.0002	1.6836	5.4100	0.0040	0.0847	2.4800
S140	0.0040	0.0643	0.6880	0.0020	0.0285	0.5010	0.0001	1.5244	7.3000	0.0040	0.0722	5.4630
S144	0.0020	0.0180	0.1480	0.0020	0.0055	0.0530	0.0002	2.2765	9.6100	0.0040	0.0730	2.2670
S145	0.0020	0.0158	0.1220	0.0020	0.0062	0.0970	0.8320	2.1245	6.0100	0.0040	0.0683	2.6910
S146	0.0020	0.0165	0.1010	0.0020	0.0054	0.0400	0.0002	2.0850	4.9000	0.0040	0.0485	0.8710
S150	0.0080	0.0589	0.2020	0.0020	0.0274	0.1300	0.0002	2.5568	7.8500	0.0040	0.4909	5.3490
S151	0.0040	0.0253	0.1710	0.0020	0.0083	0.0930	0.0002	1.9643	5.0500	0.0040	0.1440	2.0890
S190	0.0110	0.0743	0.2790	0.0040	0.0351	0.2220	0.0001	1.1912	2.4100	0.0040	0.0642	1.4450
S31	0.0040	0.0211	0.1410	0.0040	0.0088	0.1490	0.6900	1.5461	3.3100	0.0040	0.0826	1.8360
S333	0.0030	0.0155	0.1670	0.0020	0.0060	0.0770	0.0002	1.6937	5.8000	0.0040	0.0959	1.8510
S333DS	0.0040	0.0124	0.0600	0.0040	0.0040	0.0040	1.4700	1.4700	1.4700	0.2830	0.2830	0.2830

TABLE 37. Statistics on Select Parameters for the Water Conservation Areas and Tamiami Bridge Culverts Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
S34	0.0020	0.0200	0.1120	0.0020	0.0045	0.0400	1.1200	2.2011	6.0200	0.0040	0.0809	1.2250
S352	0.0560	0.1583	0.5000	-	-	-	0.0002	1.7970	3.6000	0.0260	0.1704	0.5200
S38	0.0020	0.0206	0.1320	0.0020	0.0059	0.0680	0.0002	2.1208	7.6500	0.0040	0.0634	2.1020
S38B	0.0080	0.0290	0.1450	0.0040	0.0050	0.0120	0.8700	1.4285	3.2000	0.0040	0.2155	0.8350
S39	0.0060	0.0558	0.2800	0.0020	0.0228	0.2380	0.0004	2.4397	10.9600	0.0040	0.2030	5.9450
S5A	0.0040	0.1579	0.5810	0.0020	0.0916	0.5240	0.0003	4.8965	18.6800	0.0100	1.4891	12.1560
S5AE	0.0110	0.1052	0.5600	0.0040	0.0533	0.3760	0.0005	2.1365	6.1300	0.0040	0.3130	2.6840
S5AS	0.0300	0.1537	0.4560	0.0020	0.0939	0.3970	0.0002	3.3325	12.0900	0.0040	0.4824	4.7870
S5AW	0.0270	0.0675	0.3230	0.0040	0.0248	0.0840	0.7500	1.5308	3.5300	0.0050	0.2026	1.2290
S6	0.0020	0.0875	0.8720	0.0020	0.0514	0.8490	0.0003	3.8251	17.0400	0.0001	0.8266	10.3130
S7	0.0060	0.0745	1.0300	0.0020	0.0402	0.9220	0.0002	3.0152	10.6700	0.0001	0.7336	6.6600
S8	0.0050	0.0991	0.9330	0.0010	0.0429	0.5960	0.0001	3.0272	17.4000	0.0002	0.8268	8.9000
S9	0.0020	0.0173	0.1720	0.0020	0.0056	0.1000	0.0002	1.8987	8.7100	0.0030	0.0641	0.8340
USL3BRS	0.0210	0.1374	0.4870	0.0480	0.0480	0.0480	0.5560	1.4861	2.7000	0.0040	0.1044	0.4090
USSO	0.0400	0.1706	1.2120	0.0080	0.0496	0.0980	0.0002	1.5896	4.7800	0.0150	0.0331	0.1300
COOPERTN	0.0040	0.0111	0.0340	-	-	-	-	-	-	-	-	-
FROGCITY	0.0040	0.0101	0.0180	-	-	-	-	-	-	-	-	-
GLADER	0.0040	0.0110	0.0370	-	-	-	-	-	-	-	-	-
SAFARI	0.0040	0.0112	0.0370	-	-	-	-	-	-	-	-	-
TAMBR1	0.0040	0.0135	0.4350	-	-	-	-	-	-	-	-	-
TAMBR10	0.0050	0.0101	0.0170	-	-	-	-	-	-	-	-	-
TAMBR11	0.0040	0.0107	0.0550	-	-	-	-	-	-	-	-	-
TAMBR12	0.0040	0.0112	0.0450	-	-	-	-	-	-	-	-	-
TAMBR13	0.0050	0.0126	0.0980	-	-	-	-	-	-	-	-	-
TAMBR14	0.0050	0.0105	0.0180	-	-	-	-	-	-	-	-	-
TAMBR15	0.0040	0.0122	0.0410	-	-	-	-	-	-	-	-	-
TAMBR2	0.0040	0.0115	0.0490	-	-	-	-	-	-	-	-	-
TAMBR3	0.0040	0.0113	0.0560	-	-	-	-	-	-	-	-	-
TAMBR4	0.0040	0.0111	0.0730	-	-	-	-	-	-	-	-	-
TAMBR5	0.0040	0.0111	0.1040	-	-	-	-	-	-	-	-	-

TABLE 37. Statistics on Select Parameters for the Water Conservation Areas and Tamiami Bridge Culverts Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
TAMBR6	0.0040	0.0104	0.0230	-	-	-	-	-	-	-	-	-
TAMBR7	0.0130	0.0130	0.0130	-	-	-	-	-	-	-	-	-
TAMBR8	0.0040	0.0102	0.0270	-	-	-	-	-	-	-	-	-
TAMBR9	0.0050	0.0109	0.0220	-	-	-	-	-	-	-	-	-

SECTION 18

THE BISCAYNE BAY WATER QUALITY MONITORING PROGRAM
PROJECT CODE: BISC

Purpose and Scope

This cooperative program with Dade County Department of Environmental Resources Management (DERM) consists of monthly surface water quality monitoring in Biscayne Bay and its major tributaries. DERM began routine monitoring of Biscayne Bay surface water quality in March 1979. The original program consisted of 48 fixed stations distributed throughout the Bay and at the mouths of most major tributaries. Over the years, sampling stations were added and the parameter matrix was modified. The most significant changes occurred when the District began funding the Program in 1988 as part of the Biscayne Bay Surface Water Management and Implementation (SWIM) Plan. Degradation of water quality in Biscayne Bay was a primary factor that influenced the State legislature to place Biscayne Bay on the initial SWIM priority list. Stations were added primarily in the tributaries and the parameter matrix was expanded in an effort to 1) detect spatial, seasonal and interannual trends and possible impacts on the health of the bay ecosystem; and 2) identify areas of potential degradation. These data have been instrumental in documenting a variety of impacts to surface water quality in Biscayne Bay and continue to give direction for investigations and remedial actions. The data are regularly used by academic institutions, private sector organizations and public agencies.
Monthly surface water quality monitoring at 25 sites in Biscayne Bay is also conducted by Florida International University as part of the South Florida Estuarine Water Quality Monitoring Program described in Section 23.

Sampling Locations and Descriptions

The routine water quality monitoring network consists of 90 stations at which monthly samples are collected and analyzed for a variety of physical, chemical and biological parameters to characterize the water quality. Figures 22 and 23 depict the sampling locations. Table 37 lists the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and the type of sample collection. Table 38 contains basic summary statistics for select parameters at each monitoring location.

District Publications

Biscayne Bay SWIM Plan. (1989). Planning Department, SFWMD.

Biscayne Bay SWIM Plan. (1995). Planning Department, South Florida Water Management District.

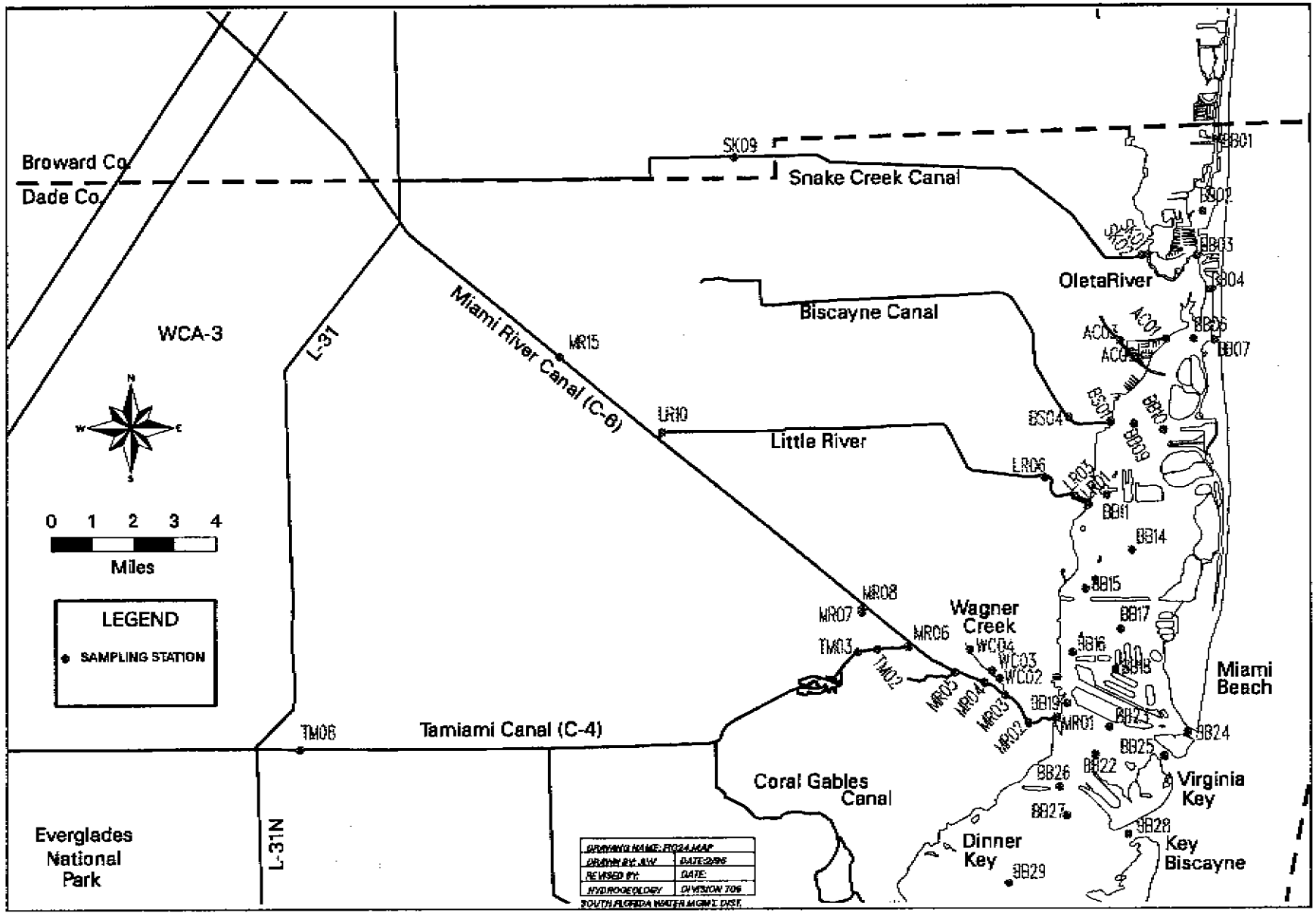

FIGURE 22. Location of Sampling Stations for the Biscayne Bay Water Quality Monitoring Program.

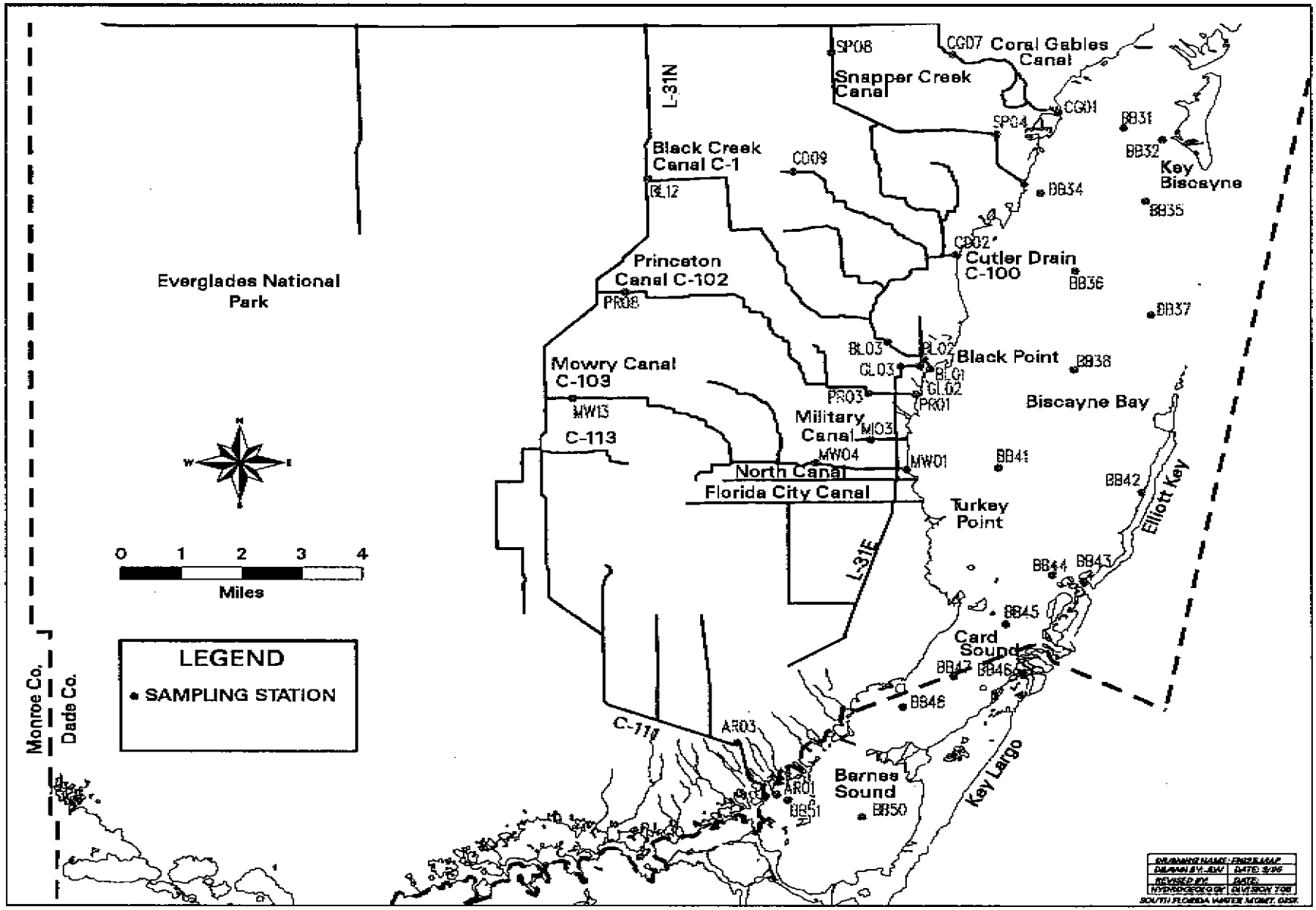

FIGURE 23. Location of Sampling Stations for the Biscayne Bay Water Quality Monitoring Program.

TABLE 38. Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
AC01	255400	800838	Mouth of New Arch Creek	1979-P	M	M	-	M	DS	G
AC02	255337	800915	Arch Creek southern mouth west of Bayshore Dr. bridge	1988-P	M	M	-	M	DS	G
AC03	255358	800941	Arch Creek south side of foot bridge at Enchanted Forest Park	1988-P	M	M	B	M	US	G
AR01	251523	802515	Mouth of Aerojet Canal (C-111)	1989-P	M	M	B	M	DS	G
AR03	251725	802640	East side of U.S. 1 bridge on Aerojet Canal (C-111)	1989-P	M	M	B	M	US	G
BB01	255808	800725	Intracoastal Waterway at Dade Broward line	1979-P	M	-	-	M	DS	G
BB02	255638	800745	Intracoastal Waterway at green marker no. 49; Near center of Dumfoundling Bay	1979-P	M	M	B	M	DS	G
BB03	255543	800754	Mouth of Oleta River at Intracoastal Waterway	1979-P	M	-	-	M	DS	G
BB04	255501	800737	Intracoastal Waterway at red marker no. 4	1979-P	M	M	-	M	DS	G
BB06	255400	800759	Intracoastal Waterway at red marker no. 8	1979-P	M	M	-	M	DS	G
BB07	255358	800730	Thirty meters west of A1A bridge in Haulover Inlet	1979-P	M	-	-	M	DS	G
BB09	255215	800922	Intracoastal Waterway at red marker no. 18	1979-P	M	M	-	M	DS	G
BB10	255207	800842	West of Biscayne Point at red marker no. 2	1979-P	M	-	-	M	DS	G
BB11	255047	801001	Ten meters south of Pelican Harbor Park pier	1979-P	M	-	-	M	DS	G
BB14	254938	800927	North of Julia Tuttle Causeway; 2 km. east of Intracoastal Waterway green marker no. 31	1979-P	M	M	B	M	DS	G
BB15	254851	801032	Intracoastal Waterway at green marker no. 39	1979-P	M	-	-	M	DS	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
BB16	254733	801051	Intracoastal Waterway at green marker no. 45	1979-P	M	-	-	M	DS	G
BB17	254801	800943	Midway between Julia Tuttle Causeway and San Marino Is.; 1 km. north of San Marino Is.	1979-P	M	M	-	M	DS	G
BB18	254711	800951	Midway between San Marino Island and Hibiscus Island	1979-P	M	-	-	M	DS	G
BB19	254630	801059	Intracoastal Waterway thirty meters south of Dodge Island bridge	1979-P	M	-	-	M	DS	G
BB22	254527	801020	Midway between Miami Marine Stadium and NOAA slip at Dodge Island ; 1.4 km. east of Intracoastal Waterway green marker no. 67	1979-P	M	M	B	M	DS	G
BB23	254600	801000	Fisherman's Channel green marker no.13	1979-P	M	-	-	M	DS	G
BB24	254553	800812	Miami Main Ship Channel red marker no. 16	1979-P	M	-	-	M	DS	G
BB25	254524	800844	Norris Cut midway between Virginia Key and Fisher Island	1979-P	M	-	-	M	DS	G
BB26	254447	801110	North side of Rickenbacker Causeway bridge and 30 meters west of Intracoastal Waterway	1979-P	M	-	-	M	DS	G
BB27	254411	801100	Intracoastal Waterway green marker no. 71	1979-P	M	M	-	M	DS	G
BB28	254347	800934	Bear Cut thirty meters west of center bridge span	1979-P	M	-	-	M	DS	G
BB29	254247	801222	Dinner Key Channel green marker no. 1	1979-P	M	M	-	M	DS	G
BB31	254134	801228	Midway (3 km.) east from mouth of Coral Gables Waterway to Key Biscayne	1979-P	M	M	B	M	DS	G
BB32	254106	801102	West of Cape Florida at red channel marker no. 4	1979-P	M	-	-	M	DS	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
BB34	253902	801530	Two kilometers east of mouth of Snapper Creek (C-2)	1979-P	M	-	-	M	DS	G
BB35	253842	801139	West of Safety Valve shoals at green marker no. 1	1979-P	M	M	-	M	DS	G
BB36	253557	801415	At mid bay red marker no. 2	1979-P	M	M	-	M	DS	G
BB37	253412	801130	West of Ragged Keys at green marker no. 1B	1979-P	M	-	-	M	DS	G
BB38	253202	801420	At southern entrance to the Featherbed Bank channel at marker no. 5	1979-P	M	M	-	M	DS	G
BB41	252812	801706	Entrance to Turkey Point Channel; marker no. 1	1979-P	M	M	-	M	DS	G
BB42	261643	801134	Fifty meters west of entrance to Elliott Key Harbor	1979-P	M	-	-	M	DS	G
BB43	252343	801402	Caesar's Creek mid channel opposite Adams Key Park Service pier	1979-P	M	-	-	M	DS	G
BB44	252359	801510	Intracoastal Waterway at red marker no.8	1979-P	M	M	-	M	DS	G
BB45	252203	801652	Intracoastal Waterway at Cutter Bank red marker no. 14	1979-P	M	-	-	M	DS	G
BB46	252002	801614	Angelfish Creek at red channel marker no. 10	1979-P	M	-	-	M	DS	G
BB47	251959	801848	Center of Card Sound four kilometers south of Cutter Bank	1979-P	M	M	B	M	DS	G
BB48	251848	802040	Intracoastal Waterway in Card Bank Channel at green marker no. 17	1979-P	M	-	-	M	DS	G
BB50	251430	802210	Barnes Sound Intracoastal Waterway midway between Card Sound bridge and Jewfish Creek	1989-P	M	M	-	M	DS	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
BB51	251510	802450	Center of Manatee Bay 500 meters north of Aerojet Channel	1989-P	M	M	-	M	DS	G
BL01	253206	801934	Mouth of Black Creek (C-1) and Goulds Canal	1979-P	M	M	B	M	DS	G
BL02	253229	801948	Black Creek (C-1) at entrance bridge (S.W. 87 Ave.) to Black Point Marina	1988-P	M	M	-	M	DS	G
BL03	253310	802107	Black Creek (C-1) east side of 97 Ave. bridge	1988-P	M	M	B	M	US	G
BL12	253940	802950	Black Creek (C-1) east side of Krome Ave. (S.W. 177 Ave.) bridge	1991-P	M	M	B	M	US	G
BS01	255218	800955	Mouth of Biscayne Canal (C-8)	1979-P	M	M	B	M	DS	G
BS04	255224	801054	Biscayne Canal (C-8) at footbridge near N.W. 107 St.	1988-P	M	M	B	M	US	G
BS10	255512	801926	Biscayne Canal (C-8) east side of bridge of Palmetto Expressway access road	1991-P	M	M	B	M	US	G
CD02	253637	801836	Cutler Drain (C-100) east side of Old Cutler Road bridge	1990-P	M	M	B	M	US	G
CD09	253955	802430	Cutler Drain (C-100) east side of S.W. 134 Ave. bridge	1991-P	M	M	B	M	US	G
CG01	254211	801448	Mouth of Coral Gables Waterway (C-3)	1979-P	M	M	-	M	DS	G
CG07	254430	801840	Coral Gables Waterway (C-3) east side of S.W. 72 Ave.	1991-P	M	M	B	M	US	G
GL02	253213	801957	Goulds Canal just east of earthen plug	1988-P	M	M	-	M	DS	G
GL03	253212	802039	North side of bridge at Goulds Canal and L-31E confluence	1988-P	M	M	-	M	US	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
LR01	255035	801027	Northern mouth of Little River (C-7)	1979-P	M	M	B	M	DS	G
LR03	255046	801046	Little River (C-7) at the intersection of the northern and southern discharge points near Belle Mead Is.	1988-P	M	M	-	M	DS	G
LR06	255109	801128	Little River (C-7) east side of N.W. 2 Ave. bridge	1990-P	M	M	B	M	US	G
LR10	255209	802022	Little River (C-7) north side of Galloway Rd. (N.W. 87 Ave.) bridge	1991-P	M	M	B	M	US	G
MI03	252920	802145	Military Canal west side of S.W. 107 Ave. bridge	1988-P	M	M	B	M	US	G
MR01	254614	801114	Miami River Canal outfall to Biscayne Bay	1979-P	M	M	B	M	US	G
MR02	254606	801152	Miami River thirty meters upstream of N.W. 2 Ave. bridge	1984-P	M	M	-	M	DS	G
MR03	254641	801226	Miami River midway between mouth of Wagner Creek and 5 St. bridge	1984-P	M	M	B	M	DS	G
MR04	254656	801255	Miami River thirty meters upstream of N.W. 12 Ave. bridge	1984-P	M	M	-	M	DS	G
MR05	254709	801336	Miami River thirty meters downstream of mouth of Comfort Canal (C-5)	1984-P	M	M	-	M	DS	G
MR06	254741	801440	Miami River thirty meters downstream from mouth of Tamiami Canal (C-4)	1984-P	M	M	B	M	DS	G
MR07	254824	801544	Miami River ten meters downstream of salinity control structure (S-26)	1984-P	M	M	-	M	DS	G
MR08	254829	801544	Miami Canal (C-6) east side of Le Jeune Rd. (N.W. 42 Ave.) bridge	1988-P	M	M	B	M	US	G
MR15	255343	802246	Miami Canal (C-6) west side of N.W. 138 St. bridge	1991-P	M	M	B	M	US	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
MW01	252809	802027	Mouth of Mowry Canal (C-103)	1979-P	M	M	-	M	DS	G
MW04	252825	802345	Mowry Canal (C-103) east side of S.W. 117 Ave. bridge	1991-P	M	M	B	M	US	G
MW13	253100	803235	Mowry Canal (C-103) east side of S.W. 217 Ave. bridge	1991-P	M	M	B	M	US	G
PR01	253107	802006	Mouth of Princeton Canal (C-102)	1990-P	M	M	-	M	DS	G
PR03	253110	802150	Princeton Canal (C-102) east side of S.W. 97 Ave. bridge	1991-P	M	M	B	M	US	G
PR08	253511	803040	Princeton Canal (C-102 west side of S.W. 197 Ave. bridge	1991-P	M	M	B	-	US	G
SK01	255545	800902	Mouth of Snake Creek (C-9)	1988-P	M	M	-	M	DS	G
SK02	255544	809010	Snake Creek (C-9) east side of Biscayne Blvd. bridge	1988-P	M	M	B	M	US	G
SK09	255750	801840	Snake Creek (C-9) east side of Ludlam Rd. (N.W. 67 Ave.) bridge	1991-P	M	M	B	M	US	G
SP01	253925	801606	Mouth of Snapper Creek (C-2)	1979-P	M	M	B	M	DS	G
SP04	254121	801705	Snapper Creek (C-2) south side of footbridge along Red Rd. (S.W. 57 Ave.) and south of Killian Dr. (S.W. 104 St.)	1991-P	M	M	B	M	US	G
SP08	254436	802304	Snapper Creek (C-2) west side of Snapper Creek Canal Dr. bridge	1991-P	M	M	B	M	US	G
TM02	254738	801523	Tamiami Canal (C-4) east side of Douglas Rd. (N.W. 37 Ave.) bridge	1988-P	M	M	-	M	DS	G

TABLE 38 (Continued). Summary of Sampling Locations and Frequency of Collection for the Biscayne Bay Water Quality Monitoring Program.

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Metals	Bacteria	US/DS	G/A
TM03	254735	801551	Tamiami Canal (C-4) east side of Le Jeune Rd. (N.W. 42 Ave.) bridge	1988-P	M	M	B	M	US	G
TM08	254539	802852	Tamiami Canal (C-4) west side of Krome Ave. (S.W. 177 Ave.) bridge	1991-P	M	M	B	M	US	G
WC02	254701	801233	Mouth of Seybold Canal	1987-P	M	M	-	M	DS	G
WC03	254711	801244	Wagner Creek south side of N.W. 14th St. bridge	1988-P	M	M	-	M	DS	G
WC04	254737	801315	Wagner Creek south side of N.W. 20th St. bridge	1988-P	M	M	B	M	DS	G

TABLE 39. Statistics on Select Parameters for the Biscayne Bay Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
AC01	0.0010	0.0127	0.0540	-	-	-	-	-	-	0.0100	0.0615	0.4000
AC02	0.0030	0.0171	0.0730	-	-	-	-	-	-	0.0100	0.0942	0.2900
AC03	0.0330	0.1475	0.9250	-	-	-	-	-	-	0.0100	0.1169	0.5400
AR01	0.0010	0.0087	0.0400	-	-	-	-	-	-	0.0100	0.0312	0.1800
AR03	0.0010	0.0061	0.0300	-	-	-	-	-	-	0.0100	0.0661	0.2500
BB01	0.0060	0.0327	0.1220	-	-	-	-	-	-	-	-	-
BB02	0.0020	0.0177	0.0650	-	-	-	-	-	-	0.0100	0.1114	2.4000
BB03	0.0020	0.0218	0.0540	-	-	-	-	-	-	-	-	-
BB04	0.0010	0.0137	0.0570	-	-	-	-	-	-	0.0100	0.0481	0.2500
BB06	0.0010	0.0106	0.0460	-	-	-	-	-	-	0.0100	0.0297	0.1900
BB07	0.0010	0.0117	0.1150	-	-	-	-	-	-	-	-	-
BB09	0.0010	0.0122	0.0630	-	-	-	-	-	-	0.0100	0.0336	0.1800
BB10	0.0010	0.0129	0.1020	-	-	-	-	-	-	-	-	-
BB11	0.0010	0.0132	0.0450	-	-	-	-	-	-	-	-	-
BB14	0.0010	0.0097	0.0630	-	-	-	-	-	-	0.0100	0.0285	0.1500
BB15	0.0010	0.0123	0.2380	-	-	-	-	-	-	-	-	-
BB16	0.0010	0.0091	0.0800	-	-	-	-	-	-	0.0100	0.0390	0.1300
BB17	0.0010	0.0103	0.0530	-	-	-	-	-	-	0.0100	0.0347	0.1500
BB18	0.0010	0.0077	0.0200	-	-	-	-	-	-	-	-	-
BB19	0.0010	0.0091	0.0660	-	-	-	-	-	-	-	-	-
BB22	0.0010	0.0089	0.0550	-	-	-	-	-	-	0.0100	0.0289	0.1700
BB23	0.0010	0.0076	0.0200	-	-	-	-	-	-	-	-	-
BB24	0.0010	0.0081	0.0300	-	-	-	-	-	-	-	-	-
BB25	0.0010	0.0076	0.0230	-	-	-	-	-	-	-	-	-
BB26	0.0010	0.0096	0.0590	-	-	-	-	-	-	-	-	-
BB27	0.0010	0.0093	0.0750	-	-	-	-	-	-	0.0100	0.0320	0.2700
BB28	0.0010	0.0082	0.0600	-	-	-	-	-	-	-	-	-
BB29	0.0010	0.0057	0.0820	-	-	-	-	-	-	0.0100	0.0294	0.1400
BB31	0.0010	0.0066	0.0500	-	-	-	-	-	-	0.0100	0.0289	0.3500
BB32	0.0010	0.0079	0.0620	-	-	-	-	-	-	0.0200	0.0200	0.0200

TABLE 39. Statistics on Select Parameters for the Biscayne Bay Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
BB34	0.0010	0.0080	0.0740	-	-	-	-	-	-	0.0100	0.0292	0.2200
BB35	0.0010	0.0071	0.0450	-	-	-	-	-	-	0.0100	0.0264	0.2300
BB36	0.0010	0.0064	0.0390	-	-	-	-	-	-	0.0100	0.0322	0.4000
BB37	0.0010	0.0070	0.0520	-	-	-	-	-	-	-	-	-
BB38	0.0010	0.0072	0.0660	-	-	-	-	-	-	0.0100	0.0266	0.1800
BB41	0.0010	0.0066	0.0580	-	-	-	-	-	-	0.0100	0.0436	0.3400
BB42	0.0010	0.0058	0.0250	-	-	-	-	-	-	-	-	-
BB43	0.0010	0.0084	0.1680	-	-	-	-	-	-	-	-	-
BB44	0.0010	0.0067	0.0390	-	-	-	-	-	-	0.0100	0.0261	0.2200
BB45	0.0010	0.0066	0.0410	-	-	-	-	-	-	-	-	-
BB46	0.0010	0.0067	0.0230	-	-	-	-	-	-	-	-	-
BB47	0.0010	0.0073	0.0440	-	-	-	-	-	-	0.0100	0.0354	0.4800
BB48	0.0010	0.0068	0.0450	-	-	-	-	-	-	0.0200	0.0267	0.0300
BB50	0.0010	0.0038	0.0200	-	-	-	-	-	-	0.0100	0.0263	0.1400
BB51	0.0010	0.0040	0.0200	-	-	-	-	-	-	0.0100	0.0228	0.1600
BL01	0.0010	0.0158	0.1100	-	-	-	-	-	-	0.0100	0.1006	0.8200
BL02	0.0010	0.0127	0.0490	-	-	-	-	-	-	0.0100	0.1234	0.8100
BL03	0.0010	0.0098	0.0550	-	-	-	-	-	-	0.0100	0.1818	0.8700
BL12	0.0010	0.0089	0.0400	-	-	-	-	-	-	0.0100	0.0215	0.1000
BS01	0.0010	0.0164	0.0600	-	-	-	-	-	-	0.0100	0.0628	0.5200
BS04	0.0050	0.0219	0.1620	-	-	-	-	-	-	0.0100	0.2478	1.7500
BS10	0.0050	0.0152	0.0440	-	-	-	-	-	-	0.0100	0.2449	0.4300
CD02	0.0010	0.0114	0.0360	-	-	-	-	-	-	0.0100	0.1145	0.3800
CD09	0.0010	0.0077	0.0400	-	-	-	-	-	-	0.0100	0.1295	0.4300
CG01	0.0010	0.0109	0.0540	-	-	-	-	-	-	0.0100	0.0479	0.2900
CG07	0.0110	0.0477	0.2100	-	-	-	-	-	-	0.0100	0.2668	1.3100
GL02	0.0070	0.0219	0.0790	-	-	-	-	-	-	0.0100	0.1187	0.6800
GL03	0.0020	0.0150	0.0520	-	-	-	-	-	-	0.0002	1.6881	3.9500
LR01	0.0010	0.0157	0.0720	-	-	-	-	-	-	0.0100	0.0596	1.7100
LR03	0.0030	0.0232	0.0580	-	-	-	-	-	-	0.0100	0.1024	0.4000

TABLE 39. Statistics on Select Parameters for the Biscayne Bay Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
LR06	0.0040	0.0274	0.0660	-	-	-	-	-	-	0.0200	0.2476	0.5500
LR10	0.0020	0.0123	0.0670	-	-	-	-	-	-	0.0100	0.0403	0.1200
MI03	0.0020	0.0152	0.1000	-	-	-	-	-	-	0.0001	0.6446	1.9000
MR01	0.0010	0.0136	0.0970	-	-	-	-	-	-	0.0100	0.0461	0.3100
MR02	0.0020	0.0217	0.0720	-	-	-	-	-	-	0.0100	0.1333	0.4000
MR03	0.0030	0.0235	0.0800	-	-	-	-	-	-	0.0100	0.1555	0.5200
MR04	0.0060	0.0241	0.0720	-	-	-	-	-	-	0.0200	0.1554	0.5200
MR05	0.0050	0.0246	0.0800	-	-	-	-	-	-	0.0200	0.1582	0.5700
MR06	0.0040	0.0294	0.2000	-	-	-	-	-	-	0.0100	0.1407	0.4600
MR07	0.0050	0.0321	0.1280	-	-	-	-	-	-	0.0100	0.0973	0.4700
MR08	0.0010	0.0155	0.0510	-	-	-	-	-	-	0.0100	0.1406	0.5700
MR15	0.0010	0.0092	0.0500	-	-	-	-	-	-	0.0100	0.0346	0.4500
MW01	0.0010	0.0121	0.0790	-	-	-	-	-	-	0.0001	0.3226	2.2000
MW04	0.0020	0.0065	0.0480	-	-	-	-	-	-	0.0002	2.0334	4.6400
MW13	0.0010	0.0080	0.0430	-	-	-	-	-	-	0.0100	0.1244	2.4100
PR01	0.0010	0.0119	0.1000	-	-	-	-	-	-	0.0002	1.4372	3.6200
PR03	0.0010	0.0063	0.0360	-	-	-	-	-	-	0.0004	3.7498	4.8600
PR08	0.0010	0.0108	0.1030	-	-	-	-	-	-	0.0100	0.2022	2.8100
SK01	0.0030	0.0172	0.0760	-	-	-	-	-	-	0.0100	0.1569	0.4500
SK02	0.0010	0.0132	0.0770	-	-	-	-	-	-	0.0100	0.2529	0.6800
SK09	0.0010	0.0086	0.0300	-	-	-	-	-	-	0.0100	0.0641	0.2000
SP01	0.0010	0.0109	0.0530	-	-	-	-	-	-	0.0100	0.0491	0.4400
SP04	0.0010	0.0100	0.0370	-	-	-	-	-	-	0.0300	0.1525	0.3600
SP08	0.0030	0.0120	0.1240	-	-	-	-	-	-	0.0100	0.0627	0.2700
TM02	0.0030	0.0219	0.0900	-	-	-	-	-	-	0.0100	0.2160	0.5000
TM03	0.0010	0.0169	0.1210	-	-	-	-	-	-	0.0100	0.2679	0.6100
TM08	0.0010	0.0081	0.0400	-	-	-	-	-	-	0.0100	0.0320	0.1200
WC02	0.0100	0.0644	0.2730	-	-	-	-	-	-	0.0100	0.1265	0.2900
WC03	0.0100	0.0932	0.3810	-	-	-	-	-	-	0.0100	0.1232	0.3900
WC04	0.0500	0.2011	0.7900	-	-	-	-	-	-	0.0100	0.0751	1.2200

SECTION 19

EVERGLADES NATIONAL PARK
PROJECT CODES: ENP and EVER

Purpose and Scope

The Everglades National Park (PARK) water quality monitoring programs were established to address the quality of water entering and leaving the PARK as well as the interior of the PARK. In January 1979, the South Florida Water Management District (SFWMD or District), the National Park Service and the United States Army Corps of Engineers (COE) entered into a joint Memorandum of Agreement (MOA) with the intent to establish non-degradation standards for water quality parameters for waters delivered to the PARK through water control structures along L-67A, L-31W and C-111. In October 1985, the District agreed to take over the responsibility for analyzing the samples collected from the interior of the PARK. The collection of the water samples from the interior of the PARK are collected by the PARK personnel. All appropriate sampling supplies are provided by the District.

These water quality monitoring programs provide a water quality and nutrient loading data base for:

1. Determining long and short term trends necessary to identify the downstream impacts of the Lake Okeechobee Technical Advisory Committee (LOTAC) / Surface Water Improvement and Management (SWIM) plan implementation for the Everglades Agricultural Area.

2. Implementing LOTAC's recommendation for a comprehensive monitoring and research plan as described in the Department of Environmental Regulation's "Lake Okeechobee Monitoring and Research Plan."

3. Comparing standards that were established for inflow water quality to the PARK. These standards are based on historical (1970-1978) average annual concentrations. At least annually, the District, PARK, and the COE meet to discuss any violations of the standards. As stated in the MOA, "Should water quality criteria not be met and a clear and present danger to water quality been determined by the parties, appropriate actions or such legal processes as may be necessary to restore or protect the quality of water entering the PARK shall be taken by the COE, National Park Service, and the District." The data analyzed by the District are forwarded to the PARK and the COE on a monthly basis.

Sampling Locations and Descriptions

The locations of the 17 sites monitored under these programs are shown on Figures 24 and 25. Project ENP consists of eight inflow/outflow sites, and project EVER consists of nine interior sites. There are 10 additional watershed monitoring sites associated with this program, these are; S-12D, S-12B, S-333, L3BRN, L-28I, S-140, S-11C, S-7, S-8, and S-9 which are shown on Figure 20, and are described in Section 17. Table 39 and 40 list all the station ID's, latitudes and longitudes, brief station descriptions, the period of record, the frequency of collection for each parameter group, whether the sample is collected upstream or downstream, and type of sample collection. Tables 41 through 42 contain statistics for each monitoring location.

District Publications

Everglades SWIM Plan. (1990), Planning Department, SFWMD.

Lake Okeechobee Monitoring and Research Plan. (1986), FDEP.

MacVicar, T. K. (1985). A Wet Season Field Test of Experimental Water Deliveries to Northeast Shark River Slough. SFWMD, Tech. Pub. No. 85-3. (DRE 215)

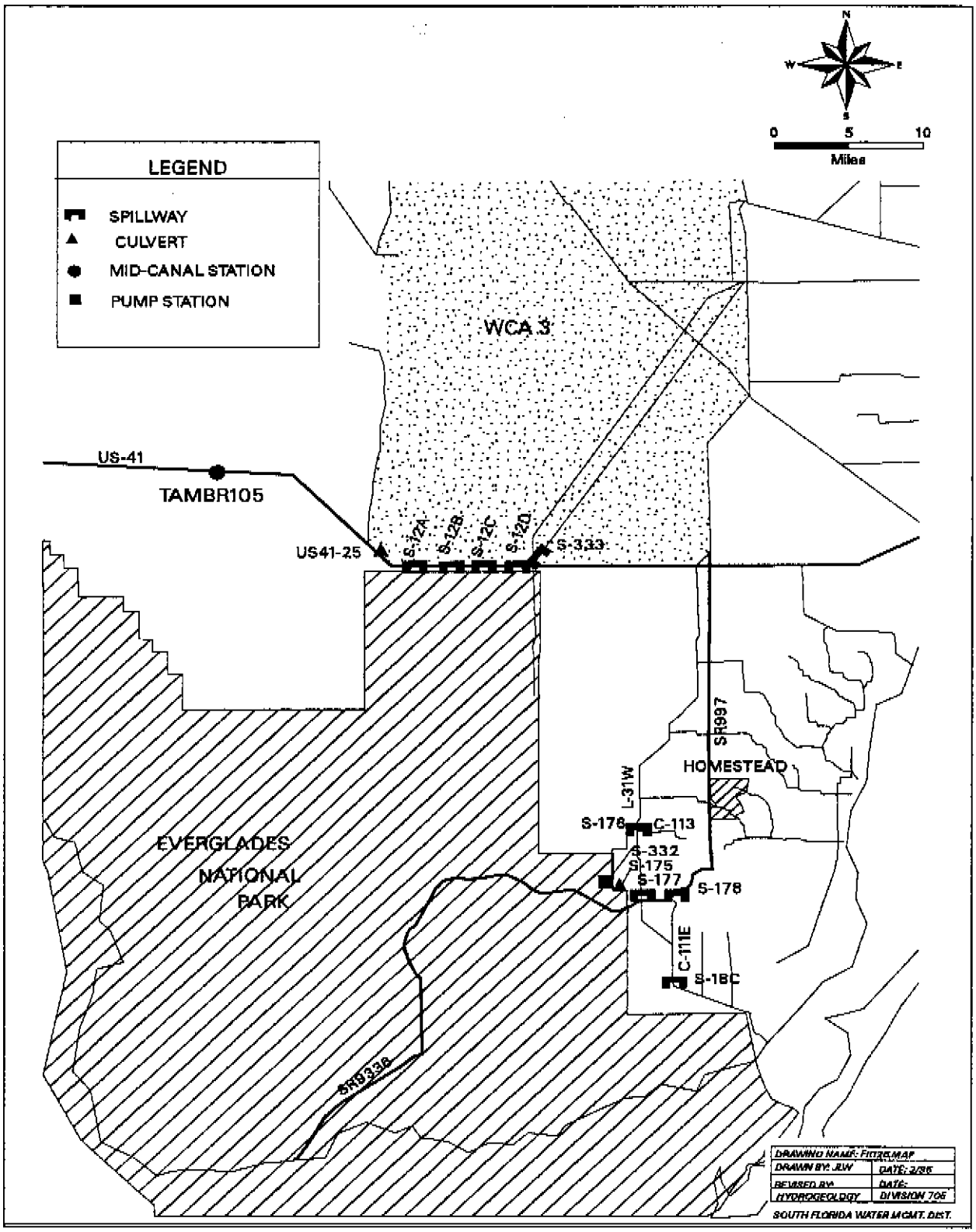

FIGURE 24. Location of the Inflow / Outflow Sampling Stations for the Everglades National Park Water Quality Monitoring Program.

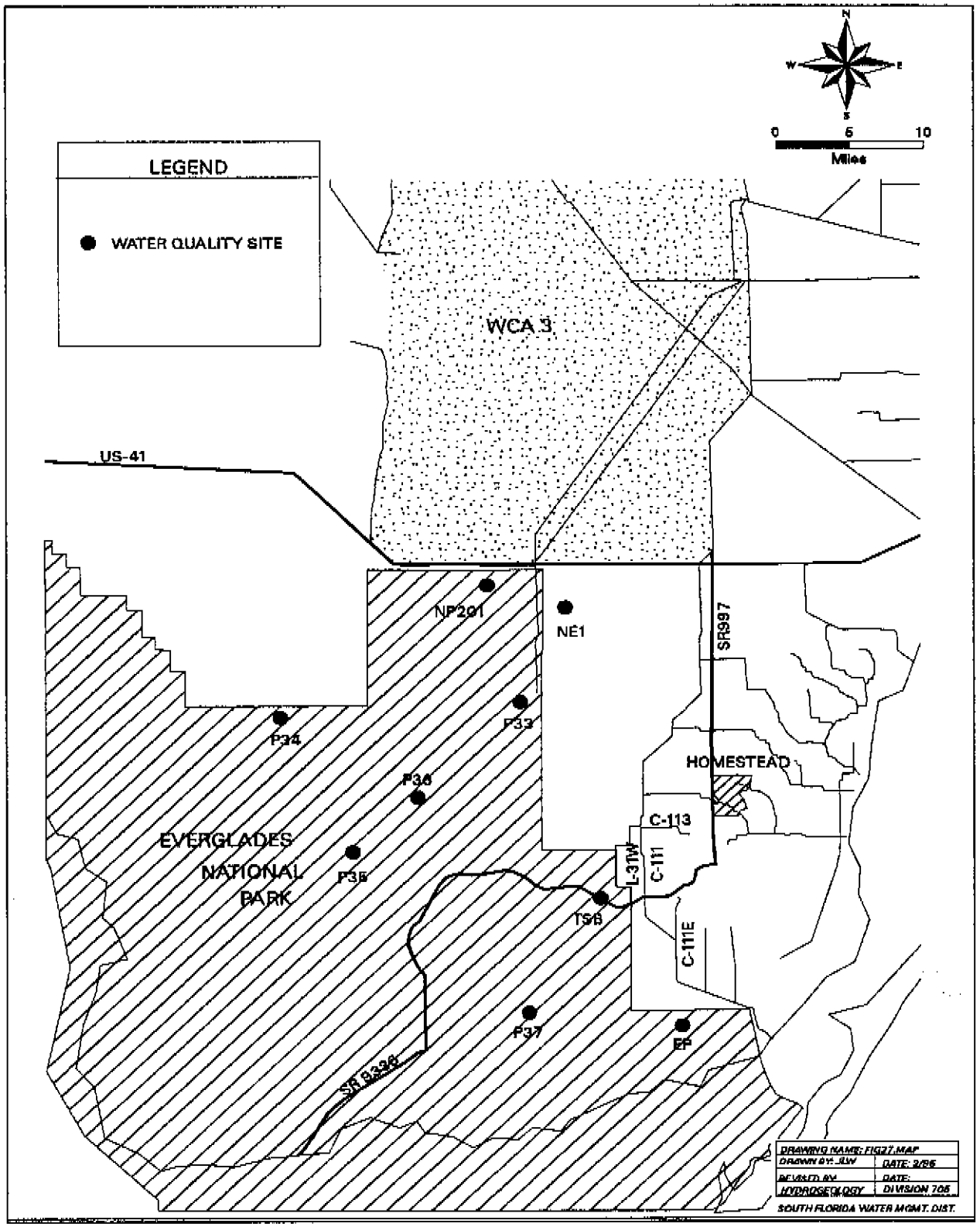

FIGURE 25. Location of the Interior Sampling Stations for the Everglades National Park Water Quality Monitoring Program.

TABLE 40. Summary of Sampling Station Locations and Frequency of Collection for the Everglades National Park (ENP) Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	US/DS	Chl.	G/A
S18C	251950	803203	A gate type structure located on C-111 south of SR-9336. The water flows southward through this structure.	1983 - P	BWF/M	BWF/M	BWF/M	M	US	M	G
S175	252501	803425	A gated culvert type structure located on the L31W levee about one mile SE of S332. Water flows southward through this structure.	1995 - P	BWF/M	BWF/M	BWF/M	M	US	M	G
S176	252855	803345	A gate type structure located at the head of the C-111 immediately upstream of C-113 west of Homestead. Water flows southward through this structure.	1983 - P	BWF/M	BWF/M	BWF/M	BA	US	M	G
S177	252407	803329	A gate type structure located on C-111 and SR-9336 southwest of Homestead. The water flows southward through this structure.	1983 - P	BWF/M	BWF/M	BWF/M	BA	US	M	G
S178	252427	803127	A gate type structure located at the head of C-111E and SR-9336 southwest of Homestead. The water flows southward through this structure.	1983 - P	BWF/M	BWF/M	BWF/M	BA	US	M	G
S332	252524	803524	A District controlled water pumping station located on the east boundary of the ENP on the L-31W levee at Taylor Slough southwest of Homestead. The water is pumped into the ENP through this structure.	1983 - P	BWF/M	BWF/M	BWF/M	M	US	M	G
TAMBR105	255049	805705	This sample is taken from bridge No. 105 on US-41 (Tamiami Trail) located 12 miles northwest of S-12A. Water flows southward under this bridge.	1985 - P	BWF/M	BWF/M	BWF/M	M	-	M	G
US41-25	254621	805023	This sample is taken from bridge No. 25 on US-41 (Tamiami Trail) located two miles northwest of S-12A. Water flows southwest through a box culvert under a bridge on US-41.	1984 - P	BWF/M	BWF/M	BWF/M	M	-	M	G

TABLE 41. Summary of Sampling Station Locations and Frequency of Collection for the Interior of the Everglades National Park Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	G/A
P33	253630	804130	This station is located at stage recorder NP-33, which is located in Shark Slough just west of the southern end of the L-67X levee.	1985 - P	M	M	M	M	G
P34	253630	805530	This station is located at stage recorder NP-34, which is located west of Shark Slough near the southern boundary of the Big Cypress Basin.	1986 - P	M	M	M	M	G
P35	252739	805156	This station is located at stage recorder NP-35, which is located near the south west end of Shark River Slough.	1985 - P	M	M	M	M	G
P36	253139	804745	This station is located at stage recorder NP-36, which is located in the middle of Shark River Slough.	1985 - P	M	M	M	M	G
P37	251708	804119	This station is located at stage recorder NP-207, which is located in the middle of Taylor Slough.	1985 - P	M	M	M	M	G
NE1	254150	803805	This station is located at stage recorder NESRS1, which is located about 5 miles south of Cooper Town which is on US 41.	1986 - P	M	M	M	M	G
NP201	254305	804333	This station is located at stage recorder NP-201, which is located about 4 miles south of S-12C which is on US 41.	1986 - P	M	M	M	M	G
EP	251609	803017	This station is located at stage recorder EP SW/GW, which is located about 4 miles south of S-18C near the southeast corner of the ENP boundary.	1986 - P	M	M	M	M	G
TSB	252405	803625	This station is located at the bridge crossing Taylor Slough on the main road SR-9336 going through the ENP.	1985 - P	M	M	M	M	G

TABLE 42. Statistics on Select Parameters for the Everglades National Park Monitoring Program for period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
S175	0.0040	0.0050	0.0130	0.0040	0.0041	0.0060	0.5150	0.6848	1.3500	0.0040	0.0357	0.1520
S176	0.0040	0.0134	0.1030	0.0030	0.0051	0.0300	0.0001	1.3352	4.0100	0.0040	0.0900	1.6800
S177	0.0040	0.0098	0.0460	0.0040	0.0046	0.0140	0.0001	1.1173	3.0700	0.0040	0.0879	1.3310
S178	0.0040	0.0285	0.2030	0.0020	0.0095	0.2190	0.0001	0.9503	3.6400	0.0040	0.0782	2.2440
S18C	0.0010	0.0086	0.0590	0.0040	0.0049	0.0490	0.0001	0.8973	3.1900	0.0040	0.0656	0.7600
S332	0.0010	0.0114	0.2910	0.0040	0.0047	0.0210	0.0001	0.9876	3.2700	0.0040	0.0754	2.1050
TAMBR105	0.0040	0.0391	0.3130	0.0040	0.0155	0.2000	0.0001	1.0258	4.5300	0.0040	0.0601	1.4130
US41-25	0.0030	0.0201	0.2560	0.0010	0.0060	0.0360	0.0001	1.0962	4.1000	0.0040	0.0422	0.7300

TABLE 43. Statistics on Select Parameters for the Interior of the Everglades National Park Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
EP	0.0020	0.0065	0.0340	0.0040	0.0052	0.0170	0.0002	1.3184	5.5100	0.0040	0.0235	0.7670
NE1	0.0040	0.0107	0.0450	0.0040	0.0052	0.0290	0.0003	1.9767	4.2900	0.0040	0.0215	0.5830
NP201	0.0030	0.0082	0.1170	0.0040	0.0053	0.0340	0.0001	1.4300	5.7100	0.0040	0.0238	0.4080
P33	0.0030	0.0126	0.5460	0.0040	0.0053	0.0400	0.0001	1.7129	21.1300	0.0040	0.0279	0.5760
P34	0.0040	0.0067	0.0290	0.0040	0.0048	0.0150	0.5100	1.1080	3.7500	0.0040	0.0425	2.0300
P35	0.0030	0.0141	0.1370	0.0040	0.0052	0.0630	0.0001	1.9317	40.8400	0.0040	0.0501	0.4490
P36	0.0030	0.0403	1.1370	0.0040	0.0058	0.0460	0.5100	2.2039	17.7000	0.0040	0.0355	1.0490
P37	0.0040	0.0072	0.0740	0.0040	0.0047	0.0140	0.5000	1.1276	7.7700	0.0040	0.1984	6.9010
TSB	0.0010	0.0121	0.1330	0.0040	0.0055	0.0520	0.0001	0.9079	4.3600	0.0040	0.0964	3.0600

SECTION 20

ROUTINE PESTICIDE MONITORING NETWORK
PROJECT CODE: PEST

Purpose and Scope

The Routine Pesticide monitoring network encompasses most of the area covered by the SFWMD. The pesticide monitoring program was established to provide a water quality data base for:

1. Complying with monitoring requirements of the Lake Okeechobee Operating Permit #50-0679349 issued by the Florida Department of Environmental Regulation (FDEP);

2. Complying with the Memorandum of Agreement (MOA) between the Miccosukee Tribe of Florida and the South Florida Water Management District (District);

3. Complying with the MOA between TENP, District, and Army Corps of Engineers (COE);

4. Implementing Lake Okeechobee Technical Advisory Committee (LOTAC)'s recommendation for a comprehensive monitoring and research plan as described in FDEP's "Lake Okeechobee Monitoring and Research Plan"; and

5. Determining long and short term trends necessary to identify potential problem areas in terms of pollution by organic contaminants (herbicides and pesticides).

Data have been collected since 1980. Initially only a few stations were collected for a narrow range of pesticides. The routine network was significantly expanded in 1984 and again in 1988, to form the framework of the current monitoring program. These data can indicate trends in the changes in water quality and allow for better management of the system. The presence of any detectable amount of pesticide may be of environmental concern, and is being documented to establish baseline levels, and to initiate follow up action by the appropriate state or federal agency.

The analyses are done contractually with FDEP laboratory in Tallahassee.

Sampling Locations and Descriptions

The locations of the 27 sites monitored under this program are shown in Figure 26. Table 43 lists all the station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection of pesticides, whether the sample is collected upstream or downstream, and type of sample collection.

Pesticide Sampling Frequency

Prior to 1991 water and sediment samples were collected quarterly. In 1991 the frequency was changed to that shown on Table 58.

District Publications

Lake Okeechobee Monitoring and Research Plan. (1986), FDEP.

Pfeuffer, R. J. (1985). Pesticide Residue Monitoring in Sediment and Surface Water Bodies Within South Florida Water Management District. SFWMD, Tech. Pub. No. 85-2. (DRE 214)

Pfeuffer, R. J. (1989). Lake Okeechobee Pesticide Monitoring Report, 1987. SFWMD, Tech. Memo. March 1989. (DRE 269)

Pfeuffer, R. J. (1991). Pesticide Residue Monitoring in Sediment and Surface Water Within the SFWMD, Volume 2. SFWMD, Tech. Pub. No. 91-1. (DRE 293)

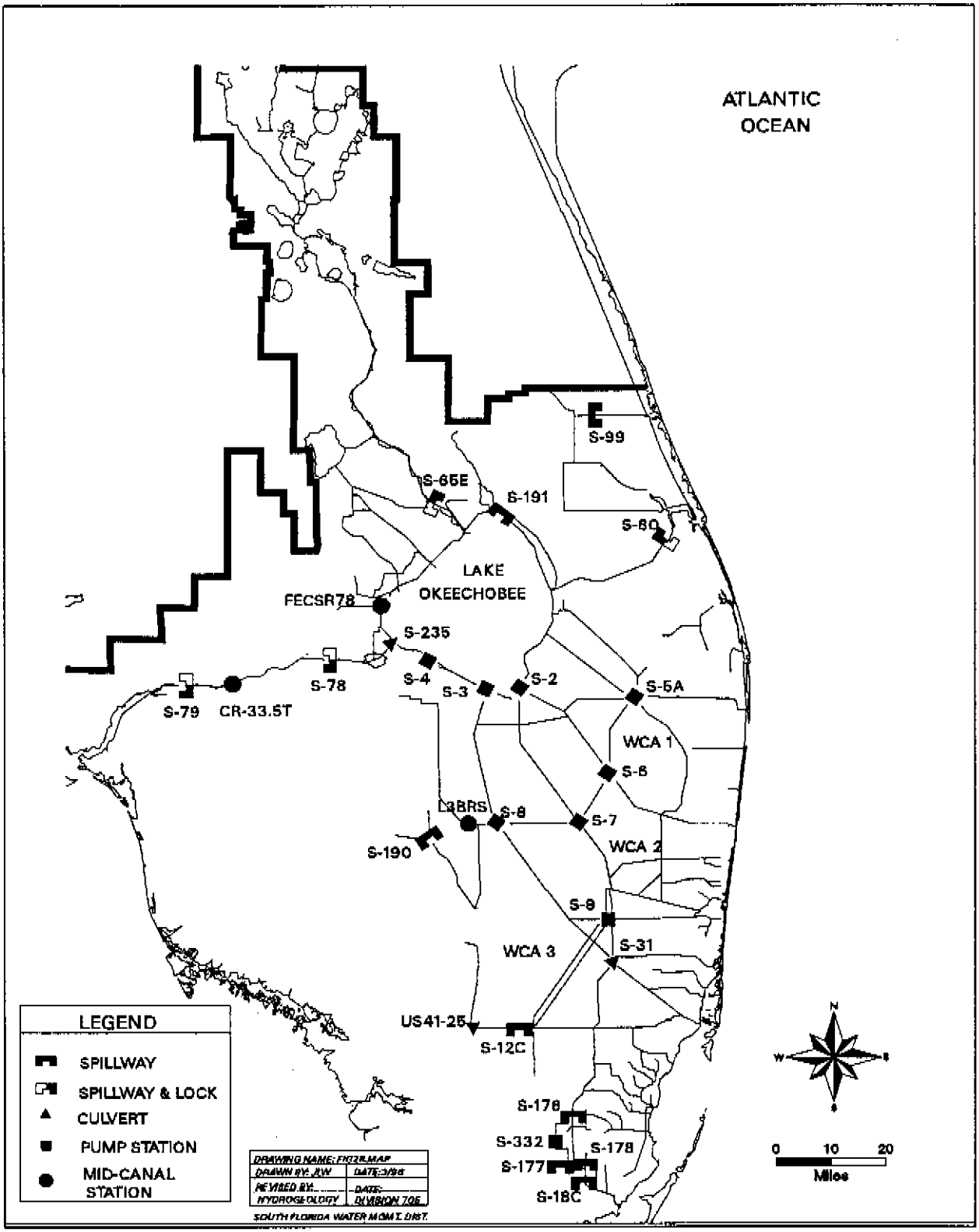

FIGURE 26. Location of Sampling Stations for the Routine Pesticide Water and Sediment Monitoring Program.

TABLE 44. Summary of Sampling Station Locations and Frequency of Collection for the Routine Pesticide Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Pesticide Species	US/DS	G/A
FECSR78	265744	810715	Collected from the bridge on State Road 78 where it crosses Fisheating Creek. Water can flow towards Lake Okeechobee or water can flow west in this canal at this point depending on water stages.	1987-P	QTR/H2O,BA/SED	-	G
L3BRS	261950	805253	Collected from Oil Well Bridge, which is located 6 1/2 miles west of pump station S-8 at the intersection of the L-3 and L-4 levees 3 1/2 miles west of WCA3A.	1987-P	QTR/H2O,BA/SED	-	G
S2	264200	804300	A South Florida Water Management District (SFWMD or District) controlled water pumping station located on the south side of Lake Okeechobee near Belle Glade. It is at the confluence of the Hillsboro and North New River Canals, and pumps into Lake Okeechobee.	1984-P	QTR/H2O,BA/SED	US	G
S3	264155	804825	A District controlled water pumping station located on the south side of Lake Okeechobee between Belle Glade and Clewiston. Water is pumped from the Miami Canal into Lake Okeechobee.	1984-P	QTR/H2O,BA/SED	US	G
S4	264722	805743	A District controlled water pumping station on C-20 near Clewiston that pumps water into Lake Okeechobee.	1984-P	QTR/H2O,BA/SED	US	G
S5A	264101	802205	A District controlled water pumping station located at the northern most end of WCA1 at State Road 80. S-5A pumps water from the EAA, L-8, and the C-51 basin into WCA1.	1987-P	QTR/H2O,BA/SED	US	G

TABLE 44 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Routine Pesticide Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Pesticide Species	US/DS	G/A
S6	262822	802650	S-6 is located about 16 miles southwest of S-5A on the Hillsboro Canal at the intersection of Hillsboro Canal (L-15), L-6, L-39, and L-7. Water is pumped in a southerly direction through this pump station down the Hillsboro Canal into WCA1.	1984-P	QTR/H2O,BA/SED	US	G
S7	262007	803213	S-7 is located approximately 11 miles southwest of S-6 at the intersection of North New River Canal (L-18), L-5, and L-6, along US-27. Water is pumped in a southerly direction down the North New River Canal into WCA2. There is also a sluice gate that can be opened to let water gravity flow northward.	1984-P	QTR/H2O,BA/SED	US	G
S8	261953	804628	S-8 is located about 15 miles west of S-7 at the intersection of Miami Canal (L-23), L-4, and L-5. Water is pumped in a southerly direction down the Miami Canal into WCA3. There is also a sluice gate that can be opened to let water gravity flow northward.	1984-P	QTR/H2O,BA/SED	US	G
S9	260340	802638	A District controlled water pumping station located along US-27 on the South New River Canal (C-11). Water is pumped from C-11 into WCA3.	1985-P	QTR/H2O,BA/SED	US	G
S12C	254542	804338	A gate type structure located along US-41 at the south end of WCA3A. It is 2 miles west of S-333. Water flows southward from WCA3A through this structure into the ENP.	1984-P	QTR/H2O,BA/SED	US	G
S18C	251950	803203	A gate type structure located on C-111 south of SR-27. The water flows southward through this structure.	1980-P	QTR/H2O,BA/SED	US	G
S31	255633	802624	A series of gated culverts located on the east side of WCA3A on the Miami Canal near SR-997. Water flows southeast through this structure down the Miami Canal.	1987-P	QTR/H2O,BA/SED	US	G

TABLE 44 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Routine Pesticide Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Pesticide Species	US/DS	G/A
S65E	271335	805742	A large gate and lock structure on the Kissimmee River, 8 1/2 miles northwest of Lake Okeechobee. This is the southernmost structure on the Kissimmee River, and it discharges water into Lake Okeechobee.	1987-P	QTR/H2O,BA/SED	US	G
S176	252855	803345	A gate type structure located at the head of the C-111 near C-113 west of Homestead. Water flows southward through this structure.	1984-P	QTR/H2O,BA/SED	US	G
S177	252407	803329	A gate type structure located on C-111 and SR-9336 southwest of Homestead. The water flows southward through this structure.	1984-P	QTR/H2O,BA/SED	US	G
S178	252427	803127	A gate type structure located at the head of C-111E and SR-9336 southwest of Homestead. The water flows southward through this structure.	1984-P	QTR/H2O,BA/SED	US	G
S190	261701	805805	A gate type structure located on the L-28 Intercepter Canal about 2 1/2 miles south of County Road 833. Water comes from the north feeder canal and is released into the L-28 Intercepter Canal, which is located within the Big Cypress Seminole Indian Reservation.	1987-P	QTR/H2O,BA/SED	US	G
S191	271135	804535	A large gate type structure on the north side of Lake Okeechobee at Nubbin Slough. Water flows into the Lake through this structure. Water samples are collected from the US-441 bridge on the northeast side of this structure.	1987-P	QTR/H2O,BA/SED	US	G
S332	252524	803524	A District controlled water pumping station located on the east boundary of the ENP on the L-31W levee at Taylor Slough west of Homestead. The water is pumped into the ENP through this structure.	1980-P	QTR/H2O,BA/SED	US	G

TABLE 44 (Continued). Summary of Sampling Station Locations and Frequency of Collection for the Routine Pesticide Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Pesticide Species	US/DS	G/A
US41-25	254621	805023	This sample is taken from bridge No. 25 on US-41 (Tamiami Trail) located two miles west of S-12A. Water flows southward through this small culvert that runs under US-41.	1984-P	QTR/H2O,BA/SED	-	G
S235	265021	810509	A small culvert type structure located near Moorehaven on the southwest side of Lake Okeechobee on LD-1 near S-77. Water flows westward through this structure into the Caloosahatchee River.	1987-P	QTR/H2O,BA/SED	US	G
S78	264722	811811	A large gate and boat lock structure (Ortona Lock and Dam) located on the Caloosahatchee River operated by the United States Army Corps of Engineers (COE). Water flows toward the west through this structure.	1988-P	QTR/H2O,BA/SED	US	G
S79	264314	814107	A large gate and boat lock and coastal structure (W. P. Franklin Lock and Dam) located on the Caloosahatchee River operated by the COE. Water flows toward the west through this structure and is mixed with salt water on the downstream side of this structure.	1988-P	QTR/H2O,BA/SED	US	G
CR-33.5T	264233	813330	Collected in the Townsend Canal on the north side of the State Road 80 bridge.	1988-P	QTR/H2O,BA/SED	-	G
S80	270639	801706	S-80 is a large spillway and boat lock coastal structure located on the St. Lucie Canal and operated by the United States Army Corps of Engineers. The water flows northeast through this structure into the St. Lucie River.	1988-P	QTR/H2O,BA/SED	US	G
S99	272820	802848	S-99 is a spillway on the C-25 canal near Ft. Pierce. The water flow at this point is toward the east.	1988-P	QTR/H2O,BA/SED	US	G

SECTION 21

ATMOSPHERIC DEPOSITION MONITORING PROGRAM
PROJECT CODE: RAIN

Purpose and Scope

The Wet/Dry Atmospheric Deposition monitoring program encompasses an area from the northern end of the Kissimmee River, south to the Everglades National Park. From 1974 to 1987 bulk rain collectors were used to collect rain water samples. In 1987 the District switched to Areochem Wet/Dry precipitation collectors, and in March of 1992, based on recommendations from the USGS, the District changed its protocol for the Wet/Dry precipitation collectors to that used by the National Atmospheric Deposition Program (NADP).

The rain program was established to provide a water quality data base for:

1. Determining nutrient concentrations in wet and dry atmospheric deposition;

2. Determining nutrient loading rates;

3. Refine trend analysis; and

4. Determining spatial variability.

5. Permit compliance for the ENR project.

Sampling Locations and Descriptions

The locations of the 19 wet/dry atmospheric monitoring locations are shown on Figure 27. Table 44 lists all the station ID's, latitude and longitude, a brief station description, the period of record, and the frequency of collection for each parameter group.

District Publications

Abtew, Wossenu., J. Obeysekera, G. Shih. (1992). Spatial Analysis for Monthly Rainfall in South Florida. SFWMD. Manuscript, December 1992. (DOR 115)

Khanal, N., R. L. Hamrick. (1971). A Stochastic Model for Daily Rainfall Data Synthesis. SFWMD. Tech. Memo. August 1971. (DRE 13)

Khanal, N., R. L. Hamrick. (1982). Long Term Tropical Storm Incidence Kissimmee River Basin Rainfall Analysis. SFWMD. Tech. Memo. April 1982. (DRE 142)

MacVicar, T.K. (1983). Rainfall Averages and Selected Extremes for Central and South Florida. SFWMD. Tech. Pub. No. 83-02. (DRE 170)

Sculley, S., Water Resources. (1986). Frequency Analysis of SFWMD Rainfall. SFWMD. Tech. Pub. No. 86-6. (DRE 226)

Shih, G. (1983). Data Analysis to Detect Rainfall Changes in South Florida. SFWMD. Tech. Memo. May 1983. (DRE 165)

Shih, G., Resource Planning Department. (1984). A Time Series Analysis of South Florida Rainfall Records. SFWMD. Tech. Memo. May 1984. (DRE 182)

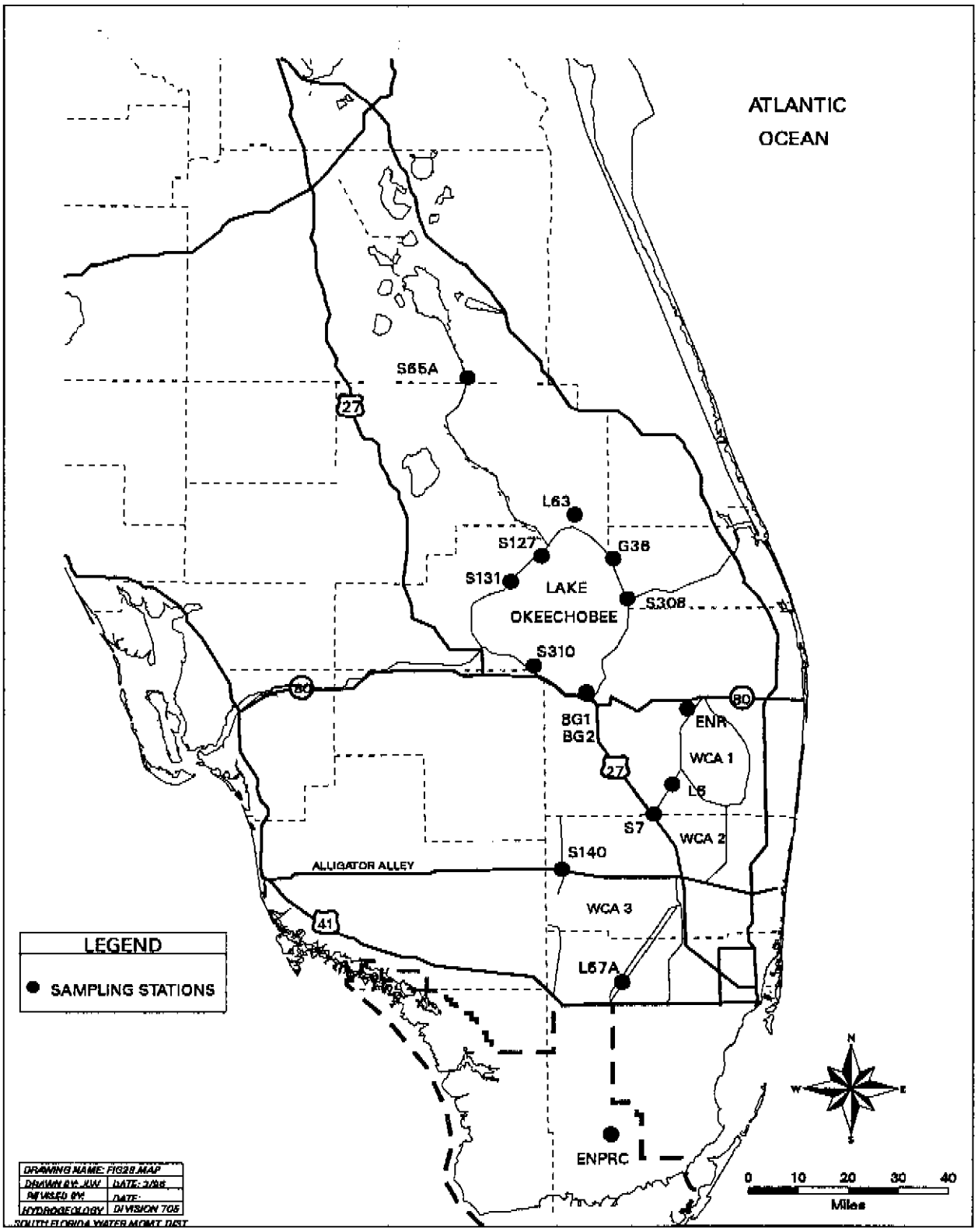

FIGURE 27. Location of Sampling Stations for the Atmospheric Deposition Monitoring Program.

TABLE 45. Summary of Sampling Station Locations and Frequency of Collection for the Atmospheric Deposition Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals
S65AWET S65ADRY	273944	810803	On the grounds near S65A, which is located on the Kissimmee River 10.5 miles south of Lake Kissimmee.	1992 - P	W	W	W	-
L63WET L63DRY	271509	804710	This site is located at the intersection of the L63 levee, and State Road 710.	1994 - P	W	W	W	-
G36WET G36DRY	270944	804303	N.E. side of Lake Okeechobee just south of the Henry Creek Lock	1993 - P	W	W	W	-
S127WET S127DRY	270719	805340	At pump station S-127 on the N.W. side of Lake Okeechobee between the Harney Pond Canal and the Kissimmee Rivver.	1987 - P	W	W	W	-
S131WET S131DRY	265842	810520	At pump station S-131 on the west side of Lake Okeechobee and north of Fisheating Creek.	1993 - P	W	W	W	-
S308WET S308DRY	265859	803713	COE structure at Lake Okeechobee and the ST. Lucie canal (C44) located on the east side of the Lake.	1993 - P	W	W	W	-
S310WET S310DRY	264537	805505	On the south side of Lake Okeechobee, and east of the S-310 lock in Clewiston.	1993 - P	W	W	W	-
BG1WET BG1DRY BG2WET BG2DRY	264245	804327	S.E. corner of Lake Okeechobee near Belle Glade on Torry Island. BG2WET and BG2DRY is a replicate collector at the same location as BG1WET and BG1DRY.	1993 - P	W	W	W	-
ENRWET ENRDRY	263900	802516	This site is located within the Everglades Nutrient Removal Project(ENR), which is located about 2 miles SW of District pump station S-5A off the L-7 levee.	1992 - P	W	W	W	-
ENR101W ENR101D	263832	802504	This site is located in the middle of cell one in the ENR project, which is about five miles S.W. of pump station S-5A.	1994 - P	W	W	W	W
ENR203W ENR203D	263835	802601	This site is located in the middle of cell two in the ENR project, which is about five miles S.W. of pump station S-5A.	1994 - P	W	W	W	W
ENR301W ENR301D	263705	802602	This site is located in the middle of cell three in the ENR project, which is about five miles S.W. of pump station S-5A.	1994 - P	W	W	W	W
ENR401W ENR401D	263747	802624	This site is located in the middle of cell four in the ENR project, which is about five miles S.W. of pump station S-5A.	1994 - P	W	W	W	W

TABLE 45(Continued). Summary of Sampling Station Locations and Frequency of Collection for the Atmospheric Deposition Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Metals
L6WET L6DRY	262547	802827	This site is located about 3.5 miles S.W. of pump station S-6 on the L6 levee.	1995 - P	W	W	W	-
S7 WET S7 DRY	262007	803213	50 yards north of pump station S-7, which is just off US-27 at the intersection of the North New River Canal (L-18), L-5, and L-6.	1995 - P	W	W	W	-
S140WET S140DRY	261017	804940	About 50 yards north of District pump station S-140, which is located near the west side of Water Conservation Area 3A, on the L-28 canal near I-75.	1995 - P	W	W	W	-
L67AWET L67ADRY	254802	804006	About 2.5 miles N.E. of S-333 (US-41) on the east side of the L67A levee.	1995 - P	W	W	W	-
ENPRCWET ENPRCDRY	254621	805023	This site is located on the grounds of the Everglades National Park Research Center, which is located in the Everglades National Park.	87 - 92/94-P	W	W	W	-

SECTION 22

MANATEE BAY / LONG SOUND
PROJECT CODE: MBLS

Purpose and Scope

The MBLS water quality monitoring program is conducted in the C-111 canal, Manatee Bay, Barnes Sound, and Long Sound areas. This monitoring program is conducted in conjunction with the C-111 monitoring and operation permit # 131654749. Water quality monitoring occurs when at least 3 of the 13 culverts are opened at S-197. Various biological and hydrological monitoring will occur at the same time. Other environmental monitoring is conducted in these same areas by TENP and DERM. The MBLS water quality monitoring program provides a data base for:

1. Determining Manatee Bay/ Barnes Sound salinity responses to storm related discharges at S-197;

2. Establishing salinity gradients in Northeast Florida Bay associated with normal flow diversions through the C-111 gaps;

3. Monitoring any additional influx of nutrients in the TENP eastern panhandle resulting from through the gaps;

4. Monitoring salinity and water quality impacts downstream of S-21 (C-1W diversions); and

5. Establishing spatial impacts on salinity gradients, and how quickly they are re-established following a discharge event.

Sampling Locations and Descriptions

The location of the 22 sites monitored under this program are shown on Figure 28. Currently nutrients and physical parameters are sampled for at 8 of the 22 sites, and only physical parameters are sampled at the remaining 14 sites. Table 45 lists all station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 46 contain statistics for each monitoring location.

District Publications

Monitoring and Operating plan for C-111 Interim Construction Project. Permit # 131654749, (1991), SFWMD, Department of Research.

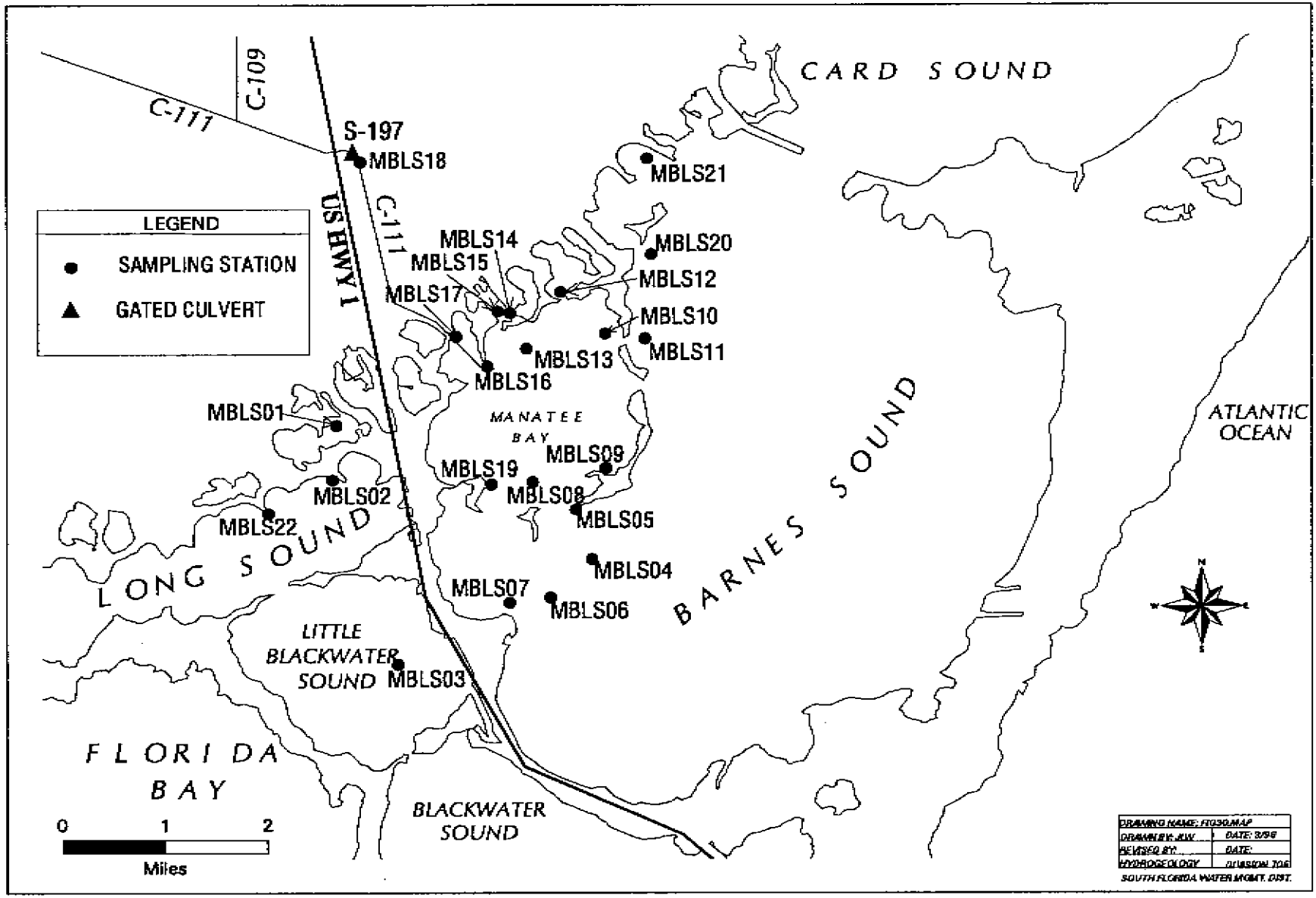

FIGURE 28. Location of Sampling Stations for the Manatee Bay / Long Sound Water Quality Monitoring Program.

TABLE 46. Summary of Sampling Locations and Frequency of Collection for the Manatee Bay / Long Sound Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
MBLS01	251453	802647	NE corner of Long Sound in small bay.	1985 - P	STE	-	-	-
MBLS02	251423	802649	NE corner of Long Sound proper.	1985 - P	STE	STE	STE	G
MBLS03	251244	802614	Central Little Blackwater Sound.	1985 - P	STE	STE	STE	G
MBLS04	251340	802423	West Central Barnes Sound.	1986 - P	STE	STE	STE	G
MBLS05	251407	802432	NW of MBLS04, 100 yards off East Island.	1991 - P	STE	-	-	-
MBLS06	251319	802447	Western Barnes Sound just S.E. of Little #6 Island.	1991 - P	STE	-	-	-
MBLS07	251316	802510	N.W. of MBLS06 at marker #2.	1988 - P	STE	-	-	-
MBLS08	251422	802456	S.W. Manatee Bay.	1991 - P	STE	-	-	-
MBLS09	251429	802415	Southern Manatee Bay, N. side of East Island. 200 yards N.E. of platform.	1986 - P	STE	-	-	-
MBLS10	251541	802415	N.E. of MBLS09 in Manatee Bay, 1/4 mile west of cut in key.	1985 - P	STE	-	-	-
MBLS11	251539	802353	Western Barnes Sound, east of MBLS10, through cut in key 200 yards out.	1991 - P	STE	-	-	-
MBLS12	251604	802440	N.E. Manatee Bay in small bay N.W. of MBLS10.	1991 - P	STE	-	-	-
MBLS13	251544	802502	Northern Manatee Bay S.W. of MBLS12.	1986 - P	STE	STE	STE	G

TABLE 46 (Continued). Summary of Sampling Locations and Frequency of Collection for the Manatee Bay / Long Sound Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
MBLS14	251553	802509	Northern Manatee Bay in small bay, just north of MBLS13.	1991 - P	STE	-	-	-
MBLS15	251554	802515	N.W. of MBLS13 in Northern Manatee Bay, in small bay.	1991 - P	STE	-	-	-
MBLS16	251524	802521	N.W. Manatee Bay at end of C-111 canal, at marker #6.	1991 - P	STE	-	-	-
MBLS17	251540	802538	C-111 canal where road ends on east side of canal.	1985 - P	STE	-	-	-
MBLS18	251712	802630	Downstream side of S-197.	1985 - P	STE	-	-	-
MBLS19	251420	802519	S.W Manatee Bay, two platforms at this site, one is a stage recorder.	1991 - P	STE	STE	STE	G
MBLS20	251625	802349	N.E. Barnes Sound	1991 - P	STE	STE	STE	G
MBLS21	251722	802347	N.E. Manatee Bay, also N.E. of MBLS20.	1991 - P	STE	STE	STE	G
MBLS22	251405	802725	N.E. Long Sound, just west of MBLS02. Recorder at this site.	1991 - P	STE	STE	STE	G

TABLE 47. Statistics on Select Parameters for the Manatee Bay Long Sound Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
MBLS01	0.0040	0.0080	0.0170	0.0040	0.0045	0.0080	-	-	-	-	-	-
MBLS02	0.0040	0.0076	0.0420	0.0040	0.0048	0.0100	-	-	-	-	-	-
MBLS03	0.0040	0.0080	0.0590	0.0040	0.0063	0.0330	0.6000	0.6700	0.7400	0.0040	0.0495	0.0950
MBLS04	0.0040	0.0108	0.0850	0.0040	0.0063	0.0140	0.5000	0.6050	0.7100	0.0040	0.0600	0.1160
MBLS07	0.0140	0.0140	0.0140	0.0080	0.0080	0.0080	-	-	-	-	-	-
MBLS09	0.0040	0.0089	0.0190	0.0040	0.0107	0.1220	0.6000	0.7300	0.8600	0.0230	0.1195	0.2160
MBLS10	0.0090	0.0090	0.0090	0.0040	0.0040	0.0040	-	-	-	-	-	-
MBLS13	0.0040	0.0094	0.0390	0.0040	0.0053	0.0140	0.7500	0.8350	0.9200	0.0070	0.0195	0.0320
MBLS14	0.0080	0.0080	0.0080	0.0040	0.0040	0.0040	-	-	-	-	-	-
MBLS17	0.0040	0.0091	0.0160	0.0040	0.0042	0.0060	-	-	-	-	-	-
MBLS18	0.0040	0.0103	0.0310	0.0020	0.0045	0.0070	0.8400	0.8750	0.9100	0.0570	0.1520	0.2470
MBLS19	0.0040	0.0098	0.0230	-	-	-	-	-	-	-	-	-
MBLS20	0.0040	0.0109	0.0400	-	-	-	-	-	-	-	-	-
MBLS21	0.0040	0.0089	0.0220	-	-	-	-	-	-	-	-	-
MBLS22	0.0040	0.0066	0.0130	-	-	-	-	-	-	-	-	-

SECTION 23

THE SOUTH FLORIDA ESTUARINE WATER QUALITY MONITORING PROGRAM

PROJECT CODE: FLAB, SWS, TTI, BISC

Purpose and Scope

This collaborative program with the Everglades National Park (ENP) and Florida International University (FIU) consists of surface water quality monitoring networks in the Shark Slough estuaries, Florida, Whitewater and Biscayne Bay, the Ten Thousand Islands, and the southwest Florida Shelf. This program has two components: 1) continuous data collection from fixed stations by ENP; and 2) discontinuous "grab sample" data collection by FIU.

The ENP continuous data collection project includes three elements: 1) the marine monitoring network (MMN); 2) the C-111 and Joe Bay network; and 3) the telemetric data network. The MMN, maintains and collects continuous physical-chemical data from 28 fixed stations within the Park. As ENP expands the MMN network on the Gulf Coast will be reported. The second element consists of continuous data collection from the Joe Bay meteorological tower and four C-111 stations in Manatee Bay and Barnes Sound, which are jointly operated and maintained by the ENP and the District. The third element consists of data that are telemetered daily from 15 MMN sites and the Joe Bay tower.

The discontinuous data collection or "grab sample" project operated by FIU consists of 149 stations, of which 100 are sampled monthly and the 49 that are located along five transects in the Gulf of Mexico are sampled quarterly. These 49 sites change slightly each trip, but are sampled along the same transect each time. Because of the slight change in location each trip, the station name changes each time. All of the sites are monitored for a variety of physical, chemical, and biological parameters to characterize water quality.

The objectives of these monitoring networks are to 1) better understand the potential for southwest Florida Shelf waters to impact Florida Bay and the Florida Keys National Marine Sanctuary, 2) assess the impacts of upstream water management practices on the receiving waterbodies, 3) detect trends in the health of the resource, and 4) fulfill requirements of legal mandates.

The data collected under this cooperative program are compiled in databases and used effectively in preparing District reports. They are submitted to FDEP to fulfill permit requirements and are used to evaluate impacts of proposed structural and operational modifications to the system. These data are also used to address questions concerning freshwater inflow, water clarity, salinity, and nutrient availability patterns, and will remain an integral component of the effort to restore the south Florida ecosystem.

Sampling Locations and Descriptions

This monitoring program consists of 182 sites, and covers the estuarine waters from Biscayne Bay south through Florida and Whitewater bays, and up the southwest Florida coast to the Ten Thousand Islands. The sampling locations are shown in Figures 29 and 30. Table 47 lists all station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 48 contains basic summary statistics for select parameters at each monitoring location.

District Publications: None

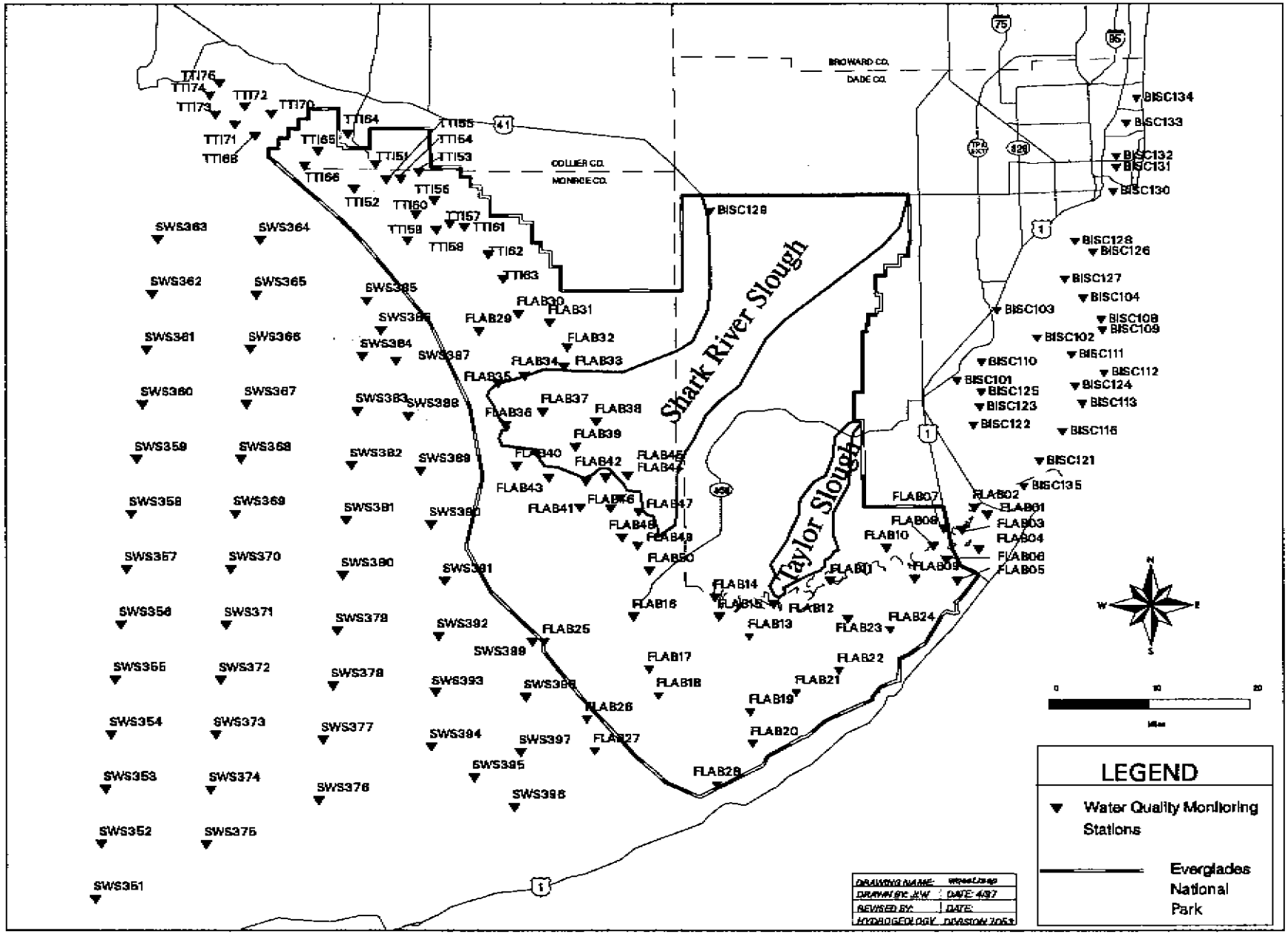

FIGURE 29. Location of Sampling Stations for the South Florida Estuarine Water Quality Monitoring Program

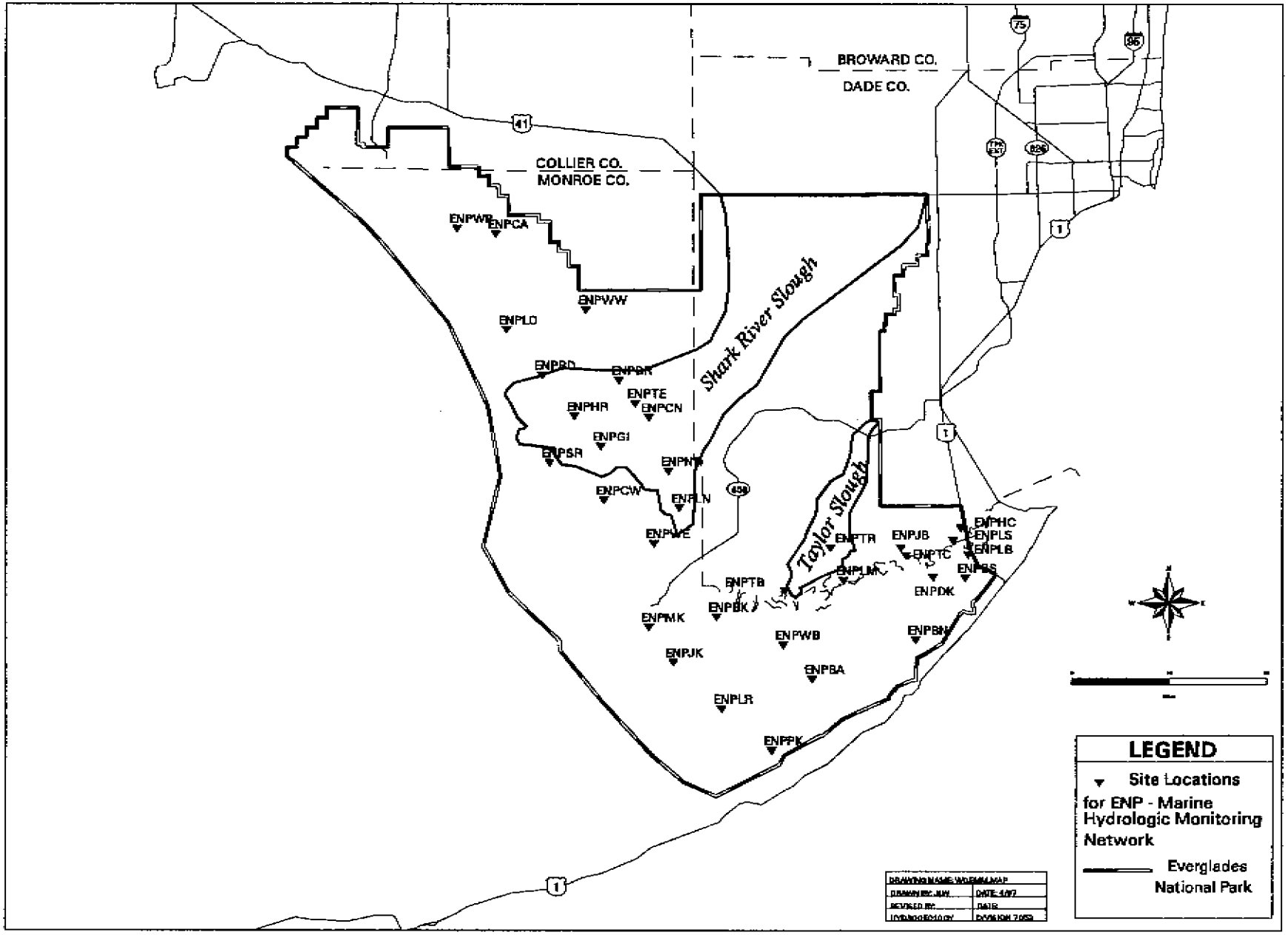

FIGURE 30. Location of Sampling Stations for the South Florida Estuarine Water Quality Monitoring Program

TABLE 48. Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
FLAB01	251625	802229	Card Sound Bridge	1991 - P	M	M	M	G
FLAB02	251706	802342	Middle Bay	1991 - P	M	M	M	G
FLAB03	251504	802455	Manatee Bay	1991 - P	M	M	M	G
FLAB04	251318	802318	Barnes Sound	1991 - P	M	M	M	G
FLAB05	251027	802523	Blackwater Sound	1991 - P	M	M	M	G
FLAB06	251225	802625	Little Blackwater Sound	1991 - P	M	M	M	G
FLAB07	251513	802639	Highway Creek	1991 - P	M	M	M	G
FLAB08	251339	802742	Long Sound	1991 - P	M	M	M	G
FLAB09	251037	802930	Duck Key	1991 - P	M	M	M	G
FLAB10	251328	803211	Joe Bay	1991 - P	M	M	M	G
FLAB11	251031	803737	Little Madeira Bay	1991 - P	M	M	M	G
FLAB12	250825	804258	Terrapin Bay	1991 - P	M	M	M	G
FLAB13	250529	804517	Whipray Bay	1991 - P	M	M	M	G
FLAB14	250902	804833	Garfield Bight	1991 - P	M	M	M	G
FLAB15	250717	804810	Rankin Lake	1991 - P	M	M	M	G
FLAB16	250706	805622	Murry Key	1991 - P	M	M	M	G
FLAB17	250233	805453	Johnson Key Basin	1991 - P	M	M	M	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
FLAB18	250009	805400	Rabbit Key Basin	1991 - P	M	M	M	G
FLAB19	245840	804513	Twin Key Basin	1991 - P	M	M	M	G
FLAB20	245546	804502	Peterson Key	1991 - P	M	M	M	G
FLAB21	250024	804053	Porpoise Lake	1991 - P	M	M	M	G
FLAB22	250224	803651	Captain's Key	1991 - P	M	M	M	G
FLAB23	250705	803559	Park Key	1991 - P	M	M	M	G
FLAB24	250606	803153	Butternut Key	1991 - P	M	M	M	G
FLAB25	250501	810450	East Cape	1991 - P	M	M	M	G
FLAB26	245851	810006	Oxfoot Bank	1991 - P	M	M	M	G
FLAB27	245507	805606	Sprigger bank	1991 - P	M	M	M	G
FLAB28	245202	804826	Old Dan Bank	1991 - P	M	M	M	G
FLAB29	253316	811101	First Bay	1992 - P	M	M	M	G
FLAB30	253449	810715	Third Bay	1992 - P	M	M	M	G
FLAB31	253403	810417	Big Lostman's Bay	1992 - P	M	M	M	G
FLAB32	253146	810236	Cabbage Island	1992 - P	M	M	M	G
FLAB33	252959	810256	Broad River Bay	1992 - P	M	M	M	G
FLAB34	252910	810640	Middle Broad River	1992 - P	M	M	M	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
FLAB35	252830	810930	Mouth Broad River	1992 - P	M	M	M	G
FLAB36	252442	810829	South Mouth Harney River	1992 - P	M	M	M	G
FLAB37	252554	810457	Harney River Junction	1992 - P	M	M	M	G
FLAB38	252502	805954	Tarpon Bay	1992 - P	M	M	M	G
FLAB39	252244	810151	Gunboat Island	1992 - P	M	M	M	G
FLAB40	252059	810728	Ponce De Leon Bay	1992 - P	M	M	M	G
FLAB41	251952	810728	Oyster bay	1992 - P	M	M	M	G
FLAB42	251933	810052	North of Marker 36	1992 - P	M	M	M	G
FLAB43	251710	810125	West of Marker 34	1992 - P	M	M	M	G
FLAB44	251955	805901	Watson R. Chickee	1992 - P	M	M	M	G
FLAB45	251803	805737	Mouth of the North River	1992 - P	M	M	M	G
FLAB46	251706	805833	Midway Keys	1992 - P	M	M	M	G
FLAB47	251647	805539	Mouth of Roberts River	1992 - P	M	M	M	G
FLAB48	251427	805729	West of Marker 18	1992 - P	M	M	M	G
FLAB49	251342	805559	Southeast of Marker 12	1992 - P	M	M	M	G
FLAB50	251127	805451	Coot Bay	1992 - P	M	M	M	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
TTI51	254827	812058	Chokoloskee	1994 - P	M	M	M	G
TTI52	254612	812300	Rabbit Key Pass	1994 - P	M	M	M	G
TTI53	254703	811956	Lopez Bay	1994 - P	M	M	M	G
TTI54	254708	811833	Lopez River	1994 - P	M	M	M	G
TTI55	254746	811648	Sunday Bay	1994 - P	M	M	M	G
TTI56	254511	811520	Huston Bay	1994 - P	M	M	M	G
TTI57	254303	811350	Upper Chatham River	1994 - P	M	M	M	G
TTI58	254228	811508	Watson Place	1994 - P	M	M	M	G
TTI59	254130	811755	Gun Rock Point	1994 - P	M	M	M	G
TTI60	254353	811705	Huston Bay	1994 - P	M	M	M	G
TTI61	254255	811225	Chevelier Bay	1994 - P	M	M	M	G
TTI62	254013	811007	Alligator Bay	1994 - P	M	M	M	G
TTI63	253800	810842	Lostman's Five Bay	1994 - P	M	M	M	G
TTI64	255112	812336	Barron River	1994 - P	M	M	M	G
TTI65	254938	812628	Indian Key Pass	1994 - P	M	M	M	G
TTI66	254817	812745	Indian Key	1994 - P	M	M	M	G
TTI67	254949	813010	West Pass	1994 - P	M	M	M	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
TTI68	255058	813232	Panther Key	1994 - P	M	M	M	G
TTI69	255227	813058	Faka Union Pass	1994 - P	M	M	M	G
TTI70	255300	813058	Faka Union Bay	1994 - P	M	M	M	G
TTI71	255200	813429	White Horse Key	1994 - P	M	M	M	G
TTI72	255340	813332	Dismal Key	1994 - P	M	M	M	G
TTI73	255255	813623	Long Rock	1994 - P	M	M	M	G
TTI74	255440	813655	Shell Key	1994 - P	M	M	M	G
TTI75	255547	813601	Blackwater River	1994 - P	M	M	M	G
BISC101	252842	801915	Convoy Point	1993 - P	M	M	M	G
BISC102	253245	801741	Black Point	1993 - P	M	M	M	G
BISC103	253424	801712	Near Black Ledge	1993 - P	M	M	M	G
BISC104	253606	801315	BNP Marker C	1993 - P	M	M	M	G
BISC108	253409	801113	Marker G-1B	1993 - P	M	M	M	G
BISC109	253351	801406	North Midbay	1993 - P	M	M	M	G
BISC110	253018	801715	Fender Point	1993 - P	M	M	M	G
BISC111	253057	801424	Featherbed Bank	1993 - P	M	M	M	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
BISC112	252918	801118	Sands Cut	1993 - P	M	M	M	G
BISC113	252630	801324	Elliot Key	1993 - P	M	M	M	G
BISC116	252300	801518	Rubicon Keys	1993 - P	M	M	M	G
BISC121	252118	801730	North Card Sound	1993 - P	M	M	M	G
BISC122	252513	801839	West Arsenicker	1993 - P	M	M	M	G
BISC123	252642	801700	Pelican Bank	1993 - P	M	M	M	G
BISC124	252821	801400	South Midbay	1993 - P	M	M	M	G
BISC126	254018	801218	BNP Marker B	1996 - P	M	M	M	G
BISC127	253748	801500	Shoal Point	1996 - P	M	M	M	G
BISC128	254118	801400	Matheson Beach	1996 - P	M	M	M	G
BISC129	254412	801100	Marker G-71	1996 - P	M	M	M	G
BISC130	254548	801018	South Dodge Island	1996 - P	M	M	M	G
BISC131	254800	801000	North Venetian Basin	1996 - P	M	M	M	G
BISC132	254900	801000	North I-195 Basin	1996 - P	M	M	M	G
BISC133	255200	800900	North Normandy Isle	1996 - P	M	M	M	G
BISC134	255418	800800	Oleta River Park	1996 - P	M	M	M	G
BISC135	251900	801900	South Card Sound	1996 - P	M	M	M	G
SWS351	244130	814730	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
SWS352	244633	814659	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS353	245130	814636	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS354	245629	814607	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS355	250129	814545	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS356	250628	814514	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS357	251128	814443	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS358	251629	814417	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS359	252130	814348	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS360	252628	814316	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS361	253129	814254	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS362	253631	814224	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS363	254131	814154	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
SWS364	254130	813200	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS365	253631	813222	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS366	253134	813256	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS367	252633	813318	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS368	252131	813348	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS369	251632	813419	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS370	251131	813445	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS371	250630	813513	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS372	250130	813543	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS373	245632	813611	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS374	245132	813639	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS375	244632	813704	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
SWS376	245036	812618	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS377	245606	812554	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS378	250100	812457	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS379	250600	812432	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS380	251100	812400	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS381	251600	812342	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS382	252100	812312	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS383	252557	812240	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS384	253056	812212	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS385	253601	812147	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS386	253320	812026	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS387	253032	811901	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
SWS388	252530	811749	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS389	252030	811637	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS390	251536	811537	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS391	251030	811419	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS392	250530	811454	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS393	250030	811512	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS394	245530	811536	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS395	245242	811130	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS396	245000	810742	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS397	245500	810706	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS398	250000	810636	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR	G
SWS399	250500	810558	West of the ENP boundary in the Gulf of Mexico collected along one of five transects.	1995 - P	QTR	QTR	QTR .	G

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
ENPWW	253512	810239	Willy Willy	1997 *	M	-	-	G
ENPLO	253320	811007	Lostmans River	1997 *	M	-	-	G
ENPWP	254233	811453	Watson Place	1997 *	M	-	-	G
ENPCA	254205	811110	Cannon Bay	1997 *	M	-	-	G
ENPBD	252909	810640	Broad River Lower	1996 - P	M	-	-	G
ENPHR	252526	810336	Harney River	1996 - P	M	-	-	G
ENPGI	252240	800146	Gunboat Island	1996 - P	M	-	-	G
ENPTE	252635	805752	Tarpon Bay East	1996 - P	M	-	-	G
ENPSR	252112	810557	Shark River	1996 - P	M	-	-	G
ENPCW	251746	810047	Clearwater Pass	1996 - P	M	-	-	G
ENPLN	251703	805338	Lane River	1996 - P	M	-	-	G
ENPWE	251352	805613	Whitewater Bay East	1995 - P	M	-	-	G
ENPBA	250133	804055	Bob Allen	1988 - P	M	-	-	G
ENPBK	250715	805002	Buoy Key	1988 - P	M	-	-	G
ENPBN	250508	803106	Butternut Key	1988 - P	M	-	-	G
ENPBR	252840	805923	Broad River	1990 - P	M	-	-	G
ENPBS	251042	802618	Blackwater Sound	1991 - P	M	-	-	G
ENPCN	252518	805633	Cane Patch	1990 - P	QTR	-	-	G

* Estimated to begin sampling in 1997

TABLE 48(Continued). Summary of Sampling Locations and Frequency of Collection for the South Florida Estuarine Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Chlorophylls	G/A
ENPDK	251046	802923	Duck Key	1988 - P	M	-	-	G
ENPHC	251514	802641	Highway Creek	1988 - P	M	-	-	G
ENPJB	251326	803229	Joe Bay	1988 - P	M	-	-	G
ENPJK	250307	805413	Johnson Key	1988 - P	M	-	-	G
ENPLB	251248	802600	Little Blackwater Sound	1991 - P	M	-	-	G
ENPLM	251031	803756	Little Madeira	1988 - P	M	-	-	G
ENPLR	245852	804933	Little Rabbit Key	1988 - P	M	-	-	G
ENPLS	251405	802727	Long Sound	1988 - P	M	-	-	G
ENPMK	250620	805632	Murray key	1988 - P	M	-	-	G
ENPNR	252023	805441	North River	1990 - P	M	-	-	G
ENPPK	245505	804446	Peterson Key	1988 - P	M	-	-	G
ENPTB	250936	804330	Terrapin Bay	1991 - P	M	-	-	G
ENPTC	251244	803201	Trout Cove	1988 - P	M	-	-	G
ENPTR	251328	803911	Taylor River	1988 - P	M	-	-	G
ENPWB	250441	804339	Whipray Basin	1988 - P	M	-	-	G

TABLE 49. Statistics on Select Parameters for the South Florida Estuarine Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
FLAB01	0.0020	0.0083	0.0200	0.0001	0.0010	0.0044	-	-	-	0.0010	0.0298	0.0870
FLAB02	0.0010	0.0087	0.0260	0.0002	0.0013	0.0035	-	-	-	0.0010	0.0139	0.0678
FLAB03	0.0010	0.0083	0.0220	0.0001	0.0015	0.0050	-	-	-	0.0010	0.0151	0.1120
FLAB04	0.0030	0.0078	0.0180	0.0003	0.0015	0.0040	-	-	-	0.0010	0.0121	0.0607
FLAB05	0.0040	0.0080	0.0204	0.0002	0.0014	0.0043	-	-	-	0.0010	0.0159	0.0630
FLAB06	0.0033	0.0099	0.0320	0.0001	0.0017	0.0045	-	-	-	0.0010	0.0182	0.0660
FLAB07	0.0027	0.0156	0.0400	0.0001	0.0021	0.0047	-	-	-	0.0010	0.0094	0.0510
FLAB08	0.0040	0.0120	0.0350	0.0002	0.0018	0.0043	-	-	-	0.0010	0.0252	0.1230
FLAB09	0.0040	0.0078	0.0170	0.0001	0.0014	0.0044	-	-	-	0.0004	0.0481	0.1630
FLAB10	0.0065	0.0152	0.0247	0.0001	0.0019	0.0050	-	-	-	0.0011	0.0322	0.1130
FLAB11	0.0043	0.0093	0.0190	0.0001	0.0013	0.0039	-	-	-	0.0015	0.0238	0.0600
FLAB12	0.0052	0.0191	0.0560	0.0001	0.0013	0.0040	-	-	-	0.0010	0.0105	0.0610
FLAB13	0.0044	0.0198	0.0460	0.0001	0.0014	0.0043	-	-	-	0.0010	0.0082	0.0443
FLAB14	0.0051	0.0385	0.1300	0.0002	0.0018	0.0057	-	-	-	0.0010	0.0064	0.0446
FLAB15	0.0053	0.0292	0.0870	0.0002	0.0016	0.0039	-	-	-	0.0004	0.0067	0.0440
FLAB16	0.0040	0.0270	0.0790	0.0004	0.0016	0.0058	-	-	-	0.0004	0.0152	0.1146
FLAB17	0.0058	0.0223	0.0533	0.0002	0.0011	0.0057	-	-	-	0.0008	0.0052	0.0570
FLAB18	0.0030	0.0180	0.0805	0.0001	0.0010	0.0055	-	-	-	0.0006	0.0041	0.0320
FLAB19	0.0027	0.0129	0.0312	0.0001	0.0012	0.0050	-	-	-	0.0008	0.0040	0.0166
FLAB20	0.0026	0.0091	0.0200	0.0000	0.0011	0.0050	-	-	-	0.0010	0.0087	0.0390
FLAB21	0.0030	0.0108	0.0290	0.0001	0.0014	0.0053	-	-	-	0.0010	0.0053	0.0187
FLAB22	0.0030	0.0091	0.0220	0.0002	0.0014	0.0041	-	-	-	0.0020	0.0121	0.0329
FLAB23	0.0010	0.0078	0.0450	0.0002	0.0014	0.0051	-	-	-	0.0030	0.0251	0.0850
FLAB24	0.0020	0.0080	0.0700	0.0001	0.0012	0.0062	-	-	-	0.0053	0.0451	0.1270
FLAB25	0.0029	0.0199	0.0550	0.0002	0.0010	0.0054	-	-	-	0.0004	0.0090	0.0340
FLAB26	0.0021	0.0233	0.0969	0.0002	0.0011	0.0053	-	-	-	0.0006	0.0357	1.3860
FLAB27	0.0030	0.0163	0.0890	0.0001	0.0013	0.0122	-	-	-	0.0004	0.0320	1.3860
FLAB28	0.0020	0.0081	0.0260	0.0002	0.0011	0.0087	-	-	-	0.0004	0.0320	1.3860
FLAB29	0.0150	0.0280	0.0500	0.0007	0.0026	0.0069	-	-	-	0.0014	0.0253	0.0660
FLAB30	0.0114	0.0289	0.0740	0.0001	0.0014	0.0064	-	-	-	0.0006	0.0164	0.0720

TABLE 49. Statistics on Select Parameters for the South Florida Estuarine Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
FLAB31	0.0057	0.0206	0.0413	0.0001	0.0010	0.0048	-	-	-	0.0010	0.0116	0.0390
FLAB32	0.0091	0.0233	0.0622	0.0001	0.0010	0.0038	-	-	-	0.0010	0.0131	0.0480
FLAB33	0.0071	0.0249	0.0544	0.0001	0.0012	0.0038	-	-	-	0.0011	0.0206	0.0900
FLAB34	0.0094	0.0305	0.0630	0.0001	0.0022	0.0095	-	-	-	0.0025	0.0393	0.1271
FLAB35	0.0110	0.0379	0.0756	0.0005	0.0046	0.0128	-	-	-	0.0034	0.0290	0.0996
FLAB36	0.0007	0.0382	0.0920	0.0012	0.0061	0.0118	-	-	-	0.0030	0.0215	0.1050
FLAB37	0.0101	0.0318	0.0560	0.0002	0.0045	0.0181	-	-	-	0.0020	0.0371	0.1200
FLAB38	0.0087	0.0233	0.0467	0.0001	0.0013	0.0033	-	-	-	0.0022	0.0322	0.1500
FLAB39	0.0088	0.0221	0.0400	0.0002	0.0026	0.0081	-	-	-	0.0039	0.0348	0.1340
FLAB40	0.0040	0.0194	0.0439	0.0008	0.0050	0.0092	-	-	-	0.0020	0.0287	0.1261
FLAB41	0.0090	0.0225	0.0439	0.0002	0.0031	0.0067	-	-	-	0.0019	0.0288	0.1444
FLAB42	0.0080	0.0228	0.0944	0.0004	0.0019	0.0056	-	-	-	0.0011	0.0185	0.1551
FLAB43	0.0090	0.0236	0.0469	0.0002	0.0026	0.0078	-	-	-	0.0012	0.0179	0.2483
FLAB44	0.0090	0.0248	0.0631	0.0007	0.0019	0.0053	-	-	-	0.0016	0.0219	0.1003
FLAB45	0.0090	0.0221	0.0560	0.0001	0.0020	0.0102	-	-	-	0.0015	0.0240	0.1262
FLAB46	0.0030	0.0225	0.0530	0.0002	0.0027	0.0208	-	-	-	0.0007	0.0252	0.2744
FLAB47	0.0080	0.0209	0.0635	0.0001	0.0016	0.0060	-	-	-	0.0011	0.0346	0.1239
FLAB48	0.0070	0.0242	0.0744	0.0002	0.0025	0.0089	-	-	-	0.0008	0.0290	0.2289
FLAB49	0.0110	0.0271	0.0830	0.0002	0.0027	0.0106	-	-	-	0.0009	0.0293	0.2034
FLAB50	0.0170	0.0407	0.1010	0.0002	0.0034	0.0136	-	-	-	0.0008	0.0345	0.3322

TABLE 49. Statistics on Select Parameters for the South Florida Estuarine Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
TTI51	0.0339	0.0373	0.0422	0.0055	0.0059	0.0062	-	-	-	0.0044	0.0076	0.0095
TTI52	0.0274	0.0325	0.0367	0.0061	0.0066	0.0069	-	-	-	0.0031	0.0043	0.0060
TTI53	0.0307	0.0329	0.0369	0.0053	0.0059	0.0071	-	-	-	0.0093	0.0151	0.0253
TTI54	0.0307	0.0357	0.0429	0.0022	0.0033	0.0040	-	-	-	0.0054	0.0101	0.0180
TTI55	0.0244	0.0294	0.0373	0.0016	0.0019	0.0022	-	-	-	0.0019	0.0062	0.0135
TTI56	0.0249	0.0304	0.0333	0.0006	0.0019	0.0040	-	-	-	0.0015	0.0052	0.0112
TTI57	0.0352	0.0416	0.0477	0.0008	0.0018	0.0038	-	-	-	0.0026	0.0066	0.0104
TTI58	0.0386	0.0446	0.0513	0.0025	0.0033	0.0042	-	-	-	0.0103	0.0114	0.0135
TTI59	0.0250	0.0346	0.0442	0.0019	0.0041	0.0060	-	-	-	0.0050	0.0058	0.0067
TTI60	0.0329	0.0411	0.0501	0.0009	0.0018	0.0027	-	-	-	0.0023	0.0075	0.0110
TTI61	0.0393	0.0449	0.0550	0.0004	0.0012	0.0023	-	-	-	0.0015	0.0052	0.0123
TTI62	0.0192	0.0200	0.0214	0.0003	0.0010	0.0019	-	-	-	0.0013	0.0035	0.0070
TTI63	0.0105	0.0168	0.0206	0.0006	0.0013	0.0025	-	-	-	0.0022	0.0090	0.0179
TTI64	0.0233	0.0354	0.0487	0.0063	0.0100	0.0150	-	-	-	0.0053	0.0138	0.0198
TTI65	0.0385	0.0422	0.0493	0.0095	0.0145	0.0205	-	-	-	0.0070	0.0119	0.0168
TTI66	0.0359	0.0405	0.0452	0.0071	0.0108	0.0171	-	-	-	0.0023	0.0067	0.0143
TTI67	0.0291	0.0365	0.0504	0.0068	0.0107	0.0167	-	-	-	0.0012	0.0075	0.0127
TTI68	0.0339	0.0417	0.0536	0.0028	0.0091	0.0163	-	-	-	0.0073	0.0082	0.0091
TTI69	0.0336	0.0422	0.0534	0.0058	0.0093	0.0134	-	-	-	0.0007	0.0070	0.0125
TTI70	0.0191	0.0340	0.0531	0.0020	0.0066	0.0105	-	-	-	0.0057	0.0109	0.0188
TTI71	0.0319	0.0427	0.0556	0.0026	0.0083	0.0143	-	-	-	0.0007	0.0045	0.0066
TTI72	0.0409	0.0630	0.0853	0.0047	0.0173	0.0257	-	-	-	0.0005	0.0097	0.0170
TTI73	0.0434	0.0485	0.0536	0.0067	0.0131	0.0213	-	-	-	0.0013	0.0051	0.0077
TTI74	0.0418	0.0555	0.0692	0.0052	0.0097	0.0128	-	-	-	0.0011	0.0054	0.0081
TTI75	0.0594	0.0675	0.0816	0.0149	0.0218	0.0260	-	-	-	0.0035	0.0059	0.0082

TABLE 49. Statistics on Select Parameters for the South Florida Estuarine Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
BISC101	0.0019	0.0057	0.0170	0.0001	0.0010	0.0029	0.2609	0.5528	1.2555	0.0006	0.1088	0.8350
BISC102	0.0026	0.0063	0.0104	0.0000	0.0009	0.0024	0.2200	0.5380	1.1476	0.0007	0.0922	0.7430
BISC103	0.0024	0.0050	0.0080	0.0000	0.0008	0.0025	0.1960	0.4167	0.6857	0.0010	0.0503	0.2656
BISC104	0.0024	0.0049	0.0086	0.0000	0.0006	0.0019	0.1501	0.2405	0.4972	0.0011	0.0090	0.0503
BISC108	0.0017	0.0048	0.0094	0.0001	0.0004	0.0013	0.0936	0.1835	0.3141	0.0002	0.0030	0.0150
BISC109	0.0019	0.0043	0.0084	0.0000	0.0006	0.0024	0.1360	0.2134	0.3814	0.0006	0.0089	0.0538
BISC110	0.0027	0.0052	0.0099	0.0000	0.0009	0.0039	0.2023	0.4148	1.0257	0.0023	0.0837	0.4727
BISC111	0.0020	0.0044	0.0082	0.0000	0.0004	0.0016	0.1330	0.2292	0.4353	0.0009	0.0086	0.0821
BISC112	0.0027	0.0048	0.0085	0.0000	0.0005	0.0016	0.1083	0.1933	0.3832	0.0005	0.0032	0.0128
BISC113	0.0020	0.0045	0.0079	0.0000	0.0005	0.0018	0.1502	0.2528	0.4592	0.0019	0.0109	0.0505
BISC116	0.0018	0.0047	0.0081	0.0000	0.0006	0.0019	0.1092	0.2448	0.3902	0.0027	0.0121	0.0464
BISC121	0.0018	0.0055	0.0130	0.0000	0.0006	0.0022	0.1241	0.3266	0.5777	0.0017	0.0173	0.0938
BISC122	0.0029	0.0055	0.0096	0.0000	0.0008	0.0026	0.2125	0.3522	0.6627	0.0008	0.0308	0.3116
BISC123	0.0019	0.0047	0.0081	0.0000	0.0008	0.0032	0.1698	0.3189	0.4964	0.0029	0.0389	0.1470
BISC124	0.0009	0.0040	0.0060	0.0000	0.0006	0.0019	0.1400	0.2612	0.4754	0.0007	0.0109	0.0941
BISC126	0.0020	0.0038	0.0053	0.0003	0.0006	0.0009	0.2400	0.2633	0.2800	0.0052	0.0073	0.0103
BISC127	0.0031	0.0034	0.0036	0.0005	0.0005	0.0005	0.2500	0.3033	0.3300	0.0019	0.0060	0.0099
BISC128	0.0035	0.0039	0.0043	0.0005	0.0006	0.0007	0.3100	0.3400	0.3600	0.0025	0.0066	0.0116
BISC129	0.0050	0.0053	0.0057	0.0007	0.0007	0.0007	0.2700	0.2767	0.2900	0.0021	0.0062	0.0096
BISC130	0.0055	0.0080	0.0113	0.0005	0.0005	0.0005	0.2400	0.2633	0.2800	0.0163	0.0176	0.0192
BISC131	0.0057	0.0071	0.0084	0.0004	0.0007	0.0009	0.3300	0.3367	0.3400	0.0246	0.0297	0.0345
BISC132	0.0061	0.0070	0.0080	0.0015	0.0015	0.0015	0.3200	0.3500	0.3900	0.0129	0.0213	0.0340
BISC133	0.0091	0.0105	0.0126	0.0010	0.0010	0.0010	0.2900	0.3400	0.3700	0.0058	0.0151	0.0293
BISC134	0.0056	0.0080	0.0099	0.0005	0.0008	0.0011	0.2200	0.2667	0.3100	0.0019	0.0079	0.0121
BISC135	0.0032	0.0040	0.0053	0.0009	0.0010	0.0010	0.3400	0.3733	0.4000	0.0078	0.0121	0.0179

SECTION 24

BIG CYPRESS PRESERVE WATER QUALITY MONITORING PROGRAM
PROJECT CODE: BCWQ

Purpose and Scope

The Big Cypress National Preserve(BCNP) is located in Southwest Florida within the Big Cypress Swamp. The 729,000-acre Preserve consists of predominantly wetlands habitat. The surface waters within the Preserve are designated as Outstanding Florida Waters(Florida Administrative Code (F.A.C.) 62-302.700). No degradation of water quality, other than allowed in Rule 62-4.242(2) and F.A.C. is permited.

A hydrologic monitoring program was established by the BCNP in 1987 to ensure the protection and preservation of preserve waters.

Interpretive data reports are submitted to the District annually and progress reports are submitted semiannually. The data provide information to identify freshwater flows that are critical to the survival of the Big Cypress watershed and Everglades National Park.

Sampling Locations and Descriptions

Under a continuing cooperative agreement with the District, the Preserve maintains a hydrologic monitoring network of 14 sites at which both water stage and quality are measured. The locations of these 14 sites are shown on Figure 31. Water stage is recorded continuously by the Preserve at 12 of the 14 sites, and the USGS maintains the other two. Water quality samples are collected by the Preserve and analyzed by the Districts Laboratory. Table 50 lists all station ID's, latitude and longitude, a brief station description, the period of record, the frequency of collection for each parameter group, and type of sample collection. Table 51 contains basic statistics for select parameters at each monitoring location.

District Publications

None

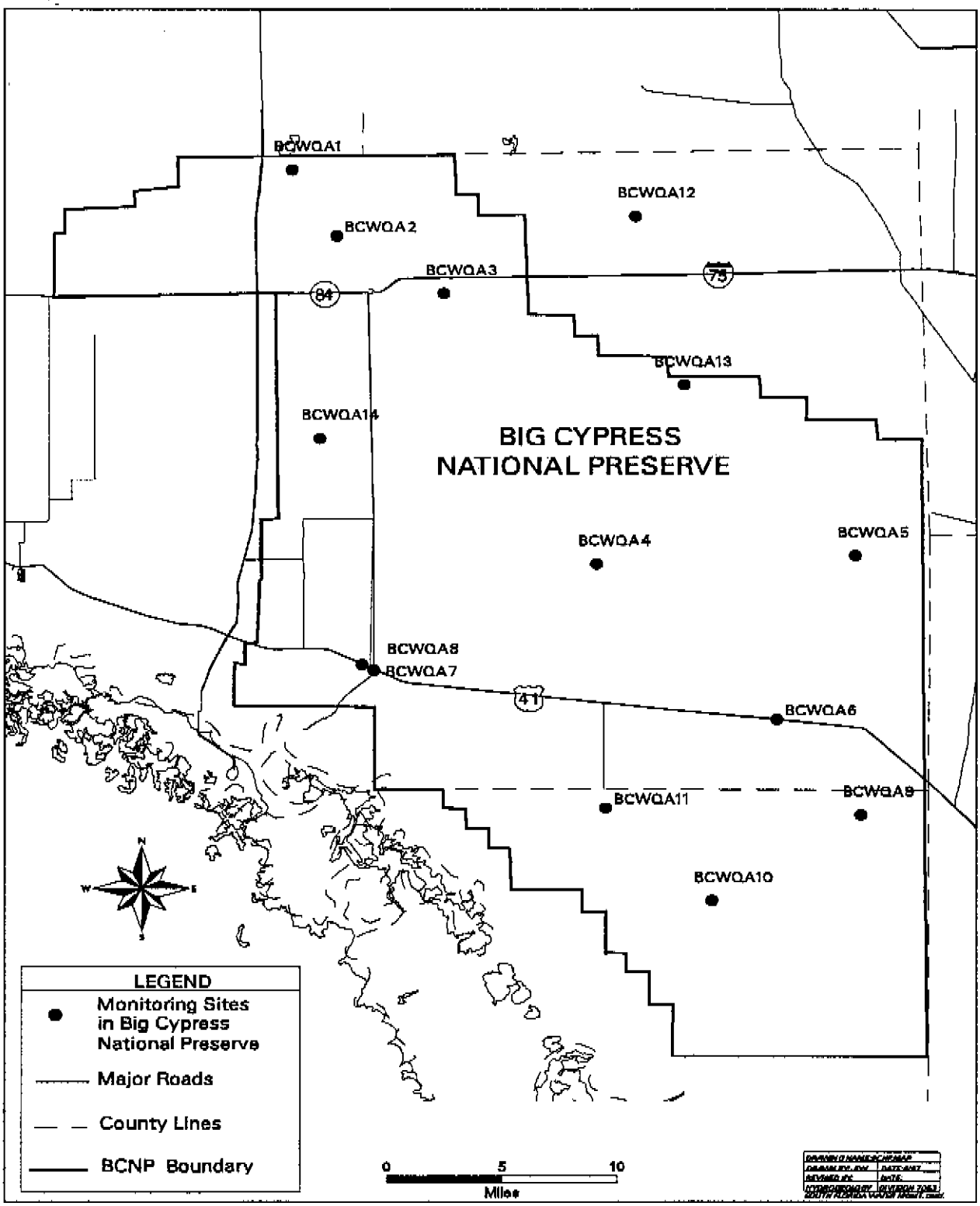

Figure 31. Location of Sampling Stations for the Big Cypress National Preserve Water Quality monitoring Program.

TABLE 50. Summary of Sampling Station Locations and Frequency of Collection for the Big Cypress National Preserve Monitoring Program

SFWMD Sta. ID	Lat	Long	Location	POR	Physical Parameters	Nutrients	Major Ions	Trace Metals	G/A
BCWQA1	261433	811914	North Bear Island, located at the northwest corner of the Preserve.	1994 - P	BM	BM	BM	BM	G
BCWQA2	261146	811719	East Hinson Marsh, about four miles northwest of SR 84 and County Rd. 839.	1994 - P	M	-	-	-	G
BCWQA3	250534	810314	East Crossing Strand, about one mile south of I75, and about four miles east of County Rd. 839.	1994 - P	BM	BM	BM	BM	G
BCWQA4	255726	810614	Monument Road, in the middle of the Preserve.	1994 - P	BM	BM	BM	BM	G
BCWQA5	255806	805535	Racoon Point, near the mid point along the eastern boundry of the Preserve.	1994 - P	BM	BM	BM	BM	G
BCWQA6	255107	805852	Bridge 105 on US-41(Tamiami Trail) located 12 miles northwest of S-12A.	1994 - P	M	-	-	-	G
BCWQA7	255312	811544	Bridge 84, near the intersection of US41 and County Rd. 839.	1994 - P	M	-	-	-	G
BCWQA8	255325	811613	Bridge 83, where the Turner River crosses under US41.	1994 - P	M	-	-	-	G
BCWQA9	254642	805444	Pinecrest Hammock, about two miles north of Loop Road and approximately five miles west of US41.	1994 - P	BM	BM	BM	BM	G
BCWQA10	254249	810119	Gum Slough, about five miles south of Loop Road.	1994 - P	BM	BM	BM	BM	G
BCWQA11	254721	810600	Roberts Lake Strand, due south of Monroe Station on Loop Road.	1994 - P	M	-	-	-	G
BCWQA12	261129	810512	Kissimmee Billy Strand, about two miles north of I75 about half way through the Preserve.	1994 - P	BM	BM	BM	BM	G
BCWQA13	260923	811319	Mullet Slough, about six miles south of I75 about half way through the Preserve.	1994 - P	BM	BM	BM	BM	G
BCWQA14	260240	811800	Deep Lake Strand, about half way between County Rd. 29 and 839, about four miles north of County Rd. 837.	1994 - P	BM	BM	BM	BM	G

TABLE 51. Statistics on Select Parameters for the Big Cypress Basin Water Quality Monitoring Program for Period of Record

SFWMD Sta. ID	Total Phosphorus			Ortho Phosphorus			Total Nitrogen			Nitrite+Nitrate(NOx)		
	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX
BCWQA1	0.0050	0.0370	0.1850	0.0040	0.0145	0.0850	0.9230	2.1037	5.9200	0.0040	0.0531	0.2540
BCWQA10	0.0040	0.0108	0.0270	0.0040	0.0060	0.0120	0.5090	0.8710	1.4000	0.0040	0.1002	0.6880
BCWQA12	0.0040	0.0227	0.0870	0.0040	0.0040	0.0040	0.5410	0.9481	2.0900	0.0040	0.0644	0.4200
BCWQA13	0.0040	0.0229	0.0770	0.0040	0.0044	0.0070	0.6680	1.1744	2.7900	0.0040	0.0404	0.2290
BCWQA14	0.0040	0.0139	0.0370	0.0040	0.0042	0.0060	0.5040	0.7416	1.4000	0.0040	0.0443	0.2820
BCWQA2	0.0330	0.0330	0.0330	0.0040	0.0040	0.0040	1.5000	1.5000	1.5000	0.0050	0.0050	0.0050
BCWQA3	0.0040	0.0140	0.0360	0.0040	0.0057	0.0190	0.8060	1.3812	2.1900	0.0040	0.0374	0.1610
BCWQA4	0.0040	0.0240	0.1230	0.0040	0.0045	0.0080	0.6820	1.1378	3.7500	0.0040	0.0261	0.0850
BCWQA5	0.0050	0.0201	0.0520	0.0040	0.0054	0.0130	0.5040	1.3599	3.8500	0.0040	0.0426	0.1290
BCWQA9	0.0050	0.0312	0.0980	0.0040	0.0041	0.0050	0.5940	0.9090	1.2200	0.0040	0.0369	0.1530

Appendix A

ABBREVIATIONS

A:	Automatic Water Sampler
BA:	Biannually
BM:	Bimonthly
BMP:	Best Management Practices
BTIITF:	Board of Trustees of the Internal Improvement Trust Fund
BW:	Biweekly
BWF:	Biweekly when flowing
C:	Centigrade
CHL:	Chlorophyll
COE:	U.S. Army Corps of Engineers
DERM:	Dade County Department of Environmental Resource Management
DS:	Downstream
EAA:	Everglades Agricultural Area
ENR:	Everglades Nutrient Removal
FDEP:	Florida Department of Environmental Protection
G:	Grab Samples
G&FWFC:	Game and Fresh Water Fish Commission
ICWW:	Intracoastal Waterway
Lat:	Latitude
Long:	Longitude
LOTAC:	Lake Okeechobee Technical Advisory Committee
M:	Monthly
MAX:	Maximum
MEAN:	Average
MF:	Monthly when flowing
MIN:	Minimum
mg/L:	Milligram per Liter
MOA:	Memorandum of Agreement
NADP:	National Atmospheric Deposition Program
NTU:	Nephelometric Turbidity Units
P:	Present
PAR:	Photosynthetically Active Radiation
POR:	Period of Record
QA/QC:	Quality Assessment / Quality Control
QTR:	Quarterly
RCWP:	Rural Clean Water Program
SED:	Sediment
SFWMD:	South Florida Water Management District
STA:	Stormwater Treatment Area
Sta.ID:	Station Identification
STD:	Standard Deviation
STE:	Storm Event
SWIM:	Surface Water Improvement and Management
TA:	Triannually
TW:	Triweekly
µg/L:	Micrograms per Liter
µg/kg	Micrograms per Kilogram
umhos/cm:	Micromhos per Centimeter
US:	Upstream
USGS:	United States Geological Survey
W:	Weekly
WCA:	Water Conservation Area
WF:	Weekly when flowing

Appendix B

CROSS REFERENCE GUIDE

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
E02	1	15	UKCL
E04	1	15	UKCL
D02	1	15	UKCL
D03	1	15	UKCL
C03	1	15	UKCL
B02	1	15	UKCL
B04	1	15	UKCL
B06	1	15	UKCL
B09	1	15	UKCL
BS-59	1	15	UKCL
A01	1	15	UKCL
A03	1	15	UKCL
A04	1	15	UKCL
ABOGG	1	15	TUK
BWSHNGLE	1	15	TUK
CREEDYBR	1	15	TUK
S65	2, 5	21, 40	V, LKR
S65A	2, 5	21, 40	V, LKR
S65B	2, 5	21, 40	V, LKR
S65C	2, 5	21, 40	V, KREA, LKR
S65D	2, 5	21, 40	V, KREA, LKR
S65E	2, 5, 11, 20	21, 40, 92, 182	V, KREA, LKR, X, PEST(1)
KREA 61	2	21	KREA
KREA 75	2	21	KREA

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
KREA 76	2	21	KREA
KREA 77	2	21	KREA
KREA 78	2	21	KREA
KREA 79	2	21	KREA
KREA 80	2	21	KREA
KREA 81	2	21	KREA
KREA 82	2	21	KREA
KREA 83	2	21	KREA
KREA 86	2	21	KREA
KREA 87	2	21	KREA
KREA 88	2	21	KREA
KREA 89	2	21	KREA
KREA91	2	21	KREA
KREA92	2	21	KREA
KREA93	2	21	KREA
KREA94	2	21	KREA
KREA95	2	21	KREA
KREA96	2	21	KREA
KREA97	2	21	KREA
TFWQ01	2	21	TFWQ
TFWQ01A	2	21	TFWQ
TFWQ01B	2	21	TFWQ
TFWQ01C	2	21	TFWQ
TFWQ02	2	21	TFWQ

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
TFWQ03	2	21	TFWQ
TFWQ04	2	21	TFWQ
TFWQ05	2	21	TFWQ
TFWQO6	2	21	TFWQ
ARCK 301	3	31	ARCK
ARCK 302	3	31	ARCK
ARCK 305	3	31	ARCK
ARCK 306	3	31	ARCK
ARCK 308	3	31	ARCK
ARCK 310	3	31	ARCK
ARCK 311	3	31	ARCK
ARCK 315	3	31	ARCK
ISTK1	4	35	ISTO
ISTK2	4	35	ISTO
ISTK3	4	35	ISTO
ISTK4	4	35	ISTO
ISTK5	4	35	ISTO
ISTK6	4	35	ISTO
ISTK6S	4	35	ISTO
ISTK7	4	35	ISTO
S68	4	35	ISTO
JOSNCR17	4	35	ISTO
ISTKC621	4	35	ISTO
ARBKSR98	4	35	ISTO

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
KREA 01	5	41	KREA
KREA 04	5	41	KREA
KREA 06A	5	41	KREA
KREA 07	5	41	KREA
KREA 08	5	41	KREA
KREA 09	5	41	KREA
KREA 10B	5	41	KREA
KREA 10D	5	41	KREA
KREA 10E	5	41	KREA
KREA 14	5	41	KREA
KREA 16	5	41	KREA
KREA 17A	5	41	KREA
KREA 19	5	41	KREA
KREA 20	5	41	KREA
KREA 21	5	41	KREA
KREA 22	5	41	KREA
KREA 23	5	41	KREA
KREA 25	5	41	KREA
KREA 28	5	41	KREA
KREA 30A	5	41	KREA
KREA 32B	5	41	KREA
KREA 32C	5	41	KREA
KREA 32D	5	41	KREA
KREA 33	5	41	KREA

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
KREA 40	5	41	KREA
KREA 40A	5	41	KREA
KREA 40B	5	41	KREA
KREA 41	5	41	KREA
KREA 41A	5	41	KREA
KREA 41B	5	41	KREA
KREA 42A	5	41	KREA
KREA 42B	5	41	KREA
KREA 42D	5	41	KREA
KREA 43A	5	41	KREA
KREA 44	5	41	KREA
KREA 44C	5	41	KREA
KREA 46A	5	41	KREA
KREA 46B	5	41	KREA
KREA 47A	5	41	KREA
KREA 49	5	41	KREA
KREA 66	5	41	KREA
TCNS 201	6	52	TCNS
TCNS 204	6	52	TCNS

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
TCNS 206	6	52	TCNS
TCNS 207	6	52	TCNS
TCNS 209	6	52	TCNS
TCNS 210	6	52	TCNS
TCNS 211	6	52	TCNS
TCNS 212	6	52	TCNS
TCNS 213	6	52	TCNS
TCNS 214	6	52	TCNS
TCNS 217	6	52	TCNS
TCNS 218	6	52	TCNS
TCNS 219	6	52	TCNS
TCNS 220	6	52	TCNS
TCNS 222	6	52	TCNS
TCNS 225	6	52	TCNS
TCNS 227	6	52	TCNS
TCNS 228	6	52	TCNS
TCNS 230	6	52	TCNS
TCNS 231	6	52	TCNS
TCNS 233	6	52	TCNS
TCNS 241	6	52	TCNS
TCNS 243	6	52	TCNS
TCNS 249	6	52	TCNS
TCNS 252	6	52	TCNS
TCNS 254	6	52	TCNS

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
TCNS 255	6	52	TCNS
TCNS 258	6	52	TCNS
TCNS 262	6	52	TCNS
TCNS 263	6	52	TCNS
TCNS 265	6	52	TCNS
TCNS 268	6	52	TCNS
TCNS 271	6	52	TCNS
TCNS 272	6	52	TCNS
TCNS 273	6	52	TCNS
TCNS 276	6	52	TCNS
TCNS 277	6	52	TCNS
TCNS 280	6	52	TCNS
TCNS 281	6	52	TCNS
TCNS 282	6	52	TCNS
IRL01	7	64	IRL
IRL02	7	64	IRL
IRL03	7	64	IRL
IRL04	7	64	IRL
IRL05	7	64	IRL
IRL06	7	64	IRL
IRL07	7	64	IRL
IRL08	7	64	IRL
IRL09	7	64	IRL
IRL10	7	64	IRL

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
IRL11	7	64	IRL
IRL12	7	64	IRL
IRL13	7	64	IRL
IRL14	7	64	IRL
IRL15	7	64	IRL
IRL16	7	64	IRL
IRL17	7	64	IRL
IRL18	7	64	IRL
IRL19	7	64	IRL
IRL20	7	64	IRL
IRL21	7	64	IRL
IRL22	7	64	IRL
IRL23	7	64	IRL
IRL24	7	64	IRL
IRL25	7	64	IRL
IRL26	7	64	IRL
IRL27	7	64	IRL
IRL28	7	64	IRL
IRL29	7	64	IRL
IRL30	7	64	IRL
IRL31	7	64	IRL
IRL32	7	64	IRL
IRL33	7	64	IRL
IRL34	7	64	IRL

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
IRL35	7	64	IRL
IRL36	7	64	IRL
IRL37	7	64	IRL
IRL38	7	64	IRL
IRL39	7	64	IRL
IRL40	7	64	IRL
SE 01	8	76	SE
SE 02	8	76	SE
SE 03	8	76	SE
SE 04	8	76	SE
SE 05	8	76	SE
SE 06	8	76	SE
SE 07	8	76	SE
SE 09	8	76	SE
SE 10	8	76	SE
HR1	8	76	SE
C15S40	9	82	WQM
C15SR809	9	82	WQM
C16S41	9	82	WQM
C16SR809	9	82	WQM
C51S155	9	82	WQM
C17S44	9	82	WQM
C17SR702	9	82	WQM
C18G92	9	82	WQM

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
C18S46	9	82	WQM
C18SR710	9	82	WQM
C44S80	9, 20	82, 182	WQM, PEST(1)
C23S48	9	82	WQM
C24S49	9	82	WQM
C25S50	9	82	WQM
C25S99	9, 20	82, 182	WQM, PEST(1)
S2	11, 20	92, 182	X, PEST(1)
S3	11, 20	92, 182	X, PEST(1)
S4	11, 20	92, 182	X, PEST(1)
INDUSCAN	11	92	X
S77	11	92	X
FECSR78	11, 20	92, 182	X, PEST(1)
S71	11	92	X
S72	11	92	X
S65E	11	92	X
S84	11	92	X
S191	5, 11, 20	40, 92, 182	X, KREA, LKR, PEST(1)
S308C	11	92	X
S352	11	92	X
CULV4A	11	92	X
CULV10	11	92	X
CULV10A	11	92	X
CULV12	11	92	X

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
CULV12A	11	92	X
S127	11	92	X
S129	11	92	X
S131	11	92	X
S133	11	92	X
S135	11	92	X
S154	5, 11	40, 92	X, KREA, LKR
S169	11	92	X
S236	11	92	X
CULV5	11	92	X
L61W	11	92	X
L61E	11	92	X
L60W	11	92	X
L60E	11	92	X
L59W	11	92	X
L59E	11	92	X
C38W	11	92	X
S154C	11	92	X
L001	11	92	Y, YNRG
L002	11	92	Y, YGS, YNRG
L003	11	92	Y, YNRG
L004	11	92	Y, YNRG
L005	11	92	Y, YGS, YNRG
L006	11	92	Y, YGS, YS, YSRG

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
L007	11	92	Y, YS, YSRG
L008	11	92	Y, YNRG
LZ2	11	92	Y, YN, YNRG
KISSR0.0	11	92	Y, YN, YNRG
KBARIN	11	92	Y, YN
KBARMID	11	92	Y, YN
KBAROUT	11	92	Y, YN
3RDPTIN	11	92	Y, YN
3RDPTMID	11	92	Y, YN
3RDPTOUT	11	92	Y, YN
STAKEIN	11	92	Y, YN
STAKEMID	11	92	Y, YN
STAKEOUT	11	92	Y, YN
TREEIN	11	92	Y, YS
TREEMID	11	92	Y, YS
TREEOUT	11	92	Y, YS
TREENOUT	11	92	Y, YS
PALMIN	11	92	Y, YS
PALMMID	11	92	Y, YS
PALMOUT	11	92	Y, YS
PLN1OUT	11	92	Y, YS
PLN2IN	11	92	Y, YS
PLN2MID	11	92	Y, YS
PLN2OUT	11	92	Y, YS

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
PLN3OUT	11	92	Y, YS
PLN4OUT	11	92	Y, YS
LZ30	11	92	Y, YS, YSRG
POLE3S	11	92	YS, YSRG
RITAWEST	11	92	Y, YS, YSRG
RITAEAST	11	92	Y, YS, YSRG
LZ25	11	92	Y, YS, YSRG
PELMID	11	92	Y, YS, YSRG
TINOUT	11	92	Y, YN
POLESIN	11	92	Y, YN
POLESMID	11	92	Y, YN
POLESOUT	11	92	Y, YN
IPOUT	11	92	Y
LZ42N	11	92	Y, YNRG
LZ42	11	92	Y, YS, YSRG
LZ40	11	92	Y, YGS, YSRG
TIN8100	11	92	OLIT
TIN13700	11	92	OLIT
TIN16100	11	92	OLIT
FEBOUT	11	92	OLIT
FEBIN	11	92	OLIT
MBOXSOU	11	92	OLIT
MH32000	11	92	OLIT
MH24000	11	92	OLIT

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
MH16000	11	92	OLIT
MH12000	11	92	OLIT
OISLAND	11	92	OLIT
CR-00.2T/S235	12, 20	114, 182	CR, PEST(1)
CR-04.8T	12	114	CR
S78	12	114, 182	CR, PEST(1)
S79	12	114, 182	CR, PEST(1)
ENR001	13	118	ENRP
ENR002	13	118	ENRP, ENRG(1)
ENR004	13	118	ENRP, ENRG(1)
ENR011	13	118	ENRP
ENR012	13	118	ENRP, ENRG(1)
ENR102	13	118	ENRP
ENR103	13	118	ENRP
ENR203	13	118	ENRP
ENR204	13	118	ENRP
ENR302	13	118	ENRP
ENR303	13	118	ENRP
ENR305	13	118	ENRP
ENR306	13	118	ENRP
ENR401	13	118	ENRP
ENR402	13	118	ENRP
G252C	13	118	ENRP
G252G	13	118	ENRP

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
G253C	13	118	ENRP
G253G	13	118	ENRP
G254B	13	118	ENRP
G254D	13	118	ENRP
G255	13	118	ENRP
G256	13	118	ENRP
G200	14	126	HOLY
G200SD	14	126	HOLY
G201	14	126	HOLY
G204	14	126	HOLY
G205	14	126	HOLY
G206	14	126	HOLY
S8	14	126	HOLY
HOLYSD1	14	126	HOLY(1)
HOLYSD2	14	126	HOLY(1)
HOLYSD3	14	126	HOLY(1)
HOLYSD4	14	126	HOLY(1)
LOX3	15	132	EVPA
LOX4	15	132	EVPA
LOX5	15	132	EVPA
LOX6	15	132	EVPA
LOX7	15	132	EVPA
LOX8	15	132	EVPA
LOX9	15	132	EVPA

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
LOX10	15	132	EVPA
LOX11	15	132	EVPA
LOX12	15	132	EVPA
LOX13	15	132	EVPA
LOX14	15	132	EVPA
LOX15	15	132	EVPA
LOX16	15	132	EVPA
S5AD	15	132	EVPA
S6D	15	132	EVPA
F1	15	132	EVPA
F2	15	132	EVPA
F4	15	132	EVPA
F5	15	132	EVPA
U3	15	132	EVPA
U5	15	132	EVPA
CA2-7	15	132	EVPA
CA2-8	15	132	EVPA
CA3-2	15	132	EVPA
CA3-3	15	132	EVPA
CA3-4	15	132	EVPA
CA3-6	15	132	EVPA
CA3-8	15	132	EVPA
CA3-11	15	132	EVPA
CA3-15	15	132	EVPA

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
NFEED	16	142	SEMI
WFEED	16	142	SEMI
S5A	17, 20	146, 182	CAMB, PEST(1)
S5AS	17	146	CAMB
S5AE	17	146	CAMB
S5AW	17	146	CAMB
S6	17	146, 182	CAMB, PEST(1)
S7	17	146, 182	CAMB, PEST(1)
S8	17	146, 126, 182	CAMB, PEST(1), HOLY
S9	17	146, 182	CAMB, PEST(1)
S10A	17	146	CAMB
S10C	17	146	CAMB
S10D	17	146	CAMB
S10E	17	146	CAMB
S11A	17	146	CAMB
S11B	17	146	CAMB
S11C	17	146	CAMB
S34	17	146	CAMB
S38	17	146	CAMB
S38B	17	146	CAMB
S39	17	146	CAMB
S144	17	146	CAMB
S145	17	146	CAMB
S146	17	146	CAMB

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
S150	17	146	CAMB
L3	17	146	CAMB
L3BRN	17	146	CAMB
L28I	17	146	CAMB
S140	17	146	CAMB
S151	17	146	CAMB
S333	17	146	CAMB
S12D	17	146	CAMB
S12C	17, 20	146, 182	CAMB, PEST(1)
S12B	17	146	CAMB
S12A	17	146	CAMB
G123	17	146	CAMB
S31	17, 20	146, 182	CAMB, PEST(1)
S190	17, 20	146, 182	CAMB, PEST(1)
L3BRS	17, 20	146, 182	CAMB, PEST(1)
L40-1	17	146	CAMB
L40-2	17	146	CAMB
C123SR84	17	146	CAMB
USL3BRS	17	146	CAMB
USSO	17	146	CAMB
C139DFC	17	146	CAMB
G136	17	146	CAMB
TAMBR6	17	146	TAMB
FROGCITY	17	146	TAMB

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
TAMBR1	17	146	TAMB
TAMBR2	17	146	TAMB
TAMBR3	17	146	TAMB
TAMBR4	17	146	TAMB
TAMBR5	17	146	TAMB
COOPERTN	17	146	TAMB
TAMBR7	17	146	TAMB
TAMBR8	17	146	TAMB
GLADER	17	146	TAMB
TAMBR9	17	146	TAMB
TAMBR10	17	146	TAMB
TAMBR11	17	146	TAMB
SAFARI	17	146	TAMB
TAMBR12	17	146	TAMB
TAMBR13	17	146	TAMB
TAMBR14	17	146	TAMB
TAMBR15	17	146	TAMB
S333DS	17	146	TAMB
AC01	18	160	BISC
AC02	18	160	BISC
AC03	18	160	BISC
AR01	18	160	BISC
AR03	18	160	BISC
BB01	18	160	BISC

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
BB02	18	160	BISC
BB03	18	160	BISC
BB04	18	160	BISC
BB06	18	160	BISC
BB07	18	160	BISC
BB09	18	160	BISC
BB10	18	160	BISC
BB11	18	160	BISC
BB14	18	160	BISC
BB15	18	160	BISC
BB16	18	160	BISC
BB17	18	160	BISC
BB18	18	160	BISC
BB19	18	160	BISC
BB22	18	160	BISC
BB23	18	160	BISC
BB24	18	160	BISC
BB25	18	160	BISC
BB26	18	160	BISC
BB27	18	160	BISC
BB28	18	160	BISC
BB29	18	160	BISC
BB31	18	160	BISC
BB32	18	160	BISC

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
BB34	18	160	BISC
BB35	18	160	BISC
BB36	18	160	BISC
BB37	18	160	BISC
BB38	18	160	BISC
BB41	18	160	BISC
BB42	18	160	BISC
BB43	18	160	BISC
BB44	18	160	BISC
BB45	18	160	BISC
BB46	18	160	BISC
BB47	18	160	BISC
BB48	18	160	BISC
BB50	18	160	BISC
BB51	18	160	BISC
BL01	18	160	BISC
BL02	18	160	BISC
BL03	18	160	BISC
BL12	18	160	BISC
BS01	18	160	BISC
BS04	18	160	BISC
BS10	18	160	BISC
CD02	18	160	BISC
CD09	18	160	BISC

Cross Reference Guide Between Stations, Section of Report, Page #, and Project Code. Data can be Retrieved from the Water Quality Database.

STATION	SECTION	PAGE #	PROJECT CODE
CG01	18	160	BISC
CG07	18	160	BISC
GL02	18	160	BISC
GL03	18	160	BISC
LR01	18	160	BISC
LR03	18	160	BISC
LR06	18	160	BISC
LR10	18	160	BISC
MI03	18	160	BISC
MR01	18	160	BISC
MR02	18	160	BISC
MR03	18	160	BISC
MR04	18	160	BISC
MR05	18	160	BISC
MR06	18	160	BISC
MR07	18	160	BISC
MR08	18	160	BISC
MR15	18	160	BISC
MW01	18	160	BISC
MW04	18	160	BISC
MW13	18	160	BISC
PR01	18	160	BISC
PR03	18	160	BISC
PR08	18	160	BISC

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SK01	18	160	BISC
SK02	18	160	BISC
SK09	18	160	BISC
SP01	18	160	BISC
SP04	18	160	BISC
SP08	18	160	BISC
TM02	18	160	BISC
TM03	18	160	BISC
TM08	18	160	BISC
WC02	18	160	BISC
WC03	18	160	BISC
WC04	18	160	BISC
S18C	19, 20	174, 182	ENP, PEST(1)
S175	19	174	ENP
S176	19, 20	174, 182	ENP, PEST(1)
S177	19, 20	174, 182	ENP, PEST(1)
S178	19, 20	174, 182	ENP, PEST(1)
S332	19, 20	174, 182	ENP, PEST(1)
TAMBR105	19	174	ENP
US41-25	19, 20	174, 182	ENP, PEST(1)
P33	19	174	EVER
P34	19	174	EVER
P35	19	174	EVER
P36	19	174	EVER

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P37	19	174	EVER
NE1	19	174	EVER
NP201	19	174	EVER
EP	19	174	EVER
TSB	19	174	EVER
S65AWET S65ADRY	21	190	RAIN
OKEEFSW OKEEFSD	21	190	RAIN
G36WET G36DRY	21	190	RAIN
S127WET S127DRY	21	190	RAIN
S131WET S131DRY	21	190	RAIN
S308WET S308DRY	21	190	RAIN
S310WET S310DRY	21	190	RAIN
BG1WET BG1DRY BG2WET BG2DRY	21	190	RAIN
ENRWET ENRDRY	21	190	RAIN
ENR101W ENR101D	21	190	RAIN
ENR203W ENR203D	21	190	RAIN

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ENR301W ENR301D	21	190	RAIN
ENR401W ENR401D	21	190	RAIN
L6WET L6DRY	21	190	RAIN
S7 WET S7 DRY	21	190	RAIN
S140WET S140DRY	21	190	RAIN
L67AWET L67ADRY	21	190	RAIN
ENPRCWET ENPRCDRY	21	190	RAIN
MBLS01	22	196	MBLS
MBLS02	22	196	MBLS
MBLS03	22	196	MBLS
MBLS04	22	196	MBLS
MBLS05	22	196	MBLS
MBLS06	22	196	MBLS
MBLS07	22	196	MBLS
MBLS08	22	196	MBLS
MBLS09	22	196	MBLS
MBLS10	22	196	MBLS
MBLS11	22	196	MBLS
MBLS12	22	196	MBLS

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MBLS15	22	196	MBLS
MBLS16	22	196	MBLS
MBLS17	22	196	MBLS
MBLS18	22	196	MBLS
MBLS19	22	196	MBLS
MBLS20	22	196	MBLS
MBLS21	22	196	MBLS
MBLS22	22	196	MBLS
FLAB01	23	202	FLAB
FLAB02	23	202	FLAB
FLAB03	23	202	FLAB
FLAB04	23	202	FLAB
FLAB05	23	202	FLAB
FLAB06	23	202	FLAB
FLAB07	23	202	FLAB
FLAB08	23	202	FLAB
FLAB09	23	202	FLAB
FLAB10	23	202	FLAB
FLAB11	23	202	FLAB
FLAB12	23	202	FLAB
FLAB13	23	202	FLAB
FLAB14	23	202	FLAB

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FLAB15	23	202	FLAB
FLAB16	23	202	FLAB
FLAB17	23	202	FLAB
FLAB18	23	202	FLAB
FLAB19	23	202	FLAB
FLAB20	23	202	FLAB
FLAB21	23	202	FLAB
FLAB22	23	202	FLAB
FLAB23	23	202	FLAB
FLAB24	23	202	FLAB
FLAB25	23	202	FLAB
FLAB26	23	202	FLAB
FLAB27	23	202	FLAB
FLAB28	23	202	FLAB
FLAB29	32	202	FLAB
FLAB30	23	202	FLAB
FLAB31	23	202	FLAB
FLAB32	23	202	FLAB
FLAB33	23	202	FLAB
FLAB34	23	202	FLAB
FLAB35	32	202	FLAB
FLAB36	23	202	FLAB
FLAB37	23	202	FLAB
FLAB38	23	202	FLAB

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FLAB45	23	202	FLAB
FLAB46	23	202	FLAB
FLAB47	23	202	FLAB
FLAB48	23	202	FLAB
FLAB49	23	202	FLAB
FLAB50	23	202	FLAB
TTI51	23	202	TTI
TTI52	23	202	TTI
TTI53	23	202	TTI
TTI54	23	202	TTI
TTI55	23	202	TTI
TTI56	23	202	TTI
TTI57	23	202	TTI
TTI58	23	202	TTI
TTI59	23	202	TTI
TTI60	23	202	TTI
TTI61	23	202	TTI
TTI62	23	202	TTI

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TTI65	23	202	TTI
TTI66	23	202	TTI
TTI67	23	202	TTI
TTI68	23	202	TTI
TTI69	23	202	TTI
TTI70	23	202	TTI
TTI71	23	202	TTI
TTI72	23	202	TTI
TTI73	23	202	TTI
TTI74	23	202	TTI
TTI75	23	202	TTI
BISC101	23	202	BISC
BISC102	23	202	BISC
BISC103	23	202	BISC
BISC104	32	202	BISC
BISC108	23	202	BISC
BISC109	23	202	BISC
BISC110	23	202	BISC
BISC111	23	202	BISC
BISC112	23	202	BISC
BISC113	32	202	BISC
BISC116	23	202	BISC

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BISC121	23	202	BISC
BISC122	23	202	BISC
BISC123	23	202	BISC
BISC124	23	202	BISC
BISC126	23	202	BISC
BISC127	23	202	BISC
BISC128	23	202	BISC
BISC129	23	202	BISC
BISC130	23	202	BISC
BISC131	23	202	BISC
BISC132	23	202	BISC
BISC133	23	202	BISC
BISC134	23	202	BISC
BISC135	23	202	BISC
SWS351	23	202	SWS
SWS352	23	202	SWS
SWS353	23	202	SWS
SWS354	23	202	SWS
SWS355	23	202	SWS
SWS356	23	202	SWS
SWS357	23	202	SWS
SWS358	23	202	SWS
SWS359	23	202	SWS
SWS360	23	202	SWS

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SWS366	23	202	BISC
SWS367	23	202	BISC
SWS368	23	202	BISC
SWS369	23	202	BISC
SWS370	23	202	BISC
SWS371	23	202	BISC
SWS372	23	202	BISC
SWS373	23	202	BISC
SWS374	23	202	BISC
SWS375	23	202	SWS
SWS376	23	202	SWS
SWS377	23	202	SWS
SWS378	23	202	SWS
SWS379	32	202	SWS
SWS380	23	202	SWS
SWS381	23	202	SWS
SWS382	23	202	SWS
SWS383	23	202	SWS
SWS384	23	202	SWS

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SWS387	23	202	BISC
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SWS390	23	202	BISC
SWS391	23	202	BISC
SWS392	23	202	BISC
SWS393	23	202	BISC
SWS394	23	202	BISC
SWS395	23	202	BISC
SWS396	23	202	BISC
SWS397	23	202	BISC
SWS398	23	202	BISC
SWS399	23	202	SWS
ENPWW	23	202	(2)
ENPLO	23	202	(2)
ENPWP	23	202	(2)
ENPCA	23	202	(2)
ENPBD	23	202	(2)
ENPHR	23	202	(2)
ENPGI	23	202	(2)
ENPTE	23	202	(2)
ENPSR	23	202	(2)

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ENPWE	23	202	(2)
ENPBA	23	202	(2)
ENPBK	23	202	(2)
ENPBN	23	202	(2)
ENPBR	23	202	(2)
ENPBS	23	202	(2)
ENPCN	23	202	(2)
ENPDK	23	202	(2)
ENPHC	23	202	(2)
ENPJB	23	202	(2)
ENPJK	23	202	(2)
ENPLB	23	202	(2)
ENPLM	23	202	(2)
ENPLR	23	202	(2)
ENPLS	23	202	(2)
ENPMK	23	202	(2)
ENPNR	23	202	(2)
ENPPK	23	202	(2)
ENPTB	32	202	(2)
ENPTC	23	202	(2)
ENPTR	23	202	(2)
ENPWB	23	202	(2)

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BCWQA1	24	223	BCWQ
BCWQA2	24	223	BCWQ
BCWQA3	24	223	BCWQ
BCWQA4	24	223	BCWQ
BCWQA5	24	223	BCWQ
BCWQA6	24	223	BCWQ
BCWQA7	24	223	BCWQ
BCWQA8	24	223	BCWQ
BCWQA9	24	223	BCWQ
BCWQA10	24	223	BCWQ
BCWQA11	24	223	BCWQ
BCWQA12	24	223	BCWQ
BCWQA13	24	223	BCWQ
BCWQA14	24	223	BCWQ

(1) Data can be retrieved from the Organics Database
(2) Data can be retrieved from the DBHYDRO database