

**Treatability Studies: An Essential Component in the Successful Design of
In Situ Permanganate Systems**

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The fundamental information that a well-designed treatability study can provide is essential to the success of *in situ* permanganate (MnO_4^-) systems. Components of natural organic matter (NOM) can exert a significant demand during *in situ* chemical oxidation, reducing the mass of oxidant available for the destruction of contaminants of concern (e.g. tetrachloroethene, trichloroethene, cis- and trans-dichloroethene, and vinyl chloride). In fact, the natural oxidant demand (NOD) can be several times greater than the demand exerted by the contaminant(s) of concern. Competition for available oxidant can also lead to a reduced rate of chemical oxidation of the target compound(s). Since site characteristics vary considerably, a made-to-order treatability study approach is required. Depending on the site conditions and remedial objectives, components of the treatability study may include natural oxidant demand batch or column experiments with groundwater, soil and/or intact cores collected from the site. If sufficient information is not available in the literature regarding the rate and extent of chemical oxidation, a kinetic study may also be required.