

Quality Assessment Report for Water Quality Monitoring

January – March 2026



**Prepared for the
Technical Oversight Committee**

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INTRODUCTION

This report is an assessment of the South Florida Water Management District (SFWMD) field sampling and laboratory analysis for total phosphorus (TP) in surface water, primarily for the projects and their associated stations as shown in **Table 1** from January 1, 2026, through March 31, 2026. The analysis reflects the status of the data at the time of download and does not account for changes made to the data after June 19, 2026.

Table 1. Projects and associated stations.

Project Name	Project ID	Stations
Everglades National Park Inflows North	PIN	S12A, S12B, S12C, S12D, S333, S333N, S355A, S355B, and S356-334
Everglades National Park Inflows East	PIE	G737, S332DX, S18C, and S328
Everglades Protection Area	EVPA	LOX3, LOX4, LOX5, LOX6, LOX7, LOX8, LOX9, LOX10, LOX11, LOX12, LOX13, LOX14, LOX15, and LOX16

The Water Quality Monitoring Section (WQM) *Field Quality Manual* (SFWMD-FIELD-QM-001) and *Field Sampling Manual* (SFWMD-FIELD-FSM-001) provided the quality system requirements, and the field sampling procedures were followed in field sample collection from January 1, 2026, to March 31, 2026. The Analytical Services Section’s *Chemistry Laboratory Quality Manual* (SFWMD-LAB-QM-001) provides the guidance and requirements for preparing and analyzing laboratory samples, as well as data verification and validation. The *Field Sampling Quality Assessment* and *Laboratory Analysis Quality Assessment* sections in this report provide a comprehensive evaluation and validation of the TP results for surface water samples collected from the locations and timeframe described above.

To prepare this report, a Microsoft Excel workbook named “qa_report_jan_mar_2026_data.xlsx” was also created, containing all TP results obtained from DBHYDRO, SFWMD’s corporate environmental database, for all sampling events. This includes grab samples collected for the projects/stations listed above during the period specified in this report. The Excel workbook will be referred to as the Reference Data Set (RDS) throughout this report and both of the documents are available on the Everglades Technical Oversight Committee (TOC) website (<https://www.sfwmd.gov/our-work/toc>). TP analyses were completed at the SFWMD Analytical Services Chemistry Laboratory (Florida Department of Health Identification # E46077).

If available, TP sample results for biannual laboratory proficiency testing as required by the National Environmental Laboratory Accreditation Program (NELAP) or results from other laboratory performance evaluation studies completed during the period specified in this report will also be included.

FIELD SAMPLING QUALITY ASSESSMENT

SAMPLE COLLECTION

All samples were collected by Water Quality Monitoring (WQM) staff. A total of 45 sampling events were conducted that included collection of samples for the projects/locations and timeframe described in the *Introduction* to this report. A complete list of the laboratory work orders obtained from the Laboratory Information Management System (LIMS) for these sampling events is shown in **Table 2**. The table details the work order identifiers, work order numbers, project codes, and sample collection dates.

Table 2. Sampling events for the reporting period.

Work Order Identifier	Work Order	Project ^a	Date Collected
P163226	97595	PIN	03/31/2026
P163296	97625	PIE	03/31/2026
P163284	97619	PIE	03/31/2026
P164540	98215	PIE	03/24/2026
P163213	97588	PIN	03/24/2026
P164528	98221	PIE	03/24/2026
P163295	97624	PIE	03/17/2026
P163225	97594	PIN	03/17/2026
P163283	97618	PIE	03/17/2026
P163212	97587	PIN	03/10/2026
P164539	98214	PIE	03/10/2026
P164527	98220	PIE	03/10/2026
P164612	98253	EVPA	03/04/2026
P163294	97623	PIE	03/03/2026
P163282	97617	PIE	03/03/2026
P163224	97593	PIN	03/03/2026
P164610	98252	EVPA	03/03/2026
P163211	97586	PIN	02/24/2026
P162621	97305	PIE	02/24/2026
P162609	97299	PIE	02/24/2026
P163222	97591	PIN	02/17/2026
P163281	97616	PIE	02/17/2026
P163293	97622	PIE	02/17/2026
P163210	97585	PIN	02/10/2026
P162608	97298	PIE	02/10/2026
P162620	97304	PIE	02/10/2026
P164140	98022	EVPA	02/05/2026
P164138	98021	EVPA	02/04/2026
P163221	97590	PIN	02/03/2026
P163292	97621	PIE	02/03/2026
P163280	97615	PIE	02/03/2026
P163209	97584	PIN	01/27/2026
P162619	97303	PIE	01/27/2026
P162607	97297	PIE	01/27/2026
P163196	97580	PIE	01/20/2026
P163194	97579	PIE	01/20/2026
P161625	96809	PIN	01/20/2026
P162618	97302	PIE	01/13/2026
P163200	97582	PIN	01/13/2026
P162606	97296	PIE	01/13/2026
P163421	97686	EVPA	01/07/2026
P163198	97581	PIN	01/06/2026
P161649	96821	PIE	01/06/2026
P163419	97685	EVPA	01/06/2026
P161679	96836	PIE	01/06/2026

a. EVPA – Everglades Protection Area; PIE – Everglades National Park Inflows East; and PIN – Everglades National Park Inflows North.

During the 45 sampling events described in **Table 2**, a total of 24 grab sample records for the projects/locations described in the *Introduction* indicate that a sample was not collected in most cases due to dry conditions, no flow, or Total Depth below 0.1 meters. The grab sample identifiers and reasons these samples were rejected or not collected are shown in **Table 3**.

Table 3. Grab samples rejected or not collected during the reporting period.

Work Order Identifier	Project ^a	Sample Identifier	Station	Date	Reason Sample Was Rejected or Not Collected ^b
97619005	PIE	P163284-5	G737	03/31/2026	Site Dry. Gates closed.
98221005	PIE	P164528-5	G737	03/24/2026	Site Dry. Gates closed.
98220009	PIE	P164527-9	S18C	03/10/2026	Gates closed, no flow
98220005	PIE	P164527-5	G737	03/10/2026	Site Dry, gates closed
97617009	PIE	P163282-9	S18C	03/03/2026	Gates closed, no visible flow.
97617005	PIE	P163282-5	G737	03/03/2026	Site Dry. Gates closed, no visible flow.
98252011	EVPA	P164610-11	LOX3	03/03/2026	Too shallow to collect. TD below 0.10 m.
98252010	EVPA	P164610-10	LOX5	03/03/2026	Too shallow to collect. TD below 0.10 m.
98252009	EVPA	P164610-9	LOX10	03/03/2026	Too shallow to collect. TD below 0.10 m.
97299009	PIE	P162609-9	S18C	02/24/2026	Gates closed, no visible flow.
97299005	PIE	P162609-5	G737	02/24/2026	Site Dry. Gates closed.
97616009	PIE	P163281-9	S18C	02/17/2026	Gates closed, no visible flow.
97616005	PIE	P163281-5	G737	02/17/2026	Site Dry. Gates closed.
97298005	PIE	P162608-5	G737	02/10/2026	Site Dry. Gates closed.
98021011	EVPA	P164138-11	LOX3	02/04/2026	Too shallow to collect. TD less than 0.1m
98021010	EVPA	P164138-10	LOX5	02/04/2026	Too shallow to collect. TD less than 0.1m
97615004	PIE	P163280-4	G737	02/03/2026	Site dry. Gates closed.
97297009	PIE	P162607-9	S18C	01/27/2026	Gate closed, no visible flow.
97297005	PIE	P162607-5	G737	01/27/2026	Site dry. Gate closed.
97579005	PIE	P163194-5	G737	01/20/2026	Site dry. Gates closed
97296009	PIE	P162606-9	S18C	01/13/2026	Gates closed. No flow.
97296005	PIE	P162606-5	G737	01/13/2026	Site Dry
96821009	PIE	P161649-9	S18C	01/06/2026	Gate closed, no visible flow.
96821005	PIE	P161649-5	G737	01/06/2026	Site Dry. Gates closed.

a. EVPA – Everglades Protection Area ; PIN – Everglades National Park Inflows North; and PIE – Everglades National Park Inflows East.

b. These abbreviated notes do not necessarily convey all the details from the sample comments that can be seen in DBHYDRO.

FIELD QUALITY CONTROL

Field quality control (QC) samples were collected during each sampling event in accordance with the procedures outlined in the *Field Sampling Manual*. These QC samples were used to evaluate the integrity of the sample collection process and were associated with all environmental samples collected during the corresponding sampling day.

If any field QC sample failed to meet the criteria established by the Florida Department of Environmental Protection (FDEP) Quality Assurance Rule (Chapter 62-160, Florida Administrative Code [F.A.C.]), appropriate data qualifiers were applied to the affected sample results to indicate potential limitations in data quality.

Field QC samples may include replicate samples (RSs), field quality control blanks, field-generated equipment blanks (EBs), field-cleaned equipment blanks (FCEBs), and field blanks (FBs). It should be noted that the sampling events listed in **Table 2** may include field QC samples collected at locations not specified in **Table 1**.

Grab samples collected at the locations listed in **Table 1** were not assigned a Project Manager Remark (PMR). However, seven samples (referenced in **Table 4**) received “J” qualifiers, indicating estimated values. These qualifiers were applied because the laboratory analysis was performed on samples collected

from a disconnected pool of water using a field protocol that did not conform to the requirements outlined in the Florida Department of Environmental Protection (FDEP) Quality Assurance Rule (Chapter 62-160, Florida Administrative Code [F.A.C.]).

Table 4. Results with qualifiers and remark codes during the reporting period for the 45 sample events listed in Table 2.

Work Identifier	Project ^a	Sample Identifier	Station	Collection Date	Qualifier or Remark Code / Reason
97625007	PIE	P163296-7	S328	03/31/2026	Collected via dipper wand. Collection is from a disconnected pool of water. Gates closed, no visible flow. Staff gauges read 2.3 ft upstream, 2.3 ft downstream NAVD88.
97624007	PIE	P163295-7	S328	03/17/2026	Gates closed, no visible flow observed. Sample collected using dipper wand from disconnected pool of water. Upstream staff gauge reads 3.75ft. Downstream staff gauge reads 3.8ft.
97623007	PIE	P163294-7	S328	03/03/2026	Grab collected from disconnected pool, HW 328 staff gauge at 1-foot NAVD88, TW 328 staff gauge at 1 ft NAVD88, gates closed, grab collected with dipper wand
97622007	PIE	P163293-7	S328	02/17/2026	Gates are closed, no visible flow observed. Sample collected from a disconnected pool of water using a dipper wand. Staff gauge reading is 0.8ft upstream and 0.8ft downstream. Tdepth measured using a graduated PVC pole.
97621007	PIE	P163292-7	S328	02/03/2026	Gates closed. Collection is from a disconnected pool of water. Collected via dipper wand. Staff gauge reads 1.35ft upstream, 1.35ft downstream NAVD88.
97580010	PIE	P163196-10	S328	01/20/2026	Gates closed. Collection is from a disconnected pool of water. Collected via dipper wand. Staff gauge reads 1.5 ft upstream, 1.5 ft downstream NAVD88.
96836007	PIE	P161679-7	S328	01/06/2026	Gates closed, no flow observed. Sampling area is a disconnected pool of water. Sample collected using a dipper wand. HW staff gauge reads 1.6ft NAVD88, tail water staff gauge reads 1.7ft NAVD88.

a. PIE – Everglades National Park Inflows East

FIELD AUDITS

SFWMD conducted one field audit of the Park Inflows East (PIE) project in the first quarter of 2026. There were no deficiencies noted during the audit.

FIELD PROCEDURE UPDATES

No major procedural updates related to TP sample collection were made during this reporting period.

SAMPLE ANALYSES

SFWMD Analytical Services Chemistry Laboratory staff conducted 192 TP analyses for the grab samples collected during the 45 sampling events listed in **Table 2** and detailed in the RDS. Of those 192 TP results, 167 were for grab samples collected from projects/locations listed in **Table 1** (excluding field quality control samples). For reference, a complete set of all 192 grab TP results can be found in the RDS described in **Table 1** with the sample identifiers, sampling locations, collection dates, etc.

LABORATORY QUALITY CONTROL

TP analyses are routinely conducted in the SFWMD Analytical Services Chemistry Laboratory in analytical batches of approximately 100 samples. To assess the quality of the sample results produced during the analyses of these batches, various types of laboratory control samples are included according to the requirements described in the *Chemistry Laboratory Quality Manual* (SFWMD-LAB-QM-001). The results of these laboratory quality control samples are associated with the analyses conducted in each batch, and qualifiers are added to the data as required by the FDEP *Quality Assurance Rule* (Chapter 62-160, F.A.C.), which is based on the specifications found in the *Chemistry Laboratory Quality Manual* (SFWMD-LAB-QM-001). The types of laboratory quality control samples typically run in a batch include samples with certified concentrations (laboratory control samples), matrix spikes, precision checks (duplicates or matrix spike duplicates), and method blanks. Since the laboratory exhibited no quality control failures for batches associated with the RDS, none of the laboratory operation related qualifiers were added for the 167 TP results of samples collected from projects/locations listed in **Table 1**.

METHOD DETECTION LIMIT AND PRACTICAL QUANTITATION LIMIT

The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined by the laboratory on an annual basis using the procedure described in the Code of Federal Regulations (CFR), 40 CFR 136, Appendix B. The practical quantitation limit (PQL) is the minimum concentration of an analyte that can be measured with a high degree of confidence that the analyte is present at or above that concentration. However, there is not any universally accepted (or required) method for determining the PQL. In the case of TP analyses, the SFWMD Analytical Services Chemistry Laboratory PQL (0.004 mg/L) is set to the concentration of the lowest standard used for calibration, which is a typical approach among analytical laboratories. Any TP results that are below the MDL (0.002 mg/L) are assigned a “U” qualifier indicating that there is high confidence that the analyte is not present. The reported TP values between the MDL (0.002 mg/L) and the PQL (0.004 mg/L) are assigned an “I” qualifier, indicating that the results are at concentrations that cannot be accurately quantified. Of the 167 TP results reported, no results were below the MDL, and only one sample had a concentration between the MDL (0.002 mg/L) and the PQL (0.004 mg/L).

ESTIMATION OF ANALYTICAL MEASUREMENT UNCERTAINTY

All measurements are subject to uncertainty, and a measured value is only complete if a statement of the associated uncertainty accompanies it. The definition of uncertainty (of measurement) can be found in the *International Vocabulary of Basic and General Standard Terms in Metrology*: “A parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurand” (JCGM 1993). The uncertainty has a probabilistic basis and reflects incomplete knowledge of the quantity. The SFWMD Analytical Services Chemistry Laboratory provides uncertainty estimates using the nested hierarchical methodology by Ingersoll (2001) in combination with a mathematical model found in Eurachem/CITAC (2012). This quality control-based nested approach uses the statistical quality control data attributed to laboratory measurement activities and does not include uncertainty attributed to field sampling activities. The estimated uncertainty is calculated using the following equation:

$$U(x) = \sqrt{s_0^2 + (s_1^2 x^2)}$$

$U(x)$ is the combined standard uncertainty in the result x at the 95% confidence interval (CI).
 s_0 is a constant contribution to the overall uncertainty derived from the procedure to determine the MDL.
 s_1 is a proportionality constant derived from nested hierarchical methodology by Ingersoll (2001).

During this reporting period, the uncertainty constants are $S_0 = 0.002$ and $S_1 = 0.068$. Estimated uncertainties are calculated automatically by LIMS using the equation and constants shown above and are provided with all TP results. The percentage measurement uncertainty (95% CI) is 100% at MDL, nearly 30% at PQL, and remains relatively constant at higher concentrations.

PROFICIENCY TESTING AND PERFORMANCE EVALUATION

The SFWMD Analytical Services Chemistry Laboratory participates in a variety of studies to evaluate the proficiency of the laboratory's quality system. During the first quarter of 2026, the laboratory received TP results for the Quasimeme 2025.2 proficiency evaluation study. The reported results were evaluated as "acceptable" with calculated Z-scores of ≤ 1.5 .

LABORATORY AUDITS

During this reporting period the laboratory finalized its annual internal audit report. There were eight corrective actions, and three recommendations identified. These findings have been entered into the laboratory's corrective action log and are in the process of being addressed. No deficiency was relevant to the laboratory's TP analytical procedure and did not affect the quality of the TP sample data.

PROCEDURE UPDATES

The TP sample preparation procedure (Standard Method 4500-P B (5)-2021, Persulfate Digestion Method) and the analytical procedure (Standard Method 4500-P H-2021, Automated Ascorbic Acid Reduction Method) did not change during this reporting period. Although the methodologies, procedures, and analyses remained the same, the revision years were updated as required by the Methods Update Rule. This rule mandates the use of the most current revision year of the Standard Methods employed.

REFERENCES

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GLOSSARY

Accuracy: The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations.

Confidence Interval (CI): A range of values so defined that there is a specified probability that the value of a parameter lies within it.

Equipment Blank (EB): Field quality control sample prepared using sampling equipment that has been brought to the site or processing area precleaned and is collected before the equipment has been used. The results of these blanks are used to monitor the on-site sampling environment, sampling equipment decontamination, sample container cleaning, suitability of sample preservatives and analyte-free water, sample transport and storage conditions, and laboratory process.

Field Blank (FB): FBs are collected by pouring analyte-free water directly into the sample container, preserved, and kept open for the same approximate time and interval as required for collection and/or processing of the routine sample. The results of this blank are used to monitor the on-site sampling environment, sample container cleaning, the suitability of sample preservatives and analyte-free water, sample transport and storage conditions, and laboratory process.

Field Cleaned Equipment Blank (FCEB): Field quality control sample prepared using sampling equipment that has been cleaned in the field or in the processing area. The results of this blank are used to monitor the on-site sampling environment, sampling equipment field decontamination, sample container cleaning, suitability of sample preservatives and analyte-free water, sample transport and storage conditions, and laboratory process.

Measurand: Particular quantity subject to measurement.

Method Detection Limit (MDL): The smallest concentration of an analyte of interest that can be measured and reported with 99% confidence that the concentration is greater than zero. The MDLs are determined from the analysis of a sample in a given matrix, using accepted sampling and analytical preparation procedures, containing the analyte at a specified level. The MDL is determined by the protocol defined in the Code of Federal Regulations (CFR) Section 40 CFR, Part 136, Appendix B, as established by the United States Environmental Protection Agency.

Practical Quantitation Limit (PQL): The smallest concentration of an analyte of interest that can be quantitatively reported with a specific degree of confidence. The PQL is verified for each matrix, technology, and analyte. The validity of the PQL is verified by analysis of a quality control sample containing the analyte of concern.

Precision: The agreement or closeness between two or more results is an indication that the measurement system is operating consistently and is a quantifiable indication of variations introduced by the analytical systems over a given time and field sampling period.

Replicate Sample (RS): An RS is collected by repeating (simultaneously or in rapid succession) the entire sample acquisition technique that was used to obtain the routine sample. A single RS set (e.g., one sample and two RSs) is collected per quarter, per project, at the same station, for the longest parameter list. RS data are compared to routine sample data to evaluate sampling precision.

Uncertainty: The range of values within which the true value is estimated to lie. It is a best estimate of possible inaccuracy due to both random and systematic error.

Z-Score: A measure of the deviation of the result (X_i) from the assigned value (X) for that determinant (calculated as $z = (X_i - X)/\sigma$, where σ is a standard deviation) (Eurachem/CITAC 2012).