NPDES Compliance Inspection Manual

Appendix AN

EPA Publication Number: 305-K-17-001
Interim Revised Version, January 2017

Appendix AN –
Sample Quality Assurance Project Plan (QAPP)

SAMPLE QUALITY ASSURANCE PROJECT PLAN (QAPP)

CAFO inspectors may be required to collect wastewater, manure, or soil samples during an inspection. Sample collection may be planned in advance or opportunistic. Opportunistic sampling might occur when a facility is observed to be discharging during the inspection. Regardless, the inspector should be prepared to collect samples. Prior to the inspection, a Quality Assurance Project Plan (QAPP) should be prepared and the inspector should prepare and be familiar with sampling equipment. Below are two QAPP templates for CAFO sampling and analysis.

Sampling, analysis, preservation technique, sample holding time, and sample container requirements are provided in 40 CFR Part 136 as authorized by Section 304(h) of the CWA. Chapter 5 of the *NPDES Compliance Inspection Manual* is a helpful reference for wastewater sampling/analysis.

QUALITY ASSURANCE PROJECT PLAN (QAPP) TEMPLATE

U.S. Environmental Protection Agency
Region

This QAPP template was prepared based on *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5), EPA/240/B-01/003, March 2001 (https://www.epa.gov/quality/epa-qar-5-epa-requirements-quality-assurance-project-plans). It contains an outline of the QAPP elements based on the EPA QA/R-5, with an abridged description of the discussion that should be included within each section (included in redline text). This template was created as a tool to assist in development of QAPPs. Users of this QAPP template may consult the EPA QA/R-5 or the more general *Guidance for Quality Assurance Project Plans* (EPA QA/G-5), EPA/240/R-02/009, December 2002 (https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5) as appropriate to obtain additional details and guidance for development of a QAPP.

DRAFT

QUALITY ASSURANCE PROJECT PLAN

<Title of Project (or portion of project addressed by this QAPP)>

Contract/WA/Grant No./Project Identifier

<Enter specific identifier>

Prepared by:

<Enter the contact information including name, affiliation, address, and phone number>

Prepared for:

U.S. Environmental Protection Agency
Region

<Enter date>

SECTION A – PROJECT MANAGEMENT

A.1 Title of Plan and Approval
Quality Assurance Project Plan
<Enter Title of Project>

Prepared by:
<Enter Affiliation>
_____ Date: _____
<Enter name, Organization>, Project Manager / Principal Investigator

Approvals:
_____ Date: _____
<Enter name, Organization>, Quality Assurance Officer
_____ Date: _____
< Enter name, Organization>, Section Chief (Mail Code)
_____ Date: _____
< Enter name, Organization >, Associate Director (Mail Code)
_____ Date: _____
<Enter additional contacts, as needed>

A.2 Table of Contents

<TOC must be regenerated upon completion of QAPP content. To do so, Click in TOC below, select Update Field, then select Update Page Numbers Only>

List of Tables

List of Figures

Appendices

A.3 Distribution List

List the individuals and their organizations that need copies of the approved QA Project Plan and any subsequent revisions, including all persons responsible for implementation (e.g., project managers), the QA managers, and representatives of all groups involved.

<insert text>

Name, Agency/Company, Title, other contact information as needed

A.4 Project/Task Organization

Identify the individuals or organizations participating in the project and discuss their specific roles and responsibilities. Include the principal data users, the decision makers, the project QA manager, and all persons responsible for implementation. Project QA manager position must indicate independence from unit colleting/using data.

Table A.1 Roles & Responsibilities

Individual(s) Assigned:	Responsible for:	Authorized to:
Name	Responsibility	Action
Name	Responsibility	Action

Provide a concise organization chart showing the relationships and the lines of communication among all project participants. The organization chart must also identify any subcontractor relationships relevant to environmental data operations, including laboratories providing analytical services.

Figure A.1 Organization Chart

A.5 Problem Definition/Background

State the specific problem to be solved, decision to be made, or outcome to be achieved. Include sufficient background information to provide a historical, scientific, and regulatory perspective for this particular project.

- Clearly state problem to be resolved, decision to be made, or hypothesis to be tested
- Historical & background information
- Cite applicable technical, regulatory, or program-specific quality standards, criteria, or objectives

<*insert text*>

A.6 Project/Task Description

Provide a summary of all work to be performed, products to be produced, and the schedule for implementation. Provide maps or tables that show or state the geographic locations of field tasks. This discussion need not be lengthy or overly detailed, but should give an overall picture of how the project will resolve the problem or question described in A.5.

- List measurements to be made/data to obtain
- Note special personnel or equipment requirements
- Provide work schedule

<*insert text*>

A.7 Quality Objectives & Criteria

Discuss the quality objectives for the project and the performance criteria to achieve those objectives. EPA requires the use of a systematic planning process to define these quality objectives and performance criteria.

- State project objectives and limits, both qualitatively & quantitatively
- State & characterize measurement quality objectives as to applicable action levels or criteria

<*insert text*>

A.8 Special Training/Certification

Identify and describe any specialized training or certifications needed by personnel in order to successfully complete the project or task. Discuss how such training will be provided and how the necessary skills will be assured and documented.

<*insert text*>

A.9 Documents and Records

Describe the process and responsibilities for ensuring the appropriate project personnel have the most current approved version of the QA Project Plan, including version control, updates, distribution, and disposition.

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

Identify any other records and documents applicable to the project that will be produced, such as audit reports, interim progress reports, and final reports. Specify the level of detail of the field sampling, laboratory analysis, literature or data base data collection, or modeling documents or records needed to provide a complete description of any difficulties encountered.

Specify or reference all applicable requirements for the final disposition of records and documents, including location and length of retention period.

<*insert text*>

SECTION B – DATA GENERATION & ACQUISITION
B.1 Sampling Process Design (Experimental Design)

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

- Types and number of samples required
- Sampling network design & rationale for design
- Sampling locations & frequency of sampling
- Sample matrices
- Classification of each measurement parameter as either critical or needed for information only
- Validation study information, for non-standard situations

<*insert text*>

B.2 Sampling Methods

Describe the sampling procedures:

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

<*insert text*>

B.3 Sampling Handling & Custody

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

<*insert text*>

B.4 Analytical Methods

Identify analytical methods to be followed (with all options) & required equipment.

- Specify any specific method performance criteria
- State requested lab turnaround time
- Provide validation information for non-standard methods
- Identify procedures to follow when failures occur
- Identify individuals responsible for corrective action and appropriate documentation

<*insert text*>

B.5 Quality Control

Identify QC activities needed for each sampling, analysis, or measurement technique. For each required QC activity, list the associated method or procedure, acceptance criteria, and corrective action. State or reference the required control limits for each QC activity and corrective action required when control limits are exceeded and how the effectiveness of the corrective action shall be determined and documented.

Describe or reference the procedures to be used to calculate applicable statistics (e.g., precision, bias, accuracy).

<*insert text*>

B.6 Instrument/Equipment Testing, Inspection, and Maintenance

Describe how inspections and acceptance testing of instruments, equipment, and their components affecting quality will be performed and documented to assure their intended use as specified.

Describe how deficiencies are to be resolved, when re-inspection will be performed, and how the effectiveness of the corrective action shall be determined and documented.

Identify the equipment and/or systems requiring periodic maintenance and/or calibration. Describe how periodic preventative maintenance will be performed, including frequency, to ensure availability and satisfactory performance of the systems. Note availability & location of spare parts.

<*insert text*>

B.7 Instrument/Equipment Calibration and Frequency

Identify all tools, gauges, instruments, and other sampling, measuring, and test equipment used for data generation or collection activities affecting quality that must be controlled and calibrated.

Describe or reference how calibration will be conducted using certified equipment and/or standards with known valid relationships to nationally recognized performance standards. If no such nationally recognized standards exist, document the basis for the calibration.

Indicate how records of calibration will be maintained and be traceable to the equipment.

<*insert text*>

B.8 Inspection/Acceptance of Supplies & Consumables

State acceptance criteria for supplies and consumables and describe how they will be inspected for use in the project. Note responsible individuals.

<*insert text*>

B.9 Data Acquisition Requirements for Non-Direct Measurements

Identify type of data needed from non-measurement sources (e.g., computer data bases and literature files), along with acceptance criteria for their use. Define intended use and describe any limitations of such data.

<*insert text*>

B.10 Data Management

Describe data management process from generation to final use or storage. Describe standard record keeping & data storage and retrieval requirements. Provide examples of any forms or checklists to be used.

Describe data handling equipment & procedures used to process, compile and analyze data (e.g., required computer hardware & software). Describe the process for assuring that applicable information resource management requirements, including EPA specific requirements, are satisfied.

<*insert text*>

SECTION C – ASSESSMENT AND OVERSIGHT

C.1 Assessments and Response Actions

Describe each assessment to be used in the project including the frequency and type (e.g., surveillance, management systems reviews, readiness reviews, technical systems audits, performance evaluations, data quality).

- What is expected information from assessment?
- What are assessment success criteria?
- What is assessment schedule?

Describe response actions to each assessment.

- How will corrective actions be addressed?
- Who is responsible for corrective actions?

How will corrective actions be verified and documented?

<*insert text*>

C.2 Reports to Management

Identify frequency and distribution of reports to inform management of project status:

- Results of performance evaluations & audits
- Results of periodic data quality assessments
- Any significant QA problems

Identify the preparer and recipients of reports, and describe any actions the recipient should take as a result of the report.

<*insert text*>

SECTION D – DATA VALIDATION AND USABILITY

D.1 Data Review, Verification, and Validation

State criteria for accepting, rejecting, or qualifying data; include project-specific calculations or algorithms.

<*insert text*>

D.2 Verification and Validation Methods

Describe the process for data validation and verification. Identify issue resolution procedure and responsible individuals. Identify the method for conveying results to data users. Provide examples of any forms or checklists to be used.

<*insert text*>

D.3 Reconciliation with User Requirements

Describe how the project results will be reconciled with the requirements defined by the data user or decision maker. Outline the proposed methods to analyze the data and determine departures from assumptions established in the planning phase of data collection. Describe how reconciliation with user requirements will be documented, issues will be resolved, and how limitations on the use of the data will be reported to decision makers.

<*insert text*>

GENERIC QUALITY ASSURANCE PROJECT PLAN (QAPP)

FOR

CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFO) INSPECTION SAMPLING

December 2012
Rev 5.0

QAPP APPROVAL:

_____ **Date:**_____
Unit Manager, USEPA

_____ **Date:**_____
Director, USEPA

_____ **Date:**_____
QA Manager, USEPA

TABLE OF CONTENTS

1.0 Project Management Elements

1.1 Distribution List

Copies of the completed/signed project plan should be distributed to:

Name	Title (examples)	Mail Stop	Phone Number	e-Mail Address
	EPA Inspector			
	Regional Sample Control Center (RSCC)			
	QA			
	Supervisor			
	Lab Manager			

Summary of analytical results shall be sent to the EPA Inspector. Electronic copies of data are not required unless specifically requested.

1.2 Project/ Task Organization

This section identifies the personnel involved in CAFO inspection sampling and analytical activities and defines their respective responsibilities in the process.

1. Inspector

The inspector conducts the inspection under the authority provided by the Clean Water Act. The inspector's responsibility is to prepare a final inspection report to be submitted to the immediate program manager based on the results of the inspection conducted and the sample analytical data obtained from the laboratory. In conjunction, the inspector shall also be responsible for:

- Site inspection and recording observations in a note book;
- Documenting the location of site using GPS;
- Conducting dye tracer tests if appropriate;
- Conducting direct readings such as pH, temperature, dissolved oxygen, etc..., if appropriate;
- Collecting water or effluent samples if appropriate;
- Coordinating with the Regional Sample Control Center (RSCC) for regional sample numbers, if appropriate;
- Coordinating with the mobile EPA or commercial laboratory for sample analyses, if appropriate;
- Maintaining sample documentation, including chain of custody, photographs, and receiving sample analytical results.

All of these tasks shall be performed in accordance with the approved QA Plan for CAFO inspections. Changes in procedure should be documented in an appropriate addendum to the plan or sample alteration form included with the site-specific inspection plan.

2. Regional Sample Control Center (RSCC)

The role of RSCC is to coordinate and schedule sample delivery and analysis with the regional laboratory based on the information provided by the inspector in the CAFO Site-Specific Inspection Plan Form (see Appendix A). For sample tracking, the RSCC also provides the inspector with an assigned block of regional sample numbers and the corresponding project code.

3. Quality Assurance Officer (QAO)

The QAO is part of the <insert text> and is located within <insert text>. The QAO is designated and assigned by the Unit Manager and authorized by the Regional QA Manager (RQAM) as his/her designee. The QAO works with the EPA inspectors and ensures that the sample collection and analyses are covered by an approved QAPP that incorporates adequate QA/QC activities to generate data of known and documented quality. The QAO reviews the preliminary CAFO Site-Specific Inspection Plan (see section 1.4.3 of this QAPP) prior to inspection, provide technical comments, if necessary, and ensure that the RSCC coordinates and schedules the analysis of parameters of concern with the applicable analytical methods and associated method performance measures. The QAO may also need to prepare the Statement of Work (SOW) that will be needed for sub-contracting sample analyses by a commercial laboratory.

4. Quality Assurance Officer (QAO)

Samples for biochemical oxygen demand (BOD) or nutrients (nitrogen, phosphorus, potassium) analyses will be done at <insert text> located in <insert text>. Due to short technical holding times, for CAFO inspections, samples for *E. Coli* and fecal coliform are sent to <insert text>. In some cases, samples may need to be shipped to a commercial or State lab. For the CAFO program, the <insert text> lab(s) is/are responsible for the following tasks: provision of "certified clean" sample containers and preservatives, sample analysis, data generation, data reduction and validation, submission of summary of analytical results and/or data print-outs (if requested) for each sample analysis to the inspector and the corresponding QC summary results for precision, accuracy and bias of the values reported.

1.3 Problem Definition/ Background

1.3.1 Background

The Federal and State National Pollutant Discharge Elimination System (NPDES) program monitors and regulates the discharge of pollutants from point sources to waters of the United States. Concentrated Animal Feeding Operations (CAFOs) are point sources, as defined by the CWA [Section 502(14). CAFO means an "animal feeding operation" (AFO) which meets the criteria in 40 CFR Part 122, appendix B, or which the EPA designates as a significant contributor of pollution pursuant to 40 CFR Part 122.23.

The purpose of this Generic Quality Assurance Project Plan (QAPP) is to provide Inspectors from <insert text> with a basic QAPP that will address the project required Data Quality Objectives (DQO) and provide guidelines on sample collection, sample documentation, analytical methods, and data validation and interpretation of data deliverables. This document was prepared in compliance with the EPA Order 5360.1A2 and the EPA QA/G-5 "*Guidance for Quality Assurance Project Plans, EPA/240/R-02/009*".

1.3.2 Objectives/Scope

Determine compliance of CAFO discharges with the Clean Water Act through the collection of samples of opportunity from the facilities inspected.

1.4 Project/ Task Description and Schedule

1.4.1 Project/Task Description

This Generic QAPP is developed for the purpose of supporting announced and unannounced CAFO inspection and sampling activities that may be performed as part of the NPDES program. Samples for coliform determination will be analyzed by <insert text>. The lab must be accredited and /or certified by a recognized accrediting authority such as <insert text>. Samples for other parameters, if needed, will be analyzed by <insert text>. All of the analyses will be performed in accordance with the analytical methodologies and QC requirements specified in Table 3 - Data Quality Objectives Summary of this Generic QAPP. See the sample collection section and specific analyses that will be performed.

1.4.2 Schedule of Tasks

Table 1 – Activity Schedule and Tentative Start and Completion Dates*

Activity	Estimated Start Date	Estimated Completion Date	Comments
Obtain block of numbers from RSCC			
Mobilize to Sites	See CSSIP		
Sample Collection			
Analysis of Samples (on-site or fixed laboratory)			
Data Review & Verification, Reporting to Inspector			
Target Completion Date			

* Note: Most of the inspections are unannounced where the facilities inspected, availability of samples and the parameters of concern are unknown at the time of inspection. The inspectors are allowed to submit the CAFO Site-Specific Inspection QA Plan (last 2 pages of this generic QAPP) within 30 days from the last day of sample collection.

1.4.3 CAFO Site-Specific Inspection Plan (CSSIP)

This CAFO generic QAPP shall cover the QA requirements of all CAFO inspections performed by EPA inspectors within Region <insert text>. After <insert text> approval of this generic QAPP, the inspectors are only required to fill-out the summary of this generic QAPP called the "CAFO Site-Specific Inspection Plan (CSSIP)". The CSSIP is a two-page summary of the sampling, analysis and QA requirements that may be performed during facility inspections. The CSSIP lists the name of facilities inspected, the samples of opportunity that were collected and the chemical and microbiological parameters that were determined by the lab. Table 3 - Data Quality Objectives Summary of this Generic QAPP is also a part of the CSSIP. The inspector(s) check mark the parameters listed in Table 2 applicable to the samples of opportunity collected from the facilities inspected. The draft CSSIP is submitted to the QAO assigned to the project prior to the inspection date for a quick review. A final CSSIP is submitted to the RSCC within 30 days from the last day of sample collection for filing. The first page of CSSIP contains the project, the account code, EPA sample numbers assigned for inspection, list of facilities inspected, address, contact person and phone number, the names of inspectors conducting the inspection and their respective environmental organization affiliations, the total number of samples collected per facility, and the parameters that were determined. The second page of CSSIP is the Table 3 – the Summary of Data Quality Objectives listing the number of samples collected, parameters for analysis, analytical procedures and methodologies and the precision, accuracy and other DQO requirements of the inspection. If applicable, Attachment 1and 2 (Sample Alteration and Corrective Action Forms), may also be included with the CSSIP. The CSSIP is submitted to the QA Office for review and approval before a scheduled sampling event or immediately after collecting samples of opportunity. A blank 2 page CSSIP is attached In Appendix A of this Generic QAPP.

1.5 Data Quality Objectives and Criteria for Measurement Data

Data Quality Objectives (DQOs) are the quantitative and qualitative terms inspectors and project managers use to describe how good the data needs to be in order to meet the project's objectives. DQOs for measurement data (referred to here as data quality indicators) are precision, accuracy, representativeness, completeness, comparability, and measurement range. The overall QA objective for analytical data is to ensure that data of known and acceptable quality are provided. To achieve this goal, data must be reviewed for 1) representativeness, 2) comparability, 3) precision, 4) accuracy (or bias), 5) completeness and 6) sensitivity. Precision, accuracy, sensitivity, completeness, sample representativeness and data comparability are necessary attributes to ensure that analytical data are reliable, scientifically sound, and legally defensible. Each analytical result or set of results generated should be fully defensible in any legal action, whether administrative, civil, or criminal.

Precision: The precision of each test depends on the number of tubes used for the analysis. The method that is used for the CAFO analysis (SM 9221) utilizes a confidence limit of 95 %. Samples in duplicate will be analyzed on a 10 % frequency (1 per 10 samples collected). The precision is evaluated using the Relative Percent Difference (RPD) values between the duplicate sample results.

Accuracy: This is not true relative to microbiology. The method has a detection limit of 1 MPN/100 ml. For other parameters analyzed in the fixed laboratory, accuracy will be evaluated by the use percent recovery (%R) of the target analyte in spiked or QC fortified samples.

$$\% \text{ Recovery} = \frac{SQ - NQ}{S} \times 100$$

SQ = quantity of spike found in sample
NQ = quantity found in native (unspiked) sample
S = quantity of spike or surrogate added to native sample

Representativeness is the degree to which data from the project accurately represent a particular characteristic of the environmental matrix which is being tested. Representativeness of samples is ensured by adherence to standard field sampling protocols and standard laboratory protocols. The design of the sampling scheme and number of samples should provide a representativeness of each matrix or product of the chemical processes being sampled.

Comparability is the measurement of the confidence in comparing the results of one sampling event with the results of another achieved by using the same matrix, sample location, sampling techniques and analytical methodologies.

Completeness: Completeness is the percentage of valid results obtained compared to the total number of samples taken for a parameter. Since sampling from inspections are usually grab and limited in number of samples, the number of valid results obtained from the analyses are expected to be equal or better than 85%. %Completeness may be calculated using the following formula:

$$\% \text{ Completeness} = \frac{\text{\# of valid results}}{\text{\# of samples taken}} \times 100$$

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of a parameter of interest. This is most often expressed in terms of method detection limit, instrument detection limit or laboratory quantitation (reporting) limit.

The QA objectives outlined, above, will be evaluated in conjunction with the data validation process.

1.6 Special Training Requirements/Certification

Inspectors are required to complete the 24-hour Basic Health and Safety training. The inspectors will obtain a basic health and safety training certification from the 24-hour training which should be maintained current by attending an 8-hour safety training refresher course every year. The inspectors must also have a signed and current “credential” certifying the

bearer as “Authorized to Conduct Investigations and Inspections Pursuant to All Federal Laws Administered by the United States Environmental Protection Agency”. All of the training courses listed above are provided by EPA Region <insert text>. Furthermore, sampling and sample documentation skills are also assured by the “mentoring” provided by the senior inspectors in the field.

The laboratories performing the sample analysis for this program are SDWA certified and/or accredited. Scientists (Microbiologists/Chemists) performing the analytical work for this project have extensive knowledge, skill and demonstrated experience in the execution of the analytical methods being requested.

1.7 Documentation and Records

Complete documentation for inspections may include but is not limited to the following forms which should be completed and collated by the EPA Inspector:

- Investigation Report
- Records Inspection Checklist
- Chain of Custody Logs
- Record of Sampling
- Laboratory Analysis Reports
- Photographs, Sketches, Paper Copies, Chemical Labels, MSDS, Application Records or other documentation.

Investigators will maintain field notes in a bound notebook and all documents, records, and data collected will be kept in a case file and submitted to the program office with the final inspection report.

The following documents will be archived at *<insert text>* or the designated laboratory performing the analysis: (1) signed hard copies of sampling and chain-of-custody records (2) electronic and hard copy of analytical data including extraction and sample preparation bench sheets, raw data and reduced analytical data.

The laboratory will store all sample receipt, sample login, extraction/preparation, and laboratory instrument print-outs and other analytical documentation as per their established SOP.

2.0 Measurement/ Data Acquisition

2.1 Sampling Process Design (Experimental Design)

Prior to compliance inspections, the EPA Inspector will review and evaluate facility files, if available, which may include facility background information, historical ownership, facility maps depicting general geographic location, property lines, surrounding land uses, a summary of all possible source areas of contamination, a summary of past permits requested and/or received,

any enforcement actions and their subsequent responses and a list of documents and studies prepared for the facility, records and inspection reports from previous compliance site visits.

Based on the data and/or a visual survey of the facility, samples of opportunity on an "as needed" basis will be collected for analysis to characterize the pollutants and determine if they are in compliance with the Clean Water Act.

2.2 Inspection and Sample Collection Procedures

2.2.1 Health and Safety

Inspectors visiting CAFO facilities, need to be aware of and sensitive to bio-security issues and/or procedures related to the potential disease transmission from one facility to another. Facility owners/operators may deny access to a facility because of the existence of a disease or illness at the facility. In addition, there is a real potential that the CAFO inspector may be the vector that transmits a disease from one facility to another if proper precautions are not taken. Minimal recommendations are that visitors to facilities wear freshly laundered clothing and clean footwear, or disposable and easy to clean rubberized rain gear, booties and gloves. EPA inspectors should follow the Agency's Biosecurity guidelines (http://www.epa.gov/agriculture/biosecurity.pdf).

2.2.2 Location

CAFO inspectors should use the Global Positioning System (GPS) for documenting locations of facilities inspected. Upon return, the locational data from each GPS instrument should be differentially corrected by the person issuing the equipment.

2.2.3 Sample Collection

Sample collection methods can vary between standard operating procedures used by samplers and different conditions encountered in the field. The following is general guidance for samplers. Samplers should document in their notes or field checklist the actual method used during sample collection.

If samples are collected manually, rubber gloves should be worn to protect the sampler. Also, the use of safety glasses should be considered. Additional safety information should be covered in a site safety plan or pre-inspection safety briefing.

When a discharge point is identified, the sampler should consider collecting, when possible, samples at a minimum of one collection point. This collection point should be obtained at the discharge point. More sample collection points may be collected by the inspectors if necessary.

When dip samples are taken for coliform analysis, the sampler should carefully remove the cap, ensuring that neither the inside of sample bottle or cap are touched. If possible, hold the cap, do not set it down.

To the extent possible, take the sample by holding the bottle near its base in the hand and plunging it, neck downward, below the surface. Use an extension pole if needed to keep from walking into the effluent stream and stirring up the sampling area. Turn bottle until neck points slightly upward and mouth is directed towards the current. If there is no current, create a

current by pushing bottle forward horizontally in a direction away from the hand. If available, there are special apparatuses that will permit mechanical removal of the cap below the water surface. This can be used to avoid potential contamination of the sample by the sampler.

After collection, carefully recap the sample bottle securely. There should be a 1 inch head space in the neck of the bottle, to allow adequate mixing by the analyst. If, however, the sample container is overfilled, DO NOT pour-out any excess sample. Place the cap back securely on the sample bottle and return to analyst overfilled and a notation will be made in the analyst's report. The sample bottle should be labeled with the date and time of collection, collector's name and sample number, and type of analysis requested. This information should be written on the label using an indelible, waterproof ink. Sample bottle should be placed in plastic bags and stored on ice immediately following collection until they are accepted by the analyst. Proper chain of custody procedures should be followed at all times.

Transfer blank: Each inspector will be provided a single transfer blank for each facility to be inspected and an extra sterile bottle. Half way through the sample collection for each facility, transfer the contents of the full bottle into a sterile bottle. Be careful not to contaminate the inside of the bottle or cap during transfer. Label this bottle with date and time of transfer, name of collector, sample number and label the bottle as a TRANSFER BLANK.

If analysis of additional parameters is needed in a specific case, additional sample containers may be needed. Required sample volume, container type, preservation techniques, and holding times for parameters likely to be sampled are included in (Table 3). Inspectors should use their discretion on which parameters should be used to document violations at a particular facility and are encouraged to discuss this with representatives of the CAFO program.

2.2.4 Sample Collection Equipment

Equipment needs will vary from inspection to inspection. The list in Table 2 provides suggestions to be considered prior to leaving for the field.

Table 2 -Suggested Sample Equipment for CAFO Field Inspections

General	Safety	Emergency
Inspector Credentials Field Notebook Camera Waterproof Pens & Markers Clipboard flashlight Extension Sampling Pole Sample containers Ice Chest Disinfectant Solution (bleach) and Water for boots[1] Extra Set of Coveralls GPS Unit	Water Proof (Rubber) Boots Rain gear Rubber gloves Soap, towels, and water for washing hands Eye protection Hard hat	First Aid Kit Phone numbers Cell Phone

[1] Inspectors/samplers are required to disinfect/decontaminate rubber boots before exiting CAFO facilities to help avoid transmitting animal pathogens from one facility to another. For more information, see Section 2.2.1 Health and Safety and 2.2.7 Decontamination Procedure of this QAPP.

2.2.5 Shipping Requirements

All of the samples are hand-delivered to the laboratory analyzing the samples. Samples for coliform analysis will be hand-delivered to the mobile microbiology laboratory within 6 hours of sample collection. Sufficient ice must be provided to ensure that samples remain cold until received and processed by the laboratory.

2.2.6 Decontamination Procedures

Samples will be collected using clean sampling devices and sample collection gears. Sampling devices and sample collection gear like rain gear, rubber boots and gloves will be cleaned and decontaminated using agricultural-approved disinfectants. Inspectors will follow the proper health and safety procedures when collecting and handling samples to minimize or not to incur contamination.

2.3 Analytical Methods Requirements

Not all parameters will be measured for each CAFO facility inspected. In some cases no samples will be taken at all, and in others, samples may be analyzed for coliform only. In other situations, samplers may be requested to collect additional data such as temperature, pH, turbidity, conductivity, etc. Table 3 -Data Quality Objective Summary lists the parameters that can be measured under this plan, the accuracy, precision, preservative, and holding time requirements.

2.4 Quality Control Requirements

Quality Control procedures for analyte measurements will be according to the requirements specified in the method that will be used in the analysis.

Laboratory instrumentation will be calibrated in accordance with the analytical procedure. Laboratory instrumentation will be maintained in accordance with the instrument manufacturer's specifications and the laboratory Standard Operating procedures (SOPs).

Other Quality Control Measures

- Media, reagents and water - Media and reagent water required for field analysis will be prepared and transported to the field site. QC tests specified for drinking water analysis will be conducted on these supplies prior to being transported. Media will be stored in tightly capped tubes in such a way to prevent formation of air bubbles and adverse environmental effects.
- Incubator and water bath - Temperature will be maintained within specified temperature ranges. Thermometers used for recording temperatures will be calibrated against NIST certified thermometer on a yearly basis. Temperatures will be read and recorded twice daily.

- Refrigerator (if present) - Temperature will be maintained within specified temperature ranges. Thermometers used for recording temperatures will be calibrated against NIST certified thermometer on a yearly basis. Temperatures will be read and recorded twice daily.
- Positive and negative culture controls: Organisms as specified in SM 9020B (Intra-laboratory QC guidelines) will be used on a daily basis to ensure the quality of the media and laboratory equipment has not changed.
- Negative laboratory control: A media sterile check will be done on a daily basis to ensure that no changes in media sterility have occurred.
- Duplicates: Ten percent (10%) of routine samples will be processed in duplicate, or a minimum of one per day that samples are received, whichever is greater. A duplicate sample is performed from the same sample bottle. Samples for microbiological analyses on-site are not required to be preserved.
- Laboratory Temperature: Must be maintained within a few degrees of 35 ºC to ensure incubator temperature consistency. This will be accomplished with the use of thermostatically controlled electric heaters or thermostatically controlled propane forced air heater.
- Sample Disposal: All "spent" growth media will be autoclaved prior to disposal. All unused water samples will be disposed of in a manner that will not result in contamination of the surrounding environment.

2.5 Instrument/Equipment Testing, Inspection and Maintenance Requirements

The laboratory will follow their standard operating procedures for any preventative maintenance required on laboratory instruments or systems used for this project.

2.6 Instrument Calibration and Frequency

Field maintenance and calibration will be performed where appropriate prior to use of the instruments. Calibration of samplers will be performed in accordance with the methodologies used in sample collection and the Instruments Operational Instructions.

The laboratory will follow the calibration procedures found in the methods listed in Table 3 or in the laboratory's SOPs.

2.7 Inspection/Acceptance Requirements for Supplies and Consumables

Sample bottles used for microbial testing will be appropriately cleaned and sterilized. They will be certified clean polypropylene bottles (250 or 500 mL). All sample jars used for chemical analysis in this project will be new and certified clean provided by the laboratory. Investigators will make note of the information on the certificate of analysis that accompanies sample jars to ensure that they meet the specifications and guidance for contaminant free sample containers.

2.8 Data Acquisition Requirements (non-Direct Measurements)

Not Applicable.

2.9 Data Management

A field log notebook, photos, GPS location data and the Field Sample and Chain of Custody Data Sheets will be used to document the sampling and inspection activities. For each sample location, the following will be recorded in the notebook:

- facility name and address
- sample number
- date
- time of each sample collection
- physical description of each sample collection point
- weather conditions
- color
- sample appearance
- sample identifier, and measurements

The Field Sample and Chain of Custody Data Sheets will have the following information:

- site name
- sample number
- date
- time of each sample collection
- sampler's name or initials
- sample location.

If applicable, a suffix l -FD will be appended to the sample identified as the field duplicate. For fixed laboratory analyses, field duplicates will be assigned a separate unique sample identifier and will be submitted 'blind' to the analytical laboratory. Analytical duplicate results will be reported with a trailing -AD (analytical duplicate) or D.

All inspection reports including those for potential enforcement cases will be completed within 30 days of inspection date. Validated laboratory results and interpretation (if necessary) will be appended. Reports will be maintained as enforcement confidential documents until release is approved by the USEPA Office of Regional Counsel (ORC). Photographs and other supporting data along with the inspection report will be used to determine NPDES compliance.

All data generated during this project will be processed, stored, and distributed according to laboratory's SOPs.

3.0 Assessment/Oversight

3.1 Assessments and Response Actions

The EPA Inspector will be responsible for reviewing field log notebooks for accuracy and completeness within 48 hours of each inspection. Sample results provided to the EPA Inspector by the laboratory will be appended to the inspection reports. The EPA Inspector will compare the sample information in the field log notebooks with the analytical results appended to the inspection report to ensure that no transcriptions errors have occurred.

With the exception of the microbiological analyses, RPDs between field duplicate and analytical duplicate measurements will be calculated by the laboratory. RPD's greater than the project requirements will be noted in the associated inspection reports.

Laboratories routinely perform performance checks using different program specific quarterly blind and double blind check standards. Each method of analysis requires specific QA/QC runs that must be complied with by the laboratory performing the analysis. An internal assessment of the data and results are also routinely conducted by the appropriate supervisors and the Laboratory QA Coordinator. No additional audits will be performed on the laboratory for this project.

Corrective action procedures that might be implemented from QA results or detection of unacceptable data will be developed if required and documented in Attachment 2.

3.2 Reports to Management

Only the data validation reports with the properly qualified data shall be provided by the laboratory to the Program Manager and/or Inspectors. If, for any reason, the schedules or procedures above cannot be followed, the EPA Inspector must complete the Attachment 1-Sample Alteration Form (SAF). The SAF should be reviewed and approved by the QAO. The laboratory should be given a copy of the QAO approved SAF for reference and project file.

4.0 Data Validation and Usability

4.1 Data Review, Validation, and Verification Requirements

The criteria for the validation will follow those specified in this QA plan and the criteria specified in the methods.

4.2 Validation and Verification Methods

All data generated shall be validated in accordance with the QA/QC requirements specified in the methods, and the technical specifications outlined in the QAPP. The summary of all analytical results will be reported to the EPA Inspector and the Program Manager. The raw data for this project shall be maintained by the laboratory. Data validation will be performed by the laboratory for all the analyses prior to the release of data. The laboratory will also archive the analytical data into their laboratory data management system.

4.3 Reconciliation with User Requirements

All data and related information obtained during the course of this project will be included in a data report package.

Table 3 - Data Quality Objectives Summary

Analytical Group	Number of Samples[1]	# of Field QA Samples: Dups & Blanks (Bottle/Rinsate/ Lot /Filter)	MS / MSD Samples	Matrix	Method	Method Detection Limits	Accuracy	Precision (RPD)	Complete-ness	Preservation	Volume, Container	Holding Time (days)
Mobile Laboratory Measurements												
Fecal Coliform Mobile Lab or Contract lab		10% dup or 1 per day	NA	Water / sludge	9221C, E	1 MPN/ 100 ml	1 MPN/ 100 ml	varies	95	Cool on ice	Use sample from Fecal Coliform	6 hours[3]
E. Coli Mobile Lab or Contract Lab		10% dup or 1 per day	NA	Water / sludge	9221 F or 9223 DQ	1 MPN / 100 ml	1 MPN / 100 ml	varies	95	Cool on ice	Use sample from Fecal Coliform	6 hours[3]
Fixed Laboratory Measurements												
TKN[4]		10% dup or 1 per day		Water / sludge	351.2	0.2 mg/ L	75-125%	± 20RPD	95	Cool on Ice H_2SO_4 <2	250 mL P, G[6]	28 days
Nitrate-Nitrite		10% dup or 1 per day		Water / sludge	353.2	0.2 mg/ L	75-125%	± 20RPD	95	Cool on Ice H_2SO_4 <2	250 mL P, G[6]	28 days
Total Phosphorus		10% dup or 1 per day		Water / sludge	365.1	0.01 mg/L	75-125%	± 20RPD	95	Cool on Ice H_2SO_4 <2	250 mL P, G[6]	28 days
BOD		10% dup or 1 per day		Water / sludge	5210B	4 mg/L	NA	± 20RPD	95	Cool on Ice	2,500 mL P. G (may use 1 gal cubitainer)	48 hours (receipt at lab by noon on last day of collection)
Potassium		10% dup or 1 per day		Water / sludge	200.7	0.7 mg/ L	75-125%	± 20RPD	95	Cool on Ice HNO_3 <2[5]	250 mL P, G	180 days

Table 3 - Data Quality Objectives Summary

Analytical Group	Number of Samples[1]	# of Field QA Samples: Dups & Blanks (Bottle/Rinsate/ Lot /Filter)	MS / MSD Samples	Matrix	Method	Method Detection Limits	Accuracy	Precision (RPD)	Complete-ness	Preservation	Volume, Container	Holding Time (days)
Field Measurements (optional - water samples only)												
Dissolved Oxygen		10% dup or 1 per day		Water	360.1	0.1 mg/L	0.2 mg/L	± 20 RPD	100	Not Required	500 ml G	Analyze Immediately
Turbidity Mobile Lab		10% dup or 1 per day		Water	180.1	0.1 NTU	0.5 NTU	± 20 RPD	100	Cool on Ice	100 mL	48 hours
pH		10% dup or 1 per day		Water	150.1	0.1 pH Units	0.1 pH Units	± 0.2 pH Units	100	Not Required	100 ml P, G	Analyze Immediately
Temperature		10% dup or 1 per day		Water	2250B	0.1 ºC	0.3 ºC	± 20 RPD	100	Not Required	Not Required	Analyze Immediately

1 - Sample number includes QA samples and Matrix Spike / Matrix Spike Duplicate (MS/MSD) samples listed in the next two columns. P, G - Plastic, Glass.

[2] - Sodium thiosulfate

[3] - Non-potable water samples have a 6 hour holding time from the time of sample collection until receipt at the laboratory. Additional 2 hours holding time are allowed from the verified time of sample receipt in the lab until the samples are seeded into an inoculation broth.

[4] - Total Kjeldahl Nitrogen

[5] –Due to shipping restrictions on nitric acid, preservation for potassium may be performed at the lab and the sample held for 18-24 hours prior to sub-sampling.

[6]- Samples for NO_3+NO_2, TKN, and Total Phosphorus may be combined in one sample container however the required volume increases. Use a 1L P,G bottle if combining nutrients.

Attachment 1-Sample Alteration Form

Project Name and Number: _____
Sample Matrix: _____
Measurement Parameter: _____

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):
_____
_____

Reason for Change in Field Procedure or Analysis Variation:
_____
_____

Variation from Field or Analytical Procedure:
_____
_____

Special Equipment, Materials or Personnel Required:
_____
_____
_____
_____

Initiators Name: _____ Date: _____

Project Officer: _____ Date: _____

Quality Staff: _____ Date: _____

Attachment 2-Corrective Action Form

Project Name and Number: _____

Sample Dates Involved: _____

Measurement Parameter: _____

Acceptable Data Range: _____

Problem Areas Requiring Corrective Action: _____
_____
_____
_____

Measures Required to Correct Problem(s): _____
_____
_____
_____

Means of Detecting Problems and Verifying Correction: _____
_____
_____
_____

Initiators Name: _____ Date: _____

Project Officer: _____ Date: _____

Quality Staff: _____ Date: _____

CAFO Inspection Generic QAPP
Appendix A: Site-Specific Inspection Plan (CSSIP)

This CSSIP will be prepared and used in conjunction with the Generic CAFO QAPP for collecting samples of opportunity during announced and unannounced inspections. Please refer to the Generic QAPP for specific details regarding CSSIP.

Project Code(s)	Sample Numbers	EPA Inspectors/Phone Numbers/Mail Stop
(As noted below)	(Assigned in blocks of 50 sample IDs per Project Code)	

COOPERATING AGENCIES/PARTIES INVOLVED:

Contact Person	Agency	Phone

LIST OF FACILITIES INSPECTED:

Facility Name	Assigned Project Code	Address	Contact person	E-mail/phone Number	# Samples Collected*

*Samples Collected is an estimate prior to the inspection and will be submitted in final form after the inspection is complete.

Parameter(s) to be tested (should match entries on DQO Table):

_____

TENTATIVE PROJECT SCHEDULE:

Activity	Est. Start Date	Est. Completion Date	Comments
Mobilize to Site			
Sample Collection			
Laboratory Receipt of Samples			
Target Completion Date			

DATA DISTRIBUTION:

Name and Mail Stop	Electronic	Hard Copy

Concurrence with the CSSIP:

QA Chemist: _____ Date: _____
Name and Signature

Inspector: _____ Date: _____
Name and Signature

Instructions

<Insert Region specific instructions>

CSSIP Page 2 - Table of Data Quality Objectives Summary

Analytical Group	Number of Samples[1]	# of Field QA Samples: Dups & Blanks (Bottle/Rinsate/ Lot /Filter)	MS / MSD Samples	Matrix	Method	Method Detection Limits	Accuracy	Precision (RPD)	Completeness	Preservation	Volume, Container	Holding Time (days)
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BOD		10% dup or 1 per day		Water / sludge	5210 B	4 mg/L	NA	± 20RPD	95	Cool on Ice	2,500 mL P. G (may use 1 gal cubitainer)	48 hours (receipt at lab by noon on last day of collection)
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pH		10% dup or 1 per day		Water	150.1	0.1 pH Units	0.1 pH Units	± 0.2 pH Units	100	Not Required	100 ml P, G	Analyze Immediately
Temperature		10% dup or 1 per day		Water	2250 B	0.1 ºC	0.3 ºC	± 20 RPD	100	Not Required	Not Required	Analyze Immediately

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