

Developing Conditional Points of Compliance at MTCA Sites Where Groundwater Discharges to Surface Water

Implementation Memorandum No. 16

Date: July 25, 2017

Revised: December 29, 2017

To: Interested Persons

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Revisions: p. 8, paragraph C: changed WAC 173-201A-**100** to WAC 173-201A-**400**
p. 15, Policy Highlight box, 2nd paragraph: added “via surface runoff”

Attachments: None

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition
AKART	all known available and reasonable methods of treatment
CPOC	conditional point of compliance
CULs	cleanup levels
Ecology	Washington State Department of Ecology
GW	Groundwater
MNA	monitored natural attenuation
MTCA	Model Toxics Control Act
NPDES	National Pollution Discharge Elimination Systems
POC	point of compliance
RCW	Revised Code of Washington
SMS	Sediment Management Standards
SW	surface water
TCP	Toxics Cleanup Program
WAC	Washington Administrative Code

1.0 Purpose and Applicability

This memorandum provides guidance from the Washington State Department of Ecology (Ecology) for setting conditional points of compliance for groundwater at contaminated sites where a contaminant plume is discharging, or could discharge, to surface water. The memorandum describes **when** and **where** groundwater conditional points of compliance may be set, and briefly touches on **how** compliance can be measured using upland wells. This memorandum, however, does not explain **how** to meet the requirements necessary to determine whether a site qualifies for use of a conditional point of compliance. A point of compliance (POC) is the location where cleanup levels must be attained at a contaminated site.

The requirements for setting groundwater points of compliance are specified in WAC 173-340-720(8). Points of compliance must be identified and evaluated during the feasibility study and established in the cleanup action plan (WAC 173-340-350(8)(c)(i)(F) and 173-340-380(1)(a)(iv)).

This memorandum applies to contaminated sites cleaned up under RCW 70.105D, Model Toxics Control Act (MTCA), and its implementing regulations, WAC 173-340 (MTCA rule) and WAC 173-204 (SMS rule). It is intended for use by Ecology cleanup project managers, local governments, environmental consultants, and others who are involved in the cleanup process under MTCA.

1.1 Terminology

Typically, before groundwater discharges into surface water, it enters into a transitional zone in the aquifer where some mixing of groundwater and surface water occurs. This zone of mixed waters (located within the aquifer and sediments before groundwater enters surface water) will be referred to in this document as the **transitional zone** (see Figure 1). Note that the transitional zone also includes (or is equivalent to) the **hyporheic zone** in fluvial settings, and usually includes **sediment porewater** in saturated sediment.

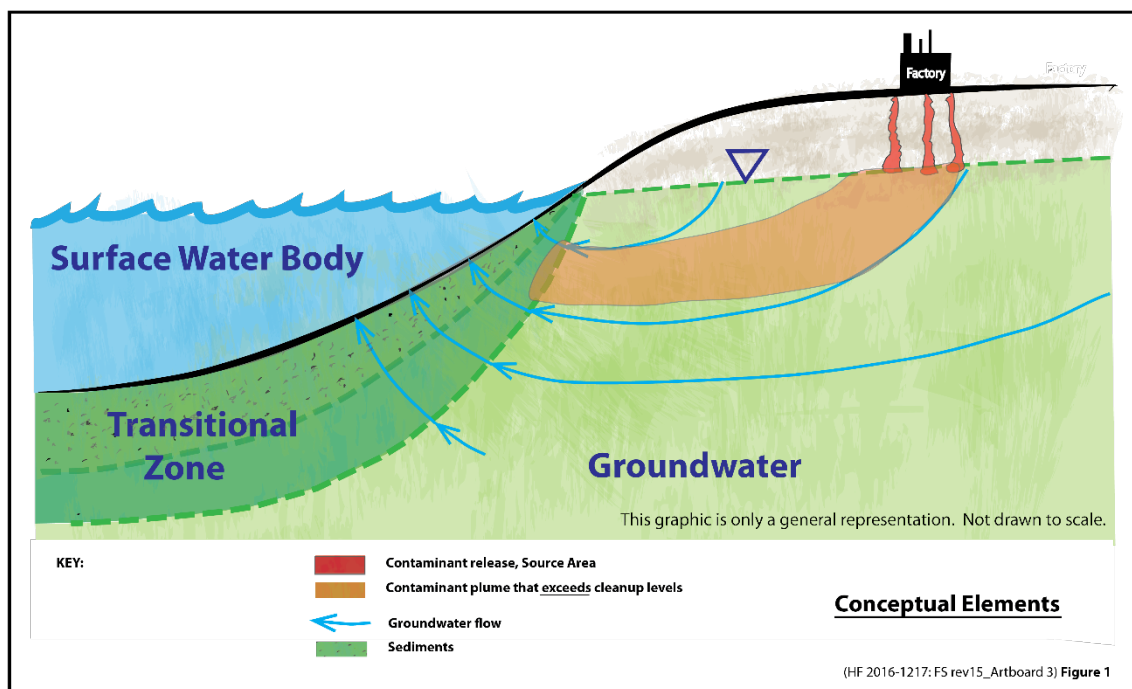


Figure 1: Conceptual elements of the groundwater to surface water pathway at a site.

PHYSICAL SETTING DEFINITIONS

Groundwater: Water in a saturated zone or stratum beneath the surface of land or below a surface water (MTCA, WAC 173-340-200). This includes water within and upgradient of the transitional zone. For sediment cleanups, the sediment porewater in the site-specific (depth-defined) biologically active zone is considered as distinct from groundwater (SMS, WAC 173-204-200).

Transitional zone: In an aquifer, this is the area where groundwater has mixed with surface water. Beneath a stream, this area is often called the **hyporheic zone**.

Mixing zone: Outside an aquifer and within a body of surface water, this is where a plume has discharged into, and is mixing with, the water column. This term has a specific regulatory meaning described in the paragraph below this box.

Surface water/Surface water body: Means lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the state of Washington or under the jurisdiction of the state of Washington (MTCA, WAC 173-340-200). This does not include the water in saturated sediment or native material underlying and surrounding a body of surface water.

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Sediment porewater: Interstitial water in sediment. “Sediment” here refers to the definition in the Sediment Management Standards: *"Surface sediments" or "sediment(s)" means, except for purposes of Part V of this chapter, settled particulate matter located in the predominant biologically active aquatic zone, or exposed to the water column. Sediment(s) also includes settled particulate matter exposed by human activity (e.g., dredging) to the biologically active aquatic zone or to the water column.* (SMS, WAC 173-204-200)

Mixing in the transitional zone is not to be confused with mixing that occurs in the water column in a body of surface water. The latter is related to a concept established under the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A), which is associated with permitting surface water discharge through the National Pollution Discharge Elimination System (NPDES). Under WAC 173-201A, the mixing zone refers to that portion of a surface water body adjacent to an effluent outfall where mixing results in dilution of the effluent within the receiving water. The mixing zone associated with NPDES regulations is not the topic of this memorandum.

POLICY HIGHLIGHT

There has been considerable confusion as to whether water in the transitional zone or sediment porewater should be considered either groundwater or surface water. This has been especially problematic when setting groundwater POC.

With regard to the transitional zone, MTCA defines groundwater as within a saturated zone beneath surface water or the land surface. This definition encompasses the transitional zone. Therefore, water in this zone is considered groundwater under MTCA.

With regard to sediment porewater, this term generally refers to interstitial water present in saturated freshwater or marine sedimentary deposits (i.e., sediment). However, there is a specific definition for this term under the Sediment Management Standards (SMS) for sites undergoing sediment cleanup. The SMS regulation recognizes sediment porewater as the interstitial water in an uppermost thickness of sediment that is defined on a site-specific basis as the biologically active zone (typically 10 to 30 centimeters thick). This SMS distinction results in assigning groundwater to a location immediately below the biologically active zone, thus providing a delineation of where the MTCA and SMS regulatory standards apply for sediment cleanups. Site managers will need to be aware of these regulatory distinctions.

1.2 Standard and Conditional Points of Compliance Defined

The **standard point of compliance (POC)** for groundwater under MTCA is defined as “...throughout the site from the uppermost level of the saturated zone to the lowest depth potentially affected by the site.” (MTCA, WAC 173-340-720(8)(b)) (see Figure 2). The definition implies that contaminated groundwater at a site will attain cleanup levels throughout the site within a reasonable restoration time frame.

For some cleanups, however, it can be demonstrated that it is not practicable to meet groundwater cleanup levels at the standard POC within a reasonable restoration time frame using all practicable methods of treatment in the site cleanup. In this case, Ecology may approve a **conditional POC (CPOC)**. This memorandum details the regulatory requirements to determine if a site qualifies to use a CPOC under WAC 173-340-720(8)(c) or (d), but not how to meet those regulatory requirements. If Ecology decides to use a CPOC, that CPOC must not exceed the property boundary, except under the following three off-property situations:

- Source property abutting surface water;
- Source property near, but not abutting,¹ surface water; or
- Source property located in an area with “area-wide” contamination.

In this memorandum:

- **Abutting** is defined as a source property that borders a surface water body, with the property boundary being either at the shoreline or in the water body.
- **Near, but not abutting** is defined herein as a source property that is separated from a water body by one or more other properties.
- **Area-wide** is defined as the source property being located within a broader area affected by co-mingled plumes from multiple sources.

The following sections detail when and where the CPOC can be set where groundwater and surface water interactions occur. Note that this memorandum does not address situations with area-wide contamination.

¹ There is no set distance by which a site may be defined as “near, but not abutting” surface water. This provision is interpreted to mean that, based on technical data specific to the site, the contaminated groundwater at the site reaches, or is likely to reach, surface water at detectable concentrations.

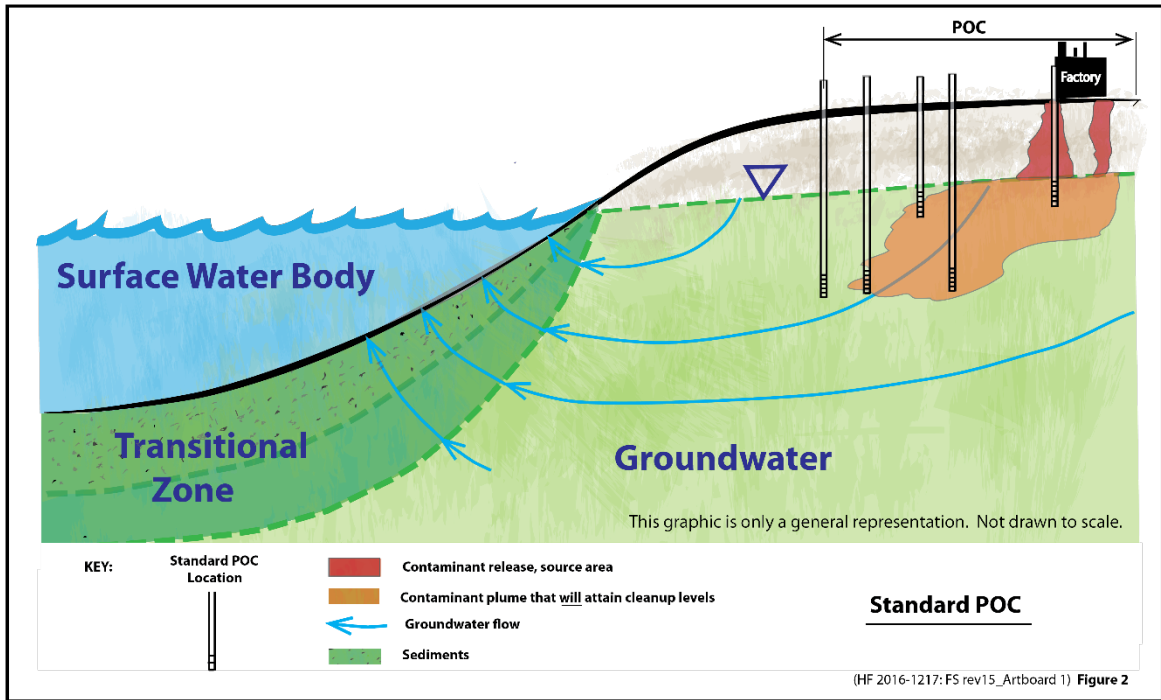


Figure 2: Schematic of a standard point of compliance.

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2.0 When may a conditional point of compliance be set?

2.1 General Requirements for Approval of Conditional Points of Compliance²

As noted in Section 1.2, when it can be demonstrated that it is not practicable to meet groundwater cleanup levels at the standard point of compliance within a reasonable restoration time frame, Ecology may approve a conditional point of compliance. The demonstration must be made in accordance with the remedy selection requirements in WAC 173-340-350 through 173-340-390 (MTCA, WAC 173-340-720(8)(c)).

Additionally, when a CPOC is proposed, the person responsible for undertaking the cleanup action must demonstrate that all practicable methods of treatment are to be used in the cleanup (WAC 173-340-720(8)(c)).

2.2 Off-Property Conditional Points of Compliance

A conditional point of compliance may be set beyond the property boundary in the following three specific situations as noted in Section 1.2, subject to several conditions specified in WAC 173-340-720(8)(d).

2.2.1 Source property abuts surface water

When the groundwater cleanup level is based on protection of surface water beneficial uses, and the property containing the source of contamination abuts surface water, Ecology may approve an off-property CPOC, subject to the following conditions (WAC 173-340-720(8)(d)(i)):

1. The general requirements for a CPOC in WAC 173-340-720(8)(c), described in Section 2.1 above.

² This memorandum does not detail how to meet the regulatory requirements necessary to determine if a site qualifies to use a CPOC under WAC 173-340-720(8)(c) or (d).

2. The following additional conditions, specified in WAC 173-340-720(8)(d)(i):
- A. It has been demonstrated that contaminated groundwater is entering, and will continue to enter, the surface water body even after the selected remedial alternative is implemented. Note that this provision does not define “contaminated ground water” as meaning an exceedance of cleanup levels;
 - B. It has been demonstrated under the remedy selection requirements in WAC 173-340-350 through 173-340-390 that it is not practicable to meet cleanup levels in groundwater before entering surface water within a reasonable restoration time frame. This means that the selected remedy will result in contaminated groundwater continuing to discharge into surface water;
 - C. Use of a mixing zone under WAC 173-201A-400 to demonstrate compliance with surface water cleanup levels shall not be allowed. Although Washington State’s Water Quality Standards for Surface Waters allows it for NPDES permitting (for example), MTCA does not allow using a mixing zone within the surface water body (i.e., water column) to demonstrate compliance;
 - D. Groundwater discharges must be provided with "all known available and reasonable methods of treatment" (AKART) prior to release. Guidance for conducting an AKART analysis is presented in Ecology’s [Water Quality Program Permit Writer’s Manual](#) (Ecology 2015). Establishing AKART is generally **more stringent** than determining an alternative that is “permanent to the maximum extent practicable” under MTCA;
 - E. Groundwater discharges must³ not result in violations of sediment quality values;
 - F. Groundwater and surface water monitoring must be performed to assess long-term performance of the selected cleanup action. This includes the potential for bioaccumulation problems resulting from surface water concentrations below method detection limits. As noted on page 201 of Responsiveness Summary for the Amendments to MTCA (Ecology 1991), if monitoring indicates a potential problem, the point of compliance may need to be moved back up into the groundwater system; and

³ In this section of the WAC, MTCA uses the term “shall” which is formal and is interpreted to mean the person or entity has a duty or obligation to perform a certain act. The word “must” is used here interchangeably.

- G. Before approving the CPOC, a notice of the proposal shall be mailed to the natural resource trustees, the Washington Department of Natural Resources, and the United States Corps of Engineers. The notice shall invite comments, and is in addition to notices required under WAC 173-340-600 (public involvement).

These requirements, taken as a whole, set a very high bar for approving off-property CPOCs in a shoreline setting.

POLICY HIGHLIGHT

It is Ecology's policy decision that the list of conditions in WAC 173-340-720(8)(d)(i)(A-G) are to be a requirement for all properties *abutting* surface water irrespective of where a CPOC is set, as they are for all *near, but not abutting* properties. An exception to this policy may be made on a site-specific basis with the approval of the regional section manager.

As written, WAC 173-340-720(8)(d)(i) states that for properties abutting surface water, the extensive list of conditions for approving a CPOC applies when the CPOC would be located within the surface water, as detailed in Section 3.0 "Where should a conditional point of compliance be set?". The rule does not indicate what conditions must be followed in approving a CPOC for properties abutting surface water where the CPOC would be located upgradient of the surface water, within groundwater.

WAC 173-340-720(8)(d)(i) states that Ecology may approve a CPOC for an abutting property, implying that approval can be given or withheld depending on circumstances. Therefore, Ecology may require additional information from a PLP to show that it meets requirements for a CPOC, and Ecology may apply restrictions as needed to be protective of human health or the environment. Ecology has determined that, absent a site-specific reason, the WAC 173-340-720(8)(d)(i)(A-G) conditions must be followed to approve a CPOC in groundwater upgradient of surface water for a property abutting surface water.

2.2.2 Source property near, but not abutting surface water

When the groundwater cleanup level is based on protection of surface water beneficial uses and the property containing the source of contamination is located *near, but not abutting* surface water, then Ecology may approve an off-property CPOC, subject to all three of the following conditions (WAC 173-340-720(8)(d)(ii)):

1. The general requirements for a CPOC in WAC 173-340-720(8)(c), described in Section 2.1 above;
2. The conditions for an off-property CPOC in WAC 173-340-720(8)(d)(i), described in Section 2.2.1 above; and
3. The following additional condition:
 - A. The affected property owners between the source of contamination and the surface water body must agree in writing to using the CPOC. Agreement from properties downgradient of the CPOC would not be needed, because they would not be affected.

2.2.3 Source property located in area-wide groundwater contamination

Ecology may establish an area-wide CPOC in accordance with WAC 173-340-720(8)(d)(iii). As noted in Section 1.2, this memorandum does not address off-property CPOCs for area-wide situations.

3.0 Where should a conditional point of compliance be set?

3.1 General Requirement for Location of Conditional Point of Compliance

Following are the two fundamental location requirements for CPOCs:

1. A CPOC must be set as close as practicable to the contamination source; and
2. A CPOC must not exceed the property boundary (WAC 173-340-720(8)(c)), except in three specific situations. These specific situations are described in Section 3.2.

Figure 3 below illustrates two potential locations for an on-property CPOC that meet these fundamental requirements:

CPOC 1 is set as close as practicable to the contamination source in “clean”⁴ water at the downgradient edge of the contaminant plume. This CPOC location would be used if none of the plume⁵ is expected to attain cleanup levels in a reasonable restoration time. Having CPOC 1 just outside the plume provides a location where cleanup levels are attained.

CPOC 2 is also set as close as practicable to the contamination source but is further upgradient within the plume. This CPOC location could be used if the distal portion of the plume is expected to attain cleanup levels within a reasonable restoration time frame.

⁴ For purposes of this memorandum, “clean” water is defined as groundwater that meets MTCA cleanup levels set for the site.

⁵ For purposes of this memorandum, “plume” is defined as a body of contaminated groundwater above MTCA cleanup levels that extends from a source of contamination by hazardous substances in an aquifer.

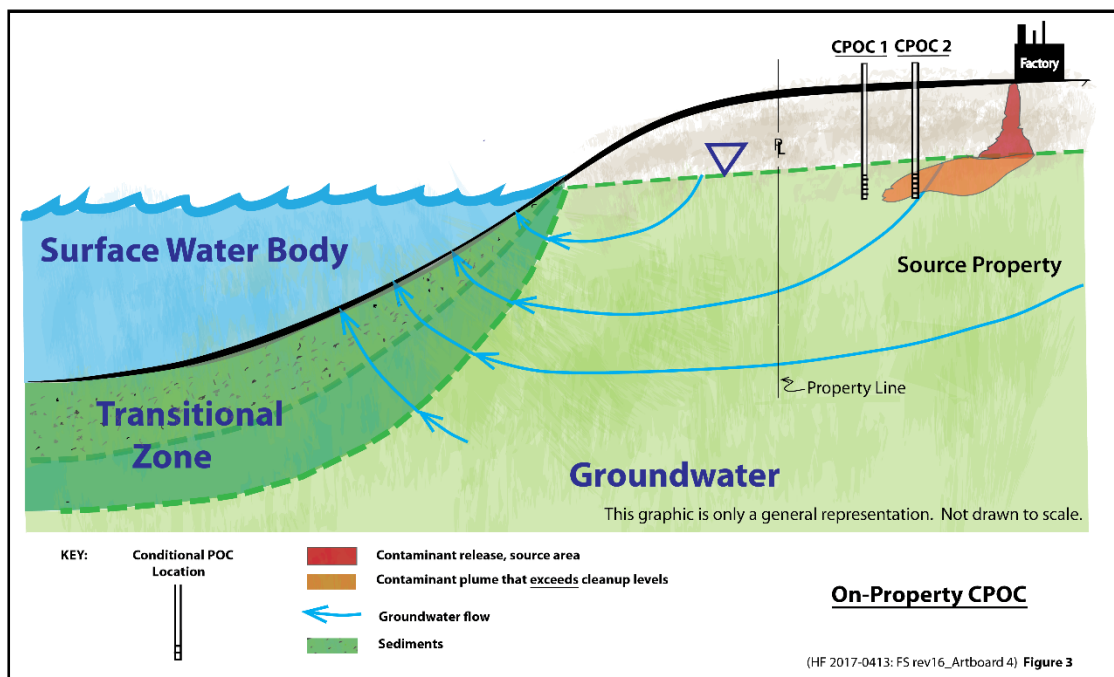


Figure 3: Schematic of an on-property conditional point of compliance (CPOC).

3.2 Location of Off-Property Conditional Point of Compliance

As discussed in Section 2.2, a CPOC may be set beyond the property boundary in three specific situations, once Ecology determines the site qualifies to use a CPOC under WAC 173-340-720(8)(c) or (d). This section discusses where to locate the POC in two of those situations.

3.2.1 Source property abuts surface water

For sites where the property containing the source of contamination abuts surface water, a CPOC may be set within the surface water as close as technically possible to the point or points where groundwater flows into the surface water provided the conditions under MTCA, WAC 173-340-720(8)(d)(i) are met (see Section 2.0). This means that subject to certain conditions, the CPOC may be set as far into surface water as the base of the water column and directly on top of sediments, if technically possible.

However, the CPOC must be set further upgradient, if conditions allow to meet the fundamental MTCA requirement that a CPOC be set as close as practicable to the source of contamination. “Further upgradient” means within the sediment porewater or further landward into the aquifer.

Figures 4a and 4b shows possible CPOC locations under two primary discharge conditions - when a contaminant plume exceeding cleanup levels is discharging into surface water (Figure 4a) and when the plume does not reach surface water (Figure 4b).

In Figure 4a, two potential CPOC location scenarios are presented: one in surface water (CPOC 1) and a second further upgradient (CPOC 2).

CPOC 1 is located as close as practicable to the source of contamination, assuming that despite application of the selected remedy and AKART, groundwater within the existing leading edge of the plume discharging to the surface water body is not expected to achieve compliance with cleanup levels in a reasonable restoration time frame. **Locating this CPOC in surface water is conditioned on whether it is technically possible, and is subject to Ecology’s discretion.**

The second CPOC location is also located as close as practicable to the source of contamination but further upgradient within groundwater. This location is predicated on the assumption that groundwater at this location will meet cleanup levels within a reasonable restoration time frame. It may or may not be within the transitional zone.

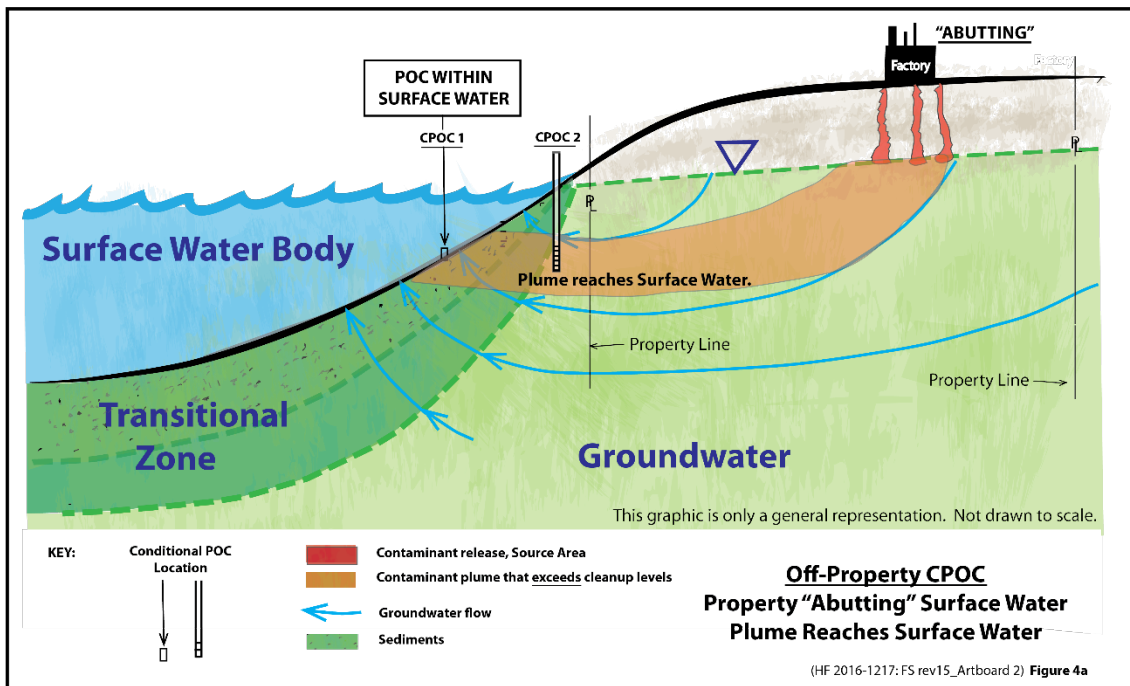


Figure 4a: Off-property conditional point of compliance (CPOC) on property abutting surface water and where the plume has reached the surface water body.

Figure 4b (next page) shows a different situation where groundwater flows into surface water, however the groundwater at the point it discharges to surface water is below cleanup levels. In this case, there is still the possibility of alternative CPOC locations. Two CPOCs are shown in the figure, each meeting the fundamental requirement that it be as close as practicable to the source of contamination. One (CPOC 1) is located within the transitional zone (not surface water) downgradient of the area that exceeds cleanup levels. The second alternative (CPOC 2) is located further upgradient, again predicated on the assumption that groundwater at this location will meet cleanup levels within a reasonable restoration time frame. It may or may not be within the transitional zone.

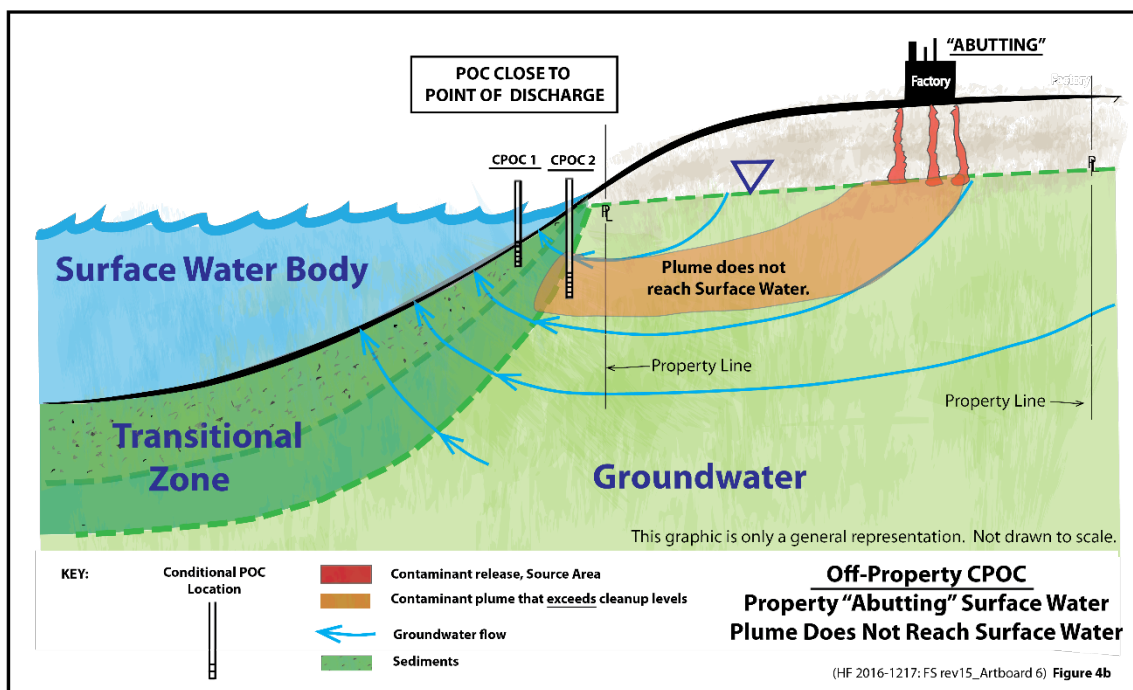


Figure 4b: Off-property conditional point of compliance on property abutting surface water and where plume does not reach the surface water body.

POLICY HIGHLIGHT

Cleanup project managers need to consider the following provision when deciding whether to establish a CPOC within surface water (Figure 4a CPOC1). WAC 173-340-370(6) requires that:

...for facilities adjacent to a surface water body, active measures will be taken to prevent/minimize releases to surface water via surface runoff and ground water discharges in excess of cleanup levels. The department expects that dilution will not be the sole method for demonstrating compliance with cleanup standards in these instances.

The goal of this provision is to encourage cutting off the source of pollution from the surface water, not to make it easier to demonstrate compliance and avoid cleanup.

3.2.2 Source property near, but not abutting surface water

There are three location requirements for this setting, provided that the conditions under MTCA, WAC 173-340-720(8)(d)(ii) have been met (see Sections 2.1, 2.2).

The first two location requirements are that: 1) the CPOC must be set as close as practicable to the source, and 2) it cannot exceed the point or points where the groundwater flows into the surface water (WAC 173-340-720(8)(d)(ii)). This means that the CPOC may not be set within the surface water body. The farthest downgradient that the CPOC may be set is within the sediment porewater/groundwater within the transitional zone.

The third requirement is that if the groundwater cleanup level is not exceeded in the groundwater prior to its entry into the surface water, the CPOC cannot extend beyond the extent of groundwater contamination above cleanup levels at the time Ecology approves the CPOC (WAC 173-340-720(8)(d)(ii)). This means that the CPOC may not be set further downgradient than the tip of the plume exceeding the cleanup level at the time the CPOC is approved (i.e., finalization of the Cleanup Action Plan).

Note that unlike the abutting case, locating this CPOC is not conditioned on whether it is technically possible.⁶ **However, approval of the CPOC location is still subject to Ecology's discretion.**

Figure 5a shows a site where the contaminants exceeding cleanup levels in groundwater reach surface water. The first CPOC (CPOC 1) represents the furthest point downgradient where the POC may be set. The second CPOC (CPOC 2) represents a potential location closer to the source where it is practicable to attain cleanup levels within a reasonable restoration time period.

Figure 5b illustrates a situation where the groundwater cleanup level is not exceeded in the groundwater prior to its entry into the surface water. In this case, as noted previously, the CPOC may not extend beyond the tip of the plume.

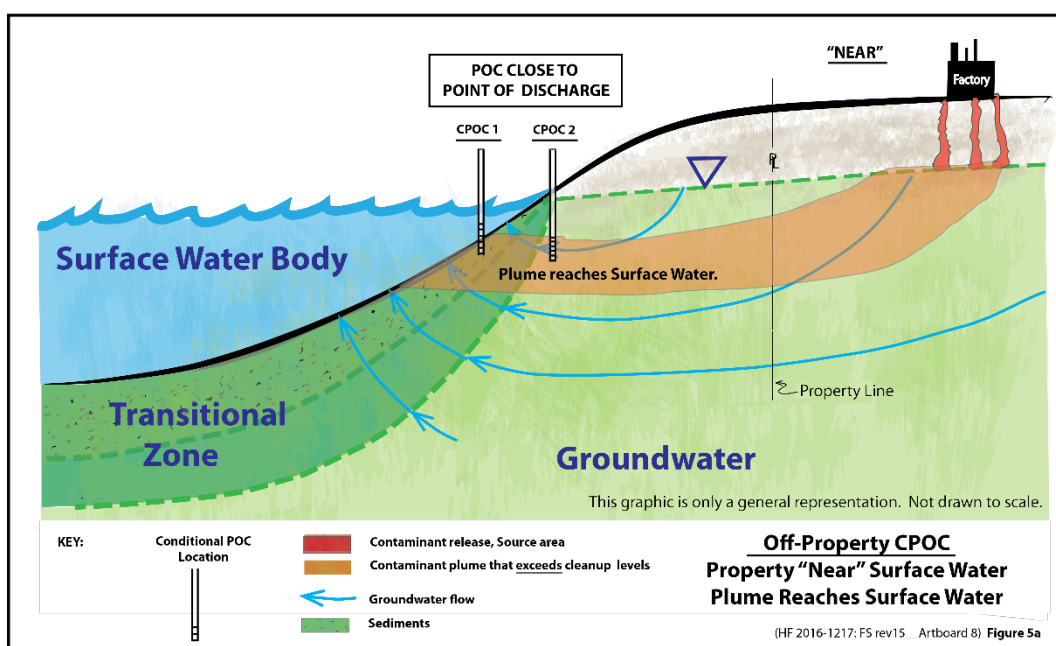


Figure 5a (above): Off-property conditional point of compliance (CPOC) on property near (but not abutting) surface water and where plume has reached the surface water body.

⁶ Setting a CPOC as close as "technically possible" to a contamination source does not take into account cost when choosing the location of the CPOC. Setting the CPOC as close as "practicable" to the source includes consideration of cost as well as technical conditions.

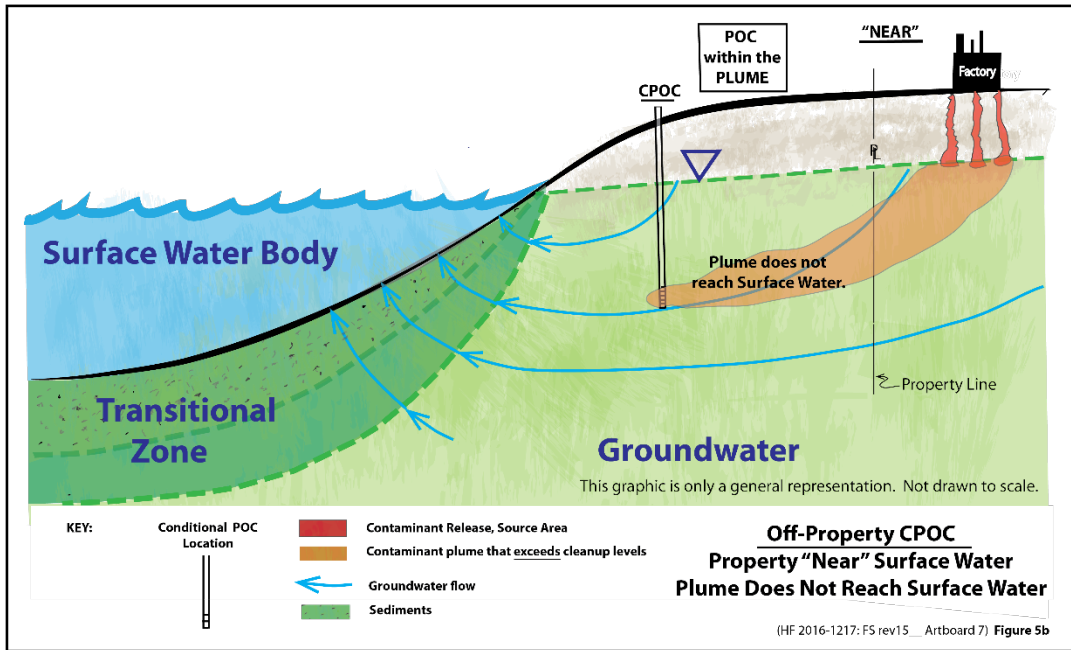


Figure 5b: Off-property conditional point of compliance (CPOC) on property near (but not abutting) surface water and where plume has not reached the surface water body.

POLICY HIGHLIGHT

The MTCA regulations addressing off-property CPOCs appear to focus on extreme downgradient locations. The requirements for *abutting* properties allow for a CPOC in surface water; the requirements for *near, but not abutting*, properties allow for a CPOC at the edge of groundwater just before it enters surface water. **This focus on extremes can be misleading to cleanup project managers when they are deciding whether to allow and where to locate an off-property CPOC.**

Locating any CPOC begins in the Feasibility Study, wherein an estimate is made of where groundwater will meet cleanup levels within a reasonable restoration time frame for each cleanup alternative being evaluated (WAC 173-340-350(8)(c)(i)(F)).

Final selection of a CPOC location will be in the Cleanup Action Plan. Here, the selection process begins by confirming the area where groundwater is expected to meet cleanup levels in a reasonable restoration time frame for the selected remedy. The CPOC must then be located as far upgradient as possible to meet the MTCA requirement that a CPOC be set as close as possible to the source of the hazardous substances. In many cases this will be within a property.

If, however, the CPOC must be located off-property in a groundwater discharge setting, the requirement that it be set as close as practicable to the source of hazardous substances still applies. **This means that in most cases the furthest downgradient CPOC locations allowed in the MTCA regulations will not be an appropriate choice.** Instead, a CPOC location will need to be established further upgradient. Of course the CPOC location also has to be at a point where groundwater will attain cleanup levels in a reasonable restoration time frame.

3.3 Further Considerations on Setting Conditional Points of Compliance in a Groundwater Discharge Setting

As previously discussed, MTCA allows off-property CPOC to be set in discharge settings under certain conditions. These settings are often high-energy environments and geochemically complex. In such situations, establishing a monitoring network that can be sampled routinely over multiple years can be challenging. Additionally, the margin for error can be very slim and the corresponding potential risk high, with compliance being potentially measured within a few inches of the receiving water body.

For these reasons, when deciding whether to approve a groundwater CPOC in a discharge setting as part of a cleanup action, the cleanup project manager should consider whether it is practical, reliable, and protective. Some of the factors that should be considered are highlighted in Table 1.

Table 1: Factors that should be considered when evaluating compliance, practicality, reliability, and protectiveness.

Factors to Consider When Evaluating Compliance, Practicality, Reliability, and Protectiveness	
Challenge	Description
Uncertainty about being able to physically obtain reliable data	In some situations, powerful wave or tidal activity; strong currents; or physical barriers such as riprap or bulkheads, can make it very difficult to obtain reliable data from near a shoreline.
Uncertainty about proximity to receptors	In some situations, there may be uncertainty about the type and sensitivity of benthic organisms that are present in sediment, or the depth to which they burrow. This results in uncertainty about whether benthic species are being protected adequately and whether risk is adequately minimized.
Uncertainty about plume discharge concentrations	Contaminant levels in a groundwater plume can vary significantly over time (contaminant mass flux). Hydrologic conditions at the point of discharge are also variable. If one or both of these situations occur, it may not be possible to establish a monitoring schedule at surface water or sediment porewater CPOCs that can be relied upon to show that discharge concentrations are being continuously protective. Areas where this might be a concern include shoreline interfaces influenced by tidal action, power dams with variable releases, or variable irrigation flows.
Uncertainty about chemical transformations in the transition zone	Dissolved contaminants passing through the transition zone are likely to be transformed to some degree through either geochemical or biologically mediated processes, especially in tidally influenced aquifers. These processes can result in new precipitates and new daughter products. The end result may be protective or detrimental to receptors of concern.
Complexity of monitored natural attenuation (MNA)	If MNA is the selected remedy, and if a CPOC is established in the transitional zone, it may be difficult to demonstrate that chemical or biological degradation is a substantial mechanism for contaminant reduction, given that other processes are also acting to reduce contaminant concentrations (dilution, adsorption, volatilization, etc.).
Contaminated sediments or other sources of contamination	If a CPOC is established in contaminated sediments or other sources of contamination, it may be difficult to demonstrate compliance. Also, the process of setting a CPOC may result in overlooking this issue if not investigated appropriately.
Compliance monitoring	MTCA states: "Compliance with ground water clean up levels shall be determined by analysis of ground water samples representative of the ground water" (WAC 173-340-720(9)). It may be possible to argue that this provision means groundwater near a water body at a site meeting the MTCA definition of groundwater might not meet the requirement of being representative.

Cleanup project managers must be certain that a CPOC at the point of discharge is not only acceptable from a regulatory standpoint, but also functional and reliable given the specific circumstances at a particular site. Because there is always some uncertainty in knowing if future compliance can be demonstrated or achieved through a shoreline monitoring system, it is recommended that CPOCs be moved upgradient of the point of discharge/transitional zone as far as possible. If the situation is particularly problematic, the cleanup project manager should consider other ways to monitor compliance (e.g., attenuation studies, or transport and fate modeling), or to augment the remedy.

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4.0 Monitoring Conditional Points of Compliance Using Upland Wells

Compliance is typically measured by obtaining samples at the CPOC and comparing sample results to cleanup levels.

However, the MTCA rule also allows using groundwater monitoring wells upgradient of a CPOC to measure compliance in a groundwater to surface water discharge setting. Specifically, the MTCA rule in WAC 173-340-720(8)(e) states that:

...[t]he department may require or approve the use of upland monitoring wells located between the surface water and the source of contamination to establish compliance where a conditional point of compliance has been established under subsection (8)(d)(i) or (ii) of this section.

In this situation, an estimate of natural attenuation between the upland well and the CPOC is necessary in order to demonstrate that groundwater at the POC meets cleanup levels. MTCA at WAC 1730340-720(8)(e)(ii) states this requirement as follows:

Where such monitoring wells are used, the department should consider an estimate of natural attenuation between the monitoring well and the point or points where ground water flows into the surface water in evaluating whether compliance has been achieved.

In evaluating how much natural attenuation will occur, other factors need to be considered, including:

- Whether groundwater could reach surface water in ways that would not provide the expected natural attenuation (e.g. short-circuiting through utility trenches and seeps); and
- Whether changes in groundwater chemistry due to natural attenuation would cause an exceedance of surface water or sediment quality standards.

Because using upland wells for compliance monitoring purposes requires extrapolation, it is recommended that actual data be obtained from the point of compliance to confirm the accuracy of the natural attenuation estimate.

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5.0 Summary

The following flowchart (Figure 6) summarizes and assists with setting a CPOC along the groundwater to surface water pathway.

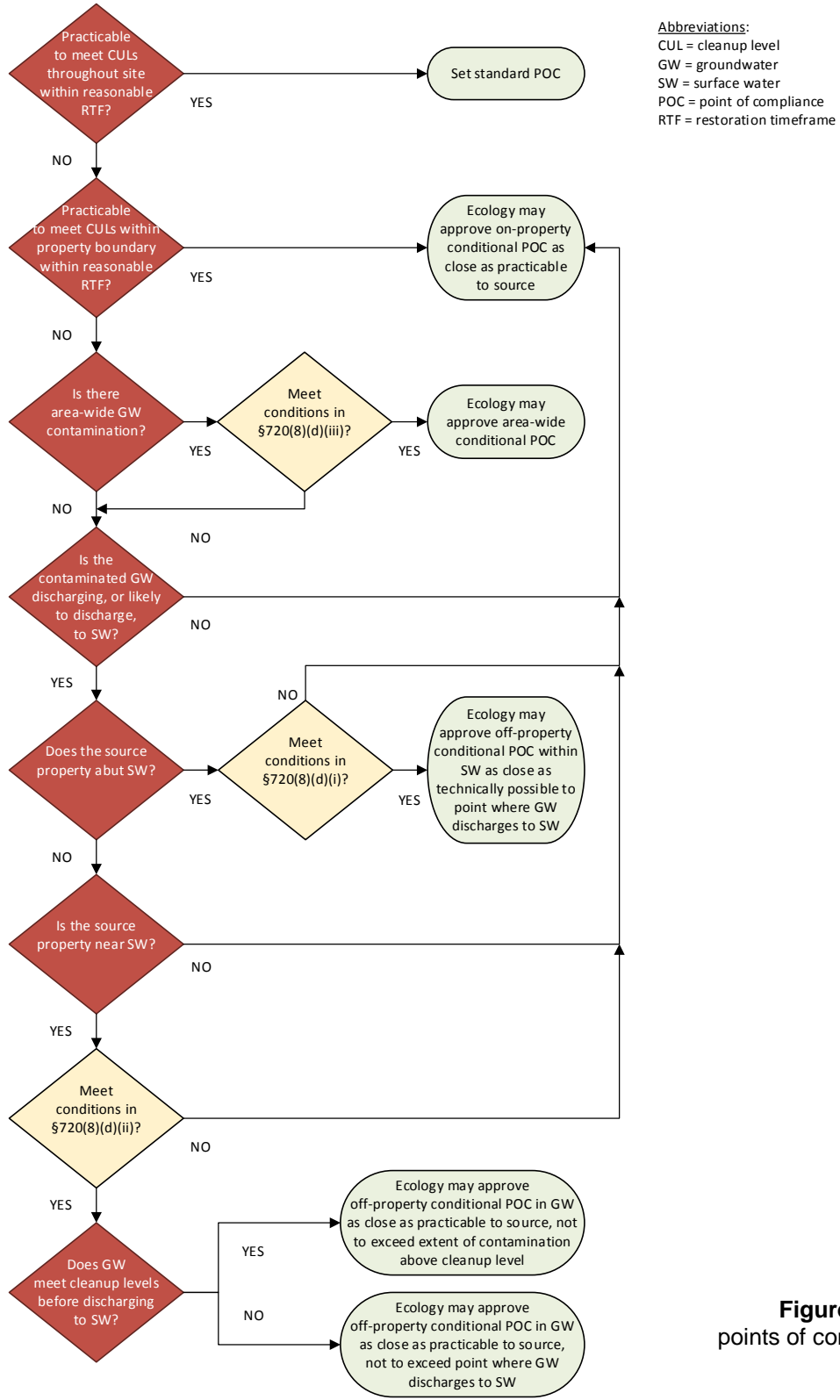


Figure 6: Flow chart for setting points of compliance for groundwater

6.0 References

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