

WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)



SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Carpenter Water & Sewer District

Assessment Completed By:
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June 30, 2004

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Carpenter Water & Sewer District**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

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SOURCE WATER ASSESSMENT SUMMARY FOR Carpenter Water & Sewer District

PWS Source Water Assessment Summary

The Carpenter Water and Sewer District water facility is a community system located in southeastern Laramie County. The system provides water to about 90 people through 36 service connections on a year round basis. In addition, the system serves a rural elementary school in the community that has a staff of 12 and a student enrollment of about 75. Most of these people live outside of the community and are there only during the school day. Source water for the system is obtained from two wells that are completed in the Chadron Member of the White River Formation. Produced water is piped to a control building where it is disinfected using sodium hypochlorite injection. It is then piped to an elevated 50,000-gallon storage tank which provides pressure for the distribution system.

In general, The Carpenter Water and Sewer District scores high for land use susceptibility because much of the land surrounding the water sources is urban or dryland agriculture. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources being present within the delineated zones.

Delineation Methods

Because the Carpenter Water and Sewer District is classified as a community groundwater system and obtains water from a porous sandstone aquifer, Lidstone delineated the source water area for this system using calculated fixed radius (CFR) methods. This method was used to estimate the two and five year time of travel radii for the groundwater system based on data obtained from the Wyoming SEO, the PWS sanitary survey, and the SWAP guidance document.

Calculated fixed radius (CFR) is an appropriate method to use when groundwater flow to the well, spring or tunnel can be characterized as porous. This process was implemented for small communities that derive water from deeper, confined aquifers, or for non-community water systems. A factor of safety (FS) of 1.5 was applied to all systems where portions of the data were suspect. At the ground surface, the radius can be used to delineate an area around the well to be used for wellhead protection. The radius is the distance from the well to a point where groundwater (and contaminant) can reach the well over a specified time period. Input data requirements are limited, consisting of the pumping rate, open (screened interval) of the well, porosity of the aquifer, and the selected time of travel (2 years and 5 years).

Groundwater Sources

Carpenter obtains its source water from two wells that are completed in the Chadron member of the White River Formation to depths ranging from 480 to 500 feet. Recharge to the White River Formation occurs through the direct infiltration of precipitation. Groundwater reaches the wells through porous media flow. Additional information on these two wells is included on the attached Well Information Sheet.

As shown on the enclosed source water area maps, the contaminant inventory zones for these

wells are centered around the wellheads. Zone 2s for the wells extend between 449 and 819 feet radially from the wellheads, while Zone 3s range from 709 to 1,295 feet. Differences in the size of the contaminant inventory zones are primarily due to differences in the pumping rates of individual wells and local aquifer permeability.

Integrity Summary

The Carpenter Water and Sewer District uses two wells to supply water to the municipal system. The wells, Carpenter School #1 and Carpenter District #1, was constructed after 1993, when stringent construction standards were required by the State of Wyoming. Records show that the wells were properly sealed to protect against surface infiltration of potential contaminants and flooding around the wellheads. As shown on the Integrity Summary Table, Carpenter District #1 received a low score of 1 and Carpenter School #1 received a score of 2 which is a direct reflection of the well completion date and wellhead accessibility.

Water Source Sensitivity Summary

The Carpenter Water and Sewer District uses two wells that are completed in the confined Chadron Formation. As shown on the Source Sensitivity Summary Table, the wells both received sensitivity scores of 6.

These wells received a score of 6 for two reasons. First, the confined aquifer is known to be less vulnerable to contamination. The second reason is that laboratory analysis of water samples from the Town within the last five years detected a few contaminants that are listed on EPA's primary and secondary drinking water standards. These include total coliform, fluoride, sulfate, and nitrate. Despite detection, these contaminants were detected at concentrations below 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 Carpenter Water and Sewer District scores medium for land use susceptibility because much of the land surrounding the water sources is urban or dryland agriculture. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources present within the delineated zones. However, transportation corridor susceptibility was assigned a medium rating in Zone 2 because of a railroad that traverses this area. 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 Carpenter Water & Sewer District
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