Operational Project Monitoring Plan

For

C51WEST and L8 BASIN PROJECT

(C51WL8)

03/01/2022

3/2/2022

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1.0 Project Organization

The following documents define the procedures used by South Florida Water Management District (SFWMD or District) personnel to meet the Florida Department of Environmental Protection's (FDEP or Department) Quality Assurance (QA) Rule, Florida Administrative Code (F.A.C.) 62-160, and should be referred to for details on key personnel and relevant responsibilities.

- Overall project organization and responsibilities -
  - SFWMD Water Quality Bureau (WQB) and Applied Sciences Bureau (ASB) Quality Management Plan (QMP).
- Field activity and data validation responsibilities -
  - SFWMD Water Quality Monitoring Section's (WQM) Field Quality Manual (QM), Field Sampling Manual (FSM) and applicable Standard Operating Procedures (SOP).
- Laboratory analysis and data validation responsibilities –
  - SFWMD Analytical Service's (AS) Chemistry Laboratory Quality Manual (CLQM) and applicable SOPs.

2.0 Project Description

2.1 Project Introduction and Background

This document serves as a reference for surface water quality monitoring for the C51WL8 Project (C51WL8). This operational monitoring plan contains descriptions of the mandate and/or permit justifying monitoring including frequency of collection and parameters by station.

In response to the Governor's Executive Order 19-12 (signed January 10, 2019) to expedite nutrient reductions in the Northern Everglades, the District' Applied Sciences Bureau and Everglades and Estuaries Protection Bureau (EEP) recommended an expansion of the District's water quality monitoring network. Specifically, the Bureau's recommendations are intended to

1. Measure progress of individual restoration projects toward attaining specific goals and maintaining compliance with FDEP and USACE permit requirements;
2. Monitor non-point source contributions to assess long-term trends in water quality;
3. Evaluate necessary modifications to the Watershed Construction Projects to help achieve water quality standards;
4. Support FDEP with system wide monitoring to measure compliance with water quality standards (i.e. TMDLs) and progress toward achieving nutrient load goals in BMAPs; and
5. Support science-based recommendations for hydrologic and ecologic improvements.

C51WL8, one of several "expanded monitoring" projects, was recommended to augment available data in support of BMAPS as well as protecting SFWMD projects and works from water quality degradation. Station choice for expanded monitoring was made following evaluations made by the Everglades and Estuaries Protection Bureau that identified data gaps/needs. The C51WL8 project encompasses the regions previously sampled as part of the B and LATE projects sampled in the late 1970s and mid 1980s respectively.

Surface water monitoring for C51WL8 began on November 14, 2019 at 12 stations (Table 1) consisting of drainage canals within the C51West and L8 basins. Another 10 stations were added with sampling beginning in January. The guidance contained herein is intended to assist in maintaining consistency of sampling locations, parameter lists, and frequencies. In addition, the plan documents the project's scope and provides an ongoing historical perspective.

Below is the time table for approved access agreements.

- On 10/15/2020, access approvals were obtained from Indian Trail Improvement District for sites C51W1.8TN1 and C51W1.8TN3.
- On 11/09/2020, approval was received from Loxahatchee Groves for sites C51W1.8TN5, C51W4.4TN1, C51W4.4TN2, and C51W5.8TN1 which were added in December 2020, increasing the number of sites with access agreements to 7.
- On 12/03/2020, Indian Trails Improvement District approved 6 addiational sites (C51W1.8N10, C51W1.8TN9, C51W1.8TN7, C51W1.8TN6, C51W1.8TN4, and C51W1.8TN8 was moved downstream for access approval increasing the approved number of sites to 13.
- On 02/01/2020, approval was received from Lake Worth Drainage District for site C51W0.1TS, and from the Town of Royal Palm Beach for sites C51W0.6TN and C51W1.8TN2 making the total approved sites to 16.
- On 03/05/2021, approvals were received from the Seminole Improvement District for sites C51W6.7TN1, C51W6.7TN2, C51W6.7TN3, C51W6.7TN4, and C51W8.2TN. Total approvals increased to 21 sites. To date no approval to sample C51W8.3TN, is expected in the near term because the land ownership is in litigation.
- On 04/05/2021 site C51W6.7TN4 was identified to have a broken platform over the culverts. Contact with the land owner indicated the site may be removed in the near future. No other accessible locations were identified within a mile, so a decision was made by Everglades & Estuaries Protection Bureau to drop the site from further monitoring.
- On 04/21/2021 site C51W1.8TN8 was reported to have an issue with access to the secondary sample location (steep backs and riprap). Sampling this station has been terminated with the expectation of an alternative location.
- Beginnng May 26, 2021, site C51W1.8TN8 was discontinued due to access issues and replaced with new station C51W1.8N11.

2.2 Sampling Mandate

Station locations, sampling frequencies, and parameters are being sampled at the request of the Everglades and Estuaries Protection Bureau. Sampling was approved by the Governing Board on 08/08/2019 (Appendix 1). Physical parameters are collected at the direction of management. There is no mercury and other toxicants monitoring requirement nor a CMP associated with this project.

2.3 Project Objectives

The primary objective of this monitoring project is to identify, quantify, and prioritize nutrient sources from the C51WL8 Basin that may be contributing to STA inflows nutrient loads.

2.3.1 Modification or Termination Conditions

The monitoring described herein will continue as required by the mandate(s) listed in Section 2.2 and Appendix 1. Conditions for modification or termination of the project are detailed in the mandate(s) specifying the conditions of the project.

3.0 Geographic Location

3.1 Regional Area

The C51WL8 project is located within western Palm Beach County (Figure 1).

3.2 Station Location and Access

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

The gates on roadways into S155A is secured with a District "W" lock (e.g. Okeechobee or "O" key). The lock requires a Regional Area "W" key, which can be obtained through a request made through the Field Project Manager (FPM) and/or Science Technician Supervisor. Contractors will need to make a formal request for the specific key and provide a $500 deposit.

Table 1: C51WL8 Surface Water Monitoring Stations and GPS Coordinates

Station	Latitude (ddmmss.ss)	Longitude (ddmmss.ss)	DESCRIPTION
C51W8.3TN	264105.372	802017.918	Drainage canal intersecting C51 canal 0.73 miles west of S-319.
C51W8.2TN	264105.399	802016.938	Drainage canal intersecting C51 canal 0.70 miles west of S319. Site represents pumped discharge from sod farms.
C51W6.7TN1	264415.78	801838.08	M-2 Canal @ Sycamore Dr. W Downstream from final ag. activities.
C51W6.7TN2	264226.37	801841.68	M-2 Canal @ Okeechobee Blvd. Mid portion of the M-2.
C51W4.4TN1	264103.308	801630.956	D Canal @ Pineapple Drive just north of US 98. D Canal Discharge into C-51W.
C51W1.8TN3	264222.863	801359.677	M-1 Canal @ Okeechobee Blvd. Mid portion of the M-1 Canal.
C51W1.8TN1	264058.7	801402.77	M-1 Canal @ Amil Gate. M-1 Canal Discharge into C-51W.
C51W1.8TN2	264155.37	801346.51	Canal Inflow to M-1 Canal at Royal Palm Beach Blvd. Significant inflow to M-1 from Royal Palm Beach.
C51W1.8TN4	264408.79	801454.24	Bridge over M1 Canal on 40th St. N. @ ITID Roach Structure. Connection from L8 basin to C-51 West Basin.
C51W0.6TN	264051.65	801252	Discharge Canal @ US 98. Inflow from Royal Palm Beach into C-51W.
C51W0.1TS	264042.97	801224.93	Drainage canal intersecting C-51 Canal. Captures small area south of the C-51 Canal. Outside of ACME A basin boundary.
S155A	264047.91	801219.94	C51 West Basin Divide structure. Sampled from structuere
Stations added after sampling initiation on 11/14/2019			
C51W1.8TN5	264222.92	801444.26	G Canal @ Okeechobee Blvd. Flows south.
C51W1.8TN6	264502.52	801451.81	M-1 Canal @ N 50th St. Direction of flow is dependent upon operation of the system.
C51W1.8TN7	264611.69	801450.31	M-1 Canal @ 130th Ave N and 62nd Ct. N. Sample at culvert wing wall within the M-1 canal. Direction of flow is dependent upon operation of the system.
C51W1.8N11	264730.48	801413.94	Tributary to the East of the M-1 Canal. 0.5 miles downstream of the former C51W1.8TN8 site
C51W1.8TN9	264743.77	801442.45	M-1 Canal @ 130th Ave N and Temple Blvd. Direction of flow is dependent upon operation of the system.
C51W1.8N10	264808.94	801840.56	L Canal @ 170th Ave N and Valencia Blvd. Direction of flow is dependent upon operation of the system.
C51W6.7TN3	264105.41	801844.43	M-2 Canal @ 0.1 miles upstream of C51 Canal.
C51W6.7TN4	264506.74	801845.11	M-2 Canal @ N. 50th Street.
C51W5.8TN1	264224.66	801750.36	A Canal @ Okeechobee Blvd.
C51W4.4TN2	264223.84	801625.95	D Road Canal at Okeechobee Blvd.

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.

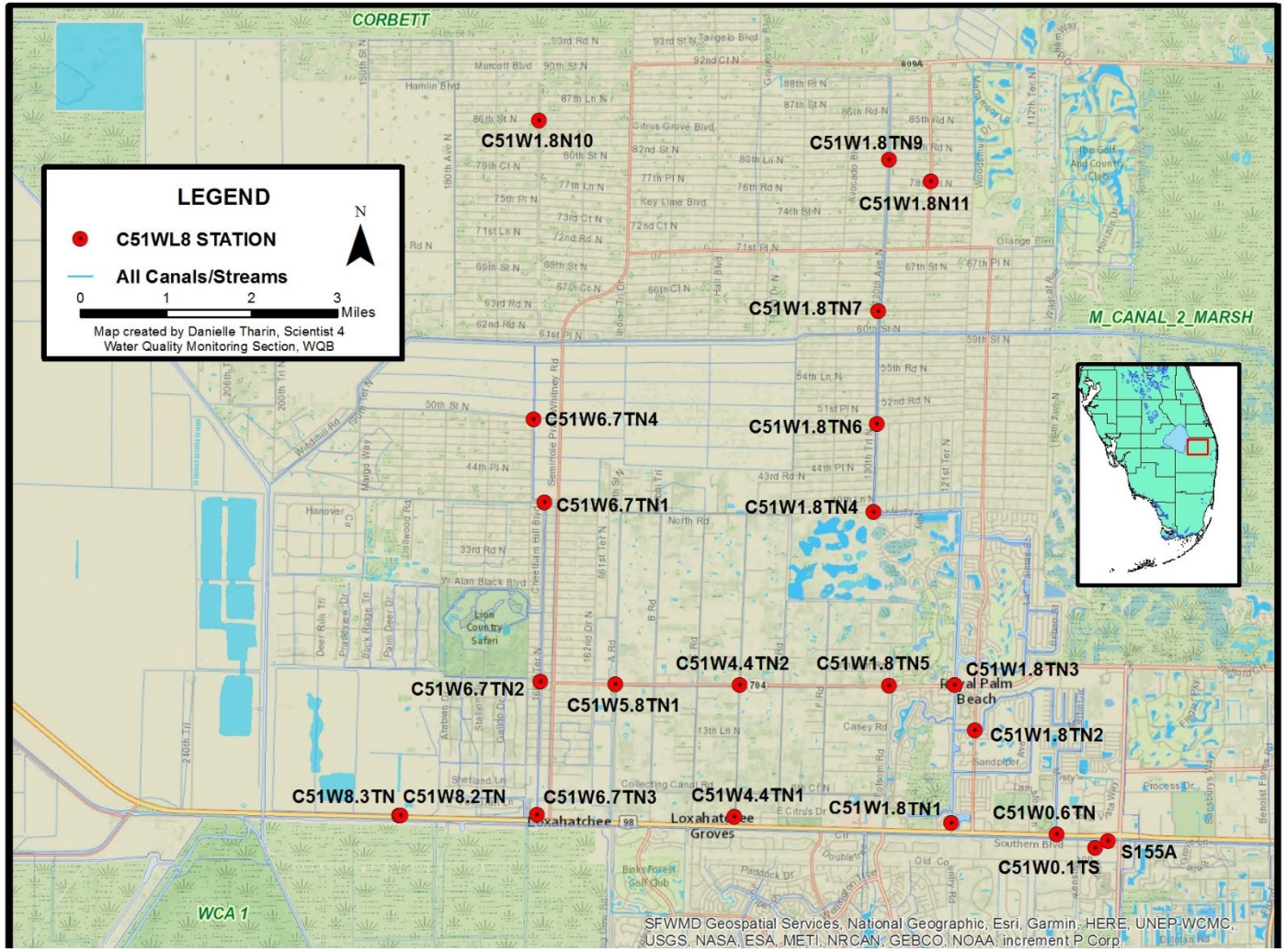

Figure 1: C51WL8 Station Locations

4.0 Field Activities

4.1 Monitoring Frequencies and Parameters Collected

All monitoring parameters, frequencies of collection and locations are listed in Table 2.

Stations are scheduled for collection on a bi-weekly frequency. The sampling locations generally do not have flow telemetry available, so each site needs to have a site visit to determine flow at the time of the site visit. If no flow is observed during the site visit, the station is designated as a No Bottle (NOB) sample. Sites designated with MBAS samples are sampled for MBAS regardless of flow.

Table 2: C51WL8 Station Frequencies and Parameter TESTS

Station	Collection Method	Frequency	Parameter TESTS
C51W8.3TN C51W8.2TN C51W6.7TN1 C51W6.7TN2 C51W4.4TN1 C51W1.8TN3 C51W1.8TN1 C51W1.8TN2 C51W1.8TN4 C51W0.6TN C51W0.1TS S155A C51W1.8TN5 C51W1.8TN6 C51W1.8TN7 C51W1.8N11 C51W1.8TN9 C51W1.8N10 C51W6.7TN3 C51W6.7TN4 C51W5.8TN1 C51W4.4TN2	Grab	Bi-weekly if flowing (BWF)	Ammonia (NH4), Nitrate/Nitrite (NOX), Orthophosphorus (OPO4), Total Nitrogen (TN), Total Phosphorus (TPO4), Total Suspended Solids (TSS)
	In-situ Grab	BWF	Dissolved Oxygen (DO), pH (PH), Temperature (TEMP), Specific Conductance (SCOND)
C51W1.8TN1 C51W1.8TN2 C51W1.8TN7 C51W1.8N11 C51W1.8N10 C51W6.7TN1 C51W6.7TN2 C51W4.4TN1	Grab	Bi-weekly (BW) MBAS sample collection regardless of flow	MBAS (Surfactants)

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.

Some of the project sites are located at a culvert, so samples may be collected at either end of the culvert. Samples are only collected if flow can be observed. The direction of flow at the time of collection shall be noted. 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 WQM FSM. Project-specific deviations are detailed in Section 4.2.

4.4 Field Parameters

The collection of field parameters follows the procedures and requirements outlined in the *Instrument Calibration and Field Measurements* section of the WQM FSM. Project-specific deviations are detailed in Section 4.2.

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 FSM. Project-specific deviations are detailed in Section 4.2.

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 FSM. 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 (DQOs)

5.1 Data Usage

The data from this project are compiled and reported in accordance with the conditions outlined in the mandates named 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 QA 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 Instrument Minimum Accuracy Requirements* table found in the *Instrument Calibration and Field Measurements* section of the FSM. The most recent version of the FSM details the specific field testing DQOs at the time of sample collection.

Samples are analyzed according to the provisions within the FDEP QA 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 FSM, 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 Unit Section Leader and specified in this monitoring plan.

5.3 Completeness Target

The completeness target (i.e., the number of samples successfully collected and analyzed, as a percentage of those that were planned) has been 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 the sample as a "NOB" to indicate an attempt was made and/or the sample could not be collected for the documented reasons.

6.0 Data and Records Management

The District evaluates data in accordance with the DQOs stated in the District's FSM and CLQM. All data submittals shall conform to existing WQB guidelines.

6.1 Contract Deliverables

Contract laboratory and/or field data and documentation are submitted to the District in the ADaPT format and/or another format as requested by the District. The Contract laboratory shall evaluate the data in accordance with the DQOs defined in the FSM and/or CLQM. All contract field and laboratory data and documentation submittals shall conform to existing FSM, CLQM, applicable SOPs and/or other formats as requested by the District.

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 *Correction of Field Records SOP* (SFWMD-FIELD-SOP-032) and the FSM. Corrections to data in DBHYDRO must follow *Data Investigations and Corrections* (SFWMD-DVS-SOP-010).

7.0 References

FDEP (Florida Department of Environmental Protection). Quality Assurance Rule, 62-160 Florida Administrative Code (F.A.C.). April 16, 2018.

SFWMD (South Florida Water Management District). *Archive Records Storage and Retention*, SFWMD-FIELD-SOP-022, Water Quality Monitoring Section

SFWMD (South Florida Water Management District). *Chemistry Laboratory Quality Manual (CLQM)*, SFWMD-LAB-QM-2021-001 or most current effective version. Analytical Services Section.

SFWMD (South Florida Water Management District). *Correction of Field Records*, SFWMD-FIELD-SOP-032, Water Quality Monitoring Section

SFWMD (South Florida Water Management District). *Field Sampling Manual (FSM)*, SFWMD-FIELD-FSM-001, Water Quality Monitoring Section.

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

SFWMD (South Florida Water Management District). *Data Investigations and Corrections*, SFWMD-DVS-SOP-010, Data Validation Services Unit.

SFWMD (South Florida Water Management District). *Sampling Flow-Related Stations*, SFWMD-FIELD-SOP-027, Water Quality Monitoring Section.

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

SFWMD (South Florida Water Management District). *Water Quality and Applied Sciences Bureaus Quality Management Plan (QMP)*, SFWMD-QS-QM-001. Applied Sciences and Water Quality Bureaus.

8.0 Revisions and Modifications

Version	Date	Section	Change/Reason
00	03/20/2020	All	Initial version as part of the expanded monitoring requested by the Everglades and Estuaries Protection Bureau. Formatting matches the current template. Updated references to the new FSM and QM documents. There is no requirement to sample Hg for this project.
01	4/27/2020	4.1, Table 2, and Appendix 1	Plan corrected to reflect change in sampling for MBAS at sites regardless of flow; updated formatting and boiler plate language.
02	3/2/2021	Section 2 and Table 1	Plan updated to reflect sampling associated with access approvals and GPS coordinates.
03	03/01/2022	Table 1, Figure 1, Table 2, Appendix 1, and Appendix 2	Updated to match the most current MP Template language (Template Version Date April 28, 2021); C51W1.8TN8 replaced with C51W1.8N11 because of access issues.

Appendix 1: Station Requirements by Mandate

Mandate	Station	Collection Method	Frequency	Parameters TESTS
Governor's Executive Order 19-12	C51W8.3TN, C51W8.2TN C51W6.7TN1, C51W6.7TN2 C51W4.4TN1, C51W1.8TN3 C51W1.8TN1, C51W1.8TN2 C51W1.8TN4, C51W0.6TN C51W0.1TS, S155A C51W1.8TN5, C51W1.8TN6 C51W1.8TN7, C51W1.8N11 C51W1.8TN9, C51W1.8N10 C51W6.7TN3, C51W6.7TN4 C51W5.8TN1, C51W4.4TN2	Grab	Bi-weekly if flowing (BWF)	Ammonia (NH4), Nitrate/Nitrite (NOX), Orthophosphorus (OPO4), Total Nitrogen (TN), Total Phosphorus (TP), Total Suspended Solids (TSS)
Governor's Executive Order 19-12	C51W1.8TN1 C51W1.8TN2 C51W1.8TN7 C51W1.8N11 C51W1.8N10 C51W6.7TN1 C51W6.7TN2 C51W4.4TN1	Grab	Bi-weekly (BW) MBAS sample collection regardless of flow	MBAS (Surfactants)
Mission Driven[1]	C51W8.3TN, C51W8.2TN C51W6.7TN1, C51W6.7TN2 C51W4.4TN1, C51W1.8TN3 C51W1.8TN1, C51W1.8TN2 C51W1.8TN4, C51W0.6TN C51W0.1TS, S155A C51W1.8TN5, C51W1.8TN6 C51W1.8TN7, C51W1.8N11 C51W1.8TN9, C51W1.8N10 C51W6.7TN3, C51W6.7TN4 C51W5.8TN1, C51W4.4TN2	In-situ Grab	BWF	Dissolved Oxygen (DO), pH (PH), Temperature (TEMP), Specific Conductance (SCOND)

[1]Part of the 2019 Expanded Monitoring directed by the Governing Board

Appendix 2: Guidance for Grab Samples

Station	Reference Point	Primary Direction of Flow
C51W8.3TN	East end of canal discharging into sump basin	East
C51W8.2TN	West end of canal discharging into sump basin	West
C51W6.7TN1	Upstream side (north) of Sycamore Dr W	South
C51W6.7TN2	Upstream side (north) of Okeechobee Blvd bridge	South
C51W4.4TN1	Upstream side (north) of Tangerine Dr. bridge	South
C51W1.8TN3	Upstream side (north) of Okeechobee Rd. Bridge	South
C51W1.8TN1	East side of AMIL Gate on upstream (north) side	South
C51W1.8TN2	Upstream (east) side of Royal Palm Beach Blvd bridge	West
C51W1.8TN4	Upstream side (north) of 40th Street N	South
C51W0.6TN	Upstream side (south) of canal on south side of Acme Rd	South
C51W0.1TS	Upstream side (north) of SR98	North
S155A	Upstream (west) side of structure	East
C51W1.8TN5	Upstream side (north) of Okeechobee Blvd & east side of Folsom Rd	South
C51W1.8TN6	Upstream side (north) of Persimmon Blvd	North & South
C51W1.8TN7	From either side of canal @ 130th Trail N (west) or 130th Ave N (east)	North & South
C51W1.8N11	Tributary to the East of the M-1 Canal. 0.5 miles downstream of former C51W1.8TN8 site	West
C51W1.8TN9	Upstream side (north) of Temple Blvd.	North & South
C51W1.8N10	Upstream side (north) of Valencia Blvd bridge	North & South
C51W6.7TN3	Upstream side (north) of SR80	South
C51W6.7TN4	Upstream (north) side of canal @Cheetham Hill Blvd	South
C51W5.8TN1	Upstream side (north) of Okeechobee Blvd, west side of “A” Rd	South
C51W4.4TN2	Upstream side (north) of Okeechobee Blvd., west side of “D” Rd	South