

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Bighorn NF Tie Hack CG**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

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SOURCE WATER ASSESSMENT SUMMARY FOR Bighorn NF Tie Hack CG

PWS Source Water Assessment Summary

The Bighorn National Forest Tie Hack Campground is a non-community water supply system and is located in Johnson County. The system is supplied by one well called the Tie Hack #1 well, which draws water from the Oldest Gneiss Complex. The system serves 35 people through five service connections. The water source scored medium with respect to the combined integrity and sensitivity ratings. The campground scored high for land use susceptibility, medium for point source susceptibility, and low for transportation corridor susceptibility.

Delineation Methods

This water system is a non-community supply that draws water from fractured igneous rocks. Hydrogeologic mapping methods were implemented to estimate the 2-year and 5-year time of travel zones for the groundwater flow system.

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 Bighorn National Forest Tie Hack Campground draws water from the Oldest Gneiss Complex. Recharge to the fractured aquifer originates as infiltrating precipitation and surface water from the South Clear Creek drainage basin, and reaches the well through conduit flow. Additional information on this well is included on the Well Information Sheet. As shown on the enclosed source water area delineation map, contaminant inventory zones 2 and 3 were delineated using hydrogeologic mapping methods and calculated fixed radius methods. Zone 2 was determined by using the five year CFR calculation of 3,547 feet. Zone 3 encompasses the South Clear Creek drainage basin terminating below the well at approximately the depth of the well.

Integrity Summary

Bighorn National Forest Tie Hack Campground uses one well, approximately 90 feet deep, to supply its water. The well was constructed after 1993 when more stringent construction standards were required by the State of Wyoming. Records indicate that the well was properly sealed to protect from surface infiltration of potential contaminants and flooding around the wellhead. However, the well lacks adequate protection of the vicinity immediately around the wellhead from contaminant sources. Records also indicate the potential lack of an annular seal. Therefore, as shown on the Integrity Summary Table; Tie Hack #1 well received a score of 3.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the well received a sensitivity score of 10. The well received the score for two reasons. First, the well is completed in an aquifer that is known to be vulnerable to contamination because of the high velocities associated with conduit flow. Second, because of the well's chemical sensitivity due to documented detections in 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 Bighorn National Forest Tie Hack Campground scored high for land use susceptibility because much of the land surrounding the water sources is forested. Forested areas were included to evaluate the potential risks of increased runoff and water quality problems following forest fires. The presence of 20 underground storage tanks within Zone 3 resulted in a medium point source contaminant susceptibility for the well. The well was assigned a low susceptibility for Zone 3 state highway types of 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 Bighorn NF Tie Hack CG
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	20	N/A

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