

Using Source Water Assessment Results To Help Prioritize Ground Water Source Protection Efforts

**By
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Introduction

In 1996, Congress passed amendments to the Safe Drinking Water Act. One of these amendments required New York State to develop what is referred to as the Source Water Assessment Program (SWAP). The primary objectives of the Source Water Assessment Program were to evaluate potential contaminant threats to public drinking water sources and help assist subsequent local source water protection efforts.

In addition, as this article details, New York Rural Water Association (NYRWA) is now utilizing New York's SWAP results to help identify and prioritize those ground water systems most in need of source water protection efforts.

The evaluation of each source of public water takes the form of a source water assessment. Each source water assessment includes four major elements:

1. Delineating (or mapping) the source water assessment area;
2. Conducting an inventory of potential sources of contamination in the delineated area;
3. Determining the susceptibility of the water supply to those contamination sources; and
4. Releasing the results of the determinations to the public.

Upstate New York's Source Water Assessments

In 1997, the New York State Department of Health (NYSDOH) began working with a number of governmental and non-governmental entities (including NYRWA) to develop New York's Source Water Assessment Plan. The plan was completed and submitted to the United States Environmental Protection Agency (USEPA) in November 1999. After USEPA approval, implementation of source water assessments began in earnest in December 2001, when the NYSDOH awarded a contract to URS Corporation, a private firm, to complete source water assessments in upstate New York. The work covered under this contract included all public water systems using wells where there was no previously completed assessment. The NYSDOH had previously awarded some mini-grants for assessment work in Cortland, Herkimer, and Oneida Counties, as well as a few individual systems. However, the work completed by URS Corporation covered the vast majority of public water systems using ground water in upstate New York. All together, URS Corporation finished assessments for some 8,400 public water systems with 12,300 wells.

With such a large number wells to assess and relatively limited financial resources, the source water assessments were completed using reasonably available existing data and

the use of a Geographic Information System (GIS). Data utilized included Public Water System (PWS) data from the NYSDOH SDWIS database, published aquifer and geologic mapping, and contaminant inventory information compiled from existing statewide databases.

In May 2003, URS Corporation completed source water assessments for upstate New York ground water sources. Hopefully, by now, most public water systems utilizing ground water have received a copy of their source water assessment report (assessments for surface water sources are being completed by NYSDOH and are not all finished as of the time of writing of this article).

Understanding Susceptibility Ratings

A source water assessment estimates the potential for contamination of a system's raw water source(s) from various types of contaminants (ten different types for ground water). A relative measure of contamination potential for a particular contaminant category is referred to as a susceptibility rating. The source's susceptibility rating for each contaminant category is based upon two factors: the natural sensitivity of the water source, and the potential contaminant prevalence. In turn, the natural sensitivity of a ground water source is based upon whether existing contamination has been detected in the supply and/or what type of aquifer the well is completed in. Wells with significant detected levels of contamination or those completed in unconfined fractured bedrock or unconfined permeable sand and gravel would have high sensitivity. The potential contaminant prevalence is determined by the relative presence of potential land cover sources of contamination and/or potential discrete sources of contamination in the source water assessment area. For example, areas with a relatively high percentage of row crop land cover would likely have medium or high potential contaminant prevalence for nitrates.

Figure 1 below is a matrix that is used to determine the susceptibility for a source to a particular contaminant category. The highest possible susceptibility to a particular contaminant is a very high rating. As Figure 1 indicates, this would be true for a source with a high natural sensitivity and high potential contaminant prevalence within its source water assessment area.

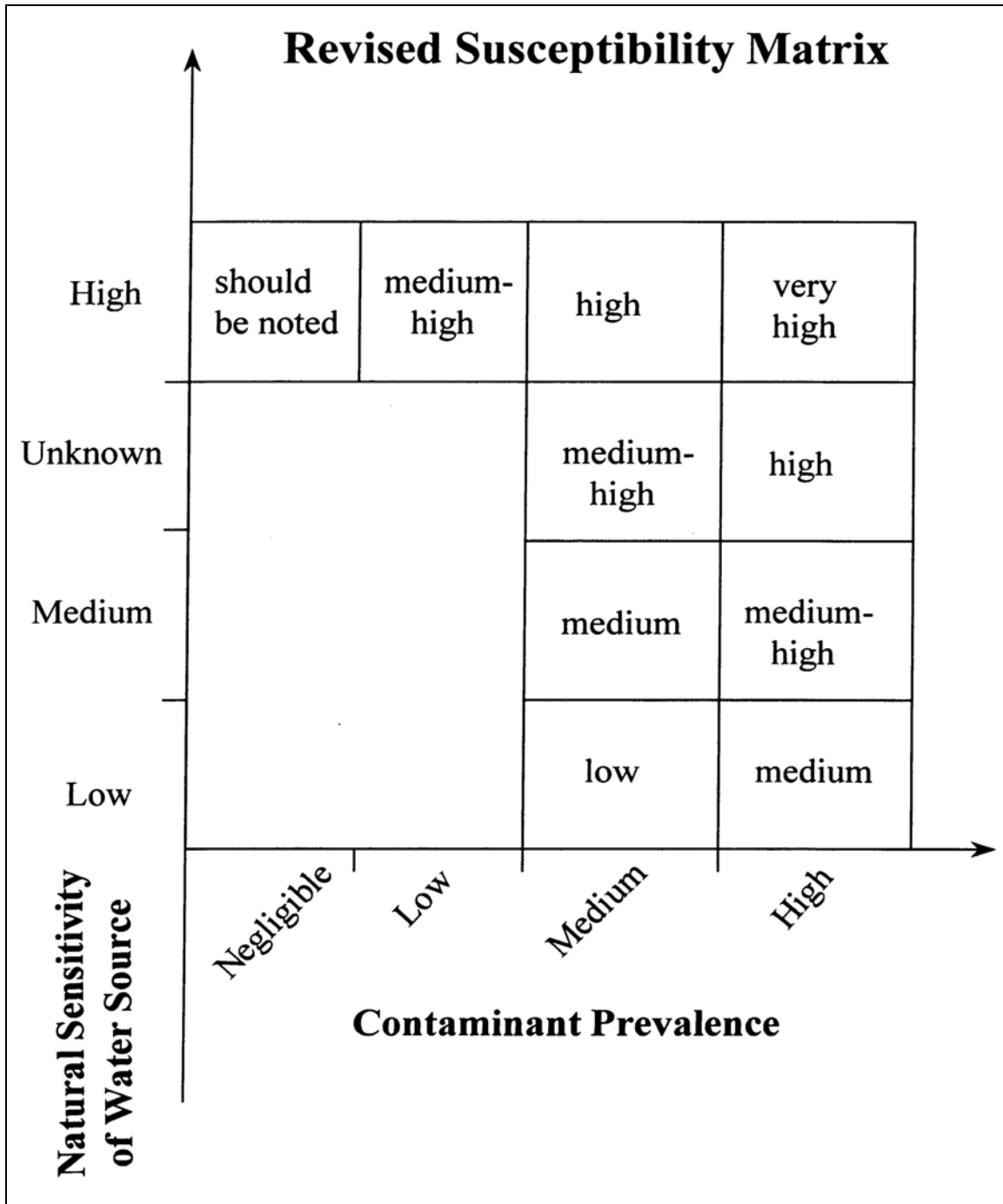


Figure 1 (from NYSDOH)

Identifying Systems With Highest Source Susceptibilities

New York Rural Water Association provides free source water protection planning assistance to rural water systems and small communities. Unfortunately, our technical assistance resources are sometimes stretched thin. In order to prioritize our protection efforts and ensure that the smaller and rural systems most in need are being serviced, NYRWA has begun to utilize the results of New York's SWAP.

After analyzing data obtained from NYSDOH regarding its upstate ground water SWAP contract, NYRWA has identified some 190 community water systems that have well(s) with **very high susceptibility** to one or more potential contaminant categories (approximately 12 percent of the community water systems studied in upstate New York). Of these systems, 177 systems serve less than 10,000 population and 158 serve less than 3,300 population. More than half are mobile home parks, apartments, or other private systems. Systems with wells that are very highly susceptible to one or more contaminant categories are clearly not evenly divided across the state. Southern tier counties from Cattaraugus County to Otsego County have larger numbers of very highly susceptible community supply wells. In addition, counties in the Hudson River Valley from Saratoga County to Orange County also generally have higher numbers of very highly susceptible community supply wells. However, areas with high surface water supply reliance (Finger Lakes, Lake Ontario, etc.) and/or low potential contaminant prevalence (i.e. the Adirondack Park) have considerably few community supply wells with very high susceptibility to one or more contaminant categories.

As indicated before, a well with a very high susceptibility to a particular contaminant category is the result of high source sensitivity and high potential contaminant prevalence. Of the 190 systems with very high susceptibility to one or more contaminant categories, the presence of residential land cover, septic systems, and SPDES/NPDES permitted facilities in the source water assessment area generally contributes to high potential contaminant prevalence. Not surprisingly, the most common contaminant categories that system sources are very highly susceptible to are enteric bacteria, enteric viruses, and nitrates.

Providing Technical Assistance to Susceptible Systems

After consulting with local health units, several water systems with very highly susceptible wells will be targeted by NYRWA for development of source water protection plans over the next several years. Twelve of the systems have already developed protection plans with NYRWA's assistance. Such plans will be revisited and revised if necessary to reflect SWAP findings. Many of the smaller, private water systems will be urged to participate in NYRWA source water protection planning using self-assessment educational materials. In this way, operators or owners of such systems can receive contact hours for license renewal and at the same time help protect their source water (see the Fall 2003 Aquafacts for details).

Closing Thoughts

Finally, if you would like help in interpreting your source water assessment or want to develop a source water protection plan for your ground water source, please let me know at 1-888-NYRURAL ext. 17 or Winkley@nyruralwater.org. Be assured that I will continue to support the protection efforts of all ground water systems in the state (not just those with very high susceptibility to contamination)!