

# Instructions for Completing a PWS-6 Report For Community or Non-Community Non-Transient Public Water Supplies

(Revised – 08/03/21)

The Source Water Delineation and Assessment Reports (SWDAR) for community or non-transient non-community public water supplies should include the sections outlined below and must adequately describe the water supply, the aquifer or surface water source, and potential sources of regulated contaminants. In addition to the text pages, several simple maps should be included to show the well(s), on-site structures, water distribution system, sewage disposal, roads, source water protection regions (described below – Table 1), general land uses, and potential sources of regulated contaminants (See Attached Example Report). If a well log is available, a copy should be included with the report (**Note-well log must be submitted before final approval can be given**). Reports should be written to show existing AND proposed development features. For more guidance on contact the Source Water Protection Program at (406) 444-5546. A resource to help you create maps of potential contaminants is DEQ's online mapping application at <https://gis.deq.mt.gov/portal/home/>; the application has online instructions and help functions. The DEQ Circular 4 referenced below is available at <http://deq.mt.gov/Portals/112/Water/PWSUB/Documents/engineers/2014/DEQ4-2013-Final.pdf>. A spreadsheet to assist with time-of-travel calculations is available in Appendix U (<http://deq.mt.gov/Water/WQINFO/nondeg/howtonondeg>).

## SWDAR Outline

- 1. INTRODUCTION AND PURPOSE:** Include the public water supply (PWS) name, address, primary contact person, telephone number, and date of report. Identify who completed this report and include contact information.
- 2. PWS INFORMATION:** Describe the location and nature of the water supply (i.e. town, subdivision, school, etc). If this is a new source at an existing PWS, describe why it is needed. Identify how many individuals the PWS will serve and the actual or projected water demand in gallons per day, (DEQ Circular 4 Tables 3.1.1 & 2, column 4). Describe the location of the well or surface water intake with respect to the on-site sewage treatment system components (septic system). Show the exact location of the septic system, mixing zones, and parcel boundaries for this property and neighboring properties on the map.
- 3. DELINEATION:** Use the following headings within this section of the report. **Hydrologic Conditions:** Use Table 1 to determine which set of source water protection regions are required for the water supply. Show the protection region boundaries on one or more of the maps. Describe the aquifer or surface water source sufficiently to justify your delineation and to assign a sensitivity rank (see Table 2). **Well Information:** Use Table 3 to list pertinent information and attach driller's logs for each well if available. **Aquifer Properties:** Use Table 4 to list aquifer properties. Describe source water quality available.
- 4. INVENTORY:** Discuss and show ownership and land uses within the control and inventory regions. Table 5 lists land use codes that can be used on the map. You can use either mapping tool to build maps showing significant potential sources of contamination within the inventory region. Use Table 6 to identify the types of significant potential contaminant sources you should identify. Fill out a copy of Table 7 to list each potential contaminant source.
- 5. SUSCEPTIBILITY:** Describe the risk the contaminant sources identified in your inventory pose to the new well. You can use the following recommended procedure for the susceptibility analysis or you can request DEQ's Source Water Protection Staff complete the susceptibility analysis.
- 6. LIMITATIONS**

Identification of potential contaminant sources is limited to those regulated for this class of PWS and is generally based on readily available public information and reports. Unregulated activities or unreported contaminant releases will likely be missed and not considered in this report. The delineation method utilizes simplifying assumptions that may not fully represent complex ground water flow systems but is intended to be conservative and protective of public health.
- 7. REFERENCES:** List other references used for this report. Table 11 shows the suggested reference format.

### *Recommended Procedure:*

Use Table 8 to assign a hazard rating for each potential contaminant source you have listed in Table 7.

Use Table 9 to help you identify natural or man-made barriers for each source listed in Table 7. Only barriers in Table 9 should be used in the susceptibility assessment.

Use Table 10 to assign susceptibility ratings for each source listed in Table 7.

In the text, describe any other source water protection efforts that will be used to address and minimize the susceptibility ratings listed in Table 7. Finally, discuss water treatment measures already being used by the PWS.

## Support Figures

**Table 1. Methods and criteria for delineating source water protection regions for PWSs.**

If Your Source of Water Is:	Delineate These Water Protection Regions	Method For Each Region:	Minimum Distance Values & Type of Inventory Required: LU – Land Uses; P&N – Pathogens and Nitrate sources
1. Ground Water that is: <ul style="list-style-type: none"> <li>• Unconfined/Semi-confined*,</li> </ul>	Control Inventory	Fixed radius Fixed radius	Distance - 100 feet Distance - 1 mile
<ul style="list-style-type: none"> <li>• Confined</li> </ul>	Control Inventory	Fixed radius Fixed radius	Distance - 100 feet Distance - 1000 feet
*Ground Water that is hydraulically Connected to Surface Water	Buffer Zone	Fixed Distance	One-half mile buffer extending upstream a distance corresponding to a 4-hour TOT but not to exceed ten miles or the nearest intake. Buffer will not exceed the extent of the watershed.
Surface water	Spill Response	Fixed Distance	One-half mile buffer extending upstream a distance corresponding to a 4-hour TOT but not to exceed ten miles or the nearest intake. Buffer will not exceed the extent of the watershed.

**Table 2. Source Water (Aquifer) Sensitivity Table.**

<u>High Source Water Sensitivity</u>	<u>Moderate Source Water Sensitivity</u>	<u>Low Source Water Sensitivity</u>
<ul style="list-style-type: none"> <li>▪ Surface water and GWUDISW</li> <li>▪ Unconsolidated Alluvium (unconfined)</li> <li>▪ Fluvial-Glacial Gravel</li> <li>▪ Terrace and Pediment Gravel</li> <li>▪ Shallow Fractured or Carbonate Bedrock</li> </ul>	<ul style="list-style-type: none"> <li>▪ Semi-consolidated Valley Fill sediments (semi-confined)</li> <li>▪ Unconsolidated Alluvium (semi-confined)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consolidated Sandstone Bedrock</li> <li>▪ Deep Fractured or Carbonate Bedrock</li> <li>▪ Semi-consolidated (confined)</li> </ul>

**Table 3. Source well information for *public water supply name*.**

Information	Well #1	Well #2
PWS Source Code	-	-
Well Location (T, R, Sec or lat, long)	-	-
MBMG #	-	-
Water Right #	-	-
Date Well was Completed	-	-
Total Depth	-	-
Perforated Interval	-	-
Static Water Level	-	-
Pumping Water Level	-	-
Drawdown	-	-
Test Pumping Rate	-	-
Specific Capacity	-	-

**Table 4.** Estimates of aquifer properties and pumping demand.

Input Parameter	Range of Values and units	Values Used (for each well if more than one)			
		Well #1	Well #2	Well #3	Well #4
PWS Source Code	-	-	-	-	-
Transmissivity	-	-	-	-	-
Thickness	-	-	-	-	-
Hydraulic Conductivity	-	-	-	-	-
Hydraulic Gradient	-	-	-	-	-
Flow Direction	-	-	-	-	-
Effective Porosity	-	-	-	-	-
Pumping Rate	-	-	-	-	-

**Table 5. Land Use Types and Map Codes.**

Land Use Type	Map Code	Land Use Type	Map Code
Sewered residential	SR	Industrial	I
Sewered commercial	SC	Railroad right-of-way,	RRW
Sewered mixed	SM	Highway right-of-way	HRW
Unsewered residential	UR	Agricultural dryland crop	ADC
Unsewered mixed	UM	Agricultural irrigated crop	AIC
Unsewered commercial	UC	Agricultural irrigated pasture	AIP
-	-	Agricultural dryland pasture	ADP
-	-	Forest	F

**Table 6. Identification of Significant Potential Contaminant Sources.**

Septic Systems Animal Feeding Operations Underground Storage Tanks Underground Storage Tanks Leaks State and Federal Superfund Sites RCRA Large Quantity Generators Underground Injection Wells Wastewater Treatment	Landfills Abandoned Mines MPDES Wastewater Dischargers Municipal Sanitary Sewer Municipal Storm Sewers Highways, Railways, Pipelines Cultivated Croplands <b>Other:</b> Activities or substances that can compromise source water quality.
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**Table 7. (MT SWPP Table 5). Significant potential contaminant sources for *enter PWS name*. (Examples included)**

Source	Contaminants	Description ( <i>Location and nature of hazard</i> )	Hazard Rating	Barriers	Susceptibility
<i>Animal Feeding Operation</i>	<i>Pathogens and Nitrates</i>	-	<i>Moderate</i>	-	-
<i>Sanitary Sewer Main</i>	<i>Pathogens and Nitrates</i>	-	-	-	-
<i>Septic Systems</i>	<i>Pathogens and Nitrates</i>	-	-	-	-
<i>Underground Pipeline</i>	<i>Fuels</i>	-	-	-	-

**Table 8a. (MT SWPP Table 6) SURFACE WATER SOURCES: Hazard of potential contaminant sources.**

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
<b>Point Sources</b>	Potential for direct discharge to Source Water	Potential for discharge to GW that is hydraulically connected to SW	Potential contaminant sources present within the watershed
<b>Septic Systems</b>	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
<b>Municipal Sanitary Sewer</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
<b>Cropped Agricultural Land</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

**Table 8b. (MT SWPP Table 6) UNCONFINED AQUIFERS: Hazard of potential contaminant sources.**

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
<b>Point Sources</b>	Within 1 year TOT	Between 1 to 3 years TOT	Over 3 years TOT
<b>Septic Systems</b>	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
<b>Municipal Sanitary Sewer</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
<b>Cropped Agricultural Land</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

**Table 8c. CONFINED AQUIFERS (modified from MT SWPP Table 6): Hazard of potential contaminant sources.**

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

**Table 9. List of Barriers**

<p><b>Well Construction Related Barriers:</b></p> <ul style="list-style-type: none"> <li>• Intake depth of &gt;50 feet below static water level.</li> <li>• Well seal (grout) extends into confining layer above aquifer</li> <li>• Meets Board of Water Well Contractor Requirements</li> </ul>	<p><b>Engineering Related Barriers:</b></p> <ul style="list-style-type: none"> <li>• Existing program to replace/repair sewer lines</li> <li>• Stormwater control structures in place</li> <li>• Leak detection and monitoring for pipelines</li> <li>• Secondary containment in place (fuel and chemical storage tanks)</li> </ul>
<p><b>Location and size of Potential Contaminant Source Related Barriers:</b></p> <ul style="list-style-type: none"> <li>• Cross or down-gradient location for the contaminant source</li> <li>• Distance from the PWS well(s)</li> <li>• Small non-commercial facility</li> </ul>	<p><b>Permit Related Barriers:</b></p> <ul style="list-style-type: none"> <li>• Permitted facility in compliance with permit requirements</li> <li>• CAFO* or AFO** plant is operating within its regulatory permit</li> <li>• Groundwater monitoring program in place and active</li> <li>• On-going remediation and monitoring or completion of remediation</li> <li>• Documented removal of contaminant source (fuel and chemical storage tanks, soils etc.)</li> </ul>
<p><b>Soil and Aquifer Related Barriers:</b></p> <ul style="list-style-type: none"> <li>• Thick unsaturated zone above the aquifer, greater than 100 feet</li> <li>• Continuous clay layer(s) overlie the aquifer</li> <li>• Clay rich surface soils</li> <li>• Upward ground-water gradient (ground-water discharge area)</li> </ul>	<p><b>Disaster and Emergency Response Related:</b></p> <ul style="list-style-type: none"> <li>• Emergency Response Plan In Place</li> <li>• Local and County Emergency Response Capacity</li> </ul>

\* Confined Animal Feeding Operation. \*\* Animal Feeding Operation

**Table 10. (MT SWPP Table 5). Relative susceptibility to specific contaminant sources as determined by hazard and the presence of barriers.**

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

**Table 11. Suggested format for listing references.**

Author Name, Date of Publication, Title of Report or Document: Publication Source and Report or Volume Number, page number.

**Example:**

- Kendy, E., and R.E. Tresch, 1996, Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana: U.S. Geological Survey Water Resources Investigations Report 96-4025, 233 p.
- Morrison – Maierle, Inc., 1980. Flower Creek Basin Flower Creek Dam Libby, Montana. MT-1458. 23 p.

# Example PWS-6 Report\*

\* This report example is modified from the original submission for the purposes of this template.

## Town of Sheridan

June 1, 2001

**Public Water Supply: PWS ID: 00329**  
**Town of Sheridan**

### INTRODUCTION AND PURPOSE

The purpose of this PWS-6 report is to assess threats to a new supply well for the Sheridan water supply system. The primary contact for this water supply is Mr. Kelly Elser, P.O. Box 78, Sheridan, Mt. 59749. Jim Stimson, Hydrogeologist with the Montana Department of Environmental Quality (DEQ), prepared the final report.

### PWS INFORMATION

Sheridan is located in lower Ruby Valley in Madison County along State Highway 287, about 36 miles northeast of Dillon (Figure 1A). DEQ public water supply records indicate the water system serves 723 residents and is classified as a community system because it serves at least 25 year-round residents. Public water and sewer services are provided within the city limits. A waste treatment lagoon is located about one-quarter mile northwest of town (Figure 1B).

The primary water supply consists of four wells located in a well field on the west-side of town (Figure 1B). Use of one of the wells is limited due to construction problems. Water from the well field is pumped to two storage reservoirs northeast of town near Nonpariel Creek and then re-routed through a variety of service connections to Sheridan residents.

Average water use is estimated at 183 gallons per minute (gpm), that is 263,520 gallons per day (gpd), with peak demand estimated at 329 gpm (473,760 gpd) during the summer. The water is not disinfected but the system is equipped to provide gas chlorination. Concerns over water supply shortages due to drought conditions during the summer of 2000 and chronic production problems with the number 4 well prompted efforts to drill the new supply well. The new well will be located in the existing well field and therefore, information from the existing wells will be used to develop a conceptual model for ground-water flow for the new well and to estimate aquifer properties.

### DELINEATION

Table 1 of the PWS-6 Template for Community and Non-Transient Non-Community PWSs was used to determine the type of inventory regions needed for this report. Two source water protection zones are delineated for the Sheridan water supply well. They include a 100-foot fixed radius control zone and a 1,000 foot fixed radius inventory region. The latter is used because the aquifer is interpreted to be semi-confined.

### Hydrologic Conditions

Hydrogeologic studies indicate that Quaternary and Tertiary sedimentary deposits are the source of Sheridan's water supply. The majority of the wells in the vicinity of Sheridan are between 15 and 60 feet deep. These wells tap a shallow water table aquifer within the Quaternary alluvium. The town's public supply wells are between 100 and 412 feet deep and production is from shallow Quaternary alluvium and deeper zones within the upper Tertiary sedimentary deposits. Geologic cross-sections from a preliminary ground-water study show that multiple confining clay layers are present in the area but in some places these layers thin and terminate. In other words, the confining layers are not laterally extensive.

# Sheridan Public Water Supply

Figure 1.

Figure 1A - Vicinity Map



Figure 1B - Potential Contaminant Sources in and around the Inventory Zone.

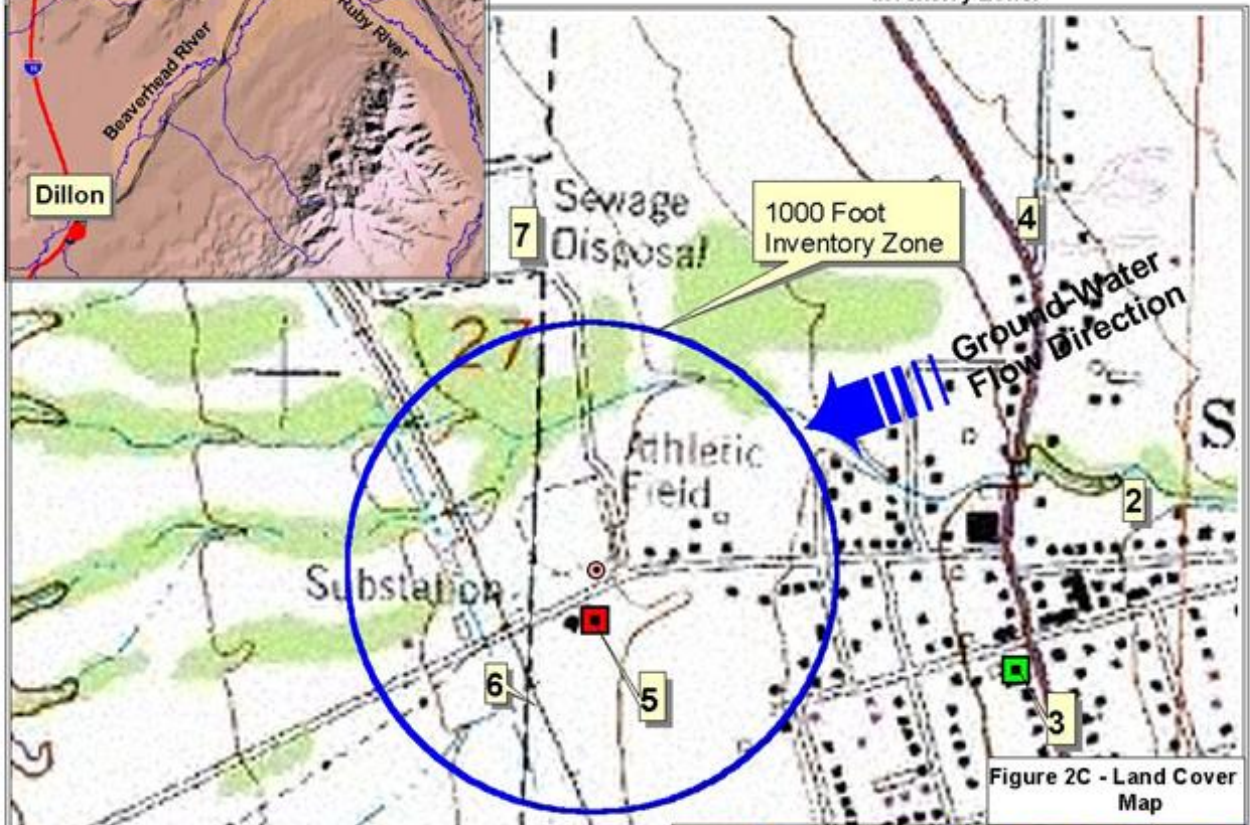
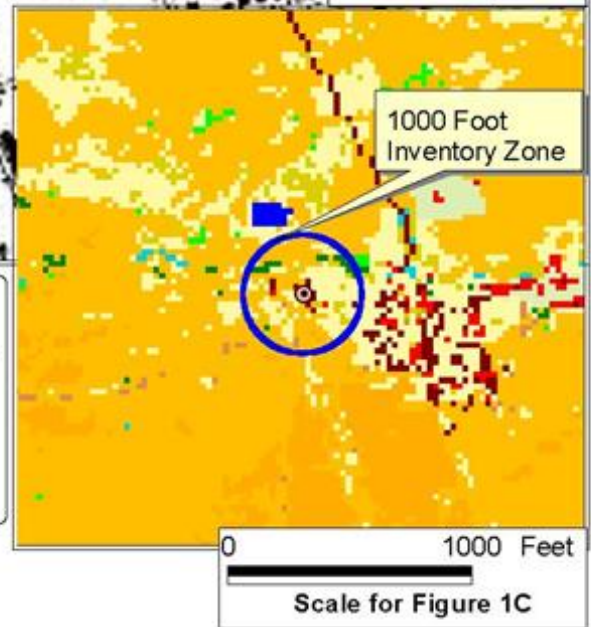


Figure 2C - Land Cover Map



### Legend for Map B

- Underground Storage Tanks
- Active Facility, Known Leaks
  - Inactive Facility, Known Leaks

### Legend for Map C - Land Use

- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transportation
- Grass/Recreational/Grasses
- Orchard/Vegetable/Garden
- Row Crops
- Small Grains
- Pasture/Hay
- Fallow
- Bare Soil/Sand/Clay
- Open Water



JRS - 01/03/2001



Therefore, the aquifer used by the Sheridan water supply is interpreted to be semi-confined, and is assigned a rank of "moderate source water sensitivity", in accordance with Table 2 of the PWS-6 template for Community or Non-Community Non-Transient Public Water Supplies (DEQ Source Water Protection Program, 2000).

#### Well Information

Table 1 of this report shows that Sheridan's public water supply wells range in depth from 100 to 412 feet. Two wells located in the well field west of Sheridan encountered 40 to 100 feet of "hard pan" or "clay" that can be interpreted as impermeable confining layers.

#### Aquifer Properties

Table 2 summarizes aquifer information for the Sheridan area. The table includes parameter values used in TOT calculations to support completing the susceptibility analysis for potential contaminant sources identified within the inventory region (Figures 1B and C).

#### Limitations

Values in Table 2 come from a limited number of studies conducted in the lower Ruby Valley. As a consequence, it is uncertain how accurately the values portray the aquifer's properties. Calculated TOT distances are considered to be conservative estimates based on available data and the professional judgement of the analyst writing this report.

### **INVENTORY**

The wells are located at a ball park on the west side of town. The control zones include land outside the town park. One or more of the control zones are encroached upon by a county road, irrigation ditch, and sewer main (see Figure 1.).

Table 3 lists the significant potential contaminant sources for the control and inventory zones. Numbers in the source column of the table provide a cross-reference to maps shown in above figure. Recreation, hay production, and grazing are the primary land uses near the well field. Based on an analysis of the USGS National Landcover Dataset (USGS 2000), land use within the entire inventory zone is approximately 52% agriculture, 18% undeveloped residential, 23% grassland, 4% low-density residential, and 3% commercial. Land use in the recharge region is dominated by grass- and shrub-land (56%), forestland (32%), and agricultural land (11%).

Two former fuel leak sites are included in the inventory, despite the fact they lie just outside the inventory zone boundary. They are included because the inventory boundary is delineated based on incomplete information, and there are uncertainties concerning aquifer properties and ground-water flow direction. Modification of the inventory zone boundary to include both sites could be warranted if future studies indicate these areas contribute water to the Sheridan supply wells.

The railway, which would normally be considered a significant potential contaminant source, is not included in the inventory and susceptibility analysis because it is abandoned.

### **SUSCEPTIBILITY**

The proximity of a potential contaminant source to the well site or the density of non-point potential contaminant sources determines the threat of contamination. Hazard and the existence of barriers to contamination determine susceptibility; see Table 10 of the PWS-6 Template for Community and Non-Transient Non-Community PWSs. Barriers can be anything that decreases the likelihood that contaminants will reach a well. Barriers can be engineered structures, management actions or natural conditions (See Table 9 of the PWS-6 Template).

Table 3 lists results from the susceptibility analysis for significant potential contaminant sources. Agricultural lands northeast of Sheridan make up about 52% of the inventory region. Municipal sewer lines within Sheridan City Limits appear to underlie approximately 20% of the inventory region east of the well. Two former leaking underground storage tank sites are present in the area, one within the inventory region. The tanks belong to the Sheridan Service Station and Bulk Station.

A segment of a railroad is located west and down-gradient from the well location (Number 6 on the map above). The town's waste water treatment lagoons are located north of the well site and outside the inventory region.

### **LIMITATIONS**

The terms "drinking water supply" or "drinking water source" refer specifically to the source of the Sheridan public water supply and not any other public or private water supply. Only significant potential sources of contamination in areas that contribute water to the drinking water source are considered in this report. A source is

considered significant if substances that are used, generated or stored are highly hazardous to human health or if the volume on-site is relatively large. Some potential or existing sources of contamination may be unintentionally missed in the inventory. The report will be periodically updated when new information becomes available. 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.

## REFERENCES

- DEQ Source Water Protection Program, 2000, PWS-6 Template for Community or Non-Community Non-Transient Public Water Supplies. Available from the DEQ web site: <http://www.deq.state.mt.us/wqinfo/SWP/Circulars.htm>
- Hannaman, D. L. and Wideman, C. J., 1988, Sequence stratigraphy of Cenozoic rocks; Geologic Society of American V. 103, p. 1335-1345.
- Kuenzi, W.D. and Fields, R. W., 1971, Tertiary stratigraphy, structure, and geologic history of the Jefferson Basin, Montana; Geologic Society of American V. 82, p. 3374-3394.
- Ruppel, E. T., 1993, Cenozoic tectonic evolution of South West Montana and East-Central Idaho, Montana Bureau of Mines and Geology (MBMG) Memoir 65.
- Ruby Valley Conservation District in association with the Ruby Valley Watershed Committee, 2000, Preliminary report on the ground-water resources of the Mill and Indian Creek subwatershed, lower Ruby Valley, Montana. Draft Hydrogeologic Report, Madison County Conservation District.
- U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.

**Table 1.** Source well information for City of Sheridan. NR = Not Reported

Well Information	Well # 1	Well # 2	Well # 3	Well #4	City Well	City Well (Tolson Well)
<b>PWS Source Code</b>	03	02	05	NR	NR	NR
<b>Well Location (T, R, Sec or lat, long)</b>	04S 05W 27 DB	04S 05W 26 CCDA	04S 05W 27 DB	04S 05W 27 DB	04S 05W 27 DA	04S 05W 26 CDA
<b>MBMG #</b>	107982	107951	107984	107983	107980	107954
<b>Water Right #</b>	NR	NR	NR	NR	NR	NR
<b>Date Well was Completed</b>	01/01/89	11/28/89	01/03/90	01/01/89	01/01/82	01/01/67
<b>Total Depth (ft)</b>	100	225	412	400	300	58
<b>Perforated Interval (ft)</b>	NR	81 - 225	250 -412	NR	NR	NR
<b>Static Water Level*</b>	18	20	22	16	9	8
<b>Pumping Water Level *</b>	NR	220	NR	NR	97	44
<b>Drawdown (ft)</b>	NR	200	NR	NR	88	36
<b>Test Pumping Rate (gpm)</b>	50	30	300	500	80	125
<b>Specific Capacity</b>	NR	0.15	NR	NR	0.91	3.47

\* feet below land surface

**Table 2.** Estimates of aquifer properties and pumping demand. (Table 5 of template)

Input Parameter	Values used for TOT Calculations	Range of Values from Sheridan wells	
		Well # 3	Well #2
PWS Source Code	-	05	02
Transmissivity (gpd/ft)	18,000	14,000 - 18,000	14,000 - 18,000
Thickness (ft)	103	62	144
Hydraulic Conductivity (gpd/ft <sup>2</sup> )	175	226 - 290	97 - 125
Hydraulic Gradient	0.02	NR	NR
Flow Direction	South-Southwest (S 70 - 75 W)	NR	NR
Effective Porosity	0.1	NR	NR
Pumping Rate (gpd)	368,640 Average of 263,520 and 473,760 reported on page 1 of text.	300 gpm	30gpm
Stagnation Point Distance (ft)	165		
Lateral Boundary Limit (ft)	520		
1-Year TOT Distance (ft)	1,679		
3-Year TOT Distance (ft)	5,037		

**Table 3.** (MT SWPP Table 5). Significant potential contaminant sources for City of Sheridan Source Water.

Source	Contaminants	Description ( <i>Location and nature of hazard</i> )	Hazard Rating	Barriers	Susceptibility
1. Dryland Agricultural Crop Lands and grazing	SOC, Nitrate	52% ag-land in the inventory zone	High	Depth >50 ft. below water level Some Ag-land is down-gradient of well	Moderate
2. Sanitary Sewer Main near wells	Pathogens & Nitrates	About 20% sewerd in Inventory Region	Moderate	Depth >50 ft. below water level	Moderate
3. Leaking Underground storage site (LUST)*	Gasoline	Just outside inventory zone	Moderate	Depth >50 ft. below water level	Moderate
4. Segment of Highway 287*	Hazardous Materials (VOCs & SOCs)	Highway is east and outside of the Inventory Region	Low	Depth >50 ft. below water level	Low
5. Underground storage site (UST)	Gasoline	Approx. 500 feet south of well	High	Remediated as of 04/21/2006 Intake Depth >50 ft. below water level	Moderate
6. Montana Rail Link Railroad	Various organic chemicals	Segment is located west of well	High	Emergency response Down-gradient Location	Low
7. Waste Water Treatment Lagoons*	Pathogens & Nitrates	Located north of the well site and outside the Inventory Region	Low	Depth >50 ft. below water level Lagoons are cross-gradient to well	Low

Site Name: TOWN OF SHERIDAN #2  
 GWIC Id: 107982  
 DNRC Water Right: P072317-00

**Section 1: Well Owner(s)**

1) TOWN OF SHERIDAN (MAIL)  
 PO BOX 78  
 SHERIDAN MT 59749 [12/09/1989]

**Section 2: Location**

Township	Range	Section	Quarter Sections		
04S	05W	27	SW¼	SW¼	NW¼ SE¼
County		Geocode			
MADISON					
Latitude	Longitude	Geomethod	Datum		
45.4561	-112.204	MAP	NAD27		

Ground Surface Altitude	Ground Surface Method	Datum	Date*
Addition	Block	Lot	

**Section 3: Proposed Use of Water**  
 PUBLIC WATER SUPPLY (1)

**Section 4: Type of Work**  
 Drilling Method: AIR ROTARY  
 Status: NEW WELL

**Section 5: Well Completion Date**  
 Date well completed: Tuesday, December 05, 1989

**Section 6: Well Construction Details**  
**Borehole dimensions**

From	To	Diameter
0	20	13
20	100	8

**Casing**

From	To	Diameter	Wall Thickness	Pressure Rating	Joint Type
-2	82	8			STEEL
82	100	0			OPEN HOLE

**Completion (Perf/Screen)**

From	To	Diameter	# of Openings	Size of Openings	Description
40	80	8		1 1/2 X 1/4	PERFS

**Annular Space (Seal/Grout/Packer)**

From	To	Description	Cont. Fed?
0	20	CEMENT	

**Section 7: Well Test Data**

Total Depth: 100  
 Static Water Level: 18  
 Water Temperature:

**Pump Test \***

Depth pump set for test \_ feet.  
 \_150\_ gpm pump rate with \_ feet of drawdown  
 after \_8\_ hours of pumping.  
 Time of recovery \_ hours.  
 Recovery water level \_ feet.  
 Pumping water level \_61\_ feet.

\* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

**Section 8: Remarks**

**Section 9: Well Log**  
**Geologic Source**  
 Unassigned

From	To	Description
0	2	TOP SOIL
2	25	BOULDERS GRAVEL
25	40	GRAVEL AND CLAY
40	80	SAND AND GRAVEL
80	100	HARD PAN

**Driller Certification**

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

<b>Name:</b>
<b>Company:</b> LINDSAY DRILLING CO INC
<b>License No:</b> WWC-253
<b>Date:</b> 12/5/1989
<b>Completed:</b>