

Standard Operating Procedure

Continuous Water Quality Monitoring

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Rutgers University-Newark

NJDEP Laboratory Certification Number: 02437



Table of Contents

Contents	Description:	Page Number
1.0	INTRODUCTION, SCOPE AND APPLICABILITY	3
2.0	TERMS AND DEFINITIONS	3
3.0	MANGEMENT REQUIREMENTS	3 - 7
4.0	CORRECTIVE ACTION	7
5.0	PREVENTATIVE ACTION	7
6.0	CONTROL OF RECORDS	7 – 8
7.0	ENVIRONMENTAL TEST METHODS AND METHOD VALIDATION	8 – 11
8.0	HANDLING SAMPLES AND TEST ITEMS	11
9.0	QUALITY ASSURANCE FOR ENVIRONMENTAL TESTING	11
10.0	REPORTING	12-13
11.0	SIGNED AGREEMENTS	14

1.0 INTRODUCTION, SCOPE AND APPLICABILITY

1.1 INTRODUCTION:

The Meadowlands Environmental Research Institute (MERI) mandate is to preserve, protect and research the valuable marshes that spread through 14 towns in New Jersey. The laboratory performs both scientific research and regulatory testing. Information and data generated by MERI for its clients under permit is scientifically credible as analysis adheres to strict guidelines set forth by the NJDEP. MERI's management is committed to generating data of the highest quality to fulfill all aspects of the laboratory's operation.

1.2 SCOPE:

MERI provides chemical and biological data to support the following:

- A) Permit testing
- B) District Operations
- C) Continuous sonde monitoring for the New Jersey Ambient Water Quality Data Exchange
- D) University Research
- E) In-house Monitoring

1.3 APPLICABILITY:

All objectives and procedures in this QM pertain to customers and clients with regulatory needs. Any research performed solely by the MERI lab or jointly with another university does not necessarily adhere to N.J.A.C. 7:18 regulations.

2.0 TERMS AND DEFINITIONS

All terms, definitions and procedures are taken from the state ruling N.J.A.C. 7:18, last amended November 22nd, 2006, which is enforced by the New Jersey Department of Environmental Protection, Office of Quality Assurance.

3.0 MANAGEMENT REQUIREMENTS

3.1 ORGANIZATION:

3.1.1 MERI is a part of Rutgers The State University of NJ – Newark and is located at 2 DeKorte Park Plaza, Lyndhurst NJ, 07071. The State Laboratory Certification Number is 02437. To inquire about research projects or permitting needs, Ying 'Cheryl' YAO can be contacted at 201- 460-4604.

3.1.2 The Quality Manual (QM) in conjunction with the Standard Operating Procedures (SOPs) provide guidance for the laboratory operations and serve as the document that defines criteria necessary to meet the standards of N.J.A.C. 7:18. The QM details the activities and evaluation criteria necessary to ensure the analytical data meet the requirements of N.J.A.C. 7:18. The QM

also documents procedures intended to ensure that all data are of high known quality in order to meet the scientific objectives of MERI.

3.2 *PERSONNEL:*

- 3.2.1 The following is a list of all personnel that work in or oversee the laboratory portion of MERI. Their titles and job responsibilities are also included.

MERI

Francisco Artigas, Ph.D: Director of MERI

The Director of MERI oversees and develops all research projects. Serves as the liaison of MERI activities to all Directors in other departments encompassed in the NJSEA and Rutgers.. Certifies analytic reports for release to clients. Supervises all activities in the laboratory. Responsible for project management and project development. Oversees all data and checks for compliance with state guidelines. In charge of all finding and applying for all research grants

Sandy Speers: Administrative Coordinator

Fills out all appropriate forms for the monthly reporting of Sports Complex samples and sends the monthly packet to the client. Orders all supplies and instruments for the lab. Assists with grant writing. In charge of processing payments for all services rendered due to permit requests.

Ying Yao, M.S: Chief Chemist & QA/QC Officer

Supervises and is responsible for all activities and data generated in the laboratory. Responsible for project management and project development. Ensures compliance with quality control and laboratory quality assurance objectives. Ensures that projects and testing are completed accurately and on time. Manages the use of the Mercury Analyzer, GC-ECD/ FID, IC, ICP-MS and GC-MS. Responsible for the low level Mercury, Chloride, Nitrate, Phosphate, Nitrite, Sulfate, and Fluoride in PT test. Ensures that all subordinates follow proper laboratory and waste management procedures (OSHA). Performs all sample analysis on the Ion Chromatograph and ensures that instrument follows NJDEP guidelines. Also keeps control charts, maintenance log, LCR and MDL for IC. Keeps records and updates supplies as well as MSDSs. Performs the annual Right To Know Study.

Yefim Levinsky, Ph.D: Environmental Research Chemist

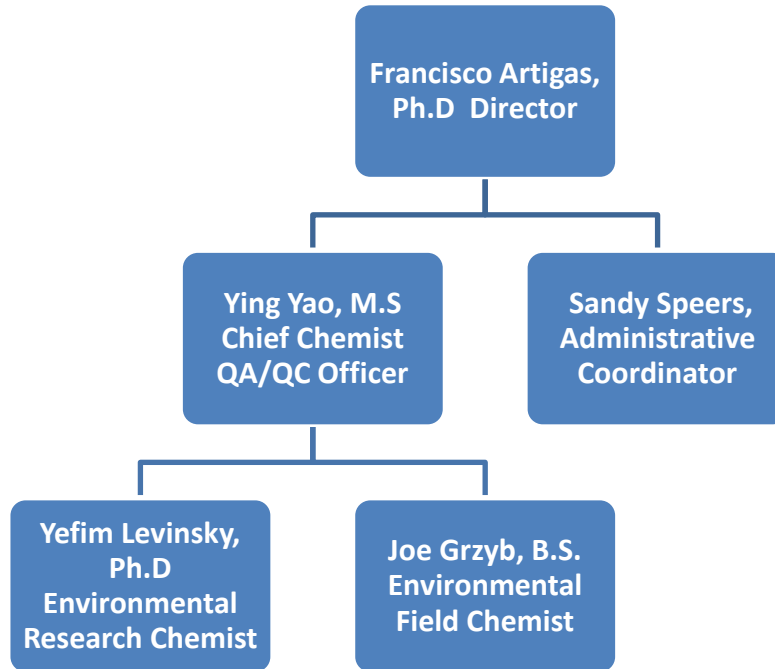
Responsible for the maintenance and certification of both the AA (Cold vapor and trap) and the ICP-MS. This includes LCR, LDR and MDL studies as well as maintaining an instrument log and instrument control charts. Digests all air, tissue, water, and sediment before analysis and runs them in accordance to N.J.A.C 7:18. Responsible for the PT tests for all heavy metal parameters, COD, BOD, TDS and TSS.

Joe Grzyb, B.S: Environmental Field Chemist

Responsible for all field sampling including soil coring, air and water sampling. Maintains and calibrates continuous monitoring devices. Ensures that data is posted on the website in an accurate and timely manner. Responsible for all sample number generation, COC and filing of COAs. Responsible for all PCB and Pesticide extraction. Responsible for conductivity, turbidity, pH, PCBs and Pesticide PT tests. Contact person for the Sports Complex testing.

Generates Sports Complex reports. Develops a work plan for sample analysis to ensure holding times are met.

3.2.2 Figure 1: MERI Organization Chart:



3.3. *ACCEPTANCE OF SAMPLES:*

3.3.1 Sampling of the continuous stations are done every hour. Each sampling event is validated by the vista data vision validation program and then can be accepted and publish on the website. If samples are out of the validation range, they will not be accepted or published and maintenance will be required for the station.

3.3.2 Technical and Supporting Procedures:

The laboratory maintains SOPs for both certified and non-certified parameters that are taken by the multimeter. MERI has a copy of those SOPs in the laboratory and the printed version can be found in the SOP binder, located in office of room EE2.

3.3.3 It is required to annually review and update (if necessary) all SOPs for certified parameters following the most updated versions of both EPA and Standard Methods.

3.3.3.1 The QA/QC officer must approve and sign the latest version of the SOP and put it in the binder.

3.3.3.2 The QA/ QC officer is responsible for keeping the Laboratory QM up to date. The QM is reviewed and revised at least annually and will be posted on MERI's website at: <http://meri.njmeadowlands.gov>. The posted version is the latest version of the QM.

4.0. CORRECTIVE ACTION

- 4.1 Corrective action must be taken when QA requirements are not met or MERI receives a list of violations after their bi-annual state audit. This includes, but is not limited to, changing SOPs, implementing new procedures, purchasing new supplies or maintaining better calibration records.
- 4.2 Each technician is responsible for implementing the corrective action that falls under their lab work. All corrective actions must be taken within 90 days of notification.
- 4.3 All corrective actions are documented and monitored to endure compliance with N.J.A.C. 7:18. The laboratory QA officer maintains a list of corrected actions undertaken by lab personnel.

5.0. PREVENTATIVE ACTION

- 5.1 Preventative Action is a proactive process used to identify, process and improve upon issues in instrumentation or procedures.
- 5.2 All maintenance or repairs performed on equipment is documented either on an Excel sheet or a laboratory note book.

6.0. CONTROL OF RECORDS

6.1 GENERAL:

- 6.1.1 Records with QA activities including external and internal audits, certification records and PT studies are filed in a dedicated area by the QA/QC officer.
- 6.1.2 All written records shall be legible, easily accessible and stored in a manner that will minimize loss, damage and deterioration. MERI will keep all records for five years and then send them for storage on site in a location called "The Castle."
- 6.1.3 All electronic records should be saved on the technician's computer and on the MERI shared drive. Data is archived to a CD if needed.

6.2 TECHNICAL:

- 6.2.1 All of the data generated for sonde parameters are collected on CR1000 data loggers and also sent through a modem to a program called Loggernet. Raw data is saved as notepad files

6.2.2 All software and hardware data will remain on the computer for at least 5 years. After 5 years, the data is saved as legacy data and downloaded onto a CD and stored.

7.0 ENVIRONMENTAL TEST METHODS AND METHOD VALIDATION

7.1 CERTIFICATION:

7.1.1 An official list of all certified parameters can be located here:
<http://meri.njmeadowlands.gov/downloads/lab/CertifiedParameters.pdf>

7.1.2 QA Targets:

A. **Turbidity:**

B. **Conductivity/Salinity:**

C. **pH:**

D. **Temperature:**

E. **Dissolved Oxygen**

7.2: CALIBRATION:

7.2.1 Calibration Standards are obtained from an accredited manufacturer that provides a certificate of analysis. Standards must be prepared fresh, each day the instrument is in use. This procedure should be logged and should include the expiration date and LOT number.

7.2.2 Records are kept when each field instrument, bench top instrument or chromatography is calibrated, which is every day they are in use.

7.2.3 All instruments are calibrated using a minimum on three standards, which the exception of the DO and conductivity meter which use a one shot calibration.

7.3 MEASUREMENT TRACEABILITY:

7.3.1 Most Quality Control Standards are obtained from ERA which is an ISO/NIST certified company. Quality Control recoveries must be +/- 10%, unless the limits are stricter of the COA.

7.3.2 Any other QC samples obtained will be traceable to NIST or EPA guidelines.

7.3.3 Continuing calibration checks are implemented for all multimeters. If proper recovery is not met, the multimeter should be recalibrated and/or probes will be replaced.

7.4 *ADDITIONAL REQUIREMENTS:*

7.4.1 All purchased reagents and solvents are dated upon receipt. When a commonly used item is out of stock, the environmental chemist must be informed and it will be reordered.

7.4.2 The preparation of all standards, stock solutions, QC samples and titrants should be documented in a laboratory notebook.

7.4.3 All technicians must participate in the annual NJDEP State proficiency test. If the first attempt fails, the technician must repeat the study after 6 months. If the second attempt fails and the parameter is suspended, the analyst must take measure to identify the issues in the methods that are causing poor results.

7.4.4 The NJDEP will conduct an on-site audit approximately every 3 years. All technicians must be present for a full evaluation of their work to check if it meets the requirements of N.J.A.C 7:18. If any deficiencies are obtained, they must be corrected and sent to the OQA in the appropriate time frame.

8.0 QUALITY ASSURANCE FOR ENVIRONMENTAL TESTING

8.1 The laboratory has an established quality control program for monitoring the performance of test methods conducted under this manual.

8.2 Calibration standards are checked against a certified reference material or other independently prepared standards.

8.3 Replicate analyses are used to evaluate precision. Precision is expressed by the relative percent difference to compare duplicate samples and spikes. Most parameters indicate that the RPD values should be less than 5 %.

8.4 The accuracy of the test is assessed using known sample concentrations and calibration standards.

9 REPORTING

9.1 Raw data is transferred from the multimeter to the CR1000 datalogger. Then it is transferred from the datalogger through a modem into Vista Data Vision software.

9.2 In the vista data vision software, data is validated and any outliers are discarded. All the validated data is published on the MERI website. <http://meri.njmeadowlands.gov/>

10 SIGNED AGREEMENTS:

Francisco Artigas, Ph.D., Director of MERI (Date)

Sandy Speers.: Administrative Assistant (Date)

Ying Yao, Chief Chemist & QA/QC Officer (Date)

Yefim Levinsky, Ph.D.: Inorganic Chemist (Date)

Joe Grzyb, B.S.: Environmental Field Chemist (Date)