



## **EHC-O™ and O-Sox™ for VOCs RECOMMENDED BASELINE SAMPLING**

### **Summary**

This document provides guidelines for baseline sampling prior to injection of EHC-O™ or application of O-Sox™ for accelerated aerobic bioremediation. The baseline would ideally consist of the following analyses in the treatment zone monitoring locations installed prior to injection:

#### **Critical Parameters:**

- Volatile Organic Carbons (VOCs), semi-volatile organic carbons (sVOCs)
- Total Petroleum Hydrocarbons (TPH)
- pH
- Dissolved Oxygen, Redox Potential (Eh)
- Reduced Metals such as dissolved iron
- Reduced inorganics such as sulfide
- Total Organic Carbon in soil (TOC) or fraction organic carbon,  $f_{OC}$

#### **Non-Critical Parameters:**

- Biological Oxygen Demand, BOD, in soil and groundwater
- Chemical Oxygen Demand, COD, in soil and groundwater
- Alkalinity
- Hardness

Critical parameters are used to assess the applicability of an aerobic treatment approach, and they can establish a baseline for potential secondary plume constituents (e.g. heavy metals). The non-critical parameters are optional, but they can provide general information about the soil and water chemistry which may be useful when analyzing performance monitoring data.

### **General Soil and Groundwater Chemistry**

At a minimum, we recommend measuring pH, Eh, DO and TPH to evaluate the conditions within the impacted area. These will help us to establish the loading requirements and to select the appropriate EHC-O regime. In addition, BOD, COD, alkalinity and hardness would be recommended to provide general information about the soil and groundwater chemistry and to get a more refined estimation of the EHC-O demand.

### **Estimation of Oxygen Demand**

The most comprehensive way to estimate the oxygen demand for a site is by directly measuring either the COD or BOD in soil and groundwater. The COD and BOD include the oxygen demand for everything in the sample that could be either biologically or chemically oxidized respectively.

Alternatively, if these parameters are not available, the oxygen demand could be estimated from the TPH or individual VOCs in the soil and groundwater via Stoichiometric calculations. If only groundwater data is available, the sorbed concentrations could be estimated using soil organic carbon partition coefficients ( $K_{oc}$ ) and  $f_{oc}$  values.

In addition, the natural oxygen demand in the soil and groundwater has to be considered, including naturally occurring degradable organic carbon, reduced metals (e.g. ferrous iron) and inorganics (e.g. nitrite and sulfide). DO levels and ORP will also indicate whether naturally occurring metals and inorganics could be expected to primarily exist in a reduced or oxidized state.

**For more information, contact us at:**

Adventus - Canada  
1345 Fewster Drive  
Mississauga, ON  
Canada L4W 2A5  
Ph: 905.273.5374  
Fx: 905.273.4367

Adventus Americas Inc.  
2871 W. Forest Rd, Ste 2  
Freeport, IL 61032  
USA  
Ph. 815.235.3503  
Fx: 815.235.3506

EnviroMetal Technologies  
745 Bridge Street W. Ste 7  
Waterloo, ON  
Canada N2V 2G6  
Ph. 519.746.2204  
Fx. 519.746.2209