

Groundwater Sources

Summary of Elements for Source Water Assessment Program

The Source Water Assessment Program for groundwater sources of drinking water includes three primary elements of the proposed California WellHead Protection Program: Delineation of Contribution Areas, Inventory of Potential Contaminant Sources, and Assessment of Vulnerability of the Water Supply to Contamination. The methods proposed to accomplish each of these elements are described below.

Delineation of Contribution Areas

Two primary zones are defined for protection areas for well sources. Various methods can be used to establish these zones, including analytical, numeric modeling, and mapping techniques. A brief description of methods to be used is attached. The criteria proposed for California would require the water supplier to define the zones using the most sophisticated method for which data and resources are available. A simple method is provided for suppliers that do not have the ability to perform more complex analyses.

Zone A is the protection area to prevent microbial and direct chemical contamination. This area is defined by the surface area overlying the portion of the aquifer that contributes water to the well within a **two year time of travel**. Within this zone, activities that could be potential sources of microbial or direct chemical spills should be strictly managed to eliminate or reduce the risk of contamination to the water supply. The two year time of travel is used because this is the current recommendation of the proposed Groundwater Disinfection Rule, and because it provides a limited time for responding to serious chemical spills.

Zone B is the protection area to prevent chemical contamination of the water supply for the long term. A **ten year time of travel** is used to represent the primary recharge area of the well. This zone is divided into two areas to reflect different methods of contamination prevention: response to spills and long term planning.

SubZone B5 encompasses the **five year time of travel**. This subzone provides more response time for chemical spills than Zone A. This area should be actively managed for control of potential chemical contaminants and spill response procedures should be planned.

SubZone B10 encompasses the area between the five and **ten year travel time** boundaries. The primary purpose of this area is to encourage decision makers and planners to recognize the long term source of the drinking water supply. Activities with a high or medium risk of contamination to the water supply should be located outside the protection area.

Inventory of Potential Contaminant Sources

The purpose of the inventory is to identify past, present and proposed activities that may pose a threat to the aquifer. A contaminant source inventory form has been developed. This form is appropriate for an initial contaminant assessment within the protection zones defined above.

In order to complete the form a combination of methods should be used. Review of written documents, land use data, and mapping should be done initially. This can then be supplemented with surveys and field reconnaissance. This inventory should be coordinated with the work that various state, local and federal agencies are or will be performing.

Assessment of Vulnerability of the Water Supply to Contamination

After completion of the delineation and contaminant inventory steps, a determination should be made of the vulnerability of the water supply to actual contamination. This assessment should consider such site specific information such as depth of the well, construction, geology of the area, and aquifer characteristics.

Existing regulations detail the vulnerability assessment procedures required to obtain a waiver for monitoring certain organic and inorganic chemicals in drinking water supplies.

California Code of Regulations (CCR), Title 22, Chapter 15, Section 64432(1) addresses vulnerability waivers for cyanide:

“(1) A water system may be eligible for a waiver from the monitoring frequencies for cyanide specified in paragraph (b)(1) of this section without any prior monitoring if it is able to document that it is not vulnerable to cyanide contamination pursuant to the requirements in section 64445(d)(1) or (d)(2).” (See below).

CCR, Title 22, Chapter 15, Section 64432.2 addresses vulnerability waivers for asbestos for groundwater systems:

“The Department will determine the vulnerability of groundwater sources on the basis of historical monitoring data and possible influence of serpentine formations.”

CCR, Title 22, Chapter 15, Section 64445(d)(1) and (2) addresses waivers for organic chemicals based on use and susceptibility:

“(d) A water system may apply to the Department for a monitoring waiver for one or more of the organic chemicals on Table 64444-A in accordance with the following:

(1) A source may be eligible for a waiver if it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and therefore, that the source can be designated non-vulnerable.

(2) If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated non-vulnerable pursuant to Paragraph (d)(1), it may still be eligible for a waiver based on a review related to susceptibility to contamination. The application to the Department for a waiver based on susceptibility shall include the following:

- (A) Previous monitoring results;
- (B) user population characteristics;
- (C) proximity to sources of contamination;
- (D) surrounding land uses;
- (E) degree of protection of the water source;
- (F) environmental persistence and transport of the chemical in water, soil and air;
- (G) elevated nitrate levels at the water supply source; and
- (H) historical system operation and maintenance data including previous Departmental inspection results.”