FLORIDA DEPARTMENT OF Environmental Protection

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VIA EMAIL
Read receipt requested

February 3, 2020

Mark Hoyer
Florida LAKEWATCH Laboratory
Fisheries & Aquatic Sciences
School of Forest Resources & Conservation
University of Florida
7922 N. W. 71st Street
Gainesville, FL 32653
Email: mvhoyer@ufl.edu

Re: Final Audit Report for Lab Records Audit

Dear Mr. Hoyer:

Thank you for responding to the preliminary audit report for the Lab Records Audit of the Florida LAKEWATCH Laboratory (LAKEWATCH). The Florida Department of Environmental Protection (department or DEP) has reviewed your response and accepted the proposed corrective actions.

Attached is the final audit report detailing the audit procedure, audit findings, and the department's audit conclusions. This final audit report will also be posted on the department's website at http://www.dep.state.fl.us/labs/cgi-bin/reports/search.asp. As noted in the report, the department concludes that LAKEWATCH was not implementing several critical QC criteria required by the QA Rules (Chapter 62-160, F.A.C.) and the LAKEWATCH SOP (Draft October 2018). These criteria involved the evaluation of lab QC data for TN and TP and subsequent sample data qualification if QC data did not meet established criteria. During the audited period, LAKEWATCH generally analyzed blanks, duplicates, and control standards, but did not appropriately qualify associated data if there were detections in the blanks or the QC samples did not meet established criteria. Due to the uncertain consequences cumulative QC issues could have on the data, DEP may consider the data from the beginning of the audited period (July 2013) through the corrective actions implementation date (November 2019) as estimated values for certain uses of the data. AEQAS does not have any recommendations against the use of Chlorophyll *a* data for the audited period.

DEP auditors determined other QC deficiencies as well, as outlined in the audit report. Corrective actions for all findings in the report are acceptable. LAKEWATCH's implementation of corrective actions described in the report will lead to an improved quality system. DEP will continue to work with LAKEWATCH to ensure that the data produced by LAKEWATCH meets data quality requirements for waterbody assessments.

Under Chapter 120 of the Florida Statutes, Florida LAKEWATCH Laboratory, and any other person whose substantial interests are affected by the department's agency action, may challenge the attached final audit report, including the corrective actions and the data usability analysis. The process to challenge any portion of this agency action is described below in the Notice of Rights section.

If you have any questions or concerns about this final audit report, please feel free to contact Nia Wellendorf at (850) 245-8190 or Jessica Patronis at (850) 245-8980.

Notice of Rights

This action is final and effective on the date mailed (via e-mail) unless a sufficient petition for an administrative hearing is timely filed under sections 120.569 and 120.57 of the Florida Statutes as provided below. If a sufficient petition for an administrative hearing is timely filed, this agency action becomes only proposed agency action, subject to the result of the administrative review process. Therefore, on the filing of a timely and sufficient petition, this action will not be final and effective until further order of the department. Because an administrative hearing may result in the reversal or substantial modification of this action, the petitioner is advised not to proceed until the deadlines noted below for filing a petition for an administrative hearing or request for an extension of time have expired.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;
(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;;
(c) A statement of when and how the petitioner received notice of the agency decision;
(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to LAKEWATCH at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant and persons entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

This determination constitutes an order of the department. Subject to the provisions of paragraph 120.68(7)(a) of the Florida Statutes, which may require a remand for an administrative hearing, the applicant has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

David Whiting, Deputy Director
Division of Environmental Assessment and Restoration
2600 Blair Stone Road
Tallahassee, FL 32399
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Attachments:
Final Audit Report

Copies furnished to:

Kenneth Hayman, DEP Office of General Counsel
Kevin O'Donnell, DEP Watershed Assessment Section
File

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this determination, including all copies, was e-mailed before the close of business on February 03, 2020, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(7) Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk 02/03/2020 Date

Final Audit Report
Florida LAKEWATCH Laboratory
Lab Records Audit
Conducted May 7 & 8, 2019

Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
January 31, 2020

Introduction

The Florida Department of Environmental Protection's (DEP or department) Aquatic Ecology and Quality Assurance section (AEQAS) conducted an audit of the Florida LAKEWATCH laboratory (LAKEWATCH or laboratory) in accordance with Rules 62-160.650 and 62-160.670, Florida Administrative Code (F.A.C.). The purpose of the audit was to verify that LAKEWATCH is complying with the quality assurance (QA) requirements of the Florida LAKEWATCH Standard Operating Procedure (SOP, Draft October 2018) and the QA Rules, Chapter 62-160, F.A.C., and correctly implementing approved analytical methods, including acceptable quality control, and maintaining adequate laboratory documentation.

This final audit report lists the procedural and documentary deficiencies, as determined by the department auditors, responses from the audited party, and the department's responses to the corrective actions proposed by the laboratory.

Background

Florida LAKEWATCH is a citizen-science organization that includes a large network of volunteer samplers, regional coordinators, and the LAKEWATCH lab and program management at the University of Florida. The samplers follow the field portion of the LAKEWATCH SOP for sample collection and storage, regional coordinators pick up the samples from regional drop-off locations and transport the samples to the lab, and the LAKEWATCH lab analyzes the samples. LAKEWATCH was created by the Florida Legislature under section 1004.49, Florida Statutes, which restricts the use of its data to trends evaluation and general background information. The LAKEWATCH lab is not required to hold certification from the Florida Department of Health Environmental Lab Certification Program, per Rule section 62-160.300(5)(c), F.A.C. The DEP Division of Environmental Assessment and Restoration was interested in potentially using LAKEWATCH data for other purposes, so AEQAS staff collaboratively worked with lab staff to adjust quality assurance activities within the lab to conform to requirements in Chapter 62-160, F.A.C., to the extent possible. These adjustments were complete in late 2013. In 2013, DEP approved LAKEWATCH to use alternative preservation (freezing) for Total Nitrogen (TN) and Total Phosphorus (TP), and to implement an extended holding time (5 months) between sample collection and analysis for TN, TP, and chlorophyll *a*. DEP also approved an alternative laboratory preparation solvent for chlorophyll *a* analysis. The purpose of this audit was for DEP to verify that LAKEWATCH has complied with the quality control procedures outlined in the LAKEWATCH SOP, which was reviewed by DEP in 2016.

Audit Description

AEQAS staff requested analytical and quality control records for forty samples representing the laboratory's analyses for Chlorophyll a, Total Nitrogen and Total Phosphorus for which data were submitted to DEP from 2013-2017 (Table 1). Color and conductivity data were also requested, but analytical records were not available for the date range indicated. Records were requested on March 15, 2019, and a team from AEQAS visited the laboratory on May 7 and 8, 2019 to review the records, tour the laboratory facility and view the current laboratory operations. Audited records included field sheets, analytical runs, calculation documentation, and results as loaded into the STORET database. LAKEWATCH does not issue laboratory reports. The LAKEWATCH SOP (Draft October 2018), Chapter 62-160, F.A.C., and the relevant methods (Table 1) provided the criteria for the audit and all findings. Personnel involved in the audit were Michael Blizzard, Jennifer Claypool, Jessica Patronis, and Nia Wellendorf from AEQAS, and Christy Horsburgh and Claude Brown from LAKEWATCH.

After the lab visit, AEQAS staff reviewed and provided feedback on the LAKEWATCH SOP document and the format of current Excel data sheets and field sheets. AEQAS will continue to work with LAKEWATCH to ensure calculation of current MDLs are appropriate.

Preliminary Audit Report and Implementation of Corrective Actions

A preliminary audit report of findings and comments to the LAKEWATCH SOP was sent to Mark Hoyer and Christine Horsburgh on August 2, 2019. Procedures or documentation that did not comply with audit criteria are identified in Tables 2 and 3, along with the department's recommended or required corrective actions. Mr. Hoyer replied on October 17, 2019, with proposed corrective actions for the noted deficiencies, which have been included in Tables 2 and 3. The AEQAS auditors' responses are found in the last column of Tables 2 and 3. Responses to several findings in the preliminary audit report needed further clarification from the laboratory. These findings were discussed with the laboratory and addressed in a second draft of the preliminary audit report on 12/05/2019, and the preliminary report was further revised based on correspondence with the laboratory. Auditors also requested and received the laboratory's revised laboratory datasheets and field sheets for use with WIN data upload, which were reviewed by AEQAS for required elements. A draft final audit report was sent to LAKEWATCH on January 28, 2020, as an opportunity for the lab to review AEQAS' responses. The final report incorporates the resolutions to all corrective actions. The LAKEWATCH SOP was revised to include AEQAS comments and elements pertaining to the findings in this audit report. Revisions to the LAKEWATCH SOP draft dated January 2020 are acceptable. As the LAKEWATCH SOP is a "living document," future revisions are expected as necessary to provide for quality system improvements.

Audit Conclusions

Based on the findings from this audit, DEP has determined that the LAKEWATCH was not implementing several critical QC criteria required by the QA Rules (Chapter 62-160, F.A.C.) and the LAKEWATCH SOP (Draft October 2018). These criteria involved the evaluation of lab QC data for TN and TP and subsequent sample data qualification if QC data did not meet established criteria. During the audited period, LAKEWATCH generally analyzed blanks, duplicates, and control standards, but did not appropriately qualify associated data if there were detections in the blanks or the QC samples did not meet established criteria. Due to the uncertain consequences cumulative QC issues could have on the data, DEP may consider the data from the beginning of the audited period (July 2013) through the corrective actions implementation date (November 2019) as estimated values for certain uses of the data. For purposes which use of estimated data is permissible, AEQAS recommends considering the following based on audit findings:

1. For total nitrogen (TN) and total phosphorus (TP) analyses, blanks were not analyzed consistently before February 2015.
2. More than 50% of audited analytical runs showed detections in blanks for TP but associated sample data were not qualified. The blank detections were likely a result of an inappropriately low MDL value. This affects low-level TP data for samples analyzed between September 2013 and November 2019.

AEQAS does not have any recommendations against the use of Chlorophyll *a* data for the audited period.

DEP auditors determined other QC deficiencies as well, as outlined in the findings tables. Corrective actions for all findings in this report are acceptable. LAKEWATCH's implementation of corrective actions described in this report will lead to an improved quality system. DEP will continue to work with LAKEWATCH to ensure that the data produced by LAKEWATCH meets data quality requirements for waterbody assessments.

Table 1. List of audited samples for the lab records audit of LAKEWATCH conducted by DEP, May 7 & 8, 2019.

Sample ID	Station	Waterbody Type	Collection Date	Analyte	Method
4967L102113	Palm Beach Loxahatchee River-62	River/stream	10/21/2013	Chlorophyll *a*	Method 10200 H; A.P.H.A. 2005 and Sartory and Grobbelarr 1984
1138L020914	Bay East Bay-5	Estuary	2/9/2014		
3628L033014	Leon Bradford-3	Lake	3/30/2014		
1979L050915	Gadsden Talquin-2	Lake	5/9/2015		
1300L120815	Broward Helen 1	Lake	12/8/2015		
6429L010116	Volusia Halifax River-3	River/stream	1/1/2016		
4173L031616	Okaloosa CBA Fort Walton Beach-3	Estuary	3/16/2016		
1994L081516	Gulf St Joseph Bay-3	Estuary	8/15/2016		
5401L092116	Polk Gaskin's Cut-2	Lake	9/21/2016		
1111L011117	Alachua Santa Fe River Sink-1	River/stream	1/11/2017		
4381L070913	Orange-Douglas-1	Lake	7/9/2013	Total Nitrogen (TN)	D'Elia et al. 1977; Simal et al. 1985; Wollin 1987; Crumpton et al. 1992; Bachmann and Canfield 1996
6562L111613	Wakulla-WakullaMiddle-2	River/stream	11/16/2013		
4171L010814	Walton-CBA-FortWaltonBeach19	Estuary	1/8/2014		
3982L032314	Miami-Dade Highland 1	Lake	3/23/2014		
4616L090714	Orange_MaryJane-3	Lake	9/7/2014		
5694L021415	PUT-FANNY-3	Lake	2/14/2015		
1139L062115	Bay-GrandLagoon-1	Estuary	6/21/2015		
6572L063015	Walton-CBA-SantaRosaBeach-4 (WAL-A BEACH-4-1)	Estuary	6/30/2015		
2681L091915	Hillsborough-Leclare-3	Lake	9/19/2015		
4808L100915	Orange Willis 2	Lake	10/9/2015		
3933L101115	Marion-Withlacoochee_Dunnellon-1	River/stream	10/11/2015		
1005L041616	Alachua-Alto-2	Lake	4/16/2016		
4172L061016	Okaloosa_CBA-Walton-Beach-2	Estuary	6/10/2016		
3862L070216	Marion-Kerr-2	Lake	7/2/2016		
4201L102616	Okaloosa-CBA-Niceville-9	Estuary	10/26/2016		
1181L081013	Bay West Bay-3 1	Estuary	8/10/2013	Total Phosphorus (TP)	Digestion: Menzel and Corwin (1965); Measurement: Murphy and Riley (1962)
5815L082713	Putnam Ross 1	Lake	8/27/2013		
2393L091813	Hillsborough Cedar east 1	Lake	9/18/2013		
6576L112113	Walton CBA Santa Rosa Beach-8-1	Estuary	11/21/2013		
6020L011114	Seminole Florida 3	Lake	1/11/2014		
3253L071114	Lake Eustis 1	Lake	7/11/2014		
1393L080514	Charlotte Candia 1	Estuary	8/5/2014		
3114L081114	Jackson Silver 3	Lake	8/11/2014		
4141L100514	Sugarloaf/Monroe N-1	Estuary	10/5/2014		
6575L121514	Walton CBA Santa Rosa Beach-7	Estuary	12/15/2014		
2359L062515	Hillsborough Brant 3	Lake	6/25/2015		
6688L083116	Walton Morris 2	Lake	8/31/2016		
3753L110616	Leon Overstreet 3	Lake	11/6/2016		
1771L120916	Columbia Lower Ichetucknee-2	River/stream	12/9/2016		
6083L122816	Seminole Little Bear 2	Lake	12/28/2016		

Table 2. Audit Findings for the lab records audit of LAKEWATCH conducted by DEP, May 7-8, 2019.

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
1.	All	QA rule 62-160.340, F.A.C.	There are no standard logs. Lab staff stated that newer worksheets will have this information.	All	**Required:** Keep a standard prep log with standard lot numbers, receipt date, date opened, expiration date (even if assigned in lab), preparation details, and prepared standard expiration. Add related procedures to LAKEWATCH SOP.	Will develop laboratory notebook logging all standard preparation dates, technician name. Date of preparation will be logged into laboratory WIN sheets. New standards will be prepared quarterly.	November 2019	Acceptable
2.	All	QA rule 62-160.340, F.A.C.	No links to standard prep, standard receipt, or expiration date. Standards not assigned lot/ID numbers. Laboratory staff said the information is on the bottle of prepared standard and the standard is discarded when expired.	All	**Required:** Link samples to standards.	Date of each standard preparation is noted on the bottle along with the standard type. If more than one bottle is prepared on a given date a letter designation is added to the date. All standard label information used will be logged into both laboratory WIN sheets and each standard notebook.	December 2019	Acceptable
3.	TP and TN	QA rule 62.160.340 (2)(f)(3), F.A.C.	A second source standard is not used to verify the calibration. Auditors discussed the use of a second source standard as an ICV, and lab staff agreed to run the ERA brand QC solution as a standard to check the curve.	All	**Required:** Verify the calibration with a standard from a separate lot. Add this to the SOP. The second source standard should be run immediately following the calibration.	Second source standard will be run immediately following the calibration.	November 2019	Acceptable

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
4.	TP and TN	QA rule 62.160.400, F.A.C.	It is unclear what the frozen blanks are associated with. The SOP mentions bottle washing but does not list analytes. Frozen blanks are not kept with samples.	All	**Required:** Clarify the purpose of the frozen blanks in the SOP. Specify where and how they are stored, and for how long. Clearly indicate what they will be analyzed for, and identify corrective actions if there is a detection in a blank. If blanks are used to check washing procedures, associate each blank with a lot of washed bottles, even if those bottle lots are not tracked with samples. These blanks will be used to monitor the cleanliness of the bottle washing procedure.	A frozen blank is used in the lab to monitor the cleanliness of the bottle washing procedure. If a problem is noted, lab staff will review bottle washing procedures covered in the SOP.	November 2019	Acceptable
5.	TP and TN	QA rule 340 (2)(b)(4), F.A.C.	There is no record of matrix spike concentration. Recovery cannot be verified. Recovery calculations are not documented.	All	**Required:** Document spike concentration, linked by lot number, with documentation of recovery calculations.	Spike concentrations will be added to each laboratory sheet.	November 2019	Acceptable. SOP has been revised to include the required corrective action, "The amount and concentration of spikes are recorded on the working laboratory data sheets along with calculated recovery percentages."
6.	TN and TP	QA rule 62-160.340, F.A.C.	Digestion logs are not maintained. Dates of digestion are not recorded. There is no way to verify that all samples (including QC) in the reported batch were digested together. Analyst said the full batch is digested together.	All	**Required:** Keep a digestion log, including date digestions occurred and all reagents used. Link to all consumables used. DEP suggests making another tab in the Excel spreadsheet that would link the digestion to the sample run.	Digestion date and time are logged for TP and TN in a notebook for each parameter. This information is also added to each WIN data sheet for each parameter. All consumables are listed in the TP and TN preparation notebooks. All information for all standards, reagents and other chemicals used are logged in each notebook by date prepared.	November 2019	Acceptable. For clarification, "consumables" specifically refers to lot numbers of reagents.

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
7.	TP and TN	LAKEWATCH SOP	Duplicate recovery RPD exceeded 20% and there was no indication of corrective action or sample qualification. The SOP says the associated sample will be qualified, but the QC check portion at the top of the page was not filled in.	6575L121514, 3114L081114, 3753L110616, 5694L021415	**Required:** Appropriately qualify the parent sample if the duplicate precision exceeds the acceptance criteria.	In each TP and TN -WIN Excel data sheets, there are formulas to calculate the precision for each set of duplicates. The Scientific Laboratory Manager enters these data into the formulas and qualifies data if precision exceeds acceptance criteria.	November 2019	Acceptable
8.	TP and TN	LAKEWATCH SOP, QA rule 62-160.340 (2)(d)(3), F.A.C.	Duplicate precision calculations are not documented.	All	**Required:** Document precision calculations.	Precision Calculations will be added to the new WIN data sheets.	November 2019	Acceptable
9.	TP and TN	LAKEWATCH SOP, QA rule 62-160.700, Table 1	Some samples were associated with faucet blank (method blank) values above the MDL. None of the samples in the run were qualified with a V. On some chemist sheets, the prompt for failed QC was filled in at the top, but the V did not carry over to the samples. On other chemist sheets, the prompt for failed QC was not filled in. This deficiency applied to the specified audited samples for TP. It did not occur in audited samples for TN, but was observed in other samples in the analytical run. Use of the V-code with Excel was discussed and lab staff stated	4141L100514, 6688L083116, 6083L122816, 3253L071114, 3753L110616, 2359L062515, 1771L120916, 1139L062115	**Required:** Evaluate sample results compared to the faucet blank results when the blank result exceeds the MDL. Apply the V qualifier to samples where the blank result is greater than 10% of the sample result.	In each TP and TN WIN Excel data sheets, there are formulas to evaluate each sample result when the blank exceeds the MDL. The method blank result is entered into the cell listed on each sheet. The V qualifier is assigned by the formula to each sample where the blank is greater than 10% of the sample result.	November 2019	Acceptable, given that the Scientific Laboratory Manager verifies that samples were appropriately qualified, per phone call 11/21/19 and response to Finding 17, below.

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
			that the macro is now working properly.					
10.	TP	QA rule 62-160.340 (3)(b), F.A.C.	On the chemist sheet, results are calculated from the absorbance and rounded to the nearest whole number. Qualifiers are assigned after the result is rounded. Since the MDL is not rounded, this could cause an inappropriate qualifier to be assigned.	All	**Required:** Assign qualifiers prior to rounding results, or do not round results. Evaluate policy for significant figures of data reported.	All WIN Excel data sheets have been corrected to use whole number results in all calculations.	November 2019	Acceptable. MDL and PQL values are also rounded, and these numbers are included in the WIN Excel datasheets.
11.	TP	TNI (2016) Module 4 1.5.2.2	The PQL is 4 ug/L and the lowest curve standard is 10 ug/L.	All	**Required:** Ensure the PQL is equal to or greater than the lowest curve point.	A TP standard of 10 µg/l used by LAKEWATCH is lower than the PQL for each run.	November 2019	Acceptable
12.	TP and TN	QA rule 62-160.340 (2)(f)(3), F.A.C.	LCS standard results do not appear to have recovery calculations associated with them. The SOP states they are reviewed, but auditors don't see the results.	All	**Required:** Calculate percent recovery and retain documentation of acceptance to inform whether to qualify samples.	LCS precision calculations will be added to the new WIN data sheets (November 2019)	November 2019	Acceptable
13.	TP	QA rule 62-160.340 (3)(b), F.A.C.	The results are rounded, causing the RPD to be inflated. With rounding, it is 66%, while without rounding, it is 22%.	3114L081114	**Recommended:** Use raw data for calculations before assigning qualifiers.	All WIN Excel data sheets have been corrected for whole numbers only in all calculations.	November 2019	Acceptable. This sample was a non-detect. Auditors realize that this is not an appropriate example to calculate an RPD.

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
14.	TP and TN	LAKEWATCH SOP	No blanks were analyzed in the run. For TP sample 6020L011114 and TN sample 4171L010814, there was a bottle blank, but no method (faucet) blank. This deficiency occurred in all audited samples analyzed prior to 3/24/2014 and sporadically on 3 occurrences before February of 2015.	2393L091813, 6576L112113, 1181L081013, 5815L082713, 1393L080514, 6020L011114, 4171L010814, 6562L111613, 4381L070913	**Required:** Analyze the appropriate number and types of blanks at the correct frequency in each run as described in the LAKEWATCH SOP. Treat the bottle blank as a sample. There should be one "faucet blank" (method blank) in each batch of 40 samples. We recommend running one blank at the start of a large sample set and the second blank after 40 samples.	Method blanks are run every 40 samples in each run.	November 2019	Acceptable.
15.	TP	LAKEWATCH SOP	Field sheet was not marked that samples were collected.	6020L011114	**Required:** Ensure all field sheets are filled out completely. Communicate with field sampler if something is missing or incorrect, and mark correction on the field sheet with initials and date.	Volunteers are regularly reminded through newsletters or directly by Lakewatch staff at all Regional meetings about correctly completing the field data sheets.	November 2019	Acceptable
16.	TP	LAKEWATCH SOP	No collection time recorded on the field sheet.	1181L081013	**Required:** Ensure all field sheets are filled out completely. Communicate with field sampler if something is missing or incorrect and mark correction on the field sheet with initials and date.	Volunteers are regularly remined through newsletters or directly by Lakewatch staff at all Regional meetings about correctly completing the field data sheets.	November 2019	Acceptable
17.	TN	QA rule 62-160.340, F.A.C.	Laboratory reported result was -560. Lab staff suspect the result was due to an empty sample tube run as a sample; however, the error was not caught before data reported.	5694L021415	**Required:** Perform second-level review of results to ensure that procedural errors are not reported as a sample result. Document errors when they occur.	The Scientific Laboratory Manager reviews all results for each run before approving data for upload to WIN.	November 2019	Acceptable

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
18.	TN	QA rule 62-160.340, F.A.C.	The duplicate RPD in this batch was 50.4% (results 820 and 490), but the associated sample was not qualified. Lab staff said the duplicate was really poured as LCS at 500 µg/L and mislabeled as a duplicate.	5694L021415	**Required:** Perform second-level review of results to ensure that procedural errors are not reported as a sample result. Document errors when they occur.	In each TN WIN Excel data sheet, there are formulas to calculate the precision of each set of duplicates. The Scientific Laboratory Manager enters these data into the formulas and qualifies data if precision exceeds acceptance.	November 2019	Acceptable
19.	TN	LAKEWATCH SOP	Sample was analyzed 2 months after defrosting and pouring (poured 6/18 and analyzed 8/26), which deviates from the SOP process description.	4172L061016	**Required:** Ensure samples are analyzed in a timely manner as specified in the LW SOP once defrosted. Document time exceedances and qualify data if necessary.	OOPS, sorry won't happen again.		Acceptable, with data qualifiers applied accordingly.
20.	TN (fresh)	LAKEWATCH SOP	Two or three duplicates of standards were run for the calibration curve, and final curve generated by selected replicates rather than the average (as stated in SOP). These were all fresh water runs (not marine), and spanned dates from 2013-2016. The laboratory indicated on our visit that this practice no longer occurs.	Analytical batch associated with samples 4616L090714, 1005L041616, 4381L070913, 3982L032314, 5694L021415	**Required**: If replicates of standards are run for the calibration curve, use the average value of the replicates to generate the curve. **Recommended**: Do not run replicates of standards for the calibration curve. If this practice is no longer occurring, please update the SOP and provide a date when the change was made.	We now run all TN samples on the autoanalyzer and only one set of standards are run for each set of samples.	January 2018	Acceptable

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
21.	TN	QA rule 62-160.340, F.A.C.	For this batch, the matrix spike result was 480 and the associated sample result was 710. We suspect that the QC sample was really an LCS rather than a matrix spike, but there isn't any notation or correction in the batch record. Additionally, some duplicates in this batch are not clearly labeled to indicate which sample they are paired with.	Analytical batch associated with sample 4381L070913	**Required:** Perform second-level review of results to ensure that procedural errors are not reported as a sample result. Document errors when they occur. Consistently indicate which samples are paired with duplicates.	In each TN WIN Excel data sheet, there are formulas to calculate the precision of each set of duplicates, all matrix spikes and LCS values. The Scientific Laboratory Manager enters these data into the formulas and qualifies data if precision exceeds acceptance. A set of duplicate samples are paired (example: Santa Fe station 1 and Santa Fe station 1D)	November 2019	Acceptable
22.	TN	TNI 2016 Module 4 1.7.1.1 (h)	Sample result (2120) was greater than the highest calibration standard (2000) but the sample was not diluted, and the result was not J-qualified. Auditors observed samples in 5 additional batches (total of 6 of 15 batches evaluated) that contained at least one sample reported beyond the calibration curve without a J qualifier.	4616L090714	**Required:** Ensure that samples are diluted when necessary. The J qualifier should be used for QC failures and when out-of-range samples are not diluted. A comment is required to accompany all "J" data.	If any sample results are beyond the calibration curve, the samples will be diluted and re-run. If the sample is not re-run, the result will be qualified with a J.	November 2019	Acceptable
23.	Chlorophyll *a*	LAKEWATCH SOP; QA rule 62-160.340 (3)(d), F.A.C.	Time filtered is not recorded. Check box on field form indicates filtration within 48 hours.	All	**Required:** Record on field sheet time the sample was filtered.	Date and time when the sample was filtered will be documented on the field sheet.	January 2020	Acceptable

Finding # (Table 2)	Analyte	Requirement Reference	Finding	Sample(s) Affected	Recommended or Required Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
24.	Chlorophyll *a*	LAKEWATCH SOP	Results in the chemist spreadsheet are rounded to a whole number, even though the PQL and MDL are less than 1. This artificially lowers results below 1 to zero and makes them non-detects.	1111L011117	**Required:** Do not round sample results to whole numbers. Evaluate policy for significant figures of data reported.	All WIN Excel data sheets have been corrected for whole numbers only in all calculations.	November 2019	LAKEWATCH agreed (phone call 12/20/2019) to use an MDL and PQL of 1 for Chlorophyll a to clear confusion about results between 0 and 1 being non-detect. Results <1 should be reported as 1 with a U qualifier.
25.	Chlorophyll *a*	LAKEWATCH SOP	From the records, there are no blank samples run with any of the chlorophyll analyses.	All	**Required:** Run a method blank and a filter blank as prescribed in the LAKEWATCH SOP.	Addressed in the new WIN data sheets with added blank.	November 2019	Acceptable
26.	Chlorophyll *a*	QA Rule 62-160.340 (1)(a), F.A.C.	Records are not kept for filter extractions.	All	**Required:** Document extraction procedures and retain records.	Will initiate filter extraction log, which will also be added to the WIN data sheet.	November 2019	Acceptable
27.	Chlorophyll *a*	LAKEWATCH SOP	The prompt on the field sheet for filtering was not marked.	4967L102113	**Required:** Ensure all field sheets are filled out completely. Communicate with field sampler if something is missing or incorrect and mark correction on the field sheet with initials and date.	Multiple approaches to informing volunteer to complete entire field sheet.	November 2019	Acceptable

Table 3. Remarks concerning the current LAKEWATCH laboratory procedures observed by DEP auditors, May 7-8, 2019.

Finding # (Table 3)	Analyte	Requirement Reference	Finding	Required or Recommended Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
1.	All	TNI 2016 Module 4 Section 5.5.13.1	Dial thermometers on the outside sample storage freezers and refrigerators were observed in the 40 °F range. It was not determined why the thermometers were reading high. An alarm system installed for out of range temperatures was mentioned during the tour of the coolers, but there was no evidence of a system per causal observation of the outdoor units.	**Required:** Ensure that freezers and refrigerators are maintained at stable and appropriate temperatures for the samples. Have a procedure to monitor temperature on sample storage coolers (once daily) and what to do when coolers fall out of range. Add this information to the SOP. All aspects of storage under LAKEWATCH control should be documented.	Temperature loggers have been deployed in each freezer and refrigerator at the UF LAKEWATCH facility. If it is noted that temperatures fall outside of acceptable ranges, the samples are moved to another cooling facility and UF Physical Staff are called to repair the freezer or refrigerator.	November 2019	Acceptable. SOP was revised and the following added, "LAKEWATCH freezers and refrigerators have temperature data loggers that will be monitored every time samples are added and removed from the freezer. Temperature logs will be kept electronically downloaded monthly."
2.	All	QA Rule 62-160.340 (2)(b), F.A.C.	Sample receipt logs are not retained.	**Required:** Record and retain records of date samples are received by the lab. Record the condition of the samples upon receipt including temperature and any defects of the bottle. Record the names of the people dropping off and receiving samples.	All Pickup inventory logs are dated with the pickup dates and retained for five years in the laboratory storage center.	November 2019	Acceptable. SOP was revised and states the following, "When picked up at a collection center all samples and data sheets present for pickup are recorded in a collection notebook to facilitate sorting on arrival to Gainesville and analyses in chronological order. These collection notebook data are archived in the LAKEWATCH laboratory."

Finding # (Table 3)	Analyte	Requirement Reference	Finding	Required or Recommended Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
3.	TN (fresh) and TP	NA	Standard curves: Blank second-derivative absorbance is subtracted from all standards and samples; this effectively forces the curve through zero, but the Excel software regression on the corrected standard second-derivative absorbances sometimes produced a non-zero intercept. Subtracting the blank absorbance from all other absorbances is not a generally accepted practice and could affect MDL values.	**Required:** Do not subtract the blank absorbance value from standards and samples.	All TN and TP WIN Excel data sheets have been changed and blank absorbance value will no longer be subtracted from standard or sample absorbance values.	December 2019	Acceptable
4.	TP, TN, Color	QA Rule 62-160.340 (1), F.A.C.	Raw instrument output records are generated but not consistently retained.	**Required:** Retain all raw instrument output records for 5 years and maintain linkage to associated sample data.	Will save raw instrument output records.	November 2019	Acceptable
5.	Chlorophyll *a*	Chlorophyll Method 10200 H; Sartory, D.P. and J.U. Grobbelarr, 1984	It is unclear how chlorophyll filters are handled in the lab before analysis. Are chlorophyll samples processed in a dark room before extraction?	**Required:** Keep filters in dark during lab processing.	Filters are kept in a dark freezer and samples covered in black plastic in the laboratory.		Acceptable
6.	Color	QA Rule	It is unclear whether the laboratory maintains a log for color standards. Expiration dates should be based on experience and any recommendations in the SM method.	**Required:** Document receipt/formulation, expiration and use dates for all color standards.	Will develop laboratory notebook logging all standard preparation dates, technician name. Date of preparation will be logged into laboratory WIN sheets. New standards will be prepared quarterly.	November 2019	Acceptable

Finding # (Table 3)	Analyte	Requirement Reference	Finding	Required or Recommended Corrective Action	Laboratory Response	Implementation Date	AEQAS Response
7.	Conductivity	DEP SOPs FT 1000 and FT 1200	For conductivity measurements, documentation is not retained for calibration and verification of the bench meter. It is unclear whether verifications are performed.	**Required:** Perform and document calibrations and verifications for conductivity meters including bracketing sample values as described in the DEP SOPs.	A calibration curve with standard concentrations that cover the range of samples will be used in each run. This information is documented on the WIN data sheet.	November 2019	Acceptable. LAKEWATCH will follow DEP SOP FT 1200 for conductivity instrument calibration and verification.
8.	All	QA Rule 62-160.120 (16), F.A.C.	The MDL used by the laboratory has not been updated and is inappropriate for use. When new MDL studies were done, the new figure was not applied to results.	**Required:** When a new MDL study is done, apply that new MDL to the working spreadsheets and apply to results. Perform new MDL studies using the revised EPA procedure; this may help address blank hits, especially TP; and may result in higher MDLs. The EPA procedure now requires ongoing evaluation of the MDL as well.	We just completed a new MDL study and all WIN data sheets have been updated with the new MDL values.	November 2019	Acceptable

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