

Quality Assurance Project Plan

for the

Surface Water Quality Program

and

Feedlot Permit Program

Revision IX

January 2020

Department of Environment and Natural Resources
Division of Environmental Services
Surface Water Quality Program and Feedlot Permit Program
Pierre, South Dakota

Section A1. Title and Approval

Projects: Ambient Surface Water Quality Monitoring
Waterbody Use Analysis Assessments
Fish Flesh Analysis
Compliance Sampling
Complaint Investigation
Fish Kill Investigation

Organization: South Dakota Department of Environment and Natural Resources
Surface Water Quality Program
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Signatures:

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Date

Shannon Minerich, SWQP & DENR Quality Assurance Officer
Water Quality Standards and Monitoring Team

Date

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Section A3. Distribution List

An electronic copy of this Quality Assurance Project Plan (QAPP) is available at R:\Work\SWQ\QAPP. The program administrators and team leaders listed below are responsible for distributing the plan to staff.

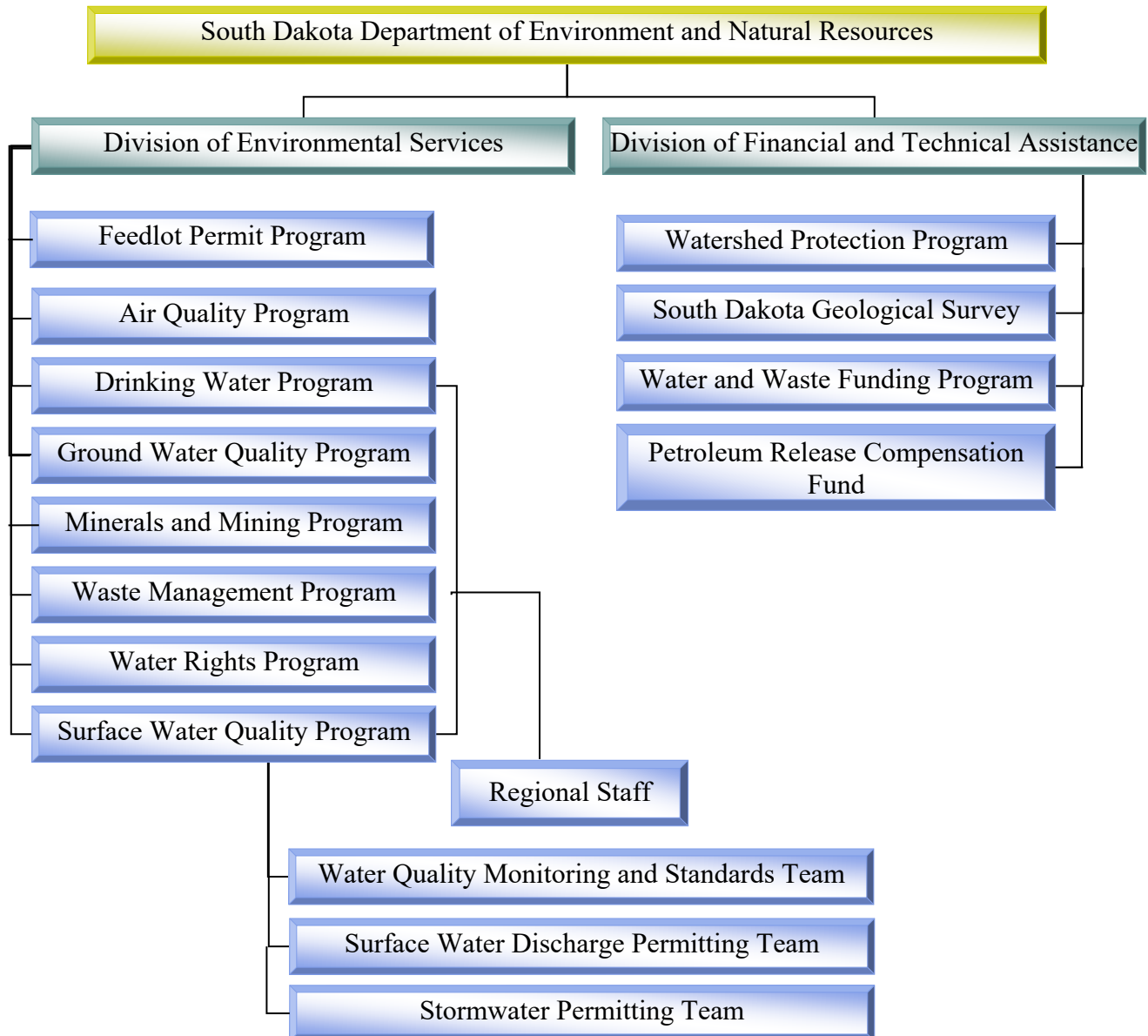
Kelli Buscher	Surface Water Quality Program Administrator
Kent Woodmansey	Feedlot Permit Program Administrator
Pat Snyder	Team Leader, Water Quality Monitoring and Standards Team
Al Spangler	Team Leader, Surface Water Discharge Permitting Team
Jill Riedel	Team Leader, Stormwater Permitting Team

All personnel involved with water quality monitoring/sampling activities for the Surface Water Quality Program or Feedlot Permit Program shall receive a copy of this plan and therefore should be thoroughly familiar with the sampling policy, management structure, and procedures. Compliance with QAPP elements results in data collection and management that is valid and is suitable for use in water quality assessments and other programs and projects.

Section A4. Project/Task Organization

Organization

The South Dakota Department of Environment and Natural Resources (DENR) is divided into two divisions: the Division of Environmental Services (DES), and the Division of Financial & Technical Assistance (DFTA). The Surface Water Quality Program (SWQP) and Feedlot Permit Program (FPP) are in the DES. This QAPP has been written to address work performed by the FPP and two teams within the SWQP: the Surface Water Discharge Permitting Team and the Water Quality Monitoring and Standards Team. The following is an organizational chart illustrating the department structure.



The Water Quality Standards and Monitoring Team coordinates and performs water quality sampling for ambient surface water quality monitoring, waterbody use analysis assessment, fish flesh analysis, complaint investigation, fish kill investigation, special assessments, and compliance sampling. Regional office staff from the Drinking Water Program assists the Water Quality Standards and Monitoring Team by collecting ambient water quality monitoring samples from their regions of the state. The Water Quality Standards and Monitoring Team works with staff from the Department of Game, Fish, and Parks and the Department of Health to collect fish flesh samples and issue fish consumption advisories.

The Feedlot Permit Program, the Surface Water Discharge Permitting Team, and the Stormwater Permitting Team, including staff in the regional offices, coordinate and perform water quality sampling as it pertains to citizen complaints, routine permitted facility inspections, and inspections conducted in response to a permittee reporting a noncompliance discharge. Team personnel also review compliance monitoring data provided by permitted facilities. Personnel from the Surface Water Discharge Permitting Team and Stormwater Permitting Team occasionally participate and/or performs waterbody use analysis assessments or special assessments.

SWQP/FPP personnel record visual observations and perform limited field analysis of parameters that may include: dissolved oxygen, flow, turbidity, chlorophyll *a*, pH, specific conductance, and temperature. All other analyses are performed by outside laboratories. The SWQP/FPP primarily uses three laboratories: the South Dakota Department of Health, Mid Continent Testing Labs, and American Engineering Testing.

QAPP Maintenance/Revisions

The SWQP Quality Assurance Officer is responsible for maintenance of this QAPP. This Quality Assurance Project Plan is reviewed annually; however, updated revisions of the plan are only required when there are significant changes to program or team work procedures and/or goals. The exception shall be sections A3 Distribution List and A4 Project Task/Organization. These sections specifically identify staff involved in data collection and data entry. Revisions to the QAPP are not required in the event of personnel or contractor changes; an addendum will be attached to reflect changes in personnel.

Key Individuals and Responsibilities

Surface Water Quality Program

Name: Title: Organization: Responsibilities:	Kelli Buscher, P.E. Engineering Manager III/ Program Administrator DENR - SWQP <ul style="list-style-type: none"> • Supervision, planning, oversight, and setting priorities for the SWQP.
Name: Title: Team Leader: Organization: Responsibilities:	Nicole Stasch Senior Secretary Vicki Murray DENR - SWQP and FP <ul style="list-style-type: none"> ▪ Public notice and issue NPDES permits; ▪ Enter discharge monitoring data into ICIS database; ▪ Scan and file documents; ▪ Certification of septic tank installers.
Water Quality Standards and Monitoring Team	
Name: Title: Supervisor: Organization: Responsibilities:	Patrick Snyder Scientist Manager 1/Team Leader Kelli Buscher DENR - SWQP Water Quality Standards and Monitoring Team <ul style="list-style-type: none"> ▪ Supervise Water Quality Standards and Monitoring Team staff; ▪ Review draft QAPP and Standard Operating Procedure (SOP) documents to make sure they are accurate and appropriate; ▪ Ensure staff are adequately trained and that training meets requirements specified in the QAPP; ▪ Provide technical guidance to senior management; and ▪ Update and maintain SWQ standards.
Name: Title: Team Leader: Organization: Responsibilities:	Sean Kruger Environmental Scientist IV Patrick Snyder DENR - SWQP Water Quality Standards and Monitoring Team <ul style="list-style-type: none"> ▪ Perform field data collection and sampling work associated with waterbody use analysis, compliance sampling for investigating surface water pollution/wastewater discharge complaints, and fish kill investigations; ▪ Coordinate statewide monitoring programs; ▪ Plan and schedule field investigations; ▪ Develop and improve lake and stream sampling protocols; and ▪ Write waterbody beneficial use analysis reports.

<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Shannon Minerich Environmental Scientist III Patrick Snyder DENR - SWQP Water Quality Standards and Monitoring Team</p> <ul style="list-style-type: none"> ▪ Environmental Reviews; ▪ Water Enhancement & Restoration Reviews; ▪ Section 404 reviews and Section 401 certification; ▪ Perform field data collection and sampling work associated with waterbody use analysis, ambient surface water quality monitoring, compliance sampling for investigating surface water pollution/wastewater discharge complaints, and fish kill investigations; ▪ Write waterbody beneficial use analysis reports; ▪ Maintain fish flesh contaminant program; ▪ Integrated Report for Surface Water Quality Assessment; ▪ DENR Quality Assurance Officer & SWQP Quality Assurance Officer; and ▪ Maintain DENR Quality Management Plan & SWQP/FPP QAPP.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Aaron Leingang Environmental Scientist II Patrick Snyder DENR - SWQP Water Quality Standards and Monitoring Team</p> <ul style="list-style-type: none"> ▪ Field data collection and sampling work associated with use analysis reviews; ambient water quality monitoring for stations in the central and western regions of the state; ▪ Investigating surface water pollution/wastewater discharge complaints and fish kill investigations; ▪ Write waterbody beneficial use analysis reports; ▪ Maintain chemical supply required for field analysis and sample preservation; ▪ Designated Sampler for inspection/calibration of SWQP/FPP equipment and instruments, and collection of blank and laboratory split samples; ▪ Maintain SWQP vehicles, gear, and supplies; ▪ Coordinates ambient surface water quality monitoring by selecting sample sites, selecting analysis parameters, setting schedules, and maintaining databases; ▪ Track the receipt of laboratory analysis data for all South Dakota ambient monitoring stations; and ▪ Performs station data input and data review and verification; maintains SWQ NR92 database, and exports data to EPA's WQX database.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Clark Christensen Environmental Scientist II Patrick Snyder DENR - SWQP Water Quality Standards and Monitoring Team - Vermillion Regional Office</p> <ul style="list-style-type: none"> ▪ Field data collection and sampling work associated with ambient water quality monitoring for stations in the southeastern region of the state; ▪ Sample collection and investigation of citizen pollution complaints for SWQP issues in the southeastern region of the state; and ▪ Perform work in the southeastern region of the state (as needed) for other DENR programs and divisions.

Other program staff doing work for the Surface Water Quality or Feedlot Permit Programs	
Name: Title: Supervisor: Organization: Responsibilities:	Jaime Haueter Environmental Scientist II Mark Mayer DENR - Drinking Water Program - Rapid City Regional Office <ul style="list-style-type: none"> ▪ Field data collection and sampling work associated with ambient water quality monitoring for stations in the Black Hills region of the state; and ▪ Sample collection and investigation of citizen pollution complaints for SWQP and FPP issues in the Black Hills region of the state.
Name: Title: Supervisor: Organization: Responsibilities:	Austin DeWitte Environmental Scientist I Mark Mayer DENR - Drinking Water Program - Watertown Regional Office <ul style="list-style-type: none"> ▪ Field data collection and sampling work associated with ambient water quality monitoring for stations in the northeast region of the state; and ▪ Sample collection and investigation of citizen pollution complaints for SWQP and FPP issues in the northeastern region of the state.
Name: Title: Supervisor: Organization: Responsibilities:	Jon Epp, P.E. Engineer III Kyrik Rombough DENR - Air Quality Program - Rapid City Regional Office <ul style="list-style-type: none"> ▪ Field data collection and sampling work associated with citizen complaints, non-compliance events, and CAFO compliance inspections; ▪ NPDES compliance inspections of WWTFs; ▪ Collects other samples as needed for other Teams in SWQP and DENR.
Surface Water Discharge Permitting Team	
Name: Title: Supervisor: Organization: Responsibilities:	Al Spangler Engineering Manager I/ Team Leader Kelli Buscher DENR - SWQP - Surface Water Discharge Permit Team <ul style="list-style-type: none"> ▪ Supervise Surface Water Discharge Permit Team staff; ▪ Review draft QAPP and Standard Operating Procedure (SOP) documents to make sure they are accurate and appropriate; ▪ Ensure staff are adequately trained and that training meets requirements specified in the QAPP; ▪ Surface Water Discharge Permits; and ▪ Occasionally perform field data collection and sampling work associated with surface water discharge compliance inspections, citizen complaints, and reported non-compliance events.
Name: Title: Team Leader: Organization: Responsibilities:	Kathleen Grigg Engineer II Al Spangler DENR - SWQP - Surface Water Discharge Permit Team <ul style="list-style-type: none"> ▪ Surface Water Discharge Permits; ▪ Water quality modeling; and ▪ Field data collection and sampling work associated with wastewater facility compliance inspections, citizen complaints, and reported non-compliance events.

<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Tina McFarling Engineer III Al Spangler DENR - SWQP - Surface Water Discharge Permit Team</p> <ul style="list-style-type: none"> ▪ Pretreatment Coordinator; ▪ Surface Water Discharge Permits; and ▪ Field data collection and sampling work associated with wastewater facility, pretreatment, and storm water compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Tim Flor Environmental Scientist III Al Spangler DENR - SWQP - Surface Water Discharge Permit Team</p> <ul style="list-style-type: none"> ▪ WET Testing Coordinator; ▪ DMR QA Coordinator; ▪ DMR database and ICIS Coordinator; and ▪ Field data collection and sampling work associated with wastewater facility compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Kyle Doerr Engineer II Al Spangler DENR - SWQP - Surface Water Discharge Permit Team</p> <ul style="list-style-type: none"> ▪ Biosolids Coordinator; ▪ Pesticide Permit; ▪ Surface Water Discharge Permits; and ▪ Field data collection and sampling work associated with wastewater and biosolids facility compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Ray Woodworth Engineer I Al Spangler DENR - SWQP - Surface Water Discharge Permit Team</p> <ul style="list-style-type: none"> ▪ Surface Water Discharge Permits; ▪ Wastewater operator assistance; and ▪ Field data collection and sampling work associated with wastewater facility compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Raul Vasquez Engineer I Al Spangler DENR - SWQP - Surface Water Discharge Permit Team</p> <ul style="list-style-type: none"> ▪ Surface Water Discharge Permits; ▪ Wastewater compliance inspections; and ▪ Field data collection and sampling work associated with wastewater facility compliance inspections, citizen complaints, and reported non-compliance events.

Stormwater Permitting Team	
Name: Title: Supervisor: Organization: Responsibilities:	Jill Riedel Engineer III/Acting Team Leader Kelli Buscher DENR - SWQP - Stormwater Permit Team - Sioux Falls Regional Office <ul style="list-style-type: none"> ▪ Stormwater Permits Team Leader; ▪ Municipal Stormwater: ▪ Stormwater Discharge Permits; ▪ Field data collection and sampling work associated with wastewater facility compliance inspections, storm water compliance inspections, citizen complaints, and reported non-compliance events.
Name: Title: Team Leader: Organization: Responsibilities:	Katie Luce Program Assistant I Jill Riedel DENR - SWQP-Stormwater Permit Team <ul style="list-style-type: none"> ▪ Issuing coverage under stormwater general permits; ▪ Primary point of contact for the 1-800-SD-STORM phone number; ▪ Public notice general permits.
Name: Title: Team Leader: Organization: Responsibilities:	Roderick McRae Engineer I Jill Riedel DENR - SWQP - Stormwater Permit Team <ul style="list-style-type: none"> ▪ Industrial Storm Water Discharge Permits; ▪ Storm Water & Surface Water Discharge Permits; ▪ Field data collection and sampling work associated with wastewater facility & stormwater compliance inspections, citizen complaints, and reported non-compliance events.
Name: Title: Team Leader: Organization: Responsibilities:	Brett Steers Engineer I Jill Riedel DENR - SWQP - Stormwater Permit Team <ul style="list-style-type: none"> ▪ Stormwater Construction Coordinator; ▪ Stormwater Permits; ▪ Surface Water Discharge Permits; and ▪ Field data collection and sampling work associated with wastewater facility & storm water compliance inspections, citizen complaints, and reported non-compliance events.

Feedlot Permit Program

<p>Name: Title: Organization: Responsibilities:</p>	<p>Kent Woodmansey, P.E. Engineering Manager III/ Program Administrator DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Supervision, planning, oversight, and setting priorities for the FP ▪ Supervise Feedlot Team staff; ▪ Review draft QAPP and Standard Operating Procedure (SOP) documents to make sure they are accurate and appropriate; ▪ Ensure staff are adequately trained and that training meets requirements specified in the QAPP; ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Occasionally perform field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Neal Konda, P.E. Engineer III Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Troy Roth, P.E. Engineer III Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, groundwater monitoring, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Jason Roggow Engineer III Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, reported non-compliance events; and ▪ Operator training education.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Matt Cherney Engineer I Kent Woodmansey DENR - Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Occasionally perform field data collection and sampling work associated with waterbody use analysis, compliance sampling for investigating surface water pollution/wastewater discharge complaints, and fish kill investigations; ▪ Compliance sampling for septic system complaints; ▪ Write waterbody beneficial use analysis reports; and ▪ On-site Wastewater Coordinator.

<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Fey Ayadi Engineer I Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Aviana Knochel Engineer I Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Paul Wegleitner Engineer III Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events; ▪ Nutrient management planning.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Keith Miller Engineer III Kent Woodmansey DENR -Feedlot Permit Program - Watertown Regional Office</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Team Leader: Organization: Responsibilities:</p>	<p>Spencer Van Overbeke Engineer I Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.
<p>Name: Title: Supervisor: Organization: Responsibilities:</p>	<p>Ben Myers Engineer III Kent Woodmansey DENR -Feedlot Permit Program</p> <ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.

Name:	Dan Gerhardt
Title:	Engineer II
Supervisor:	Kent Woodmansey
Organization:	DENR -Feedlot Permit Program
Responsibilities:	<ul style="list-style-type: none"> ▪ Concentrated Animal Feeding Operation (CAFO) permits; and ▪ Field data collection and sampling work associated with CAFO compliance inspections, citizen complaints, and reported non-compliance events.

South Dakota Department of Game, Fish, and Parks

Name:	Robert Hanten
Title:	Fisheries Biologist
Organization:	GF&P Region II
Responsibilities:	<ul style="list-style-type: none"> ▪ Coordinate fish flesh collection activities.
Name:	John Lott
Title:	Fisheries Program Administrator
Organization:	GF&P
Responsibilities:	<ul style="list-style-type: none"> ▪ Make GF&P department decisions regarding fish contaminants program.

South Dakota Department of Health Laboratory

Name:	Bill Chalcraft
Title:	Administrator/Office of Health Protection
Organization:	DOH
Responsibilities:	<ul style="list-style-type: none"> ▪ Issue fish consumption advisories; and ▪ Make DOH department decisions regarding fish contaminants program.
Name:	Stacy Ellwanger
Title:	Environmental Supervisor
Organization:	DOH - Environmental Team
Responsibilities:	<ul style="list-style-type: none"> ▪ Implement, update, and monitor laboratory QA/QC; ▪ Review laboratory reports; and supervise laboratory personnel.

MidContinent Testing Laboratories

Name:	Greg McDougal
Title:	Laboratory Manager
Organization:	MidContinent Testing Laboratories
Responsibilities:	<ul style="list-style-type: none"> ▪ Implement, update, and monitor laboratory QA/QC; ▪ Review laboratory reports; and ▪ Supervise laboratory personnel.

American Engineering Testing

Name:	Virginia VerMulm
Title:	Laboratory Manager
Organization:	American Engineering Testing
Responsibilities:	<ul style="list-style-type: none"> ▪ Implement, update, and monitor laboratory QA/QC; ▪ Review laboratory reports; and ▪ Supervise laboratory personnel.

Section A5. Problem Definition/Background

In 1967, the South Dakota Committee on Water Pollution established water quality standards and assigned beneficial use designations to surface waters. By 1972, municipal and industrial wastewater pollution of rivers, streams, and lakes in the United States had become a national concern. To clean up the nation's waters, Congress passed the federal Clean Water Act of 1972. Under the South Dakota Water Pollution Control Act (South Dakota Codified Laws, Chapter 34A-2), pollution of the waters of this state constitutes a menace to public health and welfare; creates public nuisances; is harmful to wildlife, fish, and aquatic life; and impairs domestic, agricultural, industrial, recreational, and other legitimate beneficial uses of water. For this reason, it is the goal of the DENR to conserve the waters of the state and to protect, maintain, and improve the quality thereof. Thus, rules and regulations have been established to ensure the goal is achieved.

This QAPP has been written to address all surface water sampling performed or directed by the SWQP/FPP. This includes but is not limited to sampling conducted in association with ambient surface water quality monitoring, waterbody use analysis assessment, fish flesh analysis, complaint investigations, special assessments, and compliance sampling.

Ambient Surface Water Quality Monitoring

The state of South Dakota began limited ambient surface water monitoring in 1967. The sampling was initiated in response to the Federal Water Quality Act of 1965 and water quality concerns associated with mining activities. Sampling was conducted at six sites on five waterbodies in western South Dakota. By April of 1968, it was recognized that many other potential pollution sources existed around the state. Baseline and/or background data was desired, so sampling expanded to year-round monitoring at twenty-five locations on nineteen waterbodies statewide. Since that time, monitoring schedules and sample site locations have been altered in response to data collection needs. Today, there are 153 active sampling sites statewide. Sites are selected for the purpose of monitoring potential pollution sources, to determine if a waterbody meets standards for its assigned beneficial use, for the purpose of identifying water quality trends, and when data are needed for calculating total maximum daily loads (TMDLs). Baseline data and trend analysis are also used as a management tool to determine the effectiveness of control programs on existing point and nonpoint sources and directing future control activities.

Waterbody Use Analysis Assessment

The assigned beneficial use of a waterbody determines the water quality standards for that body of water. On January 27, 1999, Section 74:51:01:02:01 of the Administrative Rules of South Dakota (ARSD) was adopted. This section requires that a use analysis study be performed in certain situations where a discharge permit is to be issued. When an application is received for a new (or renewal of) Surface Water Discharge Permit, and the waterbody fishery classification is only (9) Fish and wildlife propagation, recreation, and stock watering waters, SWQP staff assess the waterbody to determine if it is accurately classified. Data collected as part of a study is evaluated to determine if a particular waterbody is properly classified and/or meets its assigned beneficial use. The data is also recorded in written reports summarizing study results. If a waterbody is improperly classified, the data and reports may be used as a basis for recommending changes to the assigned beneficial use designation.

Fish Flesh Contamination Analysis

Beginning in 1994, in response to public and federal government concerns about the presence of various contaminants in fish, the state of South Dakota began a fish tissue sampling program. The program is a cooperative effort among the Department of Health, the Department of Game, Fish, and Parks, and DENR. The purpose of the program is to collect fish from waterbodies statewide and assess contaminant levels in fish tissue. If a pollutant of concern is found at a concentration that could impact human health, additional fish tissue sampling is conducted and a consumption advisory is issued.

Special Assessments, Compliance Sampling, and Complaint Investigation

In 1993, EPA granted the State of South Dakota National Pollutant Discharge Elimination System (NPDES) authority. The state issues Surface Water Discharge permits to any point source that is discharging pollutants to waters of the state. The permits contain effluent limits that will protect the beneficial uses of our surface waters. The permits also contain the sampling and reporting requirements that each facility must follow.

In 1993, the DENR revised its Concentrated Animal Feeding Operation (CAFO) Program based on the recommendations of the Feedlot Permit Program Review Committee. The CAFO program placed permit requirements on operations to protect waters of the state from contamination by animal wastewater. In 1997, SD DENR SWQP issued a general permit for all new or expanding swine operations, and followed that with a general permit for all other animal type CAFOs in 1998. In 2003, the two existing general permits were combined through a new general permit issued for all Concentrated Animal Feeding Operations. This general permit is required for all new, expanding, and existing CAFOs. In 2013, the CAFO Program or Feedlot group separated from the SWQP and become its own program, the Feedlot Permit Program, within DENR. In 2017, the general permit was reissued. Operations with coverage under the 2003 general permit have one to four years to get permitted under the 2017 general permit unless they make certain changes that require them to obtain permit coverage sooner.

The SWQP is responsible for inspecting pollution complaints, investigating fish kills, regulating storm water runoff, and issuing wastewater permits for CAFOs, municipal facilities, and industrial facilities. The FP is responsible for inspecting pollution complaints, regulating septic systems, and regulating CAFOs. Department personnel occasionally take compliance samples during routine inspections at permitted facilities. Samples are also taken when staff investigates known or suspected releases of wastewater, storm water, or if a fish kill occurs.

The Surface Water Quality Program and Feedlot Permit Program are committed to quality assurance in environmentally related measurements. This QAPP complies with U.S. Environmental Protection Agency requirements under the Water Pollution Control Grant, 40 CFR 31.45, and EPA Order 5360.1 A2. Further, this plan will identify procedures to be followed for the purpose of insuring uniformity in methodology and contains sampling methods and data handling procedures adopted and used by Surface Water Quality Program and Feedlot Permit Program personnel and individuals performing work for those programs.

Section A6. Program/Task Description

This Quality Assurance Project Plan was written to address the continuing operation of a number of surface water quality projects performed/directed by the Surface Water Quality Program. The projects are designed to assess the quality of South Dakota's water resources or to determine a source of surface water pollution. The data collection objective is to preserve, improve, and protect the waters of the state of South Dakota.

Ambient Water Quality Monitoring

Ambient Water Quality Monitoring (WQM) sites are chosen with the intent of obtaining a sample that is representative for conditions on a large segment of the waterbody. The number of stations on a given waterbody is a function of accessibility, potential pollution sources, assigned beneficial uses, and other factors. The sampling frequency and analysis parameters for a particular site are based upon factors such as available background data, zone of mixing, current and future potential pollution sources, existing pollution, South Dakota Surface Water Quality Standards, budget constraints, and other factors.

Current WQM sites are sampled on a monthly, quarterly, or seasonal basis. The sampling schedule, analysis parameters, location (latitude and longitude), site number, and site description are recorded and loaded into EPA's Water Quality Exchange Network (WQX) and/or SWQP databases before sample collection begins. A typical site visit includes field data collection, recording visual observations, and water sample collection for laboratory analysis. SWQP personnel are equipped to properly preserve, store, and transport (or mail) samples to the laboratory. The most commonly sampled parameters include *E coli*, total suspended solids, total dissolved solids, ammonia, nitrates, and phosphorous. Several stations are sampled for sodium, calcium, and magnesium during the irrigation season. Stations located along streams that receive flows from historic Black Hills mining areas are also analyzed for cyanide, cadmium, lead, copper, zinc, chromium, mercury, nickel, silver, and arsenic. Stations located near historic uranium mining or present in-situ exploratory drilling sites are also sampled for arsenic, barium, molybdenum, uranium, radium 226, and radium 228. Field data parameters include depth, width, water and air temperature, dissolved oxygen concentration, specific conductance, and pH.

All ambient surface water quality monitoring data is evaluated for the purpose of observing/identifying seasonal and yearly trends, evaluating the effectiveness of pollution control programs, determining the support status for a waterbodies assigned beneficial use, identifying any newly emerging pollution source, writing TMDLs, and assuring the health of the waterbody. Ambient surface water quality conditions are reported in the biennial Integrated Report (303(d) and 305(b)) to the United States Environmental Protection Agency (US EPA). All ambient water quality data collected since 1967 is stored in EPA's WQX database and DENR's NR92 database. Data in both databases is maintained by the Water Quality Monitoring and Standards Team of the Surface Water Quality Program. Ambient water quality monitoring station locations, descriptions, schedules, and parameters are available online at: <http://denr.sd.gov/des/sw/wqmonitoring.aspx>.

Beneficial Use Assessment Surveys/Use Analysis Surveys

Beneficial use assessment surveys/use analysis surveys are performed when a Surface Water Discharge permit, for discharge to a waterbody classified as a 9 (see Administrative Rules of South Dakota Chapter 74:51:02 & :03), is requested or is to be renewed. Beneficial use assessment surveys are conducted in accordance with DENR SOP Recommended Procedures for Reviewing Beneficial Use Designations, with Special Emphasis on Fishery and Recreational Uses, December 1999.

Sample sites are chosen with the intent of obtaining samples representative of conditions upstream and within five miles downstream of the discharge point (or to the end of the classified stream segment). The purpose of this sampling is to identify the entire segment for which the classification change may be recommended. The total number of sample sites is at the discretion of field personnel and depends upon many factors including accessibility, flow, stream segment distance, and location/number of discharge points. Field personnel select the type of equipment to be used in data collection, based upon conditions encountered. In all cases, photographs are taken to document site conditions. When a waterbody has flow or significant areas of pooled water, water samples are collected for chemical analysis by a laboratory. In addition to water quality samples, field water quality data is collected, fish collection is attempted, and site conditions are recorded. The fish collected are identified, counted, measured, and photographed before release.

Data collected for beneficial use assessment surveys are maintained in DENR's NR92 database and are used to produce reports and recommendations pertaining to beneficial use assignments. Final reports and copies of original data are located in the Beneficial Use Assessment Surveys/Use Analysis files maintained by the Water Quality Monitoring and Standards Team of the SWQP.

Compliance Inspections

Personnel in the Feedlot Permit Program and in the Surface Water Discharge Permit Team perform routine permit compliance inspections. During such inspections, discharged water may be sampled to verify permit compliance or noncompliance. The sample collection point is typically chosen with accessibility being the major component. Nevertheless, the primary goal is to obtain a sample that is representative of the water being discharged. Samplers may take either grab or composite samples. Field personnel may take field water quality measurements including, but not limited to, water and air temperature, dissolved oxygen concentration, specific conductance, and pH. The field sampler may also send water samples to a laboratory for analysis. Field personnel are equipped to properly preserve, store, and transport (or mail) samples to a laboratory.

Compliance sampling in water is similar regardless of whether the facility is a CAFO, septic system, permitted facility, or unidentified potential pollution source. All data from sampling associated with a permitted facility is maintained in the permit file for either the Surface Water Discharge Permit Team or the Feedlot Team. All septic tank investigation data is stored in a filing cabinet reserved for septic system records and maintained by staff from the Feedlot Permit Program. All other sample data is maintained in a file reserved for data associated with complaint investigations and maintained by the appropriate staff in the SWQP/FPP. Data collected is used in determining compliance with the requirements of Surface Water Discharge permits, Federal and/or State regulations, and/or to support legal proceedings.

Surface Water Discharge/Pollution Complaint Investigations/Special Assessments

Potential surface water pollution problems come to the attention of the Surface Water Quality Program in several ways: staff members identify potential surface water pollution problems during routine permit compliance inspections; permittees report non-compliance discharges; citizens file signed complaint forms (see South Dakota Codified Law 34A-2-111); and local government officials, other state agencies, or EPA submit complaints to the department for pollution associated with point sources or report pollution arising from unidentified sources. When pollution is discovered by on-site department personnel, the investigation begins immediately. In situations where the pollution incident is reported through the complaint process, and a site visit is deemed necessary, the investigation is performed as soon as is possible. The decision of whether to take samples depends upon conditions encountered, and lies with the individual performing the investigation. The selection of sample site locations and the number of sample sites selected again lies with field personnel and depends upon circumstances encountered in the field. When sampling as part of a pollution complaint investigation, obtaining a representative sample of water quality for a large segment of a waterbody is not the only goal. Representative samples, taken upstream and downstream of a

pollution discharge point, may be taken to establish background or ambient conditions, determine rate of dilution, and to measure the impact on fish and habitat. However, some sample sites are selected for the purpose of obtaining a sample of water contaminated by pollution. Such a sample may be used to identify the pollutant or to document the fact that a pollution event occurred. Water samples are collected for laboratory analysis and field data results are recorded (including water and air temperature, dissolved oxygen concentration, specific conductance, and pH). Analysis parameters will vary depending upon the nature of the complaint, and personnel are trained to make that determination. It should be noted that each investigation is different and for this reason, the selection of sampling sites and analysis parameters is at the discretion of department field personnel.

Information obtained as a result of an investigation is maintained in either a permit file (if the pollution was associated with a discharge from a permitted facility or facility requiring a permit) or in a complaint investigation file. Data collected is used for determining the status of compliance with the requirements of Surface Water Discharge permits, federal and/or state regulations, and/or to support legal proceedings.

SWQP/FPP personnel may conduct special assessments or sampling to gain additional information on a waterbody. Special assessments are occasionally conducted to gather additional water quality data and may be used for Surface Water Discharge permit development, determine waterbody compliance with water quality criteria, quality investigations, or provide information regarding local or regional water quality concerns. Sites and parameters are selected based on the particular issue and are addressed in the assessment sampling plan.

Fish Kill Investigations

The Water Quality Monitoring and Standards Team investigates fish kills. Fish kills may be the result of natural conditions, diseases, or anthropogenic effects. Fish kills are typically reported to SWQP by the public or other state agencies. The SWQP contacts the Department of Game, Fish, & Parks and the local Conservation Officer. The Conservation Officer will typically verify if a fish kill has occurred. As necessary, SWQP or Game, Fish, & Parks personnel will investigate the fish kill as soon as possible, preferably within 24 hours.

SWQP personnel follow protocols from the United States Department of the Interior, Fish and Wildlife Service, Resource Publication 117, Field Manual for the Investigation of Fish Kills, 1990, and water quality sampling methods from the State of South Dakota's Surface Water Quality Program & Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling.

SWQP staff photograph and record site observations in a field book including, but not limited to: water color and water odor; species, size, and physical condition of dead fish; presence and physical condition of live fish or other aquatic species; and presence, condition of plants and algae, and any other factors that may be related to the fish kill. Field personnel collect field water quality data including: dissolved oxygen content, pH, specific conductance, temperature, waterbody depth, width, and flow. Water quality samples are collected and may be analyzed for ammonia, nitrates, TKN, total phosphorous, dissolved and suspended solids, BOD, CBOD, and/or other parameters based on results of field observations at the discretion of the field sampler. Fish may also be collected for necropsy at the discretion of the field sampler.

Fish kill sampling sites are selected by assessing the extent of the fish kill along the waterbody. Sites are selected within the fish kill zone and upstream and downstream from the affected area.

Fish kill investigation results are compiled in an electronic file and maintained by the Water Quality Monitoring and Standards Team fish kill investigation Project Manager's office. Electronic water quality data is stored in DENR's NR92 database. On a biennial basis, fish kill report information is incorporated into the Integrated Report (303(d) and 305(b)) to US EPA.

Fish Flesh Contaminants Program

In a collaborative effort among the Department of Game, Fish, & Parks, the Department of Health, and the Department of Environment and Natural Resources, fish tissue from lakes and rivers are sampled and analyzed for contaminants including mercury, cadmium, selenium, pesticides, and PCBs. The data are used to monitor and assess the levels of these contaminants present in fish flesh.

The river and lake fish flesh sampling locations and schedule are determined in a joint effort by Game, Fish, & Parks and Department of Environment and Natural Resources personnel. The rivers and lakes are typically sampled in conjunction with Game, Fish, & Parks' survey sampling and occur between early spring and late fall.

The South Dakota Department of Health has chosen to issue fish consumption advisories based on the United States Food and Drug Administration's consumption limit of one (1) part per million mercury. The Department of Health will issue a fish consumption advisory when sampling results indicate the one part per million mercury threshold may be exceeded in edible fish tissue. Results from fish tissue analyses are entered into DENR's Fish Flesh database (MS Access). Other records and documents are located in Fish Tissue Data files maintained by the Water Quality Monitoring and Standards Team of the SWQP. Fish tissue contaminant parameters are available in Appendix A. Fish tissue chain of custody forms are available in Appendix D. Fish tissue sampling design and procedures are addressed in the SWQP document South Dakota Fish Contaminants Sampling Protocol, January 2013.

Mercury in fish tissue results are also used to assess the Surface Water Quality mercury in fish tissue criterion of 0.3 mg/kg. Waterbodies with fish tissue results that exceed the criterion based on South Dakota's Integrated Report assessment methodology are reported as not supporting their beneficial uses.

Section A7. Data Quality Objectives & Acceptability Criteria for Measurement Data

The objective of the SWQP/FPP quality assurance program is to conduct sufficient activities to assure complete, accurate, representative, and comparable data. These activities are a combination of field and laboratory procedures that will provide measurements that are of known quality, technically sound, statistically accurate, properly documented, and representative of the media being measured.

The SWQP characterizes the ambient conditions of the surface waters of South Dakota. In addition, enforcement, regulatory, rulemaking, and policy decisions may be made as a direct result of SWQP/FPP data and information. SWQP/FPP data are collected following the requirements of this QAPP, SOPs, and Data Quality Objectives (DQOs); and are available to other state agencies, federal and local agencies, public organizations and entities, and the general public in order to support and enhance:

- * establishment of baseline (ambient) water quality conditions;
- * analysis of trends in water quality and comparison to water quality standards;
- * continued analysis of sensitive aquatic ecosystems and water bodies of high public use and interest;
- * determination of the effectiveness of the implementation of water quality controls;
- * alerting SWQP/FPP personnel to potential water quality violations and, in the case of documented violations, determining the possible causes of water quality degradation;
- * water quality assessments in the Integrated Report to the US EPA; and
- * establishment of stream beneficial use classification.

The SWQP/FPP will employ only methods and techniques that have been determined to produce measurement data of a known and verifiable quality and which are of quality sufficient to meet the overall objectives of the water quality monitoring investigation. Data quality objectives and criterion include:

Representativeness

The representativeness of the data is mainly dependent on the sampling locations and the sampling procedures adequately representing the true condition of the sample site. Sample site, sampling of relevant media (water, sediment, and biota), and use of only approved/documented analytical methods will determine that the measurement data does represent the conditions at the investigation site, to the best extent possible. The goal for meeting total representation of the site will be tempered by the types and number of potential sampling points and media as well as the potential funding required for meeting complete representativeness. Sampling schedules will be designed with respect to frequency, locations, and methodology to maximize representativeness, where possible and applicable.

Comparability

The comparability of data is achieved by the commitment of SWQP/FPP staff and contracted laboratories to use standardized methods, where possible, including EPA-approved analytical methods, standard methods, or documented modifications thereof which provide equal or better results. Measurements are made according to standard procedure, or documented modifications, using units that are comparable within samples and comparable to South Dakota Surface Water Quality Standards Chapter 74:51:01 or EPA standards as applicable.

Completeness

The completeness of data is a relationship of how much of the data are available for use compared to the total potential data before any conclusion is reached. Ideally, 100% of the data should be available. However, the possibility of data becoming unavailable due to laboratory, sampling or other types or errors may be expected. Also, unexpected situations may arise where field conditions do not allow for 100% data completeness.

- Therefore, 90% data completeness is required by the SWQP/FPP. If less than 90% data completeness is obtained, the Team Leader or supervisor will decide if the information is usable. Corrective actions may be issued as appropriate.

Precision and Accuracy

The precision and accuracy of data are determined by particular actions of the analytical laboratory and field staff. The precision of data is a measure of the reproducibility of the measurement when an analysis is repeated. It is reported in Relative Percent Difference (RPD) or Relative Standard Deviation (RSD). The accuracy of an analysis is a measure of how much of the constituent actually present is determined. It is measured, where applicable, by adding a known amount of the constituent to a portion of the sample and determining how much of this spike is then measured and reported as Percent Recovery. Accuracy may also be measured by analyzing a reference material. The acceptable percent deviations and the acceptable percent recoveries are dependent on many factors including: analytical method used, laboratory used, media of sample, and constituent being measured.

Bias

Bias is a systematic or persistent distortion of a measurement process that causes errors in one direction. Bias is acknowledged and corrected by laboratory staff when using reference materials or analyzing spiked matrix samples.

It is the responsibility of the Project Manager to verify that the data are representative and conform to completeness standards; while precision, accuracy, comparability, and bias are the responsibility of the laboratory supervisor. Laboratories performing the analysis of samples for this project have developed precision and accuracy limits for acceptability of data. For parameters and matrices that have US EPA established criteria, the limits are either equal to, or more stringent than, the established limit. For matrices without US EPA established criteria, the laboratories have developed control limits following the procedures published in the US EPA Handbook for Analytical Quality Control in Water and Wastewater Laboratories. It is the responsibility of the Project Officer to verify that the laboratory quality control conforms to internal laboratory limits.

Section A8. Required Training

Required Training for Field Personnel

Proper training of field personnel represents a critical aspect of quality control. Field technicians are trained to conduct a wide variety of activities using standardized procedures to ensure comparability in data collection among crews and across geographic areas.

All sampling equipment and all pertinent sample collection protocols will be used extensively during "hands-on" training sessions (actual field sample collection trips). By the end of the sampling training trip(s), all crew members must demonstrate proficiency in all the required sampling activities.

It is the responsibility of the appropriate SWQP/FPP Team Leader or Supervisor to ensure employee training is satisfactory and documentation of training is maintained in personnel files. Group quality training, such as use of equipment, sampling, quality document reviews, etc., are documented and filed in the SWQP QAO office.

In addition to in-field training and certification/documentation of such training, field samplers are evaluated on their field performance during field QA audits conducted by the SWQP QAO, Project Manager, or Team Leader. If any deficiencies are noted during the audit, they will be documented and remedied prior to further field sampling. Verification of correction of any deficiencies must be documented in writing prior to the continuation of further sample collection activities. Copies of QA audit reports, as well as documentation of any deficiencies and corrective action responses are maintained in the SWQP QAO's office for a minimum of three years.

Section A9. Documentation & Records

All field data gathered by SWQP/FPP personnel are recorded in field notebooks or on project specific forms as appropriate. Laboratory results are reported to SWQP/FPP in hardcopy and/or in electronic format as available.

- These data records are maintained for at least three years in files at the respective SWQP/FPP project office.
- Data are reported to the appropriate SWQP/FPP Project Manager in an agreed format.
- All hard copies of data/records are kept on file at the respective SWQP/FPP entity conducting the field data collection or in the respective electronic database, and may be reviewed by the Project Manager or the SWQP QAO during audits.

Proper, complete, and timely documentation of projects is critical to maintaining proper QA protocols. Information is organized into the appropriate data reporting formats consistent with established document control procedures. Updated versions of field and laboratory SOPs are available for reference, providing instructions to all personnel on the proper distribution and filing of data collected during specific procedures. The SWQP QAO has the responsibility of maintaining an updated QAPP, SOPs, and forms in a central database. Read only access will be available to all staff members. Full access will be available only to the SWQP QAO. The SWQP QAO will notify the persons on the distribution list (Section A3) that an updated version of the document(s) is available and include the site location and/or provide a paper copy. In most instances, information in databases will be considered public information and released upon request through proper channels.

Standard Operating Procedures and the Quality Assurance Project Plan are approved through a

process in which the Program Administrators, Team Leaders, and QAO confirm the accuracy and completeness of the document and sign their approval on a signature sheet.

Table A9-1

Quality Assurance/Quality Control Document and Record Types

Categories	Record/Document Types
Management and Organization	Quality Management Plan Quality Assurance Project Plan Organizational Structure Standard Operating Procedures Personnel qualifications and training certifications EPA Directives/Grants Support Contracts Emergency Response Plan Integrated Report (303(d) and 305(b))
Site Information	Site Project File Site Maps/Pictures
Field and Laboratory Environmental Data Operations	QA Project Plans Standard Operating Procedures (SOPs) Field and Laboratory Notebooks Communication/Correspondence Records Sample Handling/Custody Records Inspection/Maintenance Records Calibration Records Lab Sheets
Raw Data	Any original data (routine and QC data) including data entry forms, field data, lab data.
Data Reporting	Data/Summary/Progress Reports Journal Articles/Papers/Presentations
Data Management	Data Management Plans/Flowcharts Data Management Systems
Quality Assurance	Lab QC Data Contract Lab Certification/License Documentation QA/QC Reports Response/Corrective Action Reports QA/QC Audits/Assessments

Table A9-1 describes the documents and records that may be included in the QA reporting packages for management, field operations, laboratory operations, data management, and quality assurance functions.

Archival & Retrieval of Data Reporting Packages

Each Project Manager will keep accurate, updated versions of documents and data sets listed in Table A9-1 on file and accessible for the duration of the project or a specified lesser time. Information from site files is to remain retrievable for inspection and review during regular business hours. Storage of all field and laboratory data in electronic format is to be retained and accessible for at least three years following sample analysis. Electronic data, documents, and other information is backed up on a daily basis. After a minimum of three years, data may be permanently archived on microfiche, stored for a longer period of time, or destroyed, following guidelines set forth by DENR.

Section B1. Sampling Process Design

Overview of the Overall Design Approach Used in the Surface Water Quality Program

The sampling process design is established in the South Dakota Department of Environment and Natural Resources Water Quality Monitoring Strategy, November 2007. South Dakota DENR monitors surface waters in the state through an established ambient water quality sampling program, water quality surveys, complaint investigations, fish surveys, TMDL assessments, Surface Water Discharge permits, state non-point source implementation projects, and other projects. Most of SWQP data has been entered into the United States Environmental Protection Agency WQX and PCS and/or ICIS-NPDES (Integrated Compliance Information System) computer system, and in DENR's NR92 database and SWQP database respectively. Water samples are analyzed for physical, chemical, biological, and bacteriological parameters, as appropriate, to provide baseline data for the determination of potential effects of point and nonpoint sources of pollution. Baseline data are also used as a management tool to determine the effectiveness of control programs on existing point and nonpoint sources and for directing future activities. Water samples can show whether or not a waterbody is meeting its assigned water quality beneficial uses. The water quality standards consist of water quality criteria necessary to protect the assigned beneficial uses of state surface waters. All surface waters in the state are classified for one or more of the following beneficial uses:

- (1) Domestic water supply waters;
- (2) Coldwater permanent fish life propagation waters;
- (3) Coldwater marginal fish life propagation waters;
- (4) Warmwater permanent fish life propagation waters;
- (5) Warmwater semipermanent fish life propagation waters;
- (6) Warmwater marginal fish life propagation waters;
- (7) Immersion recreation waters;
- (8) Limited contact recreation waters;
- (9) Fish and wildlife propagation, recreation, and stock watering waters;
- (10) Irrigation waters; and
- (11) Commerce and industry waters.

All streams in South Dakota are assigned the beneficial uses (9) and (10) unless otherwise stated in the Administrative Rules of South Dakota (ARSD) Chapter 74:51:03. All lakes in South Dakota are also assigned the beneficial use of (9) unless otherwise stated in the same reference (74:51:02). Lakes listed in ARSD Chapter 74:51:02 are assigned the beneficial uses of (7) and (8) unless otherwise specified. ARSD Chapter 74:51:01 contains the established surface water quality standards including toxic pollutant standards for human health and aquatic life.

Section B2. Sampling Methods

Field personnel will adhere to sample collection procedures or approved and documented alternative protocols to ensure the collection of representative, uncontaminated water, sediment, tissue, and biological samples for laboratory analyses. If protocols are revised or altered, the deviations from the standard protocols must be documented.

Sampling methods, procedures, equipment, chain of custody, laboratory sheets, sample preservation, holding times, and other aspects of sampling procedures are detailed within the State of South Dakota's Surface Water Quality Program & Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling; Code of Federal Regulations, Title 40, Part 136; and/or this document's appendices.

Fish flesh sampling procedures are followed using the SWQP document South Dakota Fish Contaminants Sampling Protocol, January 2013.

The key aspects of quality control associated with sample collection for chemical or biological analyses are as follows:

- 1) Field personnel will be thoroughly trained in the proper use of sample collection gear and will be able to distinguish acceptable versus unacceptable water, sediment, or biological specimen samples in accordance with pre-established criteria;
- 2) Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination;
- 3) Sample gear or equipment that comes in direct contact with the water sample will be made of non-contaminating materials and will be thoroughly cleaned between sampling events according to appropriate cleaning protocol;
- 4) Sample containers will be of the recommended type and will be free of contaminants; and
- 5) Conditions for sample collection, preservation and holding times will be followed.

Corrective Actions for Field Activities

Field sampling personnel have primary responsibility for responding to failures in sampling or measurement systems. Deviations from standard operating procedures and/or this QAPP are documented in the comment section of field notes. If monitoring equipment fails, field personnel will report the problem in the comment section of their field notes and will not record data values for the variables in question. Actions will be taken to replace or repair broken equipment prior to the next field use. Data will not be used that was known to be collected with any faulty equipment. It is the combined responsibility of all members of the sampling crew to determine if the performance requirements of the specific sampling method have been met, and to collect an additional sample if required.

Section B3. Sample Handling & Custody Requirements

Proper sample handling procedures, containers, preservation for water, sediment, tissue, and biological samples are provided in South Dakota's Surface Water Quality Program & Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling; and the Code of Federal Regulations, Title 40, Part 136.

In the field, all samples will be packed on ice to ensure the sample temperature will be maintained at approximately 6°C. Samples will be shipped in coolers or insulated containers. All caps and lids will be checked for tightness prior to shipping, and the cooler will be taped and sealed. Chain of custody sheets or lab sheets are placed inside plastic bags inside the cooler or taped to the inside lid. All samples will be handled, prepared, transported and stored in a manner to minimize analyte loss, contamination, or biological degradation. Sample containers will be clearly labeled. Where appropriate (as in fish tissue), samples may be frozen to prevent biological degradation. Water sample containers will be made of glass or polyethylene bottles (or other material per analytical requirement) and preserved to a temperature of 6°C until analyzed. The receiving laboratory will examine the samples for correct documentation, proper preservation and holding times. Maximum holding times for specific analyses are described in South Dakota's Surface Water Quality Program & Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling; and the Code of Federal Regulations, Title 40, Part 136. Examples of labels are available in Appendix B.

Contract laboratories will follow sample custody procedures outlined in their QA plans. Copies of the contract laboratory QA plans are on file in the SWQP QAO office.

All samples remaining after successful completion of analyses will be disposed of properly. It is the responsibility of the personnel of each analytical laboratory to ensure that all applicable regulations are followed in the disposal of samples or related chemicals. If the laboratory is unable to properly dispose of the remaining samples after the successful completion of analyses, they may return the sample to DENR for proper disposal.

Chain of custody procedures require that possession of samples be traceable from the time the samples are collected until completion and submittal of analytical results. A complete chain-of-custody form or laboratory data sheet is to accompany the transfer of samples to the analyzing laboratory. An example of chain of custody sheets and the laboratory data sheet is available in Appendix D.

Laboratory Custody Log

Laboratories shall maintain custody logs sufficient to track each sample submitted and to analyze or preserve each sample within specified holding times. A sample is considered under custody if:

- It is in actual possession;
- It is placed in a secure area (accessible by or under the scrutiny of authorized personnel only after in possession).

Field Log

Field personnel are required to keep a field log for each sampling event or obtain a copy of the completed lab sheet. The following items must be recorded in the field log or lab sheet for each sampling event:

- Time of sample collection;
- Sample station ID numbers and ID numbers for any replicate or blank samples;
- The results of any field measurements (temperature, D.O., pH, specific conductance,

- turbidity) and the time that measurements were made;
- Qualitative descriptions of relevant water conditions (e.g. color, flow level, clarity) or weather (e.g. wind, rain) at the time of sample collection;
- A description of any unusual occurrences associated with the sampling event, particularly those that may affect sample or data quality.

Field personnel shall have custody of samples during field sampling. Chain of custody forms or laboratory data sheets will accompany all samples during shipment to contract laboratories. All water quality samples will be transported to the analytical laboratory directly by the field crew or by overnight mail or courier.

Section B4. Analytical Methods

The analytical methods and performance criteria that will be used for the SWQP/FPP are specified in South Dakota's Surface Water Quality Program & Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling; and the Code of Federal Regulations, Title 40, Part 136.

The SWQP/FPP do not have written contracts with laboratories, however, all laboratories that do work for the programs must document the methods, SOPs, and the data acceptability criteria of their analytical capabilities in their QA Manual.

The laboratory supervisor of each laboratory has primary responsibility for responding to a failure of analytical systems. Solutions which are consistent with the measurement objectives will be reached in consultation with the Project Manager.

The method numbers used by laboratories for each analytical procedure they perform for SWQP/FPP is available in each laboratory's respective QA Manual on file in the SWQP QOA office.

In the event the SWQP/FPP requests an analysis that is not specified in the SOP, the laboratory will use approved analytical methods and performance criteria. The use of nonstandard methods by the laboratory will require SWQP/FPP approval.

Corrective Action for Laboratory Activities

Failures in field and laboratory measurement systems may involve instrument malfunctions, failures in calibration, sample jar breakage, blank contamination, and quality control samples outside of the defined limits. In many cases, the field technician or lab analyst may be able to correct the problem. If the problem can be resolved by the field technician or lab analyst, then they will document the problem in their field notes or laboratory record and complete the analysis. If the problem cannot be resolved, then it is conveyed to the respective supervisor, who will make the determination if the analytical system failure compromised the sample results and should not be reported. The nature and disposition of the problem is documented in the data report that is sent to the SWQP/FPP Team Leader or Project Manager.

Section B5. Quality Control Requirements

Laboratory Quality Control Requirements

Laboratory quality control requirements are the responsibility of the laboratory and are outlined in the respective laboratory QA Manual. The QA manual for each laboratory used by the SWQP/FPP is on file in the SWQP QAO office. The SWQP QAO will periodically review laboratory quality control results. Any deficiencies with laboratory quality control results will be discussed with the laboratory manager and documented. A corrective action may be issued at the discretion of the SWQP QAO.

Quality Control Requirements

The SWQP/FP conduct quality control activities to ensure that sample collection is representative, sample integrity is maintained through sample preservation and handling, quality criteria is met for the application, and to assess the performance of sampling and laboratory personnel.

Blanks - Each type of sample bottle is filled with polished DI water and preserved and iced accordingly. The purpose of the blank is to verify that contaminants are not introduced during any part of sample collection, transport, or laboratory analysis. The blank may serve as a trip blank, an equipment blank, or a method blank. At a minimum, a complete set (A, B, C, D, M bottles) of blanks will be collected by the designated sampler on a quarterly basis and analyzed by each laboratory conducting routine analyses for the SWQP/FPP. Blank results will be acceptable if they are less than the reporting limit used by the laboratory. For results greater than the laboratory reporting limit, additional blanks will be submitted for those specific parameters. Data acceptability of additional blanks is determined by evaluating the group. Acceptable results are determined by the following equation where SD=standard deviation and μ =mean:

$$SD < \mu$$

Laboratory Splits - A laboratory split is an environmental sample that is equally split and sent to two (or more) separate laboratories for analysis. The purpose of the laboratory split is to verify that each individual laboratory (analyst, analytical method, equipment) produces equivalent and comparable analytical results. On a quarterly basis, water samples will be collected by the designated sampler and analyzed by each laboratory conducting routine analyses for the SWQP/FPP. Additional laboratory splits or an investigation will be conducted if the Relative Percent Difference (RPD) between results exceeds a control limit of 70 - 130% RPD. As part of the investigation, the SWQP QAO, Project Manager, or Team Leader may select specific analytical parameters and submit a sample of a known concentration. The SWQP QAO or Project Manager will compare the laboratory results for the known sample against the certified values.

Field Duplicates - Duplicate samples will be collected by all sampling personnel for all routine parameters at a frequency of five percent. A sample will be gathered, thoroughly homogenized by mixing, and split into the sample and duplicate sample. Duplicate sample quality control is an effort to examine total error because it evaluates sample collection, preservation, and analytical procedures.

Precision may be expressed as RPD where S=sample and D=duplicate. RPD is used to determine precision when only a small amount of data is available. SWQP/FPP will use a control limit of 80-120% RPD for original and duplicate sample values (except bacteria) and a control limit of 70-130% RPD for laboratory splits. A control limit of plus or minus the analyte reporting limit will be used if either the sample or duplicate value is less than five times the analyte reporting limit.

$$RPD = \frac{|S-D|}{(S+D)/2} * 100$$

E. coli bacteria duplicate results are assessed by calculating precision criteria and determining whether the log ranges are acceptable using the following procedure:

- 1) The data are arranged in pairs where D1 is the original sample and D2 is the duplicate.
- 2) The log of each field measurement is determined (L1, L2).
- 3) The difference (range) of the log values is calculated: $R = (L1-L2)$.
- 4) Using the absolute value of each range, a mean range (Mean-R) is determined.
- 5) The precision criterion is calculated by multiplying the Mean-R by 3.27 and rounding to the tenths place.
- 6) The precision criterion is compared to the range of each pair.
- 7) Acceptable - the log range value is lower than the precision criterion;
Unacceptable - the log range value is above the precision criterion.

On an annual basis, SWQP QAO or Project Officer will evaluate split, blank, and duplicate results to determine if acceptability requirements have been met. SWQP/FPP understands that there may be occasional exceedances of acceptability criteria and will allow up to a 10% margin of error. However, if exceedances to acceptability criteria are concentrated around a particular sampler, laboratory, site, or parameter, the 10% margin of error is not applicable. If results from the split, blank, or duplicate sample do not meet acceptability criteria, the Project Manager will notify the team leader and the laboratory manager to discuss the issue and to identify and correct the source of error.

Section B6. Equipment Testing, Inspection, & Maintenance Requirements

To ensure accurate and dependable use of equipment and measurement systems, all field sampling and laboratory equipment must be properly maintained and in good working condition. Backup equipment and common spare parts are available so that if any piece of equipment fails during use, repairs or replacement can be made as quickly as possible and the measurement tasks resumed.

All field equipment will receive preventive maintenance according to the manufacturer's manual or as otherwise specified in this QAPP. All equipment, including pH meters, specific conductance meters, DO meters, and multiprobe meters will be inspected for proper function, availability of spare parts, cleanliness, battery strength, etc. on a monthly basis by a designated SWQP sampler. DO membranes will be replaced on a quarterly basis or more often as needed. Prior to taking the equipment into the field, it is the field sampler's responsibility to ensure the equipment is in good working condition and the equipment kit contains spare parts. Common spare parts may include, but are not limited to: batteries, replacement probes, wipers, replacement membranes, solutions, and tools. Any issues with the equipment should be reported to the designated SWQP sampler. The equipment will be repaired, replaced or removed from service at the discretion of the designated SWQP sampler. An equipment list is available in Appendix C.

For instruments and equipment that are exclusively issued to regional field staff, it is the responsibility of that staff member to keep the equipment properly maintained and inspect prior to use.

Section B7. Equipment Calibration & Frequency

An instrument or device used in obtaining an environmental measurement must be calibrated using a known standard. Every instrument or measuring device has a specific procedure and type of standard used for calibration. The means and frequency of calibration recommended by the manufacturer of the equipment or devices as well as any instruction given in an analytical method will be followed. Records of calibration must be kept by the person performing the calibration and be accessible for verification during a laboratory or field audit.

Calibration of field equipment is required prior to use. Equipment to be calibrated includes, but is not limited to: DO meters; pH meters; specific conductance meters; multimeters (DO, pH, temperature, and specific conductance). Calibration log books are assigned to each piece of equipment requiring calibration and are maintained by the designated SWQP sampler and each sampler who uses and calibrates the equipment. Logbooks are to be kept with the equipment during storage, while in the field, and available for inspection during an audit. Calibration information is available in Appendix C.

Equipment deficiencies observed during calibration or use will be reported to the designated SWQP sampler. The designated SWQP sampler will take appropriate action to repair, replace, or remove the equipment from service as deemed necessary.

Section B8. Inspection/Acceptance Requirements for Supplies & Consumables

The procurement of supplies, equipment, and services must be controlled to ensure that specifications are met for the high quality and reliability required for each field and laboratory function. Upon receipt of materials or equipment, the designated SWQP sampler receives and signs for the materials. The items are reviewed to ensure the shipment is complete, and they are then delivered to the proper storage location. All items are inspected for quality of product. All chemicals are dated upon receipt. All supplies are stored appropriately and are discarded upon expiration date in accordance with local, state, and federal regulations. It is the responsibility of the designated SWQP sampler to discard chemicals, calibration solutions, and other community supplies upon expiration.

Section B9. Non-direct Measurements

The use of data obtained from sources other than DENR (non-direct measurements) is highly encouraged in data assessment/data interpretation activities, provided the data was collected in projects that were supported by approved and documented standard operating procedures, and included quality control measures. SWQP/FPP staff must use their professional discretion for the use of data obtained from other sources. The data is usually obtained in electronic format and should be inspected in raw form before data reduction and interpretation. However, DENR may also utilize data following data reduction and interpretation in the form of graphs, charts, averages, percentiles, etc.

Section B10. Data Management

Information management occurs on several levels. First, sample collection must be completed in a manner to ensure the quality, compatibility, and timeliness of the data collected. Once collected and organized, it must be available for review, analysis, and interpretation. Ultimately, the data may be used in several aspects: to monitor the quality of water in the state, monitor permit compliance, and provide general information to other interested organizations and the general public.

Field data results are recorded electronically by the meter used or hand recorded in a field book. In some situations, these results may also be recorded on the lab sheets. This field data will be reported electronically by the laboratory along with laboratory analytical results.

Sample results produced by a laboratory are reduced and validated at the laboratory and are the responsibility of the laboratory manager or designee. The data is sent electronically and/or by hard copy (per agreement between SWQP/FPP and laboratory) to the appropriate Project Manager.

Field data and laboratory sample data are imported into the DENR NR92 SQL database, or other database as appropriate. The data import is compared to the hard copy results to ensure accurate entry and data verification. Quality control sample results are compared to the original samples. Any deficiencies in quality control comparisons will be documented and handled accordingly.

The NR92 database is backed up nightly by South Dakota's Bureau of Information Telecommunications (BIT). BIT is responsible for all computer hardware and software with SWQP/FPP. Data is easily stored and retrieved through database functions. Upon request, data in the NR92 database is available for use by SWQP, DENR, other agencies, and the general public. The SWQP designated sampler is responsible for data maintenance in the NR92 database. SWQP water quality data from the NR92 database is exported to EPA's WQX database on a quarterly basis. SWQP water quality monitoring data is available in WQX under the organization identification "SDDENR_WQX".

Data that is reported to SWQP in the form of discharge monitoring reports (DMRs) by Surface Water Discharge permittees is entered into EPA's ICIS-NPDES database.

Hard copies of data results, project reports, and other reports related to inspections, investigations and/or other data collection activities are filed in the respective SWQP/FPP office as appropriate.

Section C1. Assessments & Response Actions

On an annual basis or as appropriate, the SWQP/FPP will undergo a quality assessment. The audit will be conducted by the SWQP QAO, Project Manager, or appropriate Team Leader. The persons conducting the assessment shall not audit their own work. The persons conducting the assessment will be familiar with the field sampling requirements of the program and this QAPP. These persons have the authority to issue stop work orders in the event that safety, quality, or other factors are compromised. Activities may include assessments of processes, systems, operators, data, records, etc. A report will be written by the person(s) conducting the assessment and will contain the results of the assessment, parties involved, date location, and other information as necessary. The information will be reported to the individuals involved, the Team Leader, and the Program Administrator. A copy will be stored in the SWQP QAO office for a minimum of three years.

In the event the assessment results in deficiencies and a corrective action is issued, the corrective action will be given to the Supervisor or Team Leader. Upon completion of the corrective action or at the end of the requested completion date, a written report of the corrected deficiencies will be submitted to the QAO. The SWQP QAO will verify the corrective actions are complete and store the report in the SWQP QAO office.

Section C2. Reports to Management

On an annual basis the SWQP QAO will submit a quality assurance report to the Program Administrators and the DENR QAO, who in turn reports the information to EPA in an annual report. The report should include the following as applicable:

- 1) Assessment results of measurement data accuracy, precision, and completeness;
- 2) Results of performance and system audits;
- 3) Quality assurance issues;
- 4) Corrective actions and results; and
- 5) Revisions to Standard Operating Procedures and Quality Assurance Project Plans.

Section D1. Data Review, Validation, & Verification Requirements

Data validation and usability are steps used to verify that the data or products conform to project objectives and if deviations occur, how this affects the usability of the data and resulting project outcome. Data review, verification, and validation are the responsibility of the appropriate Project Manager.

Section D2. Validation & Verification Methods

Data review is an in-house examination to ensure data has been properly recorded, transmitted, reduced, processed, calculated, etc. Data review may also include review of sample information including: preservation, temperature, holding times, laboratory duplicates and blanks, and/or missing data.

Data verification is used to evaluate the completeness, correctness, and/or conformance of the data

against the contractual procedure or method. This is accomplished by examining and confirming that the specified requirements for the project have been completed.

Data validation is an analyte or sample-specific process that evaluates the quality of data against the project specifications and end-use requirements. This is confirmed by evaluating compliance with analytical methods, SOPs, project plan requirements, and this QAPP. The purpose of validation is to assess and document sampling and analysis performance to determine the quality of the data.

Validation and verification of data is accomplished with a combination of internal and external quality control checks. Conformation with methods, procedures, laboratory QA/QC, and data quality objects will be assessed. Data validation and verification is the responsibility of the appropriate SWQP/FPP Project Manager.

Performance and systems audits are also an integral component of a quality control program. Performance audits are independent checks, conducted on a planned frequency, on components of the measurement system to arrive at a quantitative measure of the output quality. Systems audits are independent checks completed on a planned frequency on the total measurement system. Announced or unannounced system audits may be performed by the SWQP QAO, Team Leader, or Project Manager.

In the event that data or audits do not conform to quality standards, the SWQP QAO or Project Manager will take appropriate measures to determine the source of the nonconformance and remediate the situation. Issues are resolved as appropriate on a case by case basis.

Section D3. Reconciliation with User Requirements

The laboratory will analyze a minimum of ten percent duplicates and matrix spikes per batch of samples collected (or as outlined in their internal quality manual). These quality assurance samples will be within acceptable limits. If not, samples will be reanalyzed based on internal laboratory procedures. The SWQP/FPP also makes an assessment of precision and accuracy through the submission of blind field duplicates, laboratory splits and/or blanks.

Precision

Precision is a measure of the reproducibility of test results. A series of measurements on the same sample for the same parameter is compared to the average value. Precision is best expressed in terms of the standard deviation.

Generally, the industrial statistic $[I = |A - B| / (A + B)]$ is used.

Precision may also be expressed as Relative Percent Difference (RPD). RPD is used to determine precision when only a small amount of data is available. SWQP/FPP will use a control limit of 80-120% RPD for original and duplicate sample values greater than or equal to five times the analyte reporting limit; or a control limit of plus or minus the analyte reporting limit if either the sample or duplicate value is less than five times the analyte reporting limit.

$$RPD = \frac{|S-D|}{(S+D)/2} * 100$$

Accuracy

The degree of agreement of a measurement with an acceptable reference or true value usually expressed as the difference between the two values, the difference as a percentage of the reference value, and sometimes expressed as a ratio or as a percentage of spike recovery. The percent recovery for recovery of spikes into natural water backgrounds is determined by the formula:

$$\% R = \frac{\text{observed} - \text{background}}{\text{spike}} * 100$$

The determination of data acceptability will be the responsibility of each laboratory supervisor and/or Project Manager. The laboratory supervisor and project leader will ensure that data meets QA/QC requirements set forth by the laboratory QA manual, the SWQP/FPP SOPs, and this QAPP.

Any data that are rejected due to poor analytical or sampling technique may result in correction and/or corrective action. This may include:

- 1) Reviewing data for transcription or math errors;
- 2) Reviewing method with chemist/technician responsible for generating the data;
- 3) Finding ways to prevent problems in the future such as training or cross-checking with two analysts;
- 4) Training on proper sample collection and preservation; or
- 5) Re-collection or re-analysis of samples.

All correction and/or corrective action taken will be documented and maintained on file in the SWQP QAO's office. Corrective actions may also be initiated as a result of other QA activities, including:

- 1) Performance audits;
- 2) QA program audits;
- 3) Laboratory/Field comparison studies; or
- 4) Assessments of data, records, or documents.

Corrective actions and follow-up from these activities will be the responsibility of the SWQP/FPP Team Leader or QAO. Ultimately the Project Manager and department staff will decide if the data collected satisfies requirements as stated in the work plan for a specific task or project. If the data quality objectives have not been met, the final report will document deficiencies and state what additional information is needed to complete the process.

APPENDIX A FISH FLESH CONTAMINANT PARAMETERS

PCBs	Pesticides		
Total PCBs	DDT	Chlordane	Heptachlor Epoxide
	DDE	Dieldrin	Terbufos
Metals	DDD	Endosulfan I	Toxaphene
Total Cadmium	BHC-alpha	Endosulfan II	
Total Selenium	BHC-beta	Endrin	
Total Mercury	BHC-gamma	Hexachlorobenzene	

APPENDIX B SAMPLE BOTTLE LABELS

Project:										
Source:										
Code:	Initials									
Station:										
Date	Time									
<input type="checkbox"/> Surface	<input type="checkbox"/> Bottom	<input type="checkbox"/> Midwater								
<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/>	<input type="checkbox"/> R	<input type="checkbox"/> V	<input type="checkbox"/> H	<input type="checkbox"/> CN	<input type="checkbox"/> Met Dis	<input type="checkbox"/> Met Recov

APPENDIX C EQUIPMENT INSPECTION/CALIBRATION SCHEDULE

Meters/ Instruments	Calibration/ Inspection Frequency	Parameter	Standards
YSI 100 pH Meter	Monthly and Prior to Use	pH	pH 4.00, 7.00, & 10.01 Solutions
		Water Temperature	Verified against mercury thermometer
YSI 556 & ProPlus Multiprobe Meter	Monthly and Prior to Use	Water Temperature	Verified against mercury thermometer
		DO	Standardized by barometric pressure
		pH	pH 4.00, 7.00, & 10.01 Solutions
		Specific Conductance	1410 µmho/cm Conductivity Solution
YSI 30 Conductivity Meter	Monthly and Prior to Use	Specific Conductance	1410 µmho/cm Conductivity Solution
YSI 200 DO Meter	Monthly and Prior to Use	DO	Standardized by barometric pressure
YSI 650 and 6600 Sonde Multiprobe Meter	Monthly* and Prior to Use (*During Projects)	Water Temperature	Verified against mercury thermometer
		DO	Standardized by barometric pressure
		pH	pH 4.00, 7.00, & 10.01 Solutions
		Specific Conductance	1410 µmho/cm Conductivity Solution
		Turbidity	DI Water & 10 NTU Solution
		Chlorophyll A	DI Water
Bi-Metal Thermometers	Annual	Temperature	Verified against mercury thermometer
Mercury Thermometers	Annual	Temperature	Verified against NIST certified thermometer

APPENDIX D
SURFACE WATER QUALITY DATA SHEETS

Agency Code	SD DENR Water Quality Data				Rev 11/12
Sample Date	Time	Sampler Print/Sign			
Source Water				Station ID	
Site Location					
Project				Project ID	
Type of Sample	<input type="checkbox"/> Replicate	<input type="checkbox"/> Grab	<input type="checkbox"/> Integrated Vertical	Medium	<input type="checkbox"/> Water / Other
	<input type="checkbox"/> Blank	<input type="checkbox"/> Composite	<input type="checkbox"/> Integrated Flow	Relative Depth	<input type="checkbox"/> Surface <input type="checkbox"/> Bottom <input type="checkbox"/> Midwater

SPC/Cond @ 25c		µmho/cm	pH		SU	Field Comments
Dissolved Oxygen		mg/L	Air Temp		C	
Discharge		CFS	Water Temp		C	
Total Depth		Ft	Turbidity		NTU	
Sample Depth		Ft	Secchi Disk		Meters	
Width		Ft	Wind		mph	
Gage Stage		Ft	Elevation		Ft	
<i>All Samples must be packed in ice and chilled to 6 C</i>						

Liter A <input type="checkbox"/> Alkalinity <input type="checkbox"/> TSOL <input type="checkbox"/> TSSOL <input type="checkbox"/> VTSS <input type="checkbox"/> TDSOL <input type="checkbox"/> BOD <input type="checkbox"/> CBOD <input type="checkbox"/> CO3 <input type="checkbox"/> Hardness <input type="checkbox"/> K <input type="checkbox"/> Lab pH <input type="checkbox"/> Lab Cond <input type="checkbox"/> Nitrate <input type="checkbox"/> Cl <input type="checkbox"/> Fluoride <input type="checkbox"/> HCO3 <input type="checkbox"/> SO4 <i>Lab Filtered A Bottle</i> <input type="checkbox"/> Ca <input type="checkbox"/> Mg <input type="checkbox"/> Na	Liter B <i>2 mL H2SO4 pH<2</i> <input type="checkbox"/> Ammonia <input type="checkbox"/> NO3-NO2-N <input type="checkbox"/> TKN <input type="checkbox"/> Total P <input type="checkbox"/> COD Lab Comments	Bottle C <i>Na2SO3 tablet if Chlorinated</i> <small>Note: 250 mL of sample required if requesting more than one of the following:</small> <input type="checkbox"/> * count/100 mL <input type="checkbox"/> Total Coliform <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> Enterococci* <input type="checkbox"/> E Coli* <input type="checkbox"/> Fecal PFG Oil Grease 2 mL HCL <input type="checkbox"/>	Bottle D <i>100 mL Field Filtered</i> <i>0.25 mL H2SO4</i> <input type="checkbox"/> TDP <input type="checkbox"/> DIN <input type="checkbox"/> Ra 226 <input type="checkbox"/> Ra 228 Bottle R Bottle CN <i>500 mL NaOH pH >10</i> <input type="checkbox"/> CN <input type="checkbox"/> WADCN Bottle H <i>Liter Glass Amber</i> <input type="checkbox"/> TPH Amber Bottle V <input type="checkbox"/> VOC <input type="checkbox"/> TOC <input type="checkbox"/> TPH Vial <input type="checkbox"/> DOC Bottle E <i>Field Filtered</i> <input type="checkbox"/> SO4 <input type="checkbox"/> Fluoride <input type="checkbox"/> Cl <input type="checkbox"/> HCO3	Metals 100mL each Add 0.25 mL HNO3 <table style="width:100%;"> <tr> <th style="text-align: 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FISH TISSUE FIELD DATA COLLECTION / CHAIN OF CUSTODY FORM

Waterbody: _____ StationID: _____ County: _____

Sampler(s): _____ Sample Date: _____ Sample Time: _____

Activity Type: _____ Survey Type: _____ Medium: biological tissue GF&P Region: _____

ProjectID: Fish Flesh Contamination Project Agency Code: 5210 Collection Gear: _____ LakeID: _____

<p>Sample ID: _____</p> <p>Species: _____</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Fish Number</th> <th style="text-align: left;">Length (mm)</th> <th style="text-align: left;">Weight (g)</th> <th style="text-align: left;">Sex (if known)</th> </tr> </thead> <tbody> <tr><td>1</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>2</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table> <p><u>Requested Analysis:</u></p> <p style="text-align: right;">Mercury: <input type="checkbox"/></p> <p style="text-align: center;">Metals, PCB's, and Pesticides: <input type="checkbox"/></p> <p>Other: _____</p>	Fish Number	Length (mm)	Weight (g)	Sex (if known)	1	_____	_____	_____	2	_____	_____	_____	3	_____	_____	_____	4	_____	_____	_____	5	_____	_____	_____	<p>Sample ID: _____</p> <p>Species: _____</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Fish Number</th> <th style="text-align: left;">Length (mm)</th> <th style="text-align: left;">Weight (g)</th> <th style="text-align: left;">Sex (if known)</th> </tr> </thead> <tbody> <tr><td>1</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>2</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table> <p><u>Requested Analysis:</u></p> <p style="text-align: right;">Mercury: <input type="checkbox"/></p> <p style="text-align: center;">Metals, PCB's, and Pesticides: <input type="checkbox"/></p> <p>Other: _____</p>	Fish Number	Length (mm)	Weight (g)	Sex (if known)	1	_____	_____	_____	2	_____	_____	_____	3	_____	_____	_____	4	_____	_____	_____	5	_____	_____	_____	<p>Sample ID: _____</p> <p>Species: _____</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Fish Number</th> <th style="text-align: left;">Length (mm)</th> <th style="text-align: left;">Weight (g)</th> <th style="text-align: left;">Sex (if known)</th> </tr> </thead> <tbody> <tr><td>1</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>2</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table> <p><u>Requested Analysis:</u></p> <p style="text-align: right;">Mercury: <input type="checkbox"/></p> <p style="text-align: center;">Metals, PCB's, and Pesticides: <input type="checkbox"/></p> <p>Other: _____</p>	Fish Number	Length (mm)	Weight (g)	Sex (if known)	1	_____	_____	_____	2	_____	_____	_____	3	_____	_____	_____	4	_____	_____	_____	5	_____	_____	_____
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Relinquished by (signature) _____

 Date/Time

Received by (signature) _____

 Date/Time

White Copy – To the laboratory with the fish samples

Yellow Copy – To DENR, Surface Water Quality Program, 523 East Capitol Avenue, Pierre, SD 57501

Pink Copy – Retain for your records

January 2014

Fish Tissue Contamination Field Sheet - Individual Fish - Hg

Waterbody _____ County _____ StationID _____

Date _____ Time _____ Survey Type intensive Activity Type individual GFP Region _____

ProjectID Fish Flesh Contamination Agency Code 5210 Collection Gear _____ Page ____ of ____

Samplers _____ Medium biological tissue

SampleID	Species	Length (mm)	Weight (g)	Sex	Analysis	Lab Barcode	Comments
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		
					Hg		



Department of Environment and Natural Resources
 523 E Capitol, Pierre, SD 57501 • 605-773-3151

Chain of Custody Record

6/1/2011

DNR Program		Preservative Filtered (Y/N) Analyses Requested						For Lab Use Only				
Project ID								Sample Condition				
Agency Code								Sample Temperature				
Contact Name/Phone								Lab Comments				
Sampled by												Turnaround Requested
		Standard				Rush						
	Station ID	Sample Date	Sample Time	Medium	No. of bottles						Comments	Lab #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
Relinquished by (signature)		Company Name	Date/Time	Received by (signature)		Company Name	Date/Time					