TOWN OF WINIFRED

PUBLIC WATER SYSTEM

PWS ID No. MT0000363

SOURCE WATER DELINEATION & ASSESSMENT REPORT

PREPARED BY:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
SOURCE WATER PROTECTION PROGRAM

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EXECUTIVE SUMMARY

This Source Water Delineation and Assessment Report (SWDAR) was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Montana. The Department of Environmental Quality (DEQ) is completing these assessments for all public water systems in Montana. Their purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water. The information that is provided includes the identification of the area most critical to maintaining safe drinking water, i.e., the Inventory Region, an inventory of potential sources of contamination within this area, and an assessment of the relative threat that these potential sources pose to the water system.

The drinking water for the Town of Winifred is supplied by two wells located in a rural area south of town. Based on the sanitary survey and available geologic maps, it appears that the wells are screened either in sand bodies of the Judith River Formation, although they may be screened in the overlying alluvial deposits. In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a low sensitivity to potential contaminant sources since it is likely consolidated sandstone bedrock. The very low levels of nitrate detected in the wells support this conclusion. Given the surrounding agricultural land use, higher levels would be expected if the wells were screened in a shallow aquifer. However, it is possible that the wells are screened in overlying underlying alluvial materials, in which case the sensitivity would be considered high. However, the question is somewhat academic, given that the wells are well removed from most potential contaminant sources. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

As part of this assessment, three types of source water protection management areas were mapped for the Town of Winifred public water system. They are: the control zone, the inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- No potential sources of contamination were identified within the control zone. The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the wells and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region are limited to agricultural land. The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. For the Town of Winifred PWS, the inventory region was delineated based upon a 1,000-foot radius.
- Potential contaminant sources identified within the recharge region are limited to agricultural land. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. The topographic divide that represents the watershed boundary (based on the 11-digit USGS hydrologic unit) is used as the recharge region for the PWS well.

The Town of Winifred public water supply has a moderate susceptibility to agricultural land, and a low susceptibility to private septic systems.

Low risk potential sources and potential sources located outside the Inventory Region, but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This

provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for the Town of Winifred. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

The costs associated with contaminated drinking water are high, and prevention is preferable to treatment. Public awareness is a powerful tool for protecting drinking water. The information in this report will help increase public awareness about the relationship between land use activities and drinking water quality.

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1.0 INTRODUCTION

Eric Sivers of the Montana Department of Environmental Quality (DEQ) Source Water Protection Section completed the Town of Winifred (PWS ID No. 0000363) Source Water Delineation and Assessment Report (SWDAR) with assistance from intern Bethany Haines.

1.1 PURPOSE

This Source Water Delineation and Assessment Report is intended to meet the technical requirements for the completion of the delineation and assessment for the Winifred Public Water System (PWS) as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182).

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protect public drinking water supplies from contamination. A major component of the Montana Source Water Protection Program is "delineation and assessment". Delineation is a process of mapping source water protection areas, which contribute water used for drinking. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported, and then determining the relative potential for contamination of drinking water by these sources. The primary purpose of this source water delineation and assessment report is to provide information that helps Winifred to protect its drinking water source.

1.2 LIMITATIONS

This report was prepared to assess the susceptibility of the Winifred PWS to significant potential contaminant sources, and is based on published information and information obtained from individuals familiar with the community. The terms "drinking water supply" or "drinking water source" refer specifically to the source of the Winifred public water supply and not any other public or private water supply. Also, not every potential or existing source of groundwater or surface water contamination in the Winifred area has been identified. Only potential sources of contamination in areas that contribute water to its drinking water source are considered.

The term "contaminant" is used in this report to refer to constituents for which maximum concentration levels (MCLs) have been specified under the national primary drinking water standards, and to certain constituents that do not have MCLs but are considered to be significant health threats.

2.0 BACKGROUND

The Town of Winifred is located in Fergus County in north-central Montana (Figure 1), approximately 40 miles north of Lewistown and 20 miles south of the Missouri River. According to the Census Bureau, the population of Fergus County in 2000 was at 11,893 with 156 individuals residing in Winifred. Winifred's economy is based primarily upon agriculture and service industries.

2.1 PHYSICAL SETTING

2.1.1 Geography and Geology

Winifred is located in the Judith Basin, a topographic depression in the non-glaciated central region of the state (Heath, 1984). The Little Belt, Big Snowy, Judith, Moccasin, and

Highwood Mountains rise to elevations of 9,000 feet and enclose Judith Basin. Winifred's elevation of approximately 3,200 feet is typical of the valley area between the mountain ranges. Exposed bedrock in Judith Basin is largely limited to Cretaceous sedimentary rocks. Winifred is located on Dog Creek, a tributary of the Missouri River. This in the Bull Whacker-Dog watershed, U.S. Geological Survey (USGS) hydrologic unit code (HUC) No. 10040101, which is located within Montana's Lower Missouri River Watershed Management Region. The Bull Whacker-Dog Watershed extends from the North Moccasin Mountains northward along Dog Creek to past Winifred to where Dog Creek and Cutbank Creek intersect.

2.1.2 Climate

Climate in the Winifred area is considered semi-arid and is typical of central Montana. Based on climate data from weather station 249033, the average maximum and minimum temperatures in this area are 84.1° F and 51.6° F in July and 29.4° F and 6.0° F in January. Annual total precipitation averages 14.96 inches. Rainfall occurs April through September with May and June being the wettest months. An annual average of 24.1 inches of snow is received in the Boulder area mainly November to April.

Information on climate in the Winifred area is based on the National Oceanic and Atmospheric Administration's (NOAA) Winifred climate station located at an elevation of 3,205 feet above mean sea level. See Table 1 for additional climate information

Table 1. Monthly Climate Summary: Winifred Climate Station
Station 249033 Period of Record: 7/1/1948 to 6/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average max. temperature (F)	29.4	36.2	43.8	56.4	66.5	74.8	84.1	83.8	71.8	60.1	43.7	34.1	57.1
Average min. temperature (F)	6.0	12.4	19.7	29.7	39.2	46.8	51.6	49.8	40.2	30.7	19.2	10.5	29.6
Average total precipitation (in.)	0.70	0.45	0.69	1.19	2.65	2.84	1.69	1.51	1.18	0.84	0.59	0.65	14.96
Average total snowfall (in.)	5.5	3.9	3.3	2.4	0.1	0.0	0.0	0.0	0.1	0.7	2.7	5.3	24.1
Average snow depth (in.)	4	3	1	0	0	0	0	0	0	0	0	2	1

2.2 THE PUBLIC WATER SUPPLY

2.2.1 Water Supply System

The Town of Winifred serves approximately 150 people through 85 service connections. The Town of Winifred system is classified as a community public water system (PWS) since it serves at least 25 of the same people every day. Information on the water system was obtained from correspondence in the DEQ Public Water Supply Section files including the most recent sanitary survey completed in July 2003 (included as Appendix A). Well water is pumped to a 50,000-gallon storage tank prior to distribution.

2.2.2 Supply Well Information

Town of Winifred's drinking water is supplied by two wells (Wells 3 and 4) located approximately five miles south of the town. No information regarding the wells was identified. Therefore, details such as completion depth, type of construction, screened interval and encountered geologic materials are unknown. Two other wells (Wells 1 and 2) are reportedly out of service and inactive.

2.2.3 Source Water

Due to lack of information regarding the supply wells, it is not possible to absolutely determine the nature of the source water. The wells are most likely screened in the Judith River Formation or possibly overlying alluvial materials. The thickness of alluvial materials at the wells is unknown, but the available geologic and topographic maps suggest that the alluvial materials may not be deep enough to provide sufficient yield. Sand bodies in the underlying Judith River Formation are a more likely source. The Judith River Formation has an average thickness of 500 feet, and is underlain by the Claggett Shale, a low permeability unit. The direction of groundwater flow direction in the vicinity of the wells is likely to the north, towards the Missouri River, although this is not conclusive. Recharge to the aquifer is likely from infiltration of precipitation and surface water through the overlying materials.

A preliminary assessment of groundwater sources under the direct influence of surface water (GWUDISW) has not been conducted by DEQ. However the well would likely be classified as groundwater based on the distance to surface water (greater than 250 feet), well construction, and other assessment criteria.

2.3 WATER QUALITY

2.3.1 Public Water Supply Monitoring Results

Every PWS is required to perform regular sampling of their water supply to detect any contamination. The analytical parameters include: coliform bacteria and other pathogenic organisms, nitrates, metals, petroleum hydrocarbons, and other organic chemicals. The monitoring schedule depends on factors such as the size and source water of a PWS, the number of supplies (e.g. wells), and the population served. Each PWS has a specific monitoring program tailored to their system according to the general protocols defined by DEQ. These schedules are available at: <http://nris.state.mt.us/wis/swap/swapquery.asp>. The Town of Winifred PWS monitoring data from DEQ's database for the past five years was reviewed and is summarized in this section.

The water system has had health-based violations (for coliform). Health based violations are issued when the amount of contaminant exceeds the safety standard (maximum contaminant level or MCL) or water was not treated properly. The health based MCL violations occurred in August 2002 and November 2000 when water samples confirmed the presence of total coliform bacteria in the water supply. In each event, analysis of subsequent samples did not detect any coliform. The water system has had multiple monitoring violations in the previous five years (for missing scheduled sampling events).

The only other compounds detected during Winifred's water sampling over the past five years include nitrite + nitrate [0.01 to 0.06 mg/L (milligrams per liter, or ppm)]. These concentrations are well below the EPA primary maximum contaminant level (MCL).

2.3.2 Background Water Quality Monitoring Results

Groundwater analytical data characterizing untreated groundwater quality was not identified for the Winifred supply wells. Background water quality sampling typically includes some general water quality parameters including major dissolved ions (calcium, magnesium, sodium, potassium, iron, manganese, silica, bicarbonate, carbonate, chloride, sulfate, nitrate, fluoride and orthophosphate), trace elements, and metals.

3.0 MANAGEMENT AREA DELINEATION

This report delineates three source water management areas. The goal of source water management is protection of the source water by 1) controlling activities in the control zone, 2) managing significant potential contaminant sources in the inventory region, and 3) ensuring that major land use activities or other significant activities in the recharge region pose minimal threat to the source water.

3.1 CONCEPTUAL MODEL

Winifred is located in the Bull Whacker-Dog watershed, U.S. Geological Survey (USGS) hydrologic unit code (HUC) No. 10040101, which is located within Montana's Lower Missouri River Watershed Management Region (Heath, 1984). As detailed above Winifred's drinking water source is interpreted to be sands of the Judith River Formation or overlying alluvial materials. The direction of groundwater flow beneath the site is presumed to be to the north, towards the Missouri River. The aquifer is semi-confined to unconfined and recharge to the wells is primarily from infiltration of surface water and precipitation through the materials.

As the aquifer is most likely consolidated sandstone bedrock, it is considered to have **Low Source Water Sensitivity** to contamination. Sensitivity is defined as the degree of ease with which contaminants may migrate to the source water aquifer. This determination is according to the DEQ Source Water Protection Program criteria for ranking aquifer sensitivity (DEQ 1999).

3.2 DELINEATION

Methods and criteria for delineating source water protection areas are specified in the Montana Source Water Protection Program (DEQ, 1999). The delineated management zones for the wells are shown on Figure 3.

Control Zone – A 100-foot radius control zone is delineated for Town of Winifred's wells. All sources of potential contaminants should be excluded in this region.

Inventory Region – The inventory zone was established within a 1,000-foot radius, based on DEQ's Source Water Protection Program criteria. All sources of potential contaminants are inventoried in this region.

Recharge Region – The recharge region for the Winifred wells includes is bounded by the topographic divide that represents the watershed boundary (based on the 11-digit USGS hydrologic unit). The goal of management in the recharge region is to maintain and improve the long-term quality of groundwater in the aquifer.

4.0 INVENTORY

Significant potential contaminant sources in the source water management areas were inventoried to assess the susceptibility of Town of Winifred's wells to contamination, and to provide a foundation for

source water protection planning. The inventory for Town of Winifred focuses on facilities or features that generate, use, store, or transport potential contaminants, as well as certain land uses in the inventory and recharge regions. It is important to remember that the sites and areas identified in this section are only potential sources of contamination to the drinking water. Contamination of drinking water sources is less likely when potential contaminants are properly used and managed.

4.1 INVENTORY METHOD

The inventory focus is slightly different in each of the delineated management areas. The inventory for the Winifred PWS focuses on all activities in the control zone for the wells; certain types of facilities and land uses in the inventory region; and general land uses and large facilities in the recharge region. Information on facilities and land uses that are potential sources of regulated contaminants was obtained from a number of databases, described below. The process for completing the inventory included several steps, which are summarized as follows:

- Step 1: Urban and agricultural land uses were identified from the U.S. Geological Survey's Geographic Information Retrieval and Analysis System <http://nris.state.mt.us/gis/datalist.html>. Sewered and unsewered residential land uses were identified from boundaries of sewer coverage obtained from municipal wastewater utilities.
- Step 2: The U.S. EPA's Envirofacts System <http://www.epa.gov/enviro/> was queried to identify EPA-regulated facilities located in the management areas. This system accesses facilities listed in the following databases: Resource Conservation and Recovery Information System (RCRIS), Biennial Reporting System (BRS), Toxic Release Inventory System (TRIS), and Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) and the Permit Compliance System (PCS - for Concentrated Animal Feeding Operations with MPDES permits). The available reports were browsed for facility information including the Handler/Facility Classification to be used in assessing whether a facility should be classified as a significant potential contaminant source.
- Step 3: Montana DEQ databases were queried to identify any of the following in the management areas:
  - Underground storage tanks (USTs) <http://www.deq.state.mt.us/UST/USTDownloads.asp>
  - Hazardous waste contaminated sites, above ground storage tanks (ASTs), landfills, and abandoned and active mines, including gravel pits <http://nris.state.mt.us/gis/bundler/>

  Any information on past releases and present compliance status was noted.
- Step 4: A business phone directory was queried by Standard Industrial Classification (SIC) code to identify businesses that generate, use, or store chemicals in the management areas. Particular attention was paid to equipment manufacturing and/or repair facilities, printing or photographic shops, dry cleaners, farm chemical suppliers, and wholesale fuel suppliers.
- Step 5: Major road and rail transportation routes were identified throughout the inventory region: <http://nris.state.mt.us/gis/gisdatalib/gisDataList.aspx>.

Potential contaminant sources are considered significant if they fall into one or more of the following categories:

1. Large quantity hazardous waste generators.
2. Landfills.
3. Underground storage tanks.
7. Cultivated cropland exceeding 20% of the inventory region.
8. Animal feeding operations.

4. Known groundwater contamination (including open or closed hazardous waste sites, state or federal Superfund sites, and leaking UST sites).
5. Underground injection well.
6. Major roads or rail transportation routes.
9. Wastewater treatment facilities, sludge handling sites, or land application areas.
10. Septic systems.
11. Sewer mains.
12. Storm sewer outflows.
13. Abandoned or active mines

4.2 INVENTORY RESULTS

4.2.1 Control Zone Inventory Results

The control zone includes the well house and 50,000-gallon storage tank (site plans are included in the sanitary survey attached as Appendix A). No potential sources of contamination were identified within the control zones for the wells. No information was provided on the well logs to indicate that the wells are sealed or grouted between the borehole and the well casing which may indicate that the wells are highly susceptible to water and other contaminants reaching the water table along the well casing. The PWS should be vigilant to ensure that potential sources of contamination are excluded from the control zone and that positive drainage away from each well casing is maintained.

4.2.2 Inventory Region Results

The inventory region includes agricultural land. The inventory results for Town of Winifred's source water are summarized in Table 3 and are shown on Figure 3.

Septic system density within the inventory region is low and is not considered a risk to the PWS drinking water. No point sources of potential pollutants (such as businesses or facilities listed on regulatory databases) were identified in the inventory region.

4.2.3 Recharge Region Inventory Results

According to the 1992 National Land Cover dataset, the primary land uses in the recharge region are agricultural land and grasslands. A stone mine (quarry) was identified, however, these operations are generally not considered a risk to the water supply unless there are significant illegal dumping or equipment operations. The percentage of agricultural land is considered a low risk to the drinking water supply. Grasslands or forests are not considered potential sources of contamination unless there are significant grazing operations in the area.

Septic system density within the watershed/recharge region is low and is not considered a risk to the PWS drinking water. No point source pollutants were identified in the recharge region.

4.3 INVENTORY UPDATE

To make this SWDAR a useful document for the years to come, the certified water system operator should review the inventory every year. Changes in land uses or potential contaminant sources should be noted and additions made as appropriate. The complete inventory should be submitted to DEQ every five years to ensure the source water delineation and assessment remains current.

5.0 SUSCEPTIBILITY ASSESSMENT

5.1 INTRODUCTION TO SUSCEPTIBILITY

Susceptibility is the degree of likelihood for a public water supply to be impacted by inventoried contaminant sources, at concentrations that would pose a concern. Susceptibility is assessed to prioritize potential pollutant sources for local management, in this case the Town of Winifred PWS managers and operators. Alternative management approaches that could be used by the PWS managers and operators to reduce susceptibility are recommended in this chapter.

5.2 DETERMINATION OF SUSCEPTIBILITY

Susceptibility is determined by considering the *hazard* rating for each potential contaminant source relative to any contaminant *barriers* (Table 2). Proximity or density of significant potential contaminant sources and nature of contaminants determines hazard, as established by the DEQ Source Water Protection Program (DEQ, 1999).

Barriers to contamination are anything that decreases the likelihood of contaminants reaching a spring or well. Barriers may be engineered structures, management actions, or natural conditions. Examples of engineered barriers include spill catchment structures and leak detection for underground storage tanks. Emergency planning and best management practices (BMPs) are considered management barriers. Thick clay-rich soils, a deep water table or a thick unsaturated zone above the well intake are examples of natural barriers.

Table 2. Susceptibility Based on Hazard and Barriers

Presence Of Barriers	**Hazard**		
	High	**Moderate**	**Low**
No Barriers	Very High Susceptibility	High Susceptibility	Moderate Susceptibility
One Barrier	High Susceptibility	Moderate Susceptibility	Low Susceptibility
Multiple Barriers	Moderate Susceptibility	Low Susceptibility	Very Low Susceptibility

5.3 RESULTS OF SUSCEPTIBILITY ASSESSMENT

A summary of the susceptibility assessment for the Town of Winifred production wells is provided in Table 3. This table only includes the potential contaminant sources (identified in the inventory) that were determined to present a significant potential risk to the drinking water supply. Therefore, this list is not exhaustive, and it is highly recommended that the PWS operator and community members familiar with the nature of businesses and land use in the area enhance the inventory through further research and local input.

Table 3. Susceptibility Assessment of Significant Potential Contaminant Sources

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard	Barriers	Susceptibility	Management Recommendations
Inventory Region						
Agricultural Land: Cropland and grazing lands	NO_3 and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	Moderate	1. depth; confining layers	Moderate	Encourage use of best management practices (BMPs)
Recharge Region						
Wastewater treatment facilities; lagoons, sludge handling sites, or land application areas	Pathogens, nitrates	Ongoing or catastrophic leakage of sewage into groundwater	Low	1. depth; confining layers	Not assessed outside of inventory region	Encourage proper operation and maintenance, emergency planning, training of local emergency response personnel, groundwater monitoring, spill prevention and BMPs.
Agricultural Crop Land	NO_3 and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	Low	1. depth; confining layers	Not assessed outside of inventory region	Encourage use of best management practices (BMPs) in the recharge region

6.0 LIMITATIONS

This Source Water Delineation and Assessment Report is intended to meet the technical requirements for the completion of the delineation and assessment for the Boulder Public Water System (PWS) as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). The following limitations should be noted:

- This report was prepared to assess the susceptibility of the NAME PWS to significant potential contaminant sources, and is based on published information and information obtained from individuals familiar with the community. The terms "drinking water supply" or "drinking water source" refer specifically to the source of the NAME public water supply and not any other public or private water supply. Also, not every potential or existing source of groundwater or surface water contamination in the NAME area have been identified. Only potential sources of contamination in areas that contribute water to its drinking water source are considered
- Delineation of the source water protection areas for the Town of Winifred PWS wells is based on published reports and lithology indicated on the well logs. The interaction of surface water with the alluvial channel deposits is not completely understood and the changes in the flow regime under seasonal conditions are not known. The delineation was completed using conservative assumptions to help ensure that the inventory zone reflects the actual area where contamination to the system may occur.
- The potential contaminant sources described in the inventory are identified from readily available information. Consequently, unregulated activities or unreported contaminant releases may have been overlooked. The use of multiple sources of information increases the likelihood that the major threats to the source water for Town of Winifred's public water supply have been identified. The inventory is not exhaustive. That a potential contaminant source is not identified in the inventory or susceptibility assessment of this report does not mean that the potential for contamination does not exist or there is not a threat. It is highly recommended that the PWS and community enhance or refine the identification of the potential contamination sources through further research and local input.

7.0 CONCLUSIONS

This Source Water Delineation and Assessment Report (SWDAR) was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Montana. The Department of Environmental Quality (DEQ) is completing these assessments for all public water systems in Montana. Their purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water. The information that is provided includes the identification of the area most critical to maintaining safe drinking water, i.e., the Inventory Region, an inventory of potential sources of contamination within this area, and an assessment of the relative threat that these potential sources pose to the water system.

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- Potential contaminant sources identified within the recharge region are limited to agricultural land. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. The topographic divide that represents the watershed boundary (based on the 11-digit USGS hydrologic unit) is used as the recharge region for the PWS well.

The Town of Winifred public water supply has a moderate susceptibility to agricultural land, and a low susceptibility to private septic systems.

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8.0 REFERENCES

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9.0 GLOSSARY

Acute Health Effect. A negative health effect in which symptoms develop rapidly.

Alkalinity. The capacity of water to neutralize acids.

Aquifer. A water-bearing layer of rock or sediment that will yield water in usable quantity to a well or spring.

Barrier. A physical feature or management plan that reduces the likelihood of contamination of a water source from a potential contaminant source

Best Management Practices (BMPs). Methods for various activities that have been determined to be the most effective, practical means of preventing or reducing non-point source pollution.

Biennial Reporting System (BRS). An EPA database that contains information on hazardous waste sites. The data can be accessed through the EPA Envirofacts website.

Chronic Health Effect. A negative health effect in which symptoms develop over an extended period of time.

Class V Injection Well. Any pit or conduit into the subsurface for disposal of waste waters. The receiving unit for an injection well typically represents the aquifer, or water-bearing interval.

Coliform Bacteria. A general type of bacteria found in the intestinal tracts of animals and humans, and also in soils, vegetation and water. Their presence in water is used as an indicator of pollution and possible contamination by pathogens.

Comprehensive Environmental Cleanup and Responsibility Act (CECRA). Passed in 1989 by the Montana State Legislature, CECRA provides the mechanism and responsibility to clean up hazardous waste sites in Montana.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Enacted in 1980. CERCLA provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the Act, EPA was given power to seek out those parties responsible for any release and assure their cooperation in the cleanup.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). A database that provides information about specific sites through the EPA Envirofacts website.

Confined Animal Feeding Operation (CAFO). Any agricultural operation that feeds animals within specific areas, not on rangeland. Certain CAFOs require permits for operation.

Confined Aquifer. A fully saturated aquifer overlain by a confining unit such as a clay layer. The static water level in a well in a confined aquifer is at an elevation that is equal to or higher than the base of the overlying confining unit.

Confining Unit. A geologic formation present above a confined aquifer that inhibits the flow of water and maintains the pressure of the groundwater in the aquifer. The physical properties of a confining unit may range from a five-foot thick clay layer to shale that is hundreds of feet thick.

Delineation. The process of determining and mapping source water protection areas.

Glacial. Of or relating to the presence and activities of ice or glaciers. Also, pertaining to distinctive features and materials produced by or derived from glaciers.

Geographic Information Systems (GIS). A computerized database management and mapping system that allows for analysis and presentation of geographic data.

Hardness. Characteristic of water caused by presence of various calcium and magnesium salts. Hard water may interfere with some industrial processes and prevent soap from lathering.

Hazard. A relative measure of the potential of a contaminant from a facility or associated with a land use to reach the water source for a public water supply. The location, quantity and toxicity of significant potential contaminant sources determine hazard.

Hydraulic Conductivity. A constant number or coefficient of proportionality that describes the rate water can move through an aquifer material.

Hydrology. The study of water and how it flows in the ground and on the surface.

Hydrogeology. The study of geologic formations and how they effect groundwater flow systems.

Inventory Region. A source water management area for groundwater systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified three year groundwater travel time.

Lacustrine. Pertaining to, produced by, or formed in a lake or lakes.

Large Capacity Septic System. Defined by Underground Injection Control regulations as an on-site septic system serving 20 or more persons.

Leaking Underground Storage Tank (LUST). A release from a UST and/or associated piping into the subsurface.

Maximum Contaminant Level (MCL). Maximum concentration of a substance in water that is permitted to be delivered to the users of a public water supply. Set by EPA under authority of the Safe Drinking Water Act to establish concentrations of contaminants in drinking water that are protective of human health.

Montana Bureau of Mines and Geology – Groundwater Information Center (MBMG/GWIC). The database of information on all wells drilled in Montana, including stratigraphic data and well construction data, when available.

Montana Pollutant Discharge Elimination System (MPDES). A permitting system that utilizes a database to track entities that discharge wastewater of any type into waters of the State of Montana.

National Pollutant Discharge Elimination System (NPDES). A national permitting system that utilizes a database to track entities that discharge wastewater into waters of the United States.

Nitrate. An important plant nutrient and type of inorganic fertilizer that can be a potential contaminant in water at high concentrations. In water the major sources of nitrates are wastewater treatment effluent, septic tanks, feed lots and fertilizers.

Nonpoint Source Pollution. Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving stream from a specific outlet. Examples of nonpoint- source pollution include agriculture, forestry, and run-off from city streets. Nonpoint sources of pollution, such as the use of herbicides, can concentrate low levels of these chemicals into surface and/or groundwaters at increased levels that may exceed MCLs.

Pathogens. A microorganism typically found in the intestinal tracts of mammals, capable of producing disease.

Phase II (and IIb) Rules. EPA updated or created legal limits on 38 contaminants. The rules became effective July 30, 1992 and January 1, 1993. Some of these contaminants are frequently-applied agricultural chemicals such as nitrate and others are industrial solvents.

Phase V Rule. EPA set standards for 23 contaminants in addition to those addressed by the Phase II Rules. The Phase V Rule became effective January 17, 1994. Some of these contaminants include inorganic chemicals such as cyanide and other Phase V contaminants are pesticides that enter water supplies through run-off from fields where farmers have applied them or by leaching through the soil into groundwater. Six are probable cancer-causing agents. Others can cause liver and kidney damage, or problems of the nervous system and brain.

Point Source. A stationary location or a fixed facility from which pollutants are discharged. This includes any single identifiable source of pollution, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fracture, container, rolling stock (tanker truck), or vessel or other floating craft, from which pollutants are or may be discharged.

Pollutant. Generally, any substance introduced into the environment that adversely affects the usefulness of a resource (e.g. groundwater used for drinking water).

Permit Compliance System (PCS). An EPA database that provides information on the status of required permits for specific activities for specific facilities. The data can be accessed through the EPA Envirofacts website.

Public Water System (PWS). A system that provides water for human consumption through at least 15 service connections or regularly serves 25 individuals.

Pumping Water Level. Water level elevation in a well when the pump is operating.

Recharge Region. An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers. As a source water management region, the term generally describes the entire area that could contribute water to an aquifer used by a public water supply. Includes areas that could contribute water over long time periods or under different water usage patterns.

Resource Conservation and Recovery Act (RCRA). Enacted by Congress in 1976. RCRA's primary goals are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner.

Resource Conservation and Recovery Information System (RCRIS). Is a database that provides information about specific sites through the EPA Envirofacts website.

Secondary Maximum Contaminant Levels (SMCL). The maximum concentration of a substance in water that is recommended to be delivered to users of a public water supply based on aesthetic qualities. SMCLs are non-enforceable guidelines for public water supplies, set by EPA under authority of the Safe Drinking Water Act. Compounds with SMCLs may occur naturally in certain areas, limiting the ability of the public water supply to treat for them.

Section Seven Tracking System (SSTS). SSTS is an automated system EPA uses to track pesticide producing establishments and the amount of pesticides they produce.

Sensitivity. The relative ease with which contaminants can migrate to source water through the natural materials

Source Water. Any surface water, spring, or groundwater source that provides water to a public water supply.

Source Water Delineation and Assessment Report (SWDAR). A report for a public water supply that delineates source water protection areas, provides an inventory of potential contaminant sources within the delineated areas, and evaluates the relative susceptibility of the source water to contamination from the potential contaminant sources under “worst-case” conditions.

Source Water Protection Areas. For surface water sources, the land and surface drainage network that contributes water to a stream or reservoir used by a public water supply. For groundwater sources, the area within a fixed radius or three-year travel time from a well, and the land area where the aquifer is recharged.

Spill Response Region. A source water management area for surface water systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified four-hour water travel time in a stream or river.

Standard Industrial Classification (SIC) Code. A method of grouping industries with similar products or services and assigning codes to these groups.

Static Water Level (SWL). Water level elevation in a well when the pump is not operating.

Susceptibility (of a PWS). The relative potential for a PWS to draw water contaminated at concentrations that would pose concern. Susceptibility is evaluated at the point immediately preceding treatment or, if no treatment is provided, at the entry point to the distribution system.

Synthetic Organic Compounds (SOC). Man-made organic chemical compounds (e.g. herbicides and pesticides).

Total Dissolved Solids (TDS). The dissolved solids collected after a sample of a known volume of water is passed through a very fine mesh filter.

Total Maximum Daily Load (TMDL). The total pollutant load to a surface water body from point, nonpoint, and natural sources. The TMDL program was established by section 303(d) of the Clean Water Act to help states implement water quality standards.

Toxicity. The quality or degree of being poisonous or harmful to plants, animals, or humans.

Toxicity Characteristic Leachate Procedure (TCLP). A test designed to determine whether a waste is hazardous or requires treatment to become less hazardous.

Toxic Release Inventory System (TRIS). An EPA database that compiles information about permitted industrial releases of chemicals to air and water. Information about specific sites can be obtained through the EPA Envirofacts website.

Transmissivity. A number that describes the ability of an aquifer to transmit water. The transmissivity is determined by multiplying the hydraulic conductivity time the aquifer thickness.

Turbidity. The cloudy appearance of water caused by the presence of suspended matter.

Unconfined Aquifer. An aquifer containing water that is not under pressure. The water table is the top surface of an unconfined aquifer.

Underground Storage Tanks (UST). A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals, and the associated plumbing system.

Volatile Organic Compounds (VOC). Chemicals such as petroleum hydrocarbons and solvents or other organic chemicals that evaporate readily to the atmosphere.

Watershed. The region drained by, or contributing water to, a stream, lake, or other water body of water.

FIGURES

APPENDIX A

PWS SANITARY SURVEY & SITE PLAN

Montana Department of
ENVIRONMENTAL QUALITY

Judy Martz, Governor

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • www.deq.state.mt.us

SDWIS
7/13/04
RB

7/8/2004

Niel Rich
Town of Winifred
PO Box 181
Winifred, Mt 59489

Dear Mr. Rich,

On July 25, 2003, John McDunn, conducted a routine Sanitary Survey inspection of the Town of Winifred water system, PWSID # MT0000363. Sanitary Surveys are required in the Administrative Rules of Montana (ARM), section 17.38.231 to ensure adequate protection of public health through the proper construction and maintenance of Public Water Supplies (PWS). In addition, Sanitary Surveys allow the PWS system owners/operators to be informed of current regulatory requirements. I would like to thank Niel for their time, assistance, and tour of the system.

The following is a list of recommendations for the system:

1) A well cap be installed on well number 3

2) The bolts on the well cap for well number 4 need to have all of the bolts installed and tightened.

3) That the road to Wells 3 and 4 be upgraded to an all weather road.

4) The location of Well 3 and 4 and the pump building be fenced.

5) That the over flow for the 50,000-gallon tank be screened.

6) That the location of the 50,000-gallon tank be fenced.

7) That the access ladder at the 50,000-gallon tank be protected from access

Date Entered LB

Aside from the situations noted above, the water system appears to be in good condition. I would also like to mention that the operators are doing an exceptional job considering the size and distances involved.

If you have any questions, comments, or corrections regarding this report, please feel free to contact me at 444-5312

Sincerely

John McDunn
Environmental Engineering Specialist
DEQ, Public Water and Subdivisions Bureau
Lee Metcalf Building
1520 East Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901
Phone (406) 444-5312

Cc: Neil Rich, P.O. Box 133, Winifred MT, 59489
Fergus County Sanitarian
Helena Sanitary Survey File

NITARY SURVEY FORM - INVENTORY

ID MT0000363 | SYSTEM NAME Winifred, Town of

DATE OF SURVEY 07/25/03 | COUNTY Fergus | SURVEYOR NAME John McDunn

(SYSTEM REPRESENTATIVE) Neil Rich | (OTHER REPRESENTATIVE)

SYSTEM ADDRESS

Addressee ____
Primary Address
Street ____
City ____ State ____ Zip ____
System Phone (____) ____ Fax (____) ____

SYSTEM OWNER

Addressee Town of Winifred
Owners Address
Street P.O. Box 181
City Winifred State MT Zip 59489
Owner Phone (406) 462-5360 Fax (____) ____

LOCATION OF SYSTEM

Nearest City Winifred Description or Physical Address ____

OPERATOR OF SYSTEM

Name Neil Rich
Certified Operator? ☒ Yes ☐ No ☐ Not required
Certification # 2563
Phone # (406) 462-5360 Cell # (____) ____ Fax # (____) ____

ALTERNATE OPERATOR OF SYSTEM

Name ____
Certified Operator? ☐ Yes ☐ No ☐ Not required
Certification # ____
Phone # (____) ____ Cell # (____) ____ Fax # (____) ____

SYSTEM STATUS

☒ A = Active ☐ P = Pending *(Add New System)*
☐ I = Inactive

SYSTEM CLASS

☒ C = Community
☐ NTNC = Non-Transient Non-Community
☐ TNC = Transient Non-Community

Total Service Connections: Residential / Non-Transient: 85
Transient: ____

Total Active Connections: Residential / Non-Transient: ____
Transient: ____

Service Connections Metered? ☐ Yes ☐ No
Percent Metered ____ %

Rates and Rate Structure ____

Resident Population (Number of permanent residents utilizing PWS daily) — Summer: 150 Winter: ____

Non-Transient Population (Number of non-transient persons utilizing PWS daily) — Summer: ____ Winter: ____

Transient Population (Number of transient persons served by PWS daily) — Summer: ____ Winter: ____

OWNER TYPE

☐ 1 Federal Government
☐ 2 Private Subdivision, Investor, Trust, Cooperative, Water Association, etc.
☐ 3 State Government
☒ 4 Local Government Authority, Commission, District, Municipality, City, etc.
☐ 5 Mixed Public/Private
☐ 6 Native American

SERVICE AREA CHARACTERISTICS LIST

☐ BR Bar
☐ CH Church
☐ DC Day Care Center
☐ DI Dispenser
☐ HS Head Start
☐ HA Homeowners Assoc.
☐ HM Hotel/Motel
☐ HR Highway Rest Area
☐ IA Industrial/Agricultural
☐ IC Interstate Carrier
☐ IN Institution
☐ MF Medical Facility
☐ MH Mobile Home Park
☒ MU Municipality
☐ OA Other Area
☐ ON Other Non-Transient Area (____ Average Daily Visitors TNC)
☐ OR Other Residential Area
☐ OT Other Transient Area
☐ PA Recreation Areas
☐ RA Residential Area
☐ RE Retail Employees
☐ RS Restaurant
☐ RV RV Park
☐ SC School
☐ SI Sanitary Improvement District
☐ SK Summer Camp
☐ SR Secondary Residences
☐ SS Service Station
☐ SU Subdivision
☐ WB Water Bottler
☐ WH Wholesaler (Sells Water)

Service Category Description ____

Comments: ____

ANITARY SURVEY FORM – WATER SYSTEM FACILITIES

SID MT0000363 | SYSTEM NAME Winifred Town of

Water System Facilities (WSF) numbers are WSF Type Codes plus an assigned number. (i.e. source facility numbering starts with 002 and all non-source facilities also start with 001). See instruction sheet for a list of WSF Type Codes. When a source is operational it is considered **A**ctive, this includes systems that are seasonal. **I**nactive sources are those which are shut down but can return to active status, such as a system out of business. **P**roposed sources are those that have been identified through the Plan Review process, but are not connected to the water system.

*A **water source facility** is a well, spring, intake, infiltration gallery or consecutive connections from which a system draws or purchases water:*

Total Number of Source Facilities ____

WATER SYSTEM FACILITIES SUMMARY (WSF)

WSF ID	Facility Name	Water Type Code	Purchased	Seller PWSID	Activity Status*
DS 001	Distribution System				
CH 001	Common Header	GW	☐ Yes ☒ No		
PC 001	Pressure Control Assembly	GW	☐ Yes ☒ No		
ST 001	Storage Tank - 50,000 gallon	GW	☐ Yes ☒ No		
WL 004	Well 3 Most South	GW	☐ Yes ☒ No		
WL 005	Wel 4 W	GW	☐ Yes ☒ No		
			☐ Yes ☐ No		
			☐ Yes ☐ No		
			☐ Yes ☐ No		
			☐ Yes ☐ No		
			☐ Yes ☐ No		
			☐ Yes ☐ No		

Description of Water System Facility flow: Wells

Example: Well 1(WL001) is pumped into pumphouse where chlorine is applied (TP001) and from there to the storage tank (ST001). The treated water flows by gravity to the distribution system (DS001)

* (A)ctive, (I)nactive, or (P)roposed

FACILITY LATITUDE AND LONGITUDE (IN DECIMAL DEGREES)
(Sources, treatment plants, storage)

WSF ID	Facility Name	Latitude	Longitude

EMERGENCY POWER

Does the system have emergency power? ☐ Yes ☒ No

If yes, what type: ____ Frequency of testing: ____

Record of primary power failures: ____ in last year Switchover: ☐ Automatic ☐ Manual

Comments: ____

SANITARY SURVEY FORM – WELLS & WELL PUMPS

Page ____ of ____

PWSID | SYSTEM NAME

(Please copy this sheet for additional wells & pumps)

COMPLETE ONE PAGE FOR EACH SOURCE — **STATUS OF SOURCE** ☐ (A)ctive ☒ (I)nactive ☐ (P)roposed

WSF ID **WL 003** *Entry Point ID* **EP 504**
These are State assigned identification numbers

Source Name **Well most south**
Name of Source – Example: Well 1 or South well, etc.

Location of Water Source (TRS or street address) ____

Entry Point Name ____
Name of EP – Example: Entry point for North Well 1 & South Well 2

Location of Entry Point ____

Available ☒ Perm ☐ Emerg ☐ Interim ☐ Seasonal ☐ Other
If seasonal: ____ to ____

GWUDISW PA Completed ☐ Yes ☐ No

Log Available? ☐ Yes ☒ No

Average Production ____ indicate units

Maximum Production ____ indicate units

Date Drilled ____ if well, , date drilled

Casing Size ____ size of casing installed in well

Case Depth ____ depth of casing installed in well

Well Depth ____ depth of well expressed in feet

Grout Depth ____ depth of grout used to seal well walls

Log SWL ____ (static) expressed in feet below ground elevation

Log PWL ____ (pumping) expressed in feet below ground elevation

Pump Capacity ____ capacity of pump installed expressed in gallons per min

Intake Type ____ type of intake mechanism

Screened Interval ____ expressed in feet below ground elevation

Well Yield ____ pump tested in gallons per minute

Latitude ____ Expressed in decimal degrees

Longitude ____ Expressed in decimal degrees

WELLS

	Yes	No	Unk	N/A
Is well site protected from flooding?	☒	☐	☐	☐
Is well located in proximity of potential sources of pollution (includes: surface water, known chemical spills, agricultural use, etc.)?	☐	☒	☐	☐
If Yes, explain ____				
Does casing extend at least ☒18 inches above outside ground level; ☐12 inches above finished floor inside well house; and ☒3 feet above 100 year flood elevation? (Check for appropriate distance)	☒	☐	☐	☐
Is top of the well casing properly sealed? (sanitary seal)	☐	☒	☐	☐
Is well vented?	☐	☐	☐	☒
Is well vent properly screened and terminated in a downward position?	☐	☐	☐	☒
Does well have suitable sampling tap? Raw Water	☐	☐	☐	☒
Treated	☐	☐	☐	☐
Are check valves, blow-off valves and water meters maintained and operating properly?	☐	☐	☐	☒
Is upper termination of well protected (housed or fenced)?	☐	☒	☐	☐
Is intake located below the maximum drawdown?	☐	☐	☐	☒

Comments: (Such as, detailed information on any items with identified deficiencies)

____

PUMPS

Type ____
(example: 30 hp line shaft turbine)
Rated Capacity ____

	Yes	No	Unk	N/A
Are pumps operable?	☐	☒	☐	☐
How frequently are pump(s) replaced? ____			☒	☐
Are backup pumps/motors provided?	☐	☐	☒	☐
Are controls functioning properly and adequately protected?	☐	☐	☐	☒
Do underground compartments have a drain?	☐	☐	☐	☒
Is facility properly protected against trespassing and vandalism?	☐	☒	☐	☐
Are pump records maintained (amp, drawdown, discharge, pressure, maintenance schedule, manuals, etc.)?	☐	☐	☐	☒
Is the plumbing adequately painted to prevent excessive corrosion?	☐	☐	☐	☒
Are adequate heating, lighting, and ventilation provided?	☐	☐	☐	☒
Is a preventive maintenance program in operation?	☐	☐	☐	☐
Cross connection program in operation?	☐	☐	☐	☒
Are recommended spare parts on hand?	☐	☐	☐	☒

Explain Controls: ____

Comments: (Such as, detailed information on any items with identified deficiencies)

____

SANITARY SURVEY FORM – WELLS & WELL PUMPS

Page ____ of ____

PWSID | SYSTEM NAME

(Please copy this sheet for additional wells & pumps)

COMPLETE ONE PAGE FOR EACH SOURCE

STATUS OF SOURCE ☒ (A)ctive ☐ (I)nactive ☐ (P)roposed

WSF ID **WL 004** *Entry Point ID* **EP 004**
These are State assigned identification numbers

Source Name **Well 4**
Name of Source – Example: Well 1 or South well, etc.

Location of Water Source (TRS or street address) ____

Entry Point Name ____
Name of EP – Example: Entry point for North Well 1 & South Well 2

Location of Entry Point ____

Available ☒ Perm ☐ Emerg ☐ Interim ☐ Seasonal ☐ Other
If seasonal: ____ to ____

GWUDISW PA Completed ☐ Yes ☐ No

Log Available? ☐ Yes ☒ No

Average Production ____ indicate units

Maximum Production ____ indicate units

Date Drilled ____ If well. . date drilled

Casing Size ____ size of casing installed in well

Case Depth ____ depth of casing installed in well

Well Depth ____ depth of well expressed in feet

Grout Depth ____ depth of grout used to seal well walls

Log SWL ____ (static) expressed in feet below ground elevation

Log PWL ____ (pumping) expressed in feet below ground elevation

Pump Capacity ____ capacity of pump installed expressed in gallons per min

Intake Type ____ type of intake mechanism

Screened Interval ____ expressed in feet below ground elevation

Well Yield ____ pump tested in gallons per minute

Latitude ____ Expressed in decimal degrees

Longitude ____ Expressed in decimal degrees

WELLS

	Yes	No	Unk	N/A
Is well site protected from flooding?	☐	☐	☐	☐
Is well located in proximity of potential sources of pollution (includes: surface water, known chemical spills, agricultural use, etc.)?	☐	☒	☐	☐
If Yes, explain ____				
Does casing extend at least ☒18 inches above outside ground level; ☐12 inches above finished floor inside well house; and ☒3 feet above 100 year flood elevation? (Check for appropriate distance)	☒	☐	☐	☐
Is top of the well casing properly sealed? (sanitary seal)	☐	☒	☐	☐
Is well vented?	☒	☐	☐	☐
Is well vent properly screened and terminated in a downward position?	☒	☐	☐	☐
Does well have suitable sampling tap? Raw Water	☐	☐	☒	☐
Does well have suitable sampling tap? Treated	☐	☐	☐	☒
Are check valves, blow-off valves and water meters maintained and operating properly?	☒	☐	☐	☐
Is upper termination of well protected (housed or fenced)?	☐	☒	☐	☐
Is intake located below the maximum drawdown?	☐	☐	☒	☐

Comments: (Such as, detailed information on any items with identified deficiencies)

____

PUMPS

Type ____ (example: 30 hp line shaft turbine)
Rated Capacity ____

	Yes	No	Unk	N/A
Are pumps operable?	☒	☐	☐	☐
How frequently are pump(s) replaced? ____			☒	☐
Are backup pumps/motors provided?	☐	☒	☐	☐
Are controls functioning properly and adequately protected?	☒	☐	☐	☐
Do underground compartments have a drain?	☐	☐	☒	☐
Is facility properly protected against trespassing and vandalism?	☐	☒	☐	☐
Are pump records maintained (amp, drawdown, discharge, pressure, maintenance schedule, manuals, etc.)?	☐	☒	☐	☐
Is the plumbing adequately painted to prevent excessive corrosion?	☐	☐	☒	☐
Are adequate heating, lighting, and ventilation provided?	☒	☐	☐	☐
Is a preventive maintenance program in operation?	☐	☒	☐	☐
Cross connection program in operation?	☐	☒	☐	☐
Are recommended spare parts on hand?	☐	☒	☐	☐

Explain Controls: ____

Comments: (Such as, detailed information on any items with identified deficiencies)

____

SANITARY SURVEY FORM - PRESSURE CONTROL ASSEMBLIES

Page ____ of ____

WSID | SYSTEM NAME

COMPLETE ONE SECTION FOR EACH PRESSURE CONTROL ASSEMBLY

CAPTIVE AIR TANK(S) (bladder tanks)

WSF ID PC001 Location, Description In pit near wells 3 and 4

	Yes	No	Unk	N/A
Is there a pressure relief valve?	☐	☐	☒	☐
Is there an operable pressure gauge?	☒	☐	☐	☐
Does low pressure level provide adequate pressure?	☒	☐	☐	☐
Is the tank operating properly (not water logged)?	☒	☐	☐	☐
Are the exterior surfaces of the tank(s) in good physical condition?	☒	☐	☐	☐
Can tank(s) be by-passed for repair?	☐	☐	☒	☐

Pump run time: ____

Time of Day: ____ Cut-In ____ psi

Cut-Out ____ psi

Pump Type: ____

Comments: ____

PRESSURE TANK(S) (air/water interface)

WSF ID ____ Location, Description ____

	Yes	No	Unk	N/A
Is there an operable pressure gauge?	☐	☐	☐	☐
Does low pressure level provide adequate pressure?	☐	☐	☐	☐
Is the tank operating properly (not water logged)?	☐	☐	☐	☐
Is air charge system adequate?	☐	☐	☐	☐
Is the exterior surface of the pressure tank in good physical condition?	☐	☐	☐	☐
Is there a water level sight glass?	☐	☐	☐	☐
Is there a bottom drain valve?	☐	☐	☐	☐
Is there a pressure relief valve?	☐	☐	☐	☐
Can tank(s) be by-passed for repair?	☐	☐	☐	☐

Pump run time ____ Cut-In ____ psi

Time of day ____ Cut-Out ____ psi

How much air is in the tank? ____

Pump type: ____

Comments: ____

CAPTIVE AIR TANK(S) (bladder tanks)

WSF ID ____ Location, Description ____

	Yes	No	Unk	N/A
Is there a pressure relief valve?	☐	☐	☐	☐
Is there an operable pressure gauge?	☐	☐	☐	☐
Does low pressure level provide adequate pressure?	☐	☐	☐	☐
Is the tank operating properly (not water logged)?	☐	☐	☐	☐
Are the exterior surfaces of the tank(s) in good physical condition?	☐	☐	☐	☐
Can tank(s) be by-passed for repair?	☐	☐	☐	☐

Pump run time: ____

Time of Day: ____ Cut-In ____ psi

Cut-Out ____ psi

Pump Type: ____

Comments: ____

PRESSURE TANK(S) (air/water interface)

WSF ID ____ Location, Description ____

	Yes	No	Unk	N/A
Is there an operable pressure gauge?	☐	☐	☐	☐
Does low pressure level provide adequate pressure?	☐	☐	☐	☐
Is the tank operating properly (not water logged)?	☐	☐	☐	☐
Is air charge system adequate?	☐	☐	☐	☐
Is the exterior surface of the pressure tank in good physical condition?	☐	☐	☐	☐
Is there a water level sight glass?	☐	☐	☐	☐
Is there a bottom drain valve?	☐	☐	☐	☐
Is there a pressure relief valve?	☐	☐	☐	☐
Can tank(s) be by-passed for repair?	☐	☐	☐	☐

Pump run time ____ Cut-In ____ psi

Time of day ____ Cut-Out ____ psi

How much air is in the tank? ____

Pump type: ____

Comments: ____

.NITARY SURVEY FORM - STORAGE

Page ____ of ____

WSID | SYSTEM NAME

COMPLETE ONE SECTION FOR EACH STORAGE FACILITY

How much storage is provided? 50,000 gallons

How much treated storage is provided? _____ gallons

Total number of days of supply? _____ days

Comments: _____

STORAGE FACILITY

WSF ID **ST001**

Location: LAT: _____ LONG: _____

Description: _____

Storage Volume? 50,000 gallons
Dimensions: _____
Year constructed: _____

	Yes	No	Unk	N/A
Does surface runoff and underground drainage drain away?	☒	☐	☐	☐
Is the site protected against flooding?	☒	☐	☐	☐
Is the site protected against trespass/vandalism?	☐	☒	☐	☐
Is tank inspected every 5 years by a structural engineer for structural integrity?	☐	☐	☒	☐

_____ Date of last inspection _____ By whom

Condition: ☒Good ☐Fair ☐Poor

Comments: _____

Foundation: ☒Slab ☐Ring ☐Other

Ladders caged and locked?	☐	☒	☐	☐
Are overflow lines, air vents, drainage lines or clean out pipes turned downward or covered, screened and terminated a minimum of 3 diameters above the ground or storage tank surface?	☐	☒	☐	☐
Overflow pad?	☒	☐	☐	☐
Is access hatch sealed properly and locked?	☐	☒	☐	☐
Are surface coatings in contact with water ANSI / NSF approved?	☐	☐	☒	☐
Is tank protected against icing and corrosion?	☐	☐	☒	☐
Can tank be isolated from system?	☐	☐	☒	☐
Is all treated water storage covered?	☒	☐	☐	☐
What is cleaning frequency for tanks? _____				
Are tanks disinfected after repairs are made?	☐	☐	☒	☐

Comments: _____
Include safety concerns of ladders, handrails, etc.)

STORAGE FACILITY

WSF ID _____

Location: LAT: _____ LONG: _____

Description: _____

Storage Volume? _____gallons
Dimensions: _____
Year constructed: _____

	Yes	No	Unk	N/A
Does surface runoff and underground drainage drain away?	☐	☐	☐	☐
Is the site protected against flooding?	☐	☐	☐	☐
Is the site protected against trespass/vandalism?	☐	☐	☐	☐
Is tank inspected every 5 years by a structural engineer for structural integrity?	☐	☐	☐	☐

_____ Date of last inspection _____ By whom

Condition: ☐Good ☐Fair ☐Poor

Comments: _____

Foundation: ☐Slab ☐Ring ☐Other

Ladders caged and locked?	☐	☐	☐	☐
Are overflow lines, air vents, drainage lines or clean out pipes turned downward or covered, screened and terminated a minimum of 3 diameters above the ground or storage tank surface?	☐	☐	☐	☐
Overflow pad?	☐	☐	☐	☐
Is access hatch sealed properly and locked?	☐	☐	☐	☐
Are surface coatings in contact with water ANSI / NSF approved?	☐	☐	☐	☐
Is tank protected against icing and corrosion?	☐	☐	☐	☐
Can tank be isolated from system?	☐	☐	☐	☐
Is all treated water storage covered?	☐	☐	☐	☐
What is cleaning frequency for tanks? _____				
Are tanks disinfected after repairs are made?	☐	☐	☐	☐

Comments: _____
(Include safety concerns of ladders, handrails, etc.)

SANITARY SURVEY FORM - MISCELLANEOUS

Page ____ of ____

WSID | SYSTEM NAME

DISTRIBUTION SYSTEM EVALUATION

System description ____

	Yes	No	Unk	N/A
System drawings available?	☐	☐	☒	☐
As-built drawings?	☐	☐	☒	☐
Drawing on-site?	☐	☐	☒	☐
Lines adequately sized?	☒	☐	☐	☐
Asbestos concrete pipe used?	☐	☐	☒	☐
Adequate pressure maintained?	☒	☐	☐	☐
Mains protected from freezing?	☒	☐	☐	☐
Distribution system free of leaks?	☐	☐	☒	☐
Fire hydrants?	☒	☐	☐	☐
Dead end lines eliminated?	☐	☐	☒	☐
Flushing program?	☐	☐	☒	☐
Pressure reducing stations? Number ____	☐	☐	☒	☐
Booster stations? Number ____	☐	☒	☐	☐
Connections to other PWSs? If Yes, please describe:____	☐	☒	☐	☐

Check one: ☒ No cross-connections were observed.
☐ Cross-connections were observed. Describe below.

Comments: ____

SAFETY

Check one: ☐ No confined spaces were observed.
☒ Confined space(s) were observed.

Describe any confined spaces observed: **In Well house - current location of Pressure tanks is in a pit.**

Confined space safety adequate? ☐ Yes ☒ No

Fall risks adequately mitigated? ☒ Yes ☐ No

Describe ____

Note any other safety deficiencies (consider items such as ladders, tank supports, guards on rotating electrical equipment, lightning protection for pumps, etc.) ____

MONITORING AND RECORDKEEPING EVALUATION

	Yes	No	Unk	N/A
Bacti monitoring satisfactory?	☒	☐	☐	☐
Appropriate records maintained?	☐	☒	☐	☐
Familiar with repeat sampling?	☒	☐	☐	☐
Bacti Sample Site Plan submitted?	☐	☐	☒	☐
Did Surveyor take a bacteriological sample?	☐	☒		

If Yes,

Date of Sample: ____ Time of Sample: ____

Chemical monitoring satisfactory? ☒ ☐ ☐ ☐

Comments: **Road to Wells 3 and 4 is not an allweather road. The road is just a 2 track farm road.**

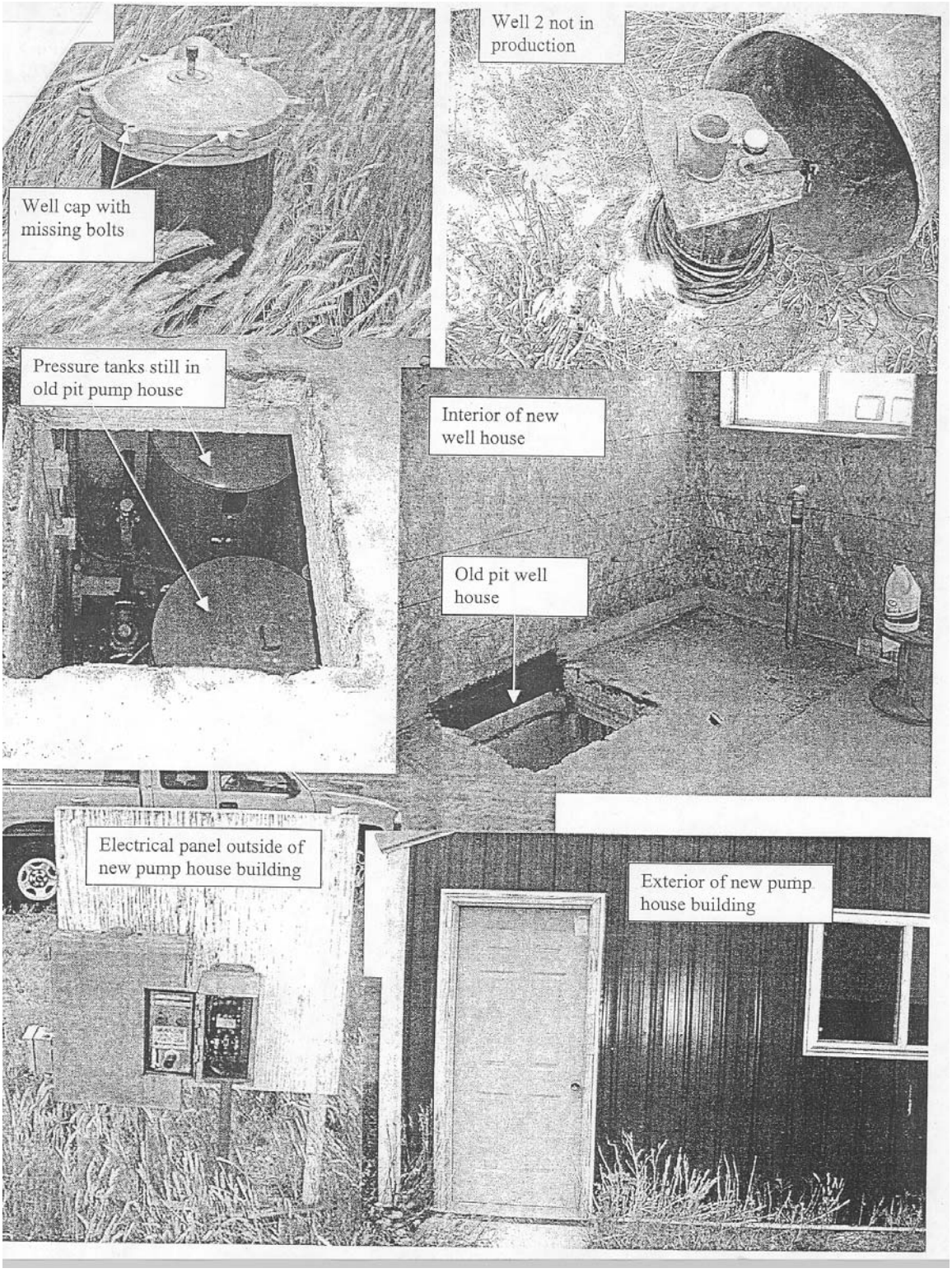
MANAGEMENT

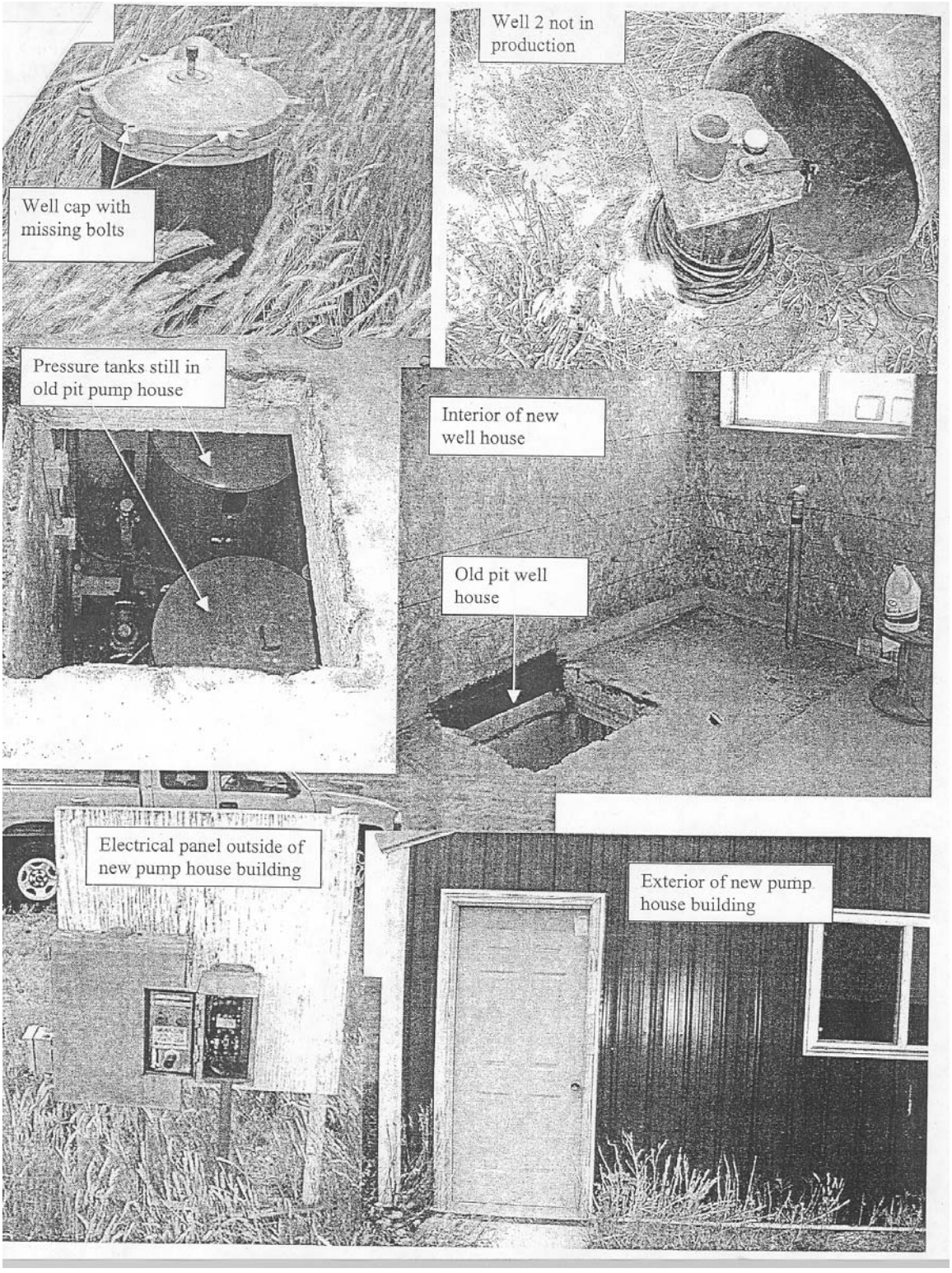
Administrative Board – Describe **City council**

Training provided – Describe ____

	Yes	No	Unk	N/A
By-laws or articles of incorporation?	☐	☐	☐	☒
Year of enactment:____				
Are copies available?	☐	☐	☐	☒
Budget:				
Exists?	☒	☐	☐	☐
Adequate?	☐	☒	☐	☐
Are personnel adequately trained?	☒	☐	☐	☐
Are operators properly certified?	☒	☐	☐	☐
Are there sufficient personnel?	☐	☒	☐	☐
Is an emergency plan available and workable?	☐	☐	☒	☐
Are abandoned wells present?	☐	☐	☒	☐
Do abandoned wells appear to be properly abandoned?	☐	☐	☒	☐
Is operator aware of procedures regarding well abandonment?	☒	☐	☐	☐
Is there an O&M manual?	☐	☐	☒	☐
Is it current?	☐	☐	☒	☐
Is a copy on-site?	☐	☐	☒	☐
O&M log maintained?	☐	☐	☒	☐
Does the system have a current Monitoring Schedule?	☒	☐	☐	☐

Comments: ____


Well cap with missing bolts
Well 2 not in production
Pressure tanks still in old pit pump house
Interior of new well house
Old pit well house
Electrical panel outside of new pump house building
Exterior of new pump house building


Well cap with missing bolts
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Pressure tanks still in old pit pump house
Interior of new well house
Old pit well house
Electrical panel outside of new pump house building
Exterior of new pump house building

APPENDIX B

SOURCE WATER MONITORING WAIVERS

MONITORING WAIVERS

Waiver Recommendation

The Town of Winifred PWS has a waiver for Phase 2 inorganics (which includes barium, cadmium, chromium, fluoride, mercury and selenium). The waiver allows the PWS to collect one sample round for these constituents every 9-year cycle (the standard is one sample round per 3-year cycle). The PWS is ineligible for additional waivers, based upon recent noncompliance with monitoring requirements. Hoever, based on past monitoring results and the susceptibility assessment, the Town of Winifred PWS may be eligible for other waivers in the future, including Phase 5 inorganics and volatile organic compounds. Information on susceptibility and use waivers is provided in this section to give the PWS operators an opportunity to consider if waivers may be feasible.

Before a susceptibility or use wavier is requested, the PWS Operators are encouraged to carefully review the Monitoring Waiver Requirements, described below. If after reviewing this section it is determined that an additional waivers are feasible, the PWS should submit a letter to DEQ requesting the specific monitoring waivers. The PWS must be in compliance with monitoring requirements to be considered. If requested by DEQ, the PWS may also need to provide additional information regarding chemical use in the area within the Inventory Region. The table below shows how identified potential contaminant sources affect the eligibility for monitoring waivers.

Susceptibility Assessment as it relates to Waiver Eligibility

Source	Contaminant	Susceptibility	Waiver Eligibility
Transportation Corridors	VOCs, SOCs, petroleum products and other chemicals		Chemical use in right-of-way may preclude waivers for some chemicals. PWS should confirm chemical use history along the right-of-way. Waivers might be rescinded if a spill occurred.
Sewer System/ Wastewater Treatment	Nitrates, pathogens		Waivers are not available for pathogens and nitrate.
Agricultural Cropped Areas	Nitrates and SOCs		Chemical use may preclude waivers for some chemicals. The PWS should confirm chemical use/storage history by land parcel.

Monitoring Waiver Requirements

The 1986 Amendments to the Safe Drinking Water Act require that community and non-community PWSs sample drinking water sources for the presence of volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs). The US EPA has authorized states to issue monitoring waivers for organic chemicals to systems that have completed an approved waiver application and review process. All PWSs in the State of Montana are eligible for consideration of monitoring waivers for several organic chemicals. The chemicals diquat, endothall, glyphosate, dioxins, ethylene dibromide (EDB), dibromochloropropane (DBCP), and polychlorinated biphenyls (PCBs) are excluded from monitoring requirements by statewide waivers.

Use Waivers

A Use Waiver can be allowed if through a vulnerability assessment, it is determined that specific organic chemicals were not used, manufactured, or stored in the area of a water source (or source area). If certain organic chemicals have been used, or if the use is unknown, the system would be determined to be vulnerable to organic chemical contamination and ineligible for a Use Waiver for those particular contaminants.

Susceptibility Waivers

If a Use Waiver is not granted, a system may still be eligible for a Susceptibility Waiver, if through a vulnerability assessment it is demonstrated that the water source would not be susceptible to contamination. The purpose of the vulnerability assessment procedures outlined in this section is to determine which of the organic chemical contaminants are in the area of investigation. The vulnerability assessment of a surface water source must consider the watershed area above the source, or a minimum fixed radius of 1.5 miles upgradient of the surface water intake. PWSs developed in unconfined aquifers should use a minimum fixed radius of one mile as an area of investigation for the use of organic chemicals. Vulnerability assessment of spring water sources should use a minimum fixed radius of one mile as an area of investigation for the use of organic chemicals. Surface water and shallow groundwater sources under the direct influence of surface water (GWUDISW) should assess the watershed area above the source, or a minimum fixed radius of one and one-half miles upgradient.

Given the wide range of landforms, land uses, and the diversity of groundwater and surface water sources across the state, additional information is often required during the review of a waiver application. Additional information may include well logs, pump test data, water quality monitoring data from surrounding public water systems, delineation of zones of influence and contribution to a well; time-of-travel or attenuation studies; vulnerability mapping; and the use of computerized groundwater flow and transport models. DEQ's PWS Section and DEQ's Source Water Protection Program will conduct review of an organic chemical monitoring waiver application. Other state agencies may be asked for assistance.

Susceptibility Waiver for Unconfined Aquifers

Unconfined aquifers are the most common source of usable groundwater. Unconfined aquifers are not contained within impervious geologic strata. As a result, the upper groundwater surface, or water table, in an unconfined aquifer is not under the pressure that produces hydrostatic head common to confined aquifers.

Unconfined aquifers are usually locally recharged from surface water or precipitation. In general, groundwater flow gradients in unconfined aquifers reflect surface topography, and the residence time of water in the aquifer is generally shorter than for water in confined aquifers. Similar water chemistry often exists between unconfined groundwater and area surface water, and physical parameters and dissolved constituents can be an indicator of the hydraulic connection between groundwater and surface water. Consequently, unconfined aquifers can be susceptible to contamination by organic chemicals migrating from the ground surface to groundwater.

Properly assessing a susceptibility waiver application for an unconfined source aquifer requires: site-specific information pertaining to the location and construction of the source development, monitoring history of the source, geologic characteristics of the unsaturated soil and vadose zones, and chemical characteristics of the organic chemicals pertaining to their mobility and persistence in the environment. The zone of contribution of the unconfined groundwater source must be defined and plotted. This should describe the groundwater flow directions, gradients, and a 3-year time-of-travel. All surface water bodies within 1,000 feet of the PWS well(s) must be plotted. Analytical monitoring history of the PWS well and those nearby should be provided as well.

Susceptibility Waiver for Confined Aquifers

Confined groundwater is isolated from overlying material by relatively impermeable geologic units. A confined aquifer is generally subject to pressures greater than atmospheric pressure. A well that is screened in a confined aquifer will have a static water level that determined by the pressure (hydrostatic head) at the top of the aquifer.

The susceptibility of a confined aquifer relates to the probability of an introduced contaminant to travel from the source of contamination to the aquifer. Important hydrogeologic controls include the depth of the aquifer, the permeability of the soil and vadose zones, the thickness and uniformity of low permeability and confining layers between the surface and the aquifer, and hydrostatic head of the aquifer.

A confined aquifer may eventually be affected by contaminated groundwater from elsewhere in the recharge area. Improper well construction or abandonment can act as a hydraulic connection to the confined aquifer. The extent of confinement of an aquifer is critical to limiting susceptibility to organic chemical contamination. The extent of confinement must be demonstrated by the PWS in order to be considered for a confined aquifer susceptibility waiver. Typical information includes: pump test data (storage coefficient), geologic mapping, well logs, water quality history, and available information related to any other wells, active or abandoned, in the recharge region.

APPENDIX C

CONCURRENCE LETTER