



Pollution Liability Insurance Agency Policy

<i>Remedial Investigation Groundwater Data Needs for Aged Sites</i>	
General Topic: Programs & Technical Guidance	Policy Number: 5.02
Contact: Senior Hydrogeologist	Effective Date: 1/3/2023 Revision Date:
References: Chapter 374-80 WAC and WAC 173-340-720	
Approval: DocuSigned by: Russell E. Olsen 160960043A07449 _____ Russell E. Olsen, Executive Director	

I. Purpose

This policy provides guidance regarding groundwater data requirements for sites with remedial investigations.

II. Scope

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

III. Definitions

Current groundwater data: Quarterly groundwater data from the previous calendar year, or groundwater from the “high” and “low” water extremes from the previous year (two quarterly monitoring events).

IV. Policy

A. Current Data

PLIA gives technical advice on many sites with remedial investigations (RIs) that were performed several years ago and may not have a current dataset that reflects current site groundwater conditions. Sites with detections of contaminants of concern (COCs) exceeding MTCA cleanup up levels (CULs) in groundwater (in some cases) may not have been adequately characterized. Additional wells may be necessary at locations where there is an insufficient dataset to move to a Feasibility Study (FS) and Cleanup Action Plan (CAP).

Due to the dynamic factors associated with the migration of a hazardous substance plume (i.e., COCs exceeding MTCA CULs) in groundwater, historical site groundwater data is of limited value within the context of establishing the current outer boundary

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of the plume. “Older” data (in some cases, 10 - 20 years old) cannot be used to accurately determine current conditions of the dissolved-phase contaminant plume, as is required by MTCA to establish points of compliance (POCs). This is why a **“current”** dataset (defined, below) is required to properly characterize the site and to complete the RI.

For PLIA’s purposes of use concerning groundwater data, **“current”** refers to:

- Quarterly groundwater data from the previous calendar year.
- or**
- Groundwater data from the “high” and “low” water extremes from the previous year (two quarterly monitoring events).

Current data is also necessary to meet the following **requirements for establishing site Points of Compliance (POCs)**, which include:

- Identifying the hazardous substance plume’s current location.
- and**
- Demonstrating CULs are met from the POC locations to the present outer boundary of the plume.

Within the context of Site characterization, all Site data is valuable. **For the purpose of Site characterization, historic data should be utilized to the full extent feasible.**

B. Plume Migration

As groundwater contaminant concentrations and plume location change, the locations where site COCs exceed or meet site CULs change over the monitoring period. The plume may attenuate and contract. Conversely, the contaminant plume may have expanded and migrated downgradient since it was last monitored. In either case, the areas that need to be sampled to demonstrate current compliance with CULs may have correspondingly changed.

The formal site boundary - which is defined by where contamination has come to be located - can be changed by the contaminant plume migrating near or past the formal site boundary. **Due to active migration of the plume, monitoring wells that were previously used to establish points of compliance (POCs) for the site may have become impacted and may no longer be valid to determine the areal extent of the plume.** However, these wells are still a part of the site and are still a point where CULs must be met. These potential scenarios may require modifications to the site monitoring well network and (in some cases) require new wells to be installed.

To adequately complete the RI, the current location of the contaminant plume and its outer boundary must be demonstrated by current data (as previously discussed). Having current data from a well location that has demonstrated site COCs < CULs over time is important to

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definitively “bound” the contaminant plume and determine the current location of the plume’s leading edge (which is required to establish POCs, see next section).

It is not uncommon for a monitoring well, which previously showed COCs > CULs, to gradually meet CULs for the site. **However, having a well location that shows a past exceedance of COCs currently test < CULs may or may not indicate a receding plume that is attenuating.** If active, the plume may migrate and result in well detections of COCs > CULs. During its downgradient migration, the plume may pass directly through the area of a well (or wells) or only a portion of the plume (depending on its configuration) may have been detected during migration, until it is downgradient of the Site monitoring well network and detections of Site COCs decrease. **Due to an inadequate monitoring well network, the concentrations detected in Site wells (in this specific scenario) do not identify an attenuating plume.**

The plume may now be downgradient of the well and may still have dissolved phase COCs > CULs, with the current location of its leading edge not precisely known. This situation could also result in dissolved phase COCs not being currently detected above Site CULs in any site well. In this case, the active plume is now downgradient of the site monitoring well network and may migrate off of the site and onto an adjacent property. **An accurate plume location and configuration must be determined to complete the RI during the site cleanup process.** This is because RI wells installed outside the “footprint” of the contaminant plume (i.e., never impacted with COCs > CULs) are required to help define the physical boundaries of the site. Strategically placed, they definitively “bound” the contaminant plume and identify its outer boundary. Data from these wells are not only used to establish the boundaries of the site, but they can also be used to establish a site POC or a Conditional POC (discussed in the following section). **These strategically placed wells (located outside the footprint of the plume) allow both site and contaminant plume boundary definition during the RI process.**

C. Establishing Points of Compliance

The default for groundwater compliance is a standard POC. When using standard POCs, contaminated groundwater at a site must meet the cleanup level throughout the site within a reasonable restoration time frame.

MTCA (WAC 173-340-720(8) (a) does not specify exactly how monitoring well data is to be used to establish a standard or conditional POC. The use of well data to define the extent of a site is distinct from the determination of where a groundwater POC should be established and how meeting CUL at that POC would be measured using the site well network.

MTCA’s POC requirements (WAC 173-340-720(8) (a) has two components: vertical and horizontal. The POC requirement in MTCA (WAC 173-340-720(8) (a), indicates that **“cleanup level must be met in all groundwaters throughout the site: (1st sentence –**

vertically) from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected by the site". (2nd sentence, horizontally) "cleanup levels shall be attained in all groundwaters from the point of compliance to the outer boundary of the hazardous substance plume". The definition of "hazardous substance plume" is site COCs above site CULs.

Having monitoring wells with data consistently showing concentrations below CULs over time is required to ultimately determine the outer boundary of the contaminant plume (as explained previously). The location of the plume's outer boundary is then used to establish site POCs, pursuant to MTCA requirements. This step is required to demonstrate that the RI is complete. **Both historic and current data (defined previously) are then used to determine where the plume boundary is currently located.**

At a monitoring well, which previously showed COC concentrations in excess of CULs and then, gradually meets CULs for the site, the plume may have been detected until it actively migrated into and past the well's monitoring area or only a portion of the plume may have been detected (by a single well or the well network) as it migrated. In either case, data from this well location cannot be used as the sole data point to determine the current outer boundary of the plume, as this well may now be either within the footprint of the plume or, if not, it may be upgradient of the plume altogether. **Since determining the plume's outer boundary is a POC requirement under MTCA, that well data cannot be used solely to establish a POC. It can be used in conjunction with other data to support a proposed POC (see Multiple Lines of Evidence section).**

In some situations, setting a groundwater Conditional POC (CPOC) may be required when it is not practicable to meet groundwater cleanup levels at the standard POC within a reasonable restoration time frame despite the use of all practicable methods of treatment in the site cleanup. In these cases, PLIA may allow the establishment of a CPOC. The PLIA Site Manager can determine if existing data (or other lines of evidence, see below) indicate that:

1. the boundary of the hazardous substance plume is known; **and**
2. data indicates that from the CPOC to the outermost boundary of the plume, CULs are met.

If a site requires a CPOC, then that location should be placed as close as practicable to the source of the hazardous substance plume. **From that location, data must be provided showing CULs are met from the CPOC locations to the outer boundary of the hazardous substance plume.** Processes to establish POCs and CPOCs for the site are discussed in the next section.

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D. Using Multiple Lines of Evidence

PLIA's Site Managers may suggest using the multiple lines of evidence approach to set standard POCs or conditional POCs instead of installing a new well (or wells) downgradient of the well location(s) with historic COC detections. The multiple lines of evidence dataset must demonstrate the following MTCA requirements are met using current data:

- Identifying the hazardous substance plume's outer boundary, **and**
- Demonstrating CULs are met from the POC locations to the current outermost boundary of the plume.

The process of using multiple lines of evidence requires close communication with the PLIA Site Manager starting at the RI stage all the way through to site closure. PLIA has advised using reconnaissance groundwater sampling data from temporary wells or screened direct push sampling tools can be used in conjunction with data from the well in question (the proposed POC location) on specific types of sites.

With an analytical result below the CUL, reconnaissance groundwater data, with the other lines of evidence discussed previously, have been sufficient to establish the POC location and/or the edge of the groundwater contaminant plume or the site boundary. PLIA considers this approach conservative, as reconnaissance samples (when collected properly) are usually biased high.

In some cases, the multiple lines of evidence process does not require new wells that would extend the site closure schedule or increase costs. The PLIA Site Manager can discuss with you the particulars of your site, your collection of data, existing data gaps and associated groundwater concerns.

This data review procedure to determine compliance with MTCA's POC requirements, although site specific, can require a minimal amount of additional data to be used in conjunction with the existing groundwater monitoring dataset. **Additional existing data that can possibly be used to establish multiple lines of evidence includes (but is not limited to) subsurface lithology, soil analytical data, and (in specific cases) reconnaissance groundwater data.**

To establish POCs or CPOCs on a site with an advancing plume that has dissolved-phase COCs above CULs may require a robust site dataset and a detailed evaluation with multiple lines of evidence.

This dataset could include (but not be limited to):

- Statistical analysis of all detections in this area of the site.
- Aquifer testing data (slug tests and/or pumping tests).

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- Fate and transport modeling.
- Evaluation of any preferential pathways.
- Possible high resolution site characterization.
- Chromatogram comparisons to laboratory standards of all contaminants.
- Evaluating some or all of these potential lines of evidence together.

Some of this data is outside the scope of certain projects due to increased data acquisition and associated evaluation time and costs. **The PLIA Site Manager can determine if the overall site groundwater dataset that exists is sufficient to establish the multiple lines of evidence necessary to set a POC or CPOC instead of installing a new well (or wells) downgradient of the location with historic COC detections.** However, if you would prefer to install additional monitoring wells to address the data gap instead of using this alternate approach, please let the PLIA Site Manager know.

This work is currently being done by PLIA at the technical program level on a site-by-site basis. **We have granted requests for site closure when consultants worked with us to develop these multiple lines of evidence to show that groundwater at a site is in compliance with MTCA regulations and no further remedial action is necessary to protect human health or the environment.**

It is important to note, however, not every site will be able to utilize the multiple lines of evidence method. For some sites, additional monitoring wells will be the only acceptable dataset to establish a site's POC. All requests to utilize the multiple lines of evidence approach must be coordinated with PLIA's Site Managers at the onset of and throughout the site cleanup process.