

QUALITY ASSURANCE PROJECT PLAN
For

Prepared by

Prepared for

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Project Name:

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A3. Distribution List

Official copies of this QAPP and accompanying documents and any subsequent revisions will be provided to:

U.S. Environmental Protection Agency

Name: Chris Pace
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Other?

Name:
Title:
Project:
Organization:

A4. Project/Task Organization

List key project personnel and their corresponding responsibilities. See Appendix B for project personnel training records.

(You can insert an organizational chart if it is helpful to you)

Name	Project Title
	Local Community Elder(s)
	Technical Advisory Committee
	Quality Assurance (QA) Officer for Habitat and Water Chemistry
	Quality Assurance (QA) Officer for Biological Assessment
	Project Manager
	Project Quality Assurance QA Officer
	Field/Sampling Leader
	Laboratory Manager/Leader

Responsibilities

Local Community Elder(s) Responsibilities

Provide information based on their observations and experiences with the water resources and surrounding natural environment.

Technical Advisory Committee (TAC) Responsibilities

The technical advisory committee will review this plan and associated standard operating procedures as well as the results obtained from the monitoring effort on an annual basis. The committee may at any time ask for additional information on any aspect of the project. If monitoring data raises a particular concern, the advisory committee will be asked to suggest and review any changes to the monitoring plan.

Project Manger Responsibilities

Oversees the water quality monitoring efforts and projects conducted by the _____. Provides and / or ensures adequate training is completed for each of the team members conducting water quality monitoring throughout the project. Has completed training in each of the monitoring elements outlined in the plan.

Project Quality Assurance QA Officer Responsibilities

Oversees quality assurance and quality control measures taken to assure the quality of the collected data.

Quality Assurance (QA) Officer for Habitat and Water Chemistry

Provides technical support and additional quality assurance for habitat and water chemistry.

Quality Assurance (QA) Officer Biological Assessment

Provides technical support and additional quality assurance for Biological Assessment.

Field/Sampling Leader Responsibilities

Field or sampling leader(s) is/are responsible for on schedule completion of assigned fieldwork with strict adherence to SOPs and complete documentation.

Laboratory Manager/Leader Responsibilities

The laboratory manger is responsible for all on schedule completion of assigned laboratory analysis with strict adherence to laboratory SOPs

A5. Problem Identification/Background

(See QAPP Template Guide)

A6. Project/Task Description

General Overview of Project (See QAPP Template Guide)

Objectives

The objectives of the _____ water quality monitoring effort is to:

-
-
-
-

The annual schedule of tasks and the personnel conducting the tasks for this project is listed in Table T-1. The parameters measured, methods used, applicability, laboratories used when applicable, method reference in this project is listed in Appendix C.

All personnel will follow the required Standard Operating Procedures (SOPs) for training (need create training SOP), sample collection, sample analysis, data collection, quality

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assurance and quality control, data management, equipment and kit management, and waste management (see Appendix D for a complete list of documents and SOPs utilized in this project).

The _____ is an on-going project designed to continue as long as funding allows.

A7. Data Quality Objectives and Criteria for Measurement of Data

Data Precision, Accuracy, Measurement Range

Appendix E shows objectives for measurement range, method detection limit, precision, and accuracy when applicable and the sample matrix for each parameter tested for this project. (See QAPP Template Guide for master list)

Precision

Precision is the degree of agreement among repeated measurements of the same characteristic, or parameter, and gives information about the consistency of methods. Replicate sample analyses will be performed when applicable by each volunteer monitor during each monthly testing event, all monitor training sessions and during annual performance evaluation and recertification. Replicate analysis applicability for each tests is described in the methods SOP. Variation of duplicate values for each parameter must not exceed the range of precision specified in Appendix D.

Accuracy

Accuracy is a measure of confidence that describes how close a measurement is to its “true” value. In this project, comparative sampling and the use of standard solutions measure accuracy.

Data Representative ness

Representative ness is the extent to which measurements actually represent the true environmental condition. Representative ness of data collected is considered in project design and sampling site selection. Representative ness will not be routinely monitored throughout the project, but is incorporated when necessary in interpreting the data.

Data Comparability

Comparability is the degree to which data can be compared directly to similar studies. Using standardized sampling, analytical methods and units of reporting with comparable sensitivity helps ensure comparability. The _____ program has selected testing methods that are EPA-approved and/or currently being employed by other water quality monitoring programs throughout the country. As the program expands, site selection will favor locations where previous water quality monitoring has taken place. Efforts will be made to duplicate the effort of past studies where possible.

Data Completeness

Completeness is the comparison between the amounts of usable data collected versus the amount of data called for in the sampling plan. In the _____, completeness is measured as the percentage of total samples collected and analyzed as a whole and for individual parameters and sites as compared to the goals set out by the project design. A complete data set has been initially set at _____ of the target number. All efforts will be made to not miss two consecutive scheduled sampling events for any one site. In this way the project can assure reasonable representativeness of conditions through seasonal and other variations over time. If less than _____ samples are taken from a site in a given year data from that site will be qualified when considering trend analysis in annual reports.

A8. Training Requirements and Certification

The Native American Fish and Wildlife Society, Water Quality & Aquatic Environment Monitoring Project (WQAEMP) will provide training. The WQAEMP training involves three phases, specialized trainings and an annual performance evaluation and recertification (See Training SOP). All trainings and annual performance evaluations and recertifications will be conducted according to the respective SOPs. Personnel receive a certificate upon completion of all trainings. Personnel are re-certified upon successful completion of their annual Performance Evaluation and Recertification session. Performance is evaluated during training and annual performance evaluation and recertification sessions. Trainers make note of each participant's precision and accuracy for all testing methods and comment on overall understanding of monitoring procedures and the watershed concept.

Performance Evaluations and Recertification

Once a trainee has successfully completed Phase I through Phase III and participated in gathering water quality data he/she is required to attend at least one Performance Evaluation and Recertification session per year. This training will be conducted according CEMP SOP: QA002, Standard Operating Procedure *For* Performance Evaluations and Recertification (Demonstration of Capabilities and the Preparation, Analysis and Reporting of Performance Evaluation (PE) Study Samples).

These follow-up workshops are scheduled once per year (see Table T-1) or individually for each monitor if schedule conflicts arise. Personnel complete one set of Performance Evaluation (PE) samples, if applicable, within acceptable limits each year to be certified to train or perform analysis of methods identified in the Quality Assurance Project Plan. The average time for the Performance Evaluation and Recertification workshop is five to eight (5-8) hours

As part of the WQAEMP training program, NAFWS provide personnel with a three ring binder of materials that includes: Part I of *Stream Corridor Restoration Principal, Processes, and Practices* (http://www.usda.gov/stream_restoration/newtofc.htm); information on safety and access; information on equipment care and waste disposal; SOPs for the methods they utilize; a list of responsibilities (see guide for example); information on data management and reporting; a

field procedure guide; Field Identification of Coastal Juvenile Salmonid; Stream Keepers Field Guide; Guide to Pacific Northwest Aquatic Invertebrates; Educational level Guide to Macro invertebrates of Alaska; and information on quality control and quality assurance.

A9. Documentation and Records

All data gathered during this project is recorded on site at the time sampling occurs using a datasheet printed on write in the rain paper. The minimum required data to be recorded for each method is identified in each method's SOP and is created in an individual text box that can be copied and pasted onto the datasheet. Appendix F contains the datasheet for this project (see guide for example datasheet). Personnel are instructed to fill out the datasheet legibly and completely and to the decimal point identified in each method's SOP. Data is entered using a #2 pencil or an indelible marker. If a mistake is made, one line is drawn through the characters in question and the new characters are entered to the immediate right of the lined-out entries. The date and monitors initials are entered immediately after the new characters.

Personnel are also instructed to use the comment section of the data sheet to report any problems or abnormalities with sampling procedures or equipment. All records and documents are kept at the _____ office and are available to EPA and ADEC for inspection at any time.

Monitoring equipment and supplies are inspected upon receipt and again during QC sessions, and an inspection form (see NAFWS SOP: HK001 or each methods SOP) is kept up to date for each kit.

B. MEASUREMENT AND DATA ACQUISITION

B1. Sampling Process Design

Sample Site Selection

In order to meeting the objective described in Section A6, the project's sampling design calls for selecting ___ sampling sites within the _____. To maintain community involvement, it is important to select monitoring sites in which community members have a personal interest. The following criteria will be considered in site selection.

- **Private property access** — if a site requires entering or crossing private property the landowner will be involved in the site selection process and permission will be obtained in writing prior to using the site for sampling.
- **Historical Data** — special consideration is given to sites where water quality data has previously been collected. All efforts will be made to include previous parameters measured.

- **Traditional/local Knowledge**— information will be collected from Elders and local Community members, based on their observations and experiences with the water resources and surrounding natural environment.
- **Representative ness**— will be met by selecting sites that represent the true natural environmental condition.
- **Logistical Access & Safety**— consideration will be given to select sites that are safe and reasonably accessible.

Each site will be given a name and identified by a site number and a location description, as well as by its latitude, longitude and elevation as determined by using either a GIS mapping program, using USGS topographical maps or a GPS. Site selection for future monitoring within _____ will be based on similar factors. See Appendix G for sample station map (see guide for example).

Sampling Parameters

As described in Section A6, testing parameters are selected based on their usefulness in inventorying water quality and projecting the general "health" of the water bodies in question. Due to cost concerns, only the more affordable sampling and analytical parameters have been selected to ensure the viability of long term monitoring. (See QAPP Template guide to select your parameters) A list of sampling and analytical parameters for this project can be found in Appendix C and E of this document.

Sampling Frequency

The impact of rain events on water quality is a factor to be considered in the _____ program. Personnel will strive to maintain a regular monitoring schedule regardless of precipitation and to document past and present weather conditions at the time of sampling. Given the climate of Alaska it is likely that some sites may not be reasonably accessible on the appointed sampling date. Personnel will make efforts to reschedule samplings as weather allows. Sampling frequency for all parameters measure in this project is shown in Tables T-1 and T-2.

Parameter	Months	Days	Time	Interval

Site Safety Plans

Sampling sites are selected, in part, because they are safely accessible. Personnel are instructed to use safe access routes and warned of site-specific hazards. Whenever possible, personnel to conduct samplings as a team. In winter months, personnel are instructed to exercise caution at sampling sites with no direct road or winter trail access and not to sample when weather conditions are extreme. Personnel may, at times, be required to chop and maintain holes in ice covered fresh water sites, but they may not monitor if ice may be too thin to support them safely.

Personnel will use appropriate safety equipment during sampling and analysis. This will include: goggles or eyewear, rubber gloves, and dust masks when necessary. Personnel who must sample their sites by wading in from shore will wear rubber boots and dress appropriately and be prepared for variable weather conditions.

B2. Sampling Method Requirements

Sampling methods for this project will be conducted as outlined in each method's Standard operating procedure. In addition, each method's SOP identifies the parameter it measures, sampling equipment, container, method of preservation, and maximum holding time before prior analysis. A complete list of all the method's SOPs included in this project can be found in Appendix D.

B3. Sample Handling and Custody Procedures

The project personnel will conduct all testing procedures in this project. Split samples or samples identified as needing additional analysis will be analyzed by an ADEC or EPA certified laboratory. Samples that require laboratory testing will be handled using the following chain of custody procedure:

- Samples will be labeled (see Figure F-1) and logged in a monitor datasheet upon collection.
- In the field, samples will be the responsibility of and stay with the project personnel or designated representative as indicated on the chain of custody.
- Once samples have been collected they are returned to the _____ and logged in for temporary storage.
- Samples are stored, preserved and analyzed as outlined by the method's SOP.
- Project personnel are responsible for coordinating sample transport to an ADEC or EPA certified laboratory for analysis.
- Laboratory personnel will record the date and time the sample arrives at the lab.
- All results from the laboratory are reported in the annual report.
- The Sample Custody Form (see Appendix H) or one provide by the laboratory will be used to record all transport and storage information.
- When samples are to be delivered to the Alaska Department of Environmental Conservation (ADEC), an official State of Alaska ADEC sample collection form will be used as the 'chain of custody' document.

Figure F-1: SAMPLE CONTAINER LABEL

Village name
907-xxx-xxxx

Field Information: Type of Sample: _____
Site #: _____ Location: _____ Sample Number ___ of ___
Preservation Method: _____ Gear: _____ Date: ___/___/___
Time: _____ AM PM Name: _____
Phone: _____ Signature: _____

Lab Information:
Date: ___/___/___ Time: _____ AM PM Phone: _____
Analyst: _____ Signature: _____

B4. Analytical Methods Requirements

The analytical method requirements for all methods used in this project are outlined in Appendix C and E of this document and each method's SOP. A complete list of SOPs can be found in Appendix D of this document.

B5. Quality Control Requirements

Many quality assurance and quality control measures are taken to assure the quality of the collected data. These include:

- Personnel are required to complete Phase I through III of training to be eligible to collect data for _____.
- Personnel attend annual re-certification to review monitoring procedures, ask questions and fine-tune skills.

- Personnel will analyze performance evaluation standards during annual re-certification to check their precision and accuracy.
- The QA Officers perform an annual Technical System Review.
- Personnel will perform analysis on replicate samples each site visit when applicable.
- Personnel will collect split samples at 10 % of randomly selected active sites for analysis at a state-certified laboratory.
- Broken equipment and expired or defective chemical reagents are replaced immediately upon discovery.
- Raw data is entered into a Microsoft Access Database where mathematical calculations, when applicable are performed by the database.
- Data that do not meet project accuracy and precision objectives are entered in the Microsoft Access Database and flagged accordingly. All field and data entry comments are included with the dataset. Data that does not meet data quality objectives will not be used. Data that falls just outside of the objectives may be used, but will be flagged accordingly.
- Personnel will review results to see if they are higher than expected for a particular site. If any results are found higher than expected, personnel will arrange to re-sample that site. If necessary, the samples will be split with an outside ADEC or EPA approved lab.
- The _____ program receives comments and technical advice from a Technical Advisory Committee (Appendix A).

B6. Instrument/Equipment Testing, Inspection, and Maintenance Requirements

The Kit Management SOP (NAFWS SOP: HK001) and each method' s SOP describe the proper handling and maintenance of equipment. Proper equipment handling and maintenance is also emphasized during all training and QC sessions.

All equipment, meters, and kits are checked upon receipt by the project personnel to ensure that operations are within technical specifications before use. Each reagent bottle is dated with the expiration date prior to being issued. A Water Quality Test Kit Inspection Form (NAFWS SOP: HK001), which includes reagent expiration dates, is completed for each kit and kept on file at the _____ office. This form is updated each time a kit receives new or replacement equipment or reagents.

Before each sampling personnel inspect all equipment and reagents. All testing equipment is to be clean and in good working order before it is used for monitoring. If any equipment or chemical reagent is found to be defective in any way, they will be immediately replaced. Equipment is also evaluated at annual QC sessions. Any faulty equipment or reagent is replaced and a new kit inspection form is created

Project personnel maintain an adequate supply of replacement equipment and reagents at the _____ office. The quantity of reagent needed for most tests is anticipated to assure that

replacements before their supplies become exhausted. Reagent stocks are rotated out upon expiration.

B7. Instrument Calibration and Frequency

All instrument calibration procedures are described in each method's SOP. A complete list of method SOPs can be found in Appendix D.

B8. Inspection and Acceptance Requirements for Supplies

Monitoring equipment and supplies are ordered from various manufacturers (see each method's SOP for manufactures name and contact information) and are inspected upon arrival by project personnel. A Water Quality Test Kit Inspection Form, (NAFWS SOP: HK001) which includes reagent expiration dates is completed for each kit and kept on file at the _____ office. Broken bottles, incomplete kits and reagents or instruments that do not meet standards are shipped back to the manufacturer for replacement.

B9. Data Acquisition Requirements

Required longitude and latitude information for monitoring sites is derived by using USGS topographic maps at 1:63,360 and confirmed using GPS coordinates taken at the site by the Biologist or environmental technician. Sites are plotted and spatially checked using a Geographic Information System (GIS) computer-mapping program (Arc view). This information is used to identify monitoring sites and assign site numbers for entry into the monitoring data system.

Historical water quality data on the sites will be collected and summarized. This data will be used in the site selection process. Additional water quality, fish and wildlife habitat, physical river characteristics and other data pertaining to the watershed will be gathered and utilized in writing the annual report. Historical data will be analyzed to assess direct comparability and may be qualified or excluded from trend analyses in annual reports.

Water quality data will be evaluated by comparison to state and federal water quality standards as applicable.

B10. Data Management

Personnel collect and report data on the datasheet(s) (Appendix F) provided for this project. All observational data, water quality data and field measurements are recorded at the time of sampling and analysis. All personnel sign the datasheets. Personnel will retain data sheets in an organized file.

Datasheets are reviewed by project personnel for decimal point errors, precision, completeness, anomalous data, and general problems. Project personnel is responsible for seeing that data are accurately entered into the Microsoft Access 2000 database. A more detailed description, functions and Standard Operating Procedures can be found in CEMP SOP: QA007. This database has been programmed to be compatible with EPA's STORET database. Data will be

exported through the Internet to the EPA STORET database to the extent allowed by the governing body. Once in the STORET database the data will be available to the extent allowed by the governing body spatially through the Internet at the Alaska's Cooperatively Implemented Information Management System (CIIMMS) website.

Data are reviewed regularly by the project personnel, and will be presented each _____ in an annual report (see Section C2).

C. Assessment and Oversight

C1. Assessment and Response Actions

Personnel

Personnel are required to attend the NAFWS training program (see Section A8) and complete minimum training requirements before monitoring. Each personnel's training history, including comments on performance during training sessions, is recorded on a Training Record (NAFWS SOP: QA001) and kept on file at the _____ office.

The activities included in QC sessions constitute performance and system audits. These follow-up workshops are scheduled once per year (see Table T-1) or individually for each projects if schedule conflicts arise. Personnel are required to attend at least one QC session annually. Results of QC exercises conducted at these sessions provide a measure of how well personnel perform. Data collected at QC sessions is used to assess the accuracy and precision of the data collected in this program. If accuracy and precision goals are not being met, QC sessions will be scheduled more frequently.

Data

As described in Section B10, project personnel reviews datasheets before data are entered into the Microsoft Access 2000 Database. The database program is designed to detect anomalous values and data review is performed regularly by project personnel to detect deficiencies. If problems are discovered with data quality or management, it is the responsibility of the project personnel to address them in a timely manner.

Project

The Chemical and Habitat and Biological QA Officers schedule an annual Technical System Review with the project personnel. This is an internal project level evaluation of compliance with primarily the technical aspects of a QAPP, such as facilities and equipment, personnel, training, analytical and field methods, record keeping, data validation, and reporting. If problems are discovered it is the responsibility of the Chemical and Habitat and Biological QA Officers and the project personnel to address them in a timely manner.

Procedures for inspection, acceptance, calibration and maintenance of equipment and supplies are described in detail in Sections B6, B7 and B8. If problems with data quality are traceable to equipment failure, inspection, calibration and maintenance will be scheduled more frequently.

The Technical Advisory Committee will review this QAPP and the overall project design annually and may suggest procedural refinements or additional testing procedures. This may include new parameters to be measured or changes to procedures currently in use. Any such changes will be subject to EPA and ADEC approval. The project is open to EPA or ADEC system audits at their discretion.

C2. Reports

Annual reports will be produced in _____ of each year and will describe activities during the previous calendar year. These reports will consist of data results, interpretation of data, information on project status, highlights, results of QC audits and internal assessments.

The project personnel are responsible for report production and distribution. Annual reports will be forwarded to ADEC, the regional office of EPA and all other parties listed in Section A3 of this document as well as the Technical Advisory Committee. Summaries of all reports highlighting the assessment results, project status and achievements will be distributed to the _____ tribal council.

D. Data Validation and Usability

D1. Data Review, Validation, and Verification Requirements

All data collected by project personnel is subject to review by the Chemical and Habitat QA Officer; Biological QA Officer; Project QA Officer; Project Manger; Field/Sampling Leader; and the Laboratory Manger/Leader to determine if the data meet QAPP objectives. Decisions to reject or qualify data are made by the Project QA Officer.

D2. Validation and Verification Methods

Data sheets must be filled out completely and signed by all monitors present at the time of sampling and analysis. The Project QA Officer checks each datasheet for precision, missing or illegible information, errors in calculation and values outside of the expected range. The Project QA Officer is responsible for ensuring that maintenance and calibration records show all monitoring equipment in use to be in compliance with the requirements of this QAPP (see Sections B6, B7 and B8). The Project QA Officer ensures that all project personnel listed on the datasheet have completed required training for the parameters tested and have attended at least one QC session within the past year (see section A8). When review is complete and any questions have been resolved, each datasheet is signed and dated by the Project QA Officer. If data quality questions cannot be adequately resolved, data will not be entered into the data system and the Project QA Officer will arrange for corrective measures (i.e. re-training,

equipment re-calibration, etc.). Any changes made to data are initialed and dated, and any action taken as a result of the data review is specifically recorded on the datasheet below the reviewers' signatures.

Data is then entered into the Microsoft Access Database, which is designed to flag any values that fall outside of the expected range for each parameter. On a quarterly basis the Project QA officer prints out the data and proof reads it against original data sheets. Errors in data entry are corrected and inconsistencies are flagged for further review. Data will be presented annually using graph and report formats to document baseline water quality, identify trends and detect deficiencies in data collection or program design.

Annual reports will include discussion of any data quality problems and will be distributed to all data users (see Section C!). Members of the Technical Advisory Committee will be asked to review these reports and offer suggestions for improving the _____ Project.

D3. Reconciliation with Data Quality Objectives

Calculations and determinations for precision and completeness are made by the Project QA Officer during the initial data sheet review process (see Sections B10, D1 and D2) and at annual QC sessions. Calculations of data accuracy are made during random site visits and at annual QC sessions; as described in Sections A8, B5 & C1. Results of precision, accuracy and completeness will be included in annual reports.

Data that do not meet project accuracy and precision objectives are entered in the Microsoft Access Database and flagged accordingly. All field and data entry comments are included with the dataset. Data that does not meet data quality objectives will not be provided to data users. Data that falls just outside of the objectives may be provided to data users, but will be flagged accordingly.

The cause of failure to meet data quality objectives will be evaluated. If the cause is found to be equipment failure, calibration and maintenance procedures will be reassessed and improved. If the problem is found to be personnel error, personnel will work Project QA Officer to resolve the problem. If accuracy and precision goals are frequently not being met, QC sessions will be scheduled more often.

If failure to meet program specifications is found to be unrelated to equipment, methods, or personnel error, the QAPP may be revised. Revisions to this QAPP will be submitted to the designated state ADEC and federal EPA, Region 10 quality assurance officers for approval.

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