

**ARCHIVE:** Archived to revise and clarify the guidance within the document (technical content remains accurate). Refer to VA30007.03.005 for the updated document.

**TITLE:** Field Filtering of Ground Water Samples

**DATE**

**EFFECTIVE:** April, 1996

**KEYWORDS:** Field Filtering; ground water; metals; nonfiltered; unfiltered; filtered samples

**RULES:** Ground water sampling within the VAP rules: OAC 3745-300-07 (D)(3)(c)(ii) and OAC 3745-300-10

**QUESTION:** Can field filtered ground water samples be used to determine whether ground water meets applicable standards for metals under the VAP?

**ANSWER:** Under most circumstances, field filtered samples should **not** be used to analyze for metal compounds under the VAP.

When determining whether or not field filtering of ground water samples is necessary, the certified professional and volunteer must consider the nature of the geologic materials. Metals compounds in the ground water may either be dissolved or bound to the surface of colloidal particles. (Colloids are particles with diameters less than 10 microns that are suspended in the ground water.) The mobility of suspended solids in the ground water depends on a number of site-specific physical and chemical variables. When sampling ground water to determine the concentration of metals, a number of problems have been encountered when filtering, including both false positive and false negative readings. When field filtering is performed, contaminants can often be removed from the sample either by adsorption to the filter material or by mechanical separation caused by the filter leading to a false negative reading. In addition, metals that are bound to mobile colloids can be removed by the filter pores. Clogging of filter pores may remove even more particles from the sample. In some instances, contaminants can leach off the filtration apparatus into the samples, causing a false positive reading.

Problems associated with unfiltered samples can also occur. A false positive can result due to increased turbidity in the water column. Since agitation of the water column can raise turbidity, leading to the

inclusion of immobile soil particles in the sample, unfiltered samples can mimic the composition of the soil medium rather than the actual ground water. In addition, sampling results can indicate spatial and temporal variations that do not correspond with the ground water quality. Poor well construction or development can result in turbidity changes between wells or within one well over time.

Based upon the site-specific problems associated with both filtered and non-filtered ground water samples, the Division of Drinking and Ground Waters currently recommends the use of low flow pumping (micro purging) in order to reduce the problems which arise from sample turbidity. Information that has been provided to the VAP and other Agency cleanup programs demonstrates that sampling by the micro purging technique significantly reduced the turbidity of the ground water at many properties. This appears to be especially true in areas where the shallow saturated zone consists of 15 to 35 feet of sand and gravel with some silt and is underlain by 0 to 20 feet of clay. Therefore, at this time, the VAP will not accept analyses of field filtered samples unless micro purging has not yielded satisfactory results and the certified professional or volunteer has consulted with the VAP and DDAGW concerning those results.

**SUMMARY:**

Under most circumstances, **unfiltered** ground water metals samples are required to demonstrate compliance with VAP applicable standards. The recommended method for sampling properties with turbid ground water is use of the low flow pump/ micro purging technique. This method has been found to be useful in reducing turbidity of ground water samples at several properties.

**OHIO EPA**  
**CONTACT:**

For any questions concerning this issue, please contact the VAP central office at (614) 644-2924.