WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)

SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Superior

Assessment Completed By:
Lidstone and Associates, Inc.
Engineering, Geology & Water Resource Consultants
4025 Automation Way, Building E
Fort Collins, CO 80525

June 30, 2004

PWS Source Water Assessment Summary

The Town of Superior maintains a community groundwater system, and is located about 16 miles east of Rock Springs and 7 miles north of I-80, at mile post 122. The treated water utility provides domestic water for a population of 250 through 120 service connections year round. Source water for the Town is obtained from three deep wells that are completed in the Ericson and Almond Formations, and are located about seven miles northeast of the treatment plant. Water from the wells is collected in two raw water storage tanks before transmission to the treatment plant. The treatment plant provides iron and manganese removal along with disinfection. Treated water is stored at the plant site and flows to the distribution system by gravity on demand.

In general, the Town of Superior water sources rated low for land use susceptibility. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources being present within the delineated zones.

Delineation Methods

The Town of Superior obtains its community drinking water from several wells that draw groundwater from a porous sandstone aquifer. Lidstone used the U.S. EPA's Wellhead Analytic Element Model (WhAEM) to delineate the source water areas for the Town's wells based on well and hydrogeologic data obtained from the sanitary survey, other consultant's reports, and Wyoming Water Research Institute reports. The source water area delineation maps for each of Superior's sources are attached to this report.

EPA’s Wellhead Analytic Element Model, or WhAEM, method was used for community water systems that derive their sources from porous media 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.

Groundwater Sources

Superior obtains its source water from three wells that are completed in the Ericson and Almond Formations to depths ranging from 968 to 1,720 feet. The area has a long history of coal mining, and over the years, 19 wells have been drilled in an attempt to find quality water for residents. The water quality in the Rock Springs Formation was found to be exceedingly hard and contained excessive amounts of sulfates and radionuclides. The water yield of the Ericson and Almond Formations in this vicinity was found to be poor and the water typically contained high to moderate levels of iron and manganese. The last three wells that the Town currently uses encountered fairly good water quality in the Ericson and Almond Formations. Recharge to these

formations occurs through the direct infiltration of precipitation on outcrops, and reaches the well through porous media flow. Additional information on these three wells is included on the attached Well Information Sheet.

As shown on the enclosed source water area map, contaminant inventory zones for the three wells are generally centered around the wellheads and overlap. Zones 2 and 3 include a relatively small portion of the Potash Wash.

Integrity Summary

The Town of Superior maintains a community groundwater system. Superior Well #18 and Well #17 were constructed between 1983 and 1993 when less stringent construction standards were required by the State of Wyoming. Superior Well # 19 was constructed after 1993 when stringent construction standards were required. As shown on the Integrity Summary Table, Superior Well #18 and Well #17 scored 3, primarily due to their well completion date and long conveyance lengths. Superior Well #19 scored a 2, primarily due to its completion date and a conveyance length of over a mile.

Water Source Sensitivity Summary

The Town of Superior obtains source water for the Town from three deep wells that are completed in the Ericson and Almond Formations. As shown on the Source Sensitivity Summary Table, the wells, Superior Well #18, Superior Well #19 and Well #17, each received a score of 6.

These wells received an intermediate sensitivity score for two reasons. The first reason is that source water is obtained from a confined aquifer which is known to be relatively insensitive to contamination. The second reason is that laboratory analysis of water from the wells within the last five years detected a few contaminants that are listed on EPA's primary and secondary drinking water standards. These included barium, sulfate, and fluoride. Despite detection, these contaminants were generally 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 Town of Superior scores low for land use susceptibility. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources being present within the delineated zones. 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 Superior

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