Cooney State Park – Marshall Cove Campground
Source Water Delineation and Assessment Report

Public Water Supply: **Cooney State Park – Marshall Cove Campground (PWSID #MT0042444)**
Report Date: **March 1, 2001**
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Introduction

This delineation and assessment report is intended to meet the technical requirements of the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). Jim Stimson, Hydrogeologist with the Montana Department of Environmental Quality (DEQ) prepared the final report with assistance from intern Briana Roach. Information on land use and potential contaminant sources comes from a variety of sources including a preliminary land cover data layer produced by the United States Geological Survey (USGS), DEQ Public Water Supply files (including sanitary surveys), and other public sources of information. A web-based GIS application is also used to query and generate maps to support writing this report. This application is called the Source Water Protection Program Query System and is available at the following web address or URL: http://nris.mt.gov/wis/swap/swapquery.asp. The application was developed by the DEQ Source Water Protection Program (SWPP) and provides access to data from the U.S. EPA, DEQ, Montana Bureau of Mines and Geology (MBMG) and other sources.

Purpose

The purpose of this delineation and assessment report is to assess threats to the Cooney State Park Marshall Cove Campground water supply using information obtained from Fish, Wildlife and Parks (FWP) personnel managing the site, the most recent sanitary survey, which was completed in August 1997 by McNenny Environmental Engineering and Consulting (available from DEQ upon request), and from published reports. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

Public Water Supply Information

Cooney State Park Marshall Cove Campground is located near the south end of the dam at Cooney Reservoir that is situated seven miles southwest of Boyd, Montana (Figure 1). The site consists of a campground, boat launch area and picnic area that has a comfort station with showers. The FWP Department operates this facility. The site is served by two wells. New Well #1 (PWS Source ID 005) is located approximately 50

feet southwest of the comfort station. This well is the primary source of water for the comfort station. Old Well #2 serves three hydrants in the campground and picnic area (PWS Source ID 004) and is located within ten feet of the normal summer reservoir pool level in a small well house at the north edge of the campground. This well is also used for the comfort station when use is too high to be supported by the newer well.

DEQ public water supply records indicate the water system serves 200 non-residents per day through one active service connection. Because the water supply does not regularly serve the same 25 persons for at least six months a year, it is classified as a transient, non-community public water supply. Water demand is approximately 4,000 gallons per day assuming 20 gallons per day per visitor (EPA, 1991). Sewage for the facility is collected in an on-site large capacity septic system located approximately 85 feet northwest of the new well (005) and approximately 110 feet southwest of the older well (004).

No well log is available for the older well (004), however, the most recent sanitary survey for Marshall Cove Campground indicates the well was drilled in the early 1960's and is approximately 125 feet deep. The well is constructed of 8-inch diameter well casing. Water is drawn from the well by a submersible pump and delivered to a small captive air pressure tank located in the well house. The well log for the newer well (005; attached) indicates the well was drilled to a depth of 325 feet below land surface in November 1991. The well is constructed of 4-inch diameter well casing that extends to a depth of 120 feet. The well has been backfilled with pea gravel to the bottom of the casing. The well has a static water level of 45 feet and well yields one and a half gallons per minute (gpm) at 75 feet of drawdown. Water is drawn from this well by a submersible pump and is then delivered to a 2,000 gallon partial bury precast concrete cistern and then to a distribution pump and pressure tank located in the comfort station utility room. The lithologic log for the newer well indicates that this well is completed in semi-consolidated sandstone beds interpreted to be within the Fort Union Formation. Wells throughout much of the surrounding area are completed in the Fort Union and this is probably true for the older public water supply well at Marshall Cove. Based on lithologic logs from four nearby wells, multiple shale beds are present above the water producing sandstone intervals, and the aquifer appears to be locally confined.

Because the older well is flooded by the reservoir each spring, the operator routinely uses chlorine tablets in the cistern as a means of disinfection. No other treatment is applied to this system. The sanitary survey indicates that the problem of insufficient water quantity could possibly be remedied by either drilling a new well near the south end of the campground property or by extending the well casing of the older well (004) above the high water level and utilizing appropriate disenfection methods. However, based on information available in the DEQ PWS files, it is not clear whether or not any action has yet been taken.

FWP is required to monitor for nitrate and coliform bacteria at Marshall Cove Campground. A health advisory was issued for the water supply in July 1997 due to a non acute Maximum Contaminant Level (MCL) violation for coliform bacteria. The

advisory was formally closed in February 1999. Although no nitrate levels have been below the maximum allowable concentrations throughout the past five years, the sanitary survey notes that the newer well (005) does have moderately high nitrate levels at around five milligrams per liter. Nitrate and microbiological monitoring results are kept on file at DEQ.

Delineation

A 100-foot radius control zone and 1,000-foot radius inventory region were delineated for Cooney State Park Marshall Cove Campground as is required for transient, non-community public water supplies under the Montana Source Water Protection Program (DEQ, 1999). The control zone is the most critical area from which direct introduction of contaminants into the well or immediate area can occur. The inventory region encompasses the area from which water or contaminants can flow into the Marshall Cove Campground wells over a period of months to years (Figure 1B). Because the older well is routinely flooded by the reservoir, surface water from the reservoir enters the aquifer via the well during these periods. Although the operator apparently takes steps to "flush" the well after the reservoir recedes, it is not known how much surface water enters the aquifer during the flood periods, and if the operator's actions are adequate. If potential contaminant sources exist around the reservoir or along contributing streams, dissolved contaminants, nitrate for example, and pathogens, like viruses and cryptosporidium, could enter the reservoir and be transported into the well. For this reason, a surface water buffer zone is also delineated for Marshall Cove Campground. The surface water buffer extends one half mile around the edge of the reservoir and one half mile from each bank of contributing streams for a distance of 10 miles upstream.

Inventory

The Montana Source Water Protection Program (Montana DEQ, 1999) requires that land uses and all potential sources of nitrate and microbial pathogens within the control zone and inventory region of transient, non-community public water supplies be identified.

Inventory of the area surrounding the Marshall Cove Campground wells reveals that the inventory and buffer regions are comprised of primarily grassland, forested land, and shrub land (Figure 1C). These types of land cover account for approximately 77% of the inventory region and are not considered to be potential sources of contamination. However, agricultural uses account for 18% of the land cover within the inventory region. Agricultural land is considered to be a significant potential contaminant source due to the likelihood that agri-chemicals are used on the land. These substances include fertilizers that can be sources of nitrate. The on-site septic system is also considered a significant potential contaminant source for the water supply.

Susceptibility Assessment

Susceptibility to potential contaminant sources is assessed both for the aquifer and the public water supply wells. According to the Montana Source Water Protection Program criteria, an aquifer consisting of semi-consolidated sediment that is semi-

confined is rated as moderately sensitive to potential sources of contamination. However, the seasonal flooding of the old well site is a very serious problem because surface water from Cooney Reservoir is allowed to enter the aquifer via the well. In effect, the confining beds within the aquifer are by-passed and eliminated as barriers. This negates any protection the multiple confining beds would normally provide. As a consequence, the aquifer in this area is considered highly sensitive to potential contaminant sources (Montana DEQ, 2000, Table 2).

The presence of agricultural landuse in a relatively small portion of the inventoried buffer region is considered a low hazard to the Marshall Cove water supply (Montana DEQ, 2000, Table 6). The Park's large capacity septic system represents a high hazard. With no other natural or engineered barriers identified, the overall susceptibility of the Marshall Cove Campground public water supply is very high for nitrate and pathogens (Montana DEQ, 2000, Table 7).

References:

Montana DEQ, 1999. Montana Source Water Protection Program, Approved by EPA in November 1999.

Montana DEQ, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies.

U.S. EPA, Office of Water, 1991. Manual of Small Public Water Supply Systems, EPA 570/9-91-003, 211 p.

U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.