



Wednesday, April 3, 2019

United States Environmental Protection Agency
Region 8

Attn: Angelique D. Diaz, Ph.D., P.E.
1595 Wynkoop Street
Denver CO 80202-1129

RE: Filtration Avoidance Criteria Exceedance and Response Options
PWS ID# WY5600041

Dear Ms. Diaz,

As you are aware, the Town of Pinedale has selected Option 3 as presented in the "Filtration Avoidance Criteria Exceedance and Response Option" letter from the Environmental Protection Agency (EPA) dated February 28, 2019. The official response from the Town of Pinedale to the EPA was sent Monday, March 18, 2019. The following letter includes the necessary follow-up response from the Town of Pinedale including an implementation plan and schedule for the Fremont Lake Watershed Study.

An initial meeting was conducted between the Town of Pinedale, the Environmental Protection Agency, and the Town of Pinedale's consulting group (Jorgensen Associates P.C., Strike Consulting Group, and JVA Inc.). The meeting was held on Wednesday March 20, 2019. The meeting focused on the preliminary scope of the watershed study as well as interim water testing requirements during the course of the study. Please find the two attachments to this letter including the information required for this submittal.

- Attachment A: Fremont Lake Watershed Study – Implementation Plan and Schedule
- Attachment B: Town of Pinedale Interim Water Quality Testing Procedures

Also discussed at meeting was the need for an official public notice to be issued with a brief explanation about the event and response plan. The Town of Pinedale will be providing draft language to you shortly before distributing this public notice.

If you have any questions regarding this response or the planned watershed study, please contact Josh Wilson at the Town of Pinedale (307) 367-4136. We appreciate your prompt review of this plan, and we look forward to resolving this issue.

Respectfully,

A handwritten signature in blue ink that reads "M. W. Murdock".

Matt W. Murdock
Mayor, Town of Pinedale

Attachment A

Fremont Lake Watershed Study **Implementation Plan and Schedule**

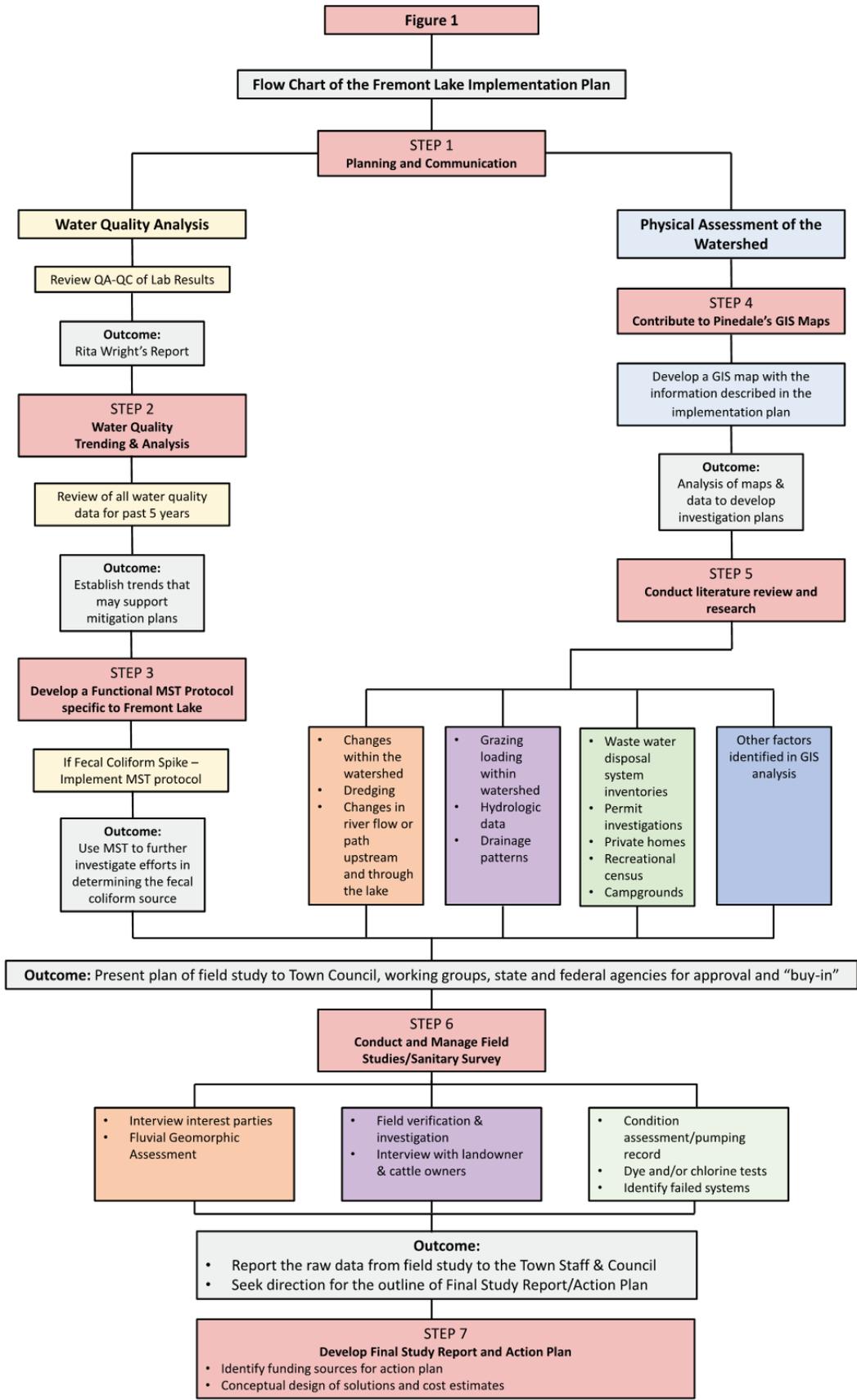
In response to the US Environmental Protection Agency's (EPA) letter, Ref: 8WP-SDB, dated February 28, 2019, the Town of Pinedale has selected Option 3: Modify your intake and/or make changes to how the Fremont Lake watershed is being managed to address actual or potential sources for fecal coliforms in the raw water. The selection of this option was communicated to EPA in a letter from the Town of Pinedale (TOWN) to EPA dated March 18, 2019.

The selected option includes the requirement of a detailed implementation plan and schedule to be submitted to the EPA by May 1, 2019. The implementation plan is required to address:

- 1) Conducting a study of the watershed to identify sources of fecal coliforms at the intakes,
- 2) Determining modifications to mitigate these sources of fecal coliforms along with a detailed schedule for implementation of these modifications, and
- 3) Providing a written description of how any proposed modifications will mitigate the identified sources of fecal coliforms.

The Town has retained the consultant team of Jorgensen Associates-JVA-Strike Consulting Group (Consultant) to assist in developing the implementation plan of the Fremont Lake Watershed Study and Mitigation Plan. During a phone call with the EPA on March 20, 2019, the Town and its Consultant discussed an initial summary of the implementation plan. The EPA concurred with the summary of the plan and provided feedback. The following provides the current implementation plan and schedule. It is intended that the plan will be adjusted based on research and field investigation. The Town has committed to a transparent process and as such will advise the EPA of any relevant adjustments to this plan.

The plan describes a 7-tiered process to implement a hypotheses-driven, science-based approach. This approach is intended to conserve resources (money and manpower) by implementing the least expensive investigative methodologies first. The plan is initially divided into two distinct pieces; 1) Water Quality Analysis and 2) Physical Assessment of the Watershed. These two distinct pieces will be undertaken separately but synergistically to eventually coalesce to support the field studies as shown in Figure 1; Flow Chart of the Fremont Lake Implementation Plan.



STEP 1: Planning and Communication

Planning and communication will be carried throughout the implementation plan. The Town initiated the planning process based on input from the EPA to retain a consultant group to conduct the watershed study. This process was initiated and completed prior to receiving the EPA letter of February 28, 2019 – *Filtration Avoidance Criteria Exceedance and Response Options*. This proactive step demonstrates the Town’s commitment to protecting the watershed as a source of raw water for the Town’s domestic drinking water and an important recreation area for the community and the region.

The town has established a Work Group to help guide the Implementation plan. The work group includes:

- Brad Bunning, Sen. Barrasso
- Holly Hinojosa, Rep. Cheney
- Charity Lafountain, Rep. Cheney
- Doug Dziak, Sen. Enzi
- Andrew Williams, Sen. Enzi
- Mike Henn, Sublette County Conservation District
- Brad Blackwell, Sublette County Conservation District
- Chace Tavelli, Wyoming Water Development
- David Waterstreet, Wyoming DEQ
- Rich Cripe, Wyoming DEQ
- Kevin Frederick, Wyoming DEQ
- Pete Cavalli, Wyoming Game & Fish / Engineers
- Ted Porvoll, USFS
- Holly Dabb, Pinedale Roundup (Newspaper)
- Ed Wood, Town Attorney
- Carrie Long, Sublette County Clerk
- Tom Noble, Sublette County Commissioner
- Dave Burnett, Sublette County Commissioner
- Rita Wright, Microbiology Consultant
- Brian Gray, Jorgensen Engineering
- Abram Pierce, Jorgensen Engineering
- Beth Callaway, Sr. Policy Advisor to Gov. Gordon
- Albert Sommers, House District 20 Representative

The Consultant will provide updates during the Town Council Meetings held on the 2nd and 4th Monday of each month. These updates are available to the public and regularly shared with the local newspaper. Additionally, the Town will distribute a current summary of the situation through a direct mailing to residents.

The Consultant will also meet regularly to communicate progress and develop or revise the strategy to accomplish the implementation plan. The Consultant will share relevant information, either verbally or through written documentation, with members of the Workgroup. These discussions will be summarized and reported to the Town with the progress reports to the Town Council. This task is essential for the Town of Pinedale to remain up-to-date on the status of the project and to remain transparent throughout the process. This task will be ongoing until the completion of the project.

WATER QUALITY ANALYSIS

Steps 2 and 3 focus on the water quality aspects of the watershed.

STEP 2: Water Quality Trending and Analysis

The Town has provided the Consultant with over 5 years of water quality testing data for trending and analysis. The analysis will evaluate the data for spatial (land use, drainage) and temporal trends (seasonal, storms, droughts, etc.) to help identify conditions that have the potential to result in elevated fecal coliform concentrations and examine linkages to the greatest potential sources of fecal contamination. The following existing water quality data sets will be trended over a period of a minimum of five years:

1. Water treatment plant intake sample point and Fremont Lake sample points for
 - a. total coliform,
 - b. fecal coliform,
 - c. chlorophyll-a,
 - d. nitrite-N,
 - e. phosphorus,
 - f. TOC, and
 - g. turbidity.

2. Data from the USGS gauging station and Bureau of Recreation Elkhart Park weather station:
 - a. Monthly and annual average Pine Creek stream flow,
 - b. precipitation, and
 - c. temperature.

Wyoming DEQ has included the investigation of Fremont Lake in the agency plans for this summer. The following is a summary from a conversation with Tavis Eddy, a Watershed Protection Monitoring Analyst for DEQ's Watershed Program:

- DEQ will be collecting samples from lakes in the Pinedale region during the summer of 2019:
 - Fremont Lake, Half Moon Lake and two others.
 - Sampling will take place at each lake in June, July, and September.
- The primary purpose of DEQ's effort will be to ascertain algae and plankton concentrations in the lakes sampled.
- These efforts will also test for E. coli in samples collected at various depths in the lakes.
- The samples will be collected by boat and DEQ will have the capability to collect samples from depths to 300 feet.
- The list of constituents for the DEQ sampling events has not yet been finalized.
 - DEQ will analyze for E. coli in the field by using a mobile IDEXX Colilert test. The results of this test typically take 24-hours.
 - The constituent list could include nitrogen as TKN and phosphorus.
 - DNA species-level testing of fecal coliform
- Mr. Eddy has stated that the Consultant and the Town are welcome to observe the field sampling/testing.
- DEQ does not have any historical water quality data for Fremont Lake.

Since DEQ has invited the Town and the Consultant Team to observe the field sampling and testing, the test results for each monthly trip will be immediately available for inclusion in this watershed study. However, it is doubtful that the full analysis and report will be available until well after the field investigation is completed in Step 6.

STEP 3: Development of a Microbial Source Tracking Protocol

For Step 3 the Consultant will develop a Microbial Source Tracking (MST) protocol for implementation in the case that positive tests for fecal coliform are found, repeated tests are positive and/or the exhaustion of traditional methods of source detection are encountered. MST is part of an effective watershed management and source water protection program where accurate identification of fecal pollution is required to implement management practices and mitigation. However, MST is a complex process that includes many decision-making steps. Once a contamination problem has been defined, the user of MST tools must thoroughly consider study objectives before deciding upon a source identifier, a detection method, and an analytical approach to apply to the problem.

This MST protocol will be structured in a manner to reduce costs while also achieving the objective of identifying the contaminant source. The following summarizes the intent of the Protocol:

- Determination if fecal bacteria are of human origin

The highest priority for source identification should be whether the bacterial load consists of human fecal material since this poses the greatest health risk to downstream users. If the bacterial load is primarily human in origin, then the watershed investigation efforts can be focused (or expanded) to the identify potential sources. Quantification is preferred to presence/absence testing, but this is dependent on budgetary restrictions. If the bacterial load is not of human origin, then the protocol can proceed to determination of species.

- Determination of source at the species level

If it is determined that the bacterial load is not of human origin, then a biased analysis of the samples should be run for specific species markers. This would likely include ruminant and canine markers but will be laboratory dependent. Not all labs have the capability to run species level DNA sequencing. Some labs can analyze for very specific genetic markers, including cattle, pigs, horses, waterfowl, etc. The land use mapping and analysis should dictate which species should be tested for.

- Overall microbial community assessment

Previous studies have used a full microbial community assessment to further refine source information for human fecal indicator bacteria; the overall microbial community characteristics for sewage, septage, and raw stool (all anthropogenic) are different and can potentially be distinguished through this method. This might be useful if a source cannot be readily identified and the focus of the investigation must be narrowed.

Another use of the full microbial community assessment is to identify patterns from DNA sequencing and match these patterns to hypothetical sources developed during the watershed

study. However, the results are, at best, theoretical, and require a qualified microbiologist to perform an expanded interpretative report since the microbial analytical summary can be very dense and very technical.

The research and development of this step will include the review of recent MST included in the Popo Agie River, and the Campbell County study of the Little Powder River. There are a multitude of references sources that will be considered in the development of this step. They include, but are not limited to:

Microbial Source Tracking Guide Document, 2005, National Risk Management Research Laboratory-Office of Research and Development-U.S. Environmental Protection Agency, EPA/600/R-05/064.

The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches, 2013, Southern California Coastal Water Research Project, Technical Report 804.

Selection and Application of Microbial Source Tracking Tools for Water Quality Investigations, 2005, U.S. Geological Survey Techniques and Method 2-A3.

This step will also review new techniques and methods including products such as PhyloChip, recently studied at Lawrence Berkeley National Laboratory.

PHYSICAL ASSESSMENT OF THE WATERSHED

Steps 4, 5 and 6 research and evaluate the physical features of the watershed.

STEP 4: Contribute to the Town's GIS Maps

EPA identifies the need to characterize the watershed as part of the watershed control program in 40CFR141.71 (b) (2):

...the effectiveness of the system's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the water system has maximized land ownership and/or controlled land use within the watershed. At a minimum, the watershed control program must:

- (i) Characterize the watershed hydrology and land ownership;
- (ii) Identify watershed characteristics and activities which may have an adverse effect on source water quality; and
- (iii) Monitor the occurrence of activities which may have an adverse effect on source water quality.

The public water system must demonstrate through ownership and/or written agreements with landowners within the watershed that it can control all human activities which may have an adverse impact on the microbiological quality of the source water...

To adequately describe the watershed, in accordance with the requirements listed above, the Consultant will include the following information into the Sublette County GIS map:

- Land use
 - Livestock grazing with relevant fence lines to analyze how the water supply of Fremont Lake is protected from contamination
 - Irrigation-farm land and tailwater ditches that may transport criteria pollutants
 - Residential use with mapped waste water disposal systems, and an assessment of the state of the efficiency of the treatment
 - Industrial land use
 - Recreational, including USFS toilet facility and waste water disposal systems
 - Wells – domestic, irrigation
 - Municipal or private water and sewer systems
- Topography adequate to determine drainage paths to the Lake and the limits of the watershed
- Property lines
- Relevant surface waters within the watershed

Sublette County’s existing GIS map, with the input of the above listed items, must be considered a dynamic source of data that will require routine upgrades. It is recommended that each bulleted item include a minimum frequency for updates. These updates may include searching for building permits within the watershed, water quantity investigations such as streamgages, water quality data such as the pending DEQ water quality investigation, and any other relevant data. Maintaining this tool will provide an efficient source of information to provide an efficient response time for future filtration avoidance studies.

STEP 5: Conduct Literature Review and Research

The intent of this step is to synthesize information from the Water Quality Analysis column in Figure 1 (Steps 2 and 3) and step 4 of the Physical Assessment of the Watershed column to guide further research and generate an initial hypothesis. Potential areas for further research include the items shown in the middle of Figure one and are summarized below:

- Changes within the watershed
 - New construction
 - Dredging
 - Changes in river flow or the river’s path
 - Any evidence of growing sandbars within the lake
- Grazing loading within the watershed
 - Drainage patterns from the pastures to the lake
 - Hydrologic data to ascertain above normal flows through these drainages that may cause erosion,
- Sources of domestic wastewater
 - Private homes
 - Lodges/hotels
 - Campgrounds
- Other Factors that were identified in previous Steps 2-4.

The sources of domestic wastewater listed in the above research items will be the initial focus of the field investigation. The wastewater systems are the prime suspect of human fecal matter and, since human fecal poses the greatest health risk to the users of the watershed, the highest priority for source identification should be whether the bacterial load consists of human fecal material.

This is not intended to be a definitive outline for the development of the initial hypothesis. It is probable that the bullet labeled “Other Factors” may be a large contribution to the hypothesis. The key to a successful outcome is to allow the research to guide the conclusions.

The intended outcome of this step is to develop a plan for the field studies. This plan will be reviewed with the EPA & Town prior to finalizing the items in step 6

STEP 6: Conduct and Manage Field Studies/ Sanitary Survey

The intent of this step is to test or revise the hypothesis established in Step 5

The following are a **scale of potential** field studies that will be considered for each of the items listed in Step 5. Field studies/efforts will be finalized based on findings from steps 1-5 and the EPA will be consulted prior to implementation. The potential field study items include:

- Changes within the watershed
 - Pull construction permit applications and verify construction
 - Conduct a fluvial geomorphic assessment of inlet rivers and drainages
 - Conduct bathymetric surveys of growing sandbars within the lake
- Grazing loading within the watershed
 - Interview grazing permitting agencies and permit holders to determine the actual loading and duration
 - Review fence lines to check for breaches that would expand access to segments of the watershed thought to be protected from grazing.
 - Verify natural sedimentation traps such as wetlands, or reservoirs on drainage patterns from the pastures to the lake
 - Conduct geomorphic assessment of 1st and 2nd order tributaries to the lake inlets to ascertain levels of erosion. This task should be considered if the watershed experienced a large storm within the 3 months leading up to the positive fecal tests of 2018. The search of hydrologic data would be looking for 25-year storms or greater.
- Sources of domestic waste water
 - Conduct a comprehensive sanitary survey of all systems within the watershed. Attempt to collaborate with EPA’s 2019 survey.
 - Definitively verify the input or exclusion of domestic waste water through die tests, or similar tests, of each system
- Other Factors that were identified in previous steps 2-4.
 - To be determined.

The MST Protocol may be implemented should there be another series of positive fecal coliforms identified. The information from these tests would be combined with the research and traditional methods to identify the source.

The outcome is to report the results of the raw data to the Town and to develop the outline of the implementation plan.

STEP 7: Implementation Plan

The intent of this step is to develop the implementation plan in accordance with EPA's letter of February 28, 2019. The purpose of the implementation plan is as follows:

- 1) Provide a report of the study of the watershed. Specifically, the information that was gathered to identify sources of fecal coliforms at the intakes,
- 2) Determine modifications within the watershed to mitigate these sources of fecal coliforms along with a detailed schedule for implementation of these modifications.

It is anticipated that the modifications will be either operational and management of the watershed or a structural modification. An example of an operational and management modification would be restricting grazing within the watershed. This would require an agreement be put in place with the landowner or Agency controlling the land. An example of a structural modification would be a failed sewer system that is leaking untreated waste water to the lake or one of the inlet sources to the lake.

Operational and Management

- a. Operational Strategies
- b. Key contacts
- c. Recommendations for Agreements or Contracts

Structural Modifications

- a. Conceptual design
- b. Cost estimates
- c. Funding sources
- d. Schedule

- 3) Provide a written description of how any proposed modifications will mitigate the identified sources of fecal coliforms
 - a. Steps necessary to implement recommendations
 - b. Report of conceptual design including assumptions and references
 - c. Recommendations for training to successfully implement modifications

Schedule of Implementation Plan

The following is a tentative schedule for the Implementation plan of the Fremont Lake Watershed Study and Mitigation Plan:

November 14, 2018

- The Town advertised a Request for Proposal to conduct a Watershed Study

February 11, 2019

- The Town issued a contract to the Consultant Team to conduct the Watershed Study

February 28, 2019

- The Town received EPA's Filtration Avoidance Criteria Exceedance and Response Options

March 18, 2019

- The Town replied EPA's above letter, notifying them that the Town selected Option 3: Modify your intake and/or make changes to how the Fremont Lake watershed is being managed to address actual or potential sources for fecal coliforms in the raw water.

March 20, 2019

- The Town and its Consultant discussed an initial summary of the implementation plan with the EPA.

April 3, 2019

- A draft implementation plan and schedule will be provided to the EPA for review and comment.

April 15, 2019 (Pending EPA Review)

- The Implementation Plan will be revised pending EPA's comments and submitted to the Town Council for approval.

May 1, 2019

- The Town will submit the final Implementation Plan to EPA.
- Step 1: Water Quality Analysis will be completed. This information will be updated with the results of the DEQ's water quality analysis. DEQ is scheduled to conduct the field testing in June July and September. The final report is not currently scheduled.

June 2019

- Step 3: Development of the MST Protocol will be completed.
- Step 4: The GIS maps of the watershed will be completed
- Step 5: Conduct Literature Review and Research will be initiated.
- DEQ will have completed the first round of water quality testing during the month of June.

July 2019

- Step 5: Conduct Literature Review and Research will be completed with the outcome to develop the plan for the field studies. Coordination and scheduling of field studies will be initiated
- DEQ will have completed the second round of water quality testing during the month of July.

August 2019

- Step 6: Conduct and Manage Field Studies/ Sanitary Survey will be initiated.

September 2019

- Step 6: Conduct and Manage Field Studies/ Sanitary Survey will be ongoing
- DEQ will have completed the final round of water quality testing during the month of September

October 2019

- Step 6: Conduct and Manage Field Studies/ Sanitary Survey will be completed with the outcome to report the results of the raw data to the Town and seek direction to develop the outline of the Report of the Watershed Study and Mitigation Plan.

December 2019

- The Consultant Team will present the Fremont Lake Watershed Study and Mitigation Plan to the Town.

January 2020

- The study will be reviewed / revised, per comments

February 2020

- The Town will submit the Fremont Lake Watershed Study and Mitigation Plan to EPA.

March 2020

- The Mitigation Plan will begin the implementation phase.

Attachment B

Town of Pinedale Interim Water Quality Testing Procedures

Interim Watershed Protection Plan Testing

Throughout the duration of the watershed study the Town of Pinedale will continue to follow the Fremont Lake Watershed Management Control Plan (2016). Testing includes collection of six lake water samples, three times during the summer months. The Town will report total coliform, fecal coliform, and e. coli to the EPA during this study period.

Interim Distribution System Testing

Pinedale will continue as normal with the Revised Total Coliform Rule testing throughout the distribution system. The RTCR plan includes testing of two water customer taps for presence/absence of Total coliform once a month, the first week of the month. The Town will report this data as specified by the RTCR.

During the duration of the watershed study the Town will sample two additional test sites and analyze for presence/absence of total coliform. The testing sites include the Sublette County Pinedale Fire Hall, 130 S Fremont Avenue, and the Redstone Early Active Learning Center, 125 Cole Avenue. These sites were selected because of accessibility, the fact that one is a child care center, and since they are deeper in the distribution system and are both on opposite sides of the distribution system. The Town will test both of these sites the third week of each month. These results will be reported to the EPA as special samples and not part of the RTCR compliance samples. If the Town does get a positive total coliform hit during this testing, the Town will contact the EPA immediately to determine how to proceed.

Long Term Testing

The Interim Watershed Protection Plan Testing and Interim Distribution System Testing, as described above, will only take place during the watershed study period. The Watershed study conducted by the consultant group will determine the long-term water testing plan.