

# **COFFEE CREEK WATER COMPANY**

## **PUBLIC WATER SYSTEM**

**PWS ID No. MT0000179**

### **DRAFT SOURCE WATER DELINEATION & ASSESSMENT REPORT**

PREPARED BY:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
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## EXECUTIVE SUMMARY

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

The drinking water for the Coffee Creek Water Company is supplied by Johnson Spring, located approximately one mile northwest of Coffee Creek. Based on the sanitary surveys, it appears that water from the spring discharges along the boundary between highly permeable terrace gravels of Arrow Bench and the low permeability Marias River Shale underlying them. In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a high sensitivity to potential contaminant sources since it is terrace and pediment gravel. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

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

- No potential sources of contamination were identified within the control zone(s). The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the spring and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region are limited to agricultural land and the railroad.

The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area upgradient of the well that is expected to supply groundwater recharge to the well over the next three years.

- Potential contaminant sources identified within the recharge region are limited to agricultural land.

The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the aquifer is likely from infiltration of precipitation into the gravels that cap Arrow Creek Bench.

The Coffee Creek Water Company public water supply has a very high susceptibility to the surrounding agricultural land and a moderate susceptibility to the nearby railroad.

Low risk potential sources and potential sources located outside the Inventory Region, but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for the Coffee Creek Water Company. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

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

The Coffee Creek PWS is burdened by high nitrate levels in the source water. The major source of nitrate is probably the dryland crop-fallow agriculture practiced over the majority of Arrow Creek Bench. The underlying shale bedrock may be a secondary source of nitrate.

A 1998 U.S. Geological Survey study of the Flaxville terrace gravel aquifer in the Fort Peck Reservation (Nimick and Thamke, 1998) concluded that dryland crop-fallow agriculture was the major contributor to widespread elevated nitrate levels. The authors suggested several land management schemes that might reduce the nitrate load, including increasing the acreage with intensive crop rotations (continuous crop and recrop), planting deeper-rooted crops such as alfalfa, or increasing the land enrolled in the federal Conservation Reserve Program (CRP). Copies of their report may be obtained by writing to the U.S. Geological Survey.

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## 1.0 INTRODUCTION

Eric Siverson, a hydrogeologist with the Montana Department of Environmental Quality (DEQ) Source Water Protection Section, completed the Coffee Creek Water Company (PWS ID No. 0000179) Source Water Delineation and Assessment Report (SWDAR).

### 1.1 PURPOSE

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

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

### 1.2 LIMITATIONS

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

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

## 2.0 BACKGROUND

Coffee Creek is located in Fergus County in central Montana ([Figure 1](#)), approximately 60 miles east-southeast of Great Falls. According to the Census Bureau, the population of Fergus County in 2000 was at 11,893 with 22 individuals residing in Coffee Creek. Recent sanitary surveys have stated the population of Coffee Creek to be 35.

### 2.1 PHYSICAL SETTING

#### 2.1.1 Geography and Geology

Quaternary gravels cap terraces on top of the Cretaceous Marias River Shale in the Coffee Creek area (Vuke *et al.*, 2002). Streams have dissected the terraces and incised the bedrock,

creating relief in excess of 300 feet. The upper member of the Marias River Shale (Kevin Member) outcrops in the area, and is characterized by partly calcareous gray shale, with minor limestone and bentonite layers. The contact between the gravel terrace and the underlying shale represents a significant change in hydraulic conductivity, and the Marias River Shale floors the shallow unconfined aquifer. Springs, such as the Coffee Creek water source (Johnson Spring) may occur where this contact is exposed in outcrop. Johnson Spring is located at the head of a coulee that has incised the terrace deeply enough to intersect the water table. The geology of the Coffee Creek area is shown on [Figure 2](#).

Coffee Creek is located in the Central Non-Glaciated Plains groundwater region of North America (Heath, 1984). The community is in the Arrow Watershed, in the Missouri River drainage of Montana ([Figure 2A](#)).

Previous correspondence and sanitary surveys suggested that the source water may originate as precipitation and runoff in the Little Belt or Highwood Mountains, traveling through terrace gravel aquifers and accumulating nitrate from the underlying shale units. However, a study of the regional local topography rules this out. The source aquifer is limited to Arrow Creek Bench, and is isolated from surrounding terrace gravel aquifers by incised streams. The recharge area is local, and limited to an area of Arrow Creek Bench. The Montana Bureau of Mines and Geology has suggested that groundwater chemistry (nitrate and selenium) suggests a saline seep in the vicinity of the source aquifer.

### **2.1.2 Climate**

Climate in the Coffee Creek area is considered semi-arid and is typical of central Montana. Based on climate data from weather station 242347, the average maximum and minimum temperatures in this area are 82.4° F and 47.7° F in July and 33.2° F and 9.2° F in January. Annual total precipitation averages 11.01 inches. Rainfall occurs April through September with May and June being the wettest months. An annual average of 31.3 inches of snow is received in the Denton/Coffee Creek area mainly November to April (Western Regional Climate Center, Monthly Climate Summary: 7/01/1948 to 6/30/2004).

Information on climate in the Coffee Creek area is based on the National Oceanic and Atmospheric Administration's (NOAA) Denton climate station located at an elevation of 3,690 feet above mean sea level. See Table 1 for additional climate information

**Table 1. Monthly Climate Summary: Denton Climate Station**  
Denton Station (242347) Period of Record: 07/01/1948 to 06/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	33.1	39.0	46.0	57.3	65.7	74.3	83.0	82.9	71.7	60.6	45.0	36.2	57.9
Average Min. Temperature (F)	6.5	11.7	18.3	27.7	36.3	44.0	47.3	46.2	36.9	28.3	16.9	9.2	27.4
Average Total Precipitation (in.)	0.59	0.44	0.69	1.14	2.75	2.89	1.77	1.56	1.29	0.85	0.55	0.58	15.10
Average Total Snowfall (in.)	10.8	6.6	7.7	3.4	1.3	0.1	0.0	0.0	0.4	1.6	4.4	7.2	43.5
Average Snow Depth (in.)	4	3	1	0	0	0	0	0	0	0	1	2	1

## 2.2 THE PUBLIC WATER SUPPLY

### 2.2.1 Water Supply System

The Coffee Creek PWS serves approximately 35 people through 19 service connections. The Coffee Creek PWS is classified as a community public water system since it serves at least 25 of the same people every day. Information on the water system was obtained from correspondence in the DEQ Public Water Supply Section files including the most recent sanitary survey completed in August 2000 (attached as Appendix A). Groundwater is provided by a flowing spring. The water is disinfected with sodium hypochlorite as it discharges into the transmission main.

### 2.2.2 Supply Well Information

The Coffee Creek Water Company's drinking water is supplied by Johnson Spring, located approximately one mile northwest of town. Groundwater percolates through a pervious floor into an inflow cell, and on to a clear well. Two secondary spring collectors located north of the collection system also discharge to the clear well, on a valve-equipped connection. According to previous sanitary surveys, the spring's yield is estimated at approximately 75 gallons per minute (gpm).

### 2.2.3 Source Water

The source water is classified as groundwater. The source aquifer is shallow and unconfined, and comprised of terrace gravels. According to the Source Water Protection Program (DEQ, 1999) the source water is considered to have HIGH sensitivity to potential contamination.

**Table 2. Water Supply Information**

Well ID	Johnson Spring
DEQ Source Code	WL002
GWIC ID	173089
DNRC Water Right	W123548
Location	NW¼, NW¼, Sec.5, T18N, R13E
Elevation	Approx. 3,700 feet
Date Completed	Early 20 <sup>th</sup> Century
Well Pump Test Data	N/A. Yield estimated at approximately 75 gpm

## 2.3 WATER QUALITY

Each PWS is required to perform regular sampling of their water supply to detect contamination. The analytical parameters include: coliform bacteria and other pathogenic organisms, nitrates, metals, petroleum hydrocarbons, and other organic chemicals. The monitoring schedule depends on factors such as the size and source water of a PWS, the number of supplies (e.g. wells), and the population served. Monitoring programs are tailored to each system, following the general protocols defined by DEQ. Monitoring schedules are available at: <<http://nris.state.mt.us/wis/swap/swapquery.asp>>. The Coffee Creek Water Company PWS monitoring data from DEQ's database for the past five years was reviewed and is summarized in this section. Analytical results are compared to quality standards established by the US EPA. Maximum Contaminant Levels (MCLs) are enforceable standards that limit the highest level of a contaminant allowed in drinking water. National Secondary Drinking Water Standards (known as SMCLs) are non-enforceable guidelines regarding contaminants that may cause aesthetic (color, odor, taste) or cosmetic (staining, skin/tooth discoloration) issues.

### 2.3.1 Public Water Supply Monitoring Results

The water system has had health-based violations (for coliform and nitrate + nitrite). Health-based violations are issued when the amount of contaminant exceeds the MCL. The coliform violations occurred in October 2004 and August 2002 when water sample analysis detected the presence of total coliform bacteria in the water supply. A Public Health Advisory was posted for the system following each of these detections. The health advisories were subsequently lifted based on the satisfactory bacteriological test results of five additional samples and proof of public notification.

Nitrate + nitrite has been routinely detected at concentrations exceeding the MCL of 10 mg/L (milligrams per liter, or parts per million). Concentrations of nitrate + nitrite generally range between 11 and 17 mg/L. The system operators have posted public notices following each violation. Correspondence in the PWS files states that the customers generally don't use PWS water for drinking, relying instead on bottled water.

### 2.3.2 Background Water Quality Monitoring Results

Untreated groundwater quality has been assessed by the Montana Bureau of Mines and Geology (MBMG), which collected a water sample for background analysis in September 2002. Background water quality sampling typically includes some general water quality parameters including major dissolved ions (calcium, magnesium, sodium, potassium, iron, manganese, silica, bicarbonate, carbonate, chloride, sulfate, nitrate, fluoride and

orthophosphate), trace elements, and metals. The water quality results are attached as Appendix B.

These analytical results and the results of regular system sampling reflect poor water quality in the source water. As described above, elevated nitrates appear to be typical of this water source. Nitrate concentrations generally exceed the MCL of 10 mg/L; concentrations of 17 mg/L are common. The sulfate (SO<sub>4</sub>) concentration of 376 mg/L exceeds the SMCL of 250 mg/L. Although the sodium concentration (117 mg/L) does not exceed the SMCL of 250 mg/L, water systems having greater than 20 mg/L of sodium in their drinking water source are encouraged to inform their customers so that individuals on a physician-prescribed low-sodium diet can inform their doctors of this additional source of dietary sodium.

### 3.0 MANAGEMENT AREA DELINEATION

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

#### 3.1 CONCEPTUAL MODEL

Coffee Creek Water Company's spring is located in the Willow Creek watershed (USGS Hydrologic Unit Code 10040102), which is located within Montana's Lower Missouri River watershed (Heath, 1984). As detailed above, Coffee Creek Water Company's drinking water source is interpreted to originate as rainfall and runoff in the Little Belt or Highwood Mountains, emerging at Johnson Spring due to the permeability contrast between the overlying gravel and the underlying shale. The direction of groundwater flow beneath the site is presumed to be from the southwest towards the northeast along Arrow Bench. The aquifer is unconfined.

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

#### 3.2 DELINEATION

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

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

*Inventory Region* – According to the DEQ's Source Water Protection Program criteria for an unconfined aquifer (DEQ, 1999), the inventory zone was delineated based on a three-year groundwater time-of-travel (TOT) distance. This established using a simple groundwater flow model according to the uniform flow equation (EPA, 1991). Conservative estimates of aquifer properties were made using available data from published reports. The results of the calculations indicate an estimated distance of approximately four miles upgradient for a three-year TOT and 7,500 feet upgradient for a one-year TOT. All significant sources of potential contaminants are inventoried in this region.

*Recharge Region* –The recharge region for the Coffee Creek Water Company spring includes portions of Arrow Creek Bench, as indicated on [Figure 3](#). The inventory for the recharge region focuses on general land uses and large industrial facilities. The goal of management in the recharge region is to maintain and improve the long-term quality of groundwater in the aquifer

## 4.0 INVENTORY

Significant potential contaminant sources in the source water management areas were inventoried to assess the susceptibility of the Coffee Creek Water Company’s spring to contamination, and to provide a foundation for source water protection planning. The inventory for Coffee Creek focuses on facilities or features that generate, use, store, or transport potential contaminants, as well as certain land uses in the inventory and recharge regions. It is important to remember that the sites and areas identified in this section are only potential sources of contamination to the drinking water. Contamination of drinking water sources is less likely when potential contaminants are properly used and managed.

### 4.1 INVENTORY METHOD

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

- Step 1: Land uses were identified from the U.S. Geological Survey’s (USGS) Geographic Information Retrieval and Analysis System <<http://nris.state.mt.us/gis/datalist.html>>. Sewered and unsewered residential land uses were identified from boundaries of sewer coverage obtained from municipal wastewater utilities.
- Step 2: The US Environmental Protection Agency’s (EPA) Envirofacts System <<http://www.epa.gov/enviro/>> was queried to identify EPA-regulated facilities located in the management areas. This system accesses facilities listed in the following databases: Resource Conservation and Recovery Information System (RCRIS), Biennial Reporting System (BRS), Toxic Release Inventory System (TRIS), and Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) and the Permit Compliance System (PCS - for Concentrated Animal Feeding Operations with MPDES permits). The available reports were browsed for facility information including the Handler/Facility Classification to be used in assessing whether a facility should be classified as a significant potential contaminant source.
- Step 3: Montana DEQ databases were queried to identify any of the following in the management areas:
  - Underground storage tanks (USTs) <<http://www.deq.state.mt.us/UST/USTDownloads.asp>>
  - Hazardous waste contaminated sites, above ground storage tanks (ASTs), landfills, and abandoned and active mines, including gravel pits <<http://nris.state.mt.us/gis/bundler/>>Any information on past releases and present compliance status was noted.
- Step 4: A business phone directory was queried by Standard Industrial Classification (SIC) code to identify businesses that generate, use, or store chemicals in the management areas. Particular

attention was paid to equipment manufacturing and/or repair facilities, printing or photographic shops, dry cleaners, farm chemical suppliers, and wholesale fuel suppliers.

- Step 5: Major road and rail transportation routes were identified throughout the inventory region: <http://nris.state.mt.us/gis/gisdata/lib/gisDataList.aspx>.

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

1. Large quantity hazardous waste generators.
2. Landfills.
3. Underground storage tanks.
4. Known groundwater contamination (including open or closed hazardous waste sites, state or federal Superfund sites, and leaking UST sites).
5. Underground injection well.
6. Major roads or rail transportation routes.
7. Cultivated cropland exceeding 20% of the inventory region.
8. Animal feeding operations.
9. Wastewater treatment facilities, sludge handling sites, or land application areas.
10. Septic systems.
11. Sewer mains.
12. Storm sewer outflows.
13. Abandoned or active mines

## 4.2 INVENTORY RESULTS

### 4.2.1 Control Zone Inventory Results

The 100-foot control zone for the wells includes the collection facility and adjacent undeveloped land (site plans are included in the sanitary survey attached as Appendix A). No potential sources of contamination were identified within the control zone. Chemical use in the control region is limited to water treatment with sodium hypochlorite. The PWS should be vigilant to ensure that potential sources of contamination are excluded from the control zone and that positive drainage away from the spring is maintained.

### 4.2.2 Inventory Region Results

The inventory results for Coffee Creek Water Company's source water are summarized in Table 3 and are shown on [Figure 3](#). The inventory region includes the Chicago, Milwaukee, St. Paul and Pacific railroad line.

Land uses within the inventory region include a high percentage of agricultural land, which presents a high hazard to the source water. Septic system density within the inventory region is low and is not considered a hazard to the PWS drinking water. Additional point sources of potential pollutants (such as businesses or facilities listed on regulatory databases) were not identified in the inventory region.

### 4.2.3 Recharge Region Inventory Results

According to the 1992 National Land Cover dataset, the primary land use in the recharge region is agricultural (small-grain). The percentage of agricultural land is considered a high hazard to the drinking water supply. Septic system density within the watershed/recharge region is low and is not considered a hazard to the PWS drinking water.

Additional sources of potential pollutions (such as businesses or facilities listed on regulatory databases) were not identified in the recharge region.

### 4.3 INVENTORY UPDATE

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

## 5.0 SUSCEPTIBILITY ASSESSMENT

### 5.1 INTRODUCTION TO SUSCEPTIBILITY

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

### 5.2 DETERMINATION OF SUSCEPTIBILITY

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

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

### 5.3 RESULTS OF SUSCEPTIBILITY ASSESSMENT

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

**Table 3. Susceptibility Assessment of Significant Potential Contaminant Sources**

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard	Barriers	Susceptibility	Management Recommendations
<i>Inventory Region</i>						
Agricultural Land: Cropland and grazing lands	NO <sub>3</sub> and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	High	None	Very High	Encourage BMPs
Transportation Routes: Highways and Railroad	Pesticides, fertilizers, VOCs, SOCs, other	Spills, routine spraying, storm water runoff, infiltration into groundwater	Moderate	None	High	Encourage and support emergency planning, training of local emergency response personnel, levees and engineered drainage to divert spills and prevent infiltration, cooperation with railroad managers or MDOT to reduce herbicide use.
<i>Recharge Region</i>						
Agricultural Crop Land	NO <sub>3</sub> and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	Not assessed	None	Not assessed outside inventory region	Encourage use of BMPs in the recharge region

## 6.0 LIMITATIONS

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

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

## 7.0 CONCLUSIONS

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

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- No potential sources of contamination were identified within the control zone(s). The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the spring and all sources of potential contaminants should be excluded in this region.
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The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area upgradient of the well that is expected to supply groundwater recharge to the well over the next three years.

- Potential contaminant sources identified within the recharge region are limited to agricultural land.

The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the aquifer is likely from infiltration of precipitation into the gravels that cap Arrow Creek Bench.

The Coffee Creek Water Company public water supply has a very high susceptibility to the surrounding agricultural land and a moderate susceptibility to the nearby railroad.

Low risk potential sources and potential sources located outside the Inventory Region, but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for the Coffee Creek Water Company. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

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

The Coffee Creek PWS is burdened by high nitrate levels in the source water. The major source of nitrate is probably the dryland crop-fallow agriculture practiced over the majority of Arrow Creek Bench. The underlying shale bedrock may be a secondary source of nitrate. A 1998 U.S. Geological Survey study of the Flaxville terrace gravel aquifer in the Fort Peck Reservation (Nimick and Thamke, 1998) concluded that dryland crop-fallow agriculture was the major contributor to elevated nitrate levels characteristic of that aquifer. The authors suggested several land management schemes that might reduce the nitrate load, including increasing the acreage with intensive crop rotations (continuous crop and recrop), planting deeper-rooted crops such as alfalfa, or increasing the land enrolled in the federal Conservation Reserve Program (CRP). Copies of their report may be obtained by writing to the U.S. Geological Survey.

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## 8.0 REFERENCES

- Heath, Ralph C., 1984. Ground-water Regions of the United States, U.S. Geological Survey, Water Supply Paper 2242, Washington D.C., 78p.
- Montana Bureau of Mines and Geology, 2004. Groundwater Information Center, lithologic well logs. <http://mbmgwic.mtech.edu/>
- Montana Department of Environmental Quality Public Water Supply Section, 2004. Safe Drinking Water Information System (SDWIS).
- Montana Department of Environmental Quality (DEQ), 1999. Montana Source Water Protection Program. <http://www.deq.state.mt.us/ppa/p2/swp/index.asp>
- Montana Department of Environmental Quality Underground Storage Tank Program web site. <http://www.deq.state.mt.us/Rem/tsb/iss/USTDownloads.asp>
- Montana Natural Resources Information Interactive Map website. 2004. <http://nris.state.mt.us/interactive.html>
- Nimick, David A., and Thamke, Joanna N., 1998. Extent, Magnitude, and Sources of Nitrate in the Flaxville and Underlying Aquifers, Fort Peck Indian Reservation, Northeastern Montana, U.S. Geological Survey Water-Resources Investigations Report 98-4079, 45p.
- United States Census Bureau, 2000. [http://factfinder.census.gov/home/saff/main.html?\\_lang=en](http://factfinder.census.gov/home/saff/main.html?_lang=en)
- United States Environmental Protection Agency “Envirofacts Data Warehouse and Applications”. <http://www.epa.gov/enviro/>
- United States Geological Survey. 1992. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.
- <http://nris.state.mt.us/nsdi/nris/nlcd/nlcdvector.html>
- Various Authors, 1999-2004. Correspondence in DEQ’s PWS files regarding the Coffee Creek Water Supply.
- Vuke, S.M., Berg, R.B., Colton, R.B., O’Brien, H.E., 2002, Geologic map of the Belt 30' x 60' quadrangle, central Montana, Montana Bureau of Mines and Geology Open File Report 450, 16 page(s), scale 1:100,000.
- Western Regional Climate Center Montana Climate Summaries. [wrc@dri.edu](mailto:wrc@dri.edu)

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## 9.0 GLOSSARY

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

Alkalinity. The capacity of water to neutralize acids.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## **FIGURES**



**APPENDIX A**

**PWS SANITARY SURVEY AND SITE PLAN**



**APPENDIX B**

**WATER QUALITY ANALYTICAL REPORTS**



**APPENDIX C**

**GROUNDWATER TIME-OF-TRAVEL CALCULATIONS**



**APPENDIX D**

**SOURCE WATER MONITORING WAIVERS**



# MONITORING WAIVERS

## Waiver Recommendation

The Coffee Creek Water Company PWS has a waiver for Phase 2 inorganics (which includes barium, cadmium, chromium, fluoride, mercury and selenium). The waiver allows the PWS to collect one sample round for these constituents every 9-year cycle (the standard is one sample round per 3-year cycle). In addition, the PWS was grandfathered under the radionuclide rule and is only required to sample once every 9-years. The PWS is unlikely to qualify for additional waivers.

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

## *Susceptibility Assessment as it relates to Waiver Eligibility*

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

## Monitoring Waiver Requirements

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

## Use Waivers

A Use Waiver can be allowed if through a vulnerability assessment, it is determined that specific organic chemicals were not used, manufactured, or stored in the area of a water source (or source area). If certain

organic chemicals have been used, or if the use is unknown, the system would be determined to be vulnerable to organic chemical contamination and ineligible for a Use Waiver for those particular contaminants.

#### Susceptibility Waivers

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

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

#### Susceptibility Waiver for Unconfined Aquifers

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

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

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

**APPENDIX F**

**CONCURRENCE LETTER**