

US EPA Region 2
Guidance for the Development of
Quality Assurance Project Plans
for Citizen Science Projects
April 2013

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Citizen Science QAPP Requirement Summary		
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A quality assurance project plan (QAPP) states the objectives and procedures to be followed for a project that uses or collects environmental information. It keeps all of the information for the project in one location for easy access by all individuals involved with the project. You should be able to give a QAPP to anyone involved with the project and when they are done reading it they will know why the work is being done and what will be done to achieve the established objectives.

On the templates, instructions are highlighted in blue while examples are provided in *italics*. Replace all italicized examples with the corresponding information from your project. Please complete all relevant tables.

Citizen Science QAPP Template #1
Title and Approval Page

Twisting River Monitoring

State Department of Environmental Protection

Effective Date of Plan: April 30, 2013

Project Manager:

Signature/Date
Name/Title

Project QA Manager:

Signature/Date
Name/Title

EPA Project Officer:

Signature/Date
Name/Title

EPA QA Officer:

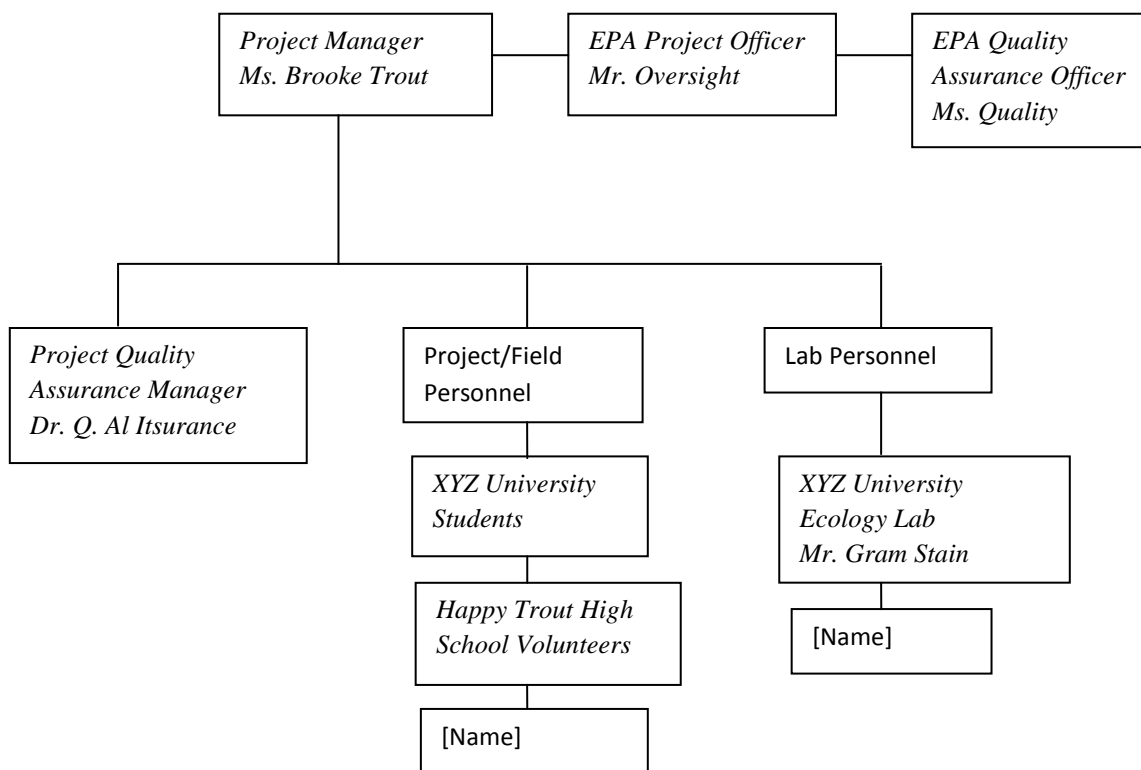
Signature/Date
Name/Title

Add additional signatures lines as needed. At a minimum, include the personnel listed above.

Citizen Science QAPP Template #2A

Project Organization Chart

The organization chart shows the lines of communication and reporting for the project, similar to a chain of command. Fill in the names of the individuals and their titles (where applicable). If the project does not have all of the personnel in the chart, put N/A in the box where this applies. If necessary add more boxes to accurately reflect the communication and reporting structure of the project.



Citizen Science QAPP Template #2B**Project Distribution List**

The distribution list ensures everyone involved with the project receives a copy of the QAPP and is aware/clear about the work being conducted. It also provides the contact information for those involved with the project. For this table, input the names and contact information for all individuals who will need to get a copy of the QAPP.

Name/Title	Contact Information
<i>Ms. Brooke Trout Project Manager</i>	Email: brooke.trout@state.gov Phone: 555-6432
<i>Dr. Q. AL Itsurance Project Quality Assurance Manager</i>	Email: gal.itsurance@state.gov Phone: 555-6459
<i>EPA Project Officer</i>	Email: epapo@epa.gov Phone: 555-6466
<i>EPA Quality Assurance Officer</i>	Email: epaqa@epa.gov Phone: 555-6467
<i>XYZ University Students Field Samplers, Data Analysts</i>	Email: student.name@xyz.edu Phone:
<i>Happy Trout High School Volunteers Field Samplers</i>	Email: student.name@HTHS.edu Phone:
<i>Mr. Gram Stain XYZ University Ecology Lab Technician</i>	Email: Ecolab@xyz.edu Phone: 555-3328

Citizen Science QAPP Template #3

Project/Task Organization

Fill in the name, title, organization affiliation and responsibilities sections of the table below. For the responsibilities section, state what work/task each individual will be doing throughout the project. The responsibilities section provides an outline of the work that will be done for the project. Project specific details will be addressed in later sections of the QAPP. **NOTE:** The names and titles should be consistent in Templates #1, #2A, #2B, and #3.

Name	Title	Organizational Affiliation	Responsibilities (specific to this project)
<i>Ms. Brooke Trout</i>	<i>Project Manager</i>	<i>State Dept. of Environmental Protection</i>	<i>Oversees quality assurance manager, data collection, team organization and training, etc.</i>
<i>Dr. Q. AL Itsurance</i>	<i>Project Quality Assurance Manager</i>	<i>State Dept. of Environmental Protection</i>	<i>Quality assurance, oversight and assessments, data verification, evaluation and usability, ensuring corrective actions are completed, etc.</i>
<i>University Students (3 people)</i>	<i>Field Personnel</i>	<i>XYZ University</i>	<i>Field sampling and data analysis</i>
<i>Volunteers (2 people)</i>	<i>Field Personnel</i>	<i>Happy Trout High School</i>	<i>Field sampling and data analysis</i>
<i>Mr. Gram Stain</i>	<i>Laboratory Personnel</i>	<i>XYZ University Ecology Lab</i>	<i>Sample analysis and data validation</i>

Citizen Science QAPP Template #4

Problem Definition and Project Objectives

Problem Definition

Clearly state the problem and environmental questions being addressed by the project.

Over the past two years fisherman have noticed a decrease in the clarity of the water and an increase in algae (chlorophyll a) in the Twisting River. Each year the town of Twisting River hosts an annual Rainbow Snouted Brook Trout competition that draws anglers from all over the world. Participants have noticed a decrease in the number and size of fish being caught. The fishermen of Twisting River noticed this decline after the Hot Pink Purple Spotted Hippo power generation plant started discharging water into the Twisting River. This project will address the following questions:

- 1. Is the discharge water from the power plant potentially causing the excessive growth of algae (chlorophyll a) in the Rainbow Snouted Brook Trout's habitat?*
- 2. Is the discharge water potentially impacting the temperature of the Rainbow Snouted Brook Trout's habitat?*
- 3. Are there differences in the water temperature and algae (chlorophyll a) concentrations upstream and downstream of the power plant?*

Project Objectives (linking data results with possible actions)

Describe how the project objectives will answer the problem presented in the problem definition provided above. Include the tasks that will be completed to provide or collect information to address the problem.

We plan on investigating the effects of water temperature on algal growth in the Twisting River.

- Objective 1: Collect water temperature data upstream of the discharge, at the discharge, and downstream of the discharge*
- Objective 2: Collect water samples to analyze the amount of algal growth upstream of the discharge, at the discharge, and downstream of the discharge*

We will sample water for algae (chlorophyll a) from a series of sampling locations in the river that the power generation plant is discharging to. The temperature of the river water will be determined in the field using a YSI meter. We will complete a correlation analysis comparing the temperature of the river and the concentration of algae (chlorophyll a).

Data Users

State who will use the data and what decisions or conclusions will be made based on the data. Include any action levels or standards to which the data will be compared.

The data collected from this project will be used by XYZ University and State Department of Environmental Protection as screening level data. XYZ University will determine if a more extensive project needs to be completed to more definitively determine if there are significant changes in temperature and algae (chlorophyll a) concentration in the river. The data will also be used to inform the State Department of Environmental Protection of a potential problem in the river in hopes that the state will review the power plant's permit limits and re-evaluate the limits when the plant's permit is up for review at the end of this year.

Citizen Science QAPP Template #5

Background and History

Background

In this section, state why this work needs to be done, identifying the reasons for conducting the work and/or the lack of information relating to the project.

The Hot Pink-Purple Spotted Hippo power generation plant was recently built along the shore of the Twisting River. The power generation plant started discharging to the Twisting River in 2010. In 2012, local fishermen noticed visible changes to the clarity of the water and growth of algae (chlorophyll a). Specifically, the fishermen have noticed a decline in Rainbow Snouted Brook Trout, a species very sensitive to increases in temperature, in the Twisting River. It is unclear if the discharge water is contributing to the increase in algae (chlorophyll a) growth and the decline of fish in the habitat of the Rainbow Snouted Brook Trout. The XYZ University located ¼ km upstream has been collecting temperature information for the Twisting River for the past 4 year. That data has been entered into a database and will be used as baseline temperature data for the Twisting River. Additional information about the buoy data can be found on Template #6. This data will be compared to the data collected in-situ during this project.

History

In this section provide any relevant historical information that would help the reader understand the problem that is being addressed. Discuss any previous work or data that has been collected as they relate to this project.

The Twisting River has provided natural habitat for the prize-winning Rainbow Snouted Brook Trout for many years. Rainbow Snouted Brook Trout are known for their large size and unique taste. Every year the local fishermen host a world renowned Rainbow Snouted Brook Trout competition. They have noticed a decrease in the size of the winning Rainbow Snouted Brook Trout. In addition to noticing a decline in the number of fish, over the past couple of years, they have also noticed a change in the availability of the Rainbow Snouted Brook Trout's food source and an increase in algae (chlorophyll a) growth in the Twisting River.

Citizen Science QAPP Template #6

Project Location

Project Location

Provide a description of the site and sampling locations and how they were chosen. Provide the rationale for selecting sample locations and what is going to be sampled. Provide a map showing the location and any other relevant information for the project. Tie this information back to the goals and objectives of the project.

The location for the project will encompass a 1km stretch of the Twisting River. This section of the river is not tidally influenced. This area of the river was selected to determine if there is a change in the temperature and algal concentrations in the Twisting River due to the influence of the discharge water from the power plant. It extends 0.5 km upstream from the discharge point from the Hot Pink-Purple Spotted Hippo power generation plant and 0.5 km downstream from the discharge point which includes the habitat for the Rainbow Snouted Brook Trout. Temperature data and water samples that will be analyzed for algae (chlorophyll a) concentration will be collected. XYZ University has a buoy located ¼ km upstream from the discharge point that has been collecting data for the past 4 years. The buoy temperature data will be used as baseline temperature data in the Twisting River. Three sampling locations were chosen in the midpoints of the river. Location 1 is 0.5 km upstream from the discharge point and it will provide data for the river that is not influenced by the discharge from the power plant. Location 2 is just south of the power plant discharge point. The data from this location will be used to determine if there is an impact from the discharge water. Location 3 is 0.5 km downstream of the discharge point and is also located within the Rainbow Snouted Brook Trout's habitat. Data from this location will be used to determine if the discharge water is potentially impacting the temperature and algae (chlorophyll a) concentrations in the Rainbow Snouted Brook Trout's habitat.

Citizen Science QAPP Template #7

Project Schedule

In the table below, list all major project activities that will be performed during the course of the project. Provide estimates of the timeframe expected for the activities to be conducted and/or completed.

Activities	Organization/Group responsible for activity completion	Timeframe work will be done
<i>Preparation of QAPP</i>	<i>Ms. Brooke Trout Project Manager</i>	<i>January 2014- Submit QAPP March 2014- Approved QAPP</i>
<i>Review and Preparation of QAPP</i>	<i>Dr. Q. AL. Itsurance Project Quality Assurance Manager</i>	<i>January/February 2014</i>
<i>Grant Oversight</i>	<i>EPA Project Officer</i>	<i>January 2014 – January 2015</i>
<i>Approval of QAPP</i>	<i>EPA Quality Assurance Officer</i>	<i>February/March 2013</i>
<i>Procurement of Equipment</i>	<i>XYZ University</i>	<i>March 2014</i>
<i>Collection of Existing Data</i>	<i>Ms. Brooke Trout XYZ University Students</i>	<i>April 2014-October 2014</i>
<i>Sample Collection</i>	<i>Ms. Brooke Trout XYZ University Students High school volunteers</i>	<i>April 2014-October 2014</i>
<i>Sample Analysis</i>	<i>Mr. Gram Stain, XYZ University Ecology Lab</i>	<i>April 2014-October 2014</i>
<i>Data Evaluation</i>	<i>Ms. Brooke Trout, XYZ University Students, Happy Trout High School Students</i>	<i>April 2014-November 2014</i>
<i>Preparation of Final Report</i>	<i>Ms. Brooke Trout</i>	<i>January 2015</i>

Citizen Science QAPP Template #8**Existing Data**

For many projects it may be necessary to use data that someone else has already collected, (i.e. existing data). Just because data was collected by a reliable source, such as a peer reviewed journal article, doesn't mean it was collected in a way that your project could use. It is important to perform a check on the data to see how the data was collected and if it is acceptable for the objectives of your project. You must complete this template if your project will be using existing data.

Identify all existing data that will be used for the project, and their originating sources. Specify how the existing data will be used, and the limitations on their use.

- In the **Existing Data** section state what existing data you will use.
- In the **Data Source** section state where that data will come from.
- In the **How Data Will Be Used** section state the need for this data and/or what purpose it will be used for.
- In the **Acceptance Criteria** section state what the requirements are for the data in order for them to be used in the project. For example, if you are looking for temperature data for a water body collected in July, then temperature data collected in June would not be acceptable for the project. Data collected with a certain instrument or by a certain method are also instances where the collected data may not be acceptable for the project.

Existing Data	Data Source	How Data Will Be Used	Acceptance Criteria
<i>Water temperature data</i>	<i>XYZ University buoy located upstream from the power generation plant</i>	<i>To determine baseline temperatures of the Twisting River for the past 2 years</i>	<i>1. Temperature data has to be collected from a properly calibrated and functional buoy</i> <i>2. Temperature data was collected from within ½ km of power generation plant</i> <i>3. Sensitivity of the temperature data from the buoy is at least 0.1 °C</i>

Citizen Science QAPP Template #9

Quality Objectives

Use this template to develop the data quality objectives (DQOs) that define the type, quantity and quality of data needed to answer specific environmental questions, and support proper environmental decisions. The examples provided below are neither inclusive nor appropriate for all projects. Fill in all information appropriate for the project. Complete this template for field, existing data and laboratory activities, if your project includes these components.

Precision is defined as the ability of a measurement to consistently be reproduced. Repeated measurements are usually used to determine precision. In the case of repeated measurements, one would see how close those measurements agree. If repeat measurements will be taken state how close those measurements need to agree by.

Precision:

Field - Duplicate temperature profiles will be taken at all three sampling stations during each sampling event. The temperature readings must agree within $\pm 0.2^{\circ}\text{C}$.

Laboratory - Results for duplicate algae (chlorophyll a) samples must agree within 25%.

Existing data - Check to see that precision was checked during the original project that produced the temperature data we are using.

Bias is defined as any influence in the project that might sway or skew the data in a particular direction. Taking samples from one location where a problem is known to exist, instead of taking samples evenly distributed over a wide area, is one example of how data can be biased. State any biases that could potentially exist and how they will be addressed in the project.

Bias:

Field - All of our sampling locations are in the middle of the Twisting River. We may miss temperature or algal dynamics near the banks of the river. Given the limits of the budget and the screening level nature of the project, mid-point stream samples are sufficient.

Laboratory – Blank filters and calibration standards will be used. Calibration standards with concentrations from $0.05\mu\text{g/L}$ - $200\mu\text{g/L}$ will be used. Resulting fluorometer readings must be within 10% of the known concentration.

Existing data- The buoy is located upstream of the discharge point. Baseline temperature data will only be used from that one location in the Twisting River. There is not any baseline temperature data for areas downstream in our study area.

Representativeness is how well the collected data depicts the true system. Describe how the collected data will accurately represent the population, place, time and/or situation of interest.

Representativeness:

Field- We are sampling within a 1 km section of the river, upstream, at the discharge and downstream to capture temperature and algae (chlorophyll a) in the Twisting River near the Hot Pink Purple Spotted Hippo power generation plant. We are only assessing during April – October. Therefore, data is not meant to be representative of conditions during winter months.

Existing data-The temperature data from the buoy records temperatures upstream of the discharge point from the power generation station and should provide representative baseline temperatures of the Twisting River.

Comparability is defined as the extent to which data from one data set can be compared directly to another data set. The data sets should have enough common ground, equivalence or similarity to permit a meaningful analysis. State if the data is intended to be compared to other data sets and how this will be achieved.

Comparability:

Field- We are using a YSI sonde and standard methods so our data will be comparable with data from other studies.

Laboratory – We are using standard EPA Method 445.0 so our data will be comparable with data from other studies.

Existing data- Our YSI sonde reads temperature to the same sensitivity as the XYZ University Buoy. So we will have comparable baseline temperature data.

Completeness is the amount of data that must be collected in order to achieve the goals and objectives stated for the project. State how much data will need to be collected in order for the project to be considered successful. This can be stated as a total number of samples or a percentage of data collected.

Completeness:

Field- We will collect and analyze 100% of algae (chlorophyll a) samples, 42 samples and 14 duplicates throughout the project. If weather or other issues impede a sampling event, the event will be rescheduled.

Existing data-Temperature data from the buoy from April-October for the past 4 years will be used in this study. If the buoy was not functioning properly during any period of that time, that data will not be used.

Sensitivity is essentially the lowest detection limit of a method, instrument or process for each of the measurement parameters of interest. State the sensitivity needed for the instruments, methods or processes used for the project in order to obtain meaningful data.

Sensitivity:

Field- The YSI sonde has a sensitivity of 0.1°C for a temperature range of -5°C to 95°C. Depth measurements will be made in cm.

Existing data- The temperature sonde on the buoy has a sensitivity of 0.1°C.

Laboratory- Method 445.0 has a method detection limit of 0.05µg chl a/L

Citizen Science QAPP Template #10A

Data Collection Methods

Sampling Design

For this section, describe and justify the data collection activities. Include location specific information, such as GPS coordinates or landmarks, for the data collection locations. Provide information about the frequency of sampling and the collection of quality control samples. Include information about your plans for sample identification and transportation.

We plan on sampling the Twisting River at 3 locations. One located ½ km upstream from the discharge point of the Hot Pink Purple Spotted Hippo power generation plant, one located at the discharge point and one located ½ km downstream from the discharge point. All three sampling locations will be located at the midpoint of the Twisting River, equidistant from each bank. Sampling will occur twice a month from April 2014-October 2014 for a total of 14 sampling events. At all 3 locations, surface samples will be collected for algae (chlorophyll a) using amber/dark 1-L HDPE bottles. One duplicate algae (chlorophyll a) sample will be taken during each sampling event. Algae (chlorophyll a) samples will be kept on ice until they are filtered in the lab. Sampling IDs will be in the following format MM-DD-YYYY-US/DS/DP, upstream (US), downstream (DS) or discharge point (DP). Sample labels will include this sample ID number. Samples will be transported to the laboratory immediately by the field staff. Temperature readings will be taken every 6 inches using a YSI sonde. River depth will be determined using a wading rod, depths are marked with tape on the YSI cable at 6 inch intervals. Temperature readings will be taken at the surface and bottom of the water column. Duplicate temperature readings at each depth will be taken at all stations during each sampling event. Sampling teams of 2 people will sample the 3 sampling locations. Sampling teams will include Ms. Brooke Trout, XYZ University students and Happy Trout High School Volunteers.

Complete all required information in the table below, using additional rows/columns, if necessary. Only a short reference back to the project objective is necessary in the table.

- In the **Matrix** section, state what kind of matrix (air, water, soil, animal/organism) is being sampled during the project.
- In the **# of Sampling Location(s)** section, provide the number of sampling locations.
- In the **# of Samples per Location** section, state if multiple efforts will be made at one location, such as sampling at different depths or taking repeated measurements over a given amount of time (i.e. once/quarter).
- In the **Parameter** section, state what substance will be measured/sampled.
- In the **Field QC Samples** section, state how many and what type of quality control samples will be collected.
- In the **Total Number of Samples** section, state the total number of samples that will be collected for each sampling event or total project including field QC samples.

- In the **Sampling SOP Reference** section, state what specific methods will be used for the sample/monitoring data collection. Attach any SOPs as necessary.
- In the **Project Objective for Sampling and Analysis or Monitoring** section, state why the data will be collected at the particular location, frequency and time.

Matrix	# of Sampling Locations	# of Samples per Location	Parameter	Field QC Samples	Total Number of Samples/ Measurements	Sampling SOP Reference	Project Objective for Sampling and Analysis or Monitoring
Water	3	1	Algae (chlorophyll a)	1 duplicate/ sampling event	4 per sampling event	XYZ University Chlorophyll a SOP	Meets the objective to sample for algae (chlorophyll a) in the Twisting River
Water	3	2	Temperature	6 duplicate readings, one at each station and depth	12 per sampling event	XYZ University YSI sonde SOP	Record temperatures in the Twisting River

Attach all SOPs as an appendix to this document.

Citizen Science QAPP Template #10B

Equipment List and Instrument Calibration

Equipment List

Generate a list of all field equipment that will be used for the project.

<i>Waders</i>
<i>Coolers with ice</i>
<i>Waterproof datasheets</i>
<i>Labels</i>
<i>1-L HDPE bottles</i>
<i>YSI sonde (include model and serial number)</i>
<i>Pens</i>
<i>Wading rod</i>
<i>Life Vest</i>

Instrument Calibration and Maintenance

In the table below, fill in any calibration or maintenance requirements for the equipment that will be used during the project. State how the calibration information will be documented.

Instrument/Equipment	Calibration Frequency	Maintenance Requirements
<i>YSI sonde</i>	<i>Calibrate before each use per manufacturer's instructions. Check calibration at the end of each day after use.</i>	<i>As per manufacturer's instructions</i>
<i>Fluorometer</i>	<i>Calibrate before each use with calibration standards with concentrations from 0.05µg/L-200µg/L.</i>	<i>As per manufacturer's instructions</i>

All calibrations for this project will be documented. Calibration records will be kept on calibration data sheets specific to each piece of equipment. Calibration records will include date, time, name of individual doing calibration, and the calibration results themselves. Acceptance criteria for calibration checks will also be included on the data sheets.

Citizen Science QAPP Template #11
Analytical Methods*

Identify all laboratory organization(s) that will provide analytical services for the project. Group by matrix, analytical group/parameter, reporting limit, detection limit, analytical/preparation method SOP, sample volume, containers, preservation requirements, maximum holding time and the laboratory contact information.

***This table only needs to be completed when sample analysis by a laboratory is applicable to the project.**

Matrix	Analytical Group/Parameter	Reporting Limit	Detection Limit	Analytical & Preparation Method/ SOP Reference	Sample Volume	Containers (number, size, type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)	Laboratory used for Analysis
<i>Water</i>	<i>Algae (chlorophyll a)</i>	<i>.2 ug/L</i>	<i>0.05 ug/L</i>	<i>EPA Method 445.0</i>	<i>1.0L</i>	<i>56 1.0 L HPDE sample containers</i>	<i>Store in dark place on ice. Filter as soon as possible. Filters should be stored in -20 °C freezer</i>	<i>3.5 weeks once filtered</i>	<i>XYZ University Ecology Lab 12 College Dr. Edison, NJ</i>

Citizen Science QAPP Template #12
Field Data Sheet

If a field data sheet will be used for the project, attach it below.

Temperature Profile Datasheet				
Date:				
Location:				
Sampler Name(s):				
Weather Conditions:				
	Time of Temperature Reading	Depth	Temperature °C (First Reading)	Temperature °C (Duplicate Reading)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Citizen Science QAPP Template #13

Training and Specialized Experience

Training

In this section, state any required training that an individual involved with the project would need. Also include any refresher trainings that may be conducted.

- In the **Personnel/Group to Be Trained** section, state who will need the specific training and how many people will be trained.
- In the **Description of Training** section, state who will perform the training and what kind of information the trainee will learn.
- In the **Frequency of Training** section, state how many times the training will be conducted during the project.

Personnel/Group to be Trained	Description of Training	Frequency of Training
<i>Undergraduate and high school volunteers</i>	<i>Proper use of YSI meter and water sampling equipment. Instruction on information to be recorded in the field.</i>	<i>Session at the beginning of the sampling season</i>

Specialized Experience

If any individuals have specialized experience that will be utilized by the project please complete the specialized experience table. State who the individual is, what specialized experience they have related to the project and their years of experience.

Person	Specialized Experience	# of Years of Experience
<i>Ms. Brooke Trout</i>	<i>Freshwater fish biologist, use of real-time monitoring equipment such as YSI meters. Experience in the collection of water samples for multiple parameters.</i>	<i>20</i>

Citizen Science QAPP Template #14

Assessments and Oversight

Assessments and project oversight include various reviews to identify shortcomings or deviations from the project. For each type of assessment, describe procedures for handling QAPP and project deviations encountered during the planned project assessments. Fill in all necessary information.

Assessment Type	Frequency of Assessment	What is Being Assessed	Who will Conduct the Assessment	How Issues or Deviations will be Addressed
<i>Data Checks and Assessments</i>	<i>1/month</i>	<i>Field data entries into spreadsheet and database</i>	<i>Mr. Q. AL Insurance</i>	<i>Verify with sampling team</i>
<i>On-Site Field Inspection</i>	<i>2 weeks into sampling season and mid-season</i>	<i>Undergraduate and high school volunteers XYZ University against QAPP/SOP</i>	<i>Ms. Brooke Trout</i>	<i>Re-train if necessary</i>

Citizen Science QAPP Template #15

Data Management

Data Management

Describe the data management processes used throughout the life of the project. Data management includes: recording and transcribing field notes, logging and retrieval of instrument data, transmittal of automated field and laboratory results, data transformation and reduction procedures, compilation of survey results, and data storage, retrieval and security uses throughout the project. Describe the way data handling errors will be controlled (i.e. spot checks for transcription and calculation errors).

Field Datasheets and Field Data:

All data from the field will be recorded on pre-printed datasheets (see template #12). Data will be transcribed from datasheets to an online database. 100% of the data will be checked for accuracy and transcription errors. If there are any discrepancies in data entries, Dr. Q. Al Itsurance will check the field datasheets and discuss them with the field sampling team. Original datasheets will be stored in Ms. Brooke Trout's office for 5 years after the completion of the project. Existing buoy data will be obtained from existing database, reviewed and added to an electronic database. The electronic database is located on a computer in XYZ University Ecology Lab. Files will be backed up daily.

Laboratory Analytical Results:

Lab results will be electronically delivered to Ms. Brooke Trout. Any algae (chlorophyll a) data that did not meet the quality control requirements of the laboratory will be flagged. Once received by Ms. Brooke Trout, the laboratory data will also be entered into the electronic database.

Citizen Science QAPP Template #16

Data Review and Usability Determination

Include in this section the types of checks that will be performed at the end of the project to determine if the data collected is usable for achieving the goals of the project. Examples of data checks are provided in the table below.

Data Checks

Field/Lab	Data Management
<i>Monitoring performed per SOPs or QAPP</i>	<i>Data entry and transcription errors</i>
<i>Field QC samples performed correctly</i>	<i>Calculation/reduction errors</i>
<i>Measurements performed correctly</i>	<i>Proper data and document storage</i>
<i>Calibrations performed correctly</i>	<i>Missing data documented</i>
<i>Data meets acceptance criteria</i>	
<i>Holding times</i>	
<i>Evaluate any deviations from QAPP or SOPs to determine the impact to the data and project objectives</i>	

Describe the process used to determine the usability of your project data. If your data review, based on the table above, does not uncover any issues and all of your QC criteria are satisfied, then your data will be assumed to be usable for the intended project objective. However, this is not always the case and so you will need to lay out a process for determining data usability in the event that all QC criteria are not met.

All data issues identified will be discussed with the QAO to determine data usability on a case by case basis. All decisions to allow data that did not fully comply with QC criteria or QAPP requirements will be explained, and any resultant limitations on data use fully discussed in the final project report.

Citizen Science QAPP Template #17

Reporting

Reports

Specify the frequency of all reports, the names of the originators and to whom they will be issued. Itemize what information and records must be included in the report(s). This might include but is not limited to the following:

- Sample collection records
- QC sample records
- Equipment calibration records
- Assessment reports
- Data reconciliation results and associated recommendations/limitations
- Final report of results

Note: If your project will include posting data to a website for public access, state in your description information about how data limitations will be conveyed.

The Project Manager is responsible for submitting quarterly project reports to the EPA Project Officer. The quarterly reports will provide a status update for the project and will include a summary of the quality assurance data checks conducted and the results of those checks. The final project report will summarize the quality assurance data check results for the entire project along with the data usability determinations made by the Project Quality Assurance Officer. The rationale for the use of any data that does not fully comply with the quality criteria requirements of the approved QAPP will be fully explained in the final report.