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## Model Toxics Control Act Cleanup Regulation: Establishing Cleanup Standards and Selecting Cleanup Actions

### Background

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Washington's hazardous waste cleanup law, the Model Toxics Control Act (chapter 70.105D RCW), mandates that site cleanups protect the state's citizens and environment. To implement this statutory mandate, the Department of Ecology (Ecology) has established cleanup standards and requirements for the cleanup of hazardous waste sites (cleanup actions). The rules establishing these standards and requirements were developed by Ecology in consultation with the Science Advisory Board (established under the Act) and with representatives from local government, citizen, environmental, and business groups. The rules were first published in February 1991, with amendments in January 1996, February 2001, and October 2007.

### Determining Cleanup Requirements

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The Model Toxics Control Act (MTCA) Cleanup Regulation (chapter 173-340 WAC) defines a two-step approach for establishing cleanup requirements for individual sites:

- **Establishing Cleanup Standards.** The standards provide a uniform, statewide approach to cleanup that can be applied on a site-by-site basis. The two primary components of the standards, cleanup levels and points of compliance, must be established for each site. Cleanup levels determine at what level a particular hazardous substance does not threaten human health or the environment. Points of compliance designate the location on the site where the cleanup levels must be met.
- **Selecting Cleanup Actions.** This step involves evaluating methods that could be used to clean a site and then deciding which of those methods would best achieve cleanup standards. When more than one method of cleanup is used at a site, it may be necessary to establish "remediation levels" to indicate what concentrations of contaminants will be handled using the different cleanup methods. Aside from meeting the cleanup standards, the cleanup actions must also comply with applicable state and federal laws, protect human health and the environment, provide for compliance monitoring to ensure effectiveness, provide for permanent cleanup to the maximum extent practicable, provide for a reasonable restoration time frame, and consider public concerns. When it is not practicable to restore a site to the cleanup standards, the regulation allows use of engineered containment systems to seal off contamination on the site in some circumstances, provided it can be shown that the cleanup will still be protective of human health and the environment.

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## Step 1. How Cleanup Levels are Established

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Eliminating all risks at a contaminated site often is not possible, even after cleanup. And since any level of exposure to a hazardous substance is assumed to result in some risk, “clean” generally means that a site is cleaned up to the point that contamination no longer poses an unacceptable threat to human health and the environment. This point is defined by the cleanup level established for each medium (ground water, surface water, soil, and air) at a site.

- For *cancer-causing substances*, the cleanup level for each substance at a site must be below a concentration that would cause an exceedance of the allowable level of excess cancer risk in humans. The allowable level of excess cancer risk is defined in the regulation (see discussion below). If more than one substance at a site can cause cancer, the effect of all of those substances combined must be considered when establishing cleanup levels.
- For *non-carcinogenic substances*, the cleanup level for each substance at a site must be below a concentration that could cause illness in humans. If more than one substance at a site affects the body in the same way, the effect of all of those substances combined must be considered when establishing cleanup levels.
- For *both types of substances*, the cleanup level for each substance must also be below a concentration that could adversely impact terrestrial or aquatic ecological receptors (plants and animals), unless it can be demonstrated that such impacts are not a concern at the site.

## Methods for Establishing Cleanup Levels

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The regulation provides three options for establishing cleanup levels. These options and their applicability are described below.

### Method A: Applicable Laws and Tables

- **How does it work?** Method A provides tables of cleanup levels that are protective of human health for 25 to 30 of the most common hazardous substances found in soil and ground water at sites. These levels were developed using the procedures in Method B. The Method A cleanup level for a substance must be at least as stringent as the concentration in the Method A table and the concentrations established under applicable state or federal laws. For soil, the Method A cleanup level must also be at least as stringent as a concentration that will not result in significant adverse effects on the protection and propagation of terrestrial ecological receptors (plants and animals), unless it can be demonstrated that such impacts are not a concern at the site.

If neither the Method A table nor the applicable state and federal laws provide a value, then the natural background concentration or the practical quantitation limit (PQL) may be used as the cleanup level.

- **When is it used?** Method A is designed for cleanups that are relatively straightforward or involve only a few hazardous substances. This method is typically used at smaller sites that do not warrant the costs of conducting detailed site studies and site-specific risk assessments.

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## Method B: Universal Method

- **How does it work?** Cleanup levels under Method B are established using applicable state and federal laws and the risk assessment equations and other requirements specified for each medium.

Method B is divided into two tiers—standard and modified. Standard Method B uses generic default assumptions to calculate cleanup levels. Modified Method B provides for the use of chemical-specific or site-specific information to change selected default assumptions.

For both standard and modified Method B, the human health risk level for individual carcinogens may not exceed one-in-a-million. If more than one type of hazardous substance is present, the total risk level at the site may not exceed 1 in 100,000. Levels for non-carcinogens cannot exceed the point at which a substance may cause illness in humans (that is, the hazard quotient cannot exceed 1).

In addition to accounting for human health impacts, Method B cleanup levels must account for any potential terrestrial or aquatic ecological impacts. Unless it can be demonstrated that such impacts are not a concern at the site, the cleanup level for each substance must be below a concentration that could adversely impact ecological receptors (plants and animals). Specific procedures are provided in the rule for assessing the impact of hazardous substances on terrestrial ecological receptors.

The natural background concentrations and practical quantitation limits for a substance must also be considered when setting cleanup levels under Method B.

- **When is it used?** Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not listed under Method A. Sites that are cleaned up to Method B cleanup levels generally do not need future restrictions on the use of the property due to the small amount of residual contamination typically left on the property.

## Method C: Conditional Method

- **How does it work?** Method C is similar to Method B. Like Method B, Method C is divided into two tiers – standard and modified. The main differences are: (1) cleanup levels are based on less stringent exposure assumptions and (2) the lifetime cancer risk is set at 1 in 100,000 for both individual substances and for the total cancer risk caused by all substances on a site.

As under Method B, potential terrestrial and aquatic ecological impacts must be accounted for in addition to human health impacts when establishing Method C cleanup levels. Unlike Method B, though, only the impacts on wildlife must be considered when conducting a terrestrial ecological evaluation.

As under Method B, the natural background concentrations and the practical quantitation limits for a substance must also be considered when establishing Method C cleanup levels.

- **When is it used?** Method C cleanup levels may be used to set soil and air cleanup levels at industrial sites and to set air cleanup levels in manholes and utility vaults. For ground water, surface water, and air cleanup levels, Method C may also be used when Method A or B cleanup levels are lower than technically possible or area background concentrations, or when attainment of those levels may result in a significantly greater overall threat to human health and the environment than attainment of Method C cleanup levels, provided all practicable methods of treatment have been used and institutional controls are in place.

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## How Points of Compliance are Determined

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"Point of compliance" defines the point or points on a site where cleanup levels must be met. This term includes both "standard" and "conditional" points of compliance.

- **Standard Point of Compliance.** The regulation defines the standard point of compliance for each medium (ground water, surface water, soil, and air). The point of compliance is generally defined as throughout the site. Unless a site qualifies for a conditional point of compliance (described below), cleanup levels must be met at the standard point of compliance for each media.
- **Conditional Point of Compliance.** For certain media (such as ground water and air), the regulation allows for the establishment of less stringent "conditional" points of compliance. As implied by the term, conditional points of compliance may only be established if certain specified conditions are met.

For example, a conditional point of compliance for ground water may only be established where it can be demonstrated that it is not practicable (due to technological limitations, environmental conditions, or other factors) to meet the cleanup level throughout the site within a reasonable restoration time frame. Attaining cleanup levels directly under a landfill, for example, would require the excavation of tons of garbage, possibly causing more harm than good. In such cases, Ecology may approve a conditional point of compliance, provided that the point is located as close to the source of contamination as possible. Any contamination left on the site must be contained within a specified area that protects humans and ecological receptors (plants and animals) from exposure to the contaminants.

## Step 2. Selecting Cleanup Actions

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Step 2 of the cleanup process involves evaluating cleanup action alternatives (method(s) for cleaning up a site) and selecting a cleanup action from among those alternatives. The MTCA Cleanup Regulation specifies certain minimum requirements that all cleanup actions must meet, including the following threshold and other requirements:

- **Compliance with Cleanup Standards.** If a cleanup action alternative does not comply with cleanup standards, the alternative is an "interim action," not a "cleanup action." However, where an alternative involves containment of soils with hazardous substance concentrations exceeding cleanup levels at the point of compliance, the alternative may be determined to comply with cleanup standards provided it meets several specific requirements, including that the alternative is protective of human health and the environment.
- **Compliance with Applicable State and Federal Laws.** Cleanup levels and actions must comply with existing state or federal laws. For example, if the cleanup involves pumping and treating ground water and discharging the treated ground water to surface water, surface water discharge requirements in state and federal water quality laws must be met.
- **Protecting Human Health and the Environment.** The cleanup action selected must either remove or destroy the contamination, restoring the site to cleanup levels, or contain the contamination in such a way that will minimize future exposure of humans and ecological receptors (plants and animals). Cleanup action alternatives that achieve cleanup levels at the applicable points of compliance and comply with applicable state and federal laws are presumed to be protective of human health and

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the environment. Cleanup action alternatives that provide for the containment of soils must be demonstrated to be protective of human health and the environment through either quantitative or qualitative risk assessments.

- **Providing for Compliance Monitoring.** The cleanup action selected must provide for monitoring to verify that the cleanup action achieves cleanup or other performance standards and that the cleanup action remains effective over time.
- **Using Permanent Solutions to the Maximum Extent Practicable.** As required by the Model Toxics Control Act, the cleanup action selected must use permanent solutions to the maximum extent practicable. Permanent solutions (cleanup actions) are actions in which cleanup standards can be met without further action being required, such as monitoring or institutional controls. To select the most practicable permanent solution from among those cleanup action alternatives that are protective of human health and the environment requires conducting a disproportionate cost analysis. This analysis involves comparing the costs and benefits of alternatives and selecting the alternative whose incremental costs are not disproportionate to the incremental benefits. The comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgment.
- **Providing for a Reasonable Restoration Time Frame.** Some cleanup methods, such as natural attenuation, can take years or even decades to restore a site for some contaminants. When evaluating alternative methods of cleanup, the period of time required to restore the site (to achieve cleanup and other performance standards) must be considered. The regulation specifies factors that must be considered when determining whether the restoration time frame is reasonable.
- **Considering Public Concerns.** Public notice and participation is an integral part of the remedy selection process. The public notice and participation requirements for cleanups conducted by Ecology or conducted by a potentially liable person under an order or decree are set forth in the rule. For example, the regulation requires that the draft cleanup action plan, which describes the proposed method of site cleanup, must be submitted for public review and comment. For cleanup plans where site-specific risk assessment is used to establish cleanup levels or to evaluate the protectiveness of a remedy or for cleanup plans that would restrict future site or resource use, public notices are required to specifically invite comment on these elements of the plan.

## **Promoting Public Participation**

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- **Citizen Technical Advisor.** Citizens may contact the Citizen Technical Advisor at the Department of Ecology to assist them in understanding the regulations governing cleanup and the implications of the cleanup choices being made.
- **Grants.** Grants are also available to citizens and non-profit public interest groups for the purpose of facilitating public participation in the investigation and cleanup of hazardous waste sites.

## **Protection After Cleanup**

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- **Institutional Controls.** Institutional controls are measures undertaken to limit or prohibit activities that interfere with the integrity of a cleanup action or that may result in exposure to hazardous substances at a site. The regulation specifies those circumstances where institutional controls are required as part of a cleanup action. These circumstances include the following: (1) sites where contamination remains at

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concentrations that exceed the established Method A or B cleanup levels; (2) sites where Method C is used to establish cleanup levels; (3) sites where soil cleanup levels are established based on industrial land use, and (4) sites where a conditional point of compliance is used. Institutional controls may also be required to establish a site-specific cleanup level for non-potable ground water or to ensure the continued protection of terrestrial ecological receptors (plants and animals). In most cases, the institutional controls must be recorded as part of the property deed to warn future property owners of the condition and to restrict activities or use of the property that could result in exposure to the contamination. Tenants must also be notified of these restrictions in any lease agreement.

- **Financial Assurance.** Sites using engineered containment systems may be required to post a bond or other financial instrument to guarantee that the containment system is maintained as long as contamination is present at the site.
- **Confirmational Monitoring.** Monitoring must be conducted at each site to confirm the long-term effectiveness of the cleanup action once cleanup standards and other performance standards have been attained.
- **Periodic Review.** Where institutional controls or financial assurances are required (see above), or if certain other conditions exist, Ecology will conduct a review of the site every five years to ensure the continued protection of human health and the environment. Ecology will also publish a notice of any periodic review in the Site Register and provide an opportunity for public review and comment.

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## Leaking Underground Storage Tanks

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Leaking underground storage tanks have the potential to cause fires or explosions and can easily contaminate nearby drinking water sources. Consequently, owners and operators of leaking underground storage tanks should contact Ecology for additional requirements that may apply to their sites.

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## For More Information / Special Accommodation Needs

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If you would like more information on setting cleanup standards or cleaning up sites, please call us toll-free at **1-800-826-7716**, or contact your regional Washington State Department of Ecology office listed below. Information about site cleanup, including access to a variety of technical guidance documents, is also accessible through our Internet address:

<http://www.ecy.wa.gov/programs/tcp/cleanup.html>.

- **Northwest Regional Office** **425/649-7000**  
(Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom Counties)
- **Southwest Regional Office** **360/407-6300**  
(Southwestern Washington, Olympic Peninsula, Pierce, Thurston and Mason Counties)
- **Central Regional Office** **509/575-2490**  
(Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima Counties)
- **Eastern Regional Office** **509/329-3400**  
(Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman Counties)

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**Disclaimer Notice:** This fact sheet is intended to help the user understand the Model Toxics Control Act Cleanup Regulation, chapter 173-340 WAC. It does not establish or modify regulatory requirements.