Absaloka Mine

PWSID MT0000417

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Revised:

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Executive Summary
April 12, 2006

Introduction and Background
Absaloka Mine is located about 25 miles east of Hardin on Highway 384, near Sarpy Creek, which is a tributary of the Yellowstone River (Figure 1). Big Horn County has a population of about 12,671 and the county's population has increased about 12% since 1990.

The Absaloka Mine pubic water supply is classified as a non-transient non-community system under the Federal Safe Drinking Water Act, because the system serves at least 25 year-round people on a daily basis. According to the most current sanitary survey, the public water supply services about 70-80 employees with one active service connection. Absaloka Mine's public water supply is served by ground water from a single ground water well that was drilled in 1973 according to the sanitary survey. The well is 7,955 feet deep and is a flowing artesian well. The well is interpreted as being completed in the Madison Formation.

Within the past five years, Absaloka Mine has no positive total coliform detections. No MCL exceedances were noted for any other constituents monitored over the past five years, this includes nitrate. The highest nitrate value recorded for water from the well was 0.62 milligrams per liter (Mg/L) In 2004, and the lowest nitrate value for the well was less than 0.05 Mg/L in 2003. The average nitrate level for the past five years was less than 0.19, which is significantly below the MCL of 10 mg/l. Overall, the water quality for this system is very good.

Delineation of Source Water Protection Areas
The purpose of delineation is to map the source of drinking water for the public water supply and to define areas within which to prioritize source water protection efforts. Three source water protection areas are defined for Absaloka Mine (Figure 3 and Figure 6). They are 1) a 100-foot control zone around the well, 2) a confined inventory region, and 3) a recharge region corresponding to the watershed that surrounds the public water supply. The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well. The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage.

Source water for the Absaloka Mine public water supply comes principally from deep within the Madison Formation. The aquifer is interpreted to be deep and confined. In general, recharge is considered to come from a combination of precipitation and snowmelt runoff in uplifted areas where the Madison Limestone crops out. Ground water flow direction is interpreted to be primarily from the south-southwest to the north-northeast ((Figure 3).

Inventory of Potential Contaminant Sources
The inventory of potential contaminant sources is used to assess the susceptibility of the Absaloka Mine public water supply to contamination and to identify priorities for source water protection planning. The inventory focuses on facilities that generate, use, store, transport, or dispose of potential contaminants and on land types where potential contaminants are present. Some potential contaminant sources are

considered significant based upon 1) the volume of potential releases, 2) the volume of hazardous materials typically handled, 3) the potential of the released materials to impact nearby surface water or ground water, and 4) the proximity of the potential contaminant sources to the source of water used by the public water supply. Maps showing the inventory results are shown in (Figure 3A and B, and Figure 6.

Susceptibility is the potential for a public water supply to draw in water contaminated by inventoried sources. Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of natural or man-made barriers that decrease the likelihood that contaminated water will flow to the public water supply well (Tables 6 and 7). For wells completed in a confined aquifer hazard is based primarily on well construction for the public water supply well and other wells located within the inventory region (Table 6). Table 8 lists all of the potential contaminant sources identified in this inventory and includes the hazard and final susceptibility ratings assigned to each potential contaminant source.

Potential contaminant sources that could pose a threat to the public water supply include: the railroad and a Mine access road. The hazard associated with the transportation routes comes from accidents that could result in spills and releases that would infiltrate into the aquifer used to provide water for Absaloka Mine. However, this road and railroad are not considered to be significant potential sources of contamination due to the low volume of traffic and the depth and construction of the public water supply well.

All other potential contaminant sources identified are assigned a low susceptibility rating. (Figure 3 and Figure 6 show the locations of potential contaminant sources in relation to the public water supply. All potential contaminant sources may not have been identified in this inventory. In some instances, inadequate location information in the available databases can result in some potential contaminant sources not being included in the inventory. Review of the inventory and this report by the local public water supply operator and the community can help address limitations of the inventory process.

Management Recommendations

It should be noted that even small releases of some chemicals in close proximity to a well could have significant negative impact on water quality. Steps can be taken to reduce the likelihood of releases to the source water for the public water supply or in the vicinity of the sources. Some of these steps are listed in Table 8.

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INTRODUCTION

This Delineation and Assessment Report was prepared by Laura Rennick, an intern with the Source Water Protection Program (SWPP) at the Montana Department of Environmental Quality (DEQ) and Jim Stimson, Hydrogeologist with the SWPP reviewed and edited the report. Absaloka Mine Public Water Supply (PWS) is located in Big Horn County, Montana, about 25 miles east of Hardin on Highway 384 (Figure 1). The DEQ PWS identification number, operator name, and operator phone number for the Absaloka Mine PWS appear on the title page of this report.

Purpose

This report is intended to meet the technical requirements for the completion of the source water delineation and assessment report for the Absaloka Mine 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 the protection of public drinking water supplies from contamination. The primary purpose of this source water delineation and assessment report is to provide information to assist the Absaloka Mine PWS operator in the identification of potential contaminant sources near its well and to encourage the development of a source water protection plan to help protect the drinking water for the long term.

Delineation and assessment constitute major components of the Montana Source Water Protection Program. Delineation entails mapping the boundaries of source water protection areas, which encompass ground water and/or surface waters contributing to public water supply. Assessment involves identifying locations or regions within source water protection areas where contaminants may be generated, stored, transported, or disposed, and determining the relative susceptibility of drinking water to contamination from these sources.

Limitations

This report was prepared to assess threats to the Absaloka Mine PWS and is based on published data including the most recent sanitary survey, which was completed on January 20, 2004, by Joe Steiner of The Cadmus Group, Inc., and information obtained from local residents familiar with the community. The terms “drinking water supply” and “drinking water source” refer specifically to the sources of Absaloka Mine PWS, and not any other public or private water supply. Also, not all of the potential or existing sources of ground water or surface-water contamination in the area of Absaloka Mine are identified. Only potential sources of contamination in areas that contribute water to the identified drinking water sources 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 carcinogenic or toxic constituents that do not have MCLs but are considered to be significant health threats.

CHAPTER 1
BACKGROUND

The Community

Absaloka Mine is located about 25 miles east of Hardin on Highway 384, near Sarpy Creek, which is a tributary of the Yellowstone River (Figure 1). Hardin is about 46 miles east of Billings, Montana along Interstate 90 (Figure 1). The town has a population of about 3,384. Hardin's population has grown by about a 15% since the 1990 census (Census and Economic Information Center, 2002). Big Horn County has a population of about 12,671 and the county's population has increased about 12% since 1990. Approximately 70-80 people work in Absaloka Mine. The PWSs is classified as non-transient, non-community systems that serve 25 or more year round employees. Table 1 below lists the PWSs and the source of water they use.

The mine operates its own public water supply (PWS) and domestic waste water is treated using one or more large capacity septic systems.

Table 1. Public Water Supplies in the area.

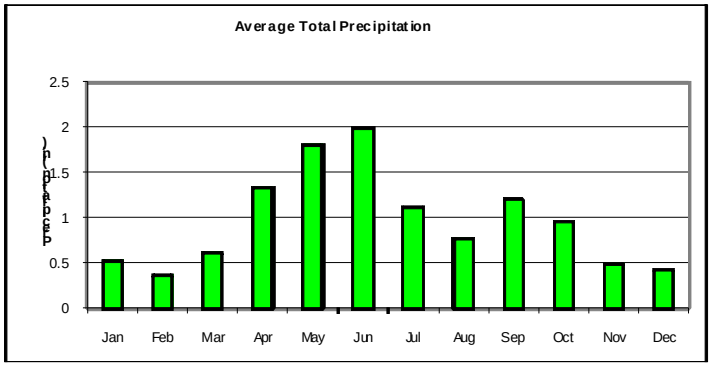
PWSID	Primary Name	Class	Source Name	Source Type	Resident Population	Non-Resident Population
MT000417	Absaloka Mine	NTNC	Well 1 Hot Artesian	Groundwater	70-80	0

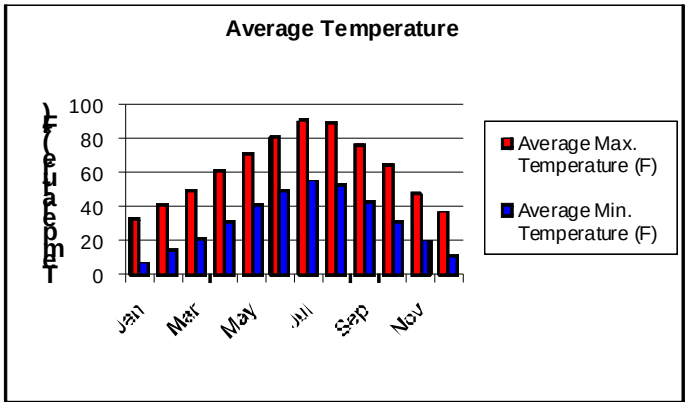
Figure 2. Average Temperatures and Precipitation

Climate

Climate information for the Absaloka Mine comes from the weather station in Hardin, as this is the nearest station to the Mine.

Based on Western Regional Climatic Center data for the period of record, annual precipitation averages 11.77 inches. Monthly average precipitation ranges from 0.38 inches in February to 1.98 inches in June.





Summer thunderstorms and winter snows provide a majority of the precipitation in the area. The annual mean snowfall in Hardin is 22.4 inches (Western Regional Climate Center).

Geographic Setting

Absaloka Mine is located in the non-glaciated central ground-water region of the United States (Heath, 1984). The elevation at the Mine is approximately 3,553 feet above mean sea level

and the town is located a little over a mile and a half east of the Sarpy Creek.

The Public Water Supply

The Absaloka Mine pubic water supply is classified as a non-transient non-community system under the Federal Safe Drinking Water Act, because the system serves at least 25 people daily year-round. The PWS services about 70-80 residents with 1 active service connections.

Absaloka Mine's public water supply is served by a single artesian well. Water from the well is pumped to the lagoons where the water is cooled. Water then flows via gravity to the treatment building. The water is pumped through a carbon filter. Pressure is maintained with two captive air pressure thanks. Water is then filtered through a cartridge filter, then through dual 0.05µ filters before being treated with a RO system. The water is then chlorinated and stored in an 11,000-gallon storage tank. Water is then pumped into the distribution system, which consists of PVC piping. Pressure on the distribution system is maintained with a single air/water pressure tank (Sanitary Survey, 2004). Well #1 is located between the two cooling lagoons west of the plant. The well was drilled to a depth of 7,955 feet on January 1, 1973, and has 7-inch casing which extends 12 inches above the finished floor inside the well house. The well yields over 2000 gallons of hot water per minute. As previously mentioned this is a flowing artesian well. There is no other completion information for the well (Sanitary Survey, 2004). The well is completed in a deep confined aquifer and is consider to have a low sensitivity to potential contaminant sources located at or near the land surface.

Public water systems must conduct routine monitoring for contaminants in accordance with Federal Safe Drinking Water Act requirements. A community public water supply, like Absaloka Mine, must sample in accordance with schedules specified in the Administrative Rules of Montana (ARM). Monitoring includes coliform bacteria, lead, copper, nitrate, nitrite, volatile organic chemicals (including hydrocarbons and chlorinated solvents), inorganic chemicals (including metals), synthetic organic chemicals (including pesticides), and radiological contaminants. Transient, non-community PWSs are required to conduct routine monitoring only for pathogens (including coliform bacteria), nitrate, and nitrite. All contaminant concentrations detected in required samples must comply with numeric maximum contaminant levels (MCLs) specified in the Federal Safe Drinking Water Act.

Absaloka Mine PWS Water Quality

Within the past five years, Absaloka Mine has no positive total coliform detections. No MCL exceedances were noted for any other constituents monitored over the past five years, this includes nitrate. The highest nitrate value recorded for water from the well was 0.62 milligrams per liter (Mg/L) In 2004, and the lowest nitrate value for the well was less than 0.05 Mg/L in 2003. The average nitrate level for the past five years was less than 0.19, which is significantly below the MCL of 10 mg/l.

Table 2. Source water sensitivity criteria (DEQ, 1999).

Source Water Sensitivity
High Source Water Sensitivity
Surface water and GWUDISW
Unconsolidated Alluvium (unconfined)
Fluvial-Glacial Gravel
Terrace and Pediment Gravel
Shallow Fractured or Carbonate Bedrock
Moderate Source Water Sensitivity
Semi-consolidated Valley Fill sediments
Unconsolidated Alluvium (semi-confined)
Low Source Water Sensitivity
Consolidated Sandstone Bedrock
Deep Fractured or Carbonate Bedrock
Semi-consolidated Valley Fill Sediments (confined)

CHAPTER 2
DELINEATION

The source water protection areas for the Absaloka Mine public water system are delineated in this chapter. The purpose of delineation is to map the source of drinking water for the public water supply and to define areas within which to prioritize source water protection efforts. Normally for a public water supply using ground water there are three source water protection regions delineated for each well. They include: 1) a 100-foot control zone, 2) an inventory region based on either Time-Of-Travel (TOT) calculations, hydrogeologic mapping or a fixed radius distance, and 3) a recharge region corresponding to the watershed that surrounds the public water supply. For ground water sources that are located close to streams, a surface water buffer region is also routinely delineated.

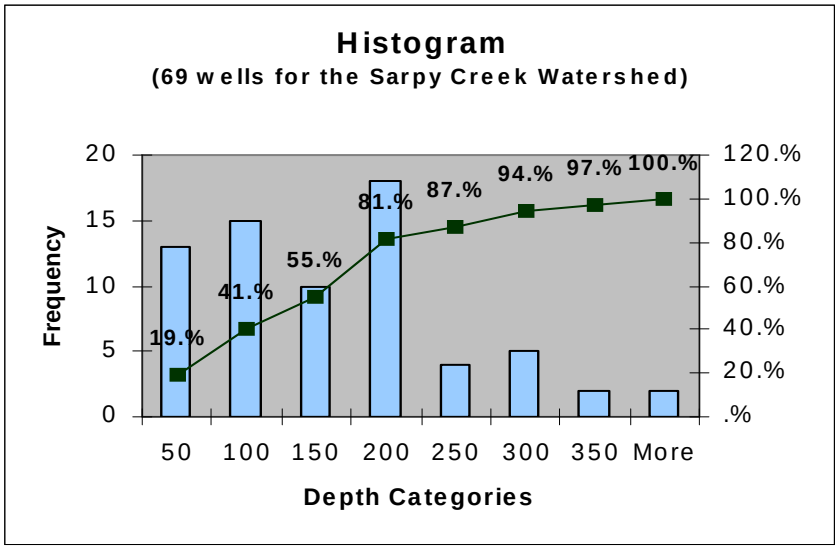
The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or the immediate surrounding areas. The inventory and surface water buffer regions should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage.

General Hydrogeologic Setting

The mine's well is very deep for a water supply well and is interpreted to be completed in the Madison Formation that consists primarily of limestone and dolomite. This formation is considered to be a regional aquifer because it is present in the subsurface throughout the eastern 2/3 of Montana. Recharge for the Madison aquifer is not local and originates in uplifted areas to the west and south of the mine site where the formation is exposed at the land surface (Whitehead, 1996). The Bighorn Mountains located about 80 miles southwest of the mines site represents one of the recharge areas.

There are other younger geologic formations in the vicinity of the mine that contain ground water and provide water to shallow wells. Most of the other shallow wells near Absaloka Mine are completed in shale and sandstone layers of the Fort Union Formation. Most of these wells are located east of the mine site.

Figure 5 Histogram of Total Depth



Local Hydrogeologic Setting

Well information for 69 well located in the watershed surrounding the Mine was retrieved on November 17, 2005 from the Ground Water Information Center (GWIC) at the Montana Bureau of Mines and Geology (MBMG). Figure 5 shows a frequency

distribution of total depth of these wells. Figure 5 indicates that the majority of wells are about 100-200 feet deep. Forty-one percent are 100 feet deep or less, and 81% are 200 feet deep or less. The average depth for all of the wells in the watershed is 251 ft. below land surface (ft. bls) and the maximum depth is 7,955 ft. bls. Well logs show that the majority of the wells are completed in shale and sandstone beds. Information for the Mine's well is summarized in Table 3.

Conceptual Model and Assumptions

Source water for the Absaloka Mine public water supply comes principally from the Madison Formation (Figure 4). This is a deep confined limestone aquifer that receives recharge from uplifted areas to the west and south of the mine site. In general, recharge is considered to come from a combination of precipitation and snowmelt runoff. Ground water flow direction is interpreted to be primarily from the south-southwest to the north-northeast.

Summary of Well Information

Table 3. Information from drillers log for the Absaloka Mine well.

Well Name: **MBMG #** **DNRC WR#**	**Well #1** **146**
Location	01N 37E 26 BDBA
Date Completed	1/1/1973
Depth (ft bgs*)	7955
Screened Interval (ft**)	Unknown
SWL Depth (ft bgs*)	Flowing
PWL Depth (ft bgs*)	-
Drawdown (ft**)	-
Test Pumping Rate (gpm***)	2000+
Specific Capacity (gpm/ft****)	-

*ft bgs = feet below ground surface, **ft = feet, ***gpm = gallons per minute, ****gpm/ft = gallons per minute per foot of drawdown.

Delineation Results

Control Zones – A 100-foot radius control zones was delineated for the well; all sources of potential contaminants should be excluded in this region. All potential contaminant sources are identified within the control zone.

Inventory Region - The inventory region consists of 1,000-foot confined inventory region buffer. Time-of Travel calculations were not calculated because of the confined nature of the aquifer.

Recharge Region – Recharge for the Madison aquifer does not originate from land areas in the vicinity of the mine or within the watershed that the mine is located in. Areas where the Madison Formation crops out represent recharge areas. Most of these areas are located in mountainous areas that are undeveloped wilderness and where potential contaminant sources are scarce.

Limiting Factors

The conceptual model presented in this report is a simplification of the real ground-water flow system near Absaloka Mine but is considered to be sufficiently accurate to assess the susceptibility of the Absaloka Mine public water supply to potential sources of contamination in the area.

Table 4. Information Used To Support Time-Of-Travel Calculations. (This Table is intentionally blank because a confined inventory region was delineated in place of Time of Travel inventory regions.

Input Parameter	Values Used	Range of Values and units
PWS Source Code		MT0000417
Transmissivity		
Thickness		
Hydraulic Conductivity		
Hydraulic Gradient		
Flow Direction		
Effective Porosity		
Pumping Rate		
1-Year TOT		
3-Year TOT		
Stagnation Point		

CHAPTER 3
INVENTORY

An inventory of potential sources of contamination was conducted to assess the susceptibility of the Absaloka Mine public water supply to contamination, and to identify priorities for source water protection planning. Inventories were conducted within the control zone, and the inventory, surface water buffer, and recharge regions. The inventory focuses on facilities that generate, use, store, transport, or dispose of potential contaminants, and on land types on which potential contaminants are generated, used, stored, transported, or disposed. Additionally, the inventory identifies potential sources of all primary drinking water contaminants and Cryptosporidium. Only significant potential contaminant sources were selected for detailed inventory.

Inventory Method

Available databases were initially searched to identify businesses and land uses that are potential sources of regulated contaminants in the inventory region. The following steps were followed:

Step 1: Land cover is identified from the National Land Cover Dataset compiled by the U.S. Geological Survey and U.S. Environmental Protection Agency (U.S.G.S., 2000). Land cover types in this dataset were mapped from satellite imagery at 30-meter resolution using a variety of supporting information.

Step 2: EPA's Envirofacts System was queried to identify EPA regulated facilities. This system accesses the following databases: Resource Conservation and Recovery Information System (RCRIS), Biennial Reporting System (BRS), Toxic Release Inventory (TRI), Permit Compliance System (PCS), and Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). The available reports were browsed for facility information including the Handler/Facility Classification to be used in assessing whether a facility is a significant potential contaminant source.

Step 3: DEQ databases were queried to identify Underground Storage Tanks (UST), hazardous waste contaminated sites, landfills, and abandoned mines.

Step 4: Major road and rail transportation routes were identified.

Step 5. All significant potential contaminant sources were identified in the inventory region and land uses and facilities that generate, store, transport, or dispose large quantities of hazardous materials were identified within the recharge region.

Potential contaminant sources are designated as significant if they fall into one of the following categories:

1) Large quantity hazardous waste generators
2) Landfills
3) Hazardous waste contaminated sites
4) Underground storage tanks
5) Major roads or rail transportation routes
6) Cultivated cropland
7) Animal feeding operations
8) Wastewater lagoons or spray irrigation
9) Septic systems
10) Sewered residential areas
11) Storm sewer outflows
12) Floor drains, sumps, or dry well
13) Abandoned or active mines

Inventory Results/Control Zones

The 100-foot control zone includes portions of an access road, water treatment lagoons, and possibly the water treatment building (Figure 3). Potential contaminants present in the control zone may include weed-control chemicals, small volumes of fuel related to equipment, possibly septic lines, and water treatment chemicals. Potential contaminants are not likely to be stored in commercial volumes and are not considered to pose a threat to the source water. That being said, it would be still be advisable for the Mine to restrict the use of fertilizers, pesticides, or herbicides near the well locations.

Inventory Results/Inventory Region

The well is located up gradient to most of the mine facility buildings and due to the well's depth and the artesian pressure causing the water to flow from the well, none of the potential contaminant sources within the inventory region are considered to pose a threat to the source water. However, some of the potential contaminant sources could pose a threat to water in the treatment lagoons. This includes airborne contaminants related to the mine operation and the railroad.

The railroad runs through the inventory region to the west of the well. The hazard comes from accidents resulting in spills and releases that would occur up gradient from the public water supply well and water treatment lagoons.

Within the inventory region all of the land is low septic density. Low, medium, and high septic densities represent the extent of septic systems in an area (Figure 3). Low septic density is not considered to be a significant potential source of contamination.

There was no information provided about the location of the on-site septic system at Absaloka Mine. However, because the all of the buildings associated with the Mine are located down gradient to the well it is probable that the septic system is not a significant potential source of contamination.

As mentioned previously, the Mine road is located within 100 feet of the well. This road does not carry heavy traffic volume. This road is not considered to be a significant potential source of contamination as it serves only the water treatment building, thus there is no through traffic. However, it is still advisable for mine personnel to be vigilant and respond appropriately should an accident involving hazardous material occur near the well and the water treatment facilities.

Land use within the inventory region is about 30% forest and shrubland, 30% grassland, 30% industrial, and about 10% open water (the cooling ponds). Forest, shrubland, grassland, and open water are not considered to be significant potential sources of contamination. However, industrial land use can be a potential source of contamination (Table 7).

Other potential contaminant sources in the Absaloka Mine area possibly include Class V injection well (floor drains, French drains, etc). These are drains that are open to the shallow aquifer system and that are not connected to a septic system or sewer service. Class V well were common in the past in a variety of private and commercial shops. The threat from Class V injection well cannot be determined because an accurate inventory of these well has not been completed for Montana. A local inventory of Class V injection well is the best way to assess the threat they may pose to the source water.

From the above list of potential contaminant sources, some are considered significant based upon the following factors: the volume of potential releases, the volume of hazardous materials typically handled, the potential of the released materials to impact nearby surface water or groundwater, and the proximity of the sources to the PWS well and infiltration lines. Significant potential contaminant sources from the above section are summarized for each source of water in Table 5 below.

Table 5. Significant Potential Contaminant Sources in the Inventory Region

Source	Contaminant	Hazard
Railroad	Variety of hazardous materials including VOCs and SOCs, others?	Spills and releases related to accidents
On-Site Septic System at Absaloka Mine	Pathogens and nitrate, household hazardous waste	Infiltration into shallow ground water
Absaloka Mine Road	Variety of hazardous materials including VOCs and SOCs, others?	Spills and releases related to accidents
Industrial Land Use (less than 28% in the inventory region)	Variety of hazardous materials including VOCs and SOCs, pathogens, nitrate	Spills, surface runoff
Class V Injection Well (existence and locations are not known) where storm and/or wastewater is concentrated and recharges groundwater.	VOCs, SOCs, petroleum hydrocarbons, metals, pathogens, nitrate	Leaks, spills, improper handling and disposal/discharge of chemicals used by various businesses and are released to systems that allow infiltration of contaminants to the subsurface or to the storm water system

Inventory Results/Recharge Region

The recharge areas for the mines well is located 60 to 80 or more miles west and south of the mine site. The Bighorn Mountains represent one of the recharge areas. Land cover in the recharge area is almost entirely undeveloped wilderness and there does not appear to be potential sources of contamination present.

Inventory Update

To make this SWDAR a useful document in the years to come, the owners, manager, or the certified water system operator(s) for the public water supply should update the inventory for their records every year. Changes in land uses or potential contaminant sources should be noted and additions made as needed. The complete inventory should be submitted to DEQ at least every 5 years to ensure that this report/plan stays current in the public record.

Inventory Limitations

The potential sources of contaminants described above are identified from readily available information. Consequently, unregulated activities or unreported contaminant releases may have been overlooked. The use of multiple sources of information, however, should ensure that the major threats to the source water have been identified.

CHAPTER 4
SUSCEPTIBILITY ASSESSMENT

Susceptibility is the potential for a public water supply to draw in water contaminated by inventoried sources. Susceptibility is assessed in order to help prioritize management actions for each potential contaminant source.

The goal of source water management is to protect 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 land use activities in the recharge region pose minimal threats to the source water. Management priorities in the inventory region are determined by ranking the significant potential contaminant sources identified in the previous chapter according to susceptibility. The PWS operators, town, and county officials could pursue alternative management approaches to help reduce susceptibility that are listed in Table 8 and discussed briefly in Chapter 5.

Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of barriers that decrease the likelihood that contaminated water will flow to the PWS well (Tables 7 and 8). For point sources, hazard is rated by the proximity of a potential contaminant source to the well.

When the PWS well is completed within a confined aquifer a 1,000-foot fixed radius inventory region is used. Hazard rating for potential contaminant sources within the inventory regioin is assigned based on the construction of the PWS well and other wells within the inventory region. Table 6 summarizes hazard assignment based on well construction. It appears that no other wells are present within the inventory region. Hazard is set at low based on the depth of the mine's well and the artesian pressure causing the water to flow to the land surface.

Table 6. Hazard of potential contaminant sources for the public water system well.

Potential Contaminate Sources	**The PWS well is not sealed through the confining layer**	**Other well in the inventory region are not sealed through the confining layer**	**All well in the inventory region are sealed through the confining layer**
Point Sources	High	Moderate	Low
Septic Systems (# per square mile)	High: > 300 Moderate: 50 to 300 Low: < 50	Moderate: > 300 Low: < 300	Low
Sanitary Sewer (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low
Cropland (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low

Barriers to contamination can be anything that decreases the likelihood that contaminants will reach a well. Barriers can be engineered structures, management actions, or natural conditions. Examples of engineered barriers are spill catchment structures for industrial facilities and leak detection for

underground storage tanks. Emergency planning and best management practices are considered management barriers. Thick clay-rich soils, a deep water table or a thick saturated zone above the well intake can be natural barriers. Table 7 shows how barriers are used to adjust the final susceptibility ratings.

Table 7. Susceptibility of Source Water based on Hazard rating and the presence of Barriers

	High Hazard Rating	**Moderate Hazard Rating**	**Low Hazard Rating**
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

Susceptibility ratings are presented individually for each significant potential contaminant source and each associated contaminant on the following page (Table 8).

Table 8. Susceptibility Assessment Significant Potential Contaminant Sources in the Inventory Region - Absaloka Mine Public Water Supply.

Inventory Region							
Source	**ID Number on Maps**	**Contaminant**	**Hazard**	**Hazard Rating**	**Barriers**	**Susceptibility**	**Management Recommendations**
On-Site Septic System at Absaloka Mine	Not Numbered	Pathogens and nitrate,	Infiltration into shallow ground water	**Low**	- Down gradient location	**Low**	-Document septic system location - Properly operate and maintain the on-site septic system and distribution lines. A two to three year septic tank pumping maintenance schedule is recommended.
Industrial Land Cover	Not Numbered	Variety of hazardous materials including VOCs and SOCs, pathogens, nitrate	Spills, over-application, surface runoff	**Low**	- Down gradient location	**Low**	-Use best management practices for use and storage of VOCs, SOCs, and other potentially hazardous materials related to the mines operation.
Railroad	Not Numbered on the map	Variety of hazardous materials including VOCs and SOCs, others?	Spills and releases related to accidents	**Low**	- Low traffic volume	**Low to Moderate**	- Maintain preparedness of local emergency personnel through active training, storm water diversion and other measures
Absaloka Mine Road	Not Numbered	Variety of hazardous materials including VOCs and SOCs, others?	Spills and releases related to accidents	**Low**	-Low traffic volume	**Low**	- Maintain preparedness of local emergency personnel through active training, storm water diversion and other measures
Class V Injection Well (existence and locations are not known) where storm and/or wastewater is concentrated and recharges groundwater.	Not Numbered	VOCs, SOCs, petroleum hydrocarbons, metals, pathogens, nitrate	Leaks, spills, improper handling and disposal/discharge of chemicals used by various businesses and are released to systems that allow infiltration of contaminants to the subsurface or to the storm water system	**Unknown**	*Unknown*	**Unknown**	Inventory; Provide educational information, materials and resources to business owners and the public on proper waste disposal and recycling

Management Recommendations

It should be noted that even small releases of some chemicals in close proximity to a well, spring, infiltration gallery, or surface water intake can have significant negative impact on water quality, and is therefore a significant threat to a public water supply. Steps can be taken to reduce the likelihood of releases to the source water for the PWS or in the vicinity of the water sources (well, springs, etc.). Some management recommendations are included in the susceptibility table (Table 8). If these, and other, management actions are implemented; they may be considered additional barriers that will reduce the susceptibility of the public water supply well to specific sources of contamination.

CHAPTER 5
MONITORING WAIVERS

Waiver Recommendation

It does not appear that Absaloka Mine has been granted any water quality monitoring waivers based on the information available for this report. From a source water protection standpoint, water quality waivers may be appropriate for the mine's PWS. If the mine desires monitoring waivers, the public water supply operators should carefully review the following section on Monitoring Waiver Requirements below. If after reviewing this section it is determined that waivers are feasible, the PWS should submit a letter with the proper documentation to DEQ requesting monitoring waivers. Table 9 in the Susceptibility Chapter can be used as a guide to request monitoring waivers.

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 the 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 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. Susceptibility is based on prior analytical or vulnerability assessment results, environmental persistence, and transport of the contaminants, natural protection of the source, wellhead protection program efforts, and the level of susceptibility indicators (such as nitrate and coliform bacteria). 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 up gradient of the surface water intake. PWSs developed in unconfined aquifers should use a minimum fixed radius of 1.0 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 1.0 mile as an area of investigation for the use of organic chemicals. Shallow groundwater sources under the direct influence of surface water (GWUDISW) should use the same area of investigation as surface water systems; that is, the watershed area above the source, or a minimum fixed radius of 1.5 miles upgradient of the point of diversion. 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.

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, or 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 Confined Aquifers

Confined groundwater is isolated from overlying material by relatively impermeable geologic formations. A confined aquifer is subject to pressures higher than atmospheric pressure that would exist at the top of the aquifer if the aquifer were not geologically confined. A well that is drilled through the impervious layer into a confined aquifer will enable the water to rise in the borehole to a level that is proportional to the water pressure (hydrostatic head) that exists at the top of a confined 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. Susceptibility of an aquifer to contamination will be influenced by the hydrogeologic characteristics of the soil, vadose zone (the unsaturated geologic materials between the ground surface and the aquifer), and confining layers. Important hydrogeologic controls include the thickness of the soil, 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. These factors will control how readily a contaminant will infiltrate and percolate toward the groundwater.

The Susceptibility waiver has the objective of assessing the potential of contaminants reaching the groundwater used by the PWS. A groundwater source that appears to be confined from surface infiltration in the immediate area of the wellhead may eventually be affected by contaminated groundwater flow from elsewhere in the recharge area. Contaminants could also enter the confined aquifer through improper well construction or abandonment where the well provides a hydraulic connection from the surface to the confined aquifer. The extent of confinement of an aquifer is critical to limiting susceptibility to organic chemical contamination. Regional conditions that define the confinement of a groundwater source must be demonstrated by the PWS in order to be considered for a confined aquifer susceptibility waiver. Confinement of an aquifer can be demonstrated by pump test data (storage coefficient), geologic mapping, and well logs. Site-specific information is required to sufficiently represent the recharge area of the aquifer and the zone of contribution to the PWS well. The following information should be provided:

- Abandoned well in the region (zone of contribution to the well),
- Other well in the region (zone of contribution to the well),
- Nitrate/Coliform bacteria analytical history of the PWS well,
- Organic chemical analytical history of the PWS well,

Susceptibility Waiver for Unconfined Aquifers

Unconfined aquifers are the most common source of usable groundwater. Unconfined aquifers differ from confined aquifers in that the groundwater is not regionally contained within relatively impervious geologic strata. As a result, the upper groundwater surface or water table in an unconfined aquifer is not under 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 comparatively 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.

The objective of the susceptibility waiver application is to assess the potential of organic chemical migration from the surface to the unconfined aquifer. The general procedures make use of a combination of 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 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.

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GLOSSARY*

Acute Health Effect. An adverse health effect in which symptoms develop rapidly.

Alkalinity. The capacity of water to neutralize acids.

Best Management Practices (BMPs). Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.

Coliform Bacteria. Bacteria found in the intestinal tracts of animals. Their presence in water is an indicator of pollution and possible contamination by pathogens.

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 that inhibits the flow of water.

Delineation. A process of mapping source water management areas.

Effective Porosity. The percent of soil, sediment, or rock through which fluids, such as air or water, can pass. Effective porosity is always less than total porosity because fluids can not pass through all openings.

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

Hazard. A measure of the potential of a contaminant leaked from a facility to reach a public water supply source. Proximity or density of significant potential contaminant sources determines hazard.

Hydraulic Conductivity. A coefficient of proportionality describing the rate at which water can move through an aquifer.

Inventory Region. A source water management area that encompasses an area expected to contribute water to a public water supply well within a fixed distance or a specified groundwater time-of-travel distance.

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.

Nitrate. An important plant nutrient and type of inorganic fertilizer. In water the major sources of nitrates are 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.

Pathogens. A bacterial organism or virus typically found in the intestinal tracts of mammals, capable of producing disease.

Point-Source. A stationary location or fixed facility from which pollutants are discharged.

Porosity. The percent of soil, sediment, or rock filled by air, water, or other fluid.

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

SIC Code. The U.S. Standard Industrial Classification (SIC) Codes classify categories of businesses. SIC Codes cover the entire range of business categories that exist within the economy.

Source Water Protection Area. For surface water sources, the land and surface drainage network that contributes water to a stream or reservoir used by a public water supply.

Susceptibility (of a PWS). The 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. 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, non-point, and natural sources. The TMDL program was established by section 303(d) of the Clean Water Act to help states implement water quality standards.

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

Transmissivity. The ability of an aquifer to transmit water.

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

Volatile Organic Compounds (VOC). Any organic compound which evaporates readily to the atmosphere (e.g. fuels and solvents).

Recharge Region / Watershed. The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common delivery point.

* Definitions taken from EPA’s Glossary of Selected Terms and Abbreviations and other sources.

FIGURES

APPENDICES

APPENDIX A – Well Logs for Absaloka Mine

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
MORRISON KNUDSEN ABSALOKA MINE

Plot this site on a topographic map
View Water Quality for this Site

Location Information

GWIC Id:	146	Source of Data:	
Location (TRS):	01N 37E 26 BDBA	Latitude (dd):	45.8069
County (MT):	BIG HORN	Longitude (dd):	-107.0856
DNRC Water Right:		Geomethod:	MAP
PWS Id:	00417002	Datum:	NAD27
Block:		Altitude (feet):	3545.00
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	7977.00	How Drilled:	
Static Water Level (ft):	-1.61	Driller's Name:	
Pumping Water Level (ft):		Driller License:	
Yield (gpm):	50.00	Completion Date (m/d/y):	
Test Type:		Special Conditions:	
Test Duration:		Is Well Flowing?:	YES
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	330MDSN
Recovery Time (hrs):		Well/Water Use:	COMMERCIAL INDUSTRIAL PUBLIC WATER SUPPLY
Well Notes:			

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Casing Information[1]

No Casing Records currently in GWIC.

Annular Seal Information

No Seal Records currently in GWIC.

Completion Information[1]

From	To	Dia	# of Openings	Size of Openings	Description
1596.0	7650.0	0.0			PERFORATED CASING

Lithology Information

No Lithology Records currently in GWIC.

[1] - All diameters reported are **inside** diameter of the casing.

APPENDIX B - DEQ PWS's Database Output

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 **Name:** ABSALOKA MINE

City: HARDIN **County:** BIG HORN **Tot Pop:** 80

Pri Src: GW **Class:** NTNC **Last Snty Srv Dt:** 01/20/2004 **Activity Status:** A

Type	Conn's	In Srvc Dts	Eff Begin Dt	Avg Daily Cnt	Type
CB	1	1/1-12/31	10/18/1993	80	NT

Administrative Contact
WASHINGTON GROUP INTERNATIONAL & WESTMOR
PO BOX 529
HARDIN, MT 59034

Financial Contact
WESTMORELAND RESOURCES
PO BOX 449
HARDIN, MT 59034

Operator
WEGNER, GREGORY CALVIN
PO BOX 412
HARDIN, MT 59034
406-665-2613

Owner
WESTMORELAND RESOURCES
PO BOX 449
HARDIN, MT 59034

Facilities and Entry Points

Status: A 10/13/2000 **Fac ID:** DS001 DISTRIBUTION SYSTEM **Src:** GW
Lat/Long Dec: **DMS:**

Smp Pt ID	Status	Description
DBPMAX1	A 01/01/2004	
SP001	A 03/31/2000	

Status: A 11/02/2000 **Fac ID:** PC001 PRESSURE CONTROL ASSEMBLY **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 01/20/2004 **Fac ID:** PC002 PRESSURE CONTROL TREATED WATER **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 01/20/2004 **Fac ID:** PF001 PUMP FACILITY 1 **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 01/20/2004 **Fac ID:** PF002 PUMPING FACILITY 2 **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 10/13/2000 **Fac ID:** ST001 STORAGE FACILITY **Src:** GW
Lat/Long Dec: **DMS:**

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Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 **Name:** ABSALOKA MINE (continued)

Status: A 10/13/2000 **Fac ID:** TP001 TP FOR WELL 1 HOT ARTESIAN **Src:** GW
Lat/Long Dec: 45.804642 **DMS:** .00 .00
TP Units: D421 D423 I640 O121 P240 P344 P742 T121

Smp Pt ID	Status	Description
EP502	A 10/13/2000	EP FOR TP FOR WELL 1

Status: A 10/13/2000 **Fac ID:** WL002 WELL 1 HOT ARTESIAN **Src:** GW
Lat/Long Dec: 45.8069 **DMS:** .00 .00
107.0856

Sample Schedules/Monitoring Requirements

Attention Community and Noncommunity Nontransient systems: the new Disinfection Byproducts Rule has taken effect. Please contact the PWS Section at 444-4400 for additional monitoring requirements.

Fac ID: DS001 **Fac Name:** DISTRIBUTION SYSTEM **Status:** A **Src:** GW

Smp Pt ID	Active	Smp Pt Description
SP001	A	

Group	Name	Schd Beg Date	Seas Coll Per	Requirement
3100	COLIFORM, TOTAL (TCR)	08/01/2002	1/1-12/31	1 RT MN

Fac ID: DS001 **Fac Name:** DISTRIBUTION SYSTEM **Status:** A **Src:** GW

Smp Pt ID	Active	Smp Pt Description
SP001	A	

Group	Name	Schd Beg Date	Init MP Beg	Seas Coll Per	Requirement
CDBP	CDS DISINFECTANT BPS	01/01/2004	01/01/2004	7/1-9/30	1 RT YR
PBCU	CDS LEAD COPPER ONLY	01/01/2011	01/01/2011	1/1-12/31	5 RT 9Y

Fac ID: TP001 **Fac Name:** TP FOR WELL 1 HOT ARTESIAN **Status:** A **Src:** GW

Smp Pt ID	Active	Smp Pt Description
EP502	A	EP FOR TP FOR WELL 1

Group	Name	Schd Beg Date	Init MP Beg	Seas Coll Per	Requirement
INO1	CDS P2-5 INORGANICS	01/01/1999	01/01/1999	1/1-12/31	1 RT 3Y
NITR	CDS NITRATE NITRITE	01/01/2000	01/01/2000	1/1-12/31	1 RT YR
SOC1	CDS SOC	01/01/1999	01/01/1999	1/1-12/31	1 RT 3Y
VOC1	CDS VOC	01/01/2002	01/01/2002	1/1-12/31	1 RT 3Y

Bacti Results FROM 01/01/2000 TO 11/10/2005

Collection Dt	Lab Number	Type	Orig Lab #	Code		TCR Presence	Fec/EC Result
09/28/2005	W0509-4092	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/30/2005	W0508-3565	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/27/2005	W0507-3072	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/29/2005	W0506-2540	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/29/2005	W0506-2541	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/26/2005	W0505-2041	RT		3100	COLIFORM, TOTAL (TCR)	A	-

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 Name: ABSALOKA MINE (continued)

Collection Dt	Lab Number	Type	Orig Lab #	Code		TCR Presence	Fec/EC Result
04/28/2005	W0504-1621	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/30/2005	W0503-1162	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/28/2005	W0503-0784	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/26/2005	W0501-0417	RT		3100	COLIFORM, TOTAL (TCR)	A	-
12/27/2004	W0412-5738	RT		3100	COLIFORM, TOTAL (TCR)	A	-
10/28/2004	W0410-4912	RT		3100	COLIFORM, TOTAL (TCR)	A	-
09/24/2004	W0409-4369	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/30/2004	W0408-3921	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/28/2004	W0407-3414	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/29/2004	W0406-2855	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/26/2004	W0405-2327	RT		3100	COLIFORM, TOTAL (TCR)	A	-
04/27/2004	W0404-1827	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/31/2004	W0404-1340	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/26/2004	W0402-0914	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/28/2004	W0401-0458	RT		3100	COLIFORM, TOTAL (TCR)	A	-
12/22/2003	W0312-6881	RT		3100	COLIFORM, TOTAL (TCR)	A	-
12/22/2003	W0312-6882	RT		3100	COLIFORM, TOTAL (TCR)	A	-
11/25/2003	W0311-6454	RT		3100	COLIFORM, TOTAL (TCR)	A	-
09/30/2003	W0310-5276	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/26/2003	W0308-4495	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/31/2003	W0308-3917	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/23/2003	W0306-3090	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/29/2003	W0305-2655	RT		3100	COLIFORM, TOTAL (TCR)	A	-
04/01/2003	B03040046-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/04/2003	B03030099-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/17/2003	B03020656-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/14/2003	B03010604-002	RT		3100	COLIFORM, TOTAL (TCR)	A	-
12/16/2002	B02120612-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
11/06/2002	B02110274-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
10/03/2002	B02100070-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
09/17/2002	B02090868-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/06/2002	B02080306-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/11/2002	B02070619-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/04/2002	B02060180-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/07/2002	B02050357-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
04/08/2002	B02040214-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/07/2002	B02030285-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/08/2002	B02020230-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/08/2002	02-50189-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-
12/06/2001	B01120070-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-

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Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 Name: ABSALOKA MINE (continued)

Collection Dt	Lab Number	Type	Orig Lab #	Code		TCR Presence	Fec/EC Result
11/16/2001	B01110151-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
10/03/2001	B01100063-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
09/20/2001	B01090170-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/21/2001	B01080190-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/25/2001	B01070159-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/05/2001	001-01-54307	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/03/2001	01-53330-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-
04/16/2001	01-52815-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/14/2001	W0103-01374	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/21/2001	W0102-00983	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/10/2001	W0101-00319	RT		3100	COLIFORM, TOTAL (TCR)	A	-
11/08/2000	W0011-07642	RT		3100	COLIFORM, TOTAL (TCR)	A	-
10/11/2000	W0010-06971	RT		3100	COLIFORM, TOTAL (TCR)	A	-
09/06/2000	W0009-06069	RT		3100	COLIFORM, TOTAL (TCR)	A	-
08/09/2000	W0008-05380	RT		3100	COLIFORM, TOTAL (TCR)	A	-
07/19/2000	W0007-04810	RT		3100	COLIFORM, TOTAL (TCR)	A	-
06/14/2000	W0006-03872	RT		3100	COLIFORM, TOTAL (TCR)	A	-
05/10/2000	W0005-03007	RT		3100	COLIFORM, TOTAL (TCR)	A	-
03/08/2000	3-01532	RT		3100	COLIFORM, TOTAL (TCR)	A	-
02/10/2000	1062	RT		3100	COLIFORM, TOTAL (TCR)	A	-
01/19/2000	00558	RT		3100	COLIFORM, TOTAL (TCR)	A	-

Chemical Results FROM 01/01/2000 TO 11/10/2005

Fac ID: DS001 **Fac Name:** DISTRIBUTION SYSTEM **Avl:** P **Status:** A **Src:** GW
Smp Pt ID: SP001 **Status:** A **Description:** **Src Typ:** FN

Analyte/CAS No		Code	Analyte Name	Type	Collection Dt	Lab	Sample Number	Result
IOC	7440-50-8	1022	COPPER	RT	09/23/2004	01	C0409-3405	< MRL .01 MG/L
IOC	7439-92-1	1030	LEAD	RT	09/23/2004	01	C0409-3405	< MRL .001 MG/L
IOC	7440-50-8	1022	COPPER	RT	09/23/2004	01	C0409-3406	< MRL .01 MG/L
IOC	7439-92-1	1030	LEAD	RT	09/23/2004	01	C0409-3406	< MRL .001 MG/L
IOC	7440-50-8	1022	COPPER	RT	09/23/2004	01	C0409-3407	< MRL .01 MG/L
IOC	7439-92-1	1030	LEAD	RT	09/23/2004	01	C0409-3407	< MRL .001 MG/L
IOC	7440-50-8	1022	COPPER	RT	09/23/2004	01	C0409-3408	< MRL .01 MG/L
IOC	7439-92-1	1030	LEAD	RT	09/23/2004	01	C0409-3408	< MRL .001 MG/L
IOC	7440-50-8	1022	COPPER	RT	09/23/2004	01	C0409-3409	< MRL .01 MG/L
IOC	7439-92-1	1030	LEAD	RT	09/23/2004	01	C0409-3409	< MRL .001 MG/L

Fac ID: TP001 **Fac Name:** TP FOR WELL 1 HOT ARTESIAN **Avl:** P **Status:** A **Src:** GW
Smp Pt ID: EP502 **Status:** A **Description:**EP FOR TP FOR WELL 1 **Src Typ:** FN

Analyte/CAS No		Code	Analyte Name	Type	Collection Dt	Lab	Sample Number	Result
IOC	7440-36-0	1074	ANTIMONY	RT	03/08/2005	01	C0503-0678	< MRL .001 MG/L
IOC	7440-39-3	1010	BARIUM	RT	03/08/2005	01	C0503-0678	< MRL .005 MG/L
IOC	7440-41-7	1075	BERYLLIUM	RT	03/08/2005	01	C0503-0678	< MRL .001 MG/L
IOC	7440-43-9	1015	CADMIUM	RT	03/08/2005	01	C0503-0678	< MRL .001 MG/L

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 **Name:** ABSALOKA MINE (continued)

Fac ID: TP001 **Fac Name:** TP FOR WELL 1 HOT ARTESIAN **Avl:** P **Status:** A **Src:**
Smp Pt ID: EP502 **Status:** A **Description:** EP FOR TP FOR WELL 1 **Src Typ:** FN

Analyte	CAS No	Code	Analyte Name	Type	Collection Dt	Lab	Sample Number	Result
IOC	7440-47-3	1020	CHROMIUM	RT	03/08/2005	01	C0503-0678	< MRL .001 MG/L
IOC	16984-48-8	1025	FLUORIDE	RT	03/08/2005	01	C0503-0678	0.12 MG/L
IOC	7439-97-6	1035	MERCURY	RT	03/08/2005	01	C0503-0678	< MRL .0002 MG/L
IOC	7440-02-0	1036	NICKEL	RT	03/08/2005	01	C0503-0678	< MRL .01 MG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	03/08/2005	01	C0503-0678	0.04 MG/L
IOC	7782-49-2	1045	SELENIUM	RT	03/08/2005	01	C0503-0678	< MRL .002 MG/L
IOC	7440-28-0	1085	THALLIUM	RT	03/08/2005	01	C0503-0678	< MRL .001 MG/L
OC	93-72-1	2110	2,4,5-TP (SILVEX)	RT	03/08/2005	01	C0503-0678	< MRL .2 UG/L
OC	94-75-7	2105	2,4-D	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	16655-82-6	2066	3-HYDROXYCARBOFURAN	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	50594-66-6	2108	ACIFLUORFEN	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	15972-60-8	2051	ALACHLOR (LASSO)	RT	03/08/2005	01	C0503-0678	< MRL .2 UG/L
OC	116-06-3	2047	ALDICARB	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	1646-88-4	2044	ALDICARB SULFONE	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	1646-87-3	2043	ALDICARB SULFOXIDE	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	309-00-2	2356	ALDRIN	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	1912-24-9	2050	ATRAZINE	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	50-32-8	2306	BENZO (A) PYRENE	RT	03/08/2005	01	C0503-0678	< MRL .02 UG/L
OC	58-89-9	2010	BHC-GAMMA (LINDANE)	RT	03/08/2005	01	C0503-0678	< MRL .02 UG/L
OC	23184-66-9	2076	BUTACHLOR (MACHETE)	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	63-25-2	2021	CARBARYL	RT	03/08/2005	01	C0503-0678	< MRL 1 UG/L
OC	1563-66-2	2046	CARBOFURAN	RT	03/08/2005	01	C0503-0678	< MRL .9 UG/L
OC	57-74-9	2959	CHLORDANE	RT	03/08/2005	01	C0503-0678	< MRL .2 UG/L
OC	75-99-0	2031	DALAPON	RT	03/08/2005	01	C0503-0678	< MRL 1 UG/L
OC	103-23-1	2035	DI(2-ETHYLHEXYL) - ADIPATE	RT	03/08/2005	01	C0503-0678	< MRL .6 UG/L
OC	117-81-7	2039	DI(2-ETHYLHEXYL) - PHTHALATE	RT	03/08/2005	01	C0503-0678	< MRL .6 UG/L
OC	1918-00-9	2440	DICAMBA	RT	03/08/2005	01	C0503-0678	< MRL 1 UG/L
OC	60-57-1	2070	DIELDRIN	RT	03/08/2005	01	C0503-0678	< MRL .02 UG/L
OC	88-85-7	2041	DINOSEB	RT	03/08/2005	01	C0503-0678	< MRL .2 UG/L
OC	72-20-8	2005	ENDRIN	RT	03/08/2005	01	C0503-0678	< MRL .01 UG/L
OC	76-44-8	2065	HEPTACHLOR	RT	03/08/2005	01	C0503-0678	< MRL .04 UG/L
OC	1024-57-3	2067	HEPTACHLOR EPOXIDE	RT	03/08/2005	01	C0503-0678	< MRL .02 UG/L
OC	118-74-1	2274	HEXACHLOROBENZENE	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	77-47-4	2042	HEXACHLOROCYCLOPENTADIENE	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	16752-77-5	2022	METHOMYL	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	72-43-5	2015	METHOXYCHLOR	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	51218-45-2	2045	METOLACHLOR	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	21087-64-9	2595	METRIBUZIN (SENCOR)	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	23135-22-0	2036	OXAMYL (VYDATE)	RT	03/08/2005	01	C0503-0678	< MRL 2 UG/L
OC	87-86-5	2326	PENTACHLOROPHENOL	RT	03/08/2005	01	C0503-0678	< MRL .04 UG/L
OC	1918-02-1	2040	PICLORAM	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	1336-36-3	2383	POLYCHLORINATED BIPHENYLS (PCB)	RT	03/08/2005	01	C0503-0678	< MRL .5 UG/L
OC	1918-16-7	2077	PROPACHLOR	RT	03/08/2005	01	C0503-0678	< MRL .1 UG/L
OC	122-34-9	2037	SIMAZINE	RT	03/08/2005	01	C0503-0678	< MRL .07 UG/L
OC	8001-35-2	2020	TOXAPHENE	RT	03/08/2005	01	C0503-0678	< MRL 1 UG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	05/26/2004	01	C0405-1367	0.62 MG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	01/14/2003	08	B03010604-002-N502	< MDL .05 MG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	01/08/2002	08	02-50189-1N502	0.18 MG/L
OC	1746-01-6	2063	2,3,7,8 TCDD (DIOXIN)	RT	09/20/2001	08	001-01-58258S	< MDL 0 MG/L
OC	93-72-1	2110	2,4,5-TP (SILVEX)	RT	09/20/2001	08	001-01-58258S	< MDL .0002 MG/L
OC	94-75-7	2105	2,4-D	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	16655-82-6	2066	3-HYDROXYCARBOFURAN	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	15972-60-8	2051	ALACHLOR (LASSO)	RT	09/20/2001	08	001-01-58258S	< MDL .0002 MG/L
OC	116-06-3	2047	ALDICARB	RT	09/20/2001	08	001-01-58258S	< MDL .0005 MG/L
OC	1646-88-4	2044	ALDICARB SULFONE	RT	09/20/2001	08	001-01-58258S	< MDL .0005 MG/L
OC	1646-87-3	2043	ALDICARB SULFOXIDE	RT	09/20/2001	08	001-01-58258S	< MDL .0008 MG/L

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 **Name:** ABSALOKA MINE (continued)

Fac ID: TP001 **Fac Name:** TP FOR WELL 1 HOT ARTESIAN **Avl:** P **Status:** A **Src:**
Smp Pt ID: EP502 **Status:** A **Description:** EP FOR TP FOR WELL 1 **Src Typ:** FN

Analyte/CAS No		Code	Analyte Name	Type	Collection Dt	Lab	Sample Number	Result
OC	309-00-2	2356	ALDRIN	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	1912-24-9	2050	ATRAZINE	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	50-32-8	2306	BENZO (A) PYRENE	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	58-89-9	2010	BHC-GAMMA (LINDANE)	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	23184-66-9	2076	BUTACHLOR (MACHETE)	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	63-25-2	2021	CARBARYL	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	1563-66-2	2046	CARBOFURAN	RT	09/20/2001	08	001-01-58258S	< MDL .0009 MG/L
OC	57-74-9	2959	CHLORDANE	RT	09/20/2001	08	001-01-58258S	< MDL .0002 MG/L
OC	75-99-0	2031	DALAPON	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	103-23-1	2035	DI(2-ETHYLHEXYL) - ADIPATE	RT	09/20/2001	08	001-01-58258S	< MDL .0006 MG/L
OC	117-81-7	2039	DI(2-ETHYLHEXYL) - PHTHALATE	RT	09/20/2001	08	001-01-58258S	< MDL .0006 MG/L
OC	96-12-8	2931	DIBROMOCHLOROPROPANE (DBCP)	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	1918-00-9	2440	DICAMBA	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	60-57-1	2070	DIELDRIN	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	88-85-7	2041	DINOSEB	RT	09/20/2001	08	001-01-58258S	< MDL .0002 MG/L
OC	85-00-7	2032	DIQUAT	RT	09/20/2001	08	001-01-58258S	< MDL .0004 MG/L
OC	145-73-3	2033	ENDOTHALL	RT	09/20/2001	08	001-01-58258S	< MDL .009 MG/L
OC	72-20-8	2005	ENDRIN	RT	09/20/2001	08	001-01-58258S	< MDL .00001 MG/L
OC	106-93-4	2946	ETHYLENE DIBROMIDE (EDB)	RT	09/20/2001	08	001-01-58258S	< MDL .00001 MG/L
OC	1071-83-6	2034	GLYPHOSATE	RT	09/20/2001	08	001-01-58258S	< MDL .006 MG/L
OC	76-44-8	2065	HEPTACHLOR	RT	09/20/2001	08	001-01-58258S	< MDL .00004 MG/L
OC	1024-57-3	2067	HEPTACHLOR EPOXIDE	RT	09/20/2001	08	001-01-58258S	< MDL .00002 MG/L
OC	118-74-1	2274	HEXACHLOROBENZENE	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	77-47-4	2042	HEXACHLOROCYCLOPENTADIENE	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	16752-77-5	2022	METHOMYL	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	72-43-5	2015	METHOXYCHLOR	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	51218-45-2	2045	METOLACHLOR	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	21087-64-9	2595	METRIBUZIN (SENCOR)	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	23135-22-0	2036	OXAMYL (VYDATE)	RT	09/20/2001	08	001-01-58258S	< MDL .002 MG/L
OC	87-86-5	2326	PENTACHLOROPHENOL	RT	09/20/2001	08	001-01-58258S	< MDL .00004 MG/L
OC	1918-02-1	2040	PICLORAM	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	1336-36-3	2383	POLYCHLORINATED BIPHENYLS (PCB)	RT	09/20/2001	08	001-01-58258S	< MDL .0001 MG/L
OC	1918-16-7	2077	PROPACHLOR	RT	09/20/2001	08	001-01-58258S	< MDL .1 MG/L
OC	122-34-9	2037	SIMAZINE	RT	09/20/2001	08	001-01-58258S	< MDL .00007 MG/L
OC	8001-35-2	2020	TOXAPHENE	RT	09/20/2001	08	001-01-58258S	< MDL .001 MG/L
OC	630-20-6	2986	1,1,1,2-TETRACHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL 0 MG/L
OC	71-55-6	2981	1,1,1-TRICHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	79-34-5	2988	1,1,2,2-TETRACHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	79-00-5	2985	1,1,2-TRICHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-34-3	2978	1,1-DICHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-35-4	2977	1,1-DICHLOROETHYLENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	563-58-6	2410	1,1-DICHLOROPROPENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC		2419	1,2,3 - TRIMETHYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	87-61-6	2420	1,2,3-TRICHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	96-18-4	2414	1,2,3-TRICHLOROPROPANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	120-82-1	2378	1,2,4-TRICHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	107-06-2	2980	1,2-DICHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	78-87-5	2983	1,2-DICHLOROPROPANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	108-67-8	2424	1,3,5-TRIMETHYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	142-28-9	2412	1,3-DICHLOROPROPANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	594-20-7	2416	2,2-DICHLOROPROPANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	71-43-2	2990	BENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	108-86-1	2993	BROMOBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-27-4	2943	BROMODICHLOROMETHANE	RT	09/20/2001	08	001-01-58258V	0.62 UG/L
OC	75-25-2	2942	BROMOFORM	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	74-83-9	2214	BROMOMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 **Name:** ABSALOKA MINE (continued)

Fac ID: TP001 **Fac Name:** TP FOR WELL 1 HOT ARTESIAN **Avl:** P **Status:** A **Src:**
Smp Pt ID: EP502 **Status:** A **Description:** EP FOR TP FOR WELL 1 **Src Typ:** FN

Analyte/CAS No		Code	Analyte Name	Type	Collection Dt	Lab	Sample Number	Result
OC	56-23-5	2982	CARBON TETRACHLORIDE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	124-48-1	2944	CHLORODIBROMOMETHANE	RT	09/20/2001	08	001-01-58258V	.00094 UG/L
OC	75-00-3	2216	CHLOROETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	67-66-3	2941	CHLOROFORM	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	74-87-3	2210	CHLOROMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	156-59-2	2380	CIS-1,2-DICHLOROETHYLENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	10061-02-6	2228	CIS-1,3-DICHLOROPROPENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	74-95-3	2408	DIBROMOMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-71-8	2212	DICHLORODIFLUOROMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-09-2	2964	DICHLOROMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	100-41-4	2992	ETHYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	87-68-3	2246	HEXACHLOROBUTADIENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	98-82-8	2994	ISOPROPYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	541-73-1	2967	M-DICHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	108-90-7	2989	MONOCHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	104-51-8	2422	N-BUTYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	103-65-1	2998	N-PROPYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	91-20-3	2248	NAPHTHALENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	95-49-8	2965	O-CHLOROTOLUENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	95-50-1	2968	O-DICHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	106-43-4	2966	P-CHLOROTOLUENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	106-46-7	2969	P-DICHLOROBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	99-87-6	2030	P-ISOPROPYLTOLUENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	100-42-5	2996	STYRENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	98-06-6	2426	TERT-BUTYLBENZENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	127-18-4	2987	TETRACHLOROETHYLENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	108-88-3	2991	TOLUENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	156-60-5	2979	TRANS-1,2-DICHLOROETHYLENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	10061-02-6	2224	TRANS-1,3-DICHLOROPROPENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	79-01-6	2984	TRICHLOROETHYLENE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-69-4	2218	TRICHLOROFLUOROMETHANE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	75-01-4	2976	VINYL CHLORIDE	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	108-38-3	2995	XYLENE, META	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	95-47-6	2997	XYLENE, ORTHO	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	106-42-3	2962	XYLENE, PARA	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
OC	1330-20-7	2955	XYLENES	RT	09/20/2001	08	001-01-58258V	< MDL .0005 MG/L
IOC	7440-36-0	1074	ANTIMONY	RT	09/20/2001	08	01-58258-1I	< MRL .003 MG/L
IOC	7440-38-2	1005	ARSENIC	RT	09/20/2001	08	01-58258-1I	< MRL .005 MG/L
IOC	7440-39-3	1010	BARIUM	RT	09/20/2001	08	01-58258-1I	< MRL .1 MG/L
IOC	7440-41-7	1075	BERYLLIUM	RT	09/20/2001	08	01-58258-1I	< MRL .001 MG/L
IOC	7440-43-9	1015	CADMIUM	RT	09/20/2001	08	01-58258-1I	< MRL .001 MG/L
IOC	7440-47-3	1020	CHROMIUM	RT	09/20/2001	08	01-58258-1I	< MRL .01 MG/L
IOC	16984-48-8	1025	FLUORIDE	RT	09/20/2001	08	01-58258-1I	1.45 MG/L
IOC	7439-97-6	1035	MERCURY	RT	09/20/2001	08	01-58258-1I	< MRL .0002 MG/L
IOC	7440-02-0	1036	NICKEL	RT	09/20/2001	08	01-58258-1I	< MRL .01 MG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	09/20/2001	08	01-58258-1I	0.07 MG/L
IOC	7782-49-2	1045	SELENIUM	RT	09/20/2001	08	01-58258-1I	< MRL .005 MG/L
IOC	14808-79-8	1055	SULFATE	RT	09/20/2001	08	01-58258-1I	169.0 MG/L
IOC	7440-28-0	1085	THALLIUM	RT	09/20/2001	08	01-58258-1I	< MRL .001 MG/L
IOC		1038	NITRATE+NITRITE (AS N)	RT	06/28/2000	MIG	C0006-2031-I502	0.16 MG/L

Violations & Enforcements FROM 01/01/2000 TO 11/10/2005

Viol Date	Comp Beg	Comp End	Fed FY	Viol No	Type	Sev	Cate	Code	Name
04/08/2005	01/01/2002	12/31/2004	2005	3	03	MJ	MON	VOC1	CDS VOC

Montana Department of
ENVIRONMENTAL QUALITY
Data Source: Public Water Supply Section

Public Water Supply System

PWSID: MT0000417 Name: ABSALOKA MINE (continued)

Viol Date	Comp Beg	Comp End	Fed FY	Viol No	Type	Sev	Cate	Code	Name
	2005 55791	04/15/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55796	05/11/2005	SIF		ST PUBLIC NOTIF RECEIVED				
	2005 55790	04/15/2005	SIE		ST PUBLIC NOTIF REQUESTED				
	2005 55789	04/15/2005	SIA		ST VIOLATION/REMINDER NOTICE				
04/07/2005	01/01/2002	12/31/2004	2005	3	03	MJ	MON	INO1	CDS P2-5 INORGANICS
	2005 55785	04/14/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55792	07/06/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55794	05/11/2005	SIF		ST PUBLIC NOTIF RECEIVED				
	2005 55784	04/14/2005	SIE		ST PUBLIC NOTIF REQUESTED				
	2005 55783	04/14/2005	SIA		ST VIOLATION/REMINDER NOTICE				
04/07/2005	01/01/2002	12/31/2004	2005	3	03	MJ	MON	SOC1	CDS SOC
	2005 55788	04/14/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55792	07/06/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55795	05/11/2005	SIF		ST PUBLIC NOTIF RECEIVED				
	2005 55787	04/14/2005	SIE		ST PUBLIC NOTIF REQUESTED				
	2005 55786	04/14/2005	SIA		ST VIOLATION/REMINDER NOTICE				
02/14/2005	01/01/2004	12/31/2004	2005	3	27	MJ	MON	CDBP	CDS DISINFECTANT BPS
	2005 55782	02/24/2005	SIE		ST PUBLIC NOTIF REQUESTED				
	2005 55781	02/24/2005	SIA		ST VIOLATION/REMINDER NOTICE				
12/30/2004	11/01/2004	11/30/2004	2005	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
	2005 55779	01/18/2005	SOX		ST COMPLIANCE ACHIEVED				
	2005 55780	01/12/2005	SIF		ST PUBLIC NOTIF RECEIVED				
	2005 55778	01/02/2005	SIE		ST PUBLIC NOTIF REQUESTED				
	2005 55777	01/02/2005	SIA		ST VIOLATION/REMINDER NOTICE				
11/16/2003	10/01/2003	10/31/2003	2004	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
	2004 55772	11/19/2003	SOX		ST COMPLIANCE ACHIEVED				
	2004 55771	11/19/2003	SIE		ST PUBLIC NOTIF REQUESTED				
	2004 55770	11/19/2003	SIA		ST VIOLATION/REMINDER NOTICE				
03/06/2001	12/01/2000	12/31/2000	2001	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
	2001 46475	06/05/2001	SOX		ST COMPLIANCE ACHIEVED				
	2001 10923	04/10/2001	SIF		ST PUBLIC NOTIF RECEIVED				
	2001 2816	03/09/2001	SIE		ST PUBLIC NOTIF REQUESTED				
	2001 2815	03/09/2001	SIA		ST VIOLATION/REMINDER NOTICE				
05/25/2000	04/01/2000	04/30/2000	2000	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
	2002 55761	06/27/2002	SOX		ST COMPLIANCE ACHIEVED				
	2000 1	06/14/2000	SIF		ST PUBLIC NOTIF RECEIVED				
	2000 915	05/28/2000	SIE		ST PUBLIC NOTIF REQUESTED				
	2000 914	05/28/2000	SIA		ST VIOLATION/REMINDER NOTICE				

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SANITARY SURVEY FORM - INVENTORY

PWSID **MT0000417**	SYSTEM NAME **Sarpy Creek Mine Washington Infrastructure**

DATE OF SURVEY **January 20, 2004**	COUNTY **Big Horn**	SURVEYOR NAME – **Joe Steiner**
(SYSTEM REPRESENTATIVE) **Gregory Wegner (Contract Operator)**		(OTHER REPRESENTATIVE) **Mike Wegleitner**

SYSTEM ADDRESS

Addressee Washington Group Infrastructure – Absaloka Mine
Primary Address

Street P.O. Box 529

City Hardin State MT Zip 59034

System Phone (406)342-5201 ext113 Fax ___

SYSTEM OWNER

Addressee SAME
Owners Address

Street ___

City ___ State ___ Zip ___

Owner Phone (___) ___ Fax (___) ___

LOCATION OF SYSTEM

Nearest City Hardin Description or Physical Address 25 mi E of I-90 on Hwy 384 (Sarpy Creek Road)

OPERATOR OF SYSTEM

Name Greg Wegner

Certified Operator? ☒ Yes ☐ No ☐ Not required

Certification # 4829

Phone # (406) 665-2613 cell 655-6585

Number of Employees ___Full Time ___Part Time

ALTERNATE OPERATOR OF SYSTEM

Name ___

Certified Operator? ☐ Yes ☐ No ☐ Not required

Certification # ___

Phone # (___) ___

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: 1
Transient: ___

Total Active Connections: Residential / Non-Transient: 1
Transient: ___

Service Connections Metered? ☐ Yes ☒ No
Percent Metered ___ %

Rates and Rate Structure

Resident Population (Number of permanent residents utilizing PWS daily) Summer: ___ Winter: ___

Non-Transient Population (Number of non-transient persons utilizing PWS daily) Summer: 70-80 Winter: 70-80

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

APPENDIX C – Sanitary Survey

SERVICE AREA CHARACTERISTICS LIST

- ☐ BR Bar
- ☐ DC Day Care Center
- ☐ DI Dispenser
- ☐ HS Head Start
- ☐ HA Homeowners Assoc.
- ☐ HM Hotel/Motel
- ☐ HR Highway Rest Area
- ☐ PA Recreation Areas
- ☐ RA Residential Area
- ☐ RE Retail Employees
- ☐ RS Restaurant
- ☐ RV RV Park
- ☐ SC School
- ☐ SI Sanitary Improvement

District

- ☒ IA Industrial/Agricultural
- ☐ IC Interstate Carrier
- ☐ IN Institution
- ☐ MF Medical Facility
- ☐ MH Mobile Home Park
- ☐ MU Municipality
- ☐ OA Other Area
- ☐ SK Summer Camp
- ☐ SR Secondary Residences
- ☐ SS Service Station
- ☐ SU Subdivision
- ☐ WB Water Bottler
- ☐ WH Wholesaler (Sells Water)

- ☐ ON Other Non-Transient Area (__ Average Daily Visitors TNC)
- ☐ OR Other Residential Area
- ☐ OT Other Transient Area

Service Category Description ___

Comments: Coal Mine site - provides water to the shop/administration building - showers and drinking water - employee said no one showers at the site anymore

SANITARY SURVEY FORM – WATER SYSTEM FACILITIES

PWSID **MT0000417**

SYSTEM NAME **Climate**

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 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 1

WATER SYSTEM FACILITIES SUMMARY (WSF)

WSF ID	Facility Name	Water Type Code	Purchased	Seller PWSID
DS 001	Distribution System			
WL002	Well 1 (Hot Artesian)	GW	☐ Yes ☒ No	
PC001	Pressure Control Assembly (Raw water)		☐ Yes ☐ No	
TP001	Treatment plant for Well 1 (WL002)		☐ Yes ☐ No	
ST001	Storage Tank (11,000 gallons)		☐ Yes ☐ No	
PC002	Pressure Control Assembly (Treated Water)		☐ Yes ☐ No	
EP502	Entry Point for TP001		☐ Yes ☐ No	
PF001	Pumping Facility 1		☐ Yes ☐ No	
PF002	Pumping Facility 2		☐ Yes ☐ No	
RS001	Raw Water Storage (Old Lagoon)		☐ Yes ☐ No	
RS002	Raw Water Storage (New Lagoon)		☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	

Description of Water System Facility flow: **Well 1 (WL002) is pumped into the lagoons (RS001 - RS002) to cool the water. The water is then gravity flowed into the treatment building. The water is pumped (PF001) through carbon filters. Pressure is maintained through two captive air pressure tanks (PC001). Then the water is filtered through a cartridge filter (5µ), then filtered through dual 0.05µ filters prior to being filtered through an RO membrane. The water is then chlorinated (TP001). The water is then stored in an 11,000-gallon tank (ST001) before being pumped (PF002) to the distribution system through a single entry point (EP502). Pressure is maintained by a single air/water pressure tank (PC002).**

Example: Well 1(WL002) 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).

Does the system have emergency power? Unknown ☐ Yes ☐ No

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

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

Security issues? ___ Comments: ___

FLUORIDATION:

Type: NA

Fluoride supply adequate?	☐ Yes ☐No	Logs or records kept?	☐Yes ☐No
Properly stored?	☐ Yes ☐No	Details___	

Fluoride setup (description)

Model ___

Settings: Stroke ___

Frequency ___

For Saturators:

Make-up Water Softened?	☐Yes ☐No
Make-up Water Metered?	☐Yes ☐No
Is there a flow sensor shut-off on the line?	☐Yes ☐No

Comments: ___

PWSID **MT0000417** | **SYSTEM NAME** **Climate**

(Please copy this sheet for additional well & pumps)

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

WSF ID WL002 *Entry Point ID* 502
These are State assigned identification numbers

Source Name Well 1 (Hot Artesian)
Name of Source – Example: Well 1 or South well, etc.

Location of Water Source (TRS or street address) between the two lagoons above plant

Entry Point Name EP for TP001
Name of EP – Example: Entry point for North Well 1 & South Well 2

Location of Entry Point discharge from ST001

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

GWUDISW PA Completed ☒ Yes ☐☐ No

Log Available? ☐ Yes ☐☒ No

Average Production 2000gpm+
indicate units

Maximum Production unk
indicate units

Date Drilled 1/1/73
if well. . date drilled

Casing Size 7-inch
size of casing installed in well

Case Depth ___
depth of casing installed in well

Well Depth 7955
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 mechanis

Screened Interval ___
expressed in feet below ground elevati

Well Yield ___
pump tested in gallons per minu

Latitude 45º 48'18"

Longitude 107º 05'3.9"

Elevation ___

WELL

	Yes	No	Unk	N/A
Is well site protected from flooding?	☒	☐	☐	☐
Is well protected from potential sources of pollution (includes: surface water, known chemical spills, agricultural use, etc.)?	☒	☐	☐	☐
If no . . 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?	☒	☐	☐	☐
Is there a concrete pad around well head?	☒	☐	☐	☐

PUMPS

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

	Yes	No	Unk	N/A
Is pump operable?	☒	☐	☐	☐
When was pump last replaced? casing replaced <30 days ago	☒	☐		
Is backup pump/motor provided?☐	☐	☒	☐	☐
Are controls functioning properly and adequately protected?	☒	☐	☐	☐
Do underground compartments have a drain?	☐	☐	☐	☒
Is facility 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?☐	☒	☐	☐	☐
Are recommended spare parts on hand?☐	☐	☐	☐	☒
Absence of observed cross-connections?	☒	☐	☐	☐

Security issues? None

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

Explain Controls: Storage tank level controls the system - as tank gets low i
starts the plant

SANITARY SURVEY FORM - TREATMENT

PWSID **MT0000417**

SYSTEM NAME **Climate**

Treatment Objective

B = Disinfection Byproduct Control
C = Corrosion Control
D = Disinfection
E = Dechlorination
F = Iron Removal
I = Inorganics Removal
M = Manganese Removal
N = *No Treatment at Source*
O = Organics Removal
P = Particulate Removal
R = Radionuclides Removal
S = Softening (Hardness Removal)
T = Taste / Odor Control
Z = Other ___

WATER TREATMENT FACILITIES

WSF ID	Treatment Plant Name	Treatment Objective and Code		
TP001	Treatment Plant for Well 1	T121 D421	P341	I640
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___
___		___	___	___

Treatment Description / Comments: Well 1 (WL002) is treated by carbon filters followed by cartridge filtration - 5µ then 0.05µ. The water is then filtered through a reverse osmosis membrane. The water is then chlorinated before being discharged to the distribution system through EP502.

PWSID **MT0000417**

SYSTEM NAME **Climate**

FOR SYSTEMS EMPLOYING FULL-TIME DISINFECTION

COMPLETE ONE SECTION FOR EACH PRESSURE CONTROL ASSEMBLY

IF USING GAS CHLORINATION

Yes No Unk N/

CAPTIVE AIR TANK(S)

Is the disinfectant used NSF approved? ☒ ☐ ☐ ☐

WSF ID PC001 Location, Description Raw water – in treatment building

Yes No Unk N/A

Is there a pressure relief valve? ☐ ☒ ☐ ☐

Is the amount of disinfectant used recorded? ☒ ☐ ☐ ☐

Is there an operable pressure gauge? ☒ ☐ ☐ ☐

If Yes, amount used: ___ lbs/day 1 ppm ___ other (give units)

Is the amount of disinfectant used compared to water pumped to verify concentration? ☐ ☒ ☐ ☐

Is chemical storage adequate and safe? ☒ ☐ ☐ ☐

If No, explain ___

Is disinfectant residual being monitored daily? ☒ ☐ ☐ ☐

Are residual reports submitted monthly? ☒ ☐ ☐ ☐

Is the disinfection equipment being operated and maintained properly? ☒ ☐ ☐ ☐

Is operational standby equipment provided? ☒ ☐ ☐ ☐

If not, are critical spare parts on hand? ☐ ☐ ☐ ☒

Has disinfection system been free from failure during the past year – no interruption? ☐ ☐ ☒ ☐

If No, give dates of interruptions ___

CT available ___minutes ___mg/L ___mg/min/L

Residual ☐Free ☐Total

Describe provisions for providing contact time between disinfection point and the first point of use: ___

PRESSURE TANK(S) (air/water interface)

Is there automatic switchover from cylinder to cylinder? ☐ ☐ ☐ ☐

Are scales provided for weighing chlorine cylinders? ☐ ☐ ☐ ☐

Are chlorine storage and use areas isolated from other work areas? ☐ ☐ ☐ ☐

Is there a pressure relief valve? ☒ ☐ ☐ ☐

Are stored cylinders capped and labeled? ☐ ☐ ☐ ☐

Is room vented to the outdoors with suction located no more than 6 inches above the floor level? ☐ ☐ ☐ ☐

Is outlet so located as to not contaminate other rooms or structures? ☐ ☐ ☐ ☐

Is fresh air vent inlet near the ceiling? ☐ ☐ ☐ ☐

Is room containing chlorination treatment labeled sufficiently (DANGER signs, etc.)? ☐ ☐ ☐ ☐

Is a view port provided into the room storing chlorine? ☐ ☐ ☐ ☐

Is a means of leak detection provided? ☐ ☐ ☐ ☐

Type? ___

Is a self-contained breathing apparatus available for use during repair of leaks? ☐ ☐ ☐ ☐ ☐

Where? ___

Are personnel trained to use apparatus? ☐ ☐ ☐ ☐ ☐

Are all doors hinged outward and equipped with panic bars? ☐ ☐ ☐ ☐ ☐

Are all gas cylinders restrained near the top and about half way down by chaining to wall or by other means? ☐ ☐ ☐ ☐

Are pre and post chlorination systems completely separated? (surface water only) ☐ ☐ ☐ ☐

For Liquid Hypochlorination

Pump model: LMI

Settings: Stroke Unk

Speed Unk

Vat Size: Unk

Feed Solution Strength: 10%

Security issues? ___

Comments: ___

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: Centrifugal Security issues? ___ Comments: 44 psi - 2 WellXTrol 350 captive air tanks	Is there an operable pressure gauge? ☒ ☐ ☐ ☐ Does low pressure level provide adequate pressure? ☒ ☐ ☐ ☐ Pump run time ___ Cut-In ___ ps Time of day ___ Cut-Out ___ ps Is there a water level sight glass? ☐ ☐ ☐ ☒ Is the tank operating properly (not water logged)? ☒ ☐ ☐ ☐ Is air charge system adequate? ☒ ☐ ☐ ☐ How much air is in the tank? Unk Is the exterior surface of the pressure tank in good physical condition? ☒ ☐ ☐ ☐ Is there a bottom drain valve? ☒ ☐ ☐ ☐ Can tank(s) be by-passed for repair? ☒ ☐ ☐ ☐ Pump type: ___ Security issues? ___ Comments: ___
CAPTIVE AIR TANK(S)	***PRESSURE TANK(S) (air/water interface)***
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: _____ Security issues? ___ Comments: _____	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? ☐ ☐ ☐ ☐ Pump run time ___ Cut-In ___ ps Time of day ___ Cut-Out ___ ps Is there a water level sight glass? ☐ ☐ ☐ ☐ Is the tank operating properly (not water logged)? ☐ ☐ ☐ ☐ Is air charge system adequate? ☐ ☐ ☐ ☐ How much air is in the tank?___ Is the exterior surface of the pressure tank in good physical condition? ☐ ☐ ☐ ☐ Is there a bottom drain valve? ☐ ☐ ☐ ☐ Can tank(s) be by-passed for repair? ☐ ☐ ☐ ☐ Pump type: ___ Security issues? ___ Comments: ___

SANITARY SURVEY FORM - STORAGE

PWSID **MT0000417**

SYSTEM NAME **Climate**

COMPLETE ONE SECTION FOR EACH STORAGE FACILITY

How much treated storage is provided? 11,000 gallons (Include all system storage)

Total number of days of supply? 1+ days

Is all treated water storage covered? ☒ Yes ☐ No ☐ Unknown

Comments:

STORAGE FACILITY

WSF ID ST001 Location, Description located in the treatment building

Storage Volume? 11,000 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 properly designed, sealed, 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?	☒	☐	☐	☐
What is cleaning frequency for tanks? unk				
Are tanks disinfected after repairs are made?	☐	☐	☒	☐

Security issues? ___

Comments: Tank is inside the treatment building
(Include safety concerns of ladders, handrails, etc.)

STORAGE FACILITY

WSF ID ___ Location, 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 properly designed, sealed, 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?	☐	☐	☐	☐
What is cleaning frequency for tanks? ___				
Are tanks disinfected after repairs are made?	☐	☐	☐	☐

Security issues? ___

Comments: ___

(Include safety concerns of ladders, handrails, etc.)

SANITARY SURVEY FORM - MISCELLANEOUS

PWSID **MT0000417** | SYSTEM NAME **Climate**

DISTRIBUTION SYSTEM EVALUATION

System description Mostly PVC

	Yes	No	Unk	N/A
System drawings available?	☒	☐	☐	☐
As-built drawings?	☒	☐	☐	☐
Date ___				
Drawing on-site?	☐	☐	☒	☐
Lines adequately sized?	☒	☐	☐	☐
Adequate pressure maintained?	☒	☐	☐	☐
Mains protected from freezing?	☒	☐	☐	☐
Distribution system free of leaks?	☒	☐	☐	☐
Are there adequate valves?	☒	☐	☐	☐
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.

Security issues? ___

Comments: ___

SAFETY

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

Describe any confined spaces observed___

Check one: ☒ No fall risks were observed.
☐ Fall risk(s) were observed.

Describe any fall risks observed___

Check one: ☒ No electrical deficiencies were observed.
☐ Electrical deficiencies(s) were observed.

Describe any electrical deficiencies observed___

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 records reviewed?	☒	☐	☐	☐
Records kept appropriately? (5 years)	☐	☐	☒	☐
Bacti Sample Site Plan submitted?	☐☒	☐	☐	☐
Familiar with repeat sampling?	☐☒	☐	☐	☐
Chemical monitoring records reviewed?	☒	☐	☐	☐
Chemical monitoring records maintained? (10 years)	☐	☐	☒	☐
Does the system have a current Monitoring Schedule?	☒	☐	☐	☐
Did Surveyor take a bacteriological sample?	☐	☒		

If Yes,

Date of Sample: ___ Time of Sample: ___

MANAGEMENT

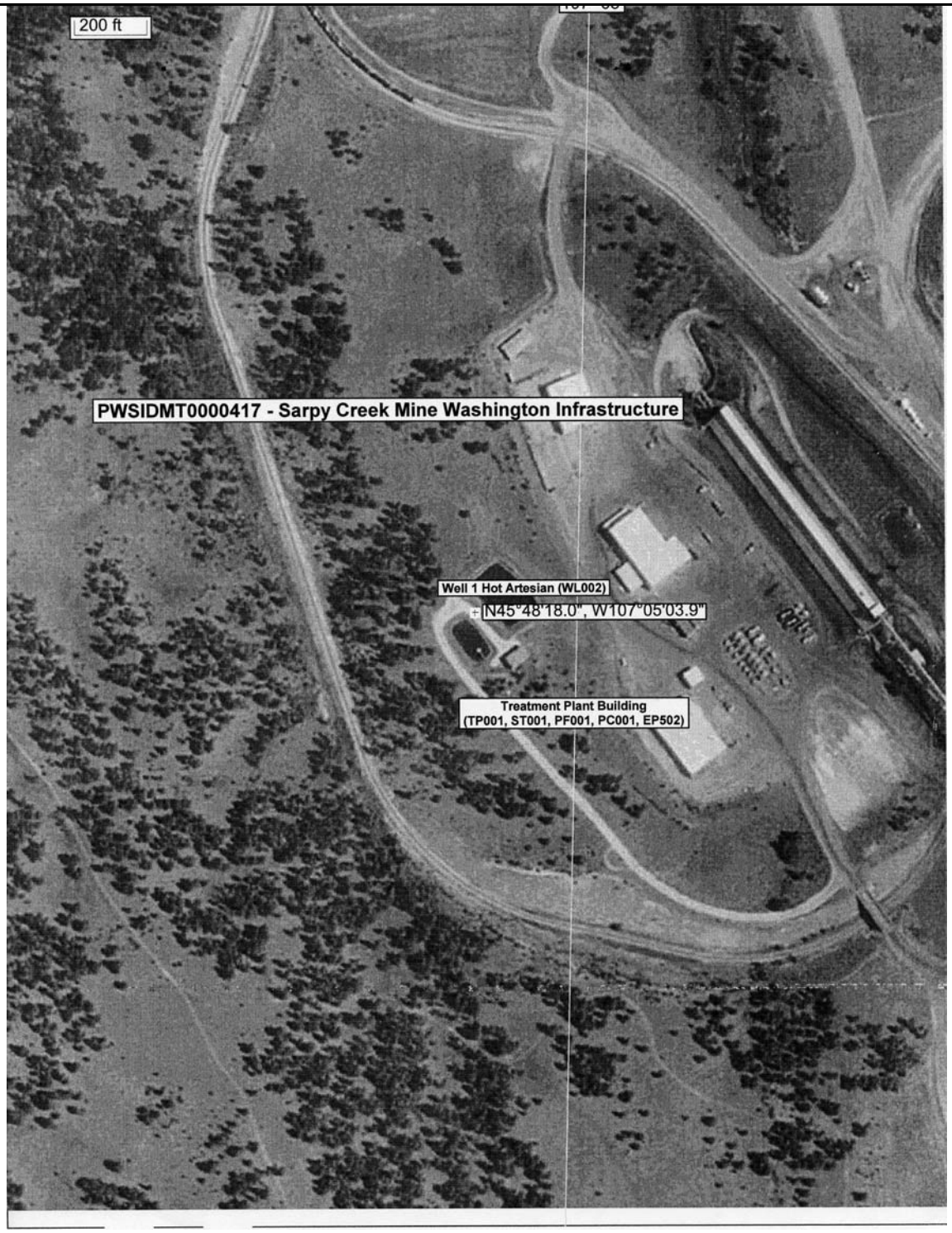
Administrative Board – Describe Private owned

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 well present?	☐	☒	☐	☐
Do abandoned well appear to be properly abandoned?	☐	☐	☐	☒

Other Records				Is operator aware of procedures regarding well abandonment?	☐	☐	☒
Disinfection Profile (if required)?	☒N/A	☐ Yes	☐ No	Is there an O&M manual?	☐	☒	☐
Stage 1 Monitoring plan?	☒N/A	☐ Yes	☐ No	Is it current?	☐	☐	☐
Sanitary surveys?		☐ Yes	☐ No	Is a copy on-site?	☐	☐	☐
Other? ___		☐ Yes	☐ No	O&M log maintained?	☐	☐	☐
				Security Program? ___			
Comments: ___				Comments: ___			

PWSID **MT0000417**	SYSTEM NAME **Climate**
Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc. and label with appropriate facility designation. Include interconnections with other PWSs.	

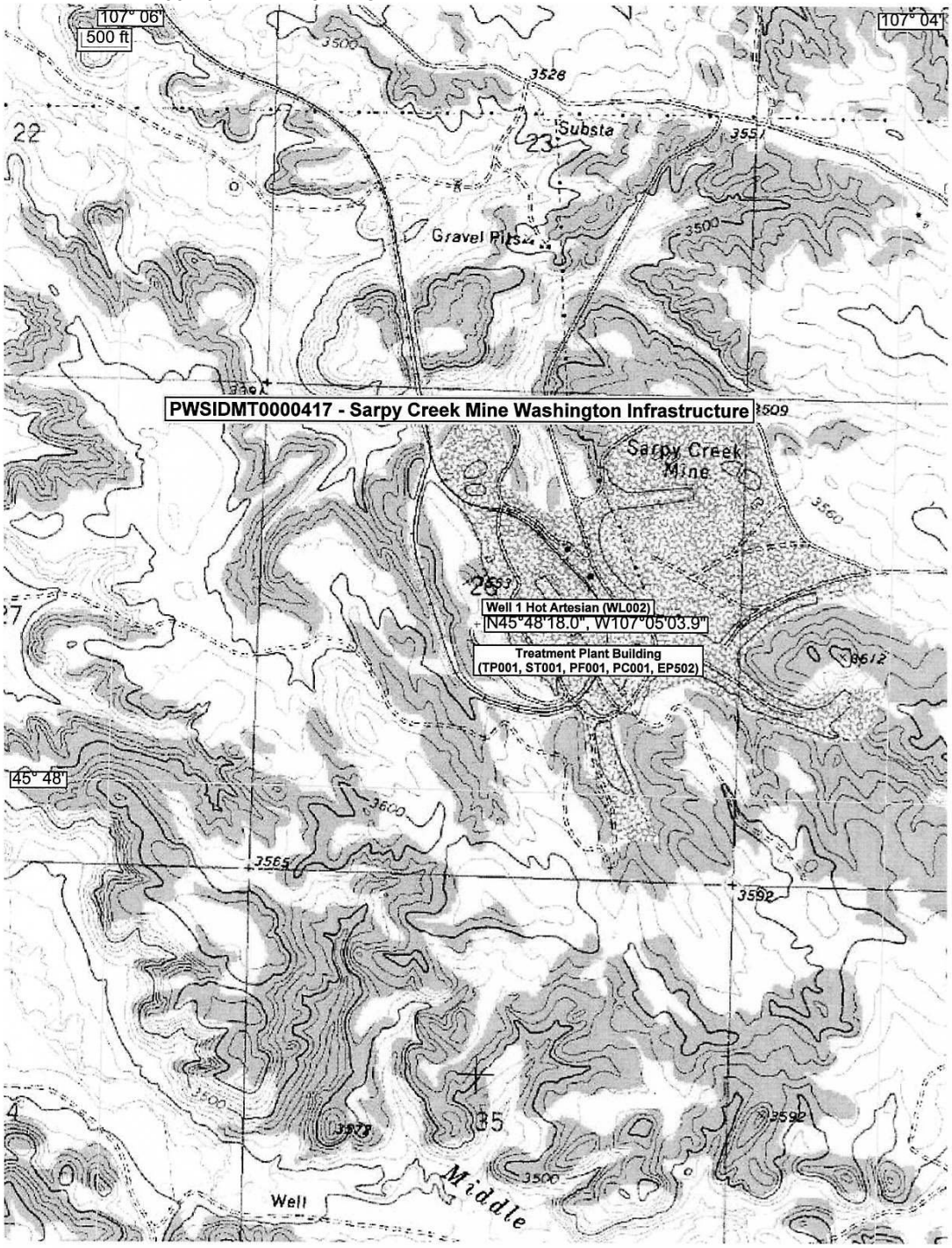


SANITARY SURVEY FORM - DIAGRAMS

PWSID **MT0000417**

SYSTEM NAME **Climate**

Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc. and label with appropriate facility designation. Include interconnections with other PWSs.



SANITARY SURVEY FORM - DIAGRAMS

PWSID **MT0000417**

	SYSTEM NAME **Climate**

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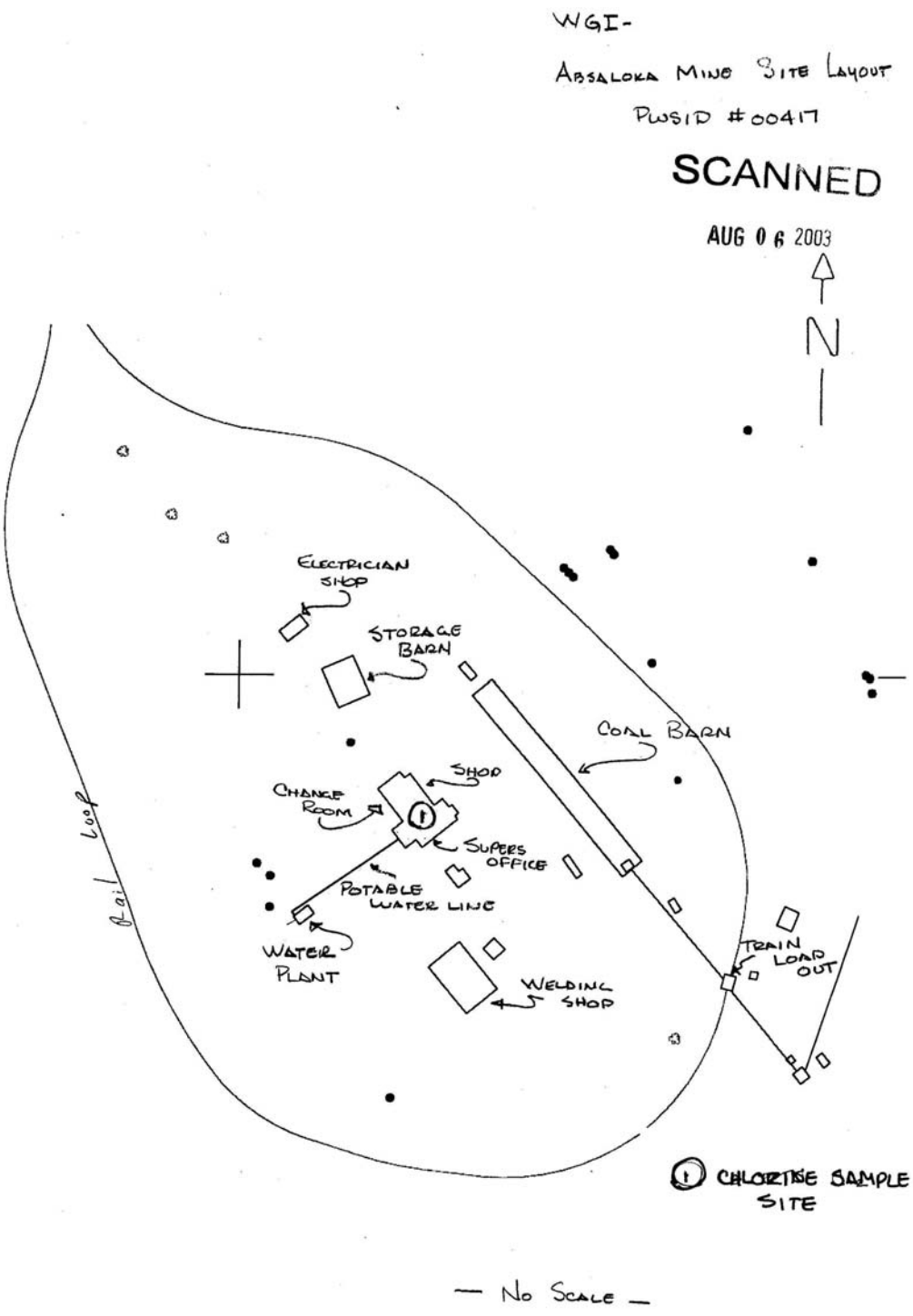
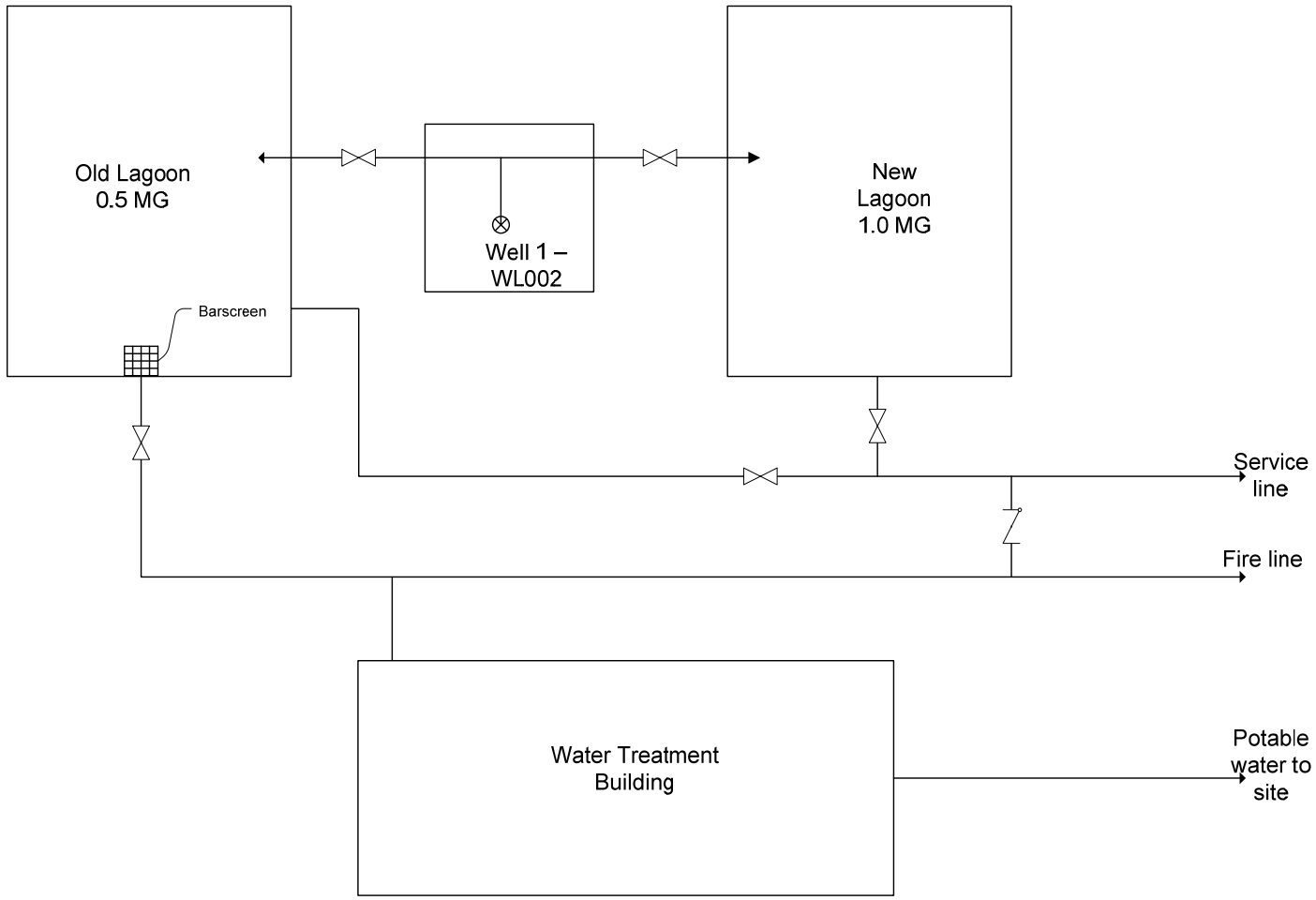


SANITARY SURVEY FORM - DIAGRAMS

PWSID **MT0000417**

SYSTEM NAME **Climate**

Draw brief schematic of pumphouse facilities (pressure control assemblies, treatment(s) valves, filters, meters, electrical controls, etc.)



SANITARY SURVEY FORM - DIAGRAMS

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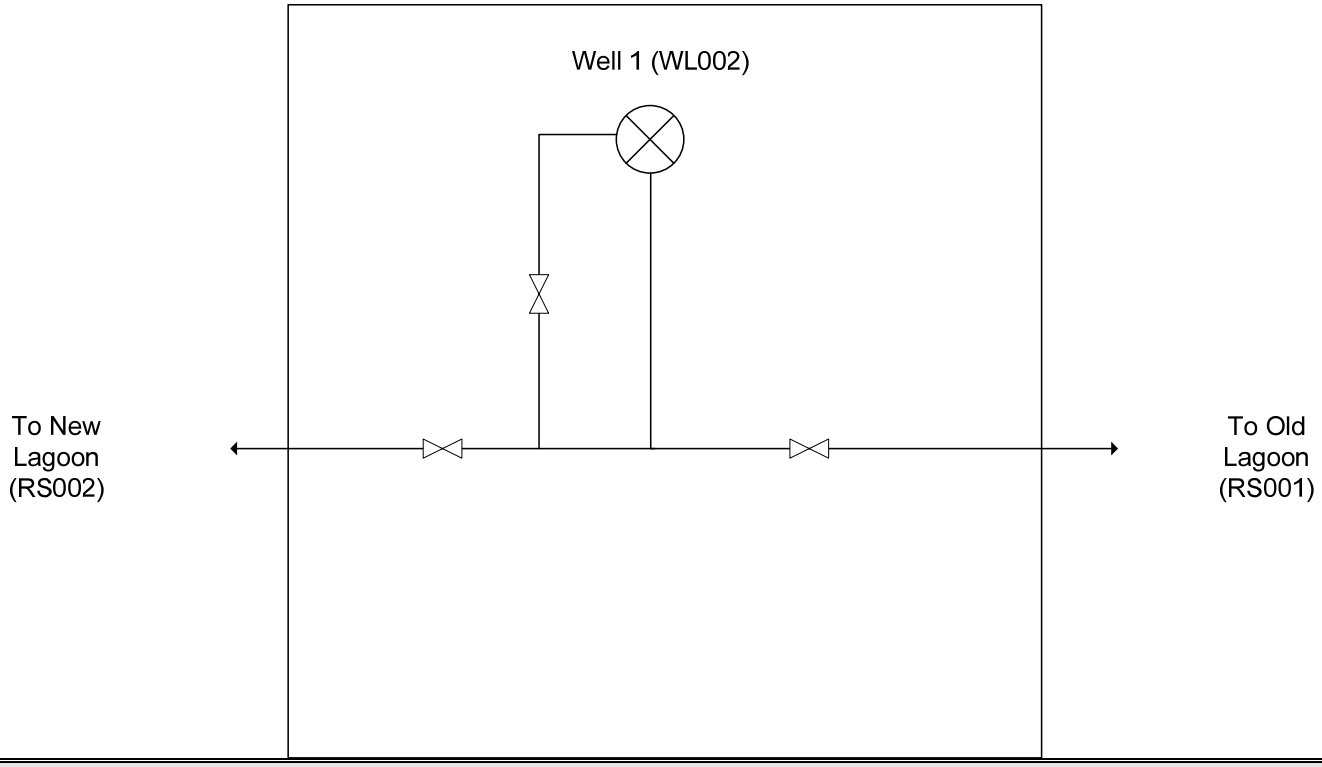

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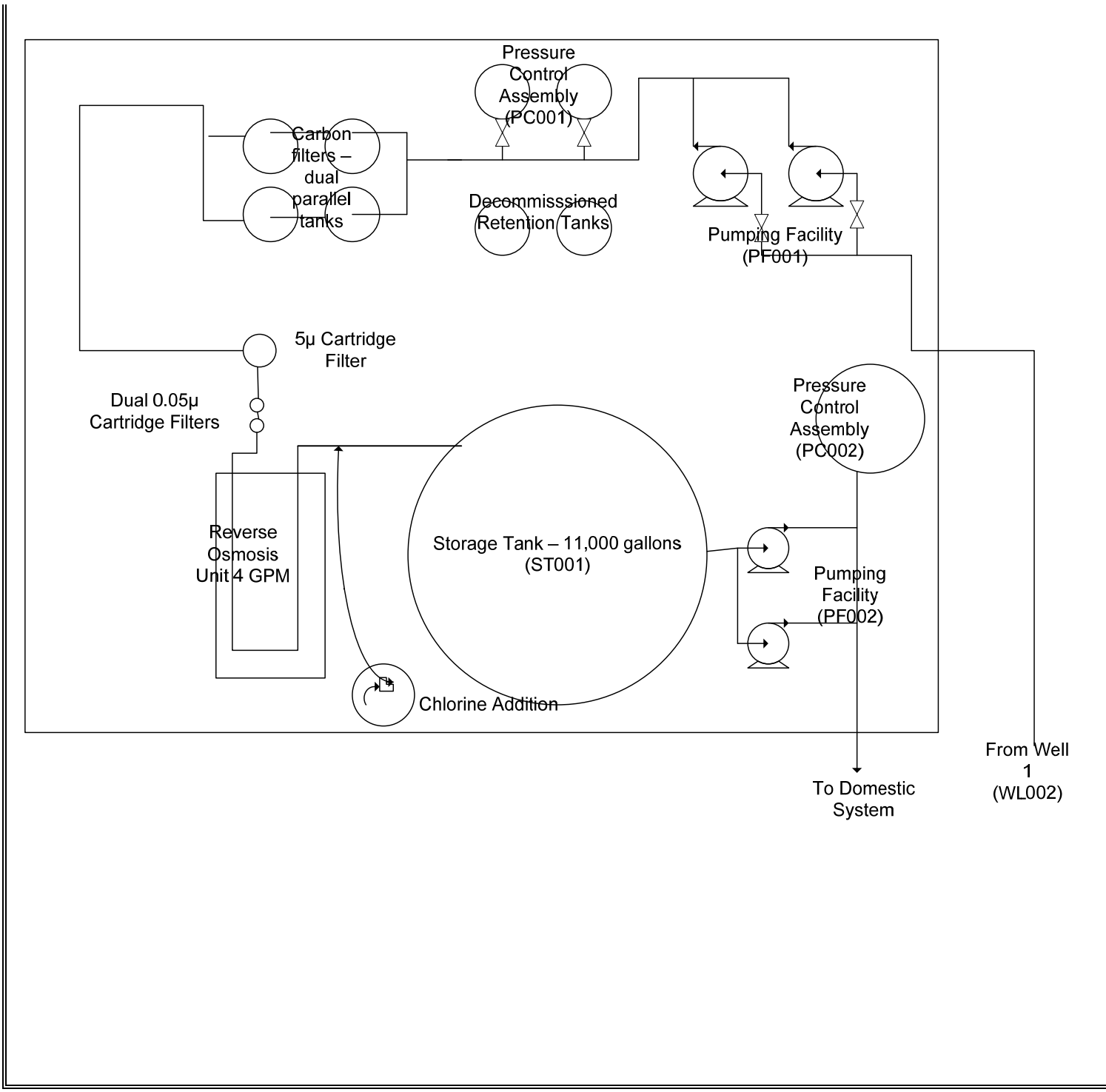
Pressure Control Assembly (PC001)
Carbon filters – dual parallel tanks
Decommisssioned Retention Tanks
Pumping Facility (PF001)
5µ Cartridge Filter
Dual 0.05µ Cartridge Filters
Pressure Control Assembly (PC002)
Reverse Osmosis Unit 4 GPM
Storage Tank – 11,000 gallons (ST001)
Pumping Facility (PF002)
Chlorine Addition
From Well 1 (WL002)
To Domestic System

APPENDIX D - Concurrence Letter & Other Correspondence