

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Powder River Coal-Caballo Mine**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

1252 Commerce Drive, Laramie, WY 82070



ENGINEERING SOLUTIONS. ADVANCING BUSINESS.

Home Office | 1252 Commerce Drive | Laramie, WY 82070 | phone 307/745.7474 | fax 307/745.7729 | www.trihydro.com

SOURCE WATER ASSESSMENT SUMMARY FOR Powder River Coal-Caballo Mine

PWS Source Water Assessment Summary

The Caballo Mine water system is a non-transient, non-community groundwater supply located south of Gillette, Wyoming. The system serves 239 people through eight service connections year-round. Facilities include a conventional treatment plant, one storage tank, and the distribution system. Fort Union Well #2 is the only water source that scored high with respect to the combined integrity and source sensitivity ratings. The coal mine generally scored low for land use susceptibility and high for point source and transportation corridor susceptibility.

Delineation Methods

This water system is a non-transient non-community system that draws water from a porous sedimentary formation. 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

The Powder River Caballo Mine draws water from sandstone units within the Fort Union Formation. Recharge to this well occurs in the outcrops of the Fort Union Formation south of the wells and generally flows to the well under artesian conditions from south to north. Additional information on this well 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. Zone 2 had a calculated radius of 2,590 feet. Zone 3 had a calculated radius of 4,096 feet.

Integrity Summary

Powder River Coal-Caballo Mine uses two wells that are approximately 1,400 feet and 1,605 feet deep to supply water. The Caballo #1 well was constructed prior to 1983 when less stringent construction standards were required by the State of Wyoming. The Fort Union Well #2 was constructed between 1983 and 1993 under moderately strict requirements. Records show that the Caballo #1 well was properly sealed to protect against surface infiltration of potential contaminants and flooding of the wellhead. However, records indicate that the Fort Union Well #2 was not properly sealed. The Fort Union #2 well also lacks surrounding flood protection and protection in the vicinity immediately around the wellhead from contaminant sources. Therefore, as shown on the Integrity Summary Table, the Caballo #1 well received a score of 4 and the Fort Union #2 well received a score of 10.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the wells received a sensitivity score of 6. The wells received a score of 1 for aquifer sensitivity because they draw water from a confined aquifer through porous media flow. 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, the Powder River Coal Company-Caballo Mine scores low for land use susceptibility. The overall point source contaminant susceptibility rating is high due to the presence of two wastewater discharge sites and one permitted underground injection facility within Zone 2 of the water sources. Both water sources were assigned a high transportation corridor susceptibility score because their source water zones are in proximity to a railroad. 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 Powder River Coal-Caballo Mine
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
Wastewater Discharge	N/A	2	6
Underground Injection	N/A	N/A	2
Oil & Gas Well	N/A	1	1

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