

**ARCHIVE:** Archived because revisions made to VAP rules in 2002 in OAC Chapter 3745-300 necessitate revisions to this guidance. However, this document is accurate under the 1996 VAP rules. Refer to VA30007.03.012 for the updated document.

## OHIO EPA

### DIVISION OF EMERGENCY AND REMEDIAL RESPONSE VOLUNTARY ACTION PROGRAM

## FREQUENTLY ASKED QUESTION #6

# Assuming Ground Water Meets Unrestricted Potable Use Standards

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#### PURPOSE

This series of fact sheets is intended to provide guidance regarding the Agency's position concerning the interpretation of certain Voluntary Action Program (VAP) rule requirements. The information provided within these documents is based upon Agency evaluation of several VAP no further action letters submitted with the intent of obtaining a covenant not to sue as well as assistance provided for several VAP technical assistance projects.

#### QUESTION

When is it acceptable to make an assumption that on-property sources of contamination have not caused a ground water zone underlying the property to exceed an unrestricted potable use standards (UPUS) and what is the effect of making this assumption on Phase II property assessment requirements and the determination of applicable ground water response requirements?

#### BACKGROUND

The VAP Phase II Property Assessment rule requires a volunteer to determine whether or not specific provisions for protecting ground water that meets unrestricted potable use standards apply at a property where a voluntary action is

being conducted. The key to this determination is knowing whether or not the ground water already has any concentrations of hazardous substances or petroleum above an unrestricted potable use standard. If ground water does not already exceed any unrestricted potable use standards, the VAP statute and rules require that remedial actions for the property include measures to prevent an exceedance of an unrestricted potable use standard in ground water anytime in the future as a result of migration of hazardous substances or petroleum from source areas on the property. This determination is, therefore, an essential factor in determining applicable standards for the property.

The Phase II Property Assessment rule (paragraph (D)(3)(a) of Ohio Administrative Code 3745-300-07) provides three alternative approaches for determining whether or not the ground water already has any concentrations of chemicals of concern above an UPUS. The first of these approaches is to (contained in OAC 3745-300-07 (D)(3)(a)(i)) simply assume that the ground water underlying the property meets UPUS. Two other approaches for demonstrating whether or not ground water meets UPUS are provided in paragraphs (D)(3)(a)(ii) and (iii) of OAC 3745-300-07. These latter two approaches involve the collection of ground water samples below the source areas or, if possible, a determination of the ninety-five per cent upper confidence limit of the arithmetic mean of concentrations of chemicals of concern through modeling. In either case, collection of site data from within or below the source areas would be needed.

The determination of whether the ground water under the property does or doesn't meet UPUS is also referenced in OAC 3745-300-10, the Ground Water Classification and Response Requirements Rule, as a trigger for the certain requirements other than developing soil clean-up standards. The occurrence of concentrations of chemicals of concern in ground water above an UPUS obliges a volunteer to either: (1) classify the ground water and comply with response requirements under OAC 3745-300-10(F) for the relevant ground water classification; or (2) comply with response requirements for Critical Resource Ground Water.

In addition to the above requirements relative to determining that ground water does or doesn't exceed UPUS, the Phase II rule contains other requirements pertinent to determining the concentrations of chemicals of concern in ground water and performing exposure pathway evaluations. **The question arises as to whether making the assumption that ground water currently meets UPUS is an approach that is always available to the volunteer for making the determination that ground water does or does not exceed UPUS. Specifically, is it available even when other available information indicates that an**

**exceedance of an UPUS has occurred or may have occurred?**

The following related questions also arise:

- ◆ What effect, if any, does the determination of whether or not ground water meets UPUS have on the other Phase II requirements for ground water evaluation?
- ◆ What effect, if any, does making the assumption that ground water currently meets UPUS have on the determination of applicable ground water response requirements as required by OAC 3745-300-10?

**ANSWER**

For the restricted purpose of determining whether provisions for protection of ground water meeting unrestricted potable use standards are an applicable standard, the determination under Paragraphs (D)(3)(a)(i) of OAC 3745-300-07 that ground water underlying a property does not contain concentrations of chemicals of concern above unrestricted potable use standards *by assuming it meets those standards* is always an acceptable option.

However, for other purposes, i.e. determining the need to classify ground water and implement ground water response requirements, making an assumption that ground water meets UPUS would sometimes result in an inappropriate conclusion that ground water classification and ground water response requirements do not apply. Therefore, for these other purposes, the option to assume that ground water meets UPUS is not always reasonably available and methods described in (D)(3)(a)(ii) or (iii) of OAC 3745-300-07 must be used to determine if ground water meets UPUS. For these purposes, making an assumption that ground water meets UPUS should only be made when other available information indicates that ground water below sources or source areas on the property has not been impacted by a release of chemicals of concern.

**DISCUSSION**

The language in OAC 3745-300-07(D)(3) makes it clear that the determination of whether the ground water under the property does or doesn't meet UPUS is the key factor in determining whether the provisions for protecting ground water that meets UPUS apply. The ground water protection provision is contained in OAC 3745-300-10(E) and 3745-300-07 (D)(3)(b) and is generally implemented at properties by developing soil clean-up standards that will be protective of ground water. However, the determination of whether the ground water under the property does or doesn't meet UPUS is also a trigger for the application of requirements contained in Paragraphs (B) and (F) of OAC 3745-300-10, the Ground Water Classification and Response Requirements Rule. The occurrence of

concentrations of chemicals of concern in ground water above an UPUS obliges a volunteer either: (1) classify the ground water and comply with response requirements under OAC 3745-300-10(F) for the relevant ground water classification; or (2) comply with the most stringent response requirements, i.e. those for Critical Resource ground water.

Portions of the Phase II rule, *other than Paragraph (D)(3)*, require the volunteer to perform a comprehensive evaluation of ground water conditions, as necessary, to evaluate the risk associated with chemicals of concern in ground water, classify the affected ground water, and discern contribution of chemicals of concern from off-property sources. Other portions of the Phase II rule that are pertinent include, but are not be limited to, the following:

- Paragraph (D)(1) requires sufficient data collection to make the determinations required under Paragraphs (D)(2) to (D)(9) of OAC 3745-300-07, which encompasses identification of chemicals of concern, evaluation of identified areas, identification of receptor populations, determination of complete exposure pathways, determination of whether provisions for protection of ground water meeting UPUS apply, determination of concentrations of chemicals of concern in all affected media, determinations of yield and classification of ground water.
- Paragraph (D)(1)(d) requires the volunteer to identify all **affected media within each identified area**.
- Paragraph (D)(1)(e) requires **samples to be collected** from environmental media, as necessary, to make determinations noted above under (D)(2) to (D)(9).
- Paragraph (D)(1)(g) requires the volunteer to identify all receptor populations that may be exposed to chemicals of concern on or emanating from the property.
- Paragraph (D)(2) requires the volunteer to determine any sources and affected media contributing to existing and potential exposure pathways.
- Paragraph (D)(5)(d) requires the volunteer to determine concentrations of COCs in ground water.
- Paragraph (D)(8) requires sampling activities to determine whether and to what extent off-property sources are contributing to ground water contamination, if the volunteer wishes to use certain provisions of OAC 3745-300-10 modifying some of the standard response requirements for ground water.

When one reads the above requirements, it becomes apparent that Phase II provisions, **other than Paragraph (D)(3)**, to conduct sampling to determine concentrations of

chemicals of concern are focused on the concentrations and associated risk at the point of exposure to a receptor. While Paragraph (D)(1)(e) requires samples to be collected, as necessary, to make determinations under (D)(2) to (D)(9), which would include the determination of whether ground water meets UPUS, it gives no direction on where to take such samples. Paragraph (D)(5)(d) contains the only other specific requirement to determine concentrations of chemicals of concern. It reads, in part: *To represent the concentrations of chemical(s) of concern **at the point of compliance or receptor**, or up-gradient of the point of compliance or receptor, the volunteer must perform sampling activities in compliance with the following criteria:...*. Paragraph (D)(3), on the other hand, provides specific direction for collecting data to determine if UPUS have been exceeded in ground water below sources or source areas.

The language in OAC 3745-300-10(B) requires a volunteer to classify ground water except when the concentrations are below UPUS, as determined “*...in accordance with rule 3745-30-07 of the Administrative Code.*” or the most stringent response requirements are applied. In addition, as stated in Paragraph OAC 3745-300-10(F)(1)(a), the response requirements for ground water under Paragraph (F), are applicable when ground water underlying or emanating from the property exceeds one or more UPUS, as determined “*...in accordance with rule 3745-30-07 of the Administrative Code.*” **Because the only specific requirements in OAC 3745-30-07 to determine whether or not UPUS have been exceeded are located Paragraph (D)(3), it is reasonable to conclude that the references in OAC 3745-300-10(B) and (F)(1)(a) for making that determination are to Paragraph (D)(3) of OAC 3745-300-07.**

Given that conclusion, the potential effect of assuming that ground water below the property meets UPUS as provided under OAC 3745-300-07(D)(3)(a)(i) on the application of requirements in OAC 3745-300-10(B) and (F)(1)(a) must be considered to determine the reasonableness of making that assumption for those purposes. If one were to always rely on OAC 3745-300-07(D)(3)(a)(i), i.e. assume that UPUS are not exceeded, to determine whether or not ground water must be classified and which, if any, response requirements apply, the obvious potential effect is that in a case where UPUS are, in fact, exceeded one would conclude that ground water classification does not need to be performed and that response requirements are not applicable. That outcome would not ensure protectiveness and is clearly not intended. Therefore, *for these purposes*, making an assumption that ground water meets UPUS should only be made when other available information indicates that ground water below sources or source areas on the property is not likely to have been impacted by a release of chemicals of concern. In circumstances where there is reason to believe that ground water below the source(s) or source area(s) has been impacted by chemicals of concern an appropriate method described in OAC 3745-300-07(D)(3)(a)(ii) or (iii) should be used to determine whether UPUS have been exceeded.

As to the effect of the determination made under OAC 3745-300-07 (D)(3)(a) on other requirements of the Phase II rule, it doesn't mitigate the need to comply with other requirements to evaluate affected media, completeness of exposure pathways or risk to receptors. Data collected under Paragraphs OAC 3745-300-07(D)(3)(a)(ii) or (iii) should be useful in arriving at representative concentration of chemicals of concern in affected media of the identified area. However, it may not be sufficient to evaluate the potential for migration or whether or not compliance with applicable standards have been or will be met. It is recommended that the purposes of sampling for OAC 3745-300-07(D)(3)(a) and other portions of the Phase II rule be carefully considered prior to sampling to maximize the usefulness of data collected.

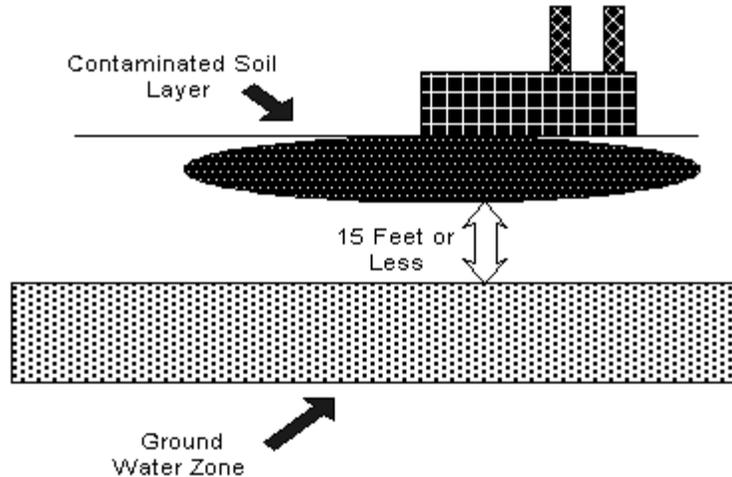
The following is guidance as to when assuming the ground water meets UPUS per OAC 3745-300-07 (D)(3)(a)(i) will comport the requirement to determine the application of provisions to protect ground water that meets UPUS as well as other parts of the rules that require determinations of the ground water classification and application of ground water response requirements. Please note that some of the factors noted below are pertinent to evaluating whether a contaminated shallow ground water zone will cause an UPUS to be exceeded in a deeper ground water zone as well as the potential for impact to a shallow ground water zone via a release to soils.

**Assuming that the ground water meets UPUS is considered to be appropriate under each of the following circumstances *for all purposes of the VAP rules*:**

- When no sources or source areas of contamination have been identified **and** the historical practices at the property, and the area within ½ mile of the property, do not indicate that releases to ground water would be expected.
- When at least 30 feet of silty clay material, which has a vertical hydraulic conductivity on the order of  $10^{-7}$  cm/sec, exists between the deepest known soil contaminant and the top of the uppermost ground water zone.
- When the chemicals of concern in the soils are not mobile in the unsaturated zone.

**Assuming that the ground water meets UPUS is inappropriate (and, therefore, sampling of the ground water underlying the property should be conducted) *for the purposes of determining the need to classify the ground water and implement ground water response requirements* under any of the following circumstances:**

- The separation between the bottom of a contaminated soil layer and the top of the uppermost ground water zone is less than 15 feet (see diagram below).



- The presence of secondary migration pathways, such as fractures, in the subsurface materials where a release has or is believed to have occurred.

**Under circumstances which differ from those mentioned above, the following factors should always be considered when determining whether or not it is appropriate to assume that the ground water underlying the property meets UPUS :**

- The vertical saturated hydraulic conductivity of the materials below the contaminated soil (and /or the upper ground water zone exceeding the UPUS).
- The concentration of the COCs in the contaminated soil and/or the upper ground water zone exceeding the UPUS.
- The persistence and mobility of the COCs in the contaminated soil and/or the upper ground water zone exceeding the UPUS.
- Secondary pathways (e.g. fractures) which exist between the COCs in the contaminated soil (and/or contaminated upper ground water zone) and the “potentially” clean ground water zone.

Because it may not always be evident, even after considering the above factors, whether a ground water zone can be **assumed** to be clean for all purposes, volunteers and certified professionals are strongly encouraged to seek VAP technical assistance for clarification when questions arise.