

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Afton BOPU**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

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PWS Source Water Assessment Summary

Delineation Methods

This water system is a community system that draws water from a porous sedimentary formation and a spring. Hydrogeologic mapping methods and groundwater modeling methods were implemented to estimate the 2-year and 5-year time of travel zones for the groundwater flow system.

U.S. EPA's Wellhead Analytic Element Model or WhAEM method was used for community water systems that derive their sources from alluvial or shallow bedrock aquifers. The WhAEM model uses well and limited hydrogeologic data to estimate time-of-travel capture zones in relatively simple hydrogeologic settings for either confined or unconfined aquifers. For the source water assessment, the WhAEM model was used to develop two year and five year groundwater capture zones. Due to this methodology, the delineated source water areas may be larger than the true capture zones for each well. However, use of this method typically results in source water protection areas that can be used to more reliably protect the water supply.

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. These techniques were used when a PWS's source was derived from a spring, fractured bedrock, or from a limestone or dolomite aquifer. Conduit flow aquifers have extremely variable flow patterns and rates, making the calculation of time of travel difficult. In some instances, 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. Because of this issue, aquifer vulnerability mapping techniques were also used as part of the hydrogeologic mapping effort to identify and delineate vulnerable areas. These areas (faults, fractures, exposed bedrock, etc.) are anticipated to be more susceptible to the rapid infiltration of contaminants released at the ground surface.

Groundwater Sources

The City of Afton uses two sources of water for their principal water supply; a periodic spring and three wells that draw water from the Salt Lake Formation. Based on data from Huntoon and Coogan, the periodic spring draws water from the Madison Limestone along an unnamed fault. Recharge for the spring originates from outcrops of the Madison Limestone east of the spring and along fracture systems associated with the Periodic Spring Anticline. Zone 2 of the spring encompasses the immediate unnamed drainage adjacent to the spring. Due the complex geologic structure of the area, Zone 3 includes the outcrop area of the Madison Limestone and the area along the fractured crest of the Periodic Spring Anticline. Afton's wells draw water from the Salt

Lake Formation. Flow to the wells is under artesian conditions generally from east to west. Hydrogeologic parameters used in the Model were similar to those reported by the Water Resources Research Institute Study of groundwater in the Green River Basin and Overthrust Belt. The delineated source areas are shown on the delineation map.

Integrity Summary

The City of Afton uses one spring and three wells to supply water to its municipal system. Afton Well #1 is approximately 317 feet deep, Junior High Well #1 is approximately 125 feet deep, both draw water from sandstone units within the Salt Lake Formation. Afton # 1 was constructed prior to 1983, when less stringent construction standards were required by the State of Wyoming. Junior High #1 was constructed between 1983 and 1993 and the new proposed well will be constructed with the newer more stringent completion standards. With the exception of Afton #1, available records indicated these wells were properly sealed to protect against surface infiltration of potential contaminants. For scoring purposes, the new well is assumed to have proper protection when it is actually installed. As shown on the Integrity Summary Table, integrity scores ranged from 1 to 11, which reflects the well completion date, the uncertain potential for the flooding of these wells and their unknown accessibility.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the city's spring source received a sensitivity score of 10 and each well received a sensitivity score of 6. The spring received its score for two reasons. The first reason is that springs are more vulnerable to contamination due to unpredictable flow pathways and their proximity to the ground surface. The second reason is that there are documented chemical detections in the groundwater. The City's three wells scored a 1 for aquifer sensitivity due to drawing water through porous media flow in an confined aquifer. The three wells scored a 5 for chemical sensitivity due to documented chemical detections in the groundwater.

Water System Susceptibility Rating

Susceptibility is defined as the potential for a public water supply to draw contaminated water at concentrations that would pose a threat or concern to human health. In general, the City of Afton scores high for land use susceptibility because much of the land surrounding the water sources is urban or forest. The presence of underground storage tanks within zones 2 and 3 resulted in a high point source contaminant susceptibility for the Afton #1 well and the new proposed well. The wells and intake were assigned a low susceptibility for all transportation corridor contaminants. 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 Afton BOPU**

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
Underground Tank	N/A	N/A	6

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