



Pollution Liability Insurance Agency Policy

<i>Silica Gel Cleanup Analytical Methods</i>	
General Topic: Programs & Technical Guidance	Policy Number: 5.00
Contact: Senior Hydrogeologist	Effective Date: 2/7/2022 Revision Date:
References: Chapters 374-80 WAC and 173-340 WAC	
Approval: DocuSigned by: Russell E. Olsen 1609CB043AB7449 _____ Russell E. Olsen, Executive Director	

I. Purpose

This policy provides a guidance for using the silica gel cleanup (SGC) sample preparation method on sites reviewed under the Pollution Liability Insurance Agency's (PLIA) Technical Assistance Program (TAP).

This policy provides PLIA's recommended approach when using SGC.

II. Scope and Intended Audience

This policy applies to all sites managed under the PLIA TAP as defined under Chapter 374-80 WAC Advice and Technical Assistance Program.

III. Background

A primary goal of TAP site characterization is to quantify the distribution of petroleum-contamination in soil and groundwater. The concentration of diesel- and oil-range petroleum hydrocarbon compounds is quantified by the Northwest Total Petroleum Hydrocarbon-Diesel extended (NWTPH-Dx) analytical method.

When performing the NWTPH-Dx analyses:

- The sample is first extracted using the standard method which uses methylene chloride as a solvent.
- Petroleum-derived compounds (polar) and other naturally occurring (non-polar) biogenic organic compounds (BOCs) such as leaf/plant matter, woody debris and peat are removed during this extraction process.
- The compounds extracted are incorporated with the analytical results.

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The non-polar organic compounds can resemble polar petroleum hydrocarbons and could skew the NWTPH-Dx analytical result towards more elevated petroleum concentrations.

The NWTPH-Dx method allows for the use of the SGC procedure as an additional sample preparation method to remove BOCs prior to sample analysis. While effective in removing BOCs, the SGC procedure may also remove polar sulfur-containing compounds associated with heavy oils/Bunker fuels and intermediary by-products of petroleum degradation. For purposes of this Policy, the sulfur-containing compounds present in heavy oils/Bunker fuels and intermediary degradation by-products are considered target analytes and therefore the SGC extraction method shall not be used to remove these compounds.

Because soil commonly contains naturally occurring organic matter, use of SGC for soil extracts being analyzed by the NWTPH-Dx method is acceptable when it can be demonstrated that BOCs are present. However, most groundwater does not contain significant levels of naturally occurring organic matter. For this reason, SGC should not be used for NWTPH-Dx analyses of groundwater unless uncontaminated background samples indicate that BOCs are present at levels that could create an analytical interference.

IV. Policy

PLIA, at its sole discretion and on a case-by-case basis, may accept analytical data subjected to the SGC extraction. The TAP Applicant is responsible for demonstrating applicability of the data to site conditions. If an Applicant wishes to use SGC extraction, the following baseline data shall be presented to PLIA for consideration.

Soil

- The NWTPH-Dx performance data with and without SGC must be included for each sample location when SGC is intended to be used. Laboratory chromatograms for each sample must also be included with the data package. All analytical reports must clearly stipulate whether SGC was used in the sample preparation process.
- Provide representative boring logs at each sample location being proposed for SGC use.
- Provide quantification of total organic carbon (TOC) using EPA Method 5310 or approved alternative in at least one sample for each boring location where SGC is used.

Groundwater

- It must be adequately demonstrated that biogenic organic compounds are present in the specific Site's groundwater. This demonstration must be done using multiple lines of evidence, as indicated below.
- The following analyses must be performed at each permanent monitoring well location (direct-push installed temporary wells and reconnaissance/grab groundwater samples are not acceptable) where SGC is intended to be used:
 - Quantification of TOC using EPA Method 5310 or approved alternative.

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- Groundwater samples should be “split” by the laboratory and performance of NWTPH-Dx analyses with and without SGC.
 - Chromatograms are reviewed for specific chemical signatures indicating the presence of organic compounds (reviewed by a chemist with experience in chromatographic interpretation).
 - Laboratory chromatograms for each sample must be included with the data package. All analytical reports must clearly stipulate whether SGC was used in the sample preparation process.
- Provide quantification of TOC using EPA Method 5310 or approved alternative method at a background location that is representative of the site and approved by PLIA. (Note: The background location cannot display evidence of petroleum impacts (as documented through analytical data). Prior approval of the background location is required by the Agency.
 - Representative boring logs at each sample location being where SGC is being considered.

It is acknowledged that the above data requirements are only the baseline information being requested for initial consideration and that the Applicant may be required by the Agency to provide further analyses and/or site information for consideration to complete a determination of whether SGC may be applicable to the site.
