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TITLE: Capture Zone of a Well

DATE EFFECTIVE: January 2004

HISTORY: New addition to the Technical Guidance Compendium

KEYWORDS: Pumping wells, capture zone, urban setting designation, USD, ground water contamination

RULE/AUTHORITY: OAC 3745-300-10(A)(1); OAC 3745-300-10(D)(1)(f)(ii); OAC 3745-300-10(D)(1)(g)(iv); OAC 3745-300-10(D)(3)(b)(ii)(b)

QUESTION: For the purpose of obtaining an Urban Setting Designation (USD), how can one determine whether the capture zone of wells within ½-mile of the USD boundary do not extend under the (proposed) USD?

BACKGROUND: One of the threshold criteria to obtain a USD is to demonstrate that know wells used for potable purposes exist within ½-mile of the property boundary. However, if potable wells are within ½-mile, the USD can still be obtained if the certified professional can demonstrate that the capture zone does not extend under the property or properties for which the designation is requested [OAC 3745-300-10(D)(1)(f)(ii)].

ANSWER: OAC 3745-300-10(A)(1) defines a capture zone to mean “all unsaturated and saturated subsurface areas that presently contribute or will contribute ground water to a well.” Therefore, all wells directly hydraulically down gradient of a USD boundary would have capture zones the extend under the USD.

Wells hydraulically side gradient or up gradient may be evaluated to determine whether pumping of these wells will cause water flowing beneath the USD to be diverted to the well. Property-specific and regional information (e.g., ground water flow direction) is needed to make this determination. Ground water flow models may be useful for this determination (See International Ground Water Modeling Center, <http://typhoon.mines.edu/>.) However, it should be noted that a specific “time of travel” cannot be assumed. The model should be run at various times of travel and reasonably anticipated pumping rates to

demonstrate that the capture zones down gradient and side gradient of the well have stabilized.

In some cases, the Volunteer may also be able to demonstrate that a ground water divide is present and the wells are within a different flow regime that is not interconnected with the water flowing beneath the USD.

The effects of pumping of non-potable wells should also be evaluated to determine whether they could potentially divert water to potable wells within ½-mile of the USD boundary.

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