



EHC-M™ FOR INORGANICS - RECOMMENDED BASELINE SAMPLING

Summary

This document provides guidelines for baseline sampling prior to injection of EHC-M™ for immobilization of metals. The baseline would ideally consist of the following analyses in the treatment zone monitoring locations installed prior to injection:

Critical Parameters:

- Metals Scan – Total concentration in soil and groundwater of target metals such as arsenic, lead, chromium etc. (including iron, calcium, magnesium and manganese)
- Metal Scan – Dissolved (field filtered) concentration of target metals such as arsenic, chromium, lead etc. in groundwater (including iron, calcium, magnesium, and manganese)
- pH
- Dissolved Oxygen, Redox Potential (Eh)
- Anion Scan (chloride, sulfate, nitrate included)
- Total Organic Carbon, TOC
- Dissolved Organic Carbon, DOC
- Alkalinity
- Hardness

These parameters are used to assess the applicability of an ISCR approach and for optimizing the application rate. These parameters also provide general information about the soil and water chemistry which may be useful when analyzing the results.

General Soil and Groundwater Chemistry

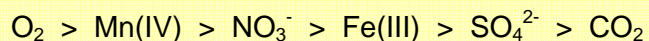
At a minimum, we recommend measuring pH, Eh, metals, anions and TOC to evaluate the conditions within the impacted area. These will help us to establish the loading requirements and to select the appropriate EHC-M product. In addition, DOC, alkalinity and hardness would be recommended to provide general information about the soil and groundwater chemistry.

Constituents of Interest – Total and Dissolved Concentrations

The metal scan should include the constituents of interest and determine both the total and dissolved concentrations in groundwater. The concentration of dissolved constituents within the treatment area is essential for both the remedial design and post-injection evaluation. The ratio between total and dissolved metals is an indicator of the redox state of the aquifer.

Competing Electron Acceptors

The level of competing electron acceptors will affect the loading requirements for EHC-M. In addition, the concentration of these could be used to estimate the redox state of the aquifer. In general the natural electron acceptors will be utilized in the following order:



EHC-M Breakdown Products

Baseline TOC, DOC, ferrous iron, sulfate, sulfide, pH and ORP data could be compared to post-injection levels to determine that the groundwater is in fact under the influence of EHC-M. Elevated levels of these parameters (except pH and ORP) would indicate effective product placement. Elevated levels of TOC, DOC and ferrous iron would be expected almost immediately following the injection of EHC-M.

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