South Dakota Quality Assurance Project Plan for the Rapid City Streams Monitoring Project

Department of Agriculture and Natural Resources

Watershed Protection Program

July 11, 2025

Applicable until December of 2027

Version I

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A3: List of Tables

A4: Problem Definition/Background

South Dakota has many waterbodies relative to its size and population when compared to most other US states. Assessing all waters of the state is challenging because of the large geographic area, numerous waters, and limited resources. Many waters that have been assigned assessment unit IDs (AU_IDs) have been monitored sufficiently to conduct Clean Water Act Section 303(d) assessment that determine if a water is supporting its assigned beneficial uses or is impaired in regard to those uses. Clean Water Act Section 305(b) requires a comprehensive overview of water quality conditions across the state, serving as a baseline for understanding water quality and identifying areas needing attention. Some waters, because of their geographic isolation or lower priority for monitoring in relation to other waters, do not have a dataset sufficient for 303(d) and 305(b) assessment.

The South Dakota DANR Water Quality Monitoring (WQM) network samples many waters across the state on a monthly or quarterly basis. Those waters that are sampled monthly generally have a dataset sufficient for assessment. Waters that have been assigned AU_IDs that are not part of the WQM network generally do not have data sufficient for assessment. Many of these waters are in more remote areas of the Black Hills and are comprised of smaller streams that slip through the cracks of statewide monitoring projects. SD DANR conducts the Rotating Basins monitoring project that provides additional data for these waters, but data gaps remain. These waters need increased, consistent monitoring to produce a dataset sufficient for 303(d) and 305(b) assessment. The purpose of the Rapid City Streams Monitoring Project is to produce water quality data to supplement data from the existing programs mentioned previously.

This project is funded with Clean Water Act Section 604(b) funds. The EPA point of contact for the 604(b) grant is Erika Larsen.

For this grant opportunity, data acquisition, analysis and storage will follow SD DANR WPP SOP Vol 1, the SD DANR WPP program QAPP and the SD DANR Quality Management Plan (QMP) (Revision VI, January 2023).

A5: Project Description and Schedule

The 25 stream sites (Table 2 in Appendix A) included in this study will be sampled on a roughly monthly basis for two years. At least five E. coli samples will be collected per year, and an effort will be made to collect several Total Suspended Solids samples during the winter to best represent base flow and seasonally influenced conditions. Stream sites will be sampled for *E. coli* and Total Suspended Solids (TSS) during the recreation season of May 1 to September 30 and will be sampled only for TSS outside the recreation season. One site, 460156, on the Cheyenne River, will be monitored for Sodium Adsorption Ratio. Measurements for dissolved oxygen, specific conductance, water temperature, and pH will be collected with a YSI multi-meter at every site.

A6: Data Quality Objectives and Criteria

The primary data driven objective for the Rapid City Streams Monitoring Project is to collect data sufficient to meet 303(d) assessment minimum data requirements. For streams, the minimum data requirement is a total of 20 samples collected in the past five years.

In addition to the SOP requirements from EPA Region 8, DANR will follow the criteria for deciding if data quality objectives have been met in terms of Completeness, Representativeness, Comparability, Precision, and Accuracy.

Completeness is a measure of the amount of valid data obtained from measurement systems compared to the amount that expected to be obtained under optimum conditions. For a set of data to be utilized with confidence to assess a parameter for a waterbody, the data must be complete, i.e., there must be enough valid data from analysis to facilitate making the assessment. The dataset will be considered complete as long as 90% of planned samples are collected and analyzed.

Representativeness expresses the degree to which data accurately and precisely represents the characteristics of that which is being measured. All samples will be collected in such a manner and at such sites to be representative of the medium from which they are taken. Data collection sites will be located within stream assessment units so as to represent the assessment unit being monitored.

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be measured and assessed through the use of standard, published sampling and analytical data. The comparability of data is achieved by the commitment of SD DANR staff, local coordinators, project partners and contracted laboratories to use standardized methods, where possible, including the SD DANR Standard Operating Procedures (SOP) Volume 1 and 2, EPA-approved analytical methods, standard methods, or documented modifications thereof which provide equal or better results. All analytical results will be reported in appropriate concentration values and units to facilitate comparison.

Precision 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). Precision will be assessed through field duplicate and lab duplicate analyses. Collection of field blanks will also ensure there is no cross contamination.

Accuracy is a measure of how much of the constituent actually present is determined. It shows how close the sample value is to the “true” value. Accuracy will be assessed through the project by the collection of field blanks and duplicates. Also, following QA/QC practices will help ensure that accuracy is accounted for.

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest. The term "detection limit" is closely related to sensitivity and is often used synonymously. All detection-limits for lab analytes are adequate for determining whether sample results meet project goals and SD water quality criteria for E. coli, TSS, dissolved oxygen, specific conductance, pH, and water temperature.

Please refer to Section 7.0 and 8.0 of the SD DANR WPP SOP Volume 1 for measurements of precision and accuracy and specific procedures for corrective actions.

A7: Distribution List

The current version of the Quality Assurance Project Plan (QAPP) will be posted on the DANR website. It will also be saved under the file pathway; N:/WATRSHED/QAQC – SOP/QAPP.

Table 1. Distribution List

Name	Title
Bill Smith	Division Director
Paul Lorenzen	Administrator Watershed Protection Program, Manager II
Alan Wittmuss	Team Leader/Environmental Scientist Manager I Assessment Team
Kris Dozark	Team Leader/Environmental Scientist Manager I Implementation Team

All personnel involved with assessment and implementation sampling activities for the South Dakota Department of Agriculture and Natural Resources, Watershed Protection Program (SD DANR WPP) shall receive a copy of this plan and therefore should be thoroughly familiar with WPP sampling policies, management structure, and procedures. Compliance with QAPP elements results in data collection and management that is valid and suitable for use in implementation, water quality and (TMDL) Total Maximum Daily Load assessments projects, other programs, and projects. This QAPP will be made available upon request.

A8: Project Organization

The following individuals are responsible for the design and implementation of this project:

Roles and Responsibility:

The Rapid City Streams Monitoring Project officer will be responsible for project design and coordination. Jesse Wilkens will serve as the project officer for the Rapid City Streams Monitoring Project and will be responsible for coordinating field work efforts. DANR staff will collect all samples, and the project officer will coordinate with Mid Continent Testing Labs, Inc. in Rapid City, SD for assessment of samples.

Management Responsibilities:

No extramural funding is associated with this project.

Quality Assurance (QA) Responsibilities:

The DANR QA Office, Tyler Frideres, will be responsible for interpreting the validity of the data. Mid Continent Labs analysts will be responsible for conducting the laboratory analyses according to their approved SOP's and ensuring that all field documentation submitted with samples has been satisfactorily completed. The project officer will ensure that all samples are collected according to the laboratory guidance from the Labs and the SD DANR WPP SOP.

Field Responsibilities:

All samples will be collected by state staff and will follow all QAPP guidance and SOP methods.

Laboratory Responsibilities:
Mid Continent Labs will be responsible for lab analysis of water samples.

Laboratory and Field Audit Responsibilities:
Laboratory audits will occur as specified in the Mid Continent Labs laboratory QA/QC documentation. All field sampling will be conducted by DANR staff. The DANR WPP QA/QC officer may conduct field audits if desired.

The project officer will ensure that the QAPP is followed as approved; and that all DANR staff have access to the most current version of the QAPP and all necessary documents to sample. Personnel will be informed of all requirements for the project prior to any sampling.

QAPP Review and Approval Responsibilities:
Staff included on the signature page of the QAPP have the authority and responsibility in their roles to review and approve this QAPP.

Goals and Objectives:
The goal of this monitoring project is to sample waters in the Black Hills that have been assigned AU_IDs but lack sufficient data for 303(d) and 305(b) assessment. Streams in South Dakota require a minimum of 20 samples over the preceding five years to meet minimum data requirements for 303(d) assessment. Waters will be sampled a total of 10 times over the course of each year, resulting in a total of 20 samples over the course of the two year project. However, only a portion of those samples will include *E. coli* samples. *E. coli* will only be sampled during the recreation season from May 1 to September 30 of each year and at least 5 of the 10 samples collected each year must include an *E. coli* sample, resulting in a total of at least 10 *E. coli* samples over the course of the two year project. Waters with a quarterly WQM site, where E. coli is collected twice per year, will meet minimum data requirements for *E. coli* if all waters are sampled as scheduled. However, waters not sampled as part of the WQM network will need to be sampled for *E. coli* in subsequent years to meet minimum data requirements. As such, this project will likely continue after the initial two year project concludes.

The data collected for this project will be stored in the SD DANR Wiski and NR92 water quality databases to add to existing datasets. The results will also provide data to SD DANR Watershed Protection Program and Water Quality Program staff to use when assessing waters for 303(d) and 305(b) assessments.

A9. Project Quality Assurance Manager Independence

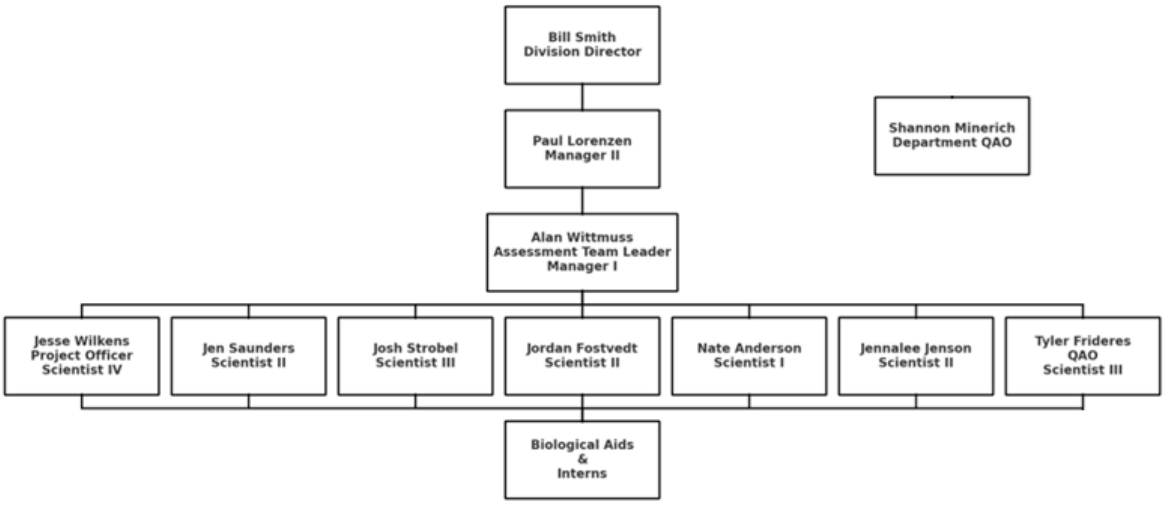
The Quality Assurance Officer for WPP, Tyler Frideres, will be involved in the process of developing QA/QC report building, but he will not be involved in migrating data, checking results from data assessment or is involved in the web portal, and thus remaining independent from the data processes.

A10. Project Organization Chart and Communications

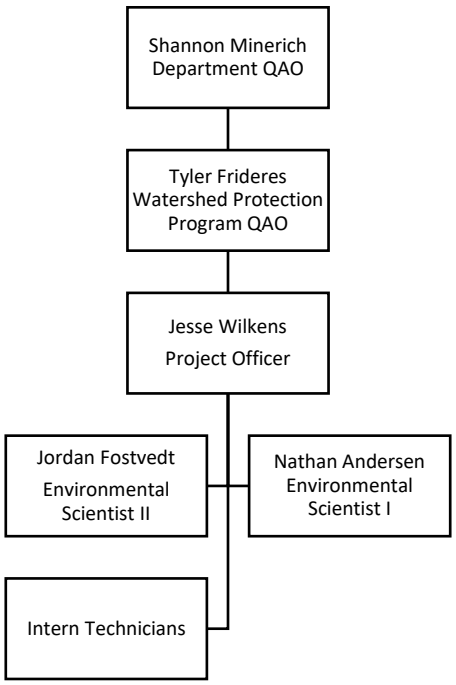
The following organizational chart outlines the roles, responsibilities, and reporting structure for personnel involved in the Rapid City Streams Monitoring Project. This structure ensures clear lines of authority, promotes accountability, and supports the consistent implementation of quality assurance measures throughout the duration of the project. While Jesse Wilkens serves as the Project Officer responsible for coordinating project activities and data collection efforts, all scientific staff ultimately report to Paul Lorenzen, the Assessment Team Manager. Interns (biological aides) are directly supervised by the project's core scientific staff, ensuring day-to-day tasks are performed in accordance with established protocols.

Standard Procedures for communications involving quality assurance, such as elevation discrepancies and QAPP non-conformances, process improvements, and seeking project concurrence and approvals follow the direction of quality assurance oversight. The project officer or other staff may relay information about quality assurance concerns to Tyler Frideres, who serves as the Program QAO and reports directly to Shannon Minerich, the Department QAO. If necessary, the Department QAO will address issues with an EPA Officer. This structure facilitates effective communication, oversight, and adherence to EPA data quality standards.

Organizational Chart: Rapid City Streams Monitoring Project



Quality Control Communication Chart: Rapid City Streams Monitoring Project



A11: Special Training and Certification

Jesse Wilkens, the Project Officer (PO), holds ultimate responsibility for ensuring the quality and integrity of all data collected under this project. In this capacity, the PO oversees a team composed of experienced full-time employees and closely supervised biological aides. The PO is responsible for documenting training and this documentation will be provided in the Quality Teams training log. Training documentation consists of a checklist of relevant techniques and procedures related to water quality sample collection that is completed by the PO during staff training. Staff participating in the project will be trained at the beginning of each field season, which is during the spring of the year when interns start participating in the project. Training regarding instrument calibration will be performed in a lab setting at the SD DANR Rapid City office, while training for sample collection will be performed in the field at project sample sites.

All personnel involved in environmental information operations (EIO) are selected based on their qualifications, training, and relevant experience. Full-time staff possess the technical expertise necessary to meet project objectives and are audited routinely, while biological aides receive direct supervision and guidance to ensure consistency with established protocols. The project officer maintains continuous oversight of field activities to ensure that all personnel conducting EIO perform their duties in accordance with project standards and EPA requirements.

There are no specialized certifications or trainings required for the work described in this project. Training consists of water sample collection and handling procedures, for which special certifications are not provided or available. Training will be provided in the field by the project officer as new staff participate in the project. The project officer will demonstrate techniques for sample and measurement collection, then observe trainees as they perform the techniques.

A12: Documents and Records

Documentation and record collection is an integral part of maintaining proper QA protocols. The project officer, Jesse Wilkens, will ensure that before any sampling is done, that all partners have a copy of the most current version of the project QAPP and all relevant SOPs. Prior to project sampling, Jesse will also ensure that all sampling sites have been entered into the NR92/WISKI database with the correct results and coordinates. All water quality data will be stored indefinitely on a SQL server and backed up to the state IT system. South Dakota DANR will ensure that all field notes documented will be sent to EPA Region 8 upon their request.

This project will produce many new water quality, habitat and biological documents and records. Those records will be stored in the NR92 and KISTERS WISKI databases, which are maintained and backed up by the state's Bureau of Information and Telecommunications (BIT). All documents and records outside of the WISKI Database will be managed and stored by the project manager and will be published in the DANR N Drive and website as necessary. The project manager will retain any external documents and records after the completion of the project. All records and documents will be maintained in accordance with the South Dakota Bureau of Administration Records Management retention provisions found at: https://boa.sd.gov/central-services/records-management.aspx.

This QAPP will be reviewed on an annual basis by the project manager and updated as necessary. This review and any changes will be included in the WPP QA/QC officer's annual report to the DANR QA/QC officer and the WPP managers. Quality system documents are prepared by the DANR QA officer or the program quality manager. Other quality-related documents, such as SAPs, PIPs, or other program forms are prepared by the project officer. During document development, revision, and approval reviews, the document may be reviewed by other team members, the team leader, and possibly the program administrator. Documents are updated based on changing needs and/or requirements, to better reflect actual conditions, and to provide continual improvement.

B. Implementing Environmental Information Operations

Guidance, tools, and templates used to develop this QAPP include the Quality Assurance Project Plan Standard (CIO 2105-S-02.1), EPA Region 8 QAPP Review Crosswalk (CIO-2105-S-02). Guidance was also provided by Watershed Protection Program QAQC officer Tyler Frideres and technical support was provided from DANR QA/QC officer Shannon Minerich.

B1. Identification of Project Environmental Information Operations

EIOs will be conducted in accordance with standardized field protocols designed to meet the specific objectives of the project. Standardized field protocols for stream sample collection and multi-meter measurement collection are outlined in SD DANR WPP SOP Volume 1. These protocols ensure that data collection methods are consistent, scientifically sound, and aligned with the overall purpose of the monitoring project. Activities such as water quality sampling are carried out using approved procedures that support reliable, reproducible results that can be used to supplement existing water quality data that can be used to make waterbody support decisions.

To satisfy the project's data quality objectives and meet performance and acceptance criteria outlined in Elements A4 and A6, all data collection efforts are designed with precision and quality control in mind. Methods are selected and implemented to ensure that collected data are representative, comparable,

and meet defined thresholds for accuracy and completeness. Quality assurance and quality control measures are integrated throughout the EIO process, and all personnel are trained to adhere to these standards. Continuous oversight by Jesse Wilkens and periodic reviews and internal audits by the QAO ensure ongoing compliance with data quality expectations.

B2. Methods for Environmental Information Acquisition Sampling Design (Experimental Design):

Sites will be sampled routinely for total suspended solids and *E. coli*. Field measurements for dissolved oxygen, pH, specific conductance, and water temperature will also be recorded.

Sampling Schedule:

A total of 10 samples for Total Suspended Solids will be collected each year. *E. coli* sampling will occur between June 1 and September 30 in the years 2025 and 2026. At least five *E. coli* samples will be collected per calendar year. TSS samples will be collected at all 10 site visits per year regardless of calendar month. Samples will not be collected on a strict monthly basis but rather when staff are available for field sampling. Ideally, 5 samples will be collected during the recreation season that include *E. coli* samples, and 5 samples will be collected outside the recreation season to represent TSS conditions during periods of low flow. If project goals have not been achieved after 2026, the project may continue into future years.

Sample Identification:

Sampling locations have been selected by the State of South Dakota and can be found in Appendix A. Sampling locations will also be identified on the chain of custody form when a sample is sent to Mid Continent Labs.

Analytical Methods

Water samples will be analyzed by Mid Continent Testing Labs, Inc. in Rapid City, SD. E. coli samples will be analyzed using method SM 9223 Quanti-Tray. TSS samples will be analyzed using method SM 2540 D.

Turnaround Time:

The standard turnaround times from Mid Continent Labs are acceptable and if faster turnaround times are required the lab will be notified via comments on the chain of custody form or via personal communication.

Sample Bottles:

Samples will be collected following the protocols in Standard Operating Procedures for Field Samplers Volume I. TSS samples will be collected in a 250 mL bottle provided by Mid Continent Labs. *E. coli* samples will be collected in a 125 mL sterile bottle supplied by Mid Continent Labs. Sodium adsorption ratio samples will be collected in a 1 L bottle, filtered, with filtrate transferred to a 250 mL bottle supplied by Mid Continent Labs.

Sampling Methods:

Water quality samples are collected using the following methods:

1. Calibrate YSI multi-probe sonde.
2. Fill the cooler with ice and label bottles.

3. Put on nitrile gloves.
4. Rinse the TSS bottle and cap three times with sampling water.
5. Do no rinse the E. coli bottle.
6. Collect grab samples by positioning the open end of the bottle toward the current flow and away from the hand of the collector. Plunge the bottle to avoid surface scum and fill to the bottle shoulder at a depth of 15 cm to 30 cm.
7. To preserve the sample bottles, place them in a cooler with ice.
8. All sample bottles must reach and maintain a temperature of 6°C or less.
9. Take a multi-meter measurement from the stream by placing it in a flowing section of the stream and allowing the values to stabilize.
10. Record YSI values for water temperature, specific conductance, pH, and dissolved oxygen on the lab datasheet.
11. Deliver the sample bottles to Mid Continent Labs within the proper hold time of 24 hours for E. coli. If only TSS is collected, it must be delivered within 48 hours. Ensure that preservation temperature is kept.

When sampling site 460156 on the Cheyenne River, a dissolved metals sample will be collected to calculate the sodium adsorption ratio. The sample will be collected using the following method:

1. Label 250 mL bottle that will be used to store the filtered sample.
2. Put on nitrile gloves.
3. Rinse the 1 L collection bottle 3 times with stream water.
4. Position the open end of the sample bottle towards the current flow and away from the hand of the collector.
5. Collect the sample by positioning the open end of the bottle toward the current flow and away from the hand of the collector. Plunge the bottle to avoid surface scum and fill to the bottle shoulder at a depth of 15 cm to 30 cm. Fill to the bottle shoulder.
6. Dissolved metals samples require field filtration using a 0.45 micron disposable filter. Field filtering must be done on site within 15 minutes of sample collection. Construct and thoroughly rinse the field filtration device with de-ionized (distilled) water prior to assembly; once rinsed, assemble the field filtration device with a new filter (47 mm diameter, 0.45 micron pore-size filter) and vacuum filter/rinse approximately 250 mL of distilled water through the filter.
7. After vacuum filtration, empty the distilled water from the bottom reservoir, by removing both the cap and the hose from the vacuum pump from the bottom reservoir spouts and pour the water out of one of the spouts down the drain or onto the ground. DO NOT remove the upper chamber during the rinsing operation.
8. Pour enough sample water (minimum of 120 mL) from one of the extra one-liter bottle(s) into the upper chamber of the filtration device and filter. If the filter clogs due to excessive amounts of suspended sediment or algal material, see step 9 below.
9. If 100 mL cannot be filtered at one time because of excessive suspended solids or algae, pour the portion of filtered water in the bottom reservoir into the metals bottle, cap, and put on ice in a sample cooler, then remove the clogged filter, and repeat the process above (“j”, “k”, and “l”).
10. After filtering is complete pour the filtered water in the lower receiver into the pre-labeled 250

mL plastic bottle.

11. Preserve the sample by adding 1-mL concentrated HNO3 (nitric acid) to the sample.
12. If you are unfamiliar with the buffer capacity of the water being sampled (feedlot waste, point source discharges, mining wastewater, etc., may be highly buffered), ensure you verify the pH with pH test paper (pH < 2 standard units) to ensure enough preservative has been added. When finished, tighten the cap securely.
13. Re-check the SD DENR WPP bottle label on the bottle to ensure that all data is correct and place the acidified bottle into the storage cooler with loose ice (6° C).
14. Deliver samples to Mid Continent Labs within 28 days.

All sampling should follow the standard operating procedures for DANR. SOP methods can be found in the SD DANR WPP SOP Volume 1.

Site Disturbance:

Ensure that the sample site is not disturbed prior to sample collection. When collecting samples, be sure not to disturb sediment that would flow into the sample bottles.

Field Duplicates:

A field duplicate is collected in the same manner as a regular sample. The duplicates are given their own sample number and labeled as “duplicate” for the sample type. The field duplicate sample is factored into the total number of samples. A field duplicate will be collected for every 10 samples.

Blank:

A field blank is handled similarly to a regular sample. The blanks are given their own sample number and labeled as “blank.” The field blank sample is factored into the total number of samples (e.g., one sample plus one duplicate and one field blank for a total of three samples). Field blanks should be filled with deionized water. A blank will be collected for every 10 samples.

Corrective Actions:

Corrective actions for deficiencies will be addressed immediately in the field or after lab receipt (documentation errors). Corrective actions include but are not limited to; discarding improperly collected or handled samples, re-sampling, and correcting labels or COC’s. The State of South Dakota will work to fix any issues or deficiencies with sample collection and documentation.

Existing Information:

As this is a new project there is no existing information. This project supplements existing data in the NR92 and WISKI databases for the purpose of 303(d) and 305(b) assessment.

Environmental Technology:

Environmental technology is not use for this project and is therefore not addressed in this QAPP.

B3. Integrity of Environmental Information

For water samples, all bottles will be stored on ice or refrigerated (4-6°C). All sample bottles will be delivered to Mid Continent Labs before the 24 hour hold time for the *E. coli* bottle and can only be

accepted Monday – Friday. Coordination of sampling schedule will be arranged to accommodate this, and sampling will occur Monday – Thursday.

The samples will be received accompanied by the datasheets containing the agency code, sample date, time, sampler, source water, station ID, site location, project, project ID, type of sample, medium, depth, YSI measurements, bottle types sent and analytes to be tested.

Lab certification and accreditation is verified by obtaining the relevant documentation from participating laboratories and including it in this QAPP. The certification and accreditation documentation for Mid Continent Labs is provided in Appendix D.

B4: Quality Control

South Dakota DANR staff will meet quality assurance/quality control (QA/QC) requirements and ensure that procedures including field duplicates, field blanks, field techniques, holding times, and datasheets are completed. Jesse Wilkens, the project officer will evaluate blanks and duplicates of all samples and will check equipment to determine if acceptability requirements have been met. The South Dakota DANR field staff will follow their own QA/QC requirements of 20% (10% blanks and 10% replicates). Mid Continent Labs will also follow their procedures for QA/QC. For more information on how precision, accuracy, and completeness is calculated refer to the current version of the Watershed Protection Program Quality Assurance Project Plan (QAPP) on the DANR website at https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications/DANR_QAPP_2022.pdf. It will also be saved under the file pathway: N:/WATRSHED/QAQC – SOP/QAPP.

Field Techniques:

DANR field staff will ensure that all samples are collected using proper techniques and following EPA approved methodology.

Field Duplicate:

The field duplicate samples will provide an indication of variability withing the sampling. Selection of sites for duplication is determined by field staff.

Field Blank:

A sterile bottle containing ultra-pure deionized water will be provided to the State Public Health Lab or Mid Continent Labs as a field blank. The blank sample should be treated like all other samples for the remainder of the field visit, during transportation and shipment.

Holding Times:

A maximum holding time of 48 hours for the TSS bottle and 24 hours for the *E. coli* bottle will be followed for the project as identified in the DANR SOP and analytical methods.

Chain of Custody Form:

Chain-of-Custody forms are used to handle and track samples from field collection to delivery to Mid Continent Labs. Chain-of-custody forms will be supplied by SD DANR and will be held until completion of the project. Chain-of-custody forms for this project can be found in Appendix B.

Existing Information:

This project is not specifically responsible for reviewing other water quality data or any models containing existing information.

B5: Instrument/Equipment Testing, Inspection, and Maintenance

The YSI multi-probe will be inspected prior to the sampling trip to ensure that all probes are undamaged and working properly. The temperature probe will be tested against a NIST thermometer yearly to monitor accuracy and variation. The probe can be cleaned as needed by submerging in hot tap water and dishwashing soap. A lab rinse bottle can also be used to flush out the ports. If necessary, the YSI can be sent to the manufacturer for inspection and maintenance as well.

Any unexpected results during testing, inspection, and maintenance should be reported to the project officer.

Instrument/Equipment Calibration and Frequency:

Calibration of the YSI multi-probe should be completed the morning of sampling at the sampling location. Optical dissolved oxygen (ODO) will be calibrated by placing the sensor in the calibration cup with 1/8 of an inch of water and the threads of the cup should be loosened from the base. Conductivity and pH will be calibrated by placing enough calibration solution in the clean calibration cup to cover the sensor. Conductivity calibration solution for DANR is produced by the State Public Health Lab and is 1,420 µs/cm at 25°C. pH will be calibrated at both 7.00 and 10.00 at 25°C. When calibrating, follow the on-screen guide on the YSI multi-probe for each calibration. Calibration is documented internally on the YSI.

Any calibration errors should be communicated to the Project Officer prior to sampling. Additional spare parts for multiparameter sondes are available throughout the field season and are maintained by Equipment Manager Jordan Turgeon.

B6: Inspection/Acceptance of Supplies and Consumables

Inspection and acceptance of supplies and services for the Rapid City Streams Monitoring Project are handled through a defined quality control process designed to ensure that all equipment and materials meet performance standards prior to deployment. Jordan Turgeon, the Equipment Manager, is responsible for conducting annual checks of all field equipment and supplies. This includes evaluating the condition and functionality of instrumentation, verifying calibration standards, and ensuring that all equipment is field-ready.

As the Quality Assurance Officer (QAO), Tyler Frideres oversees the documentation and verification process. Equipment and supply logs are maintained and updated annually as part of the QA/QC Annual Report. This log provides traceable documentation of inspection outcomes and is reviewed to ensure consistent adherence to project standards. Routine testing of instrumentation is performed throughout the field season, including verification of temperature probes against NIST-traceable thermometers obtained from the State Health Lab to ensure accuracy and traceability.

Vendors supplying scientific instrumentation or calibration standards are required to provide supporting documentation, such as calibration certificates and traceability records, confirming that equipment meets applicable performance specifications. It is the vendor's responsibility to ensure that supplied items conform to all applicable S-2 requirements and to disclose any limitations or deviations at the time of delivery.

B7: Environmental Information 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 assess water quality of the waterbody based on beneficial use and provide general information to other interested organizations and the general public.

Field notes for each site will be recorded on a field datasheet, and include the following:

- Sampler(s) name(s)
- State location ID
- Date sample collected
- Time sample collected
- Additional observations

Water quality sample results, field measurements, and metadata from this project are transmitted via email in Microsoft Excel spreadsheets from Mid Continent Labs to the Watershed Protection Program database coordinator, who enters the data into the WISKI and NR92 databases. Data is reviewed for erroneous values by the project officer before it is marked as approved for public sharing.

Hard copies of field datasheets, chain-of-custody forms and laboratory results are scanned and saved in electronic format under the file pathway: N:\WATRSHED\Rapid City\RC Streams.

C1: Assessment and Response Actions

The State of South Dakota is responsible for field sample collection and QA/QC procedures. Corrective actions for deficiencies will be addressed immediately in the field or will be resolved through collaboration of project staff.

The State of South Dakota will use the following assessments for the RC Streams Monitoring Project:

Surveillance:

The project officer will ensure that all QA/QC components are being followed by performing in-field data reviews, observing sample and measurement collection techniques, and reviewing results after sampling occurs. The PO will also observe multi-meter calibration to ensure this task is being performed adequately.

Peer Review:

Peer review may be performed before a project starts and after a project is completed. Staff members will review the Rapid City Streams Monitoring Project for completeness, accuracy, and proper documentation.

Systems Audit:
A full scale systematic, qualitative review of equipment, personnel, training, procedures, record keeping, data validation, data management and reporting aspects of the SD DANR WPP program will be completed by the SD DANR QAO, Tyler Frideres, every 2 years to evaluate SD DANR WPP QA/QC Procedures.

The EPA project manager or a representative of the Regional Quality Assurance Officer may, at any time, conduct an announced or unannounced audit or review of any data collection and analysis activities with assessment and implementation projects. This includes any contracts or subcontracts thereof used in the data collection and analysis effort.

Corrective actions related to data quality or procedural deviations are the responsibility of the Quality Assurance Officer (QAO). When issues are identified—either internally or through external review—the QAO will initiate and document appropriate corrective actions to address the root cause and prevent recurrence. All corrective actions will be recorded and summarized in the annual QA/QC report, which is reviewed by the Department QA/QC Officer, Shannon Minerich, and submitted to EPA annually as part of ongoing project oversight and quality assurance.

C2: Oversight and Reports to Management

On an annual basis the SD DANR WPP QAO, Tyler Frideres, will submit a quality assurance report to the SD DANR QAO, Shannon Minerich, who in turn reports the information to EPA and the Program Administrator in an annual report covering the Rapid City Streams Monitoring Project. All reports will also be sent to the Team Leader and Administrative Leader. The report should include the following:

- Assessment results of measurement data, accuracy, precision, and completeness
- Results of performance and system audits
- Quality assurance issues
- A list of training activities including dates
- Corrective actions and results; and
- Revisions to Standard Operating Procedures and Quality Assurance Project Plans.

D1: Environmental Information Review

The objective of data review is to assess whether or not the data collected achieved the quality objectives of the project. All analytical data generated for the Watershed Protection Program by a laboratory undergoes reduction and report preparation by the respective laboratory. Laboratory reports are reviewed by the project officer and the SD DANR WPP QAO for reasonableness. The field data recorded in the laboratory (date, time collected, depth, site number, etc.) are also checked against field reports for accuracy. Once data has been reviewed for reasonableness it will be marked as approved in the DANR NR92 and WISKI databases.

Data acceptability will be determined by the PO based on whether result values are within acceptable ranges. Acceptability is determined by calculations of precision, accuracy, and completeness. These calculations are described in the current version of the Watershed Protection Program Quality Assurance Project Plan (QAPP), which is saved on the DANR website at

https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications/DANR_QAPP_2022.pdf. It will also be saved under the file pathway: N:/WATRSHED/QAQC – SOP/QAPP. Results of these calculations and descriptions of any QA/QC issues that arose during the project will be documented in a QA report that will be drafted by the PO and submitted to the Watershed Protection Program Team Leader and QAO.

D2: Usability Determination

Data review, verification and validation are key steps in the transition from the data collection to data review and acceptance. Data review, verification and validation will include a review of the findings of all QA/QC assessment activities and the development of a report that indicates the usability determination of the project results. The report will include analysis of blank and replicate samples described in the previous section, measures of completeness and a description of any QA/QC issues that arose during the project. Any anticipated limitations of the project data will be included in the report and communicated by the PO to the Watershed Protection Program QAO and Team Leader when the report is drafted.

Signature Page

X

Alan Wittmuss
Team Leader, Manager I

X

Shannon Minerich
State QA/QC Officer

X

Tyler Frideres
Program QA/QC Officer

Recoverable Signature

X Jesse Wilkens

Jesse Wilkens
Project Officer
Signed by: Jesse.Wilkens

Appendix A

Table 2. List of stream sampling sites for the Rapid City Streams Monitoring Project.

Stream	AU_ID	Station	Lat	Long
Flynn Creek	SD-CH-R-FLYNN_01	460111	43.6828	-103.4677
Fantail Creek	SD-BF-R-FANTAIL_01	460119	44.3366	-103.7939
Stewart Gulch	SD-BF-R-STEWART_01	460124	44.3260	-103.7999
Bear Butte Creek	SD-BF-R-BEAR_BUTTE_02	460125	44.3344	-103.6405
Bear Butte Creek	SD-BF-R-BEAR_BUTTE_01	460126	44.3193	-103.6477
Beaver Creek	SD-CH-R-BEAVER_01	460128	43.4492	-104.0156
Cheyenne 01	SD-CH-R-CHEYENNE_01	460156	43.4339	-104.0355
Beaver Creek	SD-CH-R-BEAVER_02_USGS	460176	43.5173	-103.3508
Spring Creek	SD-CH-R-SPRING_02	460649	43.9854	-103.4258
Grace Coolidge Creek	SD-CH-R-GRACE_COOLIDGE_01	460650	43.7604	-103.3708
French Creek	SD-CH-R-FRENCH_03	460651	43.7164	-103.4752
French Creek	SD-CH-R-FRENCH_02	460653	43.7728	-103.5391
Fall River	SD-CH-R-FALL_01	460657	43.4024	-103.4119
West Strawberry Creek	SD-BF-R-W_STRAWBERRY_01	460675	44.3526	-103.7384
Whitewood Creek	SD-BF-R-WHITEWOOD_01	460686	44.3572	-103.7397
Annie Creek	SD-BF-R-ANNIE_01	46MN31	44.3273	-103.8947
False Bottom Creek	SD-BF-R-FALSE_BOTTOM_01	46MN38	44.3991	-103.8050
Battle Creek 1	SD-CH-R-BATTLE_01_USGS	BATTLE01	43.7254	-102.9063
Beaver Creek	SD-CH-R-BEAVER_01_USGS	BEAVER1	43.4624	-103.3049
Crow Creek	SD-BF-R-CROW_01_USGS	CROW1	44.5577	-104.0134
Highland Creek	SD-CH-R-HIGHLAND_01_USGS	HIGHLAND1	43.6294	-103.4392
Horsehead Creek	SD-CH-R-HORSEHEAD_01_USGS	HORSEHD1	43.2774	-103.3583
Little Spearfish Creek	SD-BF-R-LITTLE_SPEARFISH_01_USGS	LTTLSPRFSH01RTBN	44.3502	-103.9323
Redwater River	SD-BF-R-REDWATER_01_USGS	RDWTR01RTBN	44.5919	-103.8700
Victoria Creek	SD-CH-R-VICTORIA_01_USGS	VICTORIA1	44.0182	-103.3858

Appendix B

Agency Code: W-1605

SD DANR Water Quality Data

Rev 05/23

Sample Date: | Time: | Samplers Print/Sign:

Source Water: Flynn Creek | Station ID: 460111

Site Location: WQM 111 - Flynn Creek near Bluebell Lodge

Project: Rapid City Streams | Project ID: RCSTREAMS

Type of Sample: ☑ Grab ☐ Replicate ☐ Integrated Vertical ☐ Blank ☐ Composite ☐ Integrated Flow ☐ Lab Split

Medium: ☑ Water / Other

Relative Depth: ☑ Surface ☐ Bottom ☐ Midwater

H2O Temp	°C	Avg Secchi	Meters	*Field Comments*	
SPC	µmho/cm	Secchi A	Meters		
DO	mg/L	Secchi B	Meters		
pH	SU	Secchi C	Meters		
ORP	Volts				

All Samples must be packed in ice and chilled to 6 C

A - 1 Liter
- ☐ Alkalinity
- ☐ TSOL
- ☑ TSSOL
- ☐ VTSS
- ☐ TDSOL
- ☐ BOD
- ☐ CBOD
- ☐ CO3
- ☐ Hardness
- ☐ K
- ☐ Lab Cond
- ☐ Cl
- ☐ Fluoride
- ☐ HCO3
- ☐ SO4

B - 1 Liter
pH<2 ~2 mL H2SO4
- ☐ Ammonia
- ☐ NO3+NO2-N
- ☐ TKN
- ☐ Total P
- ☐ COD

D - 100 mL
Filtered + pH<2 0.25 mL H2SO4
☐ TDP ☐ DIN

R - 4L Cube
☐ Ra 226 ☐ Ra 228

CN - 150 mL
pH >10 ~0.4 mL NAOH
☐ CN ☐ WADCN

H - Liter Glass Amber
pH<2 ~2 mL HCL
☐ TPH Diesel

OG - Liter Glass Amber
pH<2 ~2 mL HCL
☐ Oil Grease

Dissolved Metals - 100 mL
Filtered + pH<2 ~0.5 mL HNO3
☐ Ca ☐ Na ☐ Mg ☐ Mn ☐ K ☐ Fe

Recoverable Metals - 100 mL
pH<2 ~0.5 mL HNO3
☐ Ca ☐ Na ☐ Mg ☐ Mn ☐ Fe

E - 1 Liter *Filtered*
☐ HCO3 ☐ Cl ☐ SO4 ☐ Fluoride

C - 100 mL Idex *Na2SO3 if source is Chlorinated*
Note: Use 250 mL bottle if requesting multiple tests
☐ Fecal Coliform* ☐ Total Coliform ☐ Fecal PFGE ☑ E Coli* ☐ Entercocci*

V-40mL	V1-40 mL	V2-120 mL	V3-120 mL
3 - 40 mL Amber Vials 0.5 mL HCL Zero Head Space	*2 - 40 mL Amber Vials 0.5 mL HCL Zero Head Space*	*120 mL Amber Bottle 1.5 mL H2SO4*	*120 mL Amber Bottle Filtered 1.5 mL H2SO4*
☐ TPH Gas	☐ VOC	☐ TOC	☐ DOC

Lab Comments

Dissolved Metals - 250 mL
Filtered + pH<2 ~1.5 mL HNO3
☐ Al ☐ Sb ☐ As ☐ Ba ☐ Be ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Ag ☐ Ti ☐ U ☐ V ☐ Zn ☐ Mo ☐ Silica

Recoverable Metals - 250 mL
pH<2 ~1.5 mL HNO3
☐ Al ☐ Sb ☐ As ☐ Ba ☐ Be ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Ag ☐ Ti ☐ U ☐ V ☐ Zn ☐ Mo

Relinquished By:		Date/Time
Received By:		Date/Time
Relinquished By:		Date/Time
Received By:		Date/Time
Relinquished By:		Date/Time
Received By:		Date/Time

Sample Temp (C) | **Date / Time Received** | **Lab #**

Figure 1. Example chain-of-custody form.

Appendix C

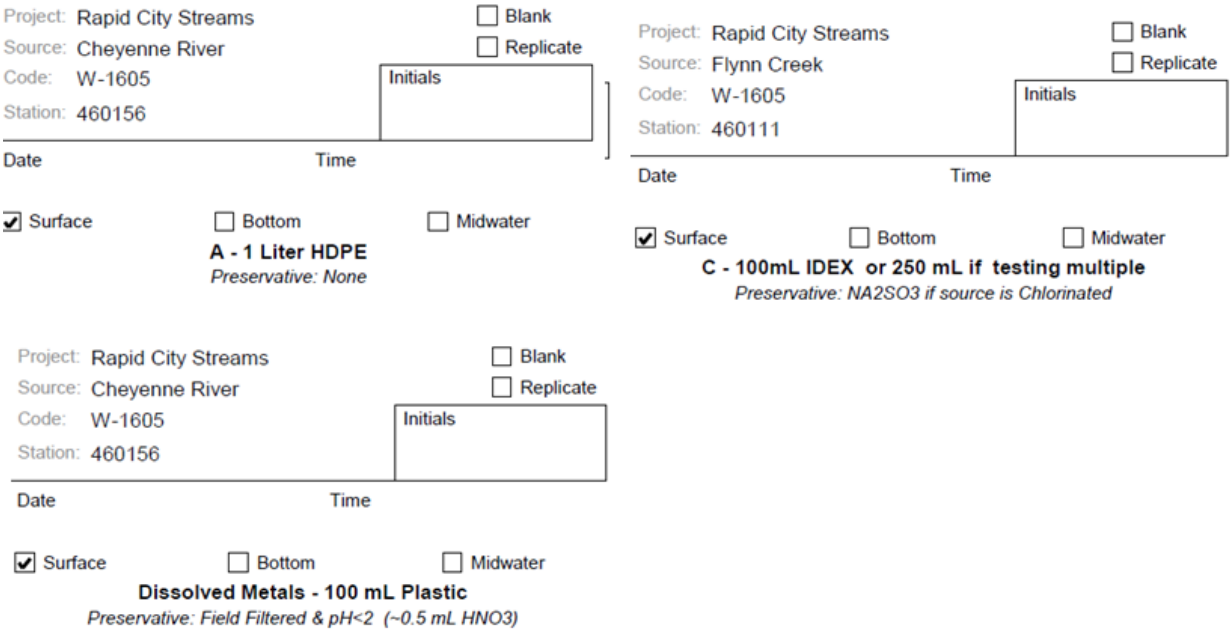


Figure 2. Example sample bottle labels.

Appendix D

DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
221 MALL DRIVE SUITE 201
RAPID CITY SD 57701
danr.sd.gov

October 2, 2024

Re: Midcontinent Testing Laboratories-Rapid City (SD00021)

STEVE RISTAU
MIDCONTINENT TESTING LABORATORIES
PO BOX 3388
RAPID CITY SD 57709

Dear Steve:

I have received documentation from Jeri Wieczorek supporting continued certification for the methods for total coliforms, E. coli, and heterotrophic plate count in the chart below. Certification expires April 22, 2027.

MICROBIOLOGICAL CONTAMINANTS	*CERTIFICATION GRANTED FOR:*	*CERTIFICATION EXPIRES:*
E. coli and Total Coliforms	SM 9223B Colilert/18 hr Colilert P/A	04/22/2027
E. coli and Total Coliforms	SM 9223B Colilert Quantitative/Quantitray	04/22/2027
HPC - Pour Plate	SM 9215	04/22/2027

Continued certification is dependent upon acceptable annual proficiency test samples, continued use of current standard operating procedures for certified methods and your certification status with the state of South Dakota. If there are any major changes in the laboratory's personnel or equipment or location or any other factor that may impair analytical capability, you must notify us within 30 days.

We reserve the right to perform our own on-site visit. If you have questions, contact either Jeri Wieczorek (605-773-3368) or me.

Sincerely,

Eric Fuehrer
Drinking Water Program
Phone: 605-394-6745

Cc: Jeri Wieczorek, Microbiological Certification Officer
Barb Friedeman, Drinking Water Program

DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

December 18, 2023

Re: Midcontinent Testing Laboratories-Rapid City (SD00021)

DEAN AURAND
MIDCONTINENT TESTING LABORATORIES
PO BOX 3388
RAPID CITY SD 57709

Dear Mr. Aurand:

I am extending Midcontinent Laboratories chemical and radiological certification expiration date to 12/31/2024. The microbiological certification expiration will remain at 4/28/2023.

REGULATED SOCs	*CERTIFICATION METHOD(S)*	*CERTIFICATION EXPIRATION*
2,4-D	515.3	12/31/2024
2,4,5-TP	515.3	12/31/2024
Alachlor	525.2	12/31/2024
Atrazine	525.2	12/31/2024
Benzo (a) Pyrene	525.2	12/31/2024
Carbofuran	531.1	12/31/2024
Chlordane	525.2	12/31/2024
Dalapon	515.3	12/31/2024
Di (ethylhexyl) Adipate	525.2	12/31/2024
Di (ethylhexyl) Phthalate	525.2	12/31/2024
Dibromochloropropane	504.1	12/31/2024
Dinoseb	515.3	12/31/2024
Diquat	549.2	12/31/2024
Endrin	525.2	12/31/2024
Ethylene Dibromide	504.1	12/31/2024
Glyphosate	547	12/31/2024
Heptachlor	525.2	12/31/2024
Heptachlor Epoxide	525.2	12/31/2024
Hexachlorobenzene	525.2	12/31/2024
Hexachlorocyclopentadiene	525.2	12/31/2024
Lindane	525.2	12/31/2024
Methoxychlor	525.2	12/31/2024
Oxamyl	531.1	12/31/2024
Pentachlorophenol	515.3	12/31/2024
Pichloram	515.3	12/31/2024
Simazine	525.2	12/31/2024

Toxaphene	525.2	12/31/2024
PCBs	525.2	12/31/2024
REGULATED INORGANICS	***CERTIFICATION METHOD(S)***	***CERTIFICATION EXPIRATION***
Antimony	200.8	12/31/2024
Arsenic	200.8	12/31/2024
Barium	200.8	12/31/2024
Beryllium	200.8	12/31/2024
Cadmium	200.8	12/31/2024
Chromium	200.8	12/31/2024
Copper	200.8	12/31/2024
Cyanide	Kelada01	12/31/2024
Fluoride	SM4500 F-C	12/31/2024
Lead	200.8	12/31/2024
Mercury	245.1	12/31/2024
Nitrate	SM4500NO3 F	12/31/2024
Nitrite	SM4500NO2 B	12/31/2024
Selenium	200.8	12/31/2024
Thallium	200.8	12/31/2024
OTHER REGULATED PARAMETERS	***CERTIFICATION METHOD(S)***	***CERTIFICATION EXPIRATION***
Total Trihalomethanes	524.2	12/31/2024
Haloacetic Acids	552.2	12/31/2024
REGULATED VOCs	***CERTIFICATION METHOD(S)***	***CERTIFICATION EXPIRATION***
Benzene	524.2	12/31/2024
Carbon Tetrachloride	524.2	12/31/2024
Chlorobenzene	524.2	12/31/2024
o-Dichlorobenzene	524.2	12/31/2024
p-Dichlorobenzene	524.2	12/31/2024
1,2-Dichlorethane	524.2	12/31/2024
1,1-Dichloroethylene	524.2	12/31/2024
cis-1,2-Dichloroethylene	524.2	12/31/2024
trans-1,2-Dichloroethylene	524.2	12/31/2024
Dichloromethane	524.2	12/31/2024
1,2-Dichloropropane	524.2	12/31/2024
Ethylbenzene	524.2	12/31/2024
Styrene	524.2	12/31/2024
Tetrachloroethylene	524.2	12/31/2024
1,2,4-Trichlorobenzene	524.2	12/31/2024
1,1,1-Trichloroethane	524.2	12/31/2024
1,1,2-Trichloroethane	524.2	12/31/2024
Trichloroethylene	524.2	12/31/2024
Toluene	524.2	12/31/2024
Vinyl Chloride	524.2	12/31/2024
Xylenes (total)	524.2	12/31/2024

RADIOCHEMISTRY	CERTIFICATION METHOD(S)	CERTIFICATION EXPIRATION
Gross Alpha	EPA 900.0	12/31/2024
Gross Beta	EPA 900.0	12/31/2024
Radium 226	Ga Inst of Tech rev 1.2	12/31/2024
Radium 228	Ga Inst of Tech rev 1.2	12/31/2024
Uranium	200.8	12/31/2024

If you have any questions, you can call either Rea Riggle (773-3368) or myself.

Sincerely,

Barb Friedeman
Drinking Water Program
Phone: 605-773-4052

Cc: Rea Riggle, Chemistry Certification Officer