

Wellhead Protection Area Delineation Fact Sheet

The fundamental goal of wellhead protection (WHP) is to prevent contaminants from entering public wells. To accomplish this goal, public well owners must first determine where the water supplying their well(s) is coming from – this area is called the WHPA area (WHPA). It can also be thought of as the recharge area to the public well and is ultimately the area to be managed by the public water supplier, as identified in the WHP plan. The process used to determine the WHPA boundaries is called *delineation*. An accurate WHPA delineation is critical to the overall success of the WHP plan.

The WHPA rule provides the framework and a minimum set of criteria to be considered for delineating WHPAs. These criteria are the technical factors which affect the size, shape, orientation, and location of the WHPA boundaries. There are five delineation criteria:

Delineation Criteria	WHP Rule Requirements
Time of Travel (TOT)	A minimum TOT of 10 years must be used.
Aquifer Transmissivity	Must be determined from a longer term (24- or 72 hour) pumping test, whenever possible.
Flow Boundaries	Includes hydraulic, geologic, and hydrologic boundary features; when identified, flow boundaries must be incorporated into the delineation approach.
Daily Volume of Water Pumped	Pumping estimate must be based on past use (last five years) and projected demand (next five years), whichever is greater.
Groundwater Flow Field	Also called the ambient flow field; the direction and magnitude of the local flow field can be estimated from existing regional and sub-regional maps.

A number of different approaches can be used to delineate the boundaries of a WHPA. Under the WHP rule, water suppliers must use an approach that is technically sound, incorporates the five criteria, and is suitable for the local hydrogeologic setting. Typically, delineation approaches involve a combination of computer modeling and hydrogeologic mapping techniques. A licensed geoscientist or engineer with experience in characterizing hydrogeologic flow systems and groundwater flow modeling must carry out the delineation.

After the WHPA boundaries are determined, the next step is to delineate the boundaries for the drinking water supply management area (DWSMA). The DWSMA is the geographic area, including the WHPA, which is to be protected and managed by the WHP plan. Water suppliers are required to use geographic landmarks, such as roads and property lines, to map the boundaries of the area so that it is identifiable to the general public.

Steps to Completing the WHPA Delineation

1. Plan the Delineation
 - a. Hold a scoping meeting with Minnesota Department of Health (MDH) staff.
 - b. Obtain technical assistance, when necessary.
2. Assess Data Elements
 - a. Compile and interpret existing hydrogeologic information important to the delineation of the WHPA.
 - b. Prepare and implement the Aquifer Test Plan.
3. Develop a Written Conceptual Model
 - a. Identify and document key assumptions regarding the groundwater flow system.
 - b. Characterize aquifer parameters.
 - c. Characterize the five delineation criteria.
4. Select the Delineation Method Best Suited to the Hydrogeologic Setting.
 - a. Meet with MDH technical staff.
5. Apply the Delineation Method.
 - a. Document steps and data used.
 - b. Demonstrate the calibration and sensitivity of computer models.
 - c. Determine the confidence in the accuracy of calculated WHPA boundaries.
6. Delineate the DWSMA Boundaries
 - a. Overlay calculated WHPA boundaries on a parcel and/or PLSS map.
 - b. Determine the location of DWSMA using geographic landmarks.
 - c. Use the result to complete Part 1 of the WHP plan. This includes recommendations for future data collection needed to support amendments.

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