FINAL AUDIT REPORT

JEA
OGC Case No. 17-0169

Combined Final Audit Report
Field Performance Audit September 13, 2016
Field and Laboratory Records Audit October 5 – 6, 2016

Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
August 30, 2017

1. Introduction

This final audit report contains a combined summary and detailed lists of findings, deficiencies, accepted corrective actions, and data usability recommendations pertaining to the Field Sampling and Testing Performance Audit (Field Performance Audit) conducted with sampling staff from the JEA on 9/13/2016, and a Field and Laboratory Records Audit (Records Audit) conducted at the JEA main laboratory facility on 10/5/2016-10/6/2016, by auditors from the Florida Department of Environmental Protection (DEP or department) Aquatic Ecology and Quality Assurance Section (AEQAS). The department's Northeast District Compliance Assistance Program (NED-CAP) requested the assistance of the AEQAS in performing the audits, which constitute a Performance Audit Inspection (PAI) of the JEA field sampling and testing and laboratory operations. The criteria for the PAI and all findings included DEP SOPs (DEP-SOP-001/01, March 1, 2014), Chapter 62-160, F.A.C., the 2003 National Environmental Laboratory Accreditation Conference (NELAC) standards, the permit compliance monitoring requirements, and the associated certified laboratory methods. For complete details of the audits, please see the preliminary audit reports for the Field Performance Audit (Reference 1) and the Records Audit (Reference 2).

2. Summary of Audits

Summaries of the two audit events conducted by the department auditors are provided below.

2.1 Field Sampling and Testing Performance Audit

Department auditors Joy Jackson and Ashley O'Neal (AEQAS) conducted a Field Performance Audit of JEA samplers Vance Reiman, Kim Neumann, and Jason Hermening in conjunction with required sampling for the St. Johns River Aggregate Permit. The audit included a two-day sampling event divided into a "north run" and a "south run." Auditors accompanied field personnel for the "south run," which included wastewater outfalls for the Southwest, Mandarin, and Monterey wastewater treatment facilities to the St. Johns River in Duval County. At each outfall, three sites were sampled: two bracketing the outfall and one background site. Sites were sampled in the following order: Southwest SWB-SW1 (background), SWA-SW2 (test 2), and SWA-SW1 (test 1); Mandarin SWA-MD2 (test 2), SWA-MD1 (test 1), and SWB-MD1 (background); and Monterey SWB-MT1 (background), SWA-MT2 (test 2) and SWA-MT1 (test 1).

Department auditors observed the samplers collect surface water quality samples for total suspended solids (TSS), biochemical oxygen demand (BOD), chloride, orthophosphate, nitrate+nitrite, total Kjeldahl nitrogen, total phosphorus, total nitrogen, copper, and cyanide (latter two analytes were only collected at the Southwest facility sites). Samples were collected at mid-depth, as prescribed by the permit, using a peristaltic pump. Sample containers were pre-preserved at the JEA Laboratory or, in the case of cyanide, by their contract lab, Pace Analytical. Dissolved oxygen and specific conductance were measured in situ with a multi-probe meter. Temperature and pH were measured with a different meter, but because the cord was not long enough to collect measurements in situ (mid-depth), they were measured in a cup on board the vessel. Turbidity was measured via a separate turbidimeter on board the vessel. All field measurements were called out from one sampler at the stern of the boat to another sampler in the wheelhouse and logged directly into a laptop computer.

After completing the field sampling, auditors met Vance Reiman at the JEA Laboratory to observe sample log-in and meter continuing calibration verification procedures, review meter calibration and verification records, and obtain copies of field sheets and lab submittal forms for the samples collected that day.

2.2 Field and Laboratory Records Audit

Sample records were chosen by the NED-CAP for evaluation based on field testing results, laboratory analytes, permit compliance sampling locations, and sampling dates to represent the permit sampling requirements for the permitted facilities that use the JEA laboratory. Samples were selected to be representative of lab and field operations during the first two quarters of 2015 and 2016 (Appendix 1).

Representatives of the department scheduled the audit with Nick Evans, Paul Legge, and other staff at JEA. Department staff requested laboratory and field records from the targeted period and selected a subset to audit. JEA staff were sent a list of samples, laboratory records, and field records to have available during the audit. Department AEQAS auditors Michael Blizzard, Jennifer Claypool and Kristen Sapp, and NED CAP auditors Bipin Adhyaru and Ginny Montoya met with JEA staff at the facility to go through the requested records. Department staff reviewed the meter calibration and verification (for field testing measurements), sample collection, sample laboratory receipt (log-in), analysis, and reporting documentation for the samples listed in Appendix 1.

3. Preliminary Audit Reports and Implementation of Corrective Actions

The preliminary audit report for the field performance audit was sent to JEA on 11/10/2016 (via email to Vance Reiman, Loan Carley, Paul Legge, and Nick Evans), and the preliminary audit report for the records audit was sent to JEA on 1/30/2017 (via email to Kevin Holbrooks). The reports included findings tables with spaces for the JEA staff to respond with further information and/or corrective actions. The JEA replied with proposed corrective actions for the field performance audit on 12/22/2016 (transmittal received from Loan Carley), and for the records audit on 3/31/2017 (transmittal received from Kevin Holbrooks).

The auditors have reviewed the corrective actions implemented or proposed by the JEA staff. During the review of JEA's responses and corrective actions, the DEP auditors requested additional information concerning the details of the audit findings and corrective actions, via emails and teleconferences with JEA staff. This final report indicates the acceptance of JEA's corrective actions by the department, and provides additional recommended and required corrective actions to improve the JEA field and laboratory quality systems, as well as conclusions and recommendations derived from the audit findings about the usability of sample data.

4. Summary of Findings and Deficiencies for Field Performance Audit

Overall, the DEP auditors determined that the JEA has implemented a functioning quality system for sampling operations, as observed during the 9/13/2016 samplers' performance of activities for the audit, and upon inspection of the JEA field documentation associated with the sampling event. However, certain findings of deficiency necessitated corrective action to improve the field quality system. A summary of findings affecting data usability for the Field Performance Audit is presented

below. A complete list of findings for the audit is provided in Table 1. Recommended and required corrective actions and the implementation of corrections by JEA are also listed in Table 1.

(a) Field pH checks - Field checks of the pH of preserved samples were not routinely performed and recorded per DEP SOP requirements.
(b) Temperature Measurements – Field temperature measurements were performed on a sample collected in an intermediate container, which may affect the representativeness of the measured temperature value. The DEP SOP FT 1400 (Field Measurement of Temperature) requires measurement *in situ*.
(c) Turbidity Calibration Verification – Sample turbidity measurements were not bracketed at the low end of the measurement range by verifying a turbidity standard with a value below that of the measured sample values.

5. Summary of Findings and Deficiencies for Records Audit

The JEA has put in place an excellent quality system for laboratory operations, and the DEP auditors found only minor issues with the linkage of information between documentation formats used by the laboratory, all of which have been or soon will be corrected. The auditors were able to reconstruct all of the selected laboratory analyses with the assistance of JEA staff. However, an examination of selected records for sampling events during the first two quarters of 2015 and 2016 resulted in findings of deficiency in the field documentation audited. A summary of findings affecting data usability for the audited field documentation is presented below, separated into grab sample field testing, continuous monitoring field testing, and sample collection. A complete list of findings for the records audit conducted on 10/5/16 - 10/6/16 is provided in Table 2. The findings for temperature and turbidity were determined after the audit visit via subsequent communications with the JEA field staff. The JEA has proposed acceptable corrective actions for all findings, as described in the table.

(a) Grab Sample Field Testing Measurements

1. A *chronological* calibration verification bracket, as defined in DEP SOP FT 1000, cannot be unequivocally established from the field documentation for a majority of the sample records examined for pH, dissolved oxygen, specific conductance, temperature, and turbidity. The time of calibration verifications was not recorded and must be assumed, based on the association of all sample measurement and calibration verification records for the specific sampling event dates audited.

2. A *quantitative* calibration verification bracket, as defined in DEP SOP FT 1000, cannot be established from the field documentation for a majority of the sample records examined for specific conductance, temperature, and turbidity. The meters used for sample measurements must be calibrated and verified with calibration standards representing the range of sample values measured. Typically, the high or the low end of the range was not verified for the bracket.

(b) Continuous Monitoring Field Testing Measurements (Unattended Sonde Deployment)

For the records examined, a chronological and quantitative bracket condition could not be unequivocally established for the dissolved oxygen measurements, as the calibration records do not indicate that initial calibration verifications were performed, according to the requirements of DEP SOP FT 1000. Because of this deficiency, the auditors would have to assume that the sondes were deployed in a calibrated condition, as indicated by the documentation provided by the rental services vendor. In addition, time stamps for the continuing calibration verifications (CCV) were not recorded in the calibration documentation for dissolved oxygen deployments.

(c) Field pH checks - Field checks of the pH of preserved samples were not routinely performed and recorded per DEP SOP requirements.

6. Conclusions and Usability Statements

In general, the JEA maintains an excellent quality system for laboratory operations. The overall functioning of the JEA field sampling and testing quality system is adequate for compliance with the requirements of the DEP SOPs, except as noted in this report of findings and deficiencies. The AEQAS auditors have reviewed and accepted the JEA's proposed corrective actions for its field and laboratory operations, which include additional recommendations and requirements by the department, as detailed in the findings tables included in this report. Moving forward, with JEA's implementation of all field and laboratory corrective actions, the AEQAS staff recommend that the department may use JEA compliance monitoring data with the assurance of data quality.

6.1 Usability Recommendations for Selected Field-Testing Measurement Data

The following recommendations apply to selected data submitted by JEA for permit compliance monitoring, and are based on the findings of the field performance audit, and the limited review of 2015-2016 documentation conducted by the auditors for the records audit. These usability statements do not apply to JEA data generated prior to the dates for the performance audit and examined records.

(a) Grab Sample Field-Testing

1. Dissolved oxygen (DO) and pH - Results for pH and DO grab sample measurements may be used with the qualification that a chronological calibration verification bracket (definition per DEP SOP FT 1000) is assumed, based on the auditors' understanding of typical JEA field procedures, but cannot be verified with appropriate time entries in the documentation, and this must be considered when using the data.

2. Conductivity, Temperature, and Turbidity – Results for specific conductance and turbidity should be considered as estimated values (denoted with "J" data qualifier code and explanation, per Table 1 in Rule 62-160.700, F.A.C.) when data are used for compliance, as neither chronological nor quantitative brackets (definition per DEP SOP FT 1000) were

verified for these field tests. Results for temperature should also be considered as estimated values (denoted with "J" data qualifier code and explanation, per Table 1 in Rule 62-160.700, F.A.C.) when data are used for compliance determinations, because no records were available for temperature calibration verifications.

(b) Continuous Monitoring Sample Field-Testing (Unattended Sonde Deployments)

1. Dissolved Oxygen - Results for DO unattended sonde sample measurements may be used with the qualification that a chronological calibration verification bracket (definition per DEP SOP FT 1000) is assumed but cannot be verified with appropriate time entries or initial calibration verifications in the documentation, as these rental units were certified as calibrated by an external vendor, and this must be considered when using the data.

2. Temperature – Results for temperature should be considered as estimated values (denoted with "J" data qualifier code and explanation, per Table 1 in Rule 62-160.700, F.A.C.) when data are used for compliance determinations because no records were available for temperature calibration verifications.

6.2 Usability Recommendations for Selected Laboratory Data

Based on the reported findings for the records audit, laboratory analysis data for all audited laboratory analyses (ammonia, nitrate+nitrite, orthophosphate, and TKN) during the audited period (2015-2016) may be used for compliance determination without restriction. This usability statement does not apply to JEA data generated prior to the dates for the examined records.

NOTE: The audits evaluated the indicated data for the use(s) described in this report. The usability of the audited data for other purposes or the usability of data produced by the audited organization for other analytes or other date ranges must be determined separately according to applicable requirements in rule 62-160.670, F.A.C.

References

(1) Preliminary Audit Report, Jacksonville Electric Authority, Field Performance Audit, September 13, 2016 (Report date 11/10/16)

(2) Preliminary Audit Report, Jacksonville Electric Authority, Lab and Field Records Audit, October 5-6, 2016 (Report date 1/30/17)

Table 1. Findings of Deficiency for the Field Sampling and Testing Performance Audit Conducted on 9/13/16

Corrective actions are indicated by DEP as recommended or required. JEA's responses have been reviewed and all corrective actions are acceptable, as noted.

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
1	FQ 1230, sections 1 and 2; FQ 1200, sections 1.1-1.2 and 2.1	Blanks (excluding trip blanks) are collected at a minimum of 5% of each reported test result/matrix combination for the life of a project. Collect at least one blank for each reported test result/matrix combination each year for each project.	Samplers indicated that blanks are not currently being collected.	**Required CA**: Collect at least one equipment blank for each test/matrix combination that requires blanks per FQ 1200, sections 1.1-1.2 and 2.1. For orthophosphate samples, the filter is included in the equipment, per FS 2000, section 1.5.	**CA Date**: 1/9/2017 **CA**: Internal Surface Water Sampling SOP section 12.1 has been revised to include: Equipment blanks shall be collected at a rate of one discharging facility per month. With the current St Johns River sampling permit, sampling is to occur bi-monthly, January being the first sampling month of the year. Schedule to collect equipment blanks per facility as scheduled below. January – Atlantic Beach / Arlington East/March - District II/May-Buckman/July - Monterrey September - Southwest November - Mandarin Equipment blanks can be collected either via new cut to length tubing, or can be collected from tubing that has been properly field cleaned. (Note: For any CA with an SOP update, field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood.) **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable. Note: Equipment blanks are not required for certain analytes. DEP SOP FQ 1200 lists analytes that require and do not require blanks. Some of the analytes that were collected on the date of the field audit (9/13/16) would NOT require blanks (BOD and TSS). The remaining analytes require blanks.

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
2	FS 2000, section 1.5 and FS 2110, section 1.1.2.1	Filters and filtration equipment are intermediate devices and therefore must be adequately rinsed. Rinse the intermediate vessel with ample amounts of site water prior to collecting the first sample.	Samplers did not rinse orthophosphate filter because they came from the supplier marked as "sterile."	**Required CA**: Rinse filters with ample site water (approximately three times the volume of the filter) prior to sample collection.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 12.1 will be revised to specify that prior to collecting an ortho-P sample, the Flipmate sample collection unit will be rinsed three times with site sample. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable.
3	FS 2100, section 2.7	Unless dictated by permit, program or order, sampling should begin at the background sites and proceed to the test sites to reduce the potential for contamination of the vessel or other sampling equipment.	The background samples were collected after the test sites at the Mandarin and Monterey outfalls.	**Required CA**: If possible, collect samples from the least contaminated sampling location (or background sampling location) to the most contaminated sampling location.	**CA Date**: 1/9/2017 **CA**: Internal SOP will be revised to meet DEP requirement to perform sampling at background sample site prior to other test sites. In addition, clarification to be added in section 10.1 "Collect samples from downstream towards upstream. For tidally dependent sample sites, take into consideration the ebb and flood as the direction of what is situationally "upstream" and "downstream." Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable. Note: For all CAs that involve revisions to the JEA Internal SOPs, DEP recommends referencing the relevant DEP SOP in the Internal JEA SOP, so the field technicians or others reading the internal JEA SOP can see where the new requirement comes from, or for broader context when necessary.

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
4	FS 1006, sections 5.1 and 5.2	When preservation requirements indicate cooling to a specific temperature, samples must be placed (submerged) in wet ice within 15 minutes of sample collection.	Samples were placed on wet ice, but were not in the ice thus not achieving thermal preservation within 15 minutes of sample collection. In addition, an insufficient amount of ice was brought on board the vessel for all the samples to achieve thermal preservation.	**Required CA**: Take enough ice on the boat so that all samples can be submerged in ice within 15 minutes of sample collection to ensure proper thermal preservation.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 7 has been revised to provide explicit details on the proper way of preserving samples on ice as well as requirement of adequate supply of ice for each sampling event. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).
5	FS 2000, section 1.4.3	Except for volatile organic compounds and sulfide, leave ample headspace in the sample bottle to allow for expansion, effervescence and proper mixing at the laboratory.	Some water sample containers were filled completely to the top.	**Required CA**: Fill bottles approximately to the "shoulder" of the container.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 10.1 has been revised to emphasis the container's appropriate fill level as per DEP requirements. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
6	FS 1002, section 1.1.	Do not insert pump tubing, measurement probes, other implements, fingers, etc. into sample containers or into samples that have been collected for laboratory analysis.	The auditor observed the sampler inserting the pump tubing inside the sample container.	**Required CA**: Do not allow anything other than the sample itself to touch the interior of the sample container.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 10.1 has been revised to include DEP requirements that nothing is entered or to come in contact with the sample container's interior except sample, this specifically includes pump tubing. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).
7	FS 2001, section 3.4.1	Pour an aliquot of the preserved sample into a disposable container (e.g., sampling cup) or onto a piece of **narrow** range pH paper to determine if the pH meets the required level.	Samplers used a full range pH paper for all analytes requiring pH adjusted preservation.	**Required CA:** Use low range pH paper to verify analytes requiring <pH 2.0 SU and use high range pH paper to confirm proper cyanide preservation.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 10.1 has been revised to adhere to DEP requirements to use narrow range pH strips for chemical preservation verification. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
8	FS 1006, section 4	For sites sampled quarterly or less frequently, check all samples that are pH-adjusted at all sites, except volatile organics.	No samples were checked for pH adjusted preservation at the first two Southwest sites (SWB-SW1 and SWA-SW2).	**Required CA:** During each site visit, conduct a pH check on all samples that must be pH-adjusted, at all sites.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 10.1 has been revised to specify an on-site preservation check of all pH preserved samples immediately after sample collection. Sampling check list to include adequate supplies of pH papers/strips. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).
9	FT 1400, section 2.3	Insert or place the thermometer or sensor *in situ* at a measuring location representative of the sampling source. Allow the thermometer or temperature sensor to equilibrate to ambient *in situ* temperature.	Temperature was measured from a container on-board the vessel rather than *in situ*. Additional cooling or heating may occur in the container and may not be representative of conditions at mid-depth.	**Required CA**: Take temperature readings *in situ*.	**CA Date**: 1/9/2017 **CA**: Internal Surface Water Sampling SOP section 10.1 has been revised to include DEP requirements for in situ temperature acquisition, using the in situ D.O. probe's temperature. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
10	FT 1000, section 2.2.2; FT 1600, section 3.2	Choose two standards that bracket the range of sample measurements. For measurement of samples of very low turbidity, select the lowest standard commercially available for bracketing the lower end of the anticipated sample turbidity range or dilute higher turbidity standards with turbidity-free water.	The turbidity values were not quantitatively bracketed. An Initial Calibration Verification was performed with a 20.0 NTU standard, and a Continuing Calibration Verification was performed with a 10.0. Field measured values were as low as 4.54 NTU.	**Required CA**: Perform a quantitative bracket on all field measurements.	**CA Date**: 1/9/2017 **CA**: A 1.0 NTU standard has been purchased and to be used to perform a quantitative bracket for turbidity measurements. Internal Field Measurement Turbidity SOP will be updated accordingly. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above). Note: Due to the potential limits to precision and accuracy for low-level measurements noted by JEA in communications subsequent to the audit, AEQAS staff will assist JEA with the resolution of any calibration verification issues for the low turbidity range.
11	FD 5000, section 1.2.1	Link the unique field identification code to the sample source or sampling point identification, the date of sample collection, the time of sample collection (for maximum holding times equal to or less than 48 hours), the analytes of interest, and the preservation technique.	During log-in, several samples were assigned the incorrect collection time of 1206; the actual collection time was 1006.	**Required CA**: Ensure the time placed on labels during log-in match those on the field data sheets.	**CA Date**: 1/9/2017 **CA**: Printed sample labels will be reviewed to ensure that the correct date and time of sampling is included. Sample Receiving SOP section 14.1 will be updated to reflect the verification of collection date and time as well as other pertinent field information on the sample label. Field and Support technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
12	FD 2000, section 2	Document the date of analyte-free water containerization.	Analyte-free water was not labeled with the date of containerization.	**Required CA**: Label all analyte-free containers with the date of containerization.	**CA Date**: 1/9/2017 **CA**: Internal SOP section 8 was updated to specify the requirement that all cubitainers used for transporting DI water in the field must be labeled with the date of containerization. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
13	FS 1000, Table FS1000-4, Footnote 6	Preserve all samples per the requirements specified in Tables FS 1000-4 through FS 1000-11.	Cyanide sampling containers came pre-preserved from JEA's contract lab. It is not clear from discussion with the sampling team or examination of the field documentation that the sample sources have been characterized for potential cyanide interferences that may require treatment of the collected sample prior to pH adjustment.	**Required CA**: Provide documentation or other explanation for the current practice of preserving cyanide samples by pH adjustment without testing and/or treatment for potential interferences.	**CA Date**: 1/9/2017 **CA**: All sample sources will be characterized (tested) for potential cyanide interferences. Detailed characterization procedure will be included in all applicable field SOPs. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	Per a phone call on 3/8/17 between JEA and department staff, JEA will evaluate the necessity for routinely checking for potential cyanide interferences by testing for the two primary interferences (chlorine and sulfide) at all aggregate permit sampling sites during multiple sampling events. Chlorine and sulfide currently are not suspected at these surface water sites. Documentation will provide justification for either routinely testing for the interferences and conducting treatment (in which case the treatment procedure will be detailed in the JEA Surface Water and Wastewater SOPs), OR not routinely testing for the interferences, and preserving cyanide samples by pH adjustment only. The corrective action described above is acceptable.

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
14	FS 1006	Preserve all samples within 15 minutes of collection per the requirements specified in Tables FS 1000-4 through FS 1000-11.	Sample pH was not initially verified in the field or in the laboratory until mentioned by auditor. Upon testing, samples were not adequately preserved. Samplers did not have extra preservative to ensure proper preservation.	**Required CA:** Carry extra chemical preservatives on the boat in case the preservative added to the bottle before sampling was not sufficient to achieve the required pH.	**CA Date**: 1/9/2017 **CA**: A Preservation Kit with additional preservative for all sample types will be taken in the field. Sampling check list to include adequate supplies of needed preservatives. Sampling SOP has been updated to include pH check in the field. Should additional preservative be needed, it will be documented on the chain of custody. Sample Receiving SOP states that samples to be subcontracted will be checked by the subcontract laboratory. Samples that will remain in-house will be checked in the lab upon receipt except as noted in the Sample Receiving SOP (e.g. Volatiles, Oil & Grease). **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).
15	FS 2110, section 1.1.3	Pump several tubing volumes through the system to flush the tubing prior to collecting the first sample.	Samplers pumped water through the tubing prior to sample collection, however, they had no information upon which to base how much or how long was adequate.	**Recommended CA:** Samplers should determine an equipment volume prior to sample collection to ensure thorough rinsing.	**CA Date**: 1/9/2017 **CA**: Internal SOP has been revised to include DEP requirements set forth in FS 2110, 1.1.3, and FS 2110, 1.2.3.3. The internal SOP's revision of section 10.1 details the proper purge volume and purge time prior to sample collection. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Finding Number	DEP SOP Reference	DEP SOP Requirements	Audit Finding/Auditors' Notes	Recommended or Required Corrective Action (CA)	JEA Response (12/22/2016)	AEQAS Final Response (8/30/2017)
16	FD 1000, section 3.1	Implement review procedures to monitor and verify accurate manual and automated data entry and recordkeeping for all documentation tasks outlined in this DEP SOP.	Field measurements were called out from one sampler at the stern of the boat to another sampler in the wheelhouse and logged directly into a laptop computer.	**Recommended CA**: Have recorder repeat field measurements back to the meter operator to ensure values are being entered correctly into the laptop.	**CA Date**: 1/9/2017 **CA**: Recorder will now repeat measurements back to meter operator to ensure values are correctly entered. Internal SOP section 10.1 has been revised to accommodate DEP requirements for the implementation of explicit procedural operations to assure representative collection of field parameter data when working in unison with multiple technicians. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).
17	FT 1000, section 2.2.2.1; FT 1100, section 2.3.2	The instrument or meter is calibrated or verified at two known values that encompass the range of observed environmental sample measurement(s).	The pH meter was calibrated over the entire range and the calibration was verified before and after sample collection with a 7.00 SU buffer. Although the standards used in calibration span the range of measurements, DEP recommends quantitatively bracketing with verifications as well.	**Recommended CA**: Create a quantitative bracket on all field measurements with verifications (e.g., conduct ICV with 7.00 SU buffer, and CCV with 10.00 SU buffer).	**CA Date**: 1/9/2017 **CA**: Internal SOP section 9 has been revised to include DEP recommendations for quantitative bracketing outside calibration. Field technicians are to read the revised SOP and sign the signing sheet attesting that the SOP has been read and understood. **[note: referenced SOPs are JEA SOPs]**	This corrective action is acceptable (see Note in finding #3 above).

Table 2. Findings of Deficiency for JEA Field and Laboratory Records Audit Conducted on 10/5/16 - 10/6/16

Corrective actions are indicated by DEP as recommended or required. JEA's responses have been reviewed and all corrective actions are acceptable, as noted.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
1	all	all	DEP SOP FD 5000	There is poor linkage between forms, a unique sample ID is not used consistently.	**Required**: Institute quality control measures that ensure the Lims ID portion of the COC is always filled out and checked for accuracy. Review records throughout the lab to ensure linkage is maintained and an outside observer can recreate sample receipt through sample disposal.	The lab will implement a process change to link the samples received throughout the analytical process, in accordance with FD1000 1.6. An example of the sample linkage report has been included in the .ZIP attachment This change, along with the data driver change noted in Finding #8, will enable an outside observer to recreate and verify these records. A review of these records will be incorporated into the field record/sample receipt review process noted in Finding #2. 5/1/17	This corrective action is acceptable.
2	NH3, NOX, TKN	S150403BFEFFMX01, S160408BFEFFMX01, S160316RSMDB1XX01, S160303BFWM4MX01, S160510RSMDB1XX01	NELAC 5.4.12.2.5.1, 5.5.8.3.1	During lab check in, the pH check was not performed or not documented and the non-conformance was not created until these records were requested.	**Recommended:** Set up a quality control check to ensure all tasks were done correctly and all forms were completed. This can be done as a spot check on a subset of records.	A field record/sample receipt review will be implemented at a frequency of at least once a week. 5/1/17	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
3	NH3, NOX, TKN	S150114RSSWA1XX01, S150114RSMDA1XX01, S160316RSMDB1XX01, S160511NRWEP1XX01, S150401BFWTLMX01, S150512RSMTB1XX01, S160301BFWTLMX01, S150114RSMTA1XX01	NELAC 5.4.12.2.5.1, 5.5.8.3.1	The lab check in pH check sheet was not provided by the lab.	**Required:** Provide the missing records or issue non-conformance reports.	New NCR 2017-03-466 has been submitted for samples (Lab IDs) Sl50114RSSWA1XX01, S150114RSMDA1XX01, Sl50114RSMTA1MX01, Sl603l6RSMDB1XX0l, and Sl50512RSMTB1XX01. Preservation check records and NCR #7297 are included in the .ZIP attachment for the other three samples (Lab IDs): Sl60511NRWEP1XX01, S150401BFWTLMXO 1, & S160301BFWTLMXO 1. Sample Receiving SOP will be updated to indicate that preserved samples are verified upon receipt, and the results of the verification are documented. 3/31/17	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
4	NH3, NOx, TKN	S150211NREF2MX01 as an example - this affects most samples	NELAC 5.5.8.2	The sample ID provided to the auditors by the lab does not match the one on the COC. A lab pH check form was provided with the same date and the same field IDs as the COC, but different IDs than those in LIMS. The field collected sample cannot be linked to the data provided by the lab.	**Required**: Explain how samples are linked to the pH check documentation, other than by field ID. If it is not possible to add the Lims ID or HSN number, then come up with a way to link these records, so that an outside observer can verify that acid preservation was checked for each sample.	The process for recording lab receipt preservation checks for the routine, daily samples will be modified. We will use the chain of custody number to link the sample ID with the lab receipt preservation check. The Sample Receiving SOP will be updated to reflect this process. This change will enable an outside observer to verify these records. 5/1/17	This corrective action is acceptable.
5	NOX, TKN, NH3, OP	S150211NREF2MX01 as an example - this affects most samples	NELAC 5.5.8.2	The chain of custody is not complete for most samples. There is no HSN or Lims ID number in the area provided for this. There is no way to link the lab records to the sample collection record.	**Required**: Institute quality control measures that ensure the Lims ID portion of the COC is always filled out and checked for accuracy. Review records throughout the lab to ensure linkage is maintained and an outside observer can recreate sample receipt through sample disposal.	We will implement a process change to link the samples received throughout the analytical process, in accordance with FD 1000, 1.6. This change, along with the data driver change noted in Finding #8, will enable an outside observer to recreate and verify these records. 5/1/17	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
6	NH3, NOx, TKN	S150211NREF2MX01, S150318NREF2MX01, S150403BFEFFMX01, S150508BFEFFMX01, S160129BFEFFMX01, S160301BFWTLMX01	DEP SOP FD 5100, section 1	The amount of acid and lot numbers were not included in the field records.	**Recommended**: Review process for ensuring good communication between samplers and the lab and completeness of field records.	We will develop a process with Wastewater Operations to record the amount of acid and tracking # of acid added to samples requiring chemical preservation in the field records so that it is fully and consistently accomplished within all wastewater treatment plants. 5/1/2017	This corrective action is acceptable.
7	NOX, TKN, NH3, OP	all	NELAC D.1.1.2.1 d)	The spike amount for CCV, MS and some other QC were not clear. Percent recoveries are only given for LCS and it is often a guess as to the concentration expected for MS/MSD, CCV.	**Recommended**: An outside observer should be able to independently confirm that QC are passing. Develop a system so this information is easily accessible.	Reagent and QC check lists for each method will be updated to indicate the concentration of each standard and how it was prepared. This change will enable an outside observer to confirm the QC recoveries. 5/1/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
8	NOX, TKN, NH3, OP	all	NELAC D.1.1.3.1 d)	The MS/MSD are not clearly labeled as to what sample was spiked, it is assumed the sample immediately before the spike is the spiked sample, but the number assigned to the MS/MSD does not clearly link back to the sample ID.	**Required**: Have a system in place for an auditor to easily recreate the process. Recommended: When entering the MS/MSD into the analytical run log, include the Lims ID of the sample used to make the spike. Alternatively, use a spiking log that can be traced back to the batch.	To enable outside observers to easily recreate the process, data drivers will be edited to include columns identifying the Lab ID, LIMS ID and Sample ID. The sample ID ties the MS/MSD to the parent sample. 5/1/2017	This corrective action is acceptable.
9	OP	S150113RSFCEB XX01	DEP Rule 62-160, Table 1	The result was between the MDL and PQL and not qualified with a I.	**Required**: Appropriately qualify data.	The detection limits in LIMS will be updated to the correct rounding I significant figures. This change will eliminate any similar future occurrences. 4/14/2017	This corrective action is acceptable.
10	OP	S160315RSBMB1 XX01, S160315RSBMA2 XX01	NA	The sample ID was not the same on the analytical run, most likely due to transcription error - the first 3 were S15 instead of S16.	No corrective action necessary	Acknowledged; no corrective action necessary.	N/A

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
11	NH3	all	NELAC 5.5.5.2.2.1 d)	The second source standard is not explicitly identified on the analytical run. It can be traced back from the lot numbers.	**Recommended**: Explicitly state which sample is the second source on the reagent and QC checklist.	The Reagent and QC check list will be updated to consistently add the words "second source" to the applicable standard name. 4/14/2017	This corrective action is acceptable.
12	NH3	S150211NREF2MX01	DEP Rule 62-160.700, Table 1	This sample appears to have been used as a matrix spike but with poor recoveries. It was also bracketed by failing blanks that were greater than 10% of the sample concentration. The sample should have had both V and J qualifiers, neither were used. The QC check sheet states the blanks were acceptable (the result was .113, above the PQL). The comments say to see NCR 6305, which was not included.	**Required**: Provide missing NCR and an explanation for the sample not being rerun or qualified. Appropriately qualify any affected samples.	NCR 6305 has been updated to identify the affected sample(s) and reason for qualification. NCR 6305 is included in the .ZIP file for reference. Lab ID S150211NREF2MX01 was not spiked, and all QC associated with this sample was acceptable. The method blank with elevated results was associated with a different prep batch. NCR 2017-03- 488 identifies the samples requiring qualification and is included in the .ZIP file for reference. 3/23/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
13	NH3	S160129BFEFFMX01	NA	The sample was rerun, presumably because of a spike failure. The data packet summary doesn't have any indication that the sample was rerun so there is no way to verify the rationale. The run log notes an NCR, but the NCR does not specify sample ID. The NCR mentions a J2 qualifier, which was not attached to this sample, but was attached to another.	**Required**: Explain the reason the sample was rerun. Ensure the link between the NCR and the individual samples is clear.	The sample (S160129BFEFFMXO 1) was rerun because it was over the calibration range. The rerun of this sample was within the calibration range, and spike recovery was within the acceptable range, and thus qualification was not necessary. NCR #6873 has been updated to include the affected Lab IDs. All lab personnel have been reminded to clearly identify all affected samples on each NCR submittal. The updated NCR and the memo to lab personnel have been included in the .ZIP attachment. 3/2/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
14	NH3	S160408BFEFFMX01	DEP-EA 001/07, section 4.1.4	This sample appears to have been used for the MS and MSD and run 3 times. The result was different each time, which may be why they used a J qualifier. The Non-conformance report was not attached so we did not have an explanation for the reruns. Only the last set of MS/MSD passed.	**Required**: Submit a copy of the NCR and an explanation for rerunning the sample, if not indicated on the NCR. Include a comment when using the J qualifier.	NCR 2017-02-406 has been included for reference in the .ZIP file attachment, which indicates that the rationale for the reruns was not documented at the time of the analysis. A discussion with the Lab Scientist that performed the analysis, who no longer works in that area, failed to identify a reason for the rerun. The J qualifier comment was already footnoted in the Single Sample Report. 3/23/2017	Since this information cannot be retrieved, the NCR is an acceptable corrective action. The lab verbally agreed to have the analysts note the reason when a sample is rerun.
15	TKN	S160509RSDTB1XX01, S160301BFWTLMX01, S160511NRWIM1XX01	EPA 351.2 rev 2	MS/MSD were only run every 15 samples, instead of the 10% required in the method. More recent runs had the correct number.	No corrective action necessary.	Acknowledged; no corrective action necessary.	N/A

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
16	TKN	S160122BFEFFMX01	NA	The reading from the instrument is 1.38, the reading on the data driver is 1.36800. All the readings in this analytical run are slightly different between the raw result and the excel sheet, and it is not obviously due to rounding.	**Required**: Investigate the reason for the discrepancies and provide an explanation.	The discrepancies were a result of a data package assembly error; TKN and TP are analyzed simultaneously on a Seal Auto Analyzer. The initial calibration curve consists of 7 points and a Blank. The analytical batch is run and the data stored. If there is a change made causing results to be re-calculated, another iteration of the run is created by the instrument software and stored under a different name, preserving the original data. In this instance, Calibration Point 7 was dropped from the initial calibration for TKN as the concentration is too low for that method and the data was re-processed for TKN. While the correct TKN data was posted in the LIMS, the incorrect iteration of raw data was put into the TKN data package. The data package review now consists of a check of the raw instrument data against what has been transferred to the data driver and subsequently entered into the LIMS to verify that the correct data has been reported. Staff training in the Nutrient section will be modified to incorporate this particular review into the scientist level peer review. 2/28/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
17	TKN	S150417BFEFFMX01	DEP Rule 62-160.700, Table 1	The first MB after the curve and CCV was 0.341. This was above 10% of the sample result. A V qualifier was required but not used. The blanks were all marked acceptable on the QC checklist.	**Required**: Attach the appropriate qualifier to all affected samples.	A "V" qualifier was added to all affected samples because an incorrect method blank was reported (now corrected). The appropriate use of method blanks was reiterated to all Nutrients Section staff. 3/2/2017	This corrective action is acceptable.
18	NOx	S150512RSMTB1XX01 S160510RSMDB1XX01	DEP Rule 62-160.700, Table 1	A possibly incorrect qualifier was used due to rounding. Both results were below the MDL on the analytical run. The results were rounded and thus equal to the MDL. It may be more appropriate to use a U qualifier in this instance than an I.	**Recommended**: Review the policy on rounding and assigning qualifiers. Consider revision if needed.	The detection limits in LIM S will be updated to the correct rounding I significant figures. This change will eliminate any similar future occurrences. 4/14/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
19	NOx	S160303BFWM4MX01	NELAC 5.4.12.2.1	There is not an exact match for this sample ID on the data package #829992. A sample with one letter different (W) has a result of 0.0367, while the reported result was 0.05. There is no way to confirm it is the correct sample. S160303BFWM4M**W**01 was used instead of S160303BFWM4M**X**01. Because the sample ID could not be verified, the other records could not be searched.	**Required**: Ensure linkage is clear between analytical runs and associated documentation. Provide the correct result for this sample and explain discrepancy.	To enable outside observers to easily recreate the linkage between analytical runs and associated documentation, data drivers will be edited to include columns identifying the Lab ID, LIMS ID and Sample ID. This information will be programmatically added from the LIMS system. The correct reported result was 0.05U, which indicated a non-detect. The analytical result of 0.0367 in the sample was below the method detection limit of 0.05. The lab ID ending in WO 1 was a typo in the data driver. This record has been corrected. 3/2/2017 As noted in Finding #8, the data driver will be automated to pull the appropriate records out of the LIMS system with the correct Lab ID and Sample ID, eliminating the need for typing LIMS IDs into analytical records. 5/1/2017	This corrective action is acceptable.
20	NOx	S150305NREF2MX01, S150512RSMTB1XX01	NELAC 5.5.5.2.2.1 d)	A second source standard was not explicitly identified on these runs. The LCS sample is assumed to be the second source, but auditors were unable to verify.	**Recommended**: Explicitly state which sample is the second source on the reagent and QC checklist.	The Reagent and QC check list will be updated to consistently add the words "second source" to the applicable standard name. 4/14/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
21	NOx	S150305NREF2MX01	NELAC D.1.1.2.1 d)	The lab did not report percent recovery on the driver of the LCS for this analytical run.	No corrective action necessary.	Acknowledged; no corrective action necessary.	N/A
22	NOx	S160609NREF2MX01	NELAC D.1.1.2.1 d)	The recoveries for LCS appeared to have been calculated incorrectly. The auditor confirmed the LCS passed. The recoveries shown on the run log are all around 400%.	**Required**: Ensure no samples were erroneously qualified and correct the documentation.	We determined no samples were erroneously qualified, as the LIMS had calculated the LCS correctly at 97.5% recovery. This issue was specific to the data driver. The incorrect spike amount for the LCS was selected on the data driver. The documentation has been annotated to indicate that, the LCS recovery was calculated to be 97.5%. The annotated data driver and LCS evaluation from the LIMS have been included in the .ZIP file attachment. 3/23/2017	This corrective action is acceptable.
23	NOx	S160121NREF2MX01	NELAC 5.4.12.1.5	Nearly all the MS/MSD recoveries failed in this run. A non-conformance report was attached but not linked to specific samples.	**Required**: Make sure the link between the NCR and the individual samples is clear. Ensure the appropriate qualifiers were attached to the affected samples.	NCR #6849 has been updated to reflect the samples affected. All lab personnel have been reminded to clearly identify all affected samples on each NCR submittal. Both the NCR and the memo to lab personnel are included in the .ZIP file attachment. To ensure that the appropriate qualifiers were attached to the affected samples, the LIMS and data packages were reviewed. 3/2/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
24	NOx	S160121NREF2MX01, S160212BFEFFMX01, S160510RSMDB1XX01, and S160609NREF2MX01	NELAC 5.4.12.1.5	Auditors were unable to calculate column efficiency with the information provided. There are several samples named NO2 STD throughout the runs, but they are not run adjacent to other standards.	**Required**: Provide the method used to determine column efficiency. **Recommended:** Explicitly state what concentration is expected for the NO2 standard and/or show the efficiency calculation on the QC checklist, so that an outside observer can determine if the column is working correctly.	A nitrite standard (N02) is the method used to determine cadmium column reduction efficiency. The concentration of the nitrite standard is 6 ppm. This additional information has been added to the Reagent and QC check list. The data driver has been updated to include the reduction efficiency calculation. 3/2/2017	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
25	Field-Testing Readings	all	DEP SOP FT 1000, section 4.3	A unique meter ID is not recorded on all documentation. The meter ID is sometimes located on the calibration log, but is not recorded on the field meter readings sheet or the chain of custody. Acceptable bracketing of meter readings cannot be verified with existing records.	**Required**: Add the unique meter ID to all field documentation. Ensure that an outside observer can determine if sample readings were bracketed by acceptable calibrations and verifications by following the record trail.	The unique meter ID and the Chain of Custody record number will be included on both the field meter calibration log and the field equipment check list. The Chain of Custody record number will be the primary link for all field documentation.	This corrective action is acceptable, provided that linkage between sample field-testing measurements and meter calibration logs is maintained.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
26	Field DO, pH, Specific Conductance, Temperature	all	DEP SOP FT 1000, section 2	Meter readings are not bracketed by acceptable calibrations and verifications. Time is only recorded for the initial calibration, not the ICV and CCVs. The meters used for continuous monitoring come calibrated, but no ICV is performed prior to deployment.	**Required:** Ensure all meter readings are bracketed chronologically by passing standards. Record the times of all measurements. When meters are calibrated by a vendor, immediately verify the calibrations, prior to deployment.	We will update the field meter calibration log to more clearly identify the chronological and quantitative bracketing requirements. 4/14/2017 JEA leases its continuous meters from vendors. These meters, which are continuous monitors, are deployed in accordance with FDEP Permit # FL0116793. The permit requires continuous monitoring of only temperature and dissolved oxygen. We will verify the calibrations for compliance parameters prior to deployment. 5/1/2017	This corrective action is acceptable. Note: The preliminary finding was based on inspection of records for verifications and calibrations for DO, and the times for the majority of verifications could not be verified. Temperature records were evaluated after the audit visit to the JEA lab facility, and are further discussed in new finding #32. Note: per JEA's response, the audit of pH and specific conductance records was not needed.
27	Field Specific Conductance, Temperature	all	DEP SOP FT 1000, section 2	Meter readings are not bracketed by acceptable calibrations and verifications. In most cases, the same standard was used for initial and continuing calibration verifications.	**Required:** Ensure all meter readings are bracketed quantitatively by acceptable calibrations and verifications. Use a range of standards that encompass all field meter readings.	We will update the field meter calibration log to more clearly identify the chronological and quantitative bracketing requirements. Verification standards will be used to ensure all field meter readings are quantitatively bracketed. 4/14/17	This corrective action is acceptable. Note: The preliminary finding was based on the use of a single standard value for all verifications and calibrations for specific conductance. Temperature records were evaluated after the audit visit to the JEA lab facility, and are further discussed in new finding #32.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
28	Field Readings/ Sample Collection	all	DEP SOP FD 5000, sections 2.1, 2.19, 3; FD 4100, section 3	Auditors were unable to determine which staff performed which duties. There is typically a signature on the chain of custody, but no printed name. It is not clear if the person signing was the one who sampled. Initials matching the signatures were seen on the calibration logs, but it is not clear if that is the same person who collected the samples and took the meter readings.	**Required**: Add a space on the field data sheet for the name or initials of the person taking readings. Specify on the COC, or other field record, the person(s) collecting the samples.	In most cases, the same person takes field meter readings and collects the samples. To account for those instances where it is more than one individual the field data sheet form will note the person(s).	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
29	Sample Collection	all	DEP SOP FD 5000, section 2.18	The depth at which samples are collected and the use of intermediate sample containers is unclear. The chain of custodies all state that samples are grab samples at the surface. The field data sheets record a total depth and a sample depth. The sample depth is too deep to be collected by direct grab in most cases. If an intermediate device is used, it is not recorded.	**Required**: Specify if the sample depth is for meter readings or sample collection. If an intermediate device is used, it must be recorded in the field record.	All surface water samples collected in the St. Johns River are collected in accordance with FDEP Permit FL0620564 (Aggregate Permit), which requires samples to be collected at mid-depth. The surface water identification referenced on the Chain of Custody Record is indicative of the matrix and not the depth at which samples are collected. In addition, the field data sheet will be updated to identify that both sample collection and field meter readings are taken at mid- depth. Because mid-depth at some sites is too deep for direct grab, the intermediate sampling device will be identified on the field equipment check list, which will be linked to the sampling event by Chain of Custody record number. 3/31/2017	This corrective action is acceptable, provided sampling staff are trained to record the actual sampling depth, not just “surface” or “mid-depth.”
30	Field Readings	all	DEP SOP FD 5000, section 2.18	It is unclear from the records which depth is used for meter readings. See finding 29.	**Required**: Specify the depth that meter readings are taken, and distinguish from sample depth if they are different.	As noted in Finding #29, the field data sheet will be updated to identify that both sample collection and field meter readings are taken at mid-depth. 3/31/2017	This corrective action is acceptable, provided sampling staff are trained to record the actual sampling depth, not just “surface” or “mid-depth.”

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
31	Sample Collection	All audited field records (see "field parameters" list in Appendix 1 of final report)	FD 5100, section 1.2	The pH of the samples was not checked or the check was not recorded.	**Required:** Record the results of pH verifications performed in the field, if required by FS 2001, section 4.	The field data sheet for the wetland sampling events will be modified to include a section for recording the requisite information for completing pH verifications in the field. 4/14/17	This corrective action is acceptable.
32	Field Temperature	All audited field records (see "field parameters" list in Appendix 1 of final report)	DEP SOPs FT 1000, section 2; FT 1400, section 2.2	No documentation for a chronological or quantitative bracket for calibration verifications for temperature was available. Note: This finding was not included in the preliminary audit report, and is the result of communications with JEA field staff after the records audit visit at the JEA lab.	**Required:** Ensure all field-testing measurements for temperature are chronologically and quantitatively bracketed by acceptable calibration verifications according to DEP SOP requirements.	Calibration verification of field thermistors at four temperatures by comparison to a NIST traceable calibration thermometer has been implemented. The four-point verification will be conducted quarterly. Single point verification (ICV, and CCV) will be used to establish the consistency of field thermistors (per email communication, 8/17/2017).	This corrective action is acceptable.

Finding Number	Analyte	Sample(s) Affected (field or lab ID)	Relevant standard, rule, or method	Finding	Required or Recommended Corrective Action	JEA Response and Implementation Date	AEQAS Final Response (8/30/17)
33	Field Turbidity	SWA-AE1, SWB-SW1, SWA-AE2, SWA-BM2, SWB-BM1, SWA-AE1	DEP SOPs FT 1000, section 2; FT 1600, section 3	No documentation for a chronological bracket for calibration verifications was available (all test records examined), and no documentation was available for quantitative calibration verification brackets (5 out of 6 records). Note: This finding was not included in the preliminary audit report, and is the result of communications with JEA field staff after the records audit visit at the JEA lab facility.	**Required**: Ensure all field-testing measurements for turbidity are chronologically and quantitatively bracketed by acceptable calibration verifications according to DEP SOP requirements.	Chronological and quantitative bracketing has been implemented for field turbidity. A 1.0 NTU turbidity standard was purchased for low level turbidity quantitative bracketing. A 0.10 NTU* standard will be purchased for quantitatively bracketing field turbidity readings less than 1.0 NTU (per email communication 8/17/17).	This corrective action is acceptable. Note: Due to the potential limits to precision and accuracy for low-level measurements noted by JEA in communications subsequent to the audit, AEQAS staff will assist JEA with the resolution of any calibration verification issues for the low turbidity range.

Appendix 1. Analytes and sample IDs evaluated.

Analyte	Sample Date	Sample ID
Field Parameters	01/13/2015 11:54	S150113RSAEA1XX01
Field Parameters	02/11/2015 10:45	S150211RSSWB1XX01
Field Parameters	03/04/2015 11:30	S150304BFWTLMX01
Field Parameters	04/13/2015 11:42	S150413RSAEA2XX01
Field Parameters	05/15/2015 12:30	S150515NRWE1KB01
Field Parameters	02/03/2016 08:45	S160203BFWTLMX01
Field Parameters	02/11/2016 09:53	S160211RSBMA2XX01
Field Parameters	03/08/2016 14:15	S160308NRWEP1XX01
Field Parameters	03/15/2016 12:43	S160315RSBMB1XX01
Field Parameters	04/04/2016 12:00	S160404BFWTLMX01
Field Parameters	05/06/2016 13:00	S160506BFWM2MX01
Field Parameters	06/13/2016 11:05	S160613RSAEA1XX01
Continuous Monitoring	03/25/15 22:00:33	WEP1
Continuous Monitoring	5/13/2015 12:00	W1M1
Continuous Monitoring	3/9/2016	W1M12
Continuous Monitoring	5/5/2016 18:00	WEP1
Ammonia (NH3)	01/14/2015 10:44	S150114RSSWA1XX01
Ammonia (NH3)	02/11/2015 07:10	S150211NREF2MX01
Ammonia (NH3)	03/18/2015 06:55	S150318NREF2MX01
Ammonia (NH3)	04/03/2015 05:00	S150403BFEFFMX01
Ammonia (NH3)	05/08/2015 05:00	S150508BFEFFMX01
Ammonia (NH3)	01/29/2016 05:00	S160129BFEFFMX01
Ammonia (NH3)	03/16/2016 11:45	S160316RSMDB1XX01
Ammonia (NH3)	04/08/2016 05:00	S160408BFEFFMX01
Ammonia (NH3)	05/11/2016 13:30	S160511NRWEP1XX01
Ammonia (NH3)	06/02/2016 07:10	S160602NREF2MX01
Nitrate + Nitrite (NOx)	01/14/2015 09:55	S150114RSMDA1XX01
Nitrate + Nitrite (NOx)	03/05/2015 07:00	S150305NREF2MX01
Nitrate + Nitrite (NOx)	04/01/2015 10:50	S150401BFWTLMX01
Nitrate + Nitrite (NOx)	05/12/2015 13:24	S150512RSMTB1XX01
Nitrate + Nitrite (NOx)	06/17/2015 07:15	S150617NREF2MX01
Nitrate + Nitrite (NOx)	01/21/2016 07:00	S160121NREF2MX01
Nitrate + Nitrite (NOx)	02/12/2016 05:00	S160212BFEFFMX01
Nitrate + Nitrite (NOx)	03/03/2016 14:00	S160303BFWM4MX01
Nitrate + Nitrite (NOx)	05/10/2016 13:00	S160510RSMDB1XX01
Nitrate + Nitrite (NOx)	06/09/2016 07:00	S160609NREF2MX01
Nitrate + Nitrite (NOx)	01/14/2015 09:55	S150114RSMDA1XX01
Orthophosphate (OP)	01/13/2015 14:40	S150113RSFCEBXX01
Orthophosphate (OP)	03/09/2015 11:48	S150309RSAEA1XX01
Orthophosphate (OP)	05/12/2015 10:32	S150512RSMDB1XX01
Orthophosphate (OP)	05/15/2015 12:30	S150515NRWE1KB01
Orthophosphate (OP)	03/15/2016 12:43	S160315RSBMB1XX01
Orthophosphate (OP)	03/15/2016 12:50	S160315RSBMA2XX01
Orthophosphate (OP)	05/09/2016 11:05	S160509RSAEA1XX01
Orthophosphate (OP)	05/09/2016 11:30	S160509RSDTA1XX01

Analyte	Sample Date	Sample ID
Orthophosphate (OP)	05/10/2016 09:27	S160510RSMTB1XX01
Orthophosphate (OP)	04/08/2015 11:00	S150408NRWM1KB01
Total Kjeldahl Nitrogen (TKN)	05/09/2016 11:15	S160509RSDTB1XX01
Total Kjeldahl Nitrogen (TKN)	03/01/2016 09:10	S160301BFWTLMX01
Total Kjeldahl Nitrogen (TKN)	05/11/2016 12:15	S160511NRWIM1XX01
Total Kjeldahl Nitrogen (TKN)	01/22/2016 05:00	S160122BFEFFMX01
Total Kjeldahl Nitrogen (TKN)	02/12/2016 05:00	S160212BFEFFMX01
Total Kjeldahl Nitrogen (TKN)	06/03/2015 06:30	S150603NREF2MX01
Total Kjeldahl Nitrogen (TKN)	03/18/2015 06:55	S150318NREF2MX01
Total Kjeldahl Nitrogen (TKN)	04/17/2015 05:00	S150417BFEFFMX01
Total Kjeldahl Nitrogen (TKN)	01/30/2015 05:00	S150130BFEFFMX01
Total Kjeldahl Nitrogen (TKN)	01/14/2015 11:55	S150114RSMTA1XX01