Before use, please be mindful of the following:

1. This tool was developed by Region 7 in conformance with the QAPP Standard, 2105-S-02.
2. The target audience is Region 7 personnel, contractors, regulated parties, cooperative agreement holders, grantees, states, tribes, localities, educational institutions, other federal agencies, volunteer organizations, and other entities generating and/or using environmental information/data and who are required by Region 7 to develop a QAPP.
3. Any example language and references included as part of this tool are hypothetical and provided simply for illustrative purposes only and are not intended to be quoted or applicable to any or all projects.
4. Some information may be specific to Region 7 and not applicable to other organizations.
5. Use of this tool is not mandatory but is meant only to provide guidance and suggestions; compliance with the requirements outlined in the QAPP Standard must be maintained.
6. Recommendation or endorsement of this tool by other organizations including other Regions is not implied or assumed.

Region 7 Basic QAPP
Guidance and Template

Instructions and Useful Notes:

1. This basic template provides guidance and examples to assist Region 7 grantees with the development of a Quality Assurance Project Plan (QAPP) in conformance with the EPA's QAPP Standard.pdf. Any QAPP prepared according to this template will substantially meet the requirements found in the Standard. The Region has chosen to combine some sections where it was appropriate to limit duplication and to simplify the QAPP development process, but all content required by the QAPP Standard is still addressed.

2. This template guidance gives item-by-item instructions for each section along with suggestions and examples to help illustrate the type of information to be included for each section. In some cases, tables are used to present examples and information, but use of tables is NOT mandatory. Other means for presenting the details such as simple text paragraphs, bulleted lists, diagrams, charts, etc. or any combination thereof may be used in place of the tables. The content of the QAPP needs to be the major focus when writing the QAPP and not the format.

3. Where appropriate, language that can generally be used in a section without modification will be indicated by ***bold Italicized test*** This language is mainly for those topics that are broadly applicable and common to most Region 7 QAPPs and can be used as is or supplemented where necessary. Red text identifies where project-specific information needs to be filled in.

4. Step-by-step instructions and guidance can be found in the gray text boxes and blank spaces indicate where the project-specific details need to be added. DELETE ALL INSTRUCTION TEXT BOXES ONCE THE QAPP IS COMPLETED.

5. The word "organization" is used in this template to generally refer to the organization responsible for managing and/or performing the work described in the QAPP.

6. Not all sections in this template will apply to every project and if a section does not apply, the language for that section needs to state "Does Not Apply" followed by the reason(s) why the section does not apply.

7. Example language is provided in blue text and this information will need to be deleted and replaced with equivalent information that applies to your project.

8. There may be some sections in the template that are adequately addressed in a separate document. Whenever this is the case, that information does not need to be repeated in the QAPP but a reference to where this information can be found included and that referenced document attached or otherwise made readily available to reviewers. Because weblinks and web addresses can change, it may be worth considering placing a controlled version of the referenced documents on file with the Region for ready access.

9. If additional information or sections not currently included in this template are needed for a particular project, they can be added as needed.

Section A – Administration

A1. Title Page

Quality Assurance Project Plan

for

Project Title:

for the

Name of Organization:

Grant or cooperative agreement number_____

Submitted to

U.S. Environmental Protection Agency

Date of QAPP Preparation:
Period of Applicability: Month-Day, Year -- Month-Day, Year
Revision: #

Instruction: At a minimum, the QAPP needs to be signed by the organization project manager and the project QA manager or the individual with QA responsibilities for the project. Add the appropriate names and titles for your organization below. If your organization requires additional approval signatures on the QAPP, add them here.

A2. Approval Page

Organization Project Manager
Name:
Title:
Signature _____Date

Organization Project QA Manager
Name:
Title:
Signature _____Date

Instruction: At a minimum, the QAPP must be signed by the Region 7 Project Officer and the Regional QA Manager. Some programs may require additional signatures such as a technical contact so consult with your Project Officer about any other signatures the Program may require and add them below. And please note in Region 7, the RQAM signature is always the final signature on any QAPP and the QAPP is not considered approved until then.

EPA Project Officer
Name:
Title:
Signature _____Date

Name: Diane Harris
Title: Regional QA Manager
Signature _____Date

A3. Table Of Contents

[Type here]

List of Figures:

List of Appendices/Attachments:

Instruction: If you have other QA planning documents you have prepared for your project like a field sampling plan, sampling and analysis plan, or similar, list them below and fill in the columns with the appropriate information. At a minimum, the Region 7 Quality Management Plan needs to be included as already shown.

A4. Project Purpose, Problem Definition, and Background

Document List

Title of Document	Date of Document	Pertinence to this QAPP
Region 7 Quality Management Plan (QMP)	***April 2020 (or current version)***	***Organizations submitting QAPPs to Region 7 are considered a stakeholder in the Region 7 Quality Program and all QAPPs are to be prepared, submitted, reviewed and approved per the Region 7 QMP.***

Project Purpose and Problem Definition

Instruction: State the problem, issue, concern, etc. your project is designed to address. This would include describing why the project is needed and how the project results will be used. If you are using the resulting information/data to make a decision and take action, list the decision(s) to be made and possible actions to be taken. If your project is to establish baseline monitoring or to determine current conditions, describe this here. If your project is intended to gather data from existing sources, this would need to be included along with how that existing data will be used. Please note your work plan may already document some or most of this information and if so, it can be copied from your workplan into your QAPP here.

Project Purpose	Example: The organization wants to document the conditions of the stream before and after development to determine the effectiveness of stormwater best management practices.
Problem(s) to be Addressed.	Example: The community is concerned about the impacts of development on the watershed.
Questions to be Answered.	Example: Are the stormwater management practices effective? Can the results be used to educate the community on the connections between land-use and water quality?
Site Map	Example: See Figure 1

Action to be taken	Example: If effectiveness cannot be demonstrated or Hg exceeds the surface water standard, this information will be forwarded to the State Stormwater Evaluation Department for consideration.
Existing Information/Data	Example: Stream flow conditions from USGS WaterWatch.

Instruction: If there are regulatory programs and/or standards that apply to your project, identify them below. Your work plan may include this information and if so, it can be coped here. If not, simply state there are none.

Example Table: Applicable Programs and/or Standards

Regulatory Program/Standard	Citation	Description
Example: Section 106 of the Clean Water Act	Example: 33 U.S. Code §1256	Example: Provides assistance to establish and implement ongoing water pollution control programs.
Example: Surface Water Action Level for Hg	Example: State Administrative Code 155.9(1)	Example: 0.002 mg/L

Project Background

Instruction: Describe the project background information that helps support the reason for the project and what led to the need for the project. This can include historical information, previous studies or investigations, and information or data from other sources. Your work plan may provide background information on the project and if so, you can copy the information from your work plan here.

Example Project Background: Streams that flow thru urbanizing watersheds can be negatively impacted. As more communities are built, the quantity of stormwater runoff will increase which could in turn increase impacts to the streams. Working together, local residents and government agencies have developed plans to implement best management practices, or BMPs, designed to minimize the potential negative water quality impacts to such streams. The area for this project has had little to no monitoring addressing stormwater impacts to streams and this project is intended to begin to fill that information and data gap.

A5. Project Task Description

Instruction: Describe the work to be performed including all tasks to be performed and any measurements to be made. Identify the schedule for completing the tasks and products to be produced. Consult your work plan for details on the tasks to be accomplished as part of the project and the planned schedule for completion. This information may be adequate to simply copy here. If specific completion dates are known (e.g., March 31, 2024) these dates should be added.

Example Table: Summary of Project Tasks, Schedule and Products

Type of Task	Schedule for accomplishing the Task	Description of the work to be Performed	Products to be Produced
Monitoring for pH, temperature, DO	Monthly for each year of the project	Readings taken with Multi-Meter.	Field sheets
Stream sampling for lab analysis	Monthly for each year of the project	Surface water samples collected	Field logbook
Lab analysis	For each sampling event	Samples submitted to laboratory for metals analysis	Data transmittal report
Data processing, review and reporting	By 12/31 for each year of the project	Review data for compliance with procedures, methods, and the QAPPs	Data quality and project assessment report

Example: This QAPP will be in effect for the project period which is four years. During this time, the QAPP will be reviewed annually to ensure it remains current. Any revisions during this time that impact data quality or usability, will be submitted for the same review and approval as the original QAPP. If the project will continue after the end of the project period, the QAPP will be updated as needed and resubmitted for review and approval per the same process as the original QAPP.

A6. Information/Data Quality Objectives (DQO) and Performance/Acceptance Criteria

Instruction: This section describes how "good" your information/data has to be to meet your project's goals, make needed decisions, and use your information/data as intended. It defines what your information/data will be evaluated against to know it is acceptable for use and your project is successful. At a minimum, the quality indicators of precision, accuracy, representativeness, comparability, completeness, and sensitivity need to be addressed. If any of these do not apply to your project or are not a concern for you, be sure to state this in your QAPP. Additional information about these quality indicators can be found in the QAPP Standard.pdf.

Example: DQOs and Table of Information/Data Quality Objectives and Performance Criteria
The data quality objective for this project is to generate new data and information that can evaluate the effectiveness of stormwater best management practices. To meet this objective, new data must be generated to document stream conditions for the identified parameters one year before the stormwater management practice is implemented and for one year after. The table below outlines the needed parameters, the quality indicators to be applied, and the performance criteria that must be met for the data to meet the project objectives, for the data to be used as intended, and for successful completion of the project. A judgmental/biased sampling approach will be used based on where the stormwater best management practices are implemented and accessibility to the sampling locations so error will be controlled thru the use and evaluation of proper field measurements, field sampling techniques, and laboratory analysis rather than thru use of a statistical sampling design.

Matrix	Measurement	Precision	Accuracy	Sensitivity	Performance Criteria
Surface water	pH	duplicate measurement	analysis of known standard	3 to 10.5 units for accuracy	±20% for precision ±0.5 for accuracy
Surface water	temperature	duplicate measurement	verification against reference thermometer	0-100°C	±20% for precision ±0.3°C for accuracy
Surface water	DO	duplicate reading	air saturated water method	1 to 20 mg/l	±20% for precision ±0.3mg/L for accuracy
Surface water	metals	field duplicates laboratory duplicates	n/a for field laboratory control samples	reporting limit <0.001mg/L for Hg routine for all other metals	±20% for field precision base method required limits or lab established limits, whichever more stringent and as documented in the lab manual and method SOPs found in Appendix A

Example: Representativeness will be ensured by collecting the samples as described in this QAPP at the same locations for each sampling evant and during normal stream flow conditions.
In order to ensure the comparability of the data sets generated by this project, samples will be collected and analyzed according to identical procedures and methods each time and will be reported in the same way and in the same units.

For the project to be successful, a completeness goal of 90% has been established. A majority of sample locations must be sampled, and valid data reported for 90% of l samples planned. If not, efforts will be made to reanalyze the samples where possible, or the locations resampled.

> Instruction: When your project includes the use of existing information/data, also known as information/data from other sources. the QAPP needs to identify the source(s) of the information/data, how it was determined it was acceptable for use in the project including any acceptance criteria applied, how this information/data will be obtained, and how it will be used.

Example Table: Existing Information Sources and Performance Criteria

Existing Information	Source	Acceptance Criteria	Procedures Used to Apply Acceptance Criteria	Use of existing data
Stream flow obtained to contribute to the understanding of how changes to land use can change streamflow	USGS WaterWatch	Compliance with USGS quality program	Information/data posted by USGS and obtained directly from the USGS website	To confirm samples are being collected under normal stream flow conditions to ensure representativeness

Example: The existing information from USGS WaterWatch will be downloaded monthly from the website following the instructions provided. This existing stream flow data will not be combined with any new stream flow data under this project and so compatibility is not of concern for this existing data.

A7. Distribution List

> Instruction: List all individuals who will receive a copy of the QAPP and any subsequent revisions. Be sure to include all key personnel with project responsibilities (can include but not be limited to field staff, subgrantees, the laboratory, etc.) and any others within your organization as may be required by your organization. And please note you will need to maintain a complete copy of the approved QAPP and all revisions in your file. The minimum requirements for the distribution list include the organization's project manager and QA personnel as well as the EPA project officer and the RQAM. Be sure to consult with your project officer to learn if the Program requires any other EPA staff to be included on the distribution list.

QAPP Distribution List

Distribution List - QAPP Recipient	Title	Organization	Contact Information
Name (Organization project manager)			
Name (Organization QA personnel)			
Name	***EPA Project Officer***	***EPA Region 7***	
Diane Harris	***RQAM***	***EPA Region 7***	***harris.dianee@epa.gov*** ***913-551-7258***

A8. Project Organization

Instruction: Identify all key personnel and organizations involved in your project. Be sure to summarize their roles and responsibilities and identify who is responsible for each of the authorities and activities noted in the headings for columns 2 thru 6 shown in the example table below.

Example Table: General Roles and Responsibilities

	QAPP Approval Authority	Executive Leadership Authority	Conducting the project	Principal information/data operations user	Maintains QAPP	Project responsibilities
Name Title (Senior leader)		***X***	--			***Provide resources***
Name Title (Organization project manager)	***X***	--	***X***	***X***		(summarize here)
Name Title (Organization QA personnel)	***X***	--	--	--		(summarize here)
Sub-grantee, contractor		--		--	--	(summarize here)

(if and when applicable)						
Name ***EPA Project Officer***	***X***	--	--	--	--	Th EPA PO is responsible for managing the grant, reviewing and approving the QAPP for conformance with Program and work plan requirements and forwarding the QAPP to the QA Office for review and approval
Diane Harris RQAM	***X***	--	--	--	--	***The RQAM is responsible for providing QA***

						assistance and guidance and for review and approval of the QAPP.

See the project organization chart in A10 for the reporting relationships of project and quality personnel.

> Instruction: When summarizing the QA personnel's responsibilities, be sure to describe their oversight authority when it comes to evaluating the effectiveness of the QAPP, their access to senior leadership to identify and discuss quality-related issues, and their independence from those responsible for conducting the environmental information/data activities for the project. If your organization finds it necessary for project personnel to have to perform both QA and environmental information/data activities, please consult your EPA Project Officer and the RQAM for options on how to address this situation and document it in the QAPP.

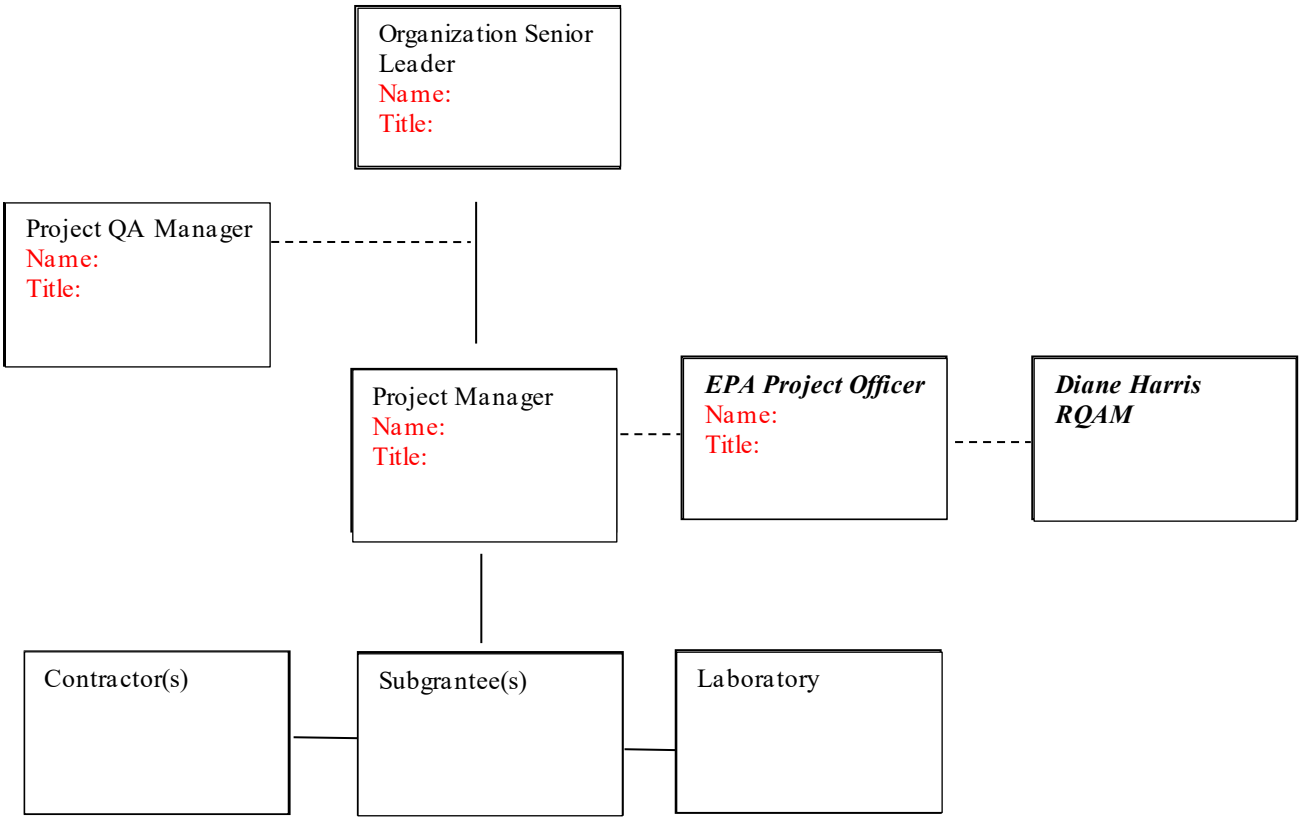
Example: The Project QA Manager approves and signs the QAPP separately from the Project Manager and they will not have any responsibilities for the environmental information/data activities described in this QAPP so that they remain independent. They do not report to the Project Manager but instead to the Senior Leader of the Organization so that they can bring to their attention and discuss any quality-related issues the Project QA Manager may identify. It is thru the review and approval of this QAPP that they help to ensure the effectiveness of the QAPP so that project objectives are met, and the resulting environmental information/data can be used as intended. The Project QA Manager also has the authority to perform project assessments at any time during the project at their discretion or upon request to help ensure QAPP effectiveness.

A10. Project Organization Chart and Communications

> Instruction: Include an organization chart that shows lines of reporting (solid lines) and lines of communication (dashed lines) within your organization and between other organizations who may be involved in performing the project. Be sure your organization chart includes the same types of information as shown in the example below. The example shown can be expanded or condensed to fit your project and the organizations involved.

The Pr

Lines of Authority———— Lines of Community----------



Lines of Communication, Communication Pathways and Communication Mechanisms

Instruction: Stuff can happen during a project which can lead to deviate from what you originally planned and the need for changes to your QAPP. It is important to recognize this possibility and to describe in your QAPP how differences and changes will be communicated to everyone who needs to know about them, who is responsible, how this communication should happen, in what timeframe, and what approvals may be needed. The most common and expected types of communications are listed in the first column of the table below. Additional or different communications can be added to fit your project.

Example Table: Communication, Communication Pathways, and Communication Mechanisms

Description of	Individual	Pathway	Mechanis	Procedures including

Communication	Responsible		m	timing
Discrepancies and QAPP non-conformances between project personnel and any sub-grantees or contractors	Example: Any project personnel can identify a discrepancy or non-conformance	Must be communicated to the Project Manager	Can be verbal or in an email	Immediately upon discovery. The Project Manager will approve the discrepancy or non-conformance or the corrective action to be taken before the project can proceed
Discrepancies and QAPP non-conformances to EPA	Project Manager	The Project Manager must communicate discrepancies and non-conformances to the EPA PO	Can be verbal or in an email	Immediately upon discovery. The Project Manager will obtain EPA PO approval as well RQAM approval (when information/data quality and usability is impacted) of the discrepancy or non-conformance or the corrective action to be taken before the project can proceed
Process improvement	Example: Any project personnel can and are encouraged to identify a process improvement	Must be communicated to the Project Manager	Can be verbal via or in an email	The Project Manager will review the proposed improvement and approve it before implementation. If the process improvement impacts information/data quality or usability, the EPA Project Officer will be consulted for EPA approval
QAPP revisions	Any project personnel can identify a need for a QAPP revision	Must be communicated to the Project Manager	Can be verbal via or in an email	The Project Manager will ensure the QAPP revision is made and forwarded to the EPA Project Officer for EPA

				review and approval.

A11. Personnel Training/Certification

Instruction: Project personnel may need specialized education, training, experience, and knowledge to successful perform tasks for your project. Use this section to identify this information including who ensures personnel training is in place, who will document the training, how the training will be provided, the needed skills ensured, and the system or procedures that will document the training and skills.

Example: All project personnel conducting sampling activities for the project must complete a two-day field training course conducted by the State Department of Environmental Resources water quality personnel. On the first day, participants are instructed on how to use, calibrate and document the results of field water quality measurements using the Multi-Meter and the second day is focused on the techniques and procedures for collecting, preserving, packaging, shipping, and documenting the collection of surface water samples for metals. To ensure the necessary skills were learned, participants of this training must pass a written test and successfully complete the tasks while being observed by the trainers. Successful completion will be documented via a training certificate that is provided to the Project Manager who then maintains the initial certificate and all refresher certificates. After the initial training, an annual refresher course is required to ensure the acquired and necessary skills are maintained. The Project Manager will use a spreadsheet to document the training was attended, when it was successfully completed, and continued evaluation of the skills thru successfully passing annual refreshers. The laboratory performing the sample analyses must be ISO 17025 accredited for environmental chemistry with current accreditation for metals by the needed method in non-potable water. See Appendix A for the Laboratory's current accreditation certificate which the Laboratory must provide to the Organization Project Manager annually.

A12. Documents and Records

Instruction: List all project documents, records, and reports that will be produced during your project. Include how they will be managed and requirements for their final disposition including their retention time and location.

Example: Table Documents and Records

Document or Record Name	How will the Document or Record be Managed	Requirements for Final Disposition including Location and Length of Time
QAPP	Final version and revisions stored electronically in the project folder on the	Will be kept by the Organization for three years after completion of the project and then disposed per EPA's disposition schedule.

	secure, shared drive	
Field documents (field sheets, field logbook, field equipment logs, chain-of-custody forms)	These will be completed electronically by field personnel a the time the field measurements and sample collection occur and placed in the project folder on the secure, shared drive	Will be kept by the Organization for three years after completion of the project and then disposed per EPA's disposition schedule.
Laboratory records (raw data, bench sheets, prep sheets, initial calibrations, QC results, chromatograms, data packages, data transmittals)	All laboratory documents, records and reports will be completed, managed, and maintained per their internal procedures outlined in their Quality Manual found in Appendix A.	Will be kept by the Laboratory for three years after completion of the project and this disposed per the direction of the Project Manager.
Quarterly and final reports	Prepared by the Project Manager as required by the grant, forwarded to the EPA Project Officer, and placed in the project folder on the secure, shared drive	Will be kept by the Organization for three years after completion of the project and then disposed per EPA's disposition schedule.

Section B – Implementing Environmental Information Operations

Instruction: List any guidance, tools, templates, etc, you may have used to develop the QAPP. Be sure to include those already listed in the table below,

Example Table: List of Guidance, Tools, Templates Used to Develop the QAPP

1	***QAPP Standard.pdf***
2	***Region 7 Basic QAPP Guidance and Template, current version***

B1. Identification of Project Environmental Information Operations

Instruction: Describe the environmental information/data activities to be performed during your project and be sure to describe how they will meet the project purpose, the quality objectives, and performance/acceptance criteria defined in sections AA4 and A6. This can include, but not be limited to sample types and numbers, sampling approach and rationale, sampling locations and frequency, and sample matrices. If your project includes existing information/data sources, be sure to also address them.

Exampl es, the sample

design outlined below must be followed to allow this evaluation to occur and the performance criteria outlined for field and analytical data in section A6 as well as the data quality indicators will provide the confidence needed that the information/data obtained are of adequate quality and can be used as intended.

Example Table: Sampling Design

Sample types and numbers	Grab samples Samples above and below implemented stormwater management practices Two samples monthly per location at 4 locations for 12 months is a total of 96 samples for lab analyses per project year
Sampling network and design	A judgmental sampling design must be implemented based on where stormwater management practices are implemented. Normal streamflow conditions are needed and so sampling will not occur less than 10 days after a heavy rainfall (>1 inch) or snowfall event (3 inches). Monthly field measurements and samples are needed to effectively monitor and evaluate the effectiveness.
Sampling locations and frequency	Four locations where stormwater management practices have been identified. See Figure 1 for these locations. Sampling will occur monthly throughout the project.
Sample matrices	Surface water

The existing information for stream flow to be obtained thru USGS WaterWatch has already evaluated and determined to be acceptable for use in this project to help ensure all samples are collected during normal stream flow conditions so that the evaluation of effectiveness can occur.

B2. Methods for Environmental Information Acquisition

Instruction: Identify and describe the methods and procedures to be followed during the project to obtain the environmental information/data. Provide a complete citation including number/identifier, version/revision date, regulatory citation if applicable. Be sure to note any available options to be used for your project or any modifications needed for your project where applicable. If your project includes field sampling and laboratory analysis, be sure to address the sample management details outlined in the example sample management and laboratory tables below.

Field Methods and Procedures

Field Operations

Example Table: List of SOPs – All field SOPs can be found in Appendix B and at www.SOPlinks.orggh

SOP/Procedure #	Title, Revision and Date	Modified for project (Y/N)	SOP Option or Equipment Type (if options are provided)	Who maintains
SOP #FS-233.A1	Calibration, Maintenance, and Use of the Multi-Meter, Revision 2, October 2021	N	None	Organization Project Manager
SOP #FS-245.C5	Sample Collection for Ambient Water Monitoring, Revision 4, June 2022	N	Direct method	Organization Field Team Leader
SOP #FS-173.D3	Sample Labeling, Packaging, Shipping, and Field Chain of Custody Procedures, Revision 3, February 2023	N	None	Organization Field Team Leader

Integrity of Environmental Information

> Instruction: When samples are collected in the field, it is important to document how samples are handled from the time of collection to storage in the field, shipment to the laboratory, and thru receipt by the laboratory. This documentation helps show the samples were handled properly during this process and custody records (e.g., a chain-of-custody form) provides a convenient way to track the custody of samples from collection to receipt by the laboratory by documenting the date, time, and individuals involved in the transfer of samples from one entity to another.

Example: To help ensure the integrity of the environmental information/data, see SOP #FS-173.D3 in Appendix B and at www.SOPlinks.orggh for details on sample handling and custody procedures. Samples will be uniquely labeled and packaged on ice in coolers as described in this SOP. Samples will be shipped to the laboratory via a commercial carrier on each day samples are collected. A sample is in custody if it is in one's actual physical possession; it is in one's view, after being in one's physical possession; it is locked up so no one can tamper with it, after being in one's physical possession; or it is placed in a designated secured area. Chain-of-custody forms will be completed and used to document the transfer of the sample and custody seals will be placed on the sample coolers to show evidence of

any tampering. Examples of the chain-of-custody form, custody seals, and sample labels can also be found in SOP #FS-173.D3. Samples will be received and properly stored at the Laboratory per their SOP# 901.4C as referenced below in the laboratory analysis table.

Example Table: Sample Management

Matrix	**Analyte/Group**	**Containers/Volumes**	**Preservation**	**Preparation Holding Time**	**Analytical Holding time**
Surface Water	Field Measurements	direct reading	none	analyzed immediately	analyzed immediately
Surface Water	Total metals (inc. Hg)	One 1-L cubitainer	HNO_3 to pH <2	n/a	180 days 28 days for Hg

Laboratory Analyses:

Example Table: Laboratory Analysis

SOP/Procedure #	Title, Revision and Date	Modified for project? (Y/N)	SOP Option or Equipment Type (if options are provided)	Data Package Turnaround
SOP# 1000.1C	Analysis of Metals by ICP-MS Spectrometry (SW-846 Method 6010D), Revision 6, March 2022	N	None	30 days
SOP# 1100.3D	Analysis of Mercury by Manual Cold-Vapor Technique, Revision 5, August 2023 (SW-846 7470A)	N	None	30 days
SOP# 901.4C	Procedures for Sample Receipt Log-In, and Storage, Revision 2 October 2022	N/A	N/A	N/A
SOP# 233.12E	Corrective Action System and Responsibilities for the Analytical Laboratory, Revision 2, January 2023	N/A	N/A	N/A

SOP# 233.15G	Determining the Effectiveness of Corrective Actions in the Laboratory, Revision 2, January 2023	N/A	N/A	N/A

All laboratory SOPs can be found in Appendix A. All laboratory analyses will be performed by Pure Genius Laboratory at 300 N. Mockingbird Lane, Plumbus City, State 55555.

Existing Information

Instruction: Existing information is compiled or obtained from databases, software applications, decision support tools, websites, existing literature, and other sources. If your project includes existing information, be sure your QAPP lists the information to be obtained, the sources of this information, how it will be collected, how it will be used in your project, and how it was determined the information is acceptable and suitable for your project. For more details on the definition and possible used of existing information, please refer to EPA's QAPP Standard.pdf .

Example: Please see Section A6 for the details on existing information as it applies to this project.

B4. Quality Control

Instruction: When samples are collected and analyzed, quality control (QC) samples can help identify and evaluate potential sources of error like contamination (e.g. blanks), natural variability in the environment and that caused by field sampling methods (e.g., field duplicates), matrix effects (e.g., matrix spikes/matrix spike duplicates,) and equipment/instrument performance (e.g. duplicates, blank spikes). Actions can then be taken to possibly correct or minimize the impacts of any identified source of error. Any planned field and laboratory QC samples need to be listed in your QAPP along with their frequency, acceptance criteria, corrective actions if not acceptable, and effectiveness of the corrective action. If you will be calculating any statistics like relative percent difference or percent recovery, the procedures need to be described or referenced. For existing data, QC could include but not be limited to activities such as an independent secondary review or checking constructed databases or spreadsheet.

Exampl

QC		Criteria	Action	eness Evaluation
Multi-Meter	3 replicates at	±10% RPD	Recalibration of	repeated 3

replicate measurements	one sampling location per sampling event	see SOP #FS-245.C5 for how to calculate RPD	the meter per SOP #FS-233.A1	replicate measurements meet criteria
Field duplicates	5%	±30%	confirm proper sampling techniques and retrain personnel if needed	next set of field duplicates meet criteria or verify potential matrix issues and document
Method blanks	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 233.12E	SOP# 233.15G
Laboratory Fortified Blanks	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 233.12E	SOP# 233.15G
MS/MSDs	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 233.12E	SOP# 233.15G
Method-specific QC checks	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 1000.1C and SOP# 1100.3D	per SOP# 233.12E	SOP# 233.15G

Example: For the stream flow data from USGS WaterWatch, a second person will verify the stream flow data for the corresponding sample locations have been correctly downloaded. Quality control checks are implemented per the USGS quality program, and these checks must be acceptable before the USGS stream flow data are posted to the website. Any corrective action for stream flow data is the responsibility of the USGS. The quality assurance and quality control programs implemented by the USGS for their stream flow data are acceptable for this project. If there are any questions or concerns regarding this data, the Project Manager will follow-up with USGS.

B5. Instrument/Equipment Calibration, Testing, Inspection, and Maintenance

Instruction: It is important to make sure that any equipment or instruments used for your project are available and in working order when needed and before they are used to generate information/data. This includes your plan for routine inspection, preventive maintenance, and calibration of field and lab equipment along with what spare parts and replacement equipment will be on hand to keep field and lab operations running smoothly. Be sure to describe or reference the procedures to be followed and documentation activities to keep and that that are traceable back to the equipment or instrument.

Exampl n Activities

	SOP		Calibration	Maintenance			Documentation

Instrument or Equipment	Reference or Procedures	Individual Responsible	Activities and Frequency	Activities and Frequency	Acceptance Criteria	Corrective Action	and Traceability
Multi-Meter	SOP #FS-233.A1	Field Team Leader	Prior to and at the end of each sampling event	per SOP #FS-233.A1	SOP #FS-233.A1	SOP #FS-233.A1	Recorded in equipment logbook
ICP-AES	SOP# 1000.1C	Analyst	per SOP# 1000.1C	per SOP# 1000.1C	per SOP# 1000.1C	per SOP# 1000.1C	Recorded in instrument logbook
CVAA	SOP# 1100.3D	Analyst	per SOP# 1100.3D	per SOP# 1100.3D	per SOP# 1100.3D	per SOP# 1100.3D	Recorded in instrument logbook

B6. Inspection/Acceptance of Supplies and Services

Instruction: Describe how you will determine if supplies (e.g., spare parts, reagents, sample bottles, calibration standards, reagents, hoses, deionized water, potable water, and electronic data storage media and services (e.g., document development, conducting work by contractors or sub-grantees) are adequate for your project. Be sure to identify who will be responsible.

Example: Sampling containers and preservatives will be provided by the Laboratory and their supply receiving agent will do the initial review and acceptance of the supplies to verify the supplies were received as ordered. Personnel performing field-testing and sampling will inspect sample containers for cracks, ill-fitting lids, and obvious defects. Sample containers with obvious defects will not be used. Manufacture guidelines for proper storage of controls, reagents, and calibrators and ethanol will be strictly followed. All consumable containers will be inspected for obvious defects upon arrival by the Field Team Leader. Any consumable items that appear to be compromised in any way will be disposed of or returned to the manufacture for refund or replacement. Safety Data Sheet for each reagent/chemical will be maintained in a 3-ring binder for the project. The Field Team Leader will date and initial all supplies upon receiving and opening. Those consumables with shortened storage life after opening will have expiration dates written on the outside of the containers. The previously identified Laboratory is the only vendor providing services for this project and the project requirements for the analyses they will be performing are already defined in this QAPP.

B7. Environmental Information Management

Instruction: Trace the path your information/data will take –from the field to the laboratory when collecting samples or from the collection of existing information/data to information/data storage and use. Describe or reference record-keeping practices, document control, and storage and retrieval on electronic media. Include how errors will be detected and corrected and the loss of information/data during the management process will be prevented. Provide or reference examples of any standard forms or checklists to be used

Example: Field data sheets and field logbooks are inspected and signed by the Field Team Leader before leaving the site and are given to the Project Manager at the end of the sampling day for review. Within 72 hours, the Field Team Leader will contact any samplers whose field sheets or field logbooks contain significant errors or omissions. Once all corrections are made, the electronic field sheets and field logbook will be uploaded to the project e-file. The Laboratory Sample Custodian will review samples upon receipt and follow up with the Project Manager on any that cannot be attributed to specific samplers, have not been properly preserved, or that exceed the maximum holding time. The laboratory manager will also sign-off on data transmittals after sample analysis is completed and all QC checks have been completed. Any issues with the analysis and any laboratory data qualifiers assigned will be defined in the data transmittal package. The data transmittal packages will be provided electronically in an Excel format so that the data can be entered. All data will be entered into a "StormWater Manager" computerized spreadsheet/data base program designed for this project and compatible with hardware and software used by both the state and county water resource agencies. As a QC check, finalized data will be reviewed by a second individual.

Sectio

C1. As

Instruction: Your QAPP documents how your project will be carried out and you want to check to make sure the QAPP is being followed as approved so that you get the environmental information/data you planned for or if there are any QA issues, there is a process to identify them and get them corrected – a.k.a assessments and response actions. This section describes the processes you have in place to evaluate project activities, how any problems identified will get corrected and documented, and the effectiveness ensured. Be sure to include who is responsible for evaluating project activities and for following up on corrections. More information and examples can be found in EPA's QAPP Standard.pdf and EPA Guidance on Technical Audits and Related Assessments for Environmental Data Operations.

Assessments

Example Table: List of Planned Project Assessments

Type of Assessment	Number/Frequency	Who performs assessment	Who responds to assessment findings	Who responsible for corrective actions
Field audit	Two – one at project initiation and one at the mid-point	Project QA Manager	Project Manager	Field Team Leader or assigned technical staff depending upon specific corrective action
Internal lab review	Per Quality Manual found in Appendix A	Laboratory QA Manager	Laboratory Director	Laboratory Director for management related corrective actions and assigned analysts for technical
External lab review	Per Quality Manual found in Appendix A in compliance with ISO 17025 accreditation	ISO 17025 Accrediting Authority	Laboratory Director and Laboratory QA Manager	Laboratory Director and Laboratory QA Manager or other assigned staff as appropriate

Response Actions

Example Table: Response Actions

How Developed	How Documented	How Tracked	Who responsible	How Reported
Root cause analysis per SOP #FS-500.B3, Rev.2, December 2022 for field audits	Assessment report with a requested due date and schedule for a	Corrective action matrix	Project Manager	Completed corrective action matrix and project final report

	follow-up field audit			
Per SOP# 233.12E and SOP# 233.15G for laboratory internal and external reviews	Per SOP# 233.12E and SOP# 233.15G for laboratory internal and external reviews	Per SOP# 233.12E and SOP# 233.15G for laboratory internal and external reviews	Laboratory Director	Per SOP# 233.12E and SOP# 233.15G for laboratory internal and external reviews

C2. Oversight and Reports to Management

Instruction: Use this section of your QAPP to identify the frequency, content, and distribution of reports to data users, EPA, and any other partnership organizations that detail the project status, results of any assessment performed as described in section C1, and how any QA problems identified have been resolved. Identify who is responsible and how it will be ensured that response actions and reporting are in place to address the project status and QA issues that arise during the project and thru assessments. Be sure to check with your Project Officer to make sure any reports required by your grant are addressed in the QAPP including the frequency, who will prepare them, and who will receive them.

Example: Section C1 provides the details on project oversight including planned assessments, the responsible individual(s), how response actions will be managed, and the reporting process for assessments including corrective actions. Any QA issues identified during implementation of the project will be reported in the semi-annual interim project status reports. Review of these reports by the Project Manager, the Project QA Manager, and the EPA Project Officer will help to ensure oversight activities, response actions, and reporting mechanisms are in place.

Table: Reports

Type of Report	Content of Report	Who transmits the report	How the report is transmitted	Recipients of the report
Semi-annual interim project status reports	Completed field activities, reported lab data, results of any assessments, identified QA issues, and data verification/validation to date, and	Field Team Leader	Email using the project email group	***Project Manager, Project QA Manager, and the EPA Project Officer***

	upcoming planned activities			

D – Environmental Information Review and Usability Determination

D1. Environmental Information Review

Instruction: Once you have the environmental information/data from your project, you will want to review the results to make sure they are complete, correct, and comply with the procedures and methods required in your QAPP (sometimes referred to as information/data verification). Next, you will want to review your results against the quality indicators and their acceptance criteria defined in section A6 and your approach for generating or obtaining the environmental information /data described in B1. This step is sometimes referred to as information/data validation. Describe or refer to the information/data review procedures. Make sure the responsible person(s) for the review is identified and how the review results will be documented and shared.

Additional information about environmental information/data review can also be found in the current versions of the following:

- EPA Guidance on Environmental Data Verification and Data Validation
- EPA Guidance for Data Quality Assessment Practical Methods for Data Analysis
- EPA Data Quality Assessment: A Reviewer's Guide
- EPA Data Quality Assessment: Statistical Tools for Practitioners

Example Table: Information/Data Verification Activities

Item reviewed	Responsible individual(s)	Description of Procedure
Chain-of-custody (C-O-C) forms	Field Team Leader and Laboratory Sample Custodian	The Field Team Leader will check all C-O-C forms before samples are shipped to ensure they are complete and accurately reflect the samples collected and being shipped. The Laboratory Sample Custodian will verify the samples received are listed on the C-O-C form and match the Work Order. Any needed corrections will be made in consultation with the Field Team Leader. The results of the C-O-C review will be documented in the Semi-Annual Interim Project Status Reports described in section

		C2 for distribution as noted.
Field data sheets and field logbook	Field Team Leader	The Field Team Leader will review each field data sheet and field logbook at the end of each day samples are collected to ensure they are complete and record the needed information. Any needed corrections will be made, or deviations documented at the time they are identified. The Field Team Leader will then initial and date the field data sheet or logbook to document their review. The results of this field documentation review will be documented in the Semi-Annual Interim Project Status Reports described in section C2 for distribution as noted.
Laboratory data transmittals	Analyst, peer reviewer, Laboratory Director	All laboratory data transmittals will be reviewed and qualified as needed by the analyst, a peer reviewer, and the Laboratory Director before any data are reported per the Quality Manual found in Appendix A. A copy of the data transmittal which includes the results of the internal review by the Laboratory will be attached to the Semi-Annual Interim Project Status Reports described in section C2 for distribution as noted.
Assessment reports	Project Manager	For any corrective actions noted, ensure they were implemented according to plan. The results will be documented in the Semi-Annual Interim Reports described in section C2 for distribution as noted.

Example Table: Information/Data Validation Activities

Item Reviewed	Individual Responsible for Reviewing	Description of Procedure
QAPP	Project Manager	Compare the field documentation and laboratory data transmittals to ensure all identified locations were sampled as planned and that valid data for the submitted samples were received. Compare the results to the qualitative

		and quantitative quality indicators found in section A6. Make note of any nonconformance with the QAPP and any deficiencies in meeting the project criteria. These review results will be documented in the Semi-Annual Interim Reports described in section C2 for distribution as noted.
Field information/data review results	Project Manager	Look for and document any noted deviations from or discrepancies with the QAPP, procedures or method. These review results will be documented in the Semi-Annual Interim Reports described in section C2 for distribution as noted.
Laboratory data transmittals	Project QA Manager	Review data report and make note of any qualified data and the reason for the qualification 10% of the laboratory data will be validated against the State Functional Guidelines for Metals Analyses. These review results will be documented in the Semi-Annual Interim Reports described in section C2 for distribution as noted.

D2. Useability Determination

Instruction: After you have verified and validated your information/data as outlined in section D1, the next step is determining whether the information/data have met your project objectives and can be used as intended. This is sometimes called a data usability assessment. If you have any statistical analysis of the information/data planned, you will describe it here. Be sure to describe how the data usability assessment will be documented and who will be responsible. If there are any known or anticipated limitations on the use of the information/data from the project, be sure to also indicate how those limitations will be shared and with whom.

Example: The Project Manager will be responsible for the data usability assessment and for determining if the project results, after being verified and validated, meet the project objectives and can be used as intended. The Project Manager will review Semi-Annual Interim Reports, assessment reports, and laboratory case narratives within the data transmittal packages to evaluate the impact of any noted deviations from the QAPP (e.g., sample locations, number of samples, noncompliance with

sampling methods, laboratory QC issues, etc.), any nonconformances with project acceptance or performance criteria (e.g., missed QC samples, unacceptable QC results, samples collected during high flow conditions, etc.) and qualified data (e.g., estimated data, data biased high or low, data invalid or not analyzed, etc.) on the usability of the data. Other than calculating the basis statistics of RPD, percent recovery, and potentially averages and ranges, no statistical analysis or test of assumptions applies because a judgmental sampling design is being used. As long as the samples are collected at the frequencies and locations outlined in this QAPP and valid laboratory data obtained for the analytes of concern, the information/data generated by this project will be usable and no limitations are anticipated. If any limitations are identified, these will be documented in the final Semi-Annual Interim Reports described in section C2 for distribution as noted.