

Quality Assurance Project Plan

Monitoring of

Sparkill Creek
Rockland County

June 12, 2020

Riverkeeper, Inc.
20 Secor Road
Ossining NY 10562

Sparkill Creek Watershed Alliance
P.O. Box 221
Sparkill, NY 10976

Approval Signatures

Meredith Streeter
Meredith Streeter – NYSDEC Program Manager

Date 8/20/2020

Brian Duffy
Brian Duffy – NYSDEC PEERS Program Coordinator

Date 8/20/2020

Keleigh Reynolds
Keleigh Reynolds – NYSDEC PEERS Program Coordinator

Date 8/21/2020

Gavin Lemley
Gavin Lemley – NYSDEC Project QA Officer

Date 8/23/2020

Lewis McCaffrey
Lewis McCaffrey – NYSDEC Assistant QA Officer

Date 8/27/2020

Jennifer Epstein
Jennifer Epstein – PEERS Project Coordinator

Date 8/17/20

Dan Shapley
Dan Shapley – Riverkeeper Water Quality Program Director

Date 8/17/20

Scott W. Cuppett
Scott Cuppett – NYSDEC Hudson River Estuary Program Grant Officer

Date 8/17/20

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Distribution List

The following individuals must receive a copy of the approved QAPP in order to complete their role in this project. All PEERS Participants collecting samples will receive all QAPPs and SOPs referenced in this document as a ZIP folder.

Name	Title	Organization	Document type
Meredith Streeter	Program Manager	NYSDEC	Electronic
Brian Duffy	NYSDEC PEERS	NYSDEC	Electronic
Keleigh Reynolds	Program Coordinator and Project QA Officers		
Gavin Lemley	Project QA Officer	NYSDEC	Electronic
Lewis McCaffrey	NYS DEC Assistant QA Officer	NYSDEC	Electronic
Jennifer Epstein	PEERS Project Coordinator	Riverkeeper	Electronic
Dan Shapley	Riverkeeper Water Quality Program Director	Riverkeeper	Electronic
Scott Cuppett	NYSDEC Hudson River Estuary Program Grant Officer	NYSDEC, Hudson River Estuary Program	Electronic
Matt Ceplo	PEERS Participant Collecting Samples	Sparkill Creek Watershed Alliance	Electronic
Jim Elling	PEERS Participant Collecting Samples	Sparkill Creek Watershed Alliance	Electronic
Carol Knudson	PEERS Participant Collecting Samples	Sparkill Creek Watershed Alliance	Electronic
Sebastian Pillitteri	PEERS Participant Collecting Samples	Riverkeeper	Electronic
Larry Vail	PEERS Participant Collecting Samples	Sparkill Creek Watershed Alliance	Electronic

INTRODUCTION

This document was prepared to provide a quality assurance/quality control framework for professional external evaluations of rivers and streams (PEERS). This document guides the PEERS Project Coordinator and Participants to ensure that the data are of sufficient quality to meet the requirements of DEC listing and assessment purposes.

I. PROJECT MANAGEMENT

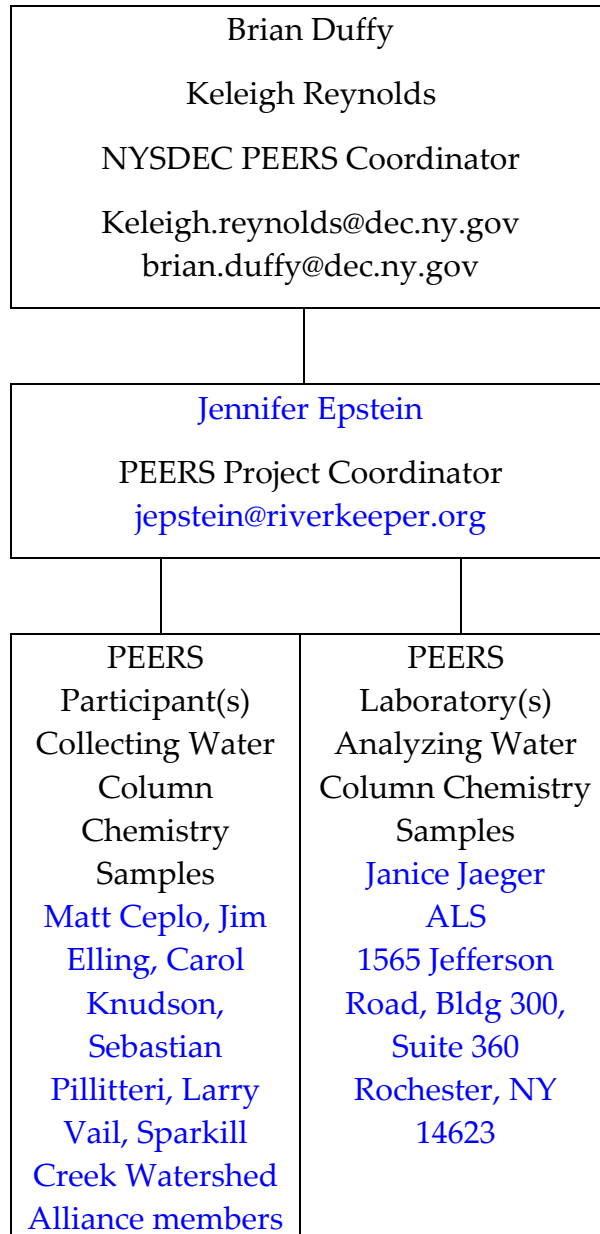
1. Organization/Responsibilities:

The responsibilities for participants in this project are provided in Table 1.

Table 1: Responsibilities and Qualifications of Participants

	Responsibilities	Qualifications
NYSDEC		
Program Manager: Meredith Streeter	Oversight of PEERS program and coordination with statewide waters monitoring programs	
PEERS Program Coordinators: Brian Duffy Keleigh Reynolds	The PEERS Program Coordinators implement the PEERS program including but not limited to writing each project specific PEERS QAPP in collaboration with the PEERS Project Coordinators, conducting the spring training/calibration, performing annual audits, maintaining all documentation and records for the department, and managing and analyzing resulting data for the department.	
Project QA Officer: Gavin Lemley	The project QA officer will be responsible for ensuring methods described in this document are followed and for qualifying data received.	
External		
Jennifer Epstein PEERS Project Coordinator	The PEERS Project Coordinator implements their own PEERS project including writing the project specific QAPP in collaboration with the PEERS Program Coordinators, submitting documentation of professional status, coordinating sampling efforts, training participants collecting water chemistry samples, coordinating laboratory analyses, and summarizing the results in a final report.	Satisfies the requirements given in section I.5
Matt Ceplo, Jim Elling, Carol Knudson, Sebastian Pillitteri, Larry Vail, Sparkill Creek Watershed Alliance members PEERS Participants collecting samples	The PEERS Participants are responsible for collecting water column chemistry and/or biological (macroinvertebrate) samples.	Water column chemistry and biological sampling certification and experience described in section I.5
ALS 1565 Jefferson Road, Bldg 300, Suite 360 Rochester, NY 14623 PEERS Laboratory Analyzing Water Column Chemistry Samples	The PEERS Laboratory(s) is responsible for analyzing water column chemistry samples	Satisfies the requirements in section I.5

Organization Chart



2. Background

The purpose of this project is a collaboration between the New York State Department of Environmental Conservation (NYSDEC) Stream Section and self-funded stream monitoring projects outside the NYSDEC. Under PEERS, the intent is to ensure external data is collected to satisfy NYSDEC Quality Assurance (QA) criteria and may be used to augment the NYSDEC Streams Section's Water Column Chemistry and/or Biological (macroinvertebrate) datasets.

In order to minimize exposure while continuing to execute the core mission of Division of Water (DOW) monitoring efforts in light of COVID-19, modifications to certain protocols were developed that incorporate social distancing recommendations. E Standard operating procedure (SOP) with specific reference to social distancing and COVID-19 (SOP#101-20.COV – Appendix B, SOP#210-20.COV- Appendix E, SOP#211-20.COV – Appendix F) contain the suffix .COV and are accessible through the Appendix of this QAPP. For general Health and Safety concerns related to COVID-19 and social distancing refer to DOW Guidance for Field Work During COVID-19 Pandemic (SOP #603-20).

The Sparkill Creek (Figure 1) is a tributary of the Hudson River that meets the Hudson at Piermont Marsh, one of four tidal wetlands in the Hudson River Estuarine Research Reserve. The Sparkill Creek is an eight-mile tributary with a watershed of more than 11 square miles, primarily in the Town of Orangetown, Rockland County.

There are two wastewater treatment plants in the Sparkill Creek Watershed, with a combined average treated volume of 24.5 million gallons/day, according to Hudson River Estuary Program data.¹ Discharging at a single point near Piermont Pier, the plants' combined discharge is the second-largest municipal treated sewage discharge to the Hudson River Estuary. While there are no direct discharge points within the Sparkill Creek Watershed, this large volume of sewage is carried through the Sparkill Creek watershed via 319 miles of 65-year old sewer pipe, according to Hudson River Estuary Program data.² Prior to installation of centralized wastewater treatment, the watershed was severely polluted due to industrial and illicit sanitary wastewater discharges.³ Much of the floodplain portion of the watershed is developed.

Data gathered by community science projects conducted by the Sparkill Creek Watershed Alliance in partnership with Riverkeeper and universities, including Columbia University's Lamont-Doherty Earth Observatory and Dominican College, show that human sewage is present in the Creek, and fecal contamination is more concentrated in the Sparkill Creek than any other Hudson River tributary routinely monitored by Riverkeeper's water quality monitoring program.⁴

The DEC's Waterbody Inventory/Priority Waterbodies List (WI/PWL) delineates four segments within the Sparkill Creek Watershed:

- Sparkill Creek, Lower (1301-0088)
- Sparkill Creek, Upper, and minor tribs (1301-0106)
- Minor Tribs to Lower Sparkill Creek (1301-0107)

¹ New York State Department of Environmental Conservation Hudson River Estuary Program. (2017). *Wastewater Infrastructure Database* [database].

² New York State Department of Environmental Conservation Hudson River Estuary Program. (2017). *Wastewater Infrastructure Database* [database].

³ New York State Department of Health, Water Pollution Control Board. 1951. Sparkill Creek Drainage Basin: Recommended Classifications and Assignment of Standards of Quality and Purity for Designated Waters of New York State.

⁴ Riverkeeper. 2020. "Tributary and Waterfront Data." <http://www.riverkeeper.org/water-quality/citizen-data/>

- Minor Tribs to Upper Sparkill Creek (1301-0108)

The most recent sampling data cited in NYSDEC's Waterbody Inventory are from 2003, from two sampling locations in the lower segment of the creek (PWLID 1301-0088). This segment is included on the NYS 303(d) List of Impaired Waters, for recreation and aquatic life uses, due to pathogens and low oxygen. The Waterbody Inventory for this segment lists the following pollutants, with varying levels of certainty: pathogens, low D.O./oxygen demand, nutrients, silt/sediment, unknown toxicity, and temperature. In the Upper Sparkill Creek (PWLID 1301-0106), recreation and aquatic life uses are listed as impaired and stressed, respectively. However these use assessments indicated the need for additional verification. Pathogens, nutrients, and chloride/salts are listed as possible pollutants. The Minor Tribs to Lower Sparkill Creek (PWLID 1301-0107) and Minor Tribs to Upper Sparkill Creek (PWLID 1301-0108) segments are unassessed. This project will focus on collection of ambient water quality data and will not include macroinvertebrate community sampling. The PEERS Program is intended to support objectives of the DOW by providing water quality data used for updates to assessment status, reporting to USEPA, and data for temporal and spatial trends analysis across NYS and this project aligns with those objectives.

This project is supported by a grant (T00881GG) from NYSDEC Hudson River Estuary Program to Riverkeeper in 2019.

3. Project/Task Description

PEERS is a collaboration between the NYSDEC Streams Section and self-funded stream sampling projects external to the NYSDEC. PEERS sampling projects may include any combination of the parameters sampled at RIBS screening or routine network locations (see RIBS QAPP, 2020) and are not limited in the minimum or maximum number of samples they may collect. The steps below describe one complete cycle in any PEERS project. The schedule for these tasks is given in Table 2.

- A project specific quality assurance project plan (QAPP) is completed before sampling begins by the PEERS Program Coordinators and PEERS Project Coordinator using the attached PEERS Project QAPP Template (Appendix G) and appropriate NYSDEC QA guidance documents.
- Also before sampling begins, the PEERS Project Coordinator and PEERS Participants collecting samples attend a field demonstration and calibration session. These are all conducted by the NYSDEC PEERS Program Coordinators *except* the training for PEERS Participants Collecting Water Column Chemistry Samples which may be conducted by the PEERS Project Coordinator. The PEERS Program Coordinators audit at least one training session conducted by the PEERS Project Coordinator.
- PEERS Participants perform field sampling according to the project specific QAPP. The PEERS Program Coordinators audit at least one sampling event for each PEERS Project. If discrepancies are observed, the PEERS Program Coordinators may do a second audit later in the sampling season.

- PEERS Laboratory(s) analyze Water Column Chemistry samples and/or identify macroinvertebrates in the biological samples as per NYSDEC QA documents. The PEERS Program Coordinators audit each laboratory identifying macroinvertebrate samples while samples are being processed. Laboratories processing water column chemistry samples are audited as part of the ELAP program.
- The PEERS Project Coordinator submit data files and a final report summarizing all quality assurance assessments to the WAVE/PEERS Coordinator by February 1 of the following year.
- The PEERS Program Coordinators add these data to the Stream Monitoring and Assessment Section database qualifying its usability or lack thereof.

The study area is the Sparkill Creek watershed (Figure 1, Table 2). By sampling all segments of the creek simultaneously for a uniform list of parameters, we will enable a comprehensive review of the stream condition and provide sufficient data to update all four stream segments in the Waterbody Inventory. Two locations will be sampled in each of the Upper Sparkill (PWLID (1301-0106) and Minor Tribs to Upper Sparkill (PWLID 1301-0108) segments, and one location each in the Lower Sparkill (PWLID 1301-0088) and Minor Tribs to Lower Sparkill segments (1301-0107) (Table 4; Figure 1).

Sampling will take place between August and October, 2020 and April and October 2021, pending QAPP approval. The project is targeting 8 samples over 2 years of collection at each site in flowing waters in order to capture year to year variability and sufficient data to be confident in the concentration of parameters to make updates to the assessment status. The field demonstration/calibration session will be scheduled prior to sampling. The field audit will be scheduled once the QAPP is approved and project sampling commences. Final Reports will be submitted by the PEERS Project Coordinator in March 2021 and 2022, after each season's sampling is complete.

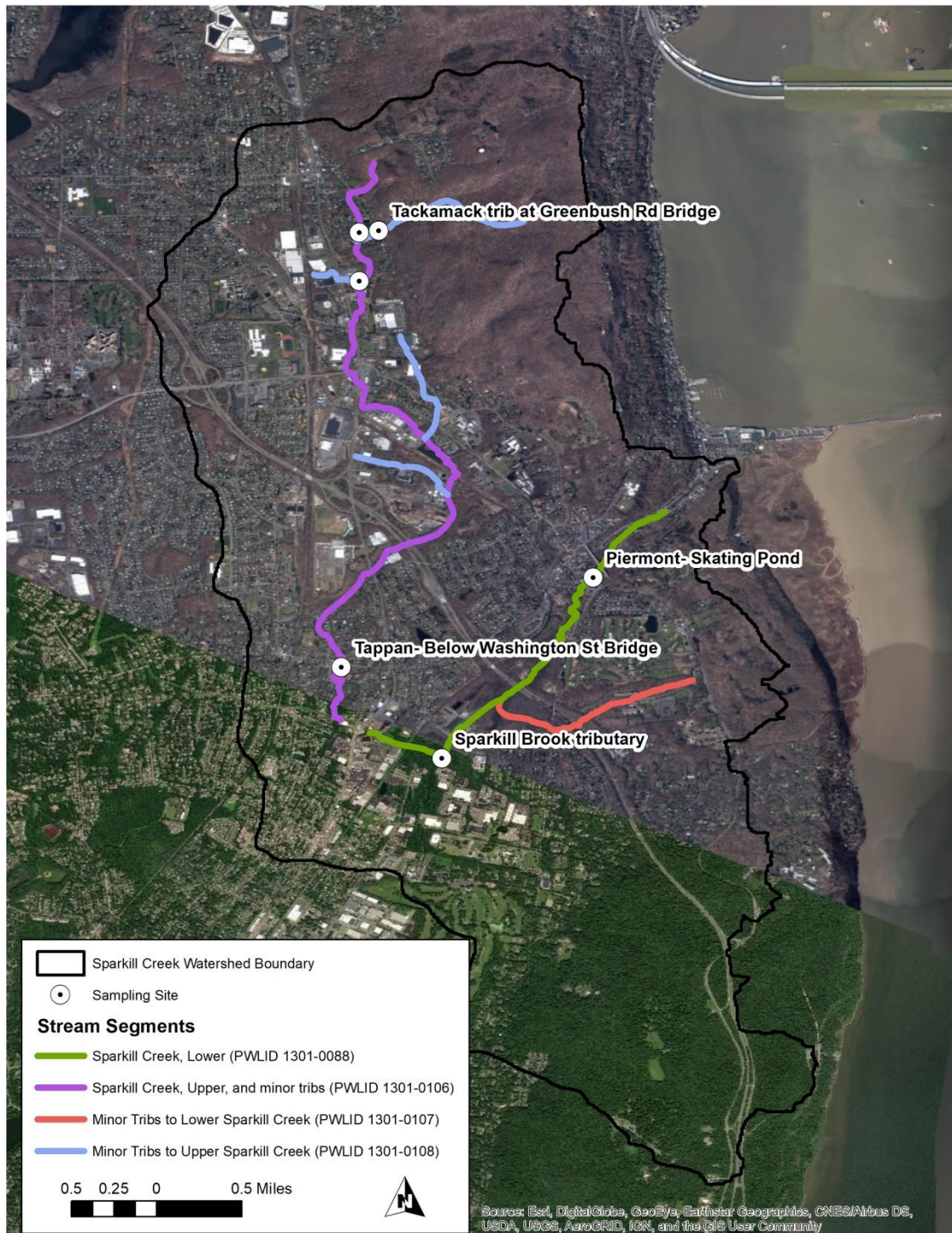


Figure 1. Location of proposed sampling locations on the four WI/PWL segments of Sparkill Creek

Table 2: Project Schedule

Task	Completion Date
Finalized PEERS Project QAPP(s)	Before sampling begins
Field demonstration and Calibration Session(s)	Before sampling begins
Sample Collection	Biological Samples are collected July-September Water Column Chemistry Samples are collected April - October
Field Audits	At least once per sampling season
Final Reports submitted by PEERS Project Coordinators	March 2022 after sampling is completed
Data added to the Streams Section Database and Metrics Calculated	May after sampling

4. Quality Objectives and Criteria

Data quality requirements for this project are as follows

1. Precision and Accuracy
 - a. Water Column Chemistry analyses are all drawn from 40CFR 136 EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants; Analytical Methods for Biological Pollutants in Wastewater and Sewage Sludge, Final Rule. Specific analyses as well as detection limits, precision and accuracy of each analysis are listed in Table 3. .

Table 3: Water Chemistry Analytical Specifications

Parameter	Analytical Lab	Standard Method	Precision	Accuracy	Calibration	Blanks	Method Detection Limit	Quantitation Limit
Temperature	In Situ	2550 B	± 1°C	± 1.5°C	Factory Set	~	(Range: -5 to 70°C)	
Dissolved Oxygen	In Situ	4500-O G	± 1%	± 2%	Daily	~	(Range: 0 to 50 mg/L or 0 to 500%)	
pH	In Situ	4500-H+B	± .05 SU	± .2 SU	Weekly	~	(Range: 0 to 14 SU)	
Specific Conductance	In Situ	2510 B	± 1µs/cm	± 1%	Weekly	~	(Range: 0 to 200 mS/cm)	
Ammonia	ALS	350.1	^	± 25%	~	Every 10	0.004 mg/L	0.01 mg/L
TKN	ALS	EPA 351.2	^	± 25%	~	Every 10	0.098 mg/L	0.1 mg/L
Nitrate	ALS	EPA 353.2	^	± 25%	~	Every 10	0.02 mg/L	0.05 mg/L
Nitrite	ALS	E353.2	^	± 25%	~	Every 10	0.007 mg/l	0.05 mg/L
Total Nitrogen	ALS	calculated	^	N/A	~	~	~	~
Total Phosphorus*	ALS	EPA 365.1	^	± 25%	~	Every 10	0.004 mg/L	0.005 mg/L
Turbidity	ALS	EPA 180.1	^	N/A	~	Every 10	0.06 NTU	1.0 NTU
Alkalinity	ALS	SM 2320B	^	N/A	~	Every 10	1.8 mg/L	2.0 mg/L
Hardness	ALS	SM 2340C	^	± 25%	~	Every 10	NA	2.0 mg/L
Chloride	ALS	EPA 300.0	^	± 25%	~	Every 10	0.041 mg/L	0.2 mg/L
Magnesium	ALS	EPA 200.7	^	± 25%	~	Every 10	0.068 mg/L	1 mg/L
Chlorophyll a	ALS	SM 10200	^	N/A	~	Every 20	N/A	0.4 µg/l

^ Precision is calculated using the following equation: %RPD > (0.9465x^{0.344})100 +5, where: x = sample / detection limit
%RPD = [diff(lab duplicate pair)/av(lab duplicate pair)]*100. See SOP 110-19: Data Validation and Verification for more details

~ calibrated by analytical laboratory

2. Site Selection and Representativeness

The site locations provide information from each stream segment, with multiple sites in the Minor Tribs to Upper Sparkill Creek (PWLID 1301-0108) and Sparkill Creek, Upper, and minor tribs (PWLID 1301-0106) segments where there is variation in land use (Figure 1). By sampling in each segment of the waterbody, the data will be representative of the watershed overall.

The watershed is heavily developed, with residential, commercial and industrial land use covering much of the watershed. However, some forested areas exist, mostly in higher-elevation areas in the eastern portion of the watershed. Land use and river characteristics at the sampling sites are typical of their respective segments and the watershed overall (Figure 1). Grab samples will be collected

into a churn which are considered representative due to the relatively small stream size according to the Standard Operating Procedure: Collection of Ambient Water Quality for RIBS Program Sampling (SOP #210-20.COV). Given the small size of the waterbody, samples will be collected at the centroid of flow using a grab sample, composited into a churn and distributed equally to all sample bottles (SOP #210-20.COV). We will ensure that collected samples accurately represent the waterbody by adhering to the collection procedures, sample preservation, and sample handling protocols outlined in this QAPP.

3. Completeness

The goal of this project is to sample and analyze at least 80% of the proposed sites and collect at least 8 samples per PWL segment over two years that are validated as acceptable data.

5. Training Requirements/Certifications

Certification/Education and Experience Requirements

Each of the following roles require distinct certification, education, and experience:

- PEERS project coordination
- Water Column Chemistry sampling
- Water Column Chemistry analysis
- Biological (macroinvertebrate) sampling
- Identification of biological samples

These roles may be performed by the same or separate individuals. The requirements for each role are outlined in Table 4

Qualifications and certifications are submitted to the NYSDEC PEERS Program Coordinators before the PEERS Project QAPP is approved (see application form, Appendix H). The NYSDEC reserves the right to reject QAPPs or professional credentials if there are any quality concerns or conflicts of interest.

Training Requirements

PEERS Project Coordinators and PEERS Participants are required to attend a training/calibration session for field sampling techniques.

The NYSDEC PEERS Program Coordinators conducts all training/calibration sessions for PEERS Project Coordinators and PEERS Participants Collecting Biological Samples. These sessions are held before sampling begins and within the same year as sampling will occur

The PEERS Project Coordinators train PEERS Participants in Water Column Chemistry Sampling techniques before sampling begins and within the same year as sampling occurs. This practice follows the “train the trainer” model (for Water Column Chemistry sampling only).

The field training and calibration session consist of both a demonstration of field techniques outlined in the PEERS Project QAPP and a calibration of these techniques.

- To calibrate biological sampling, the one of the PEERS Program Coordinators performs side by side collection with every Participant Collecting Biological Samples and the PEERS Project Coordinator. Samples should contain at least 70% of the same macroinvertebrate orders. Any discrepancies are identified and corrected during the calibration. If discrepancies cannot be satisfactorily resolved, the NYSDEC reserves the right to refuse data collected by any PEERS Participant.
- To calibrate Water Column Chemistry sampling, the PEERS Program Coordinator observes the PEERS Project Coordinator and PEERS Participants Collecting Water Column Chemistry Samples complete the field sampling procedures using a practice set of sample bottles and field forms. Any discrepancies are identified and corrected during the calibration. If discrepancies cannot be satisfactorily resolved, the NYSDEC reserves the right to refuse data collected by any PEERS Participant.

Dates for all calibration/training events for this project:
Friday July 31, 2020 (10-12 AM), Location: to be determined

The PEERS Project Coordinator and PEERS Participants listed above will serve as sampling team leaders. Additional participants will receive field training and calibration on the sampling days.

Health and Safety

For health and safety guidance, refer to health and safety sections within SOPs #210-20.COV, 211-20.COV, and 101-20.COV, provided in Appendices E, F, and B, respectively. Health and safety liability for the PEERS program are addressed under the Release of all Claims form (Appendix I).

In order to minimize exposure while continuing to execute the core mission of the RIBS Program in light of COVID-19, modifications to certain protocols were developed that incorporate social distancing recommendations.

Table 4: Credentials for PEERS Project Coordinators and Participants

PEERS Project Coordinator	College or Practical Experience	<ul style="list-style-type: none"> Completed and achieved passing marks in undergraduate core course work in limnology, aquatic biology, environmental sciences or a related discipline, <u>OR</u> has two years practical experience in environmental assessment work
	Practical Experience	<ul style="list-style-type: none"> Two years of practical experience involving work in developing water quality sampling and analysis plans, quality assurance plans, and data quality objectives processes
	Calibration by NYSDEC	<ul style="list-style-type: none"> Attend a field training and calibration session in the same year sampling takes place held by the WAVE/PEERS Coordinator
	Release of All Claims Form	<ul style="list-style-type: none"> All PEERS Participants who collect samples must sign the Release of all Claims form attached as Appendix D.
PEERS Participant Collecting Samples	Calibration by NYSDEC	<ul style="list-style-type: none"> Attend a field training and calibration session in the same year sampling takes place held by the WAVE/PEERS Coordinator
	Licensing	<ul style="list-style-type: none"> If macroinvertebrates are collected, must hold a license to collect or possess from the NYSDEC http://www.dec.ny.gov/permits/28633.html
	College or Practical Experience	<ul style="list-style-type: none"> Completed and achieved passing marks in undergraduate core course work in limnology, aquatic biology, environmental sciences or a related discipline, <u>OR</u> two years practical experience in environmental assessment work
	Release of All Claims Form	<ul style="list-style-type: none"> All PEERS Participants who collect samples must sign the Release of all Claims form attached as Appendix D.

PEERS Laboratory Samples	<p>Certification</p> <ul style="list-style-type: none"> • If macroinvertebrates are collected: Society for Freshwater Science certified Eastern Group 1 (General Arthropods), 2 (EPT), 3 (Chironomidae), and 4 (Oligochaeta) • If water chemistry collected: Certification from the NYS Dept. of Health Environmental Laboratory Approval Program for the analyses required in the specific PEERS project
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6. Documentation and Records

PEERS Project QAPP

- Each PEERS Project QAPP and Credentials are approved before sampling begins and are added as electronic pdf documents to the Stream Biomonitoring Unit Database as metadata linked to associated data records.
- Any changes to a PEERS Project QAPP after it is finalized are approved by the PEERS Program Coordinator and are recorded in a Memo To File.
- All quality assurance documents are maintained electronically on a secure NYSDEC server, at L:\DOW\Statewide Monitoring\QAQC\

Sampling Site Locations

- The PEERS Program Coordinator assigns sampling locations an alpha-numeric “Station_ID” consistent with RIBS QAPP (2020) (described in section II.3 of this document).
- Site coordinates are recorded in decimal degrees, and maintained in each PEERS Project QAPP until the project is completed and the locations are added to the Annual Data File (see below).

Forms

- Copies of field and laboratory sheets originate in the SOPs as follows but should be completed electronically as described below:
 - SOP #210-20.COV, Standard Operating Procedure: Collection of Water Column Samples for the Rotating Integrated Basin Studies (RIBS) Program (Appendix E)
 - SOP #208-19, Biological Monitoring of Surface Waters in New York
 - All sampling forms have been converted by NYSDEC to electronic format and are available through Survey123 (Appendix J). All data collected through Survey123 uploads to the NYSDEC Enterprise ArcGISonline cloud storage for record review prior to inclusion in the NYSDEC data system.
- All PEERS Project Coordinators and PEERS Participants are required to complete and sign the Release of All Claims Form (Appendix I)

Analytical Laboratory Results

Complete data packages are required for the PEERS program to provide data validation

capability. Data packages are delivered to the NYSDEC PEERS Program Coordinators, in accordance with the requirements of the NYSDEC Prescribed Analytical Protocols (2016; [ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20\(Reporting\).pdf](ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20(Reporting).pdf)).

Annual Data File/Final Report and Record Retention

The PEERS Project Coordinator will be responsible for recordkeeping and submission of field records to NYSDEC through Survey123. Screenshots will be uploaded by the PEERS Project Coordinator and maintained on a Google Drive folder as backup. Water quality data will be submitted as MS excel or .csv format to the PEERS Program Coordinator as a complete project data file after receipt of each year's data and summary of the project including any deviations from this QAPP.

Once the project is completed, the PEERS Project Coordinator compiles a final project report at the completion of sampling. The project report shall include data files and field notes, and an assessment of QA/QC and are submitted to the PEERS Program Coordinator before March of the following year.

The NYSDEC PEERS Program Coordinators will produce a data report on the PEERS Project which will include data with qualifying flags describing any limitations in the way the data may be used. All qualified data are compiled into an annual data file by the NYSDEC PEERS Program Coordinators and uploaded to the Stream Section Database.

Records and documents are maintained in a manner that ensures compliance with all applicable statutory, regulatory, requirements. Legally, all records from statewide ambient water quality monitoring fall under Records Disposition Authorization Number 17099 and are to be retained for at least 10 years as specified by the Department's Records Retention Documents found at <http://internal.dec.state.ny.us/ogc/ogc80.html>.

II. DATA GENERATION AND ACQUISITION

1. Rationale of Monitoring Design

The central goal of this PEERS project is to update the NYSDEC Waterbody Inventory for the Sparkill Creek with uniform, recent data. Project sampling locations were selected with that goal as the priority. The following factors were considered when selecting sampling locations:

- including at least one site in each of the waterbody segments;
- representing two contrasting land use categories (forest, industrial) present in different sections of the Minor Tribs to Upper Sparkill Creek segment (1301-0108);
- retaining locations previously sampled by NYSDEC; and

- obtaining at least 8 samples at each site over 2 years.

Sampling Sites

Locations to be sampled under this project QAPP are listed in Table 5.

Table 5: Site information for 2020-2021 Sparkill Creek PEERS survey

Site ID	Site Name	Latitude	Longitude	DEC Stream Segment	Predominant Upstream Land Cover ⁵
13-SPAR-1.5	Piermont-Skating Pond	41.029292	-73.925459	Sparkill Creek, Lower PWLID 1301-0088	Developed, Open Space / Woody Wetland
13-SPAB-0.1	Sparkill Brook tributary	41.013922	-73.938315	Minor Tribs to Lower Sparkill Creek PWLID 1301-0107	Developed, Mixed Intensity / Woody Wetland
13-SPAR-3.6	Tappan- Below Washington St Bridge	41.02166	-73.94684	Sparkill Creek, Upper, and minor tribs PWLID 1301-0106	Developed, Mixed Intensity
13-SPAR-7.1	Blauvelt - 15 m above Greenbush Rd	41.062025	-73.945753	Sparkill Creek, Upper, and minor tribs PWLID 1301-0106	Developed, Open Space / Deciduous Forest
13-SPAR_T9b-0.1	Blauvelt Arm tributary	41.054489	-73.945322	Minor Tribs to Upper Sparkill Creek PWLID 1301-0108	Developed, Mixed Intensity
13-TACK-0.1	Tackamack trib at Greenbush Rd Bridge	41.058766	-73.943657	Minor Tribs to Upper Sparkill Creek PWLID 1301-0108	Deciduous Forest

⁵ Multi-Resolution Land Characteristics Consortium. (2019). *2016 National Land Cover Database* [database].

2. Sampling Methods

All samples at each sampling site on each date, will have *in situ* measurements of temperature, pH, conductivity, and dissolved oxygen collected using a multi-parameter probe. Samples for laboratory analysis of ammonium, Total Kjeldahl Nitrogen, nitrate-nitrite, nitrate, nitrite, total nitrogen, total phosphorus, turbidity, alkalinity, hardness, chloride, magnesium, and chlorophyll *a* will also be collected. These parameters were selected based on the NYSDEC RIBS “screening” parameters list. (DEC RIBS QAPP, April 2020). The methods required to collect these samples are described in the SOPs #101.20.COV - Sample Handling, Transport, and Chain-of-Custody, #103-19 - Equipment Decontamination/Cleaning, #210-20.COV - Ambient Water Quality Samples for RIBS program sampling, #211.20.COV - Use, Calibration, Maintenance and Storage of multi-probe meters. Field sheet for the collection of water column samples will be collected using a smart device and Survey123 published web-form prepopulated with site information (Appendix J).

Quality Control

Quality control sampling locations will be determined through discussion with the NYSDEC PEERS Coordinator. The following quality control samples will be collected on each sampling date: equipment blank and matrix spikes (Section II.5). Use of Survey123 will increase transfer of site information and in-situ data and reduce transcription error. All values will be screenshot to ensure data are not lost.

Schedule

Sites will be sampled four times between August and October in 2020 and April and October in 2021 for a total of eight samples (Table 6). Sampling events will be spaced approximately evenly throughout the season in order to capture a range of seasonality and flow conditions. Wet weather sampling events will be noted as such. Wet weather is defined as when greater than 0.25 inches of rain as predicted by the NOAA Quantitative Prediction Forecast (<http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml>), cumulative, over the study area on the day of sampling following a minimum antecedent dry period of 72 hours. In 2020, sampling will be conducted during the weeks of August 10, August 31, September 21, and October 19. The PEERS project coordinator will develop the 2021 sampling schedule in consultation with the PEERS Program Coordinator prior to March, 2021.

Table 3: 2020 sampling schedule and quality assurance samples to be collected according to week. 2021 will be determined prior to March 2021.

	Equipment Blank	Matrix Spike/Matrix Spike Duplicate
10-Aug	x	
31-Aug	x	x
21-Sep	x	

x

All containers from the same site are grouped together in the same cooler. Each cooler has a COC exclusive to its contents.

Samples are delivered to the appropriate analytical laboratory for analysis within twenty-four hours of sampling by courier service (UPS), pick up by the laboratory or delivery by sampling staff. Upon arrival at the laboratory, samples must be refrigerated at <6°C until all analyses are completed. Processing and analysis of samples begins immediately upon receipt.

Upon receipt at the analytical laboratory, the time of sample receipt and start of analysis along with any problems encountered with equipment or samples are recorded, and subsequently reported in the data package. Complete information on laboratory procedures is contained in the PAP (2016; [ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20\(Reporting\).pdf](ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20(Reporting).pdf)).

4. Analytical Methods

Sample analyses will be performed by ALS Laboratories in Rochester, NY following methods included in Table 3 and taken from Section I.4 of the NYSDEC RIBS QAPP (2020).

The quality control for PEERS is designed to establish and maintain standards that will ensure the validity of the data. All the quality control measures below adhere to requirements of the RIBS QAPP (2020) with frequencies specifically tailored for PEERS Projects and specified in Table 6 of this QAPP.

A. Quality Control for Water Column Chemistry Samples

All chemical analyses are performed at laboratories certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP). In addition to the requirements of the ELAP program, the following measurements are used to assess the quality of water column chemistry data being generated in the project:

i. Accuracy (matrix spikes)

Matrix spike (MS) samples and matrix spike duplicate samples (MSD) are collected by all PEERS Projects to assess the accuracy of water column chemistry analyses. These samples are spiked in the laboratory with a known concentration of analyte and processed along with other samples. The percent recovery of the spiked analyte is the observed accuracy of the laboratory analysis and is used to assess compliance with the accuracy criteria established in section I.4 of this document.

Matrix spike samples are collected at least once per sampling week and correspond to at least ten percent (10%) of all samples collected. Matrix spike sampling is included in each PEERS Project schedule.

ii. Precision (matrix duplicates)

Matrix duplicates are collected by all PEERS Projects to assess the precision of the water column chemistry analyses. Duplicate samples are processed equivalently and compared to assess compliance with precision criteria established in section I.4. of this document. Duplicate analyses are conducted for both inorganic and conventional parameters.

Matrix duplicates are collected at least once per sampling week and correspond to at least ten percent (10%) of all samples collected. Matrix duplicate sampling is included in each PEERS Project schedule.

iii. *Equipment Blanks*

Equipment blank samples are collected by all PEERS Projects to assess potential contamination by field sampling techniques. To collect an equipment blank, the sampler uses deionized water sent from the laboratory through all the steps and equipment required to collect a water column chemistry sample. Equipment blank samples are analyzed for the same parameters examined in standard samples.

Equipment blanks are collected at least once per week and correspond to at least ten percent (10%) of all samples collected. Equipment blank sampling is included in each PEERS Project schedule.

iv. *Representativeness*

Representativeness in water column samples is attained by selection of proper sampling equipment to obtain an integrated sample of water from a cross section of the waterbody, as well as from different depths.

v. *Completeness*

Completeness is a measure of the number of intended samples versus samples collected and analyzed, expressed as a percentage. PEERS Projects are considered complete if at least eighty percent (80%) of samples are collected and analyzed.

5. Instrument/Equipment Testing, Maintenance, and Calibration Procedures

Multiprobe meters are calibrated according to NYSDEC SOP 211-20.COV or manufacturer's instructions. Calibration and instrument check frequencies prescribed in SOP211-20.COV must always be followed. Instruments that fail calibration are not used. All calibrations are logged weekly as prescribed.

Field Cleaning - Field cleaning of equipment (including waders) is necessary to prevent possible contamination by invasive species from one site to another. When not in use, equipment should be stored in a clean environment.

Equipment and supplies are listed in Tables 7 and 8, respectively.

Table 7: Equipment List

Item	Description	Number
------	-------------	--------

Water Sample Equipment	Churn Splitter - Loan from DEC	1
Multiprobe meter	YSI Professional <i>Plus</i>	1

6. Supplies and Consumables

Supplies and consumables should be kept in temperature-controlled area (ie indoors) and not in vehicles for aside from sampling events. Supplies and consumables described in Table 8, where applicable, should be used prior to specified expiration dates. This includes calibration standards and spare batteries. Care should be taken to note expiration dates when purchasing these items and the amount purchased should not exceed to volume needed within the sampling period (ie purchase sufficient quantity for each year only). DI water should be refreshed prior to each sampling event.

Table 8: Consumables List

Item	Quantity	Size
<i>Water Chemistry Supplies</i>		
Sample bottle labels	1	Set
Disposable gloves	1	Box
Kimwipes	1	Box
Packing tape	1	Roll
DI water	1	gallon
DI water	1	1L squirt bottle
<i>In Situ Measurement Supplies</i>		
Calibration standards for multiprobe meter	varies	varies
Spare batteries for multiprobe meter	1 set	varies

7. Data Management

The PEERS Program Coordinator reviews all data produced by PEERS Projects satisfying the below format requirements. If all data validation and usability checks are satisfied, these data are uploaded to the Stream Section Database. In some cases, established data qualifiers may be applied for values that are known to be suspicious, less than the reported value, or affected by QA/QC blank. The database automatically calculates the metrics for each sampling site once the data are uploaded.

A. Water Column Chemistry Data Format

Sample collection information (station, collection date, time) and field parameter measurements (temperature, dissolved oxygen, pH, conductivity) are recorded on the Water Chemistry Field Sheet in Survey123 (Appendix J).

Water column results and supporting documentation from contract laboratories are reported electronically by the PEERS Project Coordinator (in MS excel or other similar editable spreadsheet format) to the NYSDEC PEERS Program Coordinator in a complete data document either on CD, email or via a link to the laboratory secure data repository. These data documents include summaries of data validation conducted by the analytical laboratory.

III. ASSESSMENT AND OVERSIGHT

1. Performance and System Audits

Every PEERS Project is audited at two stages: sample collection and sample analysis. This may result in as many as 4 audits per PEERS Project if the biological sample collection and analysis is performed separately from the water column chemistry sample collection and analysis.

Field Audit

The PEERS Program Coordinator observes all field methods employed by each PEERS Project at least once per sampling season. Any discrepancies from this document or the PEERS Project QAPP are discussed. If the PEERS Program Coordinator feels these are significant, they may schedule a second audit later in the sampling season. The NYSDEC reserves the right to refuse data collected by any PEERS Project if quality concerns are significant.

Laboratory Audit

If applicable, once per year, the PEERS Program Coordinator will observe each PEERS laboratory processing biological samples. Any discrepancies from this document are discussed. The NYSDEC reserves the right to refuse data collected by any PEERS Project if quality concerns are significant.

If the PEERS Laboratory processing biological samples is located outside of NY State, the PEERS Program Coordinator will make an effort to contact colleagues with comparable professional credentials in that state to perform the audit.

PEERS Laboratories analyzing water column chemistry samples are audited annually as part of the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP). This program involves semi-annual performance evaluation samples and annual onsite audits.

2. Corrective Action

The PEERS Project Coordinator will thoroughly brief the NYSDEC PEERS Program Coordinators before implementing any changes, to identify emerging or unanticipated problems, and take corrective action, if necessary. The PEERS Program Coordinators will institute and document any corrective actions. Corrective actions should be implemented prior to the next sampling event.

Deviation from intended plans and procedures should be noted by the person observing the deviation and reported to project staff responsible for the operation or analysis in question. The appropriate project personnel shall (1) develop a corrective action plan to ensure that future sampling, analyses, etc. are conducted in accordance with the QA procedures presented in this QAPP; (2) rerun procedures in the appropriate manner and re-analyze samples, if sufficient sample material is available and holding times are not exceeded; and (3) report all problems and deviations to the NYSDEC PEERS Program Coordinators, who will also be consulted during the development of any proposed corrective action plans. All deviations from intended plans and procedures are to be recorded in the appropriate field or laboratory. Failure to implement corrective actions may result in suspension of sampling.

For PEERS laboratories, Exhibits D and E of the PAP contain the procedures the laboratory is to follow when problems are encountered in the chemical analysis of samples (2016; [ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20\(Reporting\).pdf](ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20(Reporting).pdf)).

3. Reports to Management

The PEERS Project Coordinators submits a monthly reports to the NYSDEC PEERS Program Coordinators within one month of sampling. This report includes number of samples collected, quality assurance samples collected, and a summary of field observations made by the PEERS Project Coordinator or Participants.

NYSDEC Final Progress Report

The NYSDEC PEERS Program Coordinator will perform a full data validation review on all PEERS data. This evaluation together with the analysis of the completeness, precision, and accuracy of the projects will provide a level of confidence to the data set and to the interpretations and conclusions drawn from the data. All accepted data are added to the NYSDEC Stream Section database.

The NYSDEC PEERS Program Coordinator will prepare a final progress report on the PEERS Project which will summarize QA problems encountered and describe any limitations in the way the data may be used.

The deliverables are electronic and shared with all project partners and other interested parties.

4. Data Validation and Usability

Data generated by PEERS projects are reviewed at two stages. First, the PEERS Laboratory(s) analyzing samples follows specific laboratory protocols to assure the quality and validity of the data. Second, the PEERS Program Coordinator performs a data validation review, evaluating the completeness, precision, and accuracy for the PEERS Program according to SOP 110-19: Data Validation and Verification.

A. Water Column Chemistry Data Validation

Laboratory(s) analyzing water column chemistry samples perform the following QA evaluations as per the RIBS QAPP (2020):

- 1) *Analysis Precision* – is assessed as a relative percent difference (RPD) between the matrix duplicate samples (see equation below). Precision criteria for the PEERS project are given in section I.4 of this document.
 - a. Relative Percent Difference = $[(\text{sample-duplicate})/\text{sample}]*100$
- 2) *Analysis Accuracy* - is assessed by comparing matrix spike samples with the spiked value (see equation below). The result may be positive (+) or negative (-) indicating the direction of sample bias where “+” is biased high and “-“ is biased low. Accuracy criteria for the PEERS project are given in section I.4 of this document.
 - a. Accuracy = observed value – true value

- 3) *Blanks* - method blanks are analyzed and compared to the method detection limits given in section I.4 of this document.

These QC samples are analyzed at a frequency of 1 per analytical batch as required by the PAP Exhibit E (2016; [ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20\(Reporting\).pdf](ftp://ftp.dec.state.ny.us/dow/2016LabIFB/PAP-5/2016%20PAP-5%20Exhibit%20B%20(Reporting).pdf)). Those data not meeting the previously identified criteria for precision, accuracy and blank values are re-analyzed where possible, or flagged by the laboratory if additional sample material is not available. An indication as to why flagged data did not meet the minimum QA criteria are provided.

All water column chemistry data are reviewed by the PEERS Program Coordinator to determine its validity prior to use and distribution. If data validity cannot be verified, these data are qualified in the final data set using data flags. Typical data qualifiers (flags) are presented in RIBS QAPP (2020). This information is noted in the final Progress Report.

B. Reporting

After the above QC calculations and examinations have been performed, the results are summarized in the Annual Progress Report by the PEERS Program Coordinator as per section III.3 of this document.

REFERENCES CITED

1. NYSDEC QAPP. 2020. Quality Assurance Project Plan: Rotating Integrated Basin Studies Rivers and Streams
2. NYSDEC SOP 101-20.COV. 2020. NYSDEC Division of Water Standard Operating Procedure: Sample Handling, Transport, and Chain of Custody
3. NYSDEC SOP 103-19. 2019. NYSDEC Division of Water Standard Operating Procedure: Equipment Decontamination/Cleaning
4. NYSDEC SOP 208-19. 2019. NYSDEC Division of Water Standard Operating Procedure: Biological Monitoring of Surface Waters in NY State
5. NYSDEC SOP 210-20.COV. 2020. NYSDEC Division of Water Standard Operating Procedure: Ambient Water Quality Samples for RIBS program sampling
6. NYSDEC SOP 211-20.COV. 2020. NYSDEC Division of Water Standard Operating Procedure: Use Calibration, Maintenance, and Storage of multi-probe meters used to measure water quality parameters
7. NYSDEC SOP 603-20. 2020. Guidance for Field Work During COVID-19 Pandemic

8. Stribling, J.B., K.L. Pavlik, S. M. Holdsworth, and E.W. Leppo. 2008. Data Quality, performance, and uncertainty in taxonomic identification for biological assessments. *Journal of North American Benthological Society* 27(4):906-919.
9. Stribling, J.B., S.R. Moulton II, G.T. Lester. 2003. Determining the quality of taxonomic data. *Journal of North American Benthological Society* 22(4): 621-631.

APPENDICES A-G, I – included separately as a PEERS zip file

Appendix A. Quality Assurance Project Plan 2020: Rotating Integrated Basin Studies Program

Appendix B: NYSDEC SOP 101-20.COV

Appendix C: NYSDEC SOP 103-19

Appendix D: NYSDEC SOP 208-19

Appendix E: NYSDEC SOP 210-20.COV

Appendix F: NYSDEC SOP 211-20.COV

Appendix G: PEERS Project QAPP Template

Appendix H. Training Certification Template



This form is to certify that you have:

- Read the QA documents relevant to your role
- Understand how to apply the QA documents (QAPPs and SOPs) to your work
- Know where to locate a copy of the current QA documents (QAPPs and SOPs)
- Have undergone field training conducted by NYSDEC PEERS coordinator

I, _____, certify that I have read and understood QA documentation
name

described above and associated with this project.

Signature: _____ Date: _____

This signed document should be sent to the NYSDEC PEERS coordinator

Appendix I. Release of all Claims Form

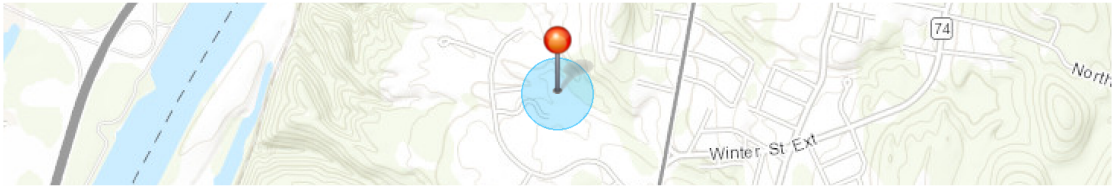
Appendix J. Survey123 Field Form

11:47 AM Fri Jul 24

2020_PEERS_Sample_Event_Information

Capture GPS *
Please record the sampling location by clicking the GPS target icon. After the map has located your position, click the check mark at the bottom of the map to save the new coordinates.

📍 42°41'N 73°42'W ± 165 m



Field Latitude:
Field acquired Latitude
42.680883483096125

Field Longitude:
Field acquired Longitude
-73.6963864202638

GPS Horizontal Accuracy:
Horizontal accuracy of field acquired GPS coordinates
165

▽ **Site Selection**

Is this a **NEW** site location? (i.e. one that **is not** on the scheduled site list or in the historical site list table) *

Only select a location as **NEW** when it is not in the site list provided in the survey. Notate in the site description the reason for sampling this location.

☐ Yes

☒ No

Is this an existing site, or a random probabilistic location, that needs to be **MOVED** from the original location? *

Only select that the site needs to be updated when you must sample outside of the original representative reach; i.e. +/- 500m up or down-stream from the original location. Notate in the site description all sampling notes why the site had to be moved.

☐ Yes

☒ No

Site Location ID:
Select the **Site ID** for the location being surveyed

13-SPAR-1.5

✕

✓

✓

11:47 AM Fri Jul 24 86%

2020_PEERS_Sample_Event_Information

Description of Location:
below valentine st. bridge.

Name of Stream being Sampled:
Sparkill Creek

Sampling Notes:
PWL Segment: 1301-0088

Sampling Information

Field Crew: *
Enter the assigned crew code of ALL field crew members separated by a coma.
N/A

Sample Project: *
What is the name of this PEERS survey?
N/A

Sample Date and Time: *
Enter the Sample Date and Water Sample Collection Time.
Friday, July 24, 2020 11:47 AM

Sampling Event Type
Indicate if this is part of Normal/Baseline monitoring or an Event sampling.
N/A

Extent of Event Flow
To the best of your ability, rank the extent of current flow conditions at this location.
0 - Low | 5 - Moderate | 10 - Severe.

Water Chemistry: *
Are water chemistry samples being collected during this site visit?

Yes

No

11:49 AM Fri Jul 24

86%



2020_PEERS_Sample_Event_Information



Site Characteristics

Dominant Landuse: *

Select the **Landuse Category** best describing the sampling location

N/A



Water Depth (m):

Enter the **Water Depth** in meters. A value of **-9999** indicates that this was not measured.

-9999



Stream Width (m):

Enter the **Stream Width** in meters. A value of **-9999** indicates that this was not measured.

-9999



Current Speed (cm/sec):

Enter the **Current Speed** in centimeters per second. A value of **-9999** indicates that this was not measured.

-9999



Canopy (%):

Select the **Percent** value that best estimates **Canopy** cover



Embeddedness (%):

Select the **Percent** value that best estimates **Embeddedness**



Macrophyte (%):

Select the **Percent** value that best estimates **Macrophyte** presence



Diatoms (%):

Select the **Percent** value that best estimates **Diatoms** presence



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86%



2020_PEERS_Sample_Event_Information



Diatoms (%):

Select the **Percent** value that best estimates **Diatoms** presence



Diatoms Thickness:

0 (None) ; 1 (Slimy, but not visible) ; 2 (Visible biofilm and a line can be drawn by scratching) ; 3 (0.5 - 1 mm thick)

4 (1 - 5 mm thick) ; 5 (> 5 mm thick)



Suspended Algae:

Select **Yes** if **Suspended Algae** present

☐

Yes

☐

No

Filamentous Algae:

Select **Yes** if **Filamentous Algae** present

☐

Yes

☐

No

Substrate Composition

Rock (%):

Estimate a **percent** for extent of Rock Substrate. A value of **-9999** indicates that this was not measured.

-9999



Rubble (%):

Estimate a **percent** estimation for extent of Rubble Substrate. A value of **-9999** indicates that this was not measured.

-9999



Gravel (%):

Estimate a **percent** estimation for extent of Gravel Substrate. A value of **-9999** indicates that this was not measured.

-9999



Sand (%):

Estimate a **percent** estimation for extent of Sand Substrate. A value of **-9999** indicates that this was not measured.

-9999



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2020_PEERS_Sample_Event_Information

-9999

Silt (%):
Estimate a **percent** estimation for extent of Silt Substrate. A value of **-9999** indicates that this was not measured.

-9999

Clay (%):
Estimate a **percent** estimation for extent of Clay Substrate. A value of **-9999** indicates that this was not measured.

-9999

YSI Measurements

Water Temperature (C°):
Enter the **Water Temperature (C°)** for the sampling location. A value of **-9999** indicates that this was not measured.

-9999

Water Percent Saturation (%):
Enter the **Water Percent Saturation (%)** for the sampling location. A value of **-9999** indicates that this was not measured.

-9999

Water Dissolved Oxygen (mg/L):
Enter the **Water Dissolved Oxygen (mg/L)** for the sampling location. A value of **-9999** indicates that this was not measured.

-9999

Water Specific Conductance (uS/cm):
Enter the **Water Conductivity (umho/cm)** for the sampling location. A value of **-9999** indicates that this was not measured.

-9999

Water Salinity (ppt):
Enter the **Water Salinity** for the sampling location. A value of **-9999** indicates that this was not measured.

-9999

Water pH (std pH unit):
Enter the **Water pH** for the sampling location. A value of **-9999** indicates that this was not measured.



-9999

11:50 AM Fri Jul 24

86%

×

2020_PEERS_Sample_Event_Information



Phycocyanin (ug/L):
Enter the **PC (ug/L)** for the sampling location. A value of **-9999** indicates that this was not measured.



Phycocyanin (RFU):
Enter the **PC (RFU)** for the sampling location. A value of **-9999** indicates that this was not measured.

▽ Images



Would you like to photo document this site? *
Photo-document the site whenever possible!

▽ Capture Images (1)

Upstream Photo:
*Manually rename the photo to the ID listed below the image by **clicking** on the photo name.*




Downstream Photo:
*Manually rename the photo to the ID listed below the image by **clicking** on the photo name.*



9. Additional Notes:

Are you satisfied with all of your responses? *

☐ Yes



Appendix K. Chain of Custody Form

CHAIN OF CUSTODY														Page <u>1</u> of <u>1</u>	
CHAIN OF CUSTODY	Project Name: PEERS							Case Code:				SDG: ([Monday's MMDDYY][team code][matrix code])			
	Contract No.:							Sampler Collector:				Sampler Phone No.:			
	Project Coordinator:							Report to Project Manager:				Bill to Project Manager:			
	Address:							Address:				Address:			
	Phone:							Phone:				Phone:			
	Email:							Email:				Email:			
Matrix Codes: WW = Wastewater GW = Groundwater W = Ambient Water SE = Sediment SL = Sludge T = Tissue O = Other <u>DI WATER</u>		Collection Date (MM/DD/YY)	Collection Time (HH:MM)	Matrix Code	Equip. Blank (EB)	Sequential Duplicate (SEQ)	MS/MSD	# Containers	Analyses Ordered (list) (Please include in () on "Analyses Ordered" line): 1 = Cool to < 6°C 2 = 0.008% Na ₂ S ₂ O ₃ 3 = H ₂ SO ₄ to pH < 2 4 = HNO ₃ to pH < 2 5 = NaOH to pH > 12 6 = 5 mL/L 12N HCl				Preservative Codes: 7 = 5 mL/L BrCl 8 = HCl to pH < 2 9 = H ₃ PO ₄ to pH < 2 10 = Protect from light 11 = Freeze to < -10°C 12 = Other _____		
SITE ID ([2-dig. basin]-[stream identifier]-[rivermile]) e.g., "06-DILA-5.4", or "14-WDEL-16.2"									Location Info/ NYSDEC Notes				Lab Sample ID/ Lab Notes		
13-SPAR-1.5															
13-SPAB-0.1															
13-SPAR-3.6															
13-SPAR-7.1															
13-SPAR_T9b-0.1															
13-TACK-0.1															
Special Analysis Instructions:															
Laboratory Reporting Instructions: "sample_name" to be reported as: "SITE ID-collection date (MMDDYYYY)-Matrix Code-[Quality Control Code if noted (EB/FB/SEQ)]" (dashes included) EXAMPLES: "13-ROND-9.9-10102018-W" (normal field sample) "13-WALK-18.6-10102018-W-EB" (equipment blank sample)															
Relinquished by Sampler:		Date:	Time:	Received by:		Date:	Time:	Laboratory Receipt Notes:							
Relinquished by:		Date:	Time:	Received by:		Date:	Time:								
Sample Temp.: _____ °C Properly Preserved: Y / N Samples Intact: Y / N															

