

WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)



SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Medicine Bow

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SOURCE WATER ASSESSMENT SUMMARY FOR Medicine Bow

PWS Source Water Assessment Summary

The Town of Medicine Bow Water Facility (Medicine Bow) is a community groundwater system located in east central Carbon County. It provides water to approximately 380 residents through 200 service connections on year round basis. Source water is obtained from three flowing artesian Casper Aquifer wells and is piped about nine miles to the distribution system. The wells have sufficient artesian flow to provide most of the town's needs without additional pumping. For treatment purposes, sodium hypochlorite is injected directly into the transmission line near the wellhead. A one million-gallon storage tank completes the system.

In general, the Town of Medicine Bow Water Facility received a low rating for land use susceptibility. Medicine Bow also scored low for transportation corridor contaminant susceptibility despite the presence of a pipeline that lies inside the delineation zone.

Delineation Methods

Medicine Bow is a community water system that obtains its water supply from fractured bedrock. Hydrogeologic mapping techniques were consequently used to identify source water areas for the wells. For this aspect of the project, Lidstone obtained and reviewed a source water area delineation that was previously completed for the Town in 1999 by the Wyoming Geological Survey. Lidstone's Professional Geologist amended this delineation as necessary to meet SWAP criteria.

Hydrogeologic mapping techniques use surface observations in combination with subsurface geologic and hydrogeologic data to identify aquifer boundaries and areas that contribute water to the aquifer. To meet SWAP criteria, these techniques were used to redelinate the source water areas for Medicine Bow's Casper Aquifer wells because these wells obtain water from fractured bedrock through conduit flow. Conduit flow aquifers have extremely variable flow patterns and rates, making the calculation of time of travel difficult. For the Medicine Bow wells, only one contaminant inventory zone was identified beyond Zone 1 due to the inherent difficulty in attempting to assign a particular time of travel to a given area under these conditions.

Groundwater Sources

Medicine Bow's three wells are located approximately seven miles east of town in Albany County along the crest of Como Bluff Anticline. These wells are completed in the Casper Formation to depths of up to 800 feet. Recharge for the wells originates as infiltrating precipitation on Casper Formation outcrops to the east and flows southwestward to the wells under artesian conditions through fracture and possibly conduit flow. Additional information of each of these three wells is included on the enclosed Well Information Sheets.

As shown on the attached source water area map, contaminant inventory zones for Medicine Bow's wells were developed to encompass those areas most likely to contribute water to the Casper Formation. Zones 2 and 3 were combined due to the fractured flow characteristics that

are typically associated with the Casper Aquifer in this area. The source water area that was delineated extends from the western and southern edges of Casper Formation outcrops, terminates on the north at the Como Bluff Fault, and includes drainages on the east that divert water westward across Casper Formation outcrops.

Integrity Summary

Medicine Bow uses three wells, two of which have the same Well ID Number, to supply water to the system. Como Wells #1 and #2 were constructed prior to 1983 when less stringent construction standards were required by the State of Wyoming. Como #4 was constructed between 1983 and 1993 when more stringent construction standards were required. Records indicate the Medicine Bow wells were properly sealed to protect against surface infiltration of potential contaminants, and are not subject to flooding. As shown on the Integrity Summary Table, Como Wells #1 and #2 and Como #4 received scores of 3 and 4 respectively due to their well completion characteristics and conveyance scores.

Water Source Sensitivity Summary

Medicine Bow obtains water from three wells, both completed in the Casper Formation. As shown on the Source Sensitivity Summary Table, these community wells received a source sensitivity score of 10. These scores reflect the fact that the wells all reside in a fractured karst substraight and the aquifer is vulnerable to contaminant intrusion. In addition, laboratory analysis of the Medicine Bow wells tested within the last five years detected contaminants that are listed on EPA's primary and secondary drinking water standards. These included nitrate, radium, fluoride, selenium, and sulfate among others. Radium was the only constituent with concentrations above the EPA's maximum contaminant levels.

Water System Susceptibility Rating

Susceptibility is defined as the potential for a public water supply to draw water contaminated at concentrations that would pose a threat or concern to human health. In general, the Town of Medicine Bow scores low for land use susceptibility. The wells were assigned a low susceptibility for the transportation corridor contaminant susceptibility. Susceptibility ratings for each type of potential contaminant source are summarized on the attached susceptibility tables.

A review of your PWS's routine water analysis results revealed that one or more chemicals that are considered contaminants in drinking water were detected at some time within the last five years. Chemical detections have a large impact on your PWS's sensitivity score because it may indicate that there is a pathway for contaminants to reach the water supply. However, it is likely that these chemicals are present only in small amounts and are not a danger to your health. Some of these chemicals may also occur naturally in water.

For more information about which chemicals were detected, please contact the PWS for a copy of the most recent Consumer Confidence Report or water analysis results. Chemical detections at levels that are a concern to human health are reported on the EPA's website: http://www.epa.gov/enviro/html/sdwis/sdwis_query.html. To see if your PWS has exceeded the federal primary or secondary drinking water standards, just click on the State of Wyoming

and then type in the name of your PWS. Consumer Confidence Reports are prepared by the PWS on a yearly basis. The reports should include information about any chemicals found in the water, even those found at very low levels. Please contact Kim Parker at DEQ, 307-777-7781, or WARWS for assistance. You may also contact EPA to find out what contaminants were detected. You may have to fill out a Freedom of Information Act request to obtain the water test results for your PWS. Please call EPA's Safe Drinking Water Hotline at 1-800-426-4791.

**POINT SUSCEPTIBILITY SUMMARY TABLE
FOR Medicine Bow
Point Source Susceptibility Summary**

It may appear from the results of this point source susceptibility summary table that your system has too many PSOCs influencing the final ratings. In some cases, a specific PSOC falls within a specific contaminant inventory zone shared by multiple wells or intakes. When this is the case, that PSOC will be scored for each intake. For example, an underground storage tank may appear within a contaminant inventory zone shared by four different wells. This would cause that single storage tank to be entered into the table four times, or once for each well or intake.

Point Source Type	Low	Medium	High
None Identified	N/A	N/A	N/A

- * Illustrates the number of PSOCs in a particular rating class for all water sources
- * N/A - Not Applicable