Operational Project Monitoring Plan

For

Florida Bay Water Quality Monitoring Network

(FLAB)

07/22/19

7/29/2019

X Nicole Penkowski

Nicole Penkowski
Associate Environmental Scientist
Signed by: Penkowski, Nicole

7/29/2019

X Denise Gierhart

Denise Gierhart
Science Technician Supervisor
Signed by: Gierhart, Denise

7/29/2019

X Joe Claude

Joseph Claude
Science Supervisor
Signed by: Claude, Joseph

X John Moorman

John Moorman
Sr Quality Assurance Supervisor
Signed by: Moorman, John

Water Quality Monitoring Section
Water Quality Bureau, Water Resources Division
South Florida Water Management District

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1.0 Project Organization

Overall project organization and responsibilities are detailed in the South Florida Water Management District (SFWMD or District) Applied Sciences Bureau (ASB) and Water Quality Bureau (WQB) Quality Management Plan (QMP). Field activity responsibilities are detailed in the District's Field Sampling Quality Manual (FSQM). Laboratory analysis and data validation responsibilities are detailed in the District's Chemistry Laboratory Quality Manual (CLQM). These documents define the procedures used by SFWMD personnel to meet the Florida Department of Environmental Protection's (FDEP) Quality Assurance (QA) Rule, Florida Administrative Code (F.A.C.) 62-160. Refer to these documents for details on key personnel and relevant responsibilities.

2.0 Project Description

2.1 Project Introduction and Background

This document serves as a reference for the Florida Bay Water Quality Monitoring Network (FLAB) project. FLAB consists of thirty-eight (38) sampling stations.

Monthly surface water monitoring at FLAB began in March 1991. Originally the project was collected and samples were analyzed by Florida International University (FIU). The District brought project management and analysis in-house in October 2008, with samples collected by a contractor. The District began sampling in-house in October 2011 and changed the sampling frequency of stations not mandated from monthly to bi-monthly. Mandated stations were collected bi-monthly from December 2011 through December of 2015. In January of 2016, the sampling frequency of mandated stations increased to monthly and remains as the current frequency.

The guidance contained in this document will assist in maintaining consistency in sampling locations, parameter lists, and frequencies as well as providing documentation of the project scope and an ongoing historical perspective.

2.2 Mandates and Permits

There are ten (10) FLAB stations, mandated by Department of the Army (DA) permit SAJ-2005-09856 modified on February 22, 2016, to be collected monthly (see Appendix 1). The remaining stations are not mandated.

2.3 Project Objectives

The monitoring stations described in this document were established to support improving water quality in the Florida Bay Water Quality Monitoring Network project area. The water quality data obtained under this program will be used to characterize:

- Problem areas within the bay, especially those related to upstream water management activities;

- Short and long term water quality trends within the bay;
- Establish a baseline set of conditions to evaluate the effectiveness of future watershed restoration projects.

The data may also be used to indicate changes in water quality that allow for better management of the bay, including environmental enhancement and prevention of any further degradation.

2.3.1 Modification or Termination Conditions

Modification of this plan will be determined by the needs of the project. This plan may be changed to reflect any future design changes, or changes to the project objectives. The plan will be reviewed and/or modified annually or more frequent if necessary, to reflect new requirements.

3.0 Geographic Location

3.1 Regional Area

FLAB is located within coastal Miami-Dade and Monroe counties stretching from the Ten Thousand Islands, White Water Bay and eastward across Florida Bay (Figure 1).

3.2 Station Location and Access

Monitoring stations are depicted in Figure 1 with locations described in Table 1.

A Scientific Research and Collecting Permit issued by the National Park Service specific to surface water quality sample collection anywhere within the Everglades National Park (ENP) boundary is required. The permit must be renewed annually by the Field Project Manager and is applicable only for the National Park Service Study #EVER-0082 (FLAB). A valid permit must be carried on the boat while sampling.

All stations require a power boat for access. The launch ramps located at the Everglades National Park Key Largo Ranger Station and Flamingo Visitor Center allow access points to reach all FLAB monitoring stations.

Table 1: FLAB Surface Water Monitoring Stations and GPS Coordinates

Station	Latitude	Longitude	Description
FLAB04	251318.23	802317.95	Barnes Sound
FLAB05	251026.58	802523.09	Blackwater Sound
FLAB06	251224.05	802625.44	Little Blackwater Sound
FLAB07	251512.96	802638.94	Highway Creek
FLAB08	251338.53	802742.01	Long Sound-0.5 nautical mile NW of entrance to Long Sound
FLAB09	251037.45	802929.65	Duck Key-0.25 nautical mile S of Duck Key
FLAB10	251328.09	803211.69	Joe Bay-0.5 nautical mile N of Trout Creek entrance
FLAB11	251030.61	803736.91	Little Madeira Bay
FLAB12	250825.33	804258.03	Terrapin Bay
FLAB13	250529.11	804517.21	Whipray Basin
FLAB14	250901.73	804833.19	Garfield Bight
FLAB15	250716.97	804810.37	Rankin Lake-1 nautical mile W of Dump Key Channel
FLAB16	250705.77	805622.74	Murray Key-0.5 nautical mile N of Murray Key
FLAB17	250232.89	805453.35	Johnson Key Basin
FLAB18	250008.71	805400.36	Rabbit Key Basin
FLAB19	245839.61	804512.67	Twin Key Basin
FLAB20	245546.2	804501.69	Peterson Key
FLAB21	250023.76	804052.57	Porpoise Lake
FLAB23	250704.69	803558.99	Park Key-1.5 nautical miles W of Park Key
FLAB24	250606.3	803153.04	Butternut Key
FLAB25	250501.32	810450.09	East Cape-Red daymarker 2
FLAB27	245506.96	805605.53	Sprigger Bank
FLAB29	253316.31	811101.21	First Bay-Mouth of Lostmans River
FLAB30	253448.61	810715.35	Third Bay-.25 nautical mile N of ENP Marker 49
FLAB31	253403.29	810417.29	Big Lostmans Bay
FLAB33	252959.03	810256.33	Broad River Bay
FLAB34	252909.78	810640.14	Middle Broad River
FLAB35	252830.07	810910.55	Broad River Mouth
FLAB36	252442.05	810829.22	Harney River Mouth
FLAB37	252554.05	810456.57	Harney Rivers Junction
FLAB38	252502.21	805954.35	Tarpon Bay-0.5 nautical mile E of ENP Marker 9
FLAB39	252244.11	810150.63	Shark River at Gunboat Island
FLAB40	252058.99	810728.45	Ponce De Leon Bay
FLAB41	251952.14	810421.61	Oyster Bay-Green daymarker 51
FLAB43	251710.07	810125.14	West Marker 34
FLAB44	251954.73	805901.32	Watson River Chickee
FLAB47	251646.74	805550.77	Roberts River Mouth
FLAB48	251426.88	805728.55	West Marker 18

The standard positional goal for station coordinates is detailed in the Establishing & Verifying Water Quality Monitoring Station Registration SOP (SFWMD-FIELD-SOP-031). The coordinates are relative to NAD83 HARN horizontal datum.

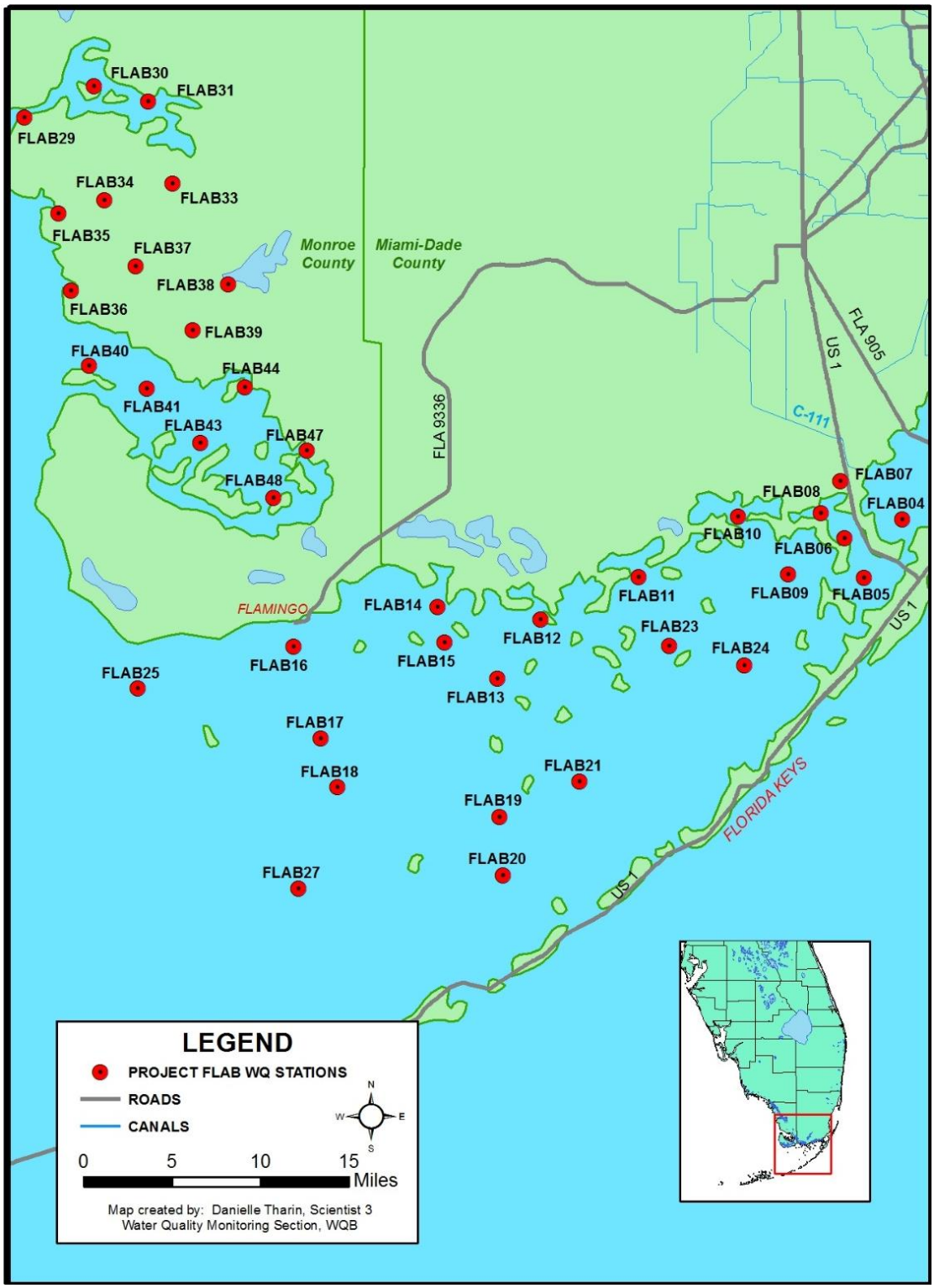

Figure 1: FLAB Station Locations

4.0 Field Activities

4.1 Monitoring Frequencies by Station and Parameter (ACODES)

All monitoring parameters, frequencies of collection and locations are indicated within Table 2.

Table 2: FLAB Grab Stations, Frequency and Parameter ACODES

Station Name	Type	Frequency	Parameter ACODES
FLAB05, FLAB07 FLAB14, FLAB16 FLAB17, FLAB18 FLAB19, FLAB20 FLAB21, FLAB24 FLAB25, FLAB27 FLAB29, FLAB30 FLAB31, FLAB33 FLAB34, FLAB35 FLAB36, FLAB37 FLAB38, FLAB39 FLAB40, FLAB41 FLAB43, FLAB44 FLAB47, FLAB48	Grab	Bi-monthly	Ammonia (NH4), Chlorophylls (CHL-N), Dissolved Oxygen (DO), Nitrate-Nitrite (NOX), Nitrites (NO2), Ortho-Phosphate (OPO4), pH, Salinity (SALINITY), Secchi Depth (SECCHI), Specific Conductivity (SCOND), Temperature (TEMP) Total Nitrogen (TN), Total Organic Carbon (TOC), Total Phosphorus[1] (TPO4), Turbidity (TURB)
FLAB04 FLAB06 FLAB08 FLAB09 FLAB10 FLAB11 FLAB12 FLAB13 FLAB15 FLAB23	Grab	Monthly	Same as Above

[1]Total phosphorus for saline waters (TPO4S) is collected and analyzed per district laboratory SOP (SFWMD-LAB-SOP-3110) for all FLAB monitoring stations. Results are reported as TPO4.

4.2 Project Specific Guidelines

All surface water grab samples are collected on the upstream side of any structure at a depth of 0.5 meters unless collection of a representative sample is inhibited by vegetation

and/or other conditions. If an alternative sampling location is required, a consultation with a Science Technician Supervisor and/or the Field Project Manager (FPM) must take place prior to the sampling being collected; this action must be documented in the field notes.

4.3 Grab Sampling Procedures

Sample collection for this project shall follow the procedures and requirements found in the Grab Sampling Protocol Section of the District's FSQM.

4.4 Field Parameters

The collection of field parameters follows the procedures and requirements outlined in the WQM FSQM.

4.5 Field Quality Control Requirements

Field quality control requirements shall follow the procedures found in the *Field Quality Control Measurements and Requirements* section of the WQM FSQM.

4.6 Autosampler Collection

There is no requirement for the use of autosamplers for this project.

4.7 Sample Submission

If the District laboratory is to be used, samples are transported to the laboratory and submitted for analyses in accordance with the requirements specified in the WQM FSQM. Samples are submitted to the laboratory on the same day as collection or via courier the following day. Sample acceptance criteria are detailed in Section 6 of the CLQM. If samples are submitted to another laboratory, it must meet the contract laboratory requirements as specified in Section 5.2 below.

5.0 Data Quality Objectives

5.1 Data Usage

The data from this project are compiled and reported in accordance with the conditions outlined in the permit or mandate specified in Appendix 1; also see Section 2.3.

5.2 Data Quality

All monitoring described herein shall meet the requirements conveyed in the FDEP's Quality Assurance Rule, 62-160 F.A.C. The District has adopted a uniform set of DQOs following criteria detailed within the *Analytical Methods and Default QA/QC Targets* table of the CLQM.

Field parameter DQOs are described in the *Field Quality Assurance Objectives* table found in the *Field Testing* section of the FSQM. The most recent version of the FSQM details the specific field testing DQOs at the time of sample collection.

Samples are analyzed according to the provisions within the FDEP Rule 62-160 F.A.C. and the CLQM. The most recent version of the CLQM details DQOs at the time of sample collection for each specific laboratory analysis. Data are qualified in accordance with the FSQM, CLQM and applicable data validation SOPs.

Contract laboratories must be certified through the National Environmental Laboratory Accreditation Program (NELAP) for the submitted samples' analyses, and the DQOs for those analyses must meet or exceed the District laboratory's DQOs (*sensu* CLQM). Analyses performed by contract laboratories must comply with DQOs derived with the assistance of the District laboratory manager and/or Data Validation Section Supervisor and specified in this monitoring plan.

5.3 Completeness Target

The completeness target (i.e., the number of samples successfully collected and analyzed) shall be set at 95% annually for this project. Sampling attempts shall be included in the completeness target. At times samples will not be able to be collected due to no flow or low water conditions, unsafe station conditions, equipment malfunction, site maintenance, tropical storms/hurricanes or other unforeseen problems that might affect sample collection and/or quality. If samples cannot be collected on an attempt, collectors shall document "no bottle" (NOB) to indicate and attempt was made and/or the sample could not be collected for the documented reasons.

6.0 Data and Records Management

The laboratory shall evaluate the data in accordance with the data quality objectives stated in the FSQM and CLQM. All data submittals shall conform to existing District guidelines.

6.1 Contract Deliverables

There are no contract deliverables for this project.

6.2 Data and Record Storage

After the data validation process, all data and records are maintained so that end users can retrieve and review information relative to a sampling event. Field records are maintained in accordance with the *Archive Records Storage and Retention* SOP (SFWMD-FIELD-SOP-022). All analytical data and specified metadata are sent to the DBHYDRO database for long-term storage and retrieval.

The District shall maintain master copies of field and laboratory generated records. It is the responsibility of the District to maintain both records of current and historical methodologies and operating procedures so that at any given time the conditions that were applied to a sampling event can be evaluated.

Field records storage protocols are outlined in the *Archive Records Storage and Retention* (SFWMD-FIELD-SOP-022). Corrections of field data or records must follow the applicable WQM SOPs and FSQM. Corrections to data in DBHYDRO must follow *Data Investigations and Corrections* (SFWMD-DVS-SOP-010).

7.0 Revisions and Modifications

Version	Date	Section	Change/Reason
	10/1/07		part of contract amendment 4600000352-A02, eliminate 100% field duplicate collection, frequency of field duplicate collection will follow district requirement, eliminated due to budget reduction and above minimum requirement by the District
	10/1/07		part of contract amendment 4600000352-A02, Eliminate FLAB32, FLAB45, FLAB46, FLAB50, eliminated due to budget reduction, stations selected based after consultation with end users of data (i.e. David Rudnik, Peter Doering, etc.)
	10/1/07		Silica (SIO2) removed from Table 7 as a routinely collected parameter, information obtained from this parameter fulfills no purpose
	9/25/09		Eliminate stations FLAB01, FLAB02, due to lack of funding
	9/25/09		Eliminate stations FLAB03, FLAB04, stations were adjacent to corresponding existing stations in the Miami-Dade DERM Biscayne Bay WQ Monitoring Project, duplicating efforts
	1/1/2010		Eliminate stations FLAB22, FLAB26, FLAB28, FLAB32, FLAB42, FLAB49 as part of an overall re-engineered review of the coastal project to maximize efficiency in coverage
	9/22/2010		Subdivide the South Florida Coastal Water Quality Monitoring Network (SFWQMN) into separate plans, including the Florida Bay Monitoring Plan, the SFWQMN was originally sampled by contractors in its entirety, the District is now bringing the Rookery Bay monitoring portion in house, with the remaining FLAB & TTI portions to be sampled by contractors
	7/21/11		There are a total of 37 stations all under the FLAB project code, per request from Kim Hanes
	7/21/11		FPM review, WP Davis
	1/31/12		Monthly Sample Frequency, Bi-Monthly Sample Frequency, Project optimization
	1/31/12		FPM review and update, WP Davis
	2/12/14		Annual Review
	3/17/15	7.0	Updated section 7 to match new OMP template

Version	Date	Section	Change/Reason
	3/17/15	Table 3	Added Secchi depth to field parameter table 3, reflect actual monitoring.
	5/31/16		Added FLAB04 monthly, station was re-activated, added to map, tables
	5/31/16		Added Permit SAJ-2005-09856, new permit adds monthly monitoring at 10 high priority stations
	5/31/16		Added Bi-Monthly and monthly stations FLAB06, FLAB08, FLAB09, FLAB10, FLAB11, FLAB12, FLAB13, FLAB15, FLAB23
	8/11/16		Old template, updated monitoring plan to new version of operational monitoring plan template
6	2/1/19	3.2	Station access details and ENP sample collection permit information added
	2/1/19	Table 2	TPO4S footnote added to table 2
	2/1/19	all	Update to match 2018 OMP template
7	07/22/19		Update Signatories, Table 2 and Appendix 1 formatting. No changes to monitoring requirements.

8.0 References

FDEP (Florida Department of Environmental Protection). Quality Assurance Rule, 62-160 Florida Administrative Code (F.A.C.)

South Florida Water Management District, Chemistry Laboratory Quality Manual (CLQM)

South Florida Water Management District, Water Quality Monitoring Section, Field Sampling Quality Manual (FSQM), SFWMD-FIELD-QM-001

South Florida Water Management District, Field Sampling Quality Management Plan (QMP)

SFWMD (South Florida Water Management District). Water Quality Monitoring Station Registration, S FWMD-FIELD-SOP-031, Water Quality Monitoring Section

Appendix 1: Station Requirements by Mandate

Station	Mandate	Collection Method	Frequency	Parameters ACODES
FLAB05 FLAB07 FLAB14 FLAB16 FLAB17 FLAB18 FLAB19 FLAB20 FLAB21 FLAB24 FLAB25 FLAB27 FLAB29 FLAB30 FLAB31 FLAB33 FLAB34 FLAB35 FLAB36 FLAB37 FLAB38 FLAB39 FLAB40 FLAB41 FLAB43 FLAB44 FLAB47 FLAB48	Mission Driven	Grab	Bi-Monthly	Ammonia (NH4), Chlorophylls (CHL-N), Dissolved Oxygen (DO), Nitrate-Nitrite (NOX), Nitrites (NO2), Ortho-Phosphate (OPO4), pH, Salinity (SALINITY), Secchi Depth (SECCHI), Specific Conductivity (SCOND), Temperature (TEMP) Total Nitrogen (TN), Total Organic Carbon (TOC), Total Phosphorus[1] (TPO4), Turbidity (TURB)
FLAB04 FLAB06 FLAB08 FLAB09 FLAB10 FLAB11 FLAB12 FLAB13 FLAB15 FLAB23	Department of the Army (DA) permit number SAJ-2005-09856 Ecological Monitoring Plan for the C-111 Spreader Canal Western Project, January 25, 2016	Grab	Monthly	Same as Above