WISE RIVER RANGER STATION

SOURCE WATER DELINEATION AND ASSESSMENT REPORT

Public Water System: WISE RIVER RANGER STATION

PWSID # MT0062187

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INTRODUCTION

This report is intended to meet the technical requirements for the completion of the delineation and assessment report for Wise River Ranger Station as required by the Montana Source Water Protection Program and the federal Safe Drinking Water Act (SDWA). Joe Gurrieri, Hydrogeologist with the USDA, Forest Service prepared the final report. Information for the well was taken from sanitary surveys, well logs, and from research of public documents.

The purpose of this delineation and assessment report is to assess threats to Wise River Ranger Station water supply using information obtained from those familiar with the surrounding area and from published reports. The emphasis of this delineation and assessment report is identifying significant potential contaminant threats to public drinking water sources and providing the information needed to develop a source water protection plan. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

PUBLIC WATER SUPPLY INFORMATION

The Wise River Ranger Station is owned and operated by the USDA, Forest Service. The Beaverhead-Deerlodge National Forest, Wise River Ranger District has the responsibility for operation, maintenance, and sampling of two wells on the site. The Montana Bureau of Mines & Geology well identification numbers are 164859 and 48824. No DNRC water right identification numbers were found. The Wise River Ranger Station is located in the town of Wise River (T1N R11W Sec. 35) in Beaverhead County (Figure 1).

The water system is classified as a transient, non-community public water supply because it serves 25 or more persons per day but does not regularly serve the same persons for at least 6 months per year. The system serves 10 residents year round and 20 non-resident visitors per day during the summer and 10 non-resident visitors in the winter through 10 service connections. There are two wells connected to the same water distribution system (Figure 2). Water demand is approximately 10,000 gallons per day in the summer and 2500 gallons per day in the winter (Attachment I). Sanitary waste is disposed of in seven onsite septic/drainfield systems (Figure 3). Generally, they are all within 50 ft. of the main buildings including the office but are not within the 100 foot control zones around the wells. The only drainfield approaching 20 people/day is at the office during summer. The other drainfields serve 2 to 8 people each per day.

Approximately 73 to 96 feet of Quaternary alluvium (MBMG, 1955) consisting of gravel, sand and silt overlie bedrock. The well reports (Attachment II) show well #2 to be 120 feet deep with a static water level at 62 feet with an 8-5/8 inch steel casing down to 97 feet. The casing is perforated in a sand and gravel aquifer from 77 to 95 feet. The well was tested at a pumping rate of 75 gpm with 1 foot of drawdown. Well #1 is 109 feet deep with a static water level at 62 feet. A solid 8-inch steel casing extends down to the top of bedrock at 73 feet and is not perforated. Water intake to the well is from the bedrock aquifer. The well was tested at 108 gpm and experienced 16 feet of drawdown.

The Beaverhead-Deerlodge National Forest is required to monitor for nitrate and coliform bacteria. Nitrate levels detected in the water supply during the period 1996 to 2000 have ranged from 0.29 to 0.65 mg/L, well below the maximum contaminant level of 10 mg/L. One positive result for coliform bacteria was detected in 1998 and one positive result was detected in 1997.

DELINEATION

A 100-foot radius control zone, a one-mile radius inventory region, and surface water buffer zones were delineated for the Wise River Ranger Station as required for transient, non-community public water supplies under the Montana Source Water Protection Program (DEQ, 1999). The control zone is the most critical area within which direct introduction of contaminants can occur. The Inventory Region encompasses the area that water or contaminants can flow to the well over a period of months to years. A surface water buffer zone was delineated for the Big Hole and Wise Rivers since they cross the inventory region for both wells, creating the possibility that a hydraulic connection exists between the wells and the rivers. If potential contaminant sources exist upstream from the public water supply well, dissolved contaminants, nitrate for example, or transported pathogens, like viruses and cryptosporidium, could enter the creek and be transported into the aquifer in which the wells are completed. The contaminated ground water could then be drawn into the wells. The surface water buffer zone is used to identify potential contaminant sources upstream from the well and extends 10 miles upstream and one half mile from each river bank (Montana DEQ, 2000, Table 1).

INVENTORY

An inventory of potential sources of contamination was conducted for the Wise River Ranger Station within the control and inventory regions and surface water buffer zones. Potential sources of all primary drinking water contaminants and Cryptosporidium were identified, however, only significant potential contaminant sources were selected for detailed inventory. The significant potential contaminants in the inventory region are nitrate and pathogens. The inventory for the site focuses on all activities in the control zone, municipal and private facilities in the inventory region, and general land uses and large facilities in the recharge region.

Land ownership within the one-mile inventory region is 82 % private and 17 % Forest Service. Land use within the inventory region consists of rangeland 44 %, crop/pasture 42 %, forest 13 %, and urban/residential 1 %

(USGS, 2000). Irrigated cropland and unsewered urban/residential land uses are considered potential sources of nitrate and/or pathogen contamination. Land use along the 10-mile buffer zone for the Wise River consists almost exclusively of rangeland. Within the buffer zone for the Big Hole River, a large portion of the area is used as crop/pasture land and a small area of medium density septic systems occur 5 miles upstream from the ranger station. Based on available data sources, there are no animal feeding operations, wastewater treatment facilities or sanitary sewer mains within the inventory region or surface water buffer zones.

SUSCEPTIBILITY ASSESSMENT

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. In this case, susceptibility is assessed in order to prioritize potential pollutant sources for management actions by the Beaverhead-Deerlodge National forest in managing the Wise River Ranger Station.

According to the Montana Source Water Protection Program criteria, an unconfined aquifer consisting of unconsolidated alluvium has is highly sensitive to potential sources of contamination (Montana DEQ, 2000, Table 2). Well #2 is perforated in, and therefore collects water from, an unconfined gravel aquifer. Although well #1 is cased all the way to bedrock, it is likely that the bedrock is recharged by the overlying gravel aquifer. The hazard rating for these aquifers is considered moderate for nitrates and microbial contaminants based on the septic system density and percentage of cropped agricultural land in the inventory region but is high due to the on-site septic systems (Montana DEQ, 2000, Table 6). With no barriers identified, the susceptibility of the Wisdom Ranger Station water supply, as defined by Montana Department of Environmental Quality (1999), is very high for nitrates and microbial contaminants (Table 1).

Table 1. Susceptibility assessment ratings.

Source	Contaminant	Hazard Rating	Barriers	Susceptibility
7 on-site septic systems	Nitrate and pathogens	High	None	Very High
Medium density septic systems	Nitrate and pathogens	Moderate	None	High
Cropped agricultural land	Nitrate and pathogens	Moderate	None	High

REFERENCES

Montana Department of Environmental Quality, 1999, Montana Source Water Protection Program, Approved by EPA in November 1999.

Montana Department of Environmental Quality, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies.

Montana Bureau of Mines and Geology, 1955, Geologic Map of Montana.

U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.

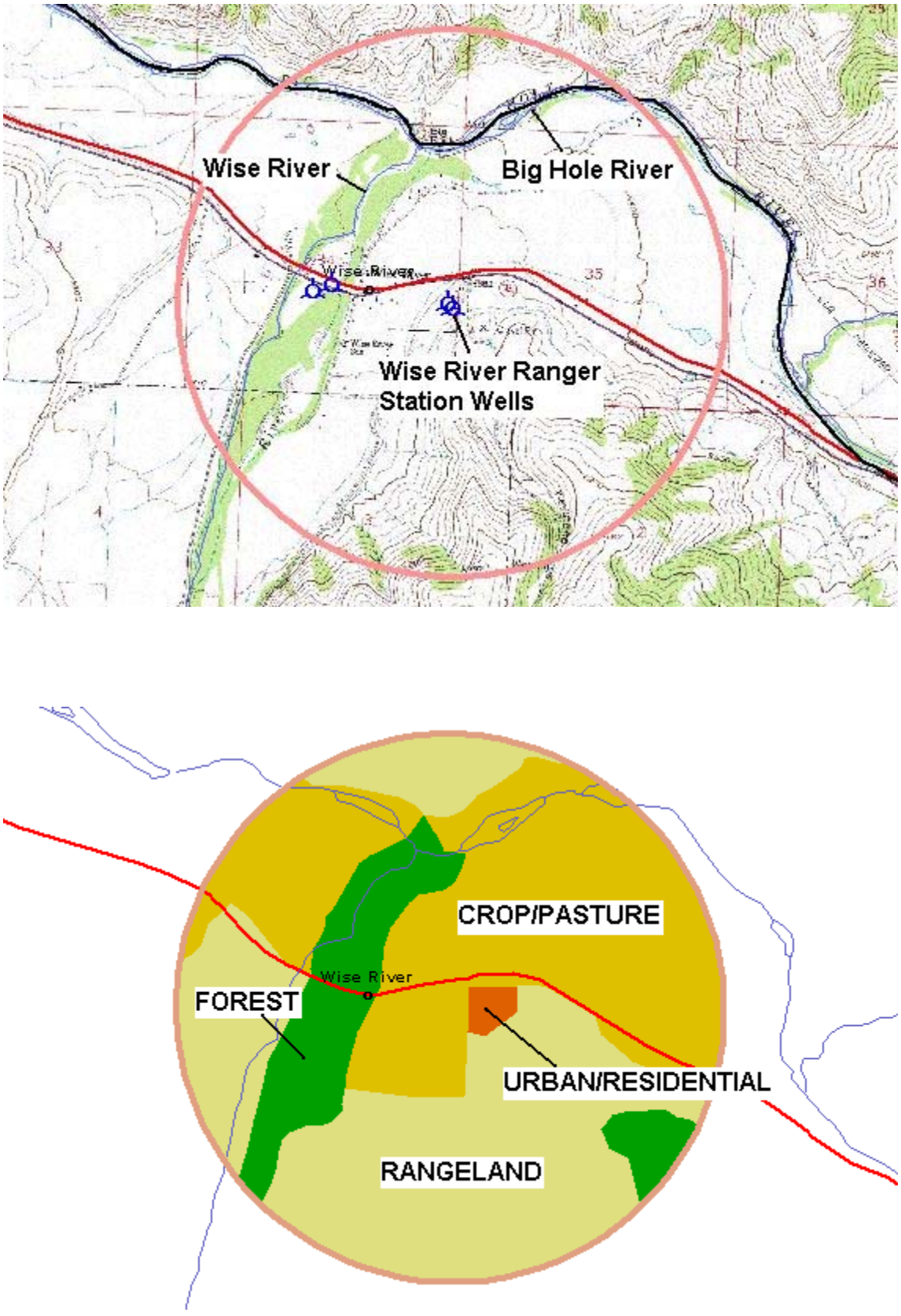

Figure 1. Vicinity and Land Use Maps

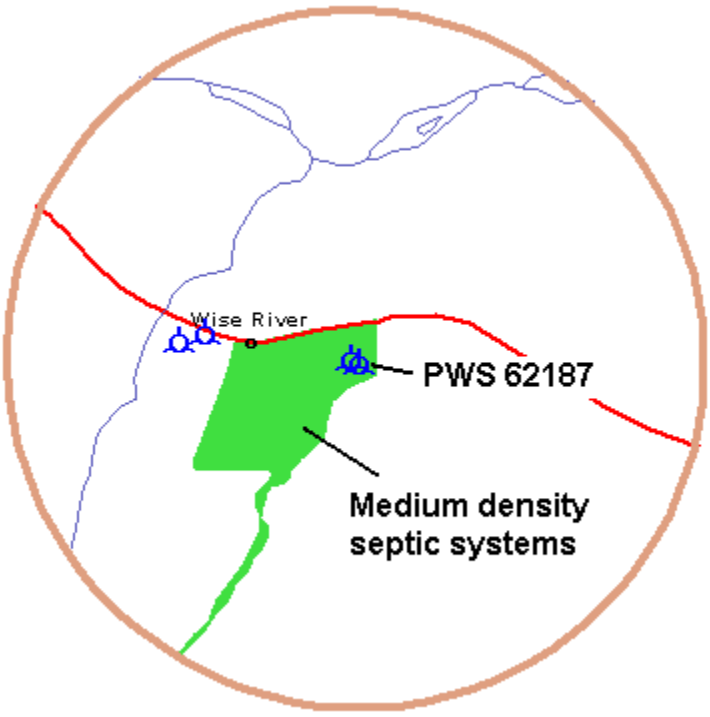

Figure 3. Septic Density Map