



Quality Plan for the NORTHEAST DISTRICT

**Water Resource Management
Technical Support Section**

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Florida Department of Environmental Protection

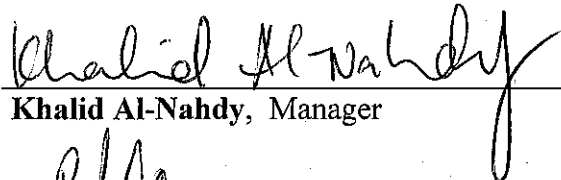
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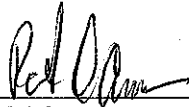
The undersigned have read and understood this Quality Plan, are charged with managing and improving the quality system, and are responsible for ensuring that all staff properly executes the procedures discussed in the plan.

 9-8-10

Melissa Long, Program Administrator Date

 9/7/2010

Khalid Al-Nahdy, Manager Date

 9/7/10

Pat O'Connor Environmental Supervisor II Date
Technical Support Section Supervisor

 09-08-2010

Lee Banks Environmental Specialist III Date
Biology QA Officer

 9/07/10

Bipin Adhyaru Environmental Specialist III Date
QA Officer

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Introduction

The DEP Quality Assurance (QA) program involves the implementation of a management system (planning, review, training, and assessment) to ensure that data collection, generation, interpretation, reporting, evaluation and archiving are of sufficient quality to support Department decisions. The effectiveness of our QA program is dependent upon the actions of all DEP staff, from "front line" employees to management, meaning QA is a function distributed throughout our organization. One aspect of our program is to ensure that Department QA activities are carried out according to commitments made to the Environmental Protection Agency as enumerated in the DEP Quality Management Plan (QMP) (Draft Revision 9/2/08).

The DEP Secretary is committed to implementation of the quality assurance requirements in the QMP and as authorized at 403.0623 F.S. and Chapter 62-160 F.A.C. (the DEP QA Rule). It is the Secretary's intent to carry out these obligations and requirements as detailed in the Department's QA Directive (Draft Revision January 2008).

In order to execute the components of the DEP QA Directive, our unit has developed a quality system. This document describes the steps we take to ensure the scientific and legal defensibility of environmental data we generate or use. It details the process of planning, training, execution, assessment and corrective action we undertake to ensure that environmental data meets our established quality criteria.

Basic Elements of Our Quality Plan

Our Quality Plan explains both the process and criteria by which the quality system is managed. The plan is utilized as an instrument of internal communication to inform our staff of current and future quality assurance activities. It discusses how specific QA duties are assigned to responsible staff. We will revise our Quality Plan as needed, and pledge to ensure the consistent application of procedures and criteria for the generation or use of our environmental data. The Quality Plan will also be used as a training document for new staff and as a reference for experienced personnel. The plan and its revisions also serve as an archival record of our formal quality system.

The elements of our plan are consistent with the Department's Quality Management Plan, Quality Assurance Directive and Quality Assurance Rule (62-160 F.A.C.). In addition, we ensure that our plan for all sampling activities, including field-meter testing, is consistent with DEP SOP FA 3300. Our plan addresses all activities associated with sampling, field testing, lab analysis and data review of any type, including those activities associated with database construction and management. Our plan also discusses how decisions about data use are made based on data quality assessments.

Where appropriate, we cite existing internal and external documents, including training manuals, guidance documents, SOPs, Rules, tables, etc. [Cite other documents where applicable throughout the quality plan]

We expect all staff to understand and follow the procedures and criteria as discussed in this plan, and to carry out their assigned responsibilities for effective utilization of our quality system.

1.0 Statement of Policy

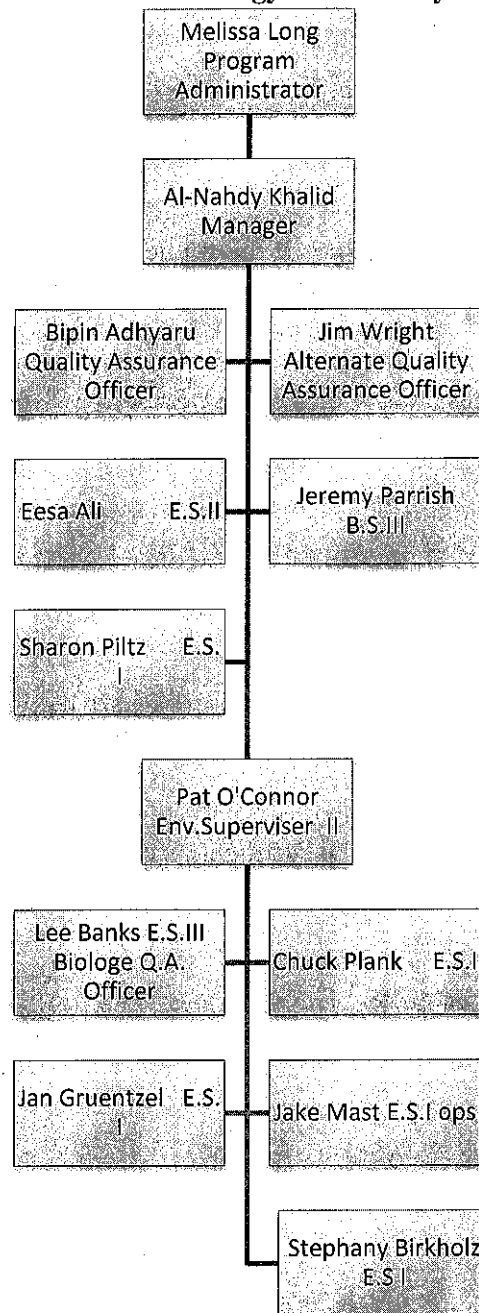
The Northeast District's Technical Support Section (Biology/Laboratory Group) of the Florida Department of Environmental Protection performs studies of interest to the State and the Department and performs field sampling and laboratory analyses of certain water quality and biological parameters. In accordance with Chapter 62-160, F.A.C. (DEP QA rule) the Northeast District Watershed Management and the Monitoring Program follow the applicable collection and quality control protocols and requirements described in DEP-SOP-001/01 (12/03/2008). This Quality Manual is in conjunction with DEP-SOP-001/01 Standard Operating Procedures is intended to provide guidance for the Section in performing these studies and analyses. The Northeast District Technical Support Sections believe in sound and useful Quality Assurance/Quality Control management practices.

2.0 Ethics

All employees of the DEP Northeast District Laboratories are held to high professional ethical standards in the performance of their duties. All employees are required to read, understand and sign an 'Ethics Statement' attesting to their commitment to honesty and integrity in performance of their duties. Improper, unethical or illegal actions will be dealt with according to the published Administrative Directives of the Florida Department of Environmental Protection.

3.0 Organization and Responsibility

Figure 3.1 Northeast District Biology/Laboratory Organization Chart



3.2 Key Personnel and Position Descriptions

- *A. **Pat O'Connor**: Environmental Sup.II; Technical Support Section Supervisor. Supervise Field Sampling, Biology and all functions of the Tech Support Section
- *B. **Bipin Adhyaru**: Environmental Specialist III, NED QA Officer, Coordination of and Participation in the quality evaluation of data used by the district;
- Oversight of staff performance of assigned QA functions;
 - Conducts systems audits of internal and external data generators (lab and field) and conducts sampling performance audits;
 - Ensures that corrective actions are implemented for data non-conformance incidents as determined by evaluation of the data against our program's Data Quality Objectives;
 - Assists program managers in the development of the Quality System and other logistical aspects of its implementation, such as coordinating associated training needs; and
 - Coordinates data reviews documents all program QA activities, including training, audits and corrective actions and uses this information when assisting the DEP QA Coordinator with compiling the DEP QA Report to the Secretary.
- *C. **Jim Wright**: Environmental Specialist III; Alternate QA/QC Officer for North East District. Performs Performance Audit Inspection.
- *D. **Lee Banks**: Environmental Specialist III; QA/QC Officer for Biology Laboratory. Participates in laboratory analysis of biological samples as well as data verification and data management.
- E. **Eesa Ali**: Environmental Specialist II; Participates in field activities which include water quality and biological sample collection. Also shares responsibility for data verification and entry.
- F. **Sharon Piltz**: Environmental Specialist I; Participates in field activities which include water quality and biological sample collection. Also shares responsibility for data verification and entry.
- G. **Jeremy Parrish**: Bio.Sci. III Participates in field activities which include water quality and biological sample collection. Also shares responsibility for data verification and entry.
- H. **Jake Mast**: Environmental Specialist I:
Participates in the field activities, which include water quality and biological sample collection.
- I. **Chuck Plank**: E.S.I: Participates in the field activities, which include water quality and biological sample collection.
- J. **Jan Gruentzel**: E.S.I: Participates in the field activities, which include water quality and biological sample collection.

(Indicates the individual is an approved signatory for purposes of this program.)*

3.3 Approved Signatories

(See section 3.2 above)

3.4 Personnel Training

All field/laboratory personnel are adequately experienced and/ receive necessary training for the duties they are to perform. Training files contain certification that each analyst has read, understood, and agreed to perform the most recent version of the test methods (DEP-SOP-001/01). Training records are maintained on each employee who is trained in skills commensurate with their responsibilities. Field staff training is consistent with FA 2100. Personnel are required to annually review all Standard Operation Procedures (SOPs) that pertain to the work they perform within the program. Establishment of experience and/or training must be documented for each employee. Training courses and workshops on specific equipment, analytical techniques or laboratory procedures shall be documented and filed in the personnel records.

The latest official versions of SOPs are located on the FDEP Internet site and are accessible to all personnel involved in field and/or laboratory activities. Hard copies of the SOPs are maintained by the QA Officer as well as the Program Manager.

3.5 Specialized Training

Field sample collection training demonstration of capability shall be included as a part of the training records. Training for bioassessments is consistent with FA 4300.

3.6 Certification

Certifications for biology lab procedures maintained as per FS 7000 series.

4.0 Documentation

4.1 Record Generation and Storage

Field data sheets are generated for all water quality sample and biological (macro invertebrate) monitoring activities. Hard copies of these sheets as well as lab bench sheets and reports are retained in accordance with the Department's Records Management policies. Reports containing the results of ongoing Taxonomic Round Robin testing are periodically made available to District staff in electronic report format, spreadsheets, by Tallahassee QA staff and are also kept by the District Laboratory Manager.

4.2 Document Control and Maintenance

4.2.1 Chapter 119 of Florida Statutes

Chapter 119 of Florida Statutes sets standards for public records. These standards apply to laboratory records regardless of whether the laboratory is in operation.

Chapter 119, F.S. can be found at this Internet address:

http://www.flsenate.gov/statutes/index.cfm?App_mode=Display_Statute&URL=Ch0119/titl0119.htm&StatuteYear=2000&Title=-%3E2000-%3EChapter%20119

4.2.2 Directive 335

The Department of Environmental Protection's Records Management Policy is set in Directive 335. It can be found at this Internet address:

<http://www.dep.state.fl.us/admin/depdirs/pdf/dep335.pdf>.

The minimum retention time for laboratory records is five years after the date of project completion or permit cycle unless otherwise specified in a Department contract, order, and permit or Title 62 rules.

4.2.3 Florida Department of Environmental Protection Records Retention Schedule - Laboratory Records

4.2.3.1 Laboratory Notebooks

This record series consists of, but is not limited to notebooks containing calibration, certificate of analysis for calibration standards, equipment maintenance.

Retention:

- a) Record copy. 10 fiscal years provided applicable audits have been released.
- b) Duplicates. Retain until obsolete, superseded or administrative value is lost.

4.2.3.2 Raw Laboratory Data

This record series consists of, but is not limited to raw data generated by the Chemistry/Biology laboratories from analytical samples of soil, water, waste, tissue, etc.

Retention:

- a) Record copy. 10 fiscal years provided applicable audits have been released.
- b) Duplicates. Retain until obsolete, superseded or administrative value is lost.

4.2.3.3 Chemistry Information Files

This record series consists of memos and correspondence, which is directly related to the workings of this particular section and its projects. Also included are current articles, which are pertinent to the projects of this section. These files are used as current reference material.

Retention:

- a) Record copy. 3 fiscal years provided applicable audits have been released.
- b) Duplicates. Retain until obsolete, superseded or administrative value is lost

4.2.3.4 Final Reports

This record series consists of, but is not limited to final reports of tests and analytical samples conducted by the Chemistry/Biology laboratories. Reports detail sample results for soil, water, waste, tissue, etc.

Retention:

- a) Record copy. 10 fiscal years provided applicable audits have been released.
- b) Duplicates. Retain until obsolete, superseded or administrative value is lost.

4.2.3.5 Laboratory Equipment Warranties and Procedures

This record series consists of, but is not limited to guarantees and warranties relating to laboratory equipment inspection reports, fire evacuation plans, purchase instructions for tax-free alcohol, controlled drugs, etc., used in research.

Retention:

- a) Record copy. 1 year after expiration.
- b) Duplicates. Retain until obsolete, superseded or administrative value is lost.

4.3 Types of Documents/Reports

The following documents are generated by the Northeast District Technical Support Section as a result of field sampling and Biology Laboratory activities:

Table 4.3.1 Documents and Forms

<i>Document</i>	<i>Format</i>	<i>Example Provided</i>
<i>Water Quality Data Sheet/Sample Custody Log</i>	Electronic & hardcopy	Attachment: NEDFielddoc.001
<i>Physical/Chemical Characterization Form</i>	Electronic & hardcopy	FD 9000-3
<i>Stream/River Habitat Assessment Field Sheet</i>	Electronic & hardcopy	FD 9000-5
<i>Stream/River Habitat Sketch Sheet</i>	hardcopy	FD 9000-4
<i>Lake Habitat Assessment Field Sheet</i>	Electronic & hardcopy	FD 9000-6
Field Instrument Calibration Records	hardcopy	Attachment: NEDFielddoc.002
Field Instrument Maintenance Logs	hardcopy	Attachment: NEDFielddoc.003
<i>Stream BioRecon Field Sheet</i>	Electronic & hardcopy	FD 9000-1
<i>Macro invertebrate Sorting Log</i>	Electronic & hardcopy	Attachment: NEDFielddoc.004
<i>Biology Sample Control Log</i> and QA forms	Electronic & hardcopy	Attachment: NEDFielddoc.005
Ecosummary Reports	Electronic	

(Items in italics indicate official form names)

4.3.1 Forms, Labels, and Logs

The forms are consistent with FD 9000 of the DEP SOPs.

4.4 Sample Identification, Chain of Custody and Sample Acceptance

4.4.1 Sample Identification

Stations sampled throughout the Northeast District are identified by a unique STORET number, which is assigned prior to or immediately after the first sample event. Biological samples from these sites are identified by an alphanumeric system that identifies the type of sample: **BR** (Biorecon), **FQI** (Floristic Quality Index), and **LCI** (Lake Condition Index).

Examples: 050001BR = Sample No. 1 in year 2005, Biorecon
050212FQI = Sample No. 212 in year 2005, Floristic Quality Index

4.4.1 Sample Identification (cont.)

Macro-invertebrate sample status is tracked through the use of the *Northeast District Biology Laboratory Sample Control Log* and Quality Assurance Documentation. Upon receipt in the lab samples are logged into the *Macro invertebrate Sample Control Sheet* with the following information:

- QA#
- Water Body Name
- STORET Station #
- Sample ID #
- Date and Time Sampled
- Sample Collection Team
- Lab Check-in Date
- Original Sorter
- QC Sorter Name
- Date Sorted
- Location of Sample
- Identifying Taxonomist
- ID Date
- Sample Disposition
- Notes

Water Chemistry samples are identified by STORET number and date on the Water Quality Data Sheet/Sample Custody Log. Water samples are assigned a unique lab sample number and logged in to the District's *Current Lab Work Spreadsheet before shipment to central laboratory or overflow laboratory.*

4.4.2. Routine Sample Custody

Samples are collected by field personnel according to DEP-SOP-001/01,

If sample bottles are provided by the Central Laboratory, custody begins at the point of sample kit preparation. After collection, the samples are shipped to the Central Laboratory by common carrier or are hand-delivered by the field staff. Collectors are required to include field data sheets with the submitted samples. Minimum information required includes:

- (a) A unique sample location/field ID combination.
- (b) The date and time of sample collection
- (c) The collector's name
- (d) The submitting agency
- (e) The sample matrix
- (f) The analyses requested

The *Water Quality Data Sheet/Sample Custody Log* sheet will be the Chain of Custody. Upon returning to the laboratory with samples the sampling group will date and sign the Chain of Custody entries on the field sheet releasing the samples to the Central laboratory through shipment.

The Chain of Custody includes the following fields:

Completed by sampler:

- 1) Delivered by (person's initials)
- 2) Location
- 3) Date
- 4) Time

4.5 Client Confidentiality

(See sec 8.2)

5.0 Capabilities, Equipment and Sample Handling

This QA Manual covers the biological and physical-chemical aspects of the laboratory and field capabilities of the Northeast District Technical Support Section.

5.1 Sampling Capabilities

Table 5.1. Sampling Capability

Parameter Group	Sample Source
Algae for taxonomy	Surface water
Benthic macro invertebrates for taxonomy	Surface water, sediments
Microbiology	Surface water, effluents, leachates
Physical/Chemical analyses	Surface water, effluents, leachates

5.2 Sampling Procedures

Table 5.2 Sampling Procedures

Parameter Group	Sample Procedure (Section of DEP-SOP-001/01)
Algae for taxonomy	FS1000, FS2000, FS2100, FS7000, FS7001, FS7100, FS7200, FS7220
Benthic macro invertebrates for taxonomy	FS7000, FS7001, FS7400-7460, FT3000-3200,
Microbiology	FS1000, FS2000, FS2100, FS2400
Physical/Chemical analyses	FS1000, FS2000, FS2100, FS2400, FT1000, FT1100, FT1200, FT1300, FT1400, FT1500, FT1700, FT1800

The acceptability of field supplies and equipment are specified in FA 3100, FC 1001 and 1002, FD 2000, FT 1000, and the FT series and Table FS 1000-1, 1000-2, and 1000-3 of the DEP SOPs.

All standards, reagents, and water supply are supplied by the district chemistry laboratory with all lot numbers monitored as to expiration dates. Sample containers are supplied from DEP central lab.

5.2.1 Non Standard Methods and Procedures

No such non-standard methods or procedures are undertaken at this time.. Should the need arise, these issues will be addressed in accordance with Rule 62-160.330 FAC, FA 2100 and FA 2200 of the DEP SOPs.

5.3 Field and Laboratory Test Methods

Table 5.3.1 Field Phys/Chem. Test Methods

Parameter	Matrix	Method #	DEP SOP #	Calibration Acceptance Limits
Conductivity	Effluent Surface water Leach ate	SM 2510 B	FT1200	+/- 5%
Dissolved oxygen	"	SM 4500-O G	FT1500	+/- 0.3 mg/L
pH	"	SM 4500-H+ B	FT1100	+/- 0.2 unit
Salinity	"	SM 2520 B	FT1300	+/- 5%
Temperature	"	SM c 0.1	FT1400	+/- 0.2 °C
Turbidity	Effluent, Surface water, Leach ate	EPA 180.1	FT1600	* Footnote
Phytoplankton Sampling	Surface Water		FS7100	The accuracy of field test measurements is reflected in the acceptance criteria for continuing calibrations as specified in the FT series of the DEP SOPs
Periphyton Sampling	Surface Water		FS7200	"

Macrophyton Sampling	Surface Water		FS7300	"
Benthic Macrophyte Sampling	Surface Water		FS7400	"
Rapid Bioassessment	Surface Water		FS7410	"
Stream Condition Index	Surface Water		FS7420	"
Hester Dendy Sampling	Surface Water		FS7430	"
Dredge Sampling	Surface Water		FS7450	"
Lake Condition Index	Surface Water		FS7460	"

* Standard Value = 0.1-10 NTU: the response must be within 10% of the standard;

Standard Value = 11-40 NTU: the response must be within 8% of the standard;

Standard Value = 41-100 NTU: the response must be within 6.5% of the standard; and

Standard Value > 100 NTU: the response must be within 5% of the standard.

5.4 Sampling Equipment

Table 5.4.1 Surface Water Sampling Equipment List

Sampling equipment is consistent with FS 1001 and Tables FS 1000-1 through FS 1000-3 and Figure FS 1000-1 of the DEP field SOPs.

<i>Equipment Type</i>	<i>Use</i>	<i>Parameter Groups</i>	<i>Restrictions/Precautions</i>
Hester-Dendy multiplate sampler	Sampling	Benthic macro invertebrate	(1)
Dip net	Sampling	Benthic macro invertebrate	(2)
Sieve	Sampling Benthic macro invertebrate		(2)
Periphytometer	Sampling Periphyton	algae	(3)
Microscope slides	Sampling	Periphyton algae	None
Bucket	Sampling Phytoplankton algae		None
Whirlpak™ bag	Sampling Transport	All bacterial parameters, sediment grain-size, Hester-Dendy samplers	(4)
Formalin	Sample preservation Benthic	macro invertebrates, periphyton algae for identification	(5)
HCl, HNO ₃ & H ₂ SO ₄	Sample preservation	Metals, organics, nutrients, as appropriate	Replace each trip
APHA sampler	Grab sampling at specific depth	Nutrients; plankton	Not for metal sampling

Narrow-range pH paper	acid-preservation check	Metals, organics, nutrients, as appropriate	None
Waders	Sampling Benthic macro invertebrate,	periphyton & phytoplankton algae	None
Glass bottles	Sampling	All bacterial parameters; BOD; toxicity bioassay and AGP/LN algal assay; organics; oils and greases; nutrients; phytoplankton.	(4)
Plastic bottles	Sampling	All bacterial parameters; BOD; phytoplankton; AGP/LN algal assay; nutrients; metals	(4)
Sampling Pole	Sampling	Bacterial parameters, Toxicity bioassay; chemical analyses; plankton	None
Van Dorn bottle	Grab sampling at specific depth	metals, nutrients; plankton	None
Automatic sampler	Sampling	Nutrients, BOD, metals, Toxicity bioassay	(7)

Table 5.4.1 Surface Water Sampling Equipment List (continued)

<i>Equipment Type</i>	<i>Use</i>	<i>Parameter Groups</i>	<i>Restrictions/Precautions</i>
YSI and Logger Series 6000	Sampling	Conductance, pH, temperature, depth, Dissolved Oxygen	None
Secchi disc	Insitu Measure	Light Penetration	As per FT 1700
Hydro lab	Sampling	Conductance, pH, temperature, depth, Dissolved Oxygen	None

Table 5.4.2 Sediment Sampling Equipment List

Equipment Type	Use	Parameter Groups	Restrictions/Precautions
Ekman Dredge	Sampling	Benthic macro invertebrates; grain-size; chemical analyses	(8)
Petite Ponar Dredge	Sampling	Benthic macro invertebrates, grain-size, chemical analyses	(9)
PVC Coring Device	Sampling	Benthic macro invertebrates; grain-size; chemical analyses for metals, nutrients	none
Tray, porcelain, plastic & stainless steel	Sampling	Benthic macro invertebrates, mixing samples for chemical analysis	(10)

Plastic scoop	Compositing; sampling	Grain-size; chemical analyses for metals, nutrients	none
Wash Bottle	Sampling	Benthic macro invertebrates	none

1. Plates that have been contaminated with toxicants or preservatives cannot be reused.
2. Sieve must be a U.S. Standard No. 30 (28 meshes per inch, 0.595 mm openings). Dip-net mesh must be no larger than U.S. No. 30.
3. Vandalism can be a problem at sites with public access.
4. When chlorinated waters are collected, the sample bottle must contain sodium thiosulfate as a dechlorinating agent for bacterial sampling other than BOD or Microtox.
5. Formalin should be buffered to a neutral or slightly alkaline level with sodium bicarbonate.
6. Device will be pre-rinsed with water to be sampled before collecting actual sample.
7. Submerge intake hose/tubing below surface of water to be sampled, whether effluent or receiving body of water. Run pump for 5 minutes prior to collecting sample to thoroughly flush pump and its hoses/tubing.
8. Light weight so that jaw does not penetrate hard substrates; inefficient in deep water or where there is moderate current.
9. Less efficient in coarse gravel; jaws can be blocked by stones, sticks, and other debris causing loss of part of the sample; not efficient in swiftly flowing water of over one m/sec velocity.
10. Tray should be white to facilitate complete rinsing of the material into the sample container.

5.4.3 Biology Lab Analytical and Support Equipment

<i>Equipment</i>	<i>Model</i>	<i>Use</i>	<i>Parameter</i>	<i>Restriction/Precaution</i>
Compound Microscope	Leica DME,	Species Identification	Macro invertebrates	None
Compound Microscope	Swift	Species Identification	Macro invertebrates	None
Dissecting Microscope	Leica MZ75	Species Identification	Macro invertebrates	None
Dissecting Microscope	Leica Stereo Zoom 7	Species Identification	Macro invertebrates	None

5.5 Sample Handling, Field Data, Containers, Preservation and Holding Times

Samples and field data will be completed in accordance with DEP- SOP-001-01. Samples will be handled with a Northeast District's Field Sheet Chain of Custody. Samples to be analyzed by the Tallahassee laboratory will be entered into the Tallahassee LIMS system before the sample date.

5.5.1 Sample Handling

Central Laboratory in Tallahassee:

Samples to be sent to the Central Laboratory in Tallahassee, sample requests (RQ) must be pre-approved in the Laboratory Information Management System (LIMS). Sampling events requiring analytical work by the Central Laboratory in Tallahassee must be scheduled with the Central Laboratory prior to sending samples. LIMS requests will be written in the LIMS system to schedule Tallahassee laboratory work. The Tallahassee Laboratory will send coolers with proper sample containers for each scheduled event. Samples will be shipped back to the Tallahassee Lab with sufficient quantities of ice to keep samples at 4 Degrees Centigrade during transport to the lab.

5.5.2 Field Data

Field data will be collected in accordance with all applicable DEP- SOP-001-01. The results will be written in ink on the field data sheet.

5.5.3 Sampling Containers, Preservatives and Holding Times

Sampling Containers, Preservatives and Holding Times are performed according to DEP SOP

FS 1000 <http://www.floridadep.org/labs/qa/sops.htm>

5.5.4 Decontamination Procedures

Decontamination procedures follow FC 1000 and FS 1001 of the DEP SOPs.

5.5.5 Waste Disposal

Waste quantity is a minute amount. It is captured and returned to district office for disposal and is consistent with FS 1011 of the DEP SOPs.

6.0 Instrument Calibration and Maintenance

The Northeast District's field tests for the parameters are listed in Table 5.3.1. Currently the District uses YSI 6000 Series and Hydro lab meters for field measurement of pH, Conductivity, Salinity, Temperature and Dissolved Oxygen.

6.1 Calibration

Field meters are calibrated in strict accordance with the criteria presented in DEP-SOP-001/01 FT1000 as well as FT1100, FT1200, FT1300, FT1400 and FT1500 for pH, Conductivity, Salinity, Temperature and Dissolved Oxygen respectively. Each of the referenced SOPs addresses source preparation and documentation of standards as well as procedures used to generate, assess and document calibrations. YSI and Hydro lab meters are calibrated at the beginning and end of each day to check for reading stability.

6.2 Maintenance

Field meters are maintained in accordance with the criteria presented in DEP-SOP-001/01 FT1000 section 3.

Preventative and corrective maintenance follow FS 1007, Table 1000-10, FT 1000, and the FT series of the DEP SOPs.

Calibration and maintenance of biology lab microscopes are performed annually by outside service contractor. Biology personnel performed Inspection and cleaning.

7.0 Review and Assessment

7.1 Quality Control

Acceptable quality control as specified in LQ 7000 must be met.

7.1.1 Field QC Checks

Benthic Macro invertebrates

Each time a grab sample is pulled, the dredge is inspected to determine that it has closed completely and that no material has been lost. Dip nets are inspected before use to assure that no holes are present. At least three pseudo-replicates are used for Hester-Dendy Multiple samples. For each type of macro invertebrate sampling performed one in ten samples are taken in duplicate and analyzed.

Physical-chemical parameters (including Chlorophyll a and Microbiology)

One in ten samples is taken in duplicate and analyzed. Blanks consisting of analyte-free water are placed in sample containers from the same batch that samples are being collected in, labeled similarly, and preserved in the field with the same preservatives and methods used to preserve the real samples. These blanks are prepared for all types of samples and are prepared at a rate of one blank or 10% of the samples taken of each type, whichever is greater. If the Van Dorn bottle is cleaned in the field then a field blank will be prepared by rinsing it with analyte-free water and collecting the rinse water.

The quality control procedures are consistent with FQ1000 (blanks, duplicates, and other QC samples) and FT 1000 (calibration, requirements, and acceptance) of the DEP SOPs.

7.1.2 Biology Lab QC Checks

Benthic Macro invertebrates

References approved for use in the identification of organisms are listed in Appendix A of the Quality Assurance Manual for the Biology Section FDEP Tallahassee 12/31/03. Species diagnoses are consulted before a final identification is made. In addition, a reference collection is maintained (and continually updated) so that organisms from a given sample can be compared to an already verified "type" material. Organisms that cannot be positively identified by use of references and/or knowledge of the biological staff will be sent to outside experts for identification. These analyses are generally performed as part of a more extensive study and interpretive reports including results of the QA checks detailed in Sections 11 and 12 are generated as part of the final study report.

Taxonomic identification efficiency is assessed and tracked for each District taxonomist through the ongoing FDEP Taxonomic Quality Control Round Robin program. Each quarter every taxonomist must submit to Tallahassee a list of the macro invertebrate samples completed during the previous quarter. From that list Tallahassee staff randomly selects a sample to be submitted for complete re-analysis by another taxonomist in a different lab. Original ID's and counts vs. QC ID's and counts are tracked by use of an electronic resolution form. Tallahassee staff prepares and provides a spreadsheet summarizing cumulative performance for each taxonomist.

Macro invertebrate sample sorting efficiency is performed in accordance with DEP-SOP-001/01 LQ7410. At least 10% of the aliquots sorted by each taxonomist are randomly selected and resorted.

Demonstrations of capability are consistent with the requirement of FA 4300 and LQ 7000 of the DEP SOPs.

7.1.3 QC Criteria

Physical-chemical parameters (including Chlorophyll a and Microbiology)

QC criteria against which quality control measures are checked according DEP SOP- FQ 1000.

Benthic Macro invertebrates

For both taxonomic identification and macro invertebrate sorting the QC criteria are 95% cumulative efficiency.

The QC measures are consistent with LQ 1000 of the DEP SOPs.

7.2 Data Review

Our program understands the need to evaluate the quality and usefulness of environmental data prior to making decisions. We conduct the following review procedures to **determine the usability of data for determination of compliance with permits or rules, etc.** These procedures are based on our established Data Quality Objectives and Data Quality Indicators, and incorporate the concepts and criteria found in DEP's "Process for Assessing Data Usability", DEP-EA-001/07.

7.2.1 Data Reduction

Benthic Macro invertebrates

Macro invertebrate identifications and count data are recorded on laboratory bench sheets. These data are entered into the macro invertebrate module of the Biology Section's *Statewide Biology Database (SBIO)* computer software. This consists of a 4th Dimension database front-end to an Oracle database on the departmental server. All data are stored in the Oracle database on the server. Species names are selected from a master list contained in the database to prevent typographical errors and any new species that are verified by the Database Administrator before being added to the master species list. Two taxonomists proof original bench sheets against data entries to confirm the count information, correct species are entered and data are associated with the correct station, replicate, and date. A data retrieval module permits data subsets to be gathered for further analyses. Prior to statistical analysis, the database program crosschecks sample dates and station designations. Calculations of population density, diversity, and other measures of community status are achieved through the use of other program modules in conjunction with various commercial statistics programs. Population density is expressed as individuals/m² for Hester-Dendy and dredge samples. For timed qualitative sampling, population components are expressed as proportional percentages of the community encountered.

7.2.2 Data Verification

Benthic Macro invertebrates

Concurrent with the data reduction measures taken in 9.2.1 above, one analyst will enter the data from the bench sheet into the *Statewide Biology Database* (SBIO) while a second analyst verifies the content and accuracy of each entry. Once this process has been completed all entries are marked complete in SBIO which results in community variables and scores being calculated and stored. All data are stored in an Oracle database on the FDEP Server.

7.2.3 Data Validation

Physical-chemical parameters

The process of transferring data from the Laboratory monthly spreadsheet into STORET database includes an intermediate process whereby data are first entered into Florida STORET via the STORET Interface Module (SIMS). The program electronically reviews each data set for required data quality elements. If there are errors or omissions detected the data will not be uploaded into STORET until such items are corrected.

Benthic Macro invertebrates

For macro invertebrate data verified as described in 7.2.2 above, community variables and scores are calculated and stored electronically.

7.3 Audits and Corrective Actions

Audits provide objective feedback concerning the effectiveness of our program's quality system, and may identify areas in need of improvement. Therefore, our unit performs the following activities as discussed below:

Audit:

The QA Officer will provide for internal audits at least annually for field sampling activities. Field sampling activities includes surface water sampling, compliance and enforcement sampling for waste water. Also conduct performance audit inspection as required by permit. QA officer report the findings to the manager for corrective action.

Corrective action:

All deficiencies will be corrected as soon as possible but no more than 15 days after audit report. All corrective action is reported to QA officer.

Benthic Macro invertebrates

If it is determined from a QC check that an individual has overlooked more than 5% of the organisms in a sample, each sample processed by that individual will be checked until picking efficiency is acceptable.

If it is determined (through expert verification or changes in taxonomy) that an incorrect or obsolete name is given to an organism, appropriate changes in data sheets and computer databases are made to reflect the corrected nomenclature. These changes are limited in scope to a

given study. Individuals who sort Benthic Macro invertebrates are responsible for checking the picking efficiency of co-workers. For evaluation of picking efficiency, the sediment and plant residue are placed in glass jars and not discarded. A co-worker then examines this residue, looking for any organisms that may be remaining. Any corrective actions for picking and taxonomic deficiencies are approved by the appropriate supervisor. External sources that initiate corrective action include knowledge gained through training workshops and new reference material, and taxonomic verification by experts. Laboratory personnel are notified of problems and corrective action through discussion with supervisor, and in conjunction with performance evaluation procedures.

7.4 Procedures for Reporting Exceptions

The laboratory will make every effort not to deviate from the analytical procedures. If circumstances arise that require deviations from standard policies or practices of the laboratory (i.e. insufficient sample volume, unusual pH) those deviations will be documented with the analytical reports. Result codes and comments will be used to qualify data reports. Any deviations will be reported to the client and will be documented in all related records.

Reporting unacceptable results is consistent with reporting requirements outlined in the FT 1000 series.

7.5 Audits

7.5.2 Benthic Macro invertebrates

7.5.2.1 Internal Audits

Annually, all field procedures will be internally reviewed and evaluated for appropriateness by the subsection field supervisors. These internal field system audits will include: proper choice of macro invertebrate sampling procedures (dip net, dredge, Hester-Dendy, and coring devices), algal sampling procedures (phytoplankton grabs, periphytometers), water sampling procedures (bacteria, nutrients, chlorophyll *a*, algal growth potential, organics, metals, and toxicity bioassay), and habitat assessment for the sampling goals. Additionally, log books, field sheets, calibration logs, and other documentation will be investigated to ensure that QA/QC concerns are properly addressed. These program components will be evaluated against the requirements of DEP-SOP-001/01 and deficiencies will be noted and addressed.

7.5.2.2 External Audits

External systems audits in the form of EPA QA field and laboratory checks occur at a frequency determined by EPA. External audits by Florida DOH in the form of laboratory certification inspections are performed annually or as requested by the DEP Bureau of Laboratories. Any audits by DEP QA Section occur at a frequency determined by them. Additionally, audits are continually performed through the observation of the analysts by supervisory personnel.

7.5.2.3 Reports to Management

Reports to management are consistent with the procedures outlined in FA 3250 of the DEP SOPs.

8.0 Consumer Relations

8.1 Complaint Handling

Every effort will be made to resolve complaints in the best manner possible. Any resolution must take into account all quality, facility and personnel requirements and if possible measures to prevent reoccurrences of the situation.

8.2 Confidentiality

All records and documents generated by the DEP Northeast District, except those associated with active criminal investigations, are public records and may be subject to disclosure according to the guidelines and exceptions published in Chapter 119 of Florida Statute

References

Quality Manual for State of Florida Department of Environmental Protection Northeast District Laboratory – March 2005. Florida Department of Environmental Protection Northeast District Laboratory, Jacksonville, FL

Standard Methods for the Examination of Water and Wastewater (designated SM), 20th Edition, American Public Health Association, Washington, DC, 1998.

Department of Environmental Protection Standard Operating Procedures for Field Activities (DEP-SOP-001/01) – February 1, 2004, Florida Department of Environmental Protection Bureau of Laboratories Environmental Assessment Section, Tallahassee, FL.

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