# SOURCE WATER ASSESSMENT
# EXECUTIVE SUMMARY
# FOR
# YNP Norris Junction

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**June 30, 2004**

**PROJECT: 424-001**

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**ASSESSMENT COMPLETED BY:** TRIHYDRO CORPORATION

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**SOURCE WATER ASSESSMENT SUMMARY**
**FOR YNP Norris Junction**

## PWS Source Water Assessment Summary

Yellowstone National Park Norris Junction is a transient, non-community public water system located in Yellowstone National Park. The system serves a campground with 1,000 people per day through 15 service connections from May 1st to September 30th. The system is supplied by three wells that draw water from undivided surficial deposits. Facilities include pump houses, a sodium hypochlorite injection unit for disinfection, treated water storage and the interconnecting transmission system. The water sources scored high with respect to the combined integrity and aquifer sensitivity ratings, except for Norris #2 which received a score of medium. The system scored high with respect to land use susceptibility, and point source susceptibility.

## Delineation Methods

This water system is a non-community system that draws water from porous alluvium. Calculated fixed radius (CFR) methods were implemented to estimate the 2-year and 5-year time of travel radii for the groundwater flow system. The CFR was calculated using well information in the sanitary survey and aquifer parameters used in the calculation were assumed for those of similar type deposits.

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

Norris Junction draws water from the alluvium along the Gibbon River valley. Recharge to the alluvial aquifer comes from the Gibbon River and tributaries, and reaches the wells through porous media flow. Groundwater within the alluvium is generally from north-northwest to south-southeast. Additional information on these wells is included on the attached Well Information Sheet. As shown on the enclosed source water area delineation map, contaminant inventory zones 2 and 3 were delineated using CFR methods for the three wells. All three wells had a Zone 2 calculated radius of 1,003 feet and a Zone 3 calculated radius of 1,586 feet.

**Integrity Summary**

Yellowstone National Park uses three shallow wells to supply water to its distribution system. Norris Wells #1 and #2 were constructed between 1983 and 1993 when moderately stringent construction standards were required, while Norris Well #3 was constructed prior to 1983 under less strict requirements. Records show that the Norris Wells #1 and #3 may not be properly sealed to protect from surface infiltration of potential contaminants. As shown on the Integrity Summary Table, the Norris wells #1 and #3 received scores of 8 and 10, respectively, primarily due to their lack of a surface seal. Norris Well #2 received a score of 2 due directly to its well construction date.

**Water Source Sensitivity Summary**

Yellowstone National Park Norris Junction uses three wells that draw water from undivided surficial deposits. As shown on the Source Sensitivity Summary Table, the wells received sensitivity scores of 10. The wells received scores of 5 for aquifer sensitivity due to being completed in shallow unconfined sedimentary deposits. The wells received a score of 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, Yellowstone National Park scores 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 one permitted underground injection facility within Zone 2 resulted in a high point source contaminant susceptibility for all three wells. 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 YNP Norris Junction**

## 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 Injection | N/A | N/A | 3 |

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