Quality Assurance Project Plan
for
Assessment of Nutrient Sources from Mainstem and Selected Watersheds in the Susquehanna River Basin

Commission QAPP #QA084 Rev. 1
(revised 3/1/2024)

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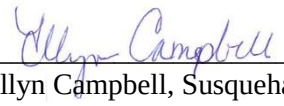

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REVIEWS AND REVISIONS

Date	Revision #	Summary of Changes	Sections	Other Comments
2/10/2023	original	--	--	--
3/1/2024	1	(1) Calendar update, (2) no longer sampling at end of the month, (3) different sonde being used for field measurements, & (4) number of samples being collected has not been updated for a while, and now reflects the correct number of sites and samples	(1) Section 1.6, (2) Section 2.1.4, (3) Sections 2.5.2 and 2.6, & (4) Table 3	

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1.0 PROJECT MANAGEMENT

1.1 Title and Approval Page — See Page 1.

1.2 Table of Contents — See Pages 2 and 3.

1.3 Distribution List

Susquehanna River Basin Commission (SRBC): Andrew Gavin, James Shallenberger, Ellyn Campbell, Brianna Hutchison, Kyle Kessler, Joshua Inners, Dawn Hintz

PA Department of Environmental Protection (PADEP): Dustin Shull, Mark Brickner, Josh Lookenbill, Pam Higgins, Janelle Barry, Chris Wilkinson, Carmen Gaston, Jennifer Fesler

New York State Department of Environmental Conservation (NYSDEC): Jacqueline Lendrum

ALS Environmental: Janice Jaeger

U.S. Geological Survey: Rebecca Bushon, Thomas Jeffords

U.S. Environmental Protection Agency, Chesapeake Bay Program Office (USEPA CBPO): Kaylyn Gootman, Durga Ghosh

SRBC website: www.srbc.gov

1.4 Project Organization

Agency	Contact	Role	Email
SRBC	Andrew Gavin	Deputy Executive Director	agavin@srbc.net
	James Shallenberger	Project Manager/QA Coordinator	jshallenberger@srbc.net
	Ellyn Campbell	Project QA Manager	ecampbell@srbc.net
	Kyle Kessler	Field Operations Lead	kkessler@srbc.net
	Joshua Inners	Field Technician	jinners@srbc.net
	Brianna Hutchison	Technical Lead	bhutchison@srbc.net
	Dawn Hintz	Database Manager	dhintz@srbc.net
PADEP, BCW, WQD	Mark Brickner	Project Officer	mbrickner@pa.gov
	Erika Arnold	QA Officer	erikarnold@pa.gov
	Dustin Shull	Environmental Group Manager, Assessment Division	dushull@pa.gov
	Josh Lookenbill	Environmental Program Manager	mlookenbill@pa.gov
PADEP Lab	Pam Higgins	Technical Director	pahiggins@pa.gov
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USEPA CBPO	Kaylyn Gootman	Project Officer	Gootman.kaylyn@epa.gov
	Durga Ghosh	QA Coordinator	dghosh@chesapeakebay.net

1.4.1 SRBC Staff Responsibilities

Project Manager and Quality Assurance Coordinator: James Shallenberger
The Project Manager is responsible for overseeing the planning of the project, sampling of necessary parameters, supervision and management of technical staff and contractors, analysis of data, and preparation of the annual report. The QA Coordinator will oversee the Project QA Manager and will communicate significant QA concerns to the Deputy Executive Director.

Project Quality Assurance Manager: Ellyn Campbell
The Project QA Manager is responsible for reviewing and securing approval for the QA Project Plan, reviewing data quality, and preparing grant progress reports.

Field Operations Lead: Kyle Kessler
The Field Operations Lead is responsible for planning the project sampling timeline, conducting sampling of necessary parameters, supervising and managing support field staff (including Joshua Inners), maintaining proper equipment function and overseeing calibrations, submitting samples to laboratories, filing results in appropriate project files, and providing data to the database manager.

Technical Lead: Brianna Hutchison
The Technical Lead is responsible for running the Weighted Regression on Time Discharge and Season (WRTDS) model to calculate loads, concentrations, flow normalized loads, and flow normalized concentrations (FNC) and for trend analysis (Hirsch and De Cicco, 2015). Trends in flow are evaluated in R using the Mann-Kendall test and Thiel-Sen slope estimator.

Database Manager: Dawn Hintz
The Database Manager is responsible for uploading data as part of the DUET Submission and pulling summary data from Access for the grant progress reports.

Support Staff: Support Staff are responsible for uploading data as part of the DUET Submission, assisting with running in-house suspended sediment samples, and updating the SNAP portal on the SRBC website.

1.5 Problem Definition/Background (EPA QA/R-5 A5)

The Chesapeake Bay Program's Nontidal Water Quality Monitoring Program consists of 126 sites throughout the Chesapeake Bay Watershed. Monitoring at these sites helps estimate nutrient and suspended-sediment pollution from individual streams in the watershed and improve calibration and verification of watershed models.

The Susquehanna River Basin Commission (Commission/SRBC) currently conducts monitoring at 27 of these sites as part of the Sediment and Nutrient Assessment Program (SNAP). Twenty-one of these sites are located in Pennsylvania, one is located in Maryland, and five are located in New York.

1.6 Project/Task Description and Schedule (EPA QA/R-5 A6)

Activity	2024 J	F	M	A	M	J	J	A	S	O	N	D	2025 J	F	M	A	M	J	J	A	S	O	N	D
COORDINATION:	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
QAPP	X																							
Water Sampling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DATA GENERATION																								
DUET Submission			X												X									
Summary Statistics								X												X				
REPORTS																								
Quarterly Grant Reports			X			X			X			X			X			X			X			X
Mid-year Grant Report							X												X					
Annual Grant Report	X												X											
Technical Report												X												X

Coordination: Planned work among SRBC staff includes discussing any proposed changes in number of sites and site locations, QAPP development, assessments and troubleshooting of supply and equipment needs, and scheduling and communicating sampling activities. Planned work includes inter-agency coordination as needed. Planned work also includes discussions with laboratories to ensure samples are received, data are reported, and troubleshooting any data quality issues that might arise.

Water Sampling: Planned work includes organization of bottles and coolers, sampling at field sites, compliance with Commission health and safety protocols, proper preparation of samples for submission to laboratories, and confirmation of receipt of samples at the laboratories within the proper timeframes.

Data Generation: Planned work includes entry of field readings into the SRBC database and transfer of laboratory data results into the project drive on the network and to the database manager for DUET Submission. Planned work also includes the generation of summary statistics, trend charts, and graphics.

Reports: Planned work includes quarterly, mid-year, and annual grant reports, as well as an annual technical report. The annual technical report will be published on the SRBC website.

1.7 Quality Objectives and Criteria for Measurement Data (EPA QA/R-5 A7)

1.7.1 Objectives and Project Decisions

This project includes two major objectives:

1. Nutrient and Suspended Sediment Monitoring. This objective includes conducting monthly and stormwater quality monitoring at the 27 sites and posting data on the SRBC website. Water quality data collected during the time period, as well as summary statistics (maximum, minimum, median, mean, and standard deviation values), are submitted to the Chesapeake Bay Program Office (CBPO).

2. Trend Analysis. This objective will use compiled datasets to conduct flow-normalized trend analyses and flow trend analyses using the US Geological Survey (USGS) WRTDS model. Trend results will be compared with results of previous years and to other agency results to identify consistencies and/or discrepancies. Statistical and graphical results will be provided to the CBPO as well as being posted on SRBC's website.

The environmental measurements and analysis provides baseline nutrient loading data for the mainstem and the selected major tributaries in sufficient detail to:

- Allow model refinement and verification,
- Track and better define nutrient loading dynamics,
- Relate measured load fluctuations to changes in water discharge due to precipitation events of varying intensities, durations, and seasons, and
- Evaluate nutrient loading trends.

1.7.2 Action Limits/Levels

Select monitoring parameters and associated target limits are included in Table 1.

1.7.3 Measurement Performance Criteria/Acceptance Criteria

Please see Table 1 for Quality Control Requirements for analysis of select parameters and field measurements.

1.8 Special Training Requirements/Certification (EPA QA/R-5 A8)

This project requires implementation of depth-integrated water quality sampling protocols while positioned on a bridge. This sampling does not require specialized training or certification. Staff holds a field training session each year to refresh familiarity with all Commission sampling protocols. This field training session is typically held in May or June each year.

1.9 Documents and Records

1.9.1 QA Project Plan Distribution

The QAPP is maintained by the Project QA Manager and distributed to Field Sampling Leads during the Coordination portion of the project. The QAPP is reviewed by both the Project Manager and Project QA Manager. Any changes to the project study design or data collection protocols that affect the operation of the project are documented as a QAPP amendment and submitted to USEPA for approval. The QAPP as well as any revisions or addendums are retained in the project-designated workspace on the network drive.

1.9.2 Field Documentation and Records

Project records and documents are managed according to the SRBC Records Retention Policy (Policy No. 2018-01) and the SRBC Quality Management Plan. Hardcopy documents are retained in project-designated Monitoring & Protection program file cabinets in the Harrisburg office after data are entered into Excel spreadsheets on the network drive or the Access database. Data collected during the previous calendar year are uploaded to DUET annually in March. The Project Manager is responsible for ensuring electronic files are saved to the network drives.

These records include but are not limited to:

- Original, revised, and amended QAPPs
- Field forms
- Chains of custody
- Calibration, maintenance, and sample logs
- Photos
- Water quality data (electronic or hardcopy)

- Data analyses
- Final reports
- Corrective actions and results

1.9.3 Laboratory Documentation and Records

The PADEP Lab and ALS Environmental emails Excel or PDF files containing the water sample results, analytical methods used, and all internal documentation pertaining to the processing of the sample at their labs. These electronic files are retained in the project-designated workspace on the network drive. The data are uploaded to the Access database. All emails between the PADEP Lab or ALS Environmental and the Commission pertaining to sample integrity or troubleshooting are saved in the project-designated workspace.

1.9.4 Quarterly, Mid-year, and Final Grant Reports and Technical Reports

Project progress is documented in quarterly, mid-year, and final grant reports, all of which are retained in the project-designated workspace. All analyses and technical reports are retained in the project-designated workspace. The technical reports are also published in the Reports Library section of the Commission website.

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Design

2.1.1 Site Selection

SRBC currently conducts monitoring at 27 sites as part of the Sediment and Nutrient Assessment Program (SNAP), including five "long-term" sites and 22 "enhanced" sites. Twenty-one of these sites are located in Pennsylvania, one is located in Maryland, and five are located in New York (Figure 1). All sites are co-located with USGS stream gaging stations to obtain discharge data. The latitude and longitude of these sites, as well as the co-located USGS gage are located in Table 2.

2.1.2 Long-term Sites

The five long-term sites sampled by SRBC were established prior to 1990 and include:

1. Susquehanna River at Towanda, PA. The Susquehanna River at Towanda was selected because it represents the contribution from New York State, although the drainage area does include a part of the Tioga River Basin in northern Pennsylvania and an area along the northern tier counties of northeastern Pennsylvania. The drainage area at Towanda is 7,797 square miles.

2. Susquehanna River at Danville, PA. The Susquehanna River at Danville has a drainage area of 11,220 square miles and includes part of northcentral Pennsylvania and much of southcentral New York. Data collected at Danville represent the loadings from the mainstem Susquehanna River.

3. West Branch Susquehanna River at Lewisburg, PA. Data collected from the West Branch Susquehanna River at Lewisburg represent the loadings from a major tributary to the mainstem. The West Branch Susquehanna River includes much of northcentral Pennsylvania and has a drainage area of 6,847 square miles. This watershed is predominantly forested (81 percent). The combined drainage area at Lewisburg and Danville represents 65.7 percent of the total Susquehanna River Basin.

4. Juniata River at Newport, PA. The Juniata River at Newport, another major tributary to the mainstem Susquehanna River, drains much of the southcentral area of Pennsylvania and has a drainage area of 3,354 square miles. The combined drainage area at Newport, Lewisburg, and Danville represents 77 percent of the total Susquehanna River Basin and 88.9 percent of the watershed above Harrisburg, PA.

5. Conestoga River at Conestoga, PA. Data collected from the Conestoga River at Conestoga provide loadings from a major tributary watershed that is actively farmed and is experiencing an increase in agricultural nutrient management programs. Additionally, this watershed is experiencing an increase in urban and suburban development. The drainage area of this basin at the sampling site is 470 square miles.

SRBC also sampled a sixth long-term site on the Susquehanna River at Marietta, PA, until September 2022, when USGS assumed sampling responsibilities. The Susquehanna River at Marietta is the southern-most sampling site upstream from the reservoirs on the Lower Susquehanna River and represents the inflow to the reservoirs from its 25,900-square-mile drainage area. This drainage area represents 94.5 percent of the total Susquehanna River Basin.

2.1.3 Enhanced Sites

Twenty-two enhanced monitoring sites are sampled by SRBC. These enhanced sites were established between 2004 and 2012 and are located at outlets of major streams draining the tributary strategy basins. These sites were chosen strategically to capture loads from different land cover types (urban, agriculture, and forest), diverse physiographic and geologic settings, and different watershed sizes. In addition, these sites are located in areas within the tributary strategy basins that have the highest nutrient delivery to the Bay. The 22 enhanced monitoring sites include:

1. Bald Eagle Creek near Castanea, PA
2. Chemung River at Chemung, NY
3. Cohocton River near Campbell, NY
4. Conodoguinet Creek near Hogestown, PA
5. East Mahantango Creek near Dalmatia, PA
6. Kishacoquillas Creek near Reedsville, PA
7. Octoraro Creek at Richardsmere, MD
8. Paxton Creek near Penbrook, PA
9. Penns Creek at Penns Creek, PA
10. Pequea Creek near Martic Forge, PA
11. Raystown Branch Juniata River at Saxton, PA
12. Shermans Creek near Dromgold, PA
13. Susquehanna River at Conklin, NY
14. Susquehanna River at Smithboro, NY
15. Susquehanna River near Wilkes-Barre, PA
16. Swatara Creek near Hershey, PA
17. Unadilla River at Rockdale, NY
18. West Branch Susquehanna River near Karthaus, PA
19. West Branch Susquehanna River near Jersey Shore, PA
20. Yellow Breeches Creek near Camp Hill, PA
21. Little Juniata River at Spruce Creek, PA*
22. Frankstown Branch Juniata River at Williamsburg, PA*

**SRBC assumed sampling of these sites from USGS in September 2022*

2.1.4 Sampling Frequency

Routine samples are collected at regularly spaced intervals at each of the 27 sites during a calendar year, around the middle of each month, regardless of discharge. The mid-month routine samples collected at all 27 sites are coded with the CBP sample type code "Routine (R)."

Routine samples that are storm-impacted are handled according to the CBP Nontidal sampling procedures which state, "If high discharge occurs during routine monthly sampling, collect the samples on the scheduled date using procedures for storm event sampling, and including a Suspended Sediment Concentration (SSC) sample." These samples are counted as routine, monthly samples and coded as sample type "Routine, Storm-impacted (RSI)." A routine, storm-impacted event has a rising discharge (cfs) of at least twice that of the pre-storm, average daily discharge.

A total of eight storm samples are collected at each of the 27 sites during a calendar year. Staff aim to collect two storm samples per season/quarter at each site. Ideally, the two samples target the rising and peak flow of the same storm. Storm samples are coded with the CBP sample type code "Storm samples (S)."

2.2 Sampling Methods (EPA QA/R5 B2)

Data collection and data analysis are performed by SRBC with cooperation from the PADEP Bureau of Laboratories (PADEP Lab) and the Bureau of Clean Water (BCW), Water Quality Division (WQD). New York samples are collected by SRBC, and additional samples at Chemung and Smithboro are collected by NYSDEC from April to September.

Water sampling is conducted using standard USGS depth-integrating samplers (DH-2, DH-81, DH-95, D-95, and D-96) and nozzles sized for isokinetic sampling (1/8-, 3/16-, 1/4-, or 5/16-inch nozzle). A newly cleaned plastic bottle is used at each site. All equipment is cleaned in the laboratory with 0.1-percent v:v ratio of Liquinox:tap water, rinsed with tap water, and then rinsed with deionized water. The equipment is rinsed with river water at each site prior to sample collection. The churn is rinsed with deionized water after completion of sample collection at each site and repackaged in plastic for the following site.

Whole-water (unfiltered) samples are collected to ensure that the samples are representative of stream conditions. Samples are collected by compositing depth-integrated samples from equal increments of discharge along the cross section in a pre-cleaned churn splitter. Sample bottles are filled while gently churning the water at a rate of approximately 9 inches/second. Field-split samples are collected by filling sample bottles from the same volume of water in the churn splitter. Samples are filtered in the field using Fondriest medium capacity dispos-a-filter, 0.45-micron, 350-cm^2 filter area. Details regarding preparation and analysis of filtered and unfiltered samples are presented in Table 3.

Suspended sediment samples are taken according to the standard operating procedure outlined in Attachment A. Field readings including temperature, dissolved oxygen, turbidity, conductivity, and pH will be taken instream at each vertical, and the median value are recorded for the site. During times when this is not possible due to high flow, all field readings are taken from the composite sample after the water quality sample has been processed from the churn.

2.3 Sample Handling and Custody (EPA QA/R5 B3)

Samples collected in the field are placed in sample containers and labeled at the time of collection. Appropriate labels contain the sample number, location, date, time, and fixative (where appropriate). PADEP sample bottles are labeled with a seven-digit identification number, sampling date, and time. The

seven-digit identification number consists of a four-digit collector identification number and a three-digit sample number.

A field notebook is kept by staff collecting the samples. Data recorded in the field notebook include the sample ID and type, date, time, field data collected, collector initials, sonde ID, sample location, field WQ location, sampler type, nozzle, lot numbers for filter and preservatives, and any comments the collector has concerning the conditions at the site or problems encountered while collecting the sample (see Attachment B).

Samples are chilled on ice immediately after collection and transported to the appropriate lab within 24 hours. All samples are submitted with the appropriate sample submission sheet (Attachments D and E), as provided by the PADEP Lab and ALS Environmental. This form includes the site location, name of person collecting the sample, and the standard analysis code, as well as any other pertinent information the lab or the sampler needs for future reference.

The lab performs the necessary analyses within the holding time limits specified in corresponding individual Quality Assurance manuals (PADEP, 2021; ALS, 2021). Custody of samples at the lab follows procedures as established by each these Quality Assurance plans, with appropriate documentation. A complete flow chart for data collection through data submission is listed in Attachment F.

2.4 Analytical Methods

Analytical methods for all parameters are included in Table 1. All Pennsylvania water samples and the Maryland sample, including QA samples, are taken to the PADEP Lab. Appropriate quality assurance measures for sample analyses and lab procedures, as established by the PADEP Lab, are the responsibility of the Quality Assurance Officer for the lab. Resolution of problems is the responsibility of a Section Chief and the respective Quality Assurance officers.

Water samples and duplicates collected at New York sites will be sent to ALS Environmental for analysis. Samples will be analyzed according to the ALS-approved QAPP.

Sand/fine particle analysis and sediment analysis for storm samples is conducted at the USGS Sediment Lab. Suspended sediment analysis for routine sampling at long-term monitoring sites is conducted at SRBC. The SRBC suspended sediment standard operating procedure (SOP) is listed in Attachment A.

2.5 Quality Control Requirements

Data collected during this study are used to help define magnitude, timing, and severity of nutrient and suspended sediment inputs to the Bay and to provide a comparison with data collected from the Susquehanna River at Conowingo, MD. For this reason, several quality assurance objectives must be met.

2.5.1 Field Sampling Quality Control

Compliance with the Quality Assurance Project Plan (QAPP) is the responsibility of each agency's Quality Assurance Officer or Manager. Quarterly reports documenting data collection activities are sent to the PADEP BCW Project Officer. A random number generator is used at the beginning of the calendar year to determine the collection schedule for blank samples and duplicate samples. This schedule is then constructed so that every site has one blank and at least one duplicate sample taken during the year.

Field blank samples are processed in the field. Deionized water for field blank samples is transported to the sampling site and processed through the pre-cleaned sampling equipment and churn splitter before filling the sample bottles with UltraPure water. Source water blanks are prepared by pouring UltraPure water directly into pre-cleaned sample bottles.

2.5.2 Field Measurement/Analysis Quality Control

Field staff are subjected to performance audits for pH and specific conductance. The USGS Water Science Center in New Cumberland schedules audits annually using standard samples provided by the USGS Central Lab. Results are verified by the USGS Central Lab. The Project Manager is responsible for verifying that all field staff are competent in the collection techniques before participation in any fieldwork. Any unsatisfactory results may result in a repeat audit, at the discretion of the Project Manager. Audits of field crews are performed by Project Officers.

A YSI EXO3 is used to measure in-situ temperature, conductivity, pH, turbidity, and dissolved oxygen. See Section 2.7 for information on required calibration of this sonde unit and Table 1 for quality control requirements.

2.5.3 Laboratory Analysis Quality Control

Analytical methods and detection limits must be compatible with those used by other data collection agencies. The analytical methods and detection limits selected for the constituents of concern were determined by consultation with the USGS and the PADEP Lab to assure compatibility of the results. Detection limits, accuracy, and precision of data are included in each lab's individual Quality Assurance Plan and are acceptable for this project. Analytical and quality assurance procedures for each laboratory are detailed in the labs' Quality Assurance Plan.

Random number generation is used to determine where and when QA samples are collected, as well as whether they are collected during the routine sampling round of a given month or during a storm/storm-impacted round.

Duplicate samples are submitted to PADEP, ALS Environmental, and USGS laboratories by field staff. The total number of quality assurance samples submitted is at least 10 percent of the samples analyzed. Duplicate sample difference should be less than 20 percent. Samples sent to the laboratory for analyses include >5 percent field-split samples including 24 duplicates in PA, 10 duplicates in NY, 22 field blanks in PA, five field blanks in NY, four source water blanks in PA, and one source water blank in NY.

Field blank and source water blank results should be less than 10 percent of the lowest value in the sample batch. Blanks are used to determine total measurement error due to contamination. If contamination of the blank is found, additional field blanks are submitted, along with samples from the same volume of UltraPure water poured directly into the pre-cleaned sample bottle. This procedure helps determine the source of contamination.

For all parameters, a spike analysis is completed for every 10 samples, with recovery amounts listed in Table 4. Data analysis methods are based on approved USEPA and USGS techniques. The appropriate Quality Assurance Officer/Manager and Project Officer/Manager review results for necessary action. Any problems which cannot be resolved by SRBC staff will be deferred to the PADEP BCW Project Officer for solution.

Variability among laboratories is quantified through the use of Chesapeake Bay Program field-split duplicate samples that are sent to the USGS and the PADEP laboratories. This activity is conducted in cooperation with the USGS Water Science Center in Catonsville, MD, which has the responsibility for inter-laboratory quality assurance. Chesapeake Bay Tributary Split Samples (Blue Plains) are delivered to the PADEP Lab, and the results are compared to other Bay laboratories. USGS nutrient reference samples are analyzed once or twice a year. The PADEP Lab also participates in the Blind Audit Program through the Chesapeake Biological Lab.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance (EPA QA/R-5 B6)

2.6.1 Field Measurement Instruments/Equipment

SRBC uses the YSI EXO3 for instream field measurements of pH, specific conductivity, dissolved oxygen, turbidity, and temperature during routine samples. During times when instream measurement is not possible due to high flow, all field measurements are taken from the composite sample after the water quality sample has been processed from the churn. Every instrument used to collect field measurements is returned for factory maintenance/calibration as needed.

SRBC will use a YSI 650 MDS with 6820 V2 logger as a backup meter.

Staff maintain the specific conductivity cell by washing with deionized water and river water. The cell is shaken dry and stored. The pH, dissolved oxygen, turbidity, and temperature probes are stored according to operating manual instructions. Staff rinse and scrub the churn splitter with Liquinox detergent, rinse with tap water, then rinse again with deionized water prior to each sampling day.

2.6.2 Laboratory Analysis Instruments/Equipment (Off-Site)

Individual quality manuals for the PADEP Lab, ALS Environmental, and USGS contain required laboratory criteria.

2.7 Instrument/Equipment Calibration and Frequency (EPA QA/R-5 B7)

2.7.1 Field Measurement Instruments/Equipment

The Field Sampling Lead is responsible for calibrating equipment. If any issues exist, the Project Manager is notified and corrective actions are taken. Each probe is calibrated at the beginning of each sampling day. For multi-day sampling efforts, the morning calibration serves as both the current day's calibration and the previous day's post-calibration. At the end of a multi-day sampling round, a final post-calibration is completed after the last day of sampling. Staff maintain records of instrument calibrations, repairs, and

maintenance in the Water Quality Field Instrument Calibration Log (see Attachment C) and report any abuse or neglect of equipment or calibration schedules to the Project Manager.

The pH probe is calibrated daily prior to sample collection against two pH buffer standards (7 and 10). The dissolved oxygen probe is calibrated daily prior to sample collection using the air calibration chamber in water method. The turbidity probe is calibrated daily prior to sample collection using 0.0 NTU and 1000 NTU standards.

The temperature probe uses a thermistor of sintered metallic oxide that changes predictably in resistance with temperature variation. The algorithm for conversion of resistance to temperature is built into the sonde software, so accurate temperature readings in degrees Celsius, Kelvin, or Fahrenheit are provided automatically. No calibration or maintenance of the temperature probe is required.

Specific conductance probes are kept in working order and are calibrated daily against one specific conductance standard (usually 1000 umhos/cm).

Acceptance Criteria: Standards (<1,000 umhos/cm) ± 4 percent
(>1,000 umhos/cm) ± 3 percent

2.7.2 Laboratory Analysis Instruments/Equipment (Off-Site)

Individual quality manuals for the PADEP Lab, ALS Environmental, and USGS contain required laboratory criteria.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables (EPA QA/R-5 B8)

2.8.1 Field Sampling Supplies and Consumables

All water quality sampling bottles are provided by, cleaned, labeled, and pretreated with appropriate preservative by SRBC staff prior to sampling. It is the responsibility of the Field Operations Lead to inspect all bottles prior to sampling and ensure that the bottles are free of any contaminants. Deionized and UltraPure water are both supplied by the PADEP Lab.

2.8.2 Laboratory Analysis Supplies and Consumables (Off-Site)

Individual quality manuals for the PADEP Lab, ALS Environmental, and USGS contain required laboratory criteria.

2.9 Data Management (EPA QA/R5 B10)

The PADEP Lab and ALS Environmental email the Project Manager the water sample results as well as result reports and all internal documentation pertaining to the processing of the sample at their lab. The Project Manager saves these electronic files in the project-designated workspace on the network drive. The data are uploaded to the Access database. All emails between the labs and SRBC pertaining to sample integrity or troubleshooting are saved in the project-designated workspace. Once entered, data are retrieved and visually checked by project staff to insure accuracy. The data are posted on SRBC's website (www.srbc.gov). All data are submitted by SRBC through the CBPO's Data Upload and Evaluation Tool (DUET). All parameters are reported in mg/L.

The Weighted Regression on Time Discharge and Season (WRTDS) model is used to calculate loads, concentrations, flow normalized loads, and flow normalized concentrations (FNC) and for trend analysis

(Hirsch and De Cicco, 2015). Trends in flow are evaluated in R using the Mann-Kendall test and Thiel-Sen slope estimator. Results are initially generated and stored on a separate hard drive but are then transferred to the project network.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments/Oversight and Response Actions (EPA QA/R5 C1)

Project coordination and review is the responsibility of the PADEP BCW Project Officer. Appropriate quarterly progress reports are sent to the USEPA Project Officer by the PADEP BCW. Any problems that occur that cannot be solved by the project officers of each agency will be resolved by the identified PADEP BCW responsible individual.

Prior to sample collection each year, SRBC and PADEP provide the CBPO with an updated set of the metadata spreadsheets addressing the upcoming field collection period including any anticipated changes in staff, parameters, and/or methods. The spreadsheets include 1) Expected Parameters & Stations, 2) Points of Contact, and 3) Methods/MDLs.

3.2 Reports to Management (EPA QA/R-5 C2)

Field operator techniques are tested annually for pH and specific conductance with USGS standard samples. The subsequent USGS report is submitted to the QA Coordinator and the Deputy Executive Director.

Quarterly reports are submitted by SRBC to the PADEP BCW Project Officer. These quarterly reports include a description of activities completed during the quarter, any problems encountered, and data analysis results. A more detailed mid-year and final grant report is completed and submitted to the CBPO. A technical report is submitted by SRBC to the PADEP BCW Project Officer annually that summarizes the analysis results.

4.0 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements (EPA QA/R-5 D1)

Primary responsibility for data validation lies with the SRBC Project Manager. Field collections are conducted according to the above methodology to ensure accurate data. The use of blank samples and duplicates, the results of which are reviewed by the Project Manager, also validates the water quality analyses. The SRBC Project Manager verifies all sample labeling, chain-of-custody forms, and lab reports to ensure they are in agreement and complete.

ALS Environmental and the PADEP Lab verify and validate data using protocols outlined in respective Quality Assurance plans (available on request). The Project Manager also checks the data reports to ensure that no data were flagged by ALS Environmental or the PADEP Lab and that the data were generated under proper methodology and holding time. The collector and other SRBC scientists may assist the Project Manager in determining the acceptability of the data at the time of receipt based on his/her knowledge of the current and historic stream conditions. In this way, peer review of the data upon receipt helps verify and validate the data. SRBC staff receive results of analyses and submit copies of the analyses and "primary printouts" to project staff. The data are verified by comparing values with ranges of values from prior sampling and by review of data plots. If an error in an analysis is detected or suspected, the questionable value is noted and a rerun will be requested. Rerun data are reviewed by the project staff, and appropriate changes are made in the computer files. If results of field-split duplicate samples are different but are within quality assurance specifications, the average of the two values will be reported.

The Project Manager reviews QA/QC reports supplied by the labs for the periods of time in which samples for the project are processed. The Project Manager immediately contacts the labs for further investigation if data are missing or appear to be in error or improper techniques were used. Laboratory corrective action is the responsibility of the Lab Quality Assurance Officer. Any issues that cannot be resolved by the Lab Officer and the SRBC Project Manager are referred to the PADEP BCW Project Officer or his/her supervisor for action.

The data go through a series of validations by SRBC staff as they are entered into the database, including checking values for duplicate samples against one another, comparing computer entries to field and laboratory data sheets, looking for data gaps and missing information, checking flow calculations, and examining raw data for outliers or inappropriate measurements. Peer review by one or two other SRBC staff after input is done to ensure correct data entry.

Corrective action is taken immediately upon discovery of a problem. Project staff interact constantly to coordinate project activities. Additionally, meetings with staff from all agencies are held at the discretion of the PADEP BCW Project Officer. Data and data-collection activities are discussed constantly and evaluated. Corrective action is taken immediately by the appropriate agency's Project Officer/Manager, if evaluation indicates action is necessary.

5.0 REFERENCES

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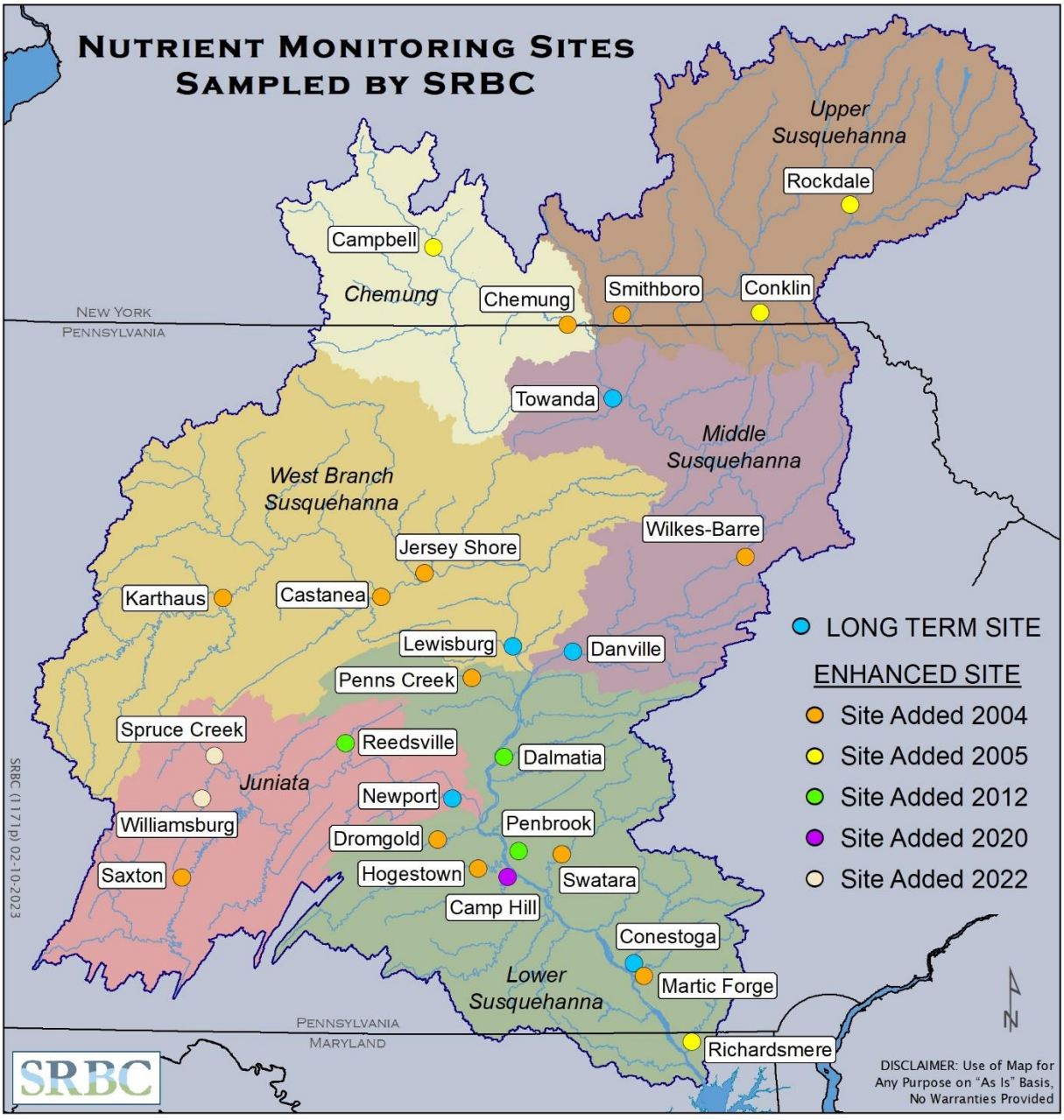
U.S. Geological Survey. 2006. Collection of water samples (ver. 2.0): U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chap. A4. Accessed 2/6/12. http://pubs.water.usgs.gov/twri9A4/.

FIGURES:

Figure 1. Site Map with Monitoring Locations



TABLES:

Table 1. Monitoring Parameters, Target Limits, and Quality Control Requirements

Parameter	**Detection Limits (mg/l)**		**Accuracy**	**Precision**
LABORATORY ANALYSIS	**ALS Environmental**	**PADEP Lab**		
Total Nitrogen	N/A	0.040	±10%	±10%
Dissolved Nitrogen	N/A	0.040	±10%	±10%
Total Kjeldahl Nitrogen	0.050	N/A	±10%	±10%
Dissolved Kjeldahl Nitrogen	0.050	N/A	±10%	±10%
Total Ammonia	0.05	0.020	±10%	±10%
Dissolved Ammonia	0.05	0.020	±10%	±10%
Total Nitrite + Nitrate	0.002	0.040	±10%	±10%
Dissolved Nitrite + Nitrate	0.002	0.040	±10%	±10%
Total Phosphorus	0.002	0.020	±10%	±10%
Dissolved Phosphorus	0.002	0.020	±10%	±10%
Dissolved Orthophosphate	0.001	0.002	±10%	±10%
Total Suspended Solids	1.0	2.000*	±10%	±10%
Total Organic Carbon	1.0	0.500	±10%	±10%
FIELD MEASUREMENTS	**Unit**		**Accuracy**	**Range**
Temperature	^{o}C		0.01	-5^{o}C to 50^{o}C
Dissolved Oxygen	mg/l		± 1%	0 to 50 mg/l
pH	SU		0.1 SU	0 to 14
Specific Conductance	µS/cm		± 1%	0 to 100,000 µS/cm
Turbidity	NTU		± 10%	± 10%
Discharge	cfs		0.001	

**reporting limit*

Table 2. Monitoring Sites with WQN and USGS Gage Identifiers and Latitude and Longitude

Long-term Monitoring Sites	WQN	USGS gage	Latitude	Longitude
Conestoga River at Conestoga, PA	273	01576754	39.939120	-76.387370
Juniata River at Newport, PA	214	01567000	40.479030	-77.128130
Susquehanna River at Danville, PA	301	01540500	40.957700	-76.621200
Susquehanna River at Lewisburg, PA	401	01553500	40.966903	-76.878719
Susquehanna River at Towanda, PA (James Street Bridge)	305	01531500	41.791592	-76.442914
Enhanced Monitoring Sites	**WQN**	**USGS gage**	**Latitude**	**Longitude**
Bald Eagle Creek near Castanea, PA	445	01548085	41.124629	-77.435039
Chemung River at Chemung, NY	--	01531000	42.003	-76.635
Cohocton River near Campbell, NY	--	01529500	42.253	-77.217
Conodoguinet Creek near Hogestown, PA	271	01570000	40.255455	-77.018537
East Mahantango Creek near Dalmatia, PA	226	01555500	40.611111	-76.911520
Frankstown Branch Juniata River at Williamsburg, PA	224	01556000	40.471857	-78.186795
Kishacoquillas Creek near Reedsville, PA	282	01565000	40.654581	-77.583589
Little Juniata River at Spruce Creek, PA	217	01558000	40.609059	-78.136330
Octoraro Creek at Richardsmere, MD	263	01578475	39.693683	-76.124727
Paxton Creek near Penbrook, PA	281	01571000	40.306099	-76.855639
Penns Creek at Penns Creek, PA	229	01555000	40.867000	-77.049270
Pequea Creek near Martic Forge, PA	204	01576787	39.905700	-76.328314
Raystown Branch Juniata River at Saxton, PA	223	01562000	40.215012	-78.264872
Shermans Creek near Dromgold, PA	243	01568000	40.344200	-77.194350
Susquehanna River at Conklin, NY	--	01503000	42.036	-75.803
Susquehanna River at Smithboro, NY	--	01515000	42.028	-76.384
Susquehanna River near Wilkes-Barre, PA	302	01536500	41.189000	-76.087200
Swatara Creek near Hershey, PA	272	01573560	40.287170	-76.677800
Unadilla River at Rockdale, NY	--	01502500	42.379	-75.406
West Branch Susquehanna River near Jersey Shore, PA	448	01549760	41.202447	-77.252190
West Branch Susquehanna River near Karthaus, PA	404	01542500	41.116950	-78.109140
Yellow Breeches Creek near Camp Hill, PA	212	01571500	40.224186	-76.860560

Table 3. Analysis for Monitoring Parameters

Parameter	Number of Samples	Sample Matrix	Analytical Method Reference	Sample Preservation	Holding Time
Dissolved Oxygen	540	Water/sediment	Median of instream field measurement at each vertical	N/A	None
pH	540	Water/sediment	Median of instream field measurement at each vertical	N/A	None
Temperature	540	Water/sediment	Median of instream field measurement at each vertical	N/A	None
Specific Conductance	540	Water/sediment	Median of instream field measurement at each vertical	N/A	None
Turbidity	540	Water/sediment	Median of instream field measurement at each vertical	N/A	None
Suspended Sediment	70	Water/sediment	SRBC* - Filtration Method	N/A	N/A
Suspended Sediment	216	Water/sediment	ASTM Method D 3977-97	N/A	N/A
Sand-Fine Splits	108	Water/Sediment	ASTM Method D 3977-97	N/A	N/A
Total Nitrogen	440	Water/sediment	SM. 4500-Norg-D**	Chill at < 6^{o}C w/out freezing	None
Dissolved Nitrogen	440	Water	SM. 4500-Norg-D**		None
Total Nitrate + Nitrite	540	Water/sediment	USEPA 353.2		48 Hours
Dissolved Nitrate + Nitrite	540	Water	USEPA 353.2		48 Hours
Dissolved Orthophosphate	540	Water	USEPA 365.1		48 Hours
Total Kjeldahl Nitrogen	100	Water/sediment	USEPA 351.2	Chill at < 6^{o}C w/out freezing H_2SO_4 to pH<2	28 Days
Dissolved Kjeldahl Nitrogen	100	Water	USEPA 351.2		28 Days
Total Ammonia	540	Water/sediment	USEPA 350.1		28 Days
Dissolved Ammonia	540	Water	USEPA 350.1		28 Days
Total Phosphorus-TP	540	Water/sediment	USEPA 365.1		28 Days
Dissolved Phosphorus-DP	540	Water	USEPA 365.1		28 Days
Total Organic Carbon	440	Water/sediment	SM 5310C		28 Days
Total Organic Carbon	100	Water/sediment	SM20 5310C +		28 Days
Total Suspended Solids	440	Water/sediment	USGS-I-3765/3767 and SM 2540E	N/A	7 Days
Total Suspended Solids	100	Water/Sediment	SM 2540 D +	N/A	7 Days

* SRBC suspended sediment methodology listed in Attachment B
**Standard Methods, 19th Edition
+ New York analysis – ALS Environmental, Inc.

Table 4. Monitoring Parameters and Recovery Amounts

Parameter	Spike Recovery Limits %		Duplicate Max Variation %	
	PADEP	**ALS**	**PADEP**	**ALS**
Total Nitrogen	± 10%	N/A	± 10%	20%
Dissolved Nitrogen	± 10%	N/A	± 10%	20%
Total Kjeldahl Nitrogen	± 10%	71-120	± 10%	20%
Dissolved Kjeldahl Nitrogen	± 10%	71-120	± 10%	20%
Total Ammonia	± 10%	90-110	± 10%	20%
Dissolved Ammonia	± 10%	90-110	± 10%	20%
Total Nitrite + Nitrate	± 10%	90-110	± 10%	20%
Dissolved Nitrite + Nitrate	± 10%	90-110	± 10%	20%
Total Phosphorus	± 10%	81-112	± 10%	20%
Dissolved Phosphorus	± 10%	81-112	± 10%	20%
Dissolved Orthophosphate	± 10%	90-110	± 10%	20%
Total Suspended Solids < 100 mg/L	± 10%	80-120	± 10%	20%
Total Suspended Solids >100 mg/L	± 20%	80-120	± 10%	20%
Total Organic Carbon	± 20%	86-117	± 10%	20%

ATTACHMENTS:

ATTACHMENT A. SUSPENDED SEDIMENT CONCENTRATION SOP

STANDARD OPERATING PROCEDURE (SOP) FOR SUSPENDED SEDIMENT CONCENTRATION (SSC)

Susquehanna River Basin Commission
4423 North Front Street
Harrisburg, PA 17110-1788
Phone (717) 238-0423
Fax (717) 238-2436

Manager, Monitoring & Protection
Name James P. Shallenberger Signature _____ Date_____

QA Officer
Name James P. Shallenberger Signature _____ Date_____

Author
Name Kevin H. McGonigal Signature _____ Date_____

Review	Date	Description of Revision /Comment	Signature
1	2/5/2015	Initial Release	

OVERVIEW & PURPOSE

The following standard operating procedure has been developed in order to provide Susquehanna River Basin Commission (SRBC) staff with information necessary to perform suspended sediment concentration analysis at the SRBC laboratory located at 4423 North Front Street.

The SOP has been adopted from Guy, 1969*. Adherence to the SOP will ensure that conformance to technical and quality system requirements are met regardless of personnel changes and that consistent, high-quality data are collected.

PROCEDURAL SECTION

A. Scope & Applicability
   1. This SOP is intended to provide specific procedures involved in suspended sediment concentration analysis to be conducted in the laboratory at Susquehanna River Basin Commission.

B. Summary of Method
   1. Filtration method outlined in Guy (1969)*

C. Definitions
   1. SSC – Suspended Sediment Concentration

D. Health & Safety Warnings
   1. Caution when working with crucibles and sediment bottles to avoid broken glass.

E. Interferences
   1. Potential interferences include contaminated containers and materials, large pieces of debris or gravel on the filter paper, which need to be removed prior to measurement.

F. Personnel Qualifications/Responsibilities
   1. Individuals new to this procedure will work with experienced staff to gain familiarity with equipment and procedures.

G. Equipment and Supplies
   1. Pyrex Gooch coarse fritted disc crucibles
   2. Whatman glass microfiber 32 mm Filters
   3. Desiccator
   4. Forceps
   5. Gravity Convection Oven
   6. Dishwasher for sediment bottles
   7. Vacuum/filtration system (Air Admiral Vacuum pump)
   8. Water Bottle
   9. Scales
      - OHAUS E4000 – weighing sediment bottles
      - Mettler AE240 – weighing crucibles

10. Tongs

H. Procedure

Use tongs during all procedures involving crucibles after cooked in the oven.

Sediment Sample Processing Procedure:

1. Clean Crucibles in water
2. Air dry and add filter paper
3. Into oven for 24 hours at 105* degrees
4. Out of oven into desiccator for 24 hours (using tongs)
5. Weigh each crucible (handle with tongs)
6. Weigh sediment sample (record Tare and Gross)
7. Record information (site, date, time etc.)
8. Record crucible number to be used
9. Pour sediment sample into crucible (rinse bottle with DI to insure all sediment collected)
10. Use forceps to remove any large pieces of organic matter and/or gravel
11. Crucibles into oven for 24 hours at 105* degrees
12. Out of oven into desiccator for 24 hours (tongs)
13. Weigh sample (tongs)
14. Crucibles to sink

Scale Calibration Procedure:

1. Turn scale on and allow 30 minutes before step 2
2. Hold bar down until calibration mode is reached
3. Wait until 100 g is requested then slide lever on right side backward
4. Wait until 0 g is requested then slide lever on right side forward
5. After calibration place crucible in center and close door. Allow several seconds for reading dot goes off on LED display before recording value.

DATA AND RECORDS MANAGEMENT

1. Suspended sediment concentration is calculated using the following equation:

$$\frac{(A - B) \times 1{,}000{,}000}{C}$$

A = Weight of crucible plus filtered sediment in grams
B = Weight of crucible plus filter paper (tare) in grams
C = Weight of entire sample minus container tare weight in grams
Results in ppm equivalent to mg/L

2. Data entry form used in laboratory to be transferred to excel
3. Records stored electronically
4. Excel Spreadsheet used for calculations
5. Data entry forms listed in section four

* As per ASTM Method D 3977-97, the oven temperature recommendation is 105 degrees. The SRBC method for oven temperature was changed from 110 degrees to 105 degrees based on USEPA recommendation on 2/27/2015 (ASTM, 1999).

REFERENCES

ASTM. 1999. D 3977-97, *Standard Test Method for Determining Sediment Concentration in Water Samples*, Annual Book of Standards, Water and Environmental Technology, 1999, Volume 11.02, p. 389-394.

Guy, H.P. and V.W. Norman. 1969. *Field methods for measurement of fluvial sediment.* U.S. Geological Survey Techniques of Water Resources Investigation, Book 3, Chapter C2 and Book 5, Chapter C1.

U.S. Environmental Protection Agency. 2007. *Guidance for Preparing Standard Operating Procedures (SOPs) (QA/G-6)*, EPA/600/B-07/001, Office of Environmental Information, Washington, DC.

DATA ENTRY AND CALCULATION FORM EXCERPTS AND EXAMPLE

Sediment Concentration Data Entry Sheet					
Station	Example				
Date	1/1/2015				
Time	1500				
Gross Sample	738				
Tare Sample	234				
Cruc. #	35				

Crucible Weights Data Entry		
Cruc #	Used	Clean
1	23.235	23.20
2		
3		
4		
5		

SEDIMENT CONCENTRATION CALCULATION SHEET											
SITE		Example									
DATE	|	1/1/2015									
TIME	|	1500									
GAGE HT.	|										
GROSS SAMP	|	738									
TARE SAMP	|	234									
NET SAMPLE	|	504	0	0	0	0	0	0	0	0	0
----------	|										
CRUC. #	|	1									
GROSS WT	|	23.235									
TARE WT	|	23.2									
NET WEIGHT	|	0.0350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
----------	|										
*1000000	|	35000	0	0	0	0	0	0	0	0	0
CONC. PPM	|	69									

ATTACHMENT B. SAMPLING LOG BOOK ENTRY PAGE

SAMPLE # _____
DATE _____
TIME _____
TEMP. _____
pH _____
D.O. _____
COND. _____
TURB. _____
FLOW _____
GAGE HT _____
Sediment # _____
Filter Lot # _____
Nitric Lot # _____
TOC Lot # _____

Iso ____ **Non-Iso** ____

☐ **SIS entered**

COLLECTOR_____
SONDE ID _____
Check if:
____ **WQ in churn**
____ **Alt location**
____ **Storm**
____ **Routine**
____ **Routine Storm Impacted**

Equipment:
____ **DH-95** ___ **D-95** ____ **DH-81**
____ **D-2** ___ **Weighted Bottle**
Nozzle: _____ $^{3}/_{16}$ _____ $^{1}/_{2}$ _____ $^{5}/_{16}$

Field Notes:

ATTACHMENT C. CALIBRATION LOG BOOK ENTRY PAGE

Date:			Employee Name:		
Time:			Sonde Type and Serial Number:		
Calibration					
Function	Temp. of Standard	Value of Standard	Initial Reading	Calibrated to	Comments
Specific conductance ≥1,000 µS/cm					Zero Check □Pass □Fail; Value =
pH calibrated (7)					
pH mv for pH 7 solution					Range 0 ± 50 mv
pH calibrated (10/4)					
pH mv for pH10 pH mv for pH 4					Range: -130 to -230 mv Range: 130 to 230 mv
Dissolved Oxygen (% Sat)					
Optional Sensors (include parameter: turbidity, etc.)					
DATA NEEDED FOR DISSOLVED OXYGEN CALIBRATION					
Altitude (A) = _____feet above msl			Barometric pressure_____mm hg		

ATTACHMENT D. PADEP LAB SAMPLE SUBMISSION SHEET

3800-FM-WSFR0121 8/2009

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Sample Submission Sheet

PA DEP Bureau of Laboratories

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

# of Unpreserved Bottles:		
Tests	**# of bottles**	**Fixative**
Metals		HNO3
Phenols		H2SO4
CN		NaOH
NA/K		HNO3
Spl. Inorg/Nutrients		H2SO4

Organic Bottles Submitted			
Bottle	**Test**	**# of bottles**	**Fixative**
40mL VOA amber	TOC		H2SO4
40mL VOA amber	DOC		H2SO4
1 L amber			
500 mL amber			
Other:	Bacteria		Pre-cl'd
Other:			

LAB USE ONLY

Lab Number:

Date Received:

Received By:

Temp. ≤ 6°C

Collector ID: 8 6

Sequence No.:

Date Collected (MM, DD, YY):

Time Collected (HH MM):

Reason Code:

Cost Center Code:

Program Code: 0 0

STD Analysis Code: 0

Matrix Code:

Residual Chlorine: Yes / No

pH less than 2.0: Yes / No

Legal Seal Number:

Legal Seal Intact: Y N

Additional Analysis

How Shipped:
- ☐ US Cargo
- ☒ Hand Delivered
- ☐ Other

Collectors Name: (printed)

Phone 717-433-0808

Relinquished By: (signature)

Date:

Station Number (WQN0###): W Q N 0

Station Name

Sampling Location

Stream Name

Stream Code

River Mile Index

Latitude (DMS)

Longitude (DMS)

FIELD RESULTS:

Temp.(°c)	(00010)	
pH (units)	(00405)	
D.O. (mg/l)	(00300)	
Sp. Cond. (µmhos)	(00094)	
Gage (ft)	(00065)	
Flow (cfs)	(00061)	
Secchi Disk	(00078)	
Turbidity (NTU)	(82079)	

Comments:

FIELD WQ TAKEN: ☐ IN STREAM ☐ IN CHURN

SAMPLE COLLECTION: ☐ ISOKINETIC ☐ NON-ISOKINETIC

ATTACHMENT E. ALS ENVIRONMENTAL LAB SAMPLE SUBMISSION SHEET

One Copy of This Sheet Goes To: a) 625 Broadway, 4th Floor, Albany, New York 12233-3502
b) With sample to contract lab c) Retain for your records

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CONTRACT LAB SAMPLE INFORMATION SHEET

Print Legibly

Clear Form

CAUTION (check if applicable)

☐ Lab personnel are expected to use caution when handling DEC samples, however, please use special caution when handling this sample since it is believed to contain significant concentrations of hazardous and/or toxic material(s).

CHECK THE BOX PRECEDING THE REQUESTED ANALYSIS

PRIORITY POLLUTANTS (Water and Wastewater Title 40 Part 136)—SPDES

☐ 1. 13PP Metals	☐ 10. Sulfate	☐ 19. Halogenated Volatiles (USEPA 601 GC)
☐ 2. Cyanide	☐ 11. Reactive Phosphorus	☐ 20. Aromatic Volatiles (USEPA 602 GC)
☐ 3. BOD	☑ 12. Total Phosphorus	☐ 21. Volatiles (USEPA 624 GC/MS)
☐ 4. CBOD	☑ 13. Nitrate/Nitrite	☐ 22. Low-Level Volatiles (USEPA 524.2 GC/MS)
☐ 5. COD	☑ 14. Ammonia	☐ 23. Acids/Base/Neutrals (USEPA 625 GC/MS)
☐ 6. pH	☐ 15. TKN	☐ 24. Pesticides/PCBs (USEPA 608 GC)
☐ 7. Settleable Solids	☐ 16. Total Phenols	☐ 25. PCBs at 0.065 µg/L (USEPA 608 GC)
☐ 8. Total Solids	☑ 17. TOC	☐ 26. PCBs congener method (1668A HRGC/HRMS)
☑ 9. TSS	☐ 18. Oil/Grease	☑ 27. Other TPO4, DPO4, TN, DN

CONTRACT LABORATORY PROTOCOLS

☐ 28. (ALL) - Water - Includes 29-33	☐ 35. (ALL) - Soil/Sediments - Includes 36-40
☐ 29. Base/Neutral/Acid (B/N/A) Water (GC/MS)	☐ 36. Base/Neutral/Acid (B/N/A) Soil/Sediments (GC/MS)
☐ 30. Volatile Organic Analysis (VOA) Water (GC/MS)	☐ 37. Volatile Organic Analysis (VOA) Soil/Sediments (GC/MS)
☐ 31. Pesticides/PCBs Water (GC/MS)	☐ 38. Pesticides/PCBs Soil/Sediments (GC)
☐ 32. 23 Metals in Water	☐ 39. 23 Metals in Soil/Sediments
☐ 33. Cyanide in Water	☐ 40. Cyanide in Soil/Sediments
☐ 34. Dioxin - Water (1613B GC/MS)	☐ 41. Doixin - Soil/Sediments (1613B GC/MS)
☐ 42. Other _____	

HAZARDOUS WASTES/RCRA ANALYSIS SW-846

☐ 43. EP Toxicity	☐ 48. EP Toxicity (Metals Only)	☐ 53. BNA (USEPA 8270 GC/MS)
☐ 44. Corrosivity	☐ 49. TCLP (Metals Only)	☐ 54. Pesticides (USEPA 8081GC/ECD)
☐ 45. Ignitability	☐ 50. Metals—17 Hazardous	☐ 55. PCBs (USEPA 8082 GC/ECD)
☐ 46. Reactivity	☐ 51. Percent Solids	☐ 56. Dioxin (USEPA 8280 GC/MS)
☐ 47. TCLP	☐ 52. VOA (USEPA 8260 GC/MS)	☐ 57. Other _____

MUNICIPAL SLUDGE

☐ 58. RS-01 ☐ 59. RS-02 ☐ 60. Other _____

COLLECTED BY:	TELEPHONE NUMBER:	REGION NO.:
	(717) 476-7206	

CONTRACT LABORATORY:	COUNTY:	SAMPLING DATE:	MILITARY TIME:
Columbia Analytical Services			

SAMPLE MATRIX:

☐ Air ☐ Soil/Sediment ☐ Groundwater ☑ Surface Water ☐ Wastewater ☐ Other _____

CASE NO.	SDG NO.	SAMPLE NO.	CHECK FOR MS/MD	TYPE OF SAMPLE
			☐ This Sample	☐ Grab ☑ Composite ☐ Term ____

☐ Check if there will be more samples with this SDG sent in this calendar week.

SAMPLING POINT:

Report via Category B, unless checked ☐

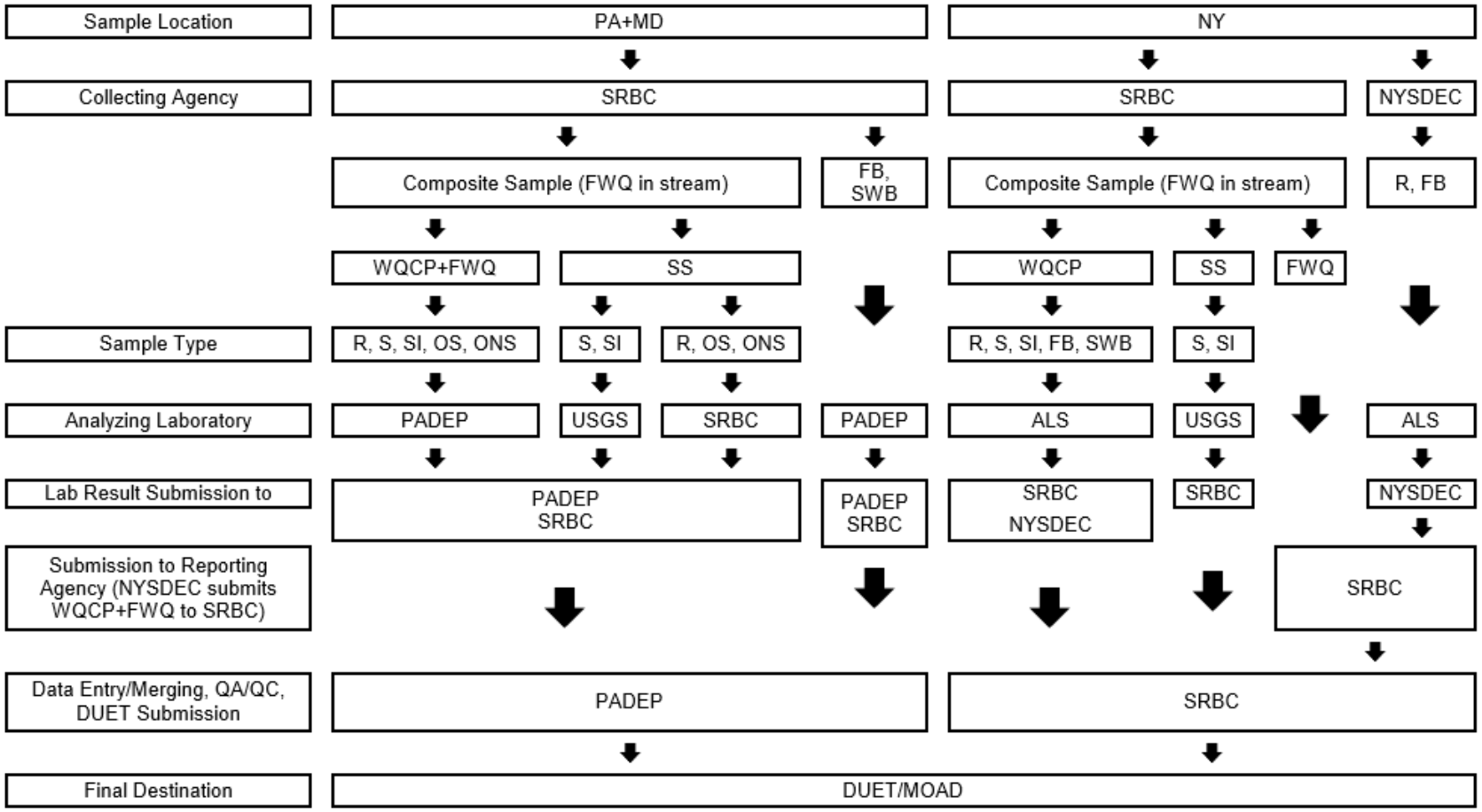
Check if field duplicate ☐ | Outfall Number

Check if sampling is part of inspection ☐

FLOW: _____ GPD _____ MGD

SPDES NUMBER/REGISTRY NUMBER

ATTACHMENT F. DATA COLLECTION AND SUBMISSION FLOW CHART



Acronyms:
R-Routine, SI-Storm Impacted, S-Storm, OS-Other Storm, ONS-Other NonStorm, FB-Field Blank, SWB-Source Water Blank, SS-Suspended Sediment, WQCP-Water Quality Chemical Parameters, FWQ-Field Water Quality, QA/QC-Quality Assurance/Quality Check, ALS-ALS Environmental, NYSDEC-New York State Department of Environmental Conservation, PADEP-Pa Department of Environmental Protection, USGS-United States Geological Survey, SRBC-Susquehanna River Basin Commission, DUET-Data Upload and Evaluation Tool, MOAD-Mother of all Databases