General Monitoring
Quality Assurance Project Plan (QAPP) Template:
[REMOVE THIS PAGE BEFORE SUBMITTING.]

*****QAPP must be reviewed and accepted before work begins.*****

Commented [SZM(1]: *** ONLY when grant/contract funding is provided by the Department of Environmental Conservation (NYSDEC) Division of Water (DOW) will it require approval by NYSDEC DOW Project Manager and Quality Assurance Officer.

PURPOSE: This template is intended as an aid in developing Quality AssuranceProject Plans. It is expected to improve the quality in both the scope and application of the environmental information gained from projects that have applied a systematic approach to project design. Communication with all parties involved on the specifics for implementing the project will help ensure transparency and establish criteria consistent with project objectives regardless of the complexity of the work.

The design of this template is expected to improve both the quality and usability of environmental information from projects. Clear communication of project plans and objectives helps reduce project errors and supports successful project implementation.

BACKGROUND: This template follows EPA QA G-5 guidance on QAPPs and provides some "boilerplate" language for common elements. However, every project is unique, and this QAPP must be edited to meet the specific needs of a project.

USAGE: Text enclosed in brackets or highlighted in yellow indicates areas meant for review and editing. **Example text is provided only for illustrative purposes and is not to be considered a complete description for fulfilling QAPP components.** Additional text revisions may be needed to meet the requirements of the project. Microsoft Word comment fields are used to provide guidance/advice.

Data Usability Assessment Report (DUAR) place holder boxes are provided throughout the document for your convenience. These elements are completed at the end of a project, after work has been completed. It provides a format for describing how the project was carried out in comparison to the plan and how well the data quality requirements were met. The inclusion of these elements is intended to simplify the process of completing a DUAR. Additionally, please use the DUAR style whenever reporting on DUAR-related information.

PRE-SUBMISSION CLEANUP: Before submitting the QAPP for review remove all yellow highlighting, make sure all [bracketed] text has been replaced with project specific text, update table of contents and lists of tables and/or figures and remove Microsoft Word comments.

Name of Monitoring Project
Quality Assurance Project Plan

DATE

Insert Organization Information

[Insert full contact information for project manager]

This document has been prepared according to the United States Environmental Protection Agency publication *EPA Requirements for Quality Assurance Project Plans* dated March 2001 (QA/R-5).

Abstract: This document details a quality assurance plan to guide the successful implementation of [name of project]. [Provide a summary of the project. Two to three sentences are sufficient. A more detailed description of the project is to be outlined in Section A6.]

Commented [RG2]: This offers the reader a quick overview of the project before getting into the details.

A PROJECT MANAGEMENT

A1. Approval/Acceptance Sheet

_____
_____

[Insert name of project manager] – Project Manager Date
[Insert organization name]

_____ _____

[Insert name] Project Quality Assurance Officer Date
[Insert organization name]

_____ _____

[Insert Additional key personnel] Title Date
Insert organization name]

Commented [RG3]: List any other individuals that have approval authority oversight of the project. For example, laboratory manager or contractor.

_____ _____

[Insert name DOW Quality Assurance Officer Date
INYSDEC DOW

Commented [RG4]: For DOW Staff and DOW grantees and contractors use only

Insert name of Project QAPP Update Log

Prepared/Revised By:	Date:	Revision No:	Summary of Changes:

'No substantive changes' may be listed to reflect updating of references, correcting typographical errors, and clarifying certain language to make the document more useful and effective.

A2. Table of Contents

Commented [RG5]: Be sure to update table of contents to reflect correct page numbers, table and figure numbers

List of Tables

List of Figures

A3. Distribution List

The following individuals are to receive a copy of the approved QAPP including any revisions in order to complete their role in this project.

Commented [RG6]: The distribution list must include all individuals that have a role in the project. Individual must also be listed in the Project Organization section and the organizational chart.

Name	Title	Organization	Document type
(Name)	Program Manager	(Organization name)	
(Name)	QA Officer	Organization name)	electronic
(Name)	(Title relative to project)	(Organization name)	

Commented [GR(7]: Note whether an electronic or hard copy will be distributed.

A4. Project/ Task Organization

The following individuals or groups will actively participate in this project and its oversight:

Commented [RG8]: List all individuals that have a role in this project. State clearly and succinctly what their responsibilities are. Include any facility staff involved in the project as well as contractors, and subcontractors. Everyone needs to be listed with their contact information, address phone number, e-mail.

Insert full name, title Project Manager, Insert email address and contact number

Responsibilities

Commented [GR(9]: The list of responsibilities provided in this section are included for reference. Tailor the responsibilities to the specific project.

1. Oversee project administration, including budget, scheduling and procurement of materials required for successful implementation of this project.
2. Oversee coordination of interactions with [names of any groups involved]
3. Determine project strategy and overall design, including site location, parameter selection, sampling frequency, etc.
4. Ensure all individuals involved in this project have the proper training to conduct fulfill their assigned role and understand and follow the protocols as detailed in this QAPP.
5. Insert additional tasks here

Insert full name, Project Quality Assurance Officer,

Oversees the Quality Assurance activities of this project and is not subject to the direct authority/supervision of (name of project manager) and is independent of individuals conducting the technical activities of the project. Insert email address and contact number

1. Ensure field procedures, analytical methods, and quality assurance/quality control requirements are consistent with project objectives and are clearly documented in the QAPP.
2. Maintain the official approved QAPP and any subsequent revisions.

3. Review all project documentation; field data sheets, calibration records, laboratory reports to see if quality control criteria specified in the QAPP were achieved.
4. Ensure corrective actions are taken to address inconsistencies, issues or problems identified from reviews.
5. Insert additional tasks here

Insert full name, Quality Assurance Officer or designee, NYSDEC, Albany, NY, oversees Division of Water Quality Assurance activities and is not subject to the authority of any persons in the (name of organization project is under). Insert email address and contact number

Commented [GR(10]: For DOW Staff and DOW grantees and contractors use only

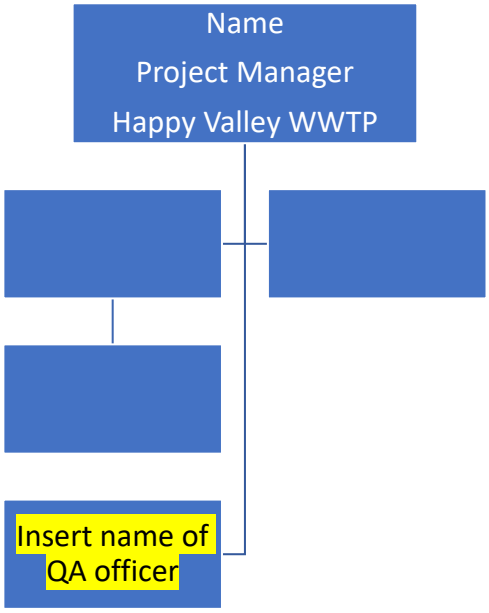
Responsibilities

1. Provide expertise regarding analytical and QA/QC Issues.
2. Review for approval the QA project plan to verify that those elements outlined in the *EPA Requirements for QA Project Plans (QA/R-5)* are successfully discussed prior to the start of any project related activities.

Lines of responsibility and communication for personnel involved in project implementation are illustrated in the project organization chart in Figure 1.

Figure 1: Project Organizational Chart

Chart indicates lines of authority. Dashed lines indicate communication only.
[insert chart include name, role and affiliation (project name, organization, agency, company]



A5. Problem Definition/Background

[State the reason for the monitoring project, what is it trying to answer, solve, provide.

Include regulatory or non-regulatory actions that are dependent on this information. Explain anticipated decisions/outcomes (both regulatory and non-regulatory) based upon the data collected. Note any water quality limits, action limits or conditions associated with the project. Example text below

Major River is a favored recreation spot for Happy Valley residents. Friends of Happy Valley are interested in the water quality of Major River and are seeking to characterize the physical and conventional water quality parameters of the waterbody.

This QAPP will help ensure that data collected and analyzed for this project are valid and verifiable. It is intended that project outcomes will demonstrate the New York State Water Quality Standards for physical and conventional parameters continue to be met in the Major River, and Major River's designated recreation use is being met.

Commented [RG11]: Problem Definition
State the specific issue being addressed. Clearly and simply state the reason for the project. Who are the intended users of the information and any decisions dependent on the results of the study.

Commented [RG12]:
Background/ historic information
Note the scientific and/ or regulatory perspective in support of the project.
Summarize what is known.
Stay specific to the project.

Commented [RG13]: This section is critical to ensure the quality objectives are sufficient to meet the needs, outcomes, decisions of the project.

Commented [GR(14]: Example text, **Do Not Cite or Quote**, remove and insert project specific information

A6. Project/Task Description

Commented [RG15]: The purpose of the project management section elements is to define and document the goal of the project and help ensure all the participants understand the goal and the approach to be used.

Project overview

The overall goals and objectives of this project are [describe the tasks and types of activities to be conducted, bulleted list may be helpful],

Major River is in the Happy Valley drainage basin and is approximately 35 miles long. The study area is shown in Figure XX and coordinates are provided in Table XX [Provide a map with general locations identified and a table of unique location identifiers with corresponding coordinates]

Commented [GR(16]: Example text only **Do Not Cite or Quote,** remove and insert project specific information

Stream Monitoring – Friends of Happy Valley volunteers will collect stream samples for analysis twice monthly for 8 months. Chemistry samples will be collected, documented, handled, and shipped to ABC Laboratory a NYSDOH ELAP-certified laboratory (include ELAP ID #) for analysis. Field data will be recorded in the Project logbook.

See Table XX for the sample frequency and type.

Site Selection– Although Happy Valley Facility discharges to Major River, this study will ensure all sampling sites are located outside of the designated mixing zone for this facility. Four sampling sites will be located along the stream length.

Sites to be sampled are listed in Table XX, with schedule provided in Table XX.

Commented [GR(17]: Example text only **Do Not Cite or Quote,** remove and insert project specific information

Provide a table with type and number of samples and associated parameters to be studied. Include an additional column for outcomes of quality assurance measures (DUAR)

Parameter	**Sampling Locations/ Site ID**	**Lat** *42.000°*	**Long** *-76.000*	**Sample Type/ Frequency/ Total Samples**	**DUAR** *Sampled as planned or note exceptions*
Field Measurements pH, temperature, Dissolved Oxygen. Conductivity	Site 1A, Site 1B, Site 1C, Site 1D			In-Situ Twice monthly 16	
Ammonia, TKN, Nitrate/Nitrite, Nitrite, Total P Total Diss. P Alkalinity	Site 1A, Site 1B, Site 1C, Site 1D			Grab 2/month 16	

Project summary and work schedule

Commented [RG18]: Include any known time constraints (ex. project completion deadline) for a specific task.

The table below outlines tasks and timeline for completion.

Table XX: Schedule of Project Tasks

Funding	Task Description	Anticipated Start Date	Anticipated End Date	Actual Completion Date
QAPP finalized approved/ accepted	Submitted QAPP for approval /acceptance by designated individuals from section A1.			
Project Milestones	Finalize project objectives and acceptance criteria with all participants.			
Schedule of Sampling events				
Analysis of information	Generation dates and submission dates			
Quarterly Reports	results of the measures, identification, statistical methodology, and data management tasks.			
Reports	Status updates and final reports submitted			

Commented [GR(19)]: DUAR column

A7. Quality Objectives and Criteria

Quality objectives

Data of known and documented quality is essential to the success of [state the project].

Either random or systematic variability (errors) may be introduced at any time throughout the project, from sample collection, handling, preparation, and analysis, through data reduction, transmission, and storage.

The methods and procedures described in this QAPP are intended to minimize both the magnitude and frequency of sources of variability (error) from either the sampling (field) or measurement process and support the scientifically validity of project environmental data.

Data quality objectives and acceptance criteria have been developed to support the project objectives (see *Section A6 Project/Task Description*) either quantitatively or qualitatively. The general approach for assessing data useability is outlined below. The type and frequency of quality control samples and measurement acceptance criteria for each parameter is specified in Section XX.

Edit the following text to document your specific process to address each of the following data quality objectives (DQOs)

Data Quality Objectives

Measurement variability: This project will require QC standards, blanks, and duplicate samples be analyzed in the laboratory environment. QC sample results will be evaluated against established precision and accuracy criteria established in approved analytical methods to assess the reliability of the analytical measurements New York State Public Health Law (PHL) § 502 requires environmental laboratory analyses of samples originating from New York State, "for the purposes of public or personal health protection or the protection of the environment or natural resources" be performed by a laboratory certified by the New York State Department of Health's Environmental Laboratory Approval Program (NYSDOH ELAP) for which the Commissioner of Health issues certificates. The NYSDOH administers ELAP pursuant to PHL § 502 and regulates laboratories through 10 NYCRR Part 55, Subpart 55-2. By utilizing a NYSDOH ELAP certified laboratory, (state laboratory and NYSDOH ELAP certificate #) this project will follow PHL§ 502 and help ensure consistency and comparability of environmental measurements and demonstrate laboratory capability.

Field and overall project variability: This project will follow the sampling design and sample collection techniques as outlined in Section XX to help ensure sample results are reflective of both the characteristics and concentration of the (identify the study area and matrix) under (identify the conditions being sampled). To evaluate the effectiveness of project quality controls variability (random or systematic) will be assessed through the following indicators:

- Precision provides information about the consistency of the application of project methods by measuring the same characteristic over repeated measurements. It is expressed in terms of the relative percent difference (RPD) between two measurements (A and B), and is computed as follows:

  RPD = $\frac{A - B}{} \times 100$

Commented [RG20]: This section identifies the project objectives and the performance measurement or acceptance criteria that is required to meet the study objectives.

How will the environmental information collected be reviewed to determine if it is of acceptable quality to address the objectives of the project with a documented level of confidence. What quality assurance and controls will be applied to document that the project has the right type, quantity, and quality of information for the project to be successful? Data quality objectives can be either qualitative or quantitative statements that define what is needed to support the final product of the project.
Criteria is required for all the steps of the project from data collection through evaluation.

Commented [GR(21]: Example text only **Do Not Cite or Quote,** remove and insert project specific information

(A + B)/2
Samples for field and laboratory duplicates will be collected once for each sampling event.

Commented [GR(22]: Example text only **Do Not Cite or Quote,** remove and insert project specific information Note if there are any parameters that do not require measurements to be performed by a NYSDOH ELAP certified laboratory and what quality assurances steps will be taken to ensure consistency and comparability and demonstrate laboratory capability.

DUAR

[Include outcomes of quality assurance measures]

- Bias/Accuracy is a measure of confidence that describes how close a measurement is to its "true" value. (name of project) helps ensure field accuracy by following field instrument calibration (note SOPs or describe process for calibration/maintenance) and following the prescribed sample collection, sample handling and field measurement protocols as outlined in Section xx. Analytical laboratory accuracy is determined by the percent recovery of the target analyte in spiked samples and by recoveries of the surrogates in all samples and QC samples. Accuracy is calculated as follows:

$$\%R = \frac{\text{Analyzed value}}{\text{true value}} \times 100$$

DUAR

[Include outcomes of quality assurance measures]

- Representativeness is how well collected samples reflect the characteristics in both composition and concentration of the environmental condition. This project will ensure samples are representative by depending on appropriate sample design in locating sites and determining frequency and type of sampling. Sampling sites are designated equidistant along Major Rivers 35 mile stretch and outside the mixing zone of Happy Valley Facility's only discharge to Major River. Samples will be collected at midstream and within the top 8inches of the water column. In addition, the frequency and scheduling of samples are designed to minimize systematic error that maybe introduced by sampling on the same day of the week and/or time of day. See Section XX for sample collection details

DUAR

[Include outcomes of quality assurance measures]

- Completeness is the comparison of the amount of useable data collected against the amount of data required to meet project objectives. This project requires 100% completeness. Therefore, when safety or environmental issues prevent sampling, additional or re-sampling may be required to obtain a complete data set.

DUAR

[Include outcomes of quality assurance measures]

- Comparability is the degree to which data can be correlated with other sets of data. By adhering to the standardized sample collection methods detailed in this QAPP and using US EPA 40 CFR Part 136 approved analytical methods analyzed by a NYSDOH ELAP certified laboratory

this project will help ensure data results are comparable with similar permit required water quality monitoring in compliance with the US EPA Clean Water Act.

DUAR

[Include outcomes of quality assurance measures]

- Sensitivity is the ability of a method to detect and quantify a parameter. The sensitivity of measurements used in this project must be sufficiently sensitive to determine compliance with the stated SPDES permit conditions and/or NYS water quality standards/guidance values. Analytical laboratories are required to follow NYSDOH ELAP certification guidance and 40 CFR Part 136 in determining Method Detection Limits. If matrix interference or other analytical issue prevents the data from being reported to the sufficiently sensitive quantitation limit, the permittee will work with their laboratory and NYS DEC to resolve data reporting issues. For field measurements, testing equipment sensitivity as defined by the manufacturer must be sufficiently sensitive to meet SPDES permit conditions and/or NYS water quality standards/guidance values. Field instrument calibration must meet the quality control criteria established for this project.

DUAR

[Include outcomes of quality assurance measures]

Any limitations on the use of the environmental data collected as part of this project will include:

- Application of data qualifiers. How to determine which data qualifiers to apply is outlined in Section XX
- A final project report that summaries the identification of all data limitations.
- Documentation of project evaluation of data limitations will be noted in the Data Useability Assessment Report (DUAR).

See B.5 Quality Control and Table XX for details on frequency, location, and acceptance criteria of quality control samples.

DUAR

[Identify any criteria that were not met and/or limitations on the use of the data]

A8. Special Training/Certification

The Project Manager (or title of the designated person) is responsible for ensuring that all personnel involved with data generation (including agency personnel, contractors, and partners) have the necessary experience and training (both technical and quality assurance) to successfully complete their tasks and functions.

Describe what training is required, how it will be provided, who will deliver the training, and who is required to have what type of training to ensure quality of data collection.

Commented [GR(23]: Note if attendance at any training sessions is required. If yes, who will provide the training and how will training attendance be tracked. List what minimum educational/ work experience are required to fulfill the roles and responsibilities of staff.

Commented [GR(24]: Training can be in-person or virtual, synchronous, or asynchronous.

State if any specific certifications or formal training/ knowledge is required.

List the roles requiring training and/or specific certification.

Examples

Training is the responsibility of the Project Manager and is required for all staff involved in this project to ensure the proper collection and handling of samples. The Friends of Happy Valley volunteers conducting sample collection activities have participated in a sample collection training workshop and will be observed in the field by an experienced member who has successfully been supporting similar activities for at least 3 years. Sample collection volunteers must also complete the Friends of Happy Valley health and safety training, and understand the risks related to collecting surface water samples. All training records are kept on file at the Friends of Happy Valley office in personnel files.

Commented [GR(25]: Example text only. **Do Not Cite or Quote**. Remove and replace with project specific information

- Field inspectors who will be collecting baseline and post-certification data must be knowledgeable in applied statistics and flood zone mapping.
- Data-entry personnel who will be processing data from inspections and self-certification responses must have experience with Excel and Access database systems.
- Individuals performing macroinvertebrate identifications must hold Society for Freshwater Science certifications in EPT, East and West and Chironomidae, East and West.
- The Project Manager will ensure that all individuals involved with the project receive and are familiar with this document and the following specified SOPs to ensure proper adherence to the procedures outlined within.

A9. Documents and Records

Commented [RG26]: A record cannot be amended or altered (analytical data). Documents can be modified or changed (QAPPs, SOPs) following a process as outlined in the QAPP .

Describe the process for distributing information to project personnel and ensuring it is securely stored. List actions needed to ensure project personnel have the most current approved version of the QA Project Plan (version control, updates).

Itemize information and records that are to be included in the data report package and specify the reporting format for hard copy and any electronic forms. Examples of records include raw data, data from other sources such as databases or literature, field logs, sample preparation and analysis logs, instrument printouts, model input and output files, and results of calibration and QC checks.

Report format/information

Describe what needs to be reported and in what format. Note: Data reporting packages need to be consistent with the requirements and procedures used for data validation and data assessment described in this QAPP.

Document/record control

Specify how information will be recorded for the project (paper and/or electronic).

Hand-recorded data records will be taken with indelible ink, and changes to such data records will be made by drawing a single line through the error with an initial by the responsible person. The Project Manager will have ultimate responsibility for all changes to records and documents.

Identify what similar controls will be put in place for electronic records.

Identify who is responsible for maintaining updated versions of the QAPP and its distribution.

All QAPP revisions or updates must be reviewed and approved by all staff identified on the original approved QAPP or their designee. The Project Manager shall retain copies of all management reports, memoranda, and all correspondence between project signatories and all project personnel identified in A4.

Other records/documents

Identify other records and documents used in or produced by the project.

Examples:

- Audit reports
- Inspection checklists and reports
- Enforcement documentation
- Amended QAPP
- Data reports
- Quarterly and annual progress reports to EPA
- Project final report (to include discussion of QA issues encountered, and how they were resolved)

Specify the level of detail for field sampling, laboratory analysis, literature or database collections, and modeling documents or records needed to provide a complete description of any difficulties encountered.

Storage of project information

Specify or reference all applicable requirements including security for the storage and back up of records and documents that will occur while the project is active as well as the final disposition of all materials. Be sure to include location and retention period for both electronic and hardcopy material.

Example Text

Field logbooks, notebooks and/or data sheets will be filled out using “write in the rain”ink or pencil. Changes/errors are not to be erased, instead a single strike out of the error will be used, followed by the individual’s initials, and corrected information. Logbooks will be bound, and pages numbered. Procedural or equipment problems are recorded along with data results. Any deviation from this Quality Assurance Project Plan will be noted. Additional sampling and

Commented [GR(27]: Example text **Do Not Cite or Quote** - remove and replace with project specific information.

Commented [GR(28]: These records document protocols used in data reduction, verification, and validation. Data reduction addresses data transformation operations such as converting raw data into reportable quantities and units, use of significant figures, recording of extreme values, blank corrections, etc. Data verification ensures the accuracy of data transcription and calculations. Verification can be done by checking a set of computer calculations either manually or digitally. Data validation ensures that QC criteria have been met.

Commented [RG29]: Verify with your IT Dept the procedures for storage and security protocols. Confirm with records retention for duration of storage.

analyses may be performed when results fall outside the specified range or data quality objectives.

DUAR will include information on field and/or laboratory QA/QC problems and any corrective actions

All samples are labeled with unique site ID#, monitor's initials, date, time of collection, and parameters to be analyzed. See the appendix for full labeling procedure.

Chain-of-Custody and/or Transmission forms will be kept with the sample transport and included in laboratory data packages.

All records and documents will be retained for at least XX years from the completion of the project at the Friends of Happy Valley Project office. All information will be available to NYS DEC for review upon request.

The Project Manager will retain copies of all management reports, memoranda, and all correspondence between project personnel identified in A4.

Commented [GR(30]: Example text only **Do Not Cite or Quote** – Remove and replace with project specific information.

B DATA GENERATION AND ACQUISITION

B1. Sampling Process Design (Experimental Design)

Commented [GR(31]: Information on sampling design can be found in EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003).

Describe the experimental data generation or data collection design for the project, including as appropriate:

- Types and number of samples required
- Sampling network design & rationale for design
- Sampling locations & frequency of sampling
- Sample matrices
- Classification of each measurement parameter as either critical or needed for information only
- Validation study information, for non-standard situations
- Note what samples will be taken and when. If an exact schedule for collecting samples cannot be established, give the general order that samples will be taken in, (upstream to downstream, shallow area to deep area, etc.).
- If sampling is event based clearly define the criteria for an "event". How will events be handled during off-hours? How will the "window" for an event be defined as ("within 0-12 hours after peak flow")?

Commented [RG32]: Give a general description of the rationale used to select and determine sampling sites and dates. How does the project design ensure samples collected are representative of the problem or the effectiveness of a solution? Include where samples will be taken, how many will be collected and when.
State contingency plans for when sampling sites cannot be sampled as planned.

The design of this project is based on sound scientific processes and meet the identified data quality objectives.

In stream sampling sites will accurately reflect and be representative of the environmental conditions of the project area. To address daily or season bias water column samples will be collected over an 8 month period for 2 consecutive years and will not be sampled on the same day or time.

Commented [GR(33]: Example text only **Do Not Cite or Quote,** remove and insert project specific information

DUAR

[Note if there were any changes from the planned sample design. If no changes were required, state "Sampling design was followed as described above."]

B2. Sampling Methods

Describe the sampling procedures:

- Identify sample collection procedures.
- Identify sampling methods and equipment
  - Sampling methods by number, date, and regulatory citation, where appropriate
  - Implementation requirements
  - Sample preservation requirements
  - Decontamination procedures
  - Any support facilities needed
- Describe specific performance requirements for the method.
  - Address what to do when a failure in the sampling or measurement system occurs
  - Who is responsible for corrective action
  - How the effectiveness of the corrective action will be determined and documented

Sample collection shall be randomly selected so as not to consistently sample at the same time of day or day of the week. see Table xx for schedule of dates.

Receiving water samples are to be collected from the center of the main channel, at a depth of 8 inches from the surface. When environmental conditions compromise the safety of the personnel, sample collection is to be re-scheduled or collected using a swing pole sampler from the shore. All sample collection modifications are to be recorded in the field logbook and noted in the DUAR.

Sample type will be identified as "grab" on COC forms/field data sheets. The sample method shall be representative of the in-stream conditions on the day of sampling. See Table XX for volume, sample collection, and sample preservation requirements. The sample collection time listed on the COC and sample bottle will be the time of the grab sample.

All samples will be collected in the appropriate sample containers, preserved as identified in 40 CFR Part 136 or prescribed by the analytical laboratory. Samples must arrive at the analytical laboratory within the appropriate sample holding times, accompanied by the Chain of Custody documentation, and following shipping requirements as noted in Section XX. The locations media to be sampled, frequency and type of sample are summarized in Table XX.

Commented [RG34]:
Sample Collection Methodology

Clearly define how the monitoring approach used will align with the project goals. Data needs to be relevant, reliable, representative and accurate.
EPA's *Generic Guide to Statistical Aspects of Developing an Environmental Results Program* (2003) can be used as resource for designing a sampling methodology.

Include SOPs as appendices and reference accordingly. If the SOP is being followed to the letter, summary of the sampling techniques is not required. If no SOP is available sampling techniques must be detailed.
Detail any project specific deviations from the referenced SOPs.

Commented [GR(35]: Example text only **Do Not Cite or Quote** – Remove and replace with project specific information.

All sampling equipment will be cleaned according to equipment specifications and free from target analytes. Pre-cleaned sample bottles will be provided by the analytical laboratory prior to each sampling event. Bottles will be stored in a cooler in a location free from dust, water, or other potential contamination.

Commented [GR(36]: Example text only **Do Not Cite or Quote** – Remove and replace with project specific information.

DUAR

[Note if there were any changes from the planned sample design. If no changes were required, state "Sampling design was followed as described above."]

B3. Sample Handling and Custody

Commented [GR(37]: Identify if staff or external groups will be inputting data directly into an electronic format (e.g. using tablet PC's, or Internet forms). Need to address electronic data input/management strategies and process for electronic signature.

Describe the requirements for sample handling and custody in the field, laboratory, and transport. Examples of sample labels, custody forms, and sample custody logs should be included.

Sample preservation is to be performed immediately upon collection.

Commented [GR(38]: Example text – **Do Not Cite or Quote**, Remove and replace with project specific information.

Sample are to be analyzed as soon as possible after collection. The times listed below are maximum times samples may be held and still considered valid.

A summary of the parameters, methods, sampling containers, preservation requirements, and holding times is presented in Table XX

Table XX.

Parameters	Container Type	Volume	Preservation	Holding Time
TSS	Poly	1000ml	Cool 6°C	7 days

B4. Analytical Methods

For physical tests or chemical analyses all laboratories must be certified by NYS Department of Health Environmental Laboratory Approval Program per NYS Public Health Law 502 and follow analytical methods as required in 40 CFR Part 136.

Commented [RG39]: Cite the methods to be used. If a parameter is not in 40 CFR Part 136 then method selection must be documented. If NYSDOH ELAP does not certify a parameter then need to document how demonstration of capability will be met.

Include a table listing the parameter, analytical method, reporting limit and quality control criteria.

Commented [GR(40]: Application of statistical methods for assessment and evaluation of the sample results must follow well-recognized approaches
State what methods will be use and include any risk factors/multipliers that are used as well as the associated uncertainty. For secondary data include discussion of the uncertainty associated with risk factors/multipliers in section B9.

Example Table:

Parameter	Approved Test Procedures[1]	Precision (RPD)	Accuracy (% R)
TSS	SM18 2540 D	<20	85 - 115

Commented [GR(41]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information

DUAR

[Note if there were any changes from the planned analytical methods. If no changes were required, state "Analytical methods were followed as described above."]

B5. Quality Control

This project will undertake the following specific steps to measure/estimate the effect of data errors …

This Section must include:

-- For each type of sampling, analysis or measurement technique, identify QC activities used, such as blanks, spikes, duplicates, etc., and frequency of those activities

-- Detail what needs to be done when control limits are exceeded, and how effectiveness of control actions will be determined and documented

-- Identify procedures and formulas for calculating applicable QC statistics such as for precision, bias, sample contamination, representativeness, comparability, and completeness.

Field duplicates, matrix spikes and equipment blanks will be collected once per sampling event for all targeted parameters. Location for the field duplicate and equipment blank will be rotated through the 4 sampling sites. At the completion of the project each sampling site will have a total of 4field duplicates, 4matrix spikes and 4 equipment blanks per year.

DUAR

[Note if there were any changes from the planned quality control sampling frequency. If no changes were required, state "Quality control sampling frequency was followed as described above."]

Data anomalies

State the procedures for handling data anomalies (such as outliers and missing data).

Variation of duplicate, matrix spike and equipment blank values for each parameter must not exceed the range of precision and accuracy discussed in Table XX. Issues with any data results will be recorded and the data flagged with the appropriate laboratory qualifier. Any changes to data are initialed by the Project Quality Assurance Officer.

Commented [SZM(42]: Insert QC table here

Commented [RG43]: Note: This section needs more detail to support the environmental samples/lab analyses taken.

QC is "the overall system of technical activities that measures the attributes and performance of a process against defined standards to verify that they meet the stated requirements established by the project." QC is both proactive and corrective in establishing techniques to prevent the generation of unacceptable data. The policy for corrective action needs to be outlined. This element will rely on information developed in section A7, "Quality Objectives and Criteria for
Measurement Data," which establishes measurement performance criteria.

Commented [GR(44]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information

Commented [GR(45]: Example text **Do Note Cite or Quote,** remove and replace with project specific information.

DUAR

[Note any issues and corrective actions taken. If no issues were identified, state "No issues identified, and no corrective actions taken."]

B6. Instrument/Equipment Testing, Inspection, and Maintenance

For instruments operated by/in the analytical laboratory, testing, inspection, and maintenance will be performed in accordance with guidelines detailed by the analytical methods and NYSDOH ELAP certification requirements.

Field Instruments and Equipment

- What will be used?
- Who will be responsible for its proper operation and function?
- Inspection and testing, how and frequency?
- Maintenance, spare parts on hand?

Example Text

Before each sampling event, all field equipment will be inspected prior to use. All equipment will be clean and in good working order before it is used for monitoring.

Routine maintenance for all meters will be conducted according to schedules and procedures described in manuals provided by the manufacturers and per NYSDOH ELAP guidance for analyze immediate on-site parameters. A maintenance log will be kept for each instrument.

A supply of replacement equipment and reagents of commonly lost or broken equipment and enough reagents to performall scheduled analysis procedures for at least 3 months will be available at Friends of Happy Valley Project Office. Reagent stocks are rotated out every four to six months or according the manufacturer's recommendation.

This information will be recorded in instrument logbooks.

Commented [GR(46]: For parameters that do not require analysis by a NYSDOH ELAP certified laboratory, the analytical laboratory is to maintain appropriate service contracts for laboratory instruments and perform routine instrument maintenance at intervals suggested by the manufacturer or by internal laboratory SOP. Cite relevant SOPs.

Commented [GR(47]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information You can cite SOPs that cover this information in more detail.

DUAR

[Note any issues and corrective actions taken. If no issues were identified, state "No data issues identified, and no corrective actions taken."]

B7. Instrument/Equipment Calibration and Frequency

For instruments operated by/in the analytical laboratory, calibrations and confirmations of calibration will be performed in accordance with guidelines detailed by the analytical methods and NYSDOH ELAP certification requirements.

Field Instruments and Equipment

- Calibration, how and frequency?

Commented [GR(48]: For parameters that do not require analysis by a NYSDOH ELAP certified laboratory, the analytical laboratory is to follow the analytical method, and manufacturers' instrument calibration frequency or as prescribed by internal laboratory SOP. Cite relevant SOPs.

- Calibration checks, how and how often?

B8. Inspection/Acceptance for Supplies and Consumables

Project Quality Assurance Officer or designee to ensure that are reagents and standards are within technical specifications before use is responsible for maintaining records of traceability for all reagents and standards.

Prior to each sampling event supplies for instrument calibration or sample handling are to be checked for expiration date, sufficient quantity and any anomalies (discoloration) that indicate they are no longer useable.

Commented [GR(49]: Example text –Do Not Cite or Quote remove and replace with project specific information.

DUAR

[Note any issues and corrective actions taken. If no issues were identified, state "No data issues identified, and no corrective actions taken."]

B9. Non-Direct Measurements (i.e., existing data)

If this project will rely upon existing data you need to identify the data sources, intended use, rationale and the criteria that will be used to determine if the data is acceptable to use.

Commented [RG50]: Existing data or non-direct measurements refers to information collected from a project other than the project being planned. It is necessary to establish the level of quality the information will need to meet to ensure the data is usable for the project objectives. Existing data may include chemical and physical characteristics; photographs, maps, meteorological data, or meta data about a location.

Otherwise indicate N/A for not applicable after the Section heading delete following text and proceed to Section B10 Data Management.

Table 1: Non-Direct Measurements (i.e., Secondary Data)

Data Sources	Intended Use	Rationale for Use	Acceptance Criteria
[Insert agency name]	Identify the target population and the selected parameters	List why this data source is being researched for information.	List what criteria data must meet. Example: laboratory analysis must have been performed by a NYS DOH ELAP accredited laboratory

Commented [GR(51]: Although existing data may have been generated by a well -respected source you need to evaluate the data in relation to your project's acceptance criteria and quality needs. identify the limitations or uncertainty associated with the data, and the procedure used to address that uncertainty in the current project. For a more complete discussion on secondary data see Chapter 3 of USEPA's *Guidance for Quality Assurance Project Plans* (2002).

Key resources/support facilities needed

State if there will be any access issues to the data sources mentioned above, and if this information will be managed within the database created/utilized for the overall project. If no obstacles anticipated, then …

[Insert Project organization] does not anticipate any obstacles to this approach.

Commented [GR(52]: Example text –**Do Not Cite or Quote** remove and replace with project specific information.

Determining limits to validity and operating conditions

If a set of existing data will be used, define the procedures that will be in place to accepting or deleting records from the dataset.

Example: Only the Project Manager will be authorized to remove an entry. In such cases, the entry will not be deleted from the database but will be marked as non-applicable, and corrective data will be provided in fields parallel to the original data.

[Add more information about this topic if using different kinds of secondary data]

Commented [GR(53]: Example text –**Do Not Cite or Quote** remove and replace with project specific information.

B10. Data Management

The Project Manager is responsible for ensuring that the management of the data is handled in a manner that maintains data integrity and that staff follow the protocols as outlined in this document. Any changes or alterations to the strategy for data management must be documented and recorded in the final report of the study.

Commented [GR(54]: Example text –**Do Not Cite or Quote** remove and replace with project specific information.

Provide information on the following issues:

Commented [RG55]: Create a subsection for each of the bulleted issues

- Data management scheme, from field to final use and storage including data entry
- Standard recordkeeping and tracking practices, and document control system (citing relevant documentation)
- Data handling equipment/procedures that will be used to process, compile, analyze, and transmit data reliably and accurately
- Individuals responsible for elements of the data management scheme
- Process for data archival and retrieval

Commented [RG56]: An example for entering handwritten data into a database. Verification using independent double key entry, internal crosschecking of data by comparing results

DUAR

[Include any changes to the project strategy for managing data and outcomes from the changes. If no changes were required, state "Data management was followed as described above."]

Example Text

All data collected by the Friends of Happy Valley for this project will be maintained in appropriate bound notebooks and secure electronic databases. Analytical data results will be transferred from the laboratory to Friends of Happy Valley in an agreed upon electronic format that can be inputted directly to the Friends of Happy Valley electronic database. An automated data review will be conducted to ensure laboratory metadata aligns with field sampling entries (i.e. date/time of sample collection, parameters analyzed). If discrepancies are noted, the laboratory will be contacted to resolve the issues.

Field data and observations are documented at the time measurements are taken in field logbooks. Field logbook information will be transferred to Friends of Happy Valley's project database by the volunteer that collected the field information. Review of data entries will be conducted on 10% of sampling events to assess for any transcription errors.

Commented [GR(57]: Example text. **Do Not Cite or Quote** Remove and replace with project specific information.

C ASSESSMENT/OVERSIGHT

C1. Assessment and Response Actions

The Project Manager will thoroughly brief Friends of Happy Valley volunteers prior to the start of project tasks and after to identify emerging/unanticipated problems and take corrective action, if necessary.

The Project Quality Assurance Officer will ensure that forms and logbooks are completed correctly. Approximately 10% of logbook entries and forms will be reviewed for entry errors. Errors will be documented and evaluated to determine if corrective actions such as additional training is required. All identified deficiencies and corrective actions are to be brought to the Project Managers attention.

The Project Quality Assurance Officer will review all quality control results assess compliance with data quality acceptance criteria. Data results outside the acceptance criteria will be evaluated. Appropriate corrective actions will be taken, and data results will be qualified as detailed in this QAPP.

Commented [GR(58]: Example text- **Do Not Cite or Quote** Remove and replace with project specific information.

DUAR

[Include any deficiencies identified or variance to acceptance criteria. List corrective changes taken. If no deficiencies or variance were identified, state "No deficiencies identified or variance to the acceptance criteria."]

C2. Reports to Management

Quarterly and annual progress reports, and a project final report will be prepared. Progress reports will note the status of project activities and identify whether any QA problems were encountered (and, if so, how they were handled). The project final report will analyze and interpret data, present observations, draw conclusions and identify data gaps.

Commented [GR(59]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information. The final report must describe any deficiencies identified, corrective actions taken, variations from the proposed plan, including an evaluation of data quality indictors and the associated limitations in the way the data may be used to be considered as a DUAR.

Table XX Project QA Status Reports

Type of Report	Frequency	Preparer	Recipients
QAPP	Once, prior to the start to work on the project	Insert agency name and project role ex. Project Manager	See Distribution list Section A4
Amended or updated QAPP	As changes or modifications are made	Insert fields as above	All recipients of original QAPP
Progress Report	Quarterly	Insert fields as above	Insert recipients
Final Project Report	Once	Insert fields as above	Insert recipients

Commented [GR(60]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information

D DATA REVIEW AND EVALUATION

D1. Data Review, Verification and Validation

The Project Manager and the Quality Assurance Officer are responsible for determining that data are of adequate quality to support this project. The project will be modified as directed by the Project Manager. The Project Manager shall be responsible for the implementation of changes to the project and shall document the effective date of all changes made.

The Project Manager shall authorize all changes or deviations in the operation of the project. Any significant changes will require an amendment to the QAPP. All verification and validation methods will be noted in the analysis provided in the final project report (DUAR).

The Quality Assurance Officer will perform monthly quality checks of data packages to identify any systemic errors. Field data will be reviewed to ensure information is complete and note any deviations from this QAPP. Deviations will be brought to the attention of the Project Manager.

Commented [GR(61]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information

Quality checks include:

- Methods used for sample collection, preservation, and analysis
- Data quality indicators within acceptance criteria
- Reporting limits sufficiently sensitive
- Application of laboratory qualifiers, and corrective actions
- Complete data package for each sampling event
- Equipment maintenance and calibration

DUAR

[Include any deficiencies identified or variance to project details. List corrective changes taken. If no deficiencies or variance were identified, state "No deficiencies identified or variance to the project details."]

D2. Verification and Validation Methods

Commented [RG62]: Provide the details of how the data will be reviewed to determine if it satisfies the QAPP-defined user requirements.

Identify the process used in data reduction, verification, and validation. For data reduction how is raw data converted into reportable information. Are units maintained? What conventions are used in data operations such as application of rounding numbers or use of significant figures. How are extreme values treated? Data verification is the process used to assess the accuracy of data transcription and calculations. These measures help ensure that QC criteria have been met.

Define what steps will be taken to confirm that QA/QC steps have been followed correctly and have met the requirements of the QAPP. State what statistical tests (described below in Section D3) will be used to determine the extent to which inferences can be drawn from the sample data.

The Project Quality Assurance Officer will review the laboratory data packages and data quality indicators monthly to ensure acceptance criteria are being met.

The cause for failure of data quality indicators to meet acceptance criteria will be evaluated to determine what if any project procedures need to be revised.

The Project Manager and project staff will be notified any issues and the required corrective action. All changes will be documented in an amended QAPP and distributed per Section A4.

Commented [GR(63]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information

D3. Evaluating Data in Terms of User Needs

Provide language in support of how the results of the study will be analyzed and evaluated to determine whether the needs of the project were met and then reported.

Describe the protocol to identify and handle unusable data, with particular emphasis on the impact of such data on project representativeness.

The data quality objectives and validation procedures for this project are designed to ensure that the Project Manager and Project Quality Assurance Officer will be able to identify and correct any systematic errors found in the procedures for sample collection and reporting.

It is the Project Manager's responsibility to ensure that data not meeting the data quality objectives as defined in this QAPP are qualified as not valid and do not bias project outcomes. The Project manager has the authority and responsibility to implement and ensure corrective actions are followed.

Commented [RG64]: The purpose of this element is to describe, in detail, the process for validating (determining if data satisfy QAPP-defined user requirements) and verifying (ensuring that conclusions can be correctly drawn) project data.

Commented [GR(65]: Example text, **Do Not Cite or Quote,** remove and replace with project specific information