FINAL AUDIT REPORT

Polk County Laboratory
OGC Case No. 15-0161

Laboratory Records Audit, August 7, 2014

Aquatic Ecology and Quality Assurance Section
Water Quality Standards Program
Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection

April 10, 2015

Introduction

This laboratory records audit of the Polk County Laboratory was conducted by the Florida Department of Environmental Protection (Department) Aquatic Ecology and Quality Assurance Section in accordance with Rules 62-160.650 and 62-160.670, Florida Administrative Code, to include the evaluation of specific data quality objectives identified for data used to assess impairment of state surface waters. The laboratory records audit is used to verify that an organization is correctly implementing approved analytical methods, including acceptable calibration and quality control, and maintaining adequate laboratory documentation. This audit report lists the procedural and documentary deficiencies observed by the Department auditors and the corrective actions implemented by the laboratory in response to the audit findings.

Description of Audit

On August 7, 2014, Department auditors visited the Polk County Laboratory to review all documentation associated with the selected audit samples (Table 1). While at the laboratory, auditors were able to ask for clarification of any documentation and request additional information where necessary. The laboratory records audit was completed in one day with no further documentation or records requested at a later date.

Findings

Deficient procedures or documentation that did not comply with evaluation criteria are identified in the attached audit report findings tables (Tables 2 and 3). Audit findings of deficiency were minor. The approved corrective actions and implementation time line are included in the findings tables.

Preliminary Audit Report and Implementation of Corrective Actions

A preliminary audit report was sent to the Polk County Laboratory manager (Diane Gibson) on December 18, 2014. The report included a findings table with space for the audited party to respond with further information and/or corrective actions. Polk County Laboratory staff replied with proposed corrective actions on December 19, 2014 (Table 2). The Polk County Laboratory response to two findings concerning database management referred the auditors to the City of Lakeland Public Works Lakes and Stormwater Division for additional follow-up. The Department transmitted those two findings to City of Lakeland's Lakes and Stormwater Manager Curtis Porterfield on January 29, 2015. City of Lakeland staff replied with proposed corrective actions on February 27, 2015 (Table 3). The auditors have reviewed the responses and corrective actions and deem them acceptable**.** Corrective actions were implemented according to the statements in Tables 2 and 3 and are approved by the Department with this final report.

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Usability Statement

Based on the results of this laboratory records audit, the Aquatic Ecology and Quality Assurance Section has determined that data produced by the Polk County Laboratory for the following audited analytes may be used by the Department for both planning and verified listing purposes when assessing the impairment status of waters: chlorophyll-a (corrected for pheophytin), color (true), and total phosphorus (as P). The results of this audit have no bearing on usability of data produced by the Polk County Laboratory for other analytes.

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Table 1. List of audited samples for the laboratory records audit of the Polk County Laboratory conducted by the Florida Department of Environmental Protection Aquatic Ecology and Quality Assurance Section on August 7, 2014.

STORET ID	Field ID	Collect Date	Analyte
44577	LH20	6/1/2009	Color, True
44379	BENTLEY	6/2/2009	Phosphorus as P
44811	LH11	8/4/2009	Color, True
44795	LH8	8/4/2009	Phosphorus as P
45913	PARKER	9/3/2009	Phosphorus as P
45838	MEADOWVIEW	9/9/2009	Chlorophyll a, corrected for pheophytin
54046	BENTLEY	12/1/2009	Chlorophyll a, corrected for pheophytin
54300	LH31	12/2/2009	Chlorophyll a, corrected for pheophytin
54352	LH11	1/12/2010	Chlorophyll a, corrected for pheophytin
47541	SOMERSET	3/4/2010	Phosphorus as P
47255	LH20	5/4/2010	Phosphorus as P
50624	HUNTER	6/2/2010	Chlorophyll a, corrected for pheophytin
50806	WIRE	6/3/2010	Chlorophyll a, corrected for pheophytin
50559	HOLLOWAY	6/9/2010	Color, True
50465	LH11	8/3/2010	Phosphorus as P
50884	BONNET	9/13/2010	Chlorophyll a, corrected for pheophytin
51495	MIRROR	9/16/2010	Color, True
52509	BONNY	12/2/2010	Color, True
56623	LH11	3/2/2011	Color, True
56948	LH29	5/10/2011	Chlorophyll a, corrected for pheophytin
58144	CRAGO	9/8/2011	Chlorophyll a, corrected for pheophytin
58739	PARKER	9/8/2011	Phosphorus as P
58339	LH11	10/4/2011	Color, True
58313	LH8	10/4/2011	Color, True
58560	LH31	11/1/2011	Chlorophyll a, corrected for pheophytin
58817	BENTLEY	12/6/2011	Phosphorus as P
59106	HORNEY	12/6/2011	Chlorophyll a, corrected for pheophytin
59207	MIRROR	12/6/2011	Phosphorus as P
60260	WIRE	1/4/2012	Chlorophyll a, corrected for pheophytin
60026	BONNY	2/1/2012	Chlorophyll a, corrected for pheophytin
60065	GIBSON	2/1/2012	Color, True
60673	BONNET	7/10/2012	Phosphorus as P
60920	WIRE	7/10/2012	Color, True
60777	LH20	8/7/2012	Phosphorus as P
60725	CRAGO	8/8/2012	Phosphorus as P
60894	PARKER	8/8/2012	Color, True

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STORET ID	Field ID	Collect Date	Analyte
61297	BENTLEY	11/7/2012	Chlorophyll a, corrected for pheophytin
61557	MORTON	11/7/2012	Chlorophyll a, corrected for pheophytin
61648	BEULAH	1/8/2013	Color, True
61674	BONNET	1/8/2013	Color, True
61635	BENTLEY	2/4/2013	Chlorophyll a, corrected for pheophytin
61632	BENTLEY	2/4/2013	Phosphorus as P
61710	BONNY	2/4/2013	Phosphorus as P
61895	MORTON	2/4/2013	Chlorophyll a, corrected for pheophytin
61882	MORTON	2/4/2013	Color, True
61765	GIBSON	2/6/2013	Chlorophyll a, corrected for pheophytin
61762	GIBSON	2/6/2013	Phosphorus as P

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Table 2. Audit findings for the laboratory records audit of the Polk County Laboratory conducted by the Florida Department of Environmental Protection Aquatic Ecology and Quality Assurance Section on August 7, 2014.

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Analysis	Lab / sample ID	Finding	Corrective action / response	DEP comments
Chlorophyll-a	25937 / Bentley	Collection date in STORET (2/4/13) is different from field record (2/6/13)	This seems to be an error with Lakeland reporting our lab data to STORET. Our chain of custody, sample receipt log, database, raw data sheet, and final report of analysis show collected date of 02/06/13. Implementation: See Table 3	Accepted.
Chlorophyll-a	24630 / LH29	Relative Percent Difference (RPD) > 20 but data are not qualified. Please clarify whether the lab has documented a higher control limit.	In that batch, the sample that failed Quality Control for RPD was qualified with J3 (failed accuracy or precision). The entire batch was not qualified. Implementation: none	Accepted.
Color	All	Glass fiber filter used (filtrate from chlorophyll a) to perform color analyses. Need documentation of pore size which, should be 0.45µm per SM method 2120B (2011)	Color Standard Operating Procedure was updated this month during analyst audit and now references use of 1 um glass fiber filters when filtering samples for color. We run SM2120B, 1993 which does not specify pore size. Implemented 12-11-14	Accepted. 1993 version in Standard Methods was an approved method for the relevant analysis dates. DEP recommends using the current revision of SM 2120B (2011).

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Color	22509 / LH20, 22779 / LH11	Number of standards used is 11 (9 standards specified in SM 2120B, 2011). 45 PCU standard added and blank used as lowest standard (these are not specified in SM 2120B).	Our SOP references SM2120B, 1993 which lists standards in Section 3.d as 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70. We have always used a zero standard with color, just as almost every other analyte with standards. Implementation: none	Accepted. 1993 version in Standard Methods was an approved method for the relevant analysis dates. DEP recommends using the current revision of SM 2120B (2011). The use of a color blank is not recommended.
Color	22509 / LH20, 22779 / LH11	RPD was not recorded for documentation of precision.	These two records from 2009 did not have RPD calculated on the bench sheets. I did indicate that the result was an average by using Data Qualifier Code (DQC) of A. At that time, we tracked accuracy and precision in a way that the results were copied from the bench sheets onto a separate log by our data manager. Beginning in 2010, with a change in QC tracking, we began calculating accuracy and precision on bench sheets. Implemented 01-01-10	Accepted. Per email communication on 3-12-15, the laboratory clarified precision tracking and additional documentation procedures.

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General	All LH samples	Inconsistent use of abbreviation for Lake Hollingsworth sample name in the documentation ("HW" and "LH").	This is an issue to address with Lakeland. All of our records (chain of custody, database, sample receipt log, raw data sheet, and final report of analysis) show Lake Hollingsworth stations as HW8, HW11, etc. as written by Lakeland on the chain of custody. Apparently there has been some error by Lakeland in submitting our lab data to STORET. Implementation: See Table 3	Accepted.
Total Phosphorus	24849 / Parker, 25050 / Mirror, 25051 / Bentley, 22519 / Bentley, 23872 / LH11, 25929 / Bonny, 25933 / Gibson, 25612 / LH20, 25937 / Bentley, 25617 / Crago, 25553 / Bonnet	Precision not recorded for Laboratory Control Sample and Duplicates (LCS/LCSD). LCSD was run with spike QC sample and only assessed for spike recovery in the laboratory record.	This is true. We have run LCS/LCSD samples since 2007 but we didn't calculate RPD on them until 2014. We calculated RPD primarily from sample / sample dup results before that. The results are there on the bench sheet for anyone that wants to calculate RPD on LCS/LCSD. Implementation 2014	Accepted. Per email communication on 3-12-15, the laboratory clarified precision tracking and additional documentation procedures. DEP recommends use of a control chart or other trend analysis for internal quality control per 40 CFR, Part 136.7.
Total Phosphorus	25929 / Bonny, 22834 / Parker	pH check not noted on lab login sheet	Analyst error. One instance, this was the only sample not recorded. On the other, none were recorded that day. Will check for compliance when logging in sample details. Implementation ongoing	Accepted.

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Table 3. Audit findings for the laboratory records audit of the Polk County Laboratory conducted by the Florida Department of Environmental Protection Aquatic Ecology and Quality Assurance Section on August 7, 2014. Findings were identified by laboratory audit responses as the responsibility of the City of Lakeland Lakes and Stormwater Division.

Analysis	Lab sample ID	Finding	Corrective action / response	DEP comments
Chlorophyll-a	25937 / Bentley	Reported collection date is different than field record	According to the field record and chain of custody, the correct sample date is 2/6/13. The problem seems to have occurred when data was pulled into the template used to upload to STORET. City of Lakeland was responsible for this data entry error and will contact Lisa Schwenning to rectify. Implementation ongoing	Accepted.
General	All LH samples	Inconsistent use of abbreviation for Lake Hollingsworth sample name in the documentation ("HW" and "LH").	Due to prior years of staff changes, it is difficult to determine where the inconsistency originated. However, these stations are no longer used or sampled. Should any be used in the future, efforts will be made to assure that STORET identifiers and City of Lakeland field records are consistent. Implementation: none	Accepted.

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