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**TITLE:** Use of Literature Biodegradation Rates in Property Specific Fate and Transport Modeling

**DATE**

**EFFECTIVE:** September 29, 1997

**KEYWORDS:** biodegradation, fate and transport modeling, modeling

**RULES:** Rule citation relating to this issue: Ohio Administrative Code (OAC) 3745-300-09(D)(3)(b)(iii)(B)(2)

**QUESTION:** Can biodegradation rate(s) based on values from literature (i.e. published studies from scientific or engineering journals) be used as an input value(s) for property specific modeling conducted under the Voluntary Action Program (VAP)?

**ANSWER:** Use of literature biodegradation rates is **not** allowed for property specific modeling conducted under the VAP. The volunteer or Certified Professional (CP) should use a property specific biodegradation rate or use a value of zero.

**BACKGROUND:** Biodegradation is the process by which microorganisms breakdown pollutants. Many indigenous (native) microbes in the soil and ground water are capable of transforming both naturally occurring and man-made organic compounds through direct metabolism into non hazardous substances. The potential for natural biodegradation to occur as well as the rate natural biodegradation occurs is affected by several factors including the following: the presence of microorganisms, soil moisture content, soil temperature, soil pH, oxygen availability, presence of nutrients, redox potential and the presence of other electron acceptors.

Literature values for biodegradation rates are highly variable and are often based on laboratory testing or field conditions where the factors affecting biodegradation can be controlled. Because of these controlled factors it is difficult, if not impossible to determine whether literature values represent the conditions at a VAP property without monitoring the degradation rates, or fate, of the contaminants on the property along with the other reactants and products indicative of bioremediation.

Consequently, if a property specific biodegradation rate is not available or cannot be obtained for the VAP property, a biodegradation rate of zero should be used.

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

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