



DEPARTMENT OF
ECOLOGY
State of Washington

Concise Explanatory Statement
Chapter 173-351 WAC
Criteria for Municipal Solid Waste Landfills

Summary of rule making and response to comments

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Concise Explanatory Statement

Chapter 173-351 WAC Criteria for Municipal Solid Waste Landfills

Waste 2 Resources Program
Washington State Department of Ecology
Olympia, Washington 98504-7600

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Introduction

The purpose of a Concise Explanatory Statement is to:

- Meet the Administrative Procedure Act (APA) requirements for agencies to prepare a Concise Explanatory Statement (RCW 34.05.325).
- Provide reasons for adopting the rule.
- Describe any differences between the proposed rule and the adopted rule.
- Provide Ecology's response to public comments.

This Concise Explanatory Statement provides information on The Washington State Department of Ecology's (Ecology) rule adoption for:

Title: Criteria for Municipal Solid Waste Landfills
WAC Chapter(s): Chapter 173-351 WAC
Adopted date: November 7, 2012
Effective date: December 9, 2012

To see more information related to this rule making or other Ecology rule makings please visit our web site: <http://www.ecy.wa.gov/laws-rules/index.html>

Reasons for Adopting the Rule

In 2004 EPA amended the federal rule (40 CFR Part 258) to allow Municipal Solid Waste Landfills (MSWLFs) to obtain Research, Development, and Demonstration (RD&D) permits for new and existing landfills and lateral expansions. This rule adopts this provision to allow use of innovative or new technologies for run-on control systems, liquid restrictions, and final cover requirements. The amended rule will allow facilities, with concurrence from the local health jurisdictions and the state solid waste program, to take advantage of these RD&D permits provided that MSWLF owners/operators demonstrate that compliance with the permit will not increase risk to human health and the environment.

Prior to these amendments, Ecology had partial approval from EPA for our MSWLF rule. One of the primary goals of this rule making is to gain full federal approval of Washington's municipal solid waste landfill permitting program. On October 9, 1991, EPA promulgated revised criteria for municipal solid waste landfills, 40 CFR Part 258. Subtitle D of the Resource Conservation and Recovery Act (RCRA) requires states to develop permitting programs to ensure facilities comply with federal criteria under Part 258. On October 15, 1993, Ecology submitted an application for a state program adequacy determination. EPA issued its determination on March 24, 1994, with a partial approval of Washington's program. The definition of an existing MSWLF unit and the design criteria in WAC 173-351-300 were not approved by EPA.

Section 4005(a) of RCRA provides that citizens may use the citizen suit provisions of Section 7002 of RCRA to enforce the federal municipal solid waste landfill criteria in 40 CFR Part 258 independent of any state enforcement program. Any owner or operator complying with provisions in a state program approved by EPA is considered to be in compliance with the federal criteria. Ecology wants to ensure through this rule making that any owner or operator of a municipal solid waste landfill unit permitted in accordance with Chapter 173-351 WAC is not vulnerable to citizen suits resulting from Washington's partial approval.

By incorporating the recent RD&D and other federal amendments into Chapter 173-351 WAC, we anticipate achieving full approval of our state program from EPA.

Rule changes include:

- Adoption of new federal regulations which allow for issuance of Research, Development and Demonstration (RD&D) permits
- Elimination of equivalent and arid liner designs and greater flexibility for alternate liner designs consistent with federal regulations
- Elimination of arid closure cover design criteria
- Adoption of new post-closure care period standards, which are based on potential risk to human and environmental receptors
- Addition of a requirement to file an environmental covenant at closure in accordance with Chapter 64.70 RCW, Uniform Environmental Covenants Act
- Inclusion of prevailing wage law provisions for financial assurance for closure
- Changing dissolved metals groundwater monitoring parameters to total metals
- General "housekeeping" issues such as clarification of definitions, formatting changes and ensuring that the rule is consistent with Chapter 173-350 WAC, Solid Waste Handling Standards.

Differences Between the Proposed Rule and Adopted Rule

RCW 34.05.325(6)(a)(ii) requires Ecology to describe the differences between the text of the proposed rule as published in the *Washington State Register* and the text of the rule as adopted, other than editing changes, stating the reasons for the differences.

There are some differences between the proposed rule filed on May 21, 2012 and the adopted rule filed on November 8, 2012. Ecology made these changes for all or some of the following reasons:

- In response to comments we received.
- To ensure clarity and consistency.
- To meet the intent of the authorizing statute.

The following content describes the changes and Ecology’s reasons for making them. Where a change was made solely for editing or clarification purposes, we did not include it in this section. All changes Ecology made to the text of the proposed rule amendments are identified in Appendix C to this document.

1. Multiple locations: Inserted “or through the permit modification process of WAC 173-351-720(6).”

Reason: Comments received requested provisions for making changes to plans, other documents, and permit provisions using a more flexible process. The change made in many locations in the rule allows owners or operators to use the permit modification process to seek changes.

2. WAC 173-351-010: Inserted text under the effective dates.

Reason: Changes were made under groundwater monitoring and post-closure requirements which included specific effective dates.

3. WAC 173-351-100: Changed the definition of “modification.”

Reason: Comments received requested provisions for making changes to plans, other documents, and permit provisions using a more flexible process. The change in the definition allows owners or operators to use the permit modification process to seek changes.

4. WAC 173-351-130(2)(b): Changed requirements for when an owner or operator must notify the Federal Aviation Authority.

Reason: Ecology reviewed 49 USC § 44718 and the Federal Aviation Administration’s Advisory Circular Number 150/5200-33A in response to comments and agree that the six-mile notification would only apply to new landfill units.

5. WAC 173-351-200(11)(b)(ix): Revised annual reporting requirements for financial assurance.

Reason: The reporting requirements were changed to reflect changes for financial assurance in WAC 173-351-600.

6. WAC 173-351-400: Deleted the note at the end of the section.

Reason: The note required groundwater sampling to be performed by or under the direct supervision of a geologist or other licensed professional. Chapter 18.220 RCW, Geologists, and Chapter 308-15 WAC, Geologic Licensing Services, establish the licensing requirements for persons practicing geology. The law is administered by Geologist Licensing Board at the Washington State Department of Licensing. Ecology does not want to include provisions that may be in conflict with the jurisdictional agency.

7. WAC 173-351-410(3): Deleted requirements to report groundwater data in printed electronic report form.

Reason: The proposed rule required groundwater data to be reported in multiple forms. Ecology eliminated the requirement to submit groundwater data in both a printed and electronic report form (i.e. spreadsheet) to simplify the process. Ecology will specify that groundwater data be submitted through the department's Environmental Information Management database.

8. WAC 173-351-430(2) and 440(2): Inserted provisions for developing groundwater background data for MSWLF units transitioning from dissolved metals sampling and analysis to total metals.

Reason: This rule changes the manner in which groundwater samples are sampled and analyzed for metal constituents. Existing landfills have accumulated historical data for dissolved metals for the purpose of establishing background conditions. The change provides a method for existing facilities to establish background concentrations for total metals.

9. WAC 173-351-500(1)(a)(ii): Changed requirements for alternative final cover system designs.

Reason: The alternative final cover design, having equivalent performance to the composite layer cover system, specified in the proposed rule was unintentional. Ecology understands that incorporating a geomembrane into the final cover design is not always necessary to prevent excess infiltration or exposure of waste from erosion. The adopted rule provides for alternative final cover designs having equivalent performance to the cover systems specified for arid areas in the earlier version of the rule.

10. WAC 173-351-500(2)(c): Inserted a one year effective date for updating post-closure plans to incorporate changes to requirements.

Reason: Owners or operators of existing MSWLF units are required to modify their post-closure plans to incorporate new functional stability criteria and environmental covenants. The change provides a one year period to accomplish the changes.

11. WAC 173-351-600(2)(a)(v), (3)(a)(v), and (4)(a)(iv): Deleted requirement to annually submit findings of reviews performed to determine if cost estimates require adjustment for inflation..

Reason: In response to comments, Ecology deleted the proposed sections, eliminating the requirement to annually submit findings of reviews performed to determine if cost estimates require adjustment for inflation. Owners or operators must still ensure cost estimates, and associated financial assurance mechanism, are kept current.

12. WAC 173-351-600(5)(a)(ii): Inserted additional financial assurance mechanisms for municipal corporations.

Reason: The additional financial assurance mechanisms were added to provide municipal corporations the options that are available to private companies.

13. WAC 173-351-990 Appendix II: Changed iron and manganese sampling and analysis from total metals to dissolved metals.

Reason: Iron and manganese are evaluated as geochemical indicator parameters using cation/anion balance calculations. Total metal values would include contributions from particulate matter which would skew dissolved ion values.

Response to Comments

Description of comments:

Ecology accepted comments between May 21, 2012 and July 6, 2012. This section provides extracted verbatim comments that we received during the public comment period and our responses. (RCW 34.05.325(6)(a)(iii))

Ecology reviewed the public comments and grouped them into the applicable section of the rule. Groupings are organized showing the proposed rule, adopted rule (if different), comments, and Ecology's response to comments. Each of the citations reflects a particular issue or set of issues raised by one or more individuals or organizations.

Commenter identification:

Quotes from written and oral comments are shown in italics. References to comments are shown and designated by the name of the individual providing the comment and the organization they represent if applicable [e.g., (*John Smith, Organization*)]. A comprehensive list of persons who submitted comments are provided as an index following this section. Copies of written comments and public testimony are included as appendices to this document.

General Comments

Public Comments

I wanted to find out if any of these rules are going to apply to that and what do you do with an unlined landfill that's been going on for so long. Does it become a cleanup site? What do they do? Ecology is supposed to be working on it but I haven't heard about anything further going on. We have actually 3 landfills that are problematic in Mason County; the city the county and now the state in one. (Vandehey)

Ecology's Response to Public Comments

This rule applies to landfill units that receive household waste after November 26, 1993. Except under special conditions, the rule does not apply to municipal solid waste landfill units that were closed before April 4, 1994, such as the Mason County Municipal Landfill. This rule also does not apply to landfill units that do not accept household waste such as wood waste landfills, inert waste landfills, or limited purpose landfills regulated under Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling, or Chapter 173-350 WAC, Solid Waste Handling Standards.

Public Comments

The rule making process for updating WAC 173-351 will have significant financial impacts to Yakima County. We are requesting that the Department of Ecology consult with Yakima County to mitigate these impacts. (Mifflin, Yakima County Public Services)

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Ecology's Response to Public Comments

Ecology's technical staff are available to consult with facility owners and operators, environmental consulting firms, and local health jurisdictions to help identify the most cost-effective solutions for meeting requirements and opportunities for cost savings available under the rule updates.

Proposed Rule Example

WAC 173-351-140(1)(a) Sole source aquifers ... (vi) Is prepared by a ~~((hydrogeologist or other professional groundwater scientist in accordance with WAC 173-351-400(2)))~~ geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists; and

Public Comments

King County is seeking clarification whether or not the term "licensed professional" includes a professional engineer or if DOE is seeking to preclude professional engineers from performing these tasks? We wish to extend this comment to all new sections referring to 18.220 RCW, Geologists. (Kiernan, King County)

Ecology's Response to Public Comments

Chapter 18.220 RCW, Geologists, and Chapter 308-15 WAC, Geologic Licensing Services, establish the licensing requirements for persons practicing geology. The law is administered by Geologist Licensing Board at the Washington State Department of Licensing. Questions regarding meeting professional requirements under Chapter 18.220 RCW should be directed to Washington Department of Licensing. They can be contacted by phone at 360-664-1497, email at geologist@dol.wa.gov, or by mail at Geologist Licensing Board, Department of Licensing, PO Box 9045, Olympia, WA 98507-9045.

WAC 173-351-010 Purpose, applicability, and effective dates.

Proposed Rule

WAC 173-351-010 (2) Applicability.

(a) These criteria apply to new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this regulation(~~(+)~~). All other solid waste disposal facilities and practices that are not regulated under subtitle C of RCRA and chapter 70.105 RCW are subject to the criteria contained in 40 CFR Part 257, Criteria For Classification of Solid Waste Disposal Facilities, chapter 173-350 WAC, and/or chapter 173-304 WAC as amended.

Public Comments

The "Applicability" section set forth above does not provide a specific reference concerning the applicability of these regulations to "bioreactor landfills" and "leachate recirculating landfills." In later sections of the code, the regulations refer to "R&D permits." The "Applicability" section needs to clarify whether or not the regulations apply to these additional landfills and permits. (Kiernan, King County)

Ecology's Response to Public Comments

The rule applies to all municipal solid waste landfill units except as specified. Bioreactor landfills, and other landfill units accepting household wastes, are a subset of those identified in the applicability section and are subject to the rule.

Proposed Rule

WAC 173-351-010(2)(c) All MSWLF units that receive waste on or after ~~((the effective date of this chapter))~~ November 26, 1993, must comply with this chapter by ~~((the effective date of this chapter))~~ November 26, 1993, unless:

(i) Later effective dates are specified elsewhere in this chapter, such as WAC 173-351-400 (1)(b), groundwater monitoring ~~((and WAC 173 351 600 (4)(e)))~~; or

Adopted Rule

WAC 173-351-010(3) Effective dates.

(a) All MSWLF units that receive waste on or after ~~((the effective date of this chapter))~~ November 26, 1993, must comply with this chapter by ~~((the effective date of this chapter))~~ November 26, 1993, unless:

(i) Later effective dates are specified elsewhere in this chapter, such as WAC 173-351-400 (1)(b), groundwater monitoring, WAC 173-351-430 (2)(b), detection monitoring program, WAC 173-351-440(2), assessment monitoring, WAC 173-351-500 (2)(c), closure and post-closure care, and WAC 173-351-600 (1)(b), financial assurance criteria ~~((and WAC 173 351 600 (4)(e)))~~; or

Public Comments

Effective Date of this Chapter – The proposed effective date of this chapter is November 26, 1993. Please clarify that Terrace Heights Landfill and Cheyne Landfill will be considered in compliance if the proposed rule is adopted and that only new expansions would be affected by the proposed rule change.

Department of Ecology clarified that the Terrace Heights Landfill and Cheyne Landfill would be in compliance if the rule was adopted and that only new expansions would be affected at the meeting on June 14, 2012. (Mifflin, Yakima County Public Services)

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Ecology's Response to Public Comments

Municipal solid waste landfill (MWSLF) units that were constructed and received waste prior to November 26, 1993, are existing units as defined. Existing MSWLF units are exempt from some requirements of the rule. Each of the location restrictions in WAC 173-351-130 provides the degree of applicability to existing units. For example, owners or operators of all MSWLF units must be designed and operated to not pose a bird hazard to aircraft while the Federal Aviation Administration must be notified only for proposed new MSWLF units and lateral expansions. The location requirements of WAC 173-351-140 only apply to new MSWLF units and lateral expansions. The design criteria in WAC 173-351-300 apply only to new MSWLF units and lateral expansions of existing units.

Terrace Heights Landfill and Cheyne Landfill were permitted under the arid landfill design requirements of the 1993 version of WAC 173-351-300(2)(b). The arid landfill design requirements are now the basis for the alternative design in WAC 173-351-300(2)(b) with minor changes. WAC 173-351-300(2)(b) incorporates Chapter 173-200 WAC, Water Quality Standards for Groundwaters of the State of Washington, a requirement to adequately control methane, and four concentrations in Table 1 were adjusted to comply with current standards. These changes from the earlier arid landfill design criteria are the only way in which compliance with the newly adopted design criteria would affect an active landfill unit.

WAC 173-351-100 Definitions

Public Comments

All definitions should be included in the same section at the beginning of WAC 173-351 to enable the reader to easily locate and access the applicable information necessary to accurately understand the code terminology.

The definition of "airport" is previously defined in section 100 of WAC 173-352. It does not need to be in both places. King County recommends that this definition be deleted and that a reference to WAC 173-352-130 be inserted into the definition of "airport" within the definitions section of the code.

King County is concerned that important code definitions are being placed within certain code sections and not also provided in the general "Definition Section" of WAC 173-351. King County urges DOE to include all definitions in the general "Definition Section" for greatest clarity and usefulness to the reader. Definitions may also be referenced, included and/or repeated in specific code sections within WAC 173-351, but it is far easier for the regulated community to look in the "Definitions Section" of the regulation for all definitions than to have to look up a reference to various sections seek a specific definition. (Kiernan, King County)

Ecology's Response to Public Comments

Several definitions were copied into the definitions section that were previously only referenced under definitions and were located in the body of the rule. These include "airport", "areas

susceptible to mass movement”, “bird hazard”, “disease vectors”, “displacement”, “fault”, “flood plain”, “free liquids”, “gas condensate”, “Holocene”, “lithified earth material”, “liquid waste”, “lower explosive limit”, “maximum horizontal acceleration in lithified earth material”, “100-year flood”, “poor foundation conditions”, “regulated dangerous waste”, “seismic impact zone”, “sole source aquifer”, “structural components”, “unstable area”, “vulnerability”, and “wetlands.”

These definitions were not deleted from the body of the rule because they are found in the only section where the term is used. Ecology believes including all definitions in the definitions section and locating some definitions in the section they are used makes the rule easier to use as it reduces the need to flip between sections in the rule. For example, the term “airport” is only used under in WAC 173-351-130(2), airport safety.

Terms that include regulatory requirements in their definition are only referenced in the definitions section. These include “composite layer”, “composite liner”, “point of compliance”, and “random inspection.” For example, the definition of “random inspection” in WAC 173-351-200(1)(b)(ii) provides the procedures which must be followed to perform random inspection.

Proposed Rule

"Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally in the environment or that occurs at concentrations greater than natural background levels.

"Contaminated" or "contamination" means the alteration of the physical, chemical, biological, or radiological properties of soil or waters of the state such that the soil or water could pose a threat to human health or the environment or the alteration is a violation of any applicable environmental regulation.

Public Comments

Basically, it felt that the definition of contaminant needs to be further consistent and more specific with regards to what is a contaminant. You have definition of contamination, probably should follow within that same realm of characterization rather than saying does not occur naturally in the environment. I think that is overly broad and reaching. (Taam, Spokane Regional Solid Waste System)

This proposed change allows any analyte to be a contaminant. The newly proposed language is also much broader than the original wording from the code and fails to specify the cause of the alleged contamination, e.g., whether or not it was caused by the owner/operator of the facility, etc. Additionally, changing "groundwater" to "waters of the state" is a large expansion of scope. It is important for DOE to provide a clear definition of "waters of the state" and to identify what is included under that category. Furthermore, how will "a threat to human health or the environment" be determined? Will confined waters that are hydrogeologically independent of beneficial water sources (puddles, leachate ponds) be excluded or included?

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Additionally, the change in the definition of "contaminated" uncouples Maximum Contaminant Levels and Statistically Significant Increases from contamination and replaces them with "threats to human health or the environment" or violation of another regulation. This is much broader than the original wording and more subjective, leading to greater uncertainty on the part of the regulated community. (Kiernan, King County)

Ecology's Response to Public Comments

The definition of contaminant was developed to coincide with the various ways the term is used in the rule. It was intentionally meant to broadly apply to changes to the environment resulting from human activity. For example, new MSWLF units and lateral expansion may not be located over designated sole source aquifers unless the owner or operator can demonstrate it is not vulnerable to contamination from the landfill's active area. The demonstration includes an assessment of contaminant movement and ease of contaminant remediation should the integrity of landfill engineering controls fail. The term is also used multiple times in regards to contaminant fate and transport modeling.

The term is not meant to specify the cause of the contamination. Contaminant fate and transport modeling would evaluate potential contaminants released from a MSWLF unit. Under WAC 173-351-440(7)(e) an owner or operator may demonstrate that a source other than a MSWLF unit caused the contamination while performing assessment monitoring.

The term *waters of the state* was used in the definition to include potential discharges to surface waters along with groundwater. Waters of the state are defined in Water Pollution Control, RCW 90.48.020 to include lakes, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

A threat to human health or the environment would initially be established in groundwater using the procedures in WAC 173-351-440(8). Contaminant concentrations are established in accordance with Chapter 173-340 WAC, the Model Toxics Control Act Cleanup Regulation for releases requiring remedial action.

Proposed Rule

"Free liquids((-)" means any portion of material passing through and dropping from a filter as determined by Method 9095B (Paint Filter Liquids Test), in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200(9).

"Liquid waste((-)" means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200 (9)(c)(i).

Public Comments

King County recommends inserting the word 'waste' into this definition as shown above in bold type. The definition of "free liquids" should not include non-waste materials. (Kiernan, King County)

Ecology's Response to Public Comments

The term "free liquids" is only defined to clarify the definition of "liquid waste." Liquid wastes are restricted from placement in landfill units under WAC 173-351-200(9).

Proposed Rule

"Existing MSWLF unit" means any municipal solid waste landfill unit that is receiving solid waste as of the appropriate dates specified in WAC 173-351-010 (3)(a). Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good waste management practices, including operating plans approved under chapter 173-304 WAC. ~~((For the purposes of this rule, any existing horizontal expansion approved by the jurisdictional health department for which as-built plans documenting construction prior to the effective date of this chapter, have been prepared and submitted to the jurisdictional health department shall be considered an existing MSWLF unit.))~~

"Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit that is not an existing horizontal expansion. (See also definition of "existing MSWLF unit.")

"Municipal solid waste landfill unit (MSWLF unit)" means a discrete area of land or an excavation that receives household waste, and that is not a land application ~~((unit))~~ site, surface impoundment, injection well, or ~~((waste))~~ pile, as those terms are defined under chapter ~~((173-304))~~ 173-350 WAC, ~~((the Minimum functional standards for))~~ Solid waste handling standards or chapter 173-218 WAC, Underground injection control program. A MSWLF unit also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally-exempt small quantity generator waste, and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion.

"New MSWLF unit" means any municipal solid waste landfill unit that has not received waste prior to ~~((the effective date of this regulation.))~~ November 26, 1993.

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Public Comments

These revised definitions raise a question concerning landfills developed in phases with multiple cells or units -each cell or unit having disparate open and closure periods-are they considered discrete units per the definitions or is the whole landfill the unit? (Kiernan, King County)

Ecology's Response to Public Comments

The Criteria for Municipal Solid Waste Landfills, Chapter 173-351 WAC apply to MSWLF units individually. The term municipal solid waste landfill unit refers to an individual structure used for the disposal of household waste. MSWLF units are often constructed in phases, each phase being a lateral expansion. Lateral expansions are considered part of the MSWLF unit. Each MSWLF unit has a closure plan but the cover system may also be constructed in phases. Post-closure care begins once the entire unit is closed. A facility can have multiple MSWLF units within its property boundaries.

Proposed Rule

"Modification" means a substantial change in the design or operational plans including removal of a design element of a MSWLF unit previously set forth in a permit application or a disposal or processing activity that is not approved in the permit. To be considered a substantial change, a modification must be reasonably related to a specific requirement of this rule. Lateral expansions, a fifty percent increase or greater in design volume capacity or changes resulting in significant adverse environmental impacts that have ~~((lead))~~ led a responsible official to issue a declaration of significance under WAC 197-11-736 ~~((shall))~~ are not ~~((be))~~ considered a modification but ~~((would))~~ require permit reissuance under these rules.

Adopted Rule

"Modification" means a substantial change in the design or operational plans including removal of a design element of a MSWLF unit previously set forth in a permit application or a disposal or processing activity that is not approved in the permit. A substantial change includes any change in the design, operation, closure, post-closure, financial assurance, environmental monitoring or other aspect of an MSWLF unit that is reasonably related to a specific requirement of this rule and was not previously set forth in a permit application or approved in the permit. ~~((To be considered a substantial change, a modification must be reasonably related to a specific requirement of this rule.))~~ Lateral expansions, a fifty percent

increase or greater in design volume capacity or changes resulting in significant adverse environmental impacts that have ~~((lead))~~ led a responsible official to issue a declaration of significance under WAC 197-11-736 ~~((shall))~~ are not ~~((be))~~ considered a modification but ~~((would))~~ require permit reissuance under these rules.

Proposed Rule Example

WAC 173-351-200(2)(b) Alternative materials of an alternative thickness other than at least six inches (15 centimeters) of earthen material may be approved by the jurisdictional health department ~~((if the))~~. The owner or operator must demonstrate~~((s))~~ during the permit process of WAC 173-351-700 that the alternative material and thickness will not present a threat to human health or the environment; will not adversely affect gas or leachate composition or collection; will control disease vectors, fires, odors, blowing litter, and scavenging; and provide~~((s))~~ adequate access for heavy vehicles~~((, will not adversely affect gas or leachate composition and controls and scavenging without presenting a threat to human health and the environment))~~.

Adopted Rule Example (emphasis added)

WAC 173-351-200(2)(b) Alternative materials of an alternative thickness other than at least six inches (15 centimeters) of earthen material may be approved by the jurisdictional health department ~~((if the))~~. The owner or operator must demonstrate~~((s))~~ during the permit process of WAC 173-351-700 **or through the permit modification process of WAC 173-351-720(6)** that the alternative material and thickness will not present a threat to human health or the environment; will not adversely affect gas or leachate composition or collection; will control disease vectors, fires, odors, blowing litter, and scavenging; and provide~~((s))~~ adequate access for heavy vehicles~~((, will not adversely affect gas or leachate composition and controls and scavenging without presenting a threat to human health and the environment))~~.

Public Comments

The regulations should be revised to allow of variance or alternative compliance designs or procedures to be approved outside of the normal permitting process under WAC 173-351-700.

There are numerous provisions in the current regulations and Proposed Revisions where a landfill owner or operator can seek and obtain regulatory relief from the health department or Ecology, but these opportunities are specifically tied to the permitting process under WAC 173-351-700. For example, WAC 173-351-210 requires that "[e]ach owner or operator must

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develop, keep, and abide by a plan of operation approved as part of the permitting process in WAC 173-351-700." WAC 173-351-210 (emphasis added). Thus, this provision could be read to preclude a landfill owner from making any change to the plan of operation – even if approved by the health department – unless the change was made during the permitting process.

While, WMW does not disagree with the need to obtain approvals, the requirement should be made more flexible so that appropriate and approved changes could be made at times other than "during the permitting process in WAC 173-351-700." This change can generally be made by deleting the phrase "during the permitting process in WAC 173-351-700" wherever it appears in Chapter 173-351 WAC. (Shanley, Waste Management)

King County believes that there should be opportunities to propose alternative cover materials during other times of site operation than only during the permitting process. Alternative cover material may become available or practicable years after the permit has been approved, and the opportunity to use these materials should not be restricted to permit application. (Kiernan, King County)

Ecology's Response to Public Comments

Ecology agrees that an owner or operator needs the ability to propose changes to the design, operation, monitoring, financial assurance, and other aspects of a MSWLF unit at any time with a process that is less burdensome than the full permitting process. The definition of modification was expanded to include any aspect related to a specific requirement of the rule or permit provision. The allowance "or through the permit modification process of WAC 173-351-720(6)" was inserted throughout the rule so that an owner or operator, jurisdictional health department, and Ecology have a well defined process for approval or denial of proposed modifications.

Proposed Rule

"Vulnerability((-)" means the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or cleanup, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. See WAC 173-351-140 (1)(b).

Public Comments

King County recommends changing this definition to: "means the quantifiable risk propensity or likelihood of a" (Kiernan, King County)

Ecology's Response to Public Comments

The definition of "vulnerability" was not changed from the language adopted in 1993 under WAC 173-351-140(1)(b). Ecology does not believe changing the language during this rule making process is necessary.

WAC 173-351-130 Location Restrictions.

Proposed Rule

WAC 173-351-130(2)(b) Owners or operators proposing to site new MSWLF units and/or lateral expansions within a (~~five-mile eight~~) six-mile (ten kilometer) radius of any airport runway end used by turbojet or piston-type aircraft must notify the effected airport and the Federal Aviation Administration (FAA) and conform to all applicable requirements.

Adopted Rule

WAC 173-351-130(2)(b) Owners or operators proposing to site new MSWLF units (~~and/or~~) within a six-mile (ten kilometer) radius or lateral expansions within a five-mile (eight kilometer) radius of any airport runway end used by turbojet or piston-type aircraft must notify the effected airport and the Federal Aviation Administration (FAA) and conform to all applicable requirements.

Public Comments

The revision to the airport safety location restrictions in WAC 173-351-130(2)(b) are inconsistent with 40 CFR Part 258 and 49 USC§ 44718(d).

Without explanation, Ecology has inserted a change to the airport safety restrictions in WAC 173-351-130(2)(b) that increases the notification requirement from five miles to six miles for landfills located near certain airports. While WMW does not dispute that notification is appropriate for siting new landfills within six miles of an airport, it disagrees that this requirement should be imposed on lateral expansions of existing landfills. WMW believes that Ecology has proposed this revision because federal DOT requirements place limitations on the construction of new landfills within six miles of airports. 49 USC§ 44718(d)(1) ("No person shall construct or establish a municipal solid waste landfill ... that receives putrescible waste ... within 6 miles of a public airport ... unless the State aviation agency ... requests that the [FAA] exempt the landfill from the application of this subsection and the Administrator determines that such exemption would have no adverse impact on aviation safety."). This requirement clearly applies to new landfills and clearly does not apply to existing landfills,

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including expansions of existing landfills. The statute states that the requirement "shall not apply to the construction, establishment, expansion, or modification of, or to any other activity undertaken with respect to, a municipal solid waste landfill if the construction or establishment of the landfill was commenced on or before the date of the enactment of this subsection [April 5, 2000]." 49 USC§ 44718(d)(1) (emphasis added).

If the Proposed Revisions are to address this issue, they should be revised to apply only to landfills where the "construction or establishment ... was commenced" after April 5, 2000. (Shanley, Waste Management)

Ecology's Response to Public Comments

Ecology reviewed 49 USC § 44718 and the Federal Aviation Administration's Advisory Circular Number 150/5200-33A and agree that the six-mile notification would only apply to new landfill units. Appropriate changes were incorporated into the rule as adopted.

WAC 173-351-140 Location Restrictions.

Proposed Rule

WAC 173-351-140(1) Groundwater

~~((e))~~ (b) Drinking water supply wells. ~~((No))~~ New MSWLF units
~~((or))~~ and lateral expansions active area ~~((shall))~~ may not be
located closer than one thousand feet (three hundred meters) to
any drinking water supply well, in use and existing at the time
of the purchase of the property containing the active area
unless the owner or operator can demonstrate during the permit
process of WAC 173-351-700 that the active area is no less than
a ninety-day hydraulic travel time to the nearest down-gradient
drinking water supply well in the first useable aquifer. The
owner or operator must place the demonstration in the
application for a permit under WAC 173-351-700 ~~((and be issued a
solid waste permit by the jurisdictional health department))~~.
Such a demonstration must be prepared by a geologist or other
licensed professional in accordance with the requirements of
chapter 18.220 RCW, Geologists, and include:

Public Comments

This change appears to remove a grandfather clause when purchase of land for a future landfill predates the use of a water well. The revised language might impose a limitation on use of portions of current landfill property. Does travel time criterion in the demonstrations proposed include vadose zone travel time? If not, why not? Yakima County requests that the current rule not be changed for this section.

Rule language was modified as requested above by the Department of Ecology. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

Ecology agrees that changes proposed in the informal public review period to remove the time of purchase establishing applicability could be problematic to facility owners and operators.

WAC 173-351-200 Operating criteria.

Proposed Rule

WAC 173-351-200(1)(b) For purposes of this subsection:

(i) "~~((Regulated dangerous))~~ Prohibited waste" means a solid waste that is:

(A) A dangerous waste as defined in WAC ((173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 CFR Part 61,)) 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or was not generated by an exempted small quantity generator as defined in WAC 173-303-070;

Adopted Rule

(A) A dangerous waste as defined in WAC ((173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 CFR Part 61,)) 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or WAC 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070;

Public Comments

WMW does however have one specific recommendation for a revision to WAC 173-351-200(1)(b)(i) to reconcile an inconsistency between Chapter 173-351 WAC and Chapter 173-303WAC – the Dangerous Waste (“DW”) regulations. Specifically, WMW recommends that Ecology revise WAC 173-351-200(1)(b)(i) to include the underlined text below which would read as follows:

"Regulated dangerous waste" means a solid waste that is a dangerous waste as defined in WAC 173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 C.F.R. Part 61, that is not excluded from regulation as a dangerous waste under WAC 173-303-071, or that is not a conditionally excluded special waste under WAC 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070; ...

This revision is necessary because the DW regulations allow for the disposal of certain conditionally excluded special waste in municipal solid waste (“MSW”) landfills permitted under Chapter 17-351 WAC, yet the MSW landfill regulations do not include a corresponding authorization. Specially, the DW regulations provide, at WAC 173-303-073:

.....

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While the codified exclusion of certain dangerous wastes from "regulated dangerous waste" under WAC 173-303-071 is included, the regulations omit – we believe unintentionally – the exclusion for conditionally excluded special wastes under WAC 173-303-073.

WMW believes that the proposed revision is necessary to reconcile the two sets of regulations and is consistent with Ecology's determination "special wastes pose a relatively low hazard to human health and the environment." (Kenefick, Waste Management Washington)

Ecology's Response to Public Comments

Ecology agrees that conditionally excluded special wastes under WAC 173-303-073 are not dangerous waste for the purposes of this rule. Appropriate changes were incorporated into the rule as adopted.

Proposed Rule

WAC 173-351-200(2) Cover material requirements.

(a) Except as provided in (b) of this subsection, the owners or operators of all MSWLF units must cover disposed solid waste with six inches (fifteen centimeters) of earthen material, i.e., soils, at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

Public Comments

The definition of soils is not specific as the characteristics of soils; there needs to be a specific indication of the characteristics of appropriate cover soil. For example, the California regulations have a good example of the makeup of the aggregate acceptable for soil. (Kiernan, King County)

Ecology's Response to Public Comments

Ecology believes the existing language provides sufficient specificity.

Public Comments

The proposed language does not clearly identify how this requirement applies to a facility that is actively managing waste 24 hours/day. Can language be included that clarifies this language for such a facility? (Mains, Regional Disposal Company)

Ecology's Response to Public Comments

Owners or operators of facilities operating twenty four hours a day should cover waste within twenty-four hours of placement in a landfill, or more frequently if necessary to control disease vectors, fires, odors, blowing litter, and scavenging.

Proposed Rule

WAC 173-351-200(3) Disease vector control.

(a) Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

Public Comments

Jurisdictional health departments need more guidance on appropriate techniques for protection of human health and the environment. They also need guidance on how to determine what constitutes an acceptable level of vector control. This section is the cause of much conflict between local regulators and landfill operators. (Kiernan, King County)

Ecology's Response to Public Comments

The Washington State Department of Health and local health jurisdictions have primacy in protecting human health and the environment from pathogens carried by disease vectors. Requirements for appropriate and acceptable vector controls change over time as health threats evolve and emerge. Guidance is available from Washington State Department of Health, Centers for Disease Control and Prevention, and Environmental Protection Agency.

Proposed Rule

WAC173-351-200(9)Liquids restrictions.

(a) Except as allowed under WAC 173-351-710, bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:

WAC173-351-200(9)(a)(ii)(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300 ((2)(a)(i) and (ii) or (iii))(3); and

Public Comments

WAC 173-351-200(9)(a)(ii)(A) should allow liquids addition for landfills with an alternative design approved under WAC 173-351-300(2)(b).

As currently drafted, liquids addition under WAC 173-351-200(9) is allowable only if the landfill is designed with a prescriptive liner under WAC 173-351-300(2)(a), but not with an alternative design approved under subsection (2)(b). WAC 173-351-200(9) should be revised to read as follows:

(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300(2)(a) or an alternative design approved under WAC 173-351-300(2)(b);

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While liquids addition would still be subject to the approval of the health department, this revision would remove the limitation that only the prescriptive liner (subsection (2)(a)) could be used even though the alternative liner (subsection (2)(b)) meets or exceeds the liner performance criteria.

In 2000, EPA recognized that this restriction may be unnecessary and began a rulemaking process that would have eliminated the restriction. EPA noted,

Many MSWLF stakeholders (e.g., States, local governments, solid waste associations, and industry) believe that under certain conditions, leachate recirculation should be allowed when alternative liners are used. In fact, some believe that alternative liner technologies can be superior to the composite liner design specified in the criteria. We are trying to determine if it is possible to design and operate MSWLFs safely when alternative liner designs are used and leachate is recirculated. As required by the regulations, such an alternative liner design must assure that the performance standard specified at 40 CFR §258.40(a)(1) and the requirement to maintain a hydraulic head within the landfill of 30 cm. or less are met.

65 Fed. Reg. 18014, 18017 (Apr. 6, 2000). Unfortunately, EPA suspended this effort and instead addressed the alternative liner design issue under the RD&D rulemaking. 67 Fed. Reg. 39662, 39664 (June 10, 2002). (Shanley, Waste Management)

The proposed edit excludes reintroduction of liquids generated by the MSWLF unit over an approved liner system that demonstrates the groundwater quality standards at the relative compliance point(s) will not be exceeded. Should the reference be expanded to include alternate liner systems as approved through 173-351-300 (2)? (Mains, Regional Disposal Company)

Ecology's Response to Public Comments

The restriction from placing bulk or noncontainerized liquids in MSWLF units not constructed with leachate collection and composite liner comes from the federal Criteria for Municipal Solid Waste Landfills at 40 CFR Part 258.28(a)(2). The federal rule does not provide for directors of approved states to grant waivers or allow alternative designs under this requirement.

WAC 173-351-210 Plan of operation.

Proposed Rule

Each plan of operation (~~(shall)~~) must include:

(7) How operators will meet each requirement of WAC 173-351-200 and 173-351-220; and

Public Comments

Addition of this requirement increases the bureaucratic nature of the operating plan, which is intended to be a document to 'convey to site operating personnel the concept of operation intended by the designer.' Each additional layer of bureaucracy included in the operating plan decreases the likelihood that the operating plan will be used as a functional tool for operating personnel. King County respectfully requests that DOE consider the function of the operating plan and its purpose. For example, is the purpose of the operating plan to satisfy the permitting agency that the facility owner/operator has the ability to develop a document capable of listing all requirements repeatedly, or is it to guide operating personnel in meeting the intent of the designer? (Kiernan, King County)

Ecology's Response to Public Comments

The purpose of the plan of operation is to communicate to site personnel the concept of operation intended by the designer. The concept of operation must ensure conformance with applicable regulatory requirements. This subsection is not meant require a plan of operation to include an explanation of how operators will meet the requirements of WAC 173-351-200 and 220. Rather, it is intended to ensure that all operational requirements are addressed in the plan of operation so site personnel will understand how operate the facility in a manner that conforms to regulatory requirements. It also allows a local health jurisdiction to ensure the facility will meet applicable requirements when it is operated in accordance with the plan of operation.

WAC 173-351-300 Design criteria.

Public Comments

I guess from the standpoint of performance related versus standard design, I think the previous performance related criteria makes more sense. We are not all the same. Eastern Washington, Central Washington is not the same as Western Washington and I don't think one should be all. In fact, the west side, I think, yeah, they have a lot more rain and a lot more groundwater and all the other water problems and they should have, actually, higher standards than Eastern Washington or Central Washington. So, I think just to get delegation, or to be in compliance with EPA, I guess we don't really care. And, I think it loses the purpose of Ecology to be in compliance with EPA and just because they say so we have to do that. We've had this system here for a long period of time and it's worked just well, so yeah, it would be nice to be consistent, but that is the purpose of the state and the State Department of Ecology. So, that's from our point of view. (Taam, Spokane Regional Solid Waste System)

Ecology's Response to Public Comments

The design criteria in the version of the rule adopted in 1993 WAC 173-351-300(2)(a) and (b) provide two distinct approaches to design for arid and nonarid locations. Arid was defined as locations having less than twelve inches of precipitation annually while nonarid locations have twelve or greater inches of precipitation. This concept was carried over from the previous rule applicable to municipal solid waste landfills in WAC 173-304-460(c).

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Nonarid locations required conformance to a prescriptive design or a design demonstrated to be equivalent to the prescriptive design. Landfills located in areas meeting the arid definition were required to be designed to a performance standard demonstrated to protect groundwater quality.

There have been significant advances in understanding regarding landfill design and materials since the previous rule and version of this rule were developed. These resulted from lessons learned with new materials, such as geosynthetic clay liners, potential adverse groundwater quality impacts resulting from volatile organic compound transport in landfill gas, bioreactor landfills, advances in modeling, and the increasing size of landfill units. Ecology believes it is no longer appropriate for annual precipitation to be the prime factor driving landfill designs.

Proposed Rule

WAC 173-351-300(2) New MSWLF units and lateral expansions ~~((shall))~~ must be constructed:

(a) ~~((For nonarid landfills, in accordance with a standard design as follows:~~

~~(i))~~ With a composite liner as defined in ((a)(ii)) subsection (3) of this ((subsection)) section and a leachate collection system that is designed and constructed to maintain less than a 1 foot (30 cm) depth of leachate over the liner((-

Note: Leachate head in leachate pump sump areas, only, shall not be allowed to exceed two feet (60 cm).

~~(ii))~~ and less than a 2-foot depth over the leachate pump sump area; or

(b) In accordance with an alternative design approved by the jurisdictional health department with the department's written consent. Alternative designs must ensure that the maximum contaminant levels listed in Table 1 of this section and the criteria in the water quality standards for groundwaters of the state of Washington, chapter 173-200 WAC, will not be exceeded in the hydrostratigraphic unit(s) identified in the hydrogeologic characterization/report at the relevant point of compliance as specified during the permitting process in WAC 173-351-700. Alternative designs must also sufficiently control methane to meet the criteria in WAC 173-351-200 (4)(a).

Public Comments

Ecology should delete the requirement in WAC 173-351-300(2)(a) that there can be no more than 2 feet of leachate head over a leachate pump sump area.

Ecology's regulations and Proposed Revisions include a requirement that leachate collection system must be maintained such that the depth of leachate over the leachate pump sump area is no more than two feet. WAC 173-351-300(2)(a). This is not a requirement of Subtitle D and is unnecessary. By specifying the maximum depth of leachate over a sump, the regulations

unnecessarily restrict the design and operation of the leachate collection system. The optimal design of the leachate sump can vary from site to site and should not be unnecessarily constrained by such a prescriptive standard. While WMW does not disagree with the requirement to maintain less than one foot of leachate head over the liner, WMW recommends deleting the 2-foot head-over-sump restriction. (Shanley, Waste Management)

Ecology's Response to Public Comments

This requirement is in place to prevent excess hydraulic head over a liner system to reduce leakage resulting from flaws in materials. The limit of no more than two feet of head over the leachate pump sump area is not a new requirement. The limit was included as a note in the version adopted in 1993 under WAC 173-351-300(2)(a). The same requirement was included for leachate systems in the Minimum Functional Standards for Solid Waste Handling at WAC 173-304-460(3)(b)(ii), adopted in 1985, and the Solid Waste Handling Standards at WAC 173-350-400(3)(c)(ii). Ecology does not believe the limit poses significant design or operational constraints.

Public Comments

What does the word "or" mean at the end of the sentence above? Is it reasonable to infer from the language used that an alternative design can preclude the designated liner, the leachate collection, the leachate depth restrictions, or all three of these systems as long as WAC 173-200 criteria are not exceeded? Please clarify the meaning of the term "or" as it is used in this code section. Additionally, this explanation should be placed in the general "Definitions Section" for greatest clarity and usefulness. Furthermore, as previously stated, while terms may be referenced in the specific code sections, it is most helpful to include a standard definition of a term in the "Definition Section" of WAC 173-352 for ultimate clarity. (Kiernan, King County)

The term "alternative design" should be a defined term and placed in the "Definitions Section" of the code. As appropriate, such definition could also be included in the above text, but in all events, the definition should remain constant to provide the reader with ultimate clarity. (Kiernan, King County)

Ecology's Response to Public Comments

The word "or" following WAC 173-351-300(2)(a) means that MSWLF units must be constructed either with a composite liner and leachate collection system or with an alternative design meeting the requirements of WAC 173-351-300(2)(b).

Alternative design means a design that is different than one meeting the requirements of WAC 173-351-300(2)(a).

Public Comments

Our primary area of concern continues to be the existence of, and even planning for, new, unlined landfills. One public witness at the Lacey hearing addressed this concern, as have others in the industry. We simply believe that unlined landfills are

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unsafe and harmful to the environment and the populace, whether they are for municipal solid waste or other waste streams.

We believe that unlined landfills afford those individuals who would skirt other solid waste laws a below market disposal option, encouraging the delivery of more volume and potentially questionable waste streams to these unlined landfills rather than to operators who have expended the full cost of regulatory compliance, and established facilities that are markedly more protective of the environment and public health in our state. We would urge that any existing or new unlined landfills be held to higher standards when it comes to the acceptance of waste, financial assurance and monitoring, and be subject to more regular inspection by regulatory authorities to insure that waste streams accepted are in accordance with permit provisions.

Unlined landfills have and remain a threat to the environment, collection systems and eventually a liability that will be assumed by the ratepayer and/or taxpayer.

We trust that the Department shares our concern and that the proposed rules regarding liner design will be fashioned to eventually eliminate the use of all unlined landfills in our state. New unlined landfills should not be approved, and existing unlined facilities (operational or closed) should be in compliance with the proven science and technology we have now, not that which, if it existed at all, was or was not applied 50 plus years ago.

WRRRA urges you to consider seriously the comments that will be filed by our members who are directly involved in this issue. For our part, we urge you to vigorously enforce any rules and to recognize that the "day" of the unlined or inadequately lined landfill has long since passed, and we all need to recognize this reality. (Lovaass, Washington Refuse and Recycling Association)

Ecology's Response to Public Comments

One of the primary goals of this rule making is to gain full federal approval of Washington's municipal solid waste landfill permitting program. On October 9, 1991, EPA promulgated revised criteria for municipal solid waste landfills, 40 CFR Part 258. Subtitle D of the Resource Conservation and Recovery Act (RCRA) requires states to develop permitting programs to ensure facilities comply with federal criteria under Part 258. On October 15, 1993, Ecology submitted an application for a state program adequacy determination. EPA issued its determination on March 24, 1994, with a partial approval of Washington's program. The design criteria in WAC 173-351-300 were not approved by EPA.

Section 4005(a) of RCRA provides that citizens may use the citizen suit provisions of Section 7002 of RCRA to enforce the federal municipal solid waste landfill criteria in 40 CFR Part 258 independent of any state enforcement program. Any owner or operator complying with provisions in a state program approved by EPA is considered to be in compliance with the federal criteria. Ecology wants to ensure through this rule making that any owner or operator of

a municipal solid waste landfill unit designed and constructed in accordance with Chapter 173-351 WAC is not vulnerable to citizen suits resulting from Washington's partial approval.

When Ecology began this rule making it agreed with the commenter that the criteria in the 1993 version of the rule "can result in unlined landfills that do not adequately control leachate or landfill gas." (See CR-101, June 2004.) However, Ecology determined it could not justify requiring liner and leachate collection systems for MSWLF units that could be demonstrated to protect human health and the environments and meet all state and federal regulations without these systems.

Alternative landfill designs, which include unlined landfills, must ensure that the revised concentration values listed in WAC 173-351-300, Table 1, and the criteria in the Water Quality Standards for Ground Waters of the State of Washington, Chapter 173-200 WAC are not exceeded. Further, landfill gasses must be sufficiently controlled to meet the explosive gas criteria in WAC 173-351-200(4)(a). The revised rule addresses concerns with unlined landfills and other alternative designs in three ways. First, the concentration values in Table 1 were amended so that they protect human health and the environment and meet all state and federal rules applicable to groundwaters and drinking water. Second, the criteria in the Water Quality Standards for Ground Waters of the State of Washington, Chapter 173-200 WAC, are adopted into the rule. These criteria apply to any activities that have the potential to pollute groundwaters of the state. Adopting them into this rule clarifies their applicability to owners and operators of municipal solid waste landfill units. Third, controlling landfill gasses is now included as a design criteria. Controlling landfill gas continues as an operational criteria but this revision acknowledges the role of design.

Ecology believes that through the updates to the criteria applicable to alternative designs, and the increasing body of knowledge regarding contaminant fate and transport mechanisms, human health, the environment, and groundwaters of the state will be protected with municipal solid waste landfill units meeting the alternative design criteria.

Public Comments

The proposed modifications to the rule delete the arid design which is the approved design standard for both Cheyne and Terrace Heights Landfills and instead allows for an alternate design. Since a demonstration has been made and approved for both Terrace Heights Landfill and Cheyne Landfill it is our understanding that the proposed rule change should not affect current operations at either landfill or future excavations of Cell 2 at Cheyne. Please clarify that our understanding is correct.

The Department of Ecology confirmed that our understanding is correct on June 14, 2012. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

Several landfills in Eastern Washington were permitted under the arid landfill design requirements of the 1993 version of WAC 173-351-300(2)(b). The arid landfill design requirements are now the basis for the alternative design in WAC 173-351-300(2)(b) with minor changes. WAC 173-351-300(2)(b) incorporates Chapter 173-200 WAC, Water Quality Standards for Groundwaters of the State of Washington, a requirement to adequately control methane, and four concentrations in Table 1 were adjusted to comply with current standards. These changes from the earlier arid

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landfill design criteria are the only way in which compliance with the newly adopted design criteria would affect an active landfill unit approved under the form arid design criteria.

Proposed Rule

WAC 173-351-300(7) Liner separation from groundwater. New MSWLF units and lateral expansions may not be designed such that the bottom of the lowest liner component is any less than ten feet (three meters) above the seasonal high level of groundwater, unless a demonstration can be made during the permit process of WAC 173-351-700 that a hydraulic gradient control system, or the equivalent, can be installed which prevents the controlled seasonal high level of groundwater in the identified water-bearing unit from contacting the bottom of the lowest liner component. For the purposes of this section, groundwater includes any water-bearing unit that is horizontally and vertically extensive, hydraulically recharged and volumetrically significant as to harm or endanger the integrity of the liner at any time. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700. This demonstration must include:

Public Comments

This section does not provide clarity for perched ground water zones. The definition does not specify what DOE considers to be 'horizontally and vertically extensive' or 'volumetrically significant' ground water, exposing the regulated community to uncertainty as to whether a specific perched zone will fall under the requirements of this section. (Kiernan, King County)

Ecology's Response to Public Comments

It is necessary to keep the definition of a water-bearing unit general in WAC 173-351-300(7) since there is potential for great variability in such units in the field. The purpose of defining water-bearing units as those that are horizontally and vertically extensive, hydraulically recharged and volumetrically significant, is to emphasize that small, localized pockets of groundwater may not be sufficient to endanger the integrity of a liner. Although it might seem that rigid criteria might help the regulated community by providing greater certainty as to whether a specific perched zone falls under the requirements of this section, such rigid criteria are not realistic and might actually constrain project proponents when constraints are unnecessary.

Proposed Rule

TABLE 1

CHEMICAL	Maximum Contaminant (Levels MCL) Concentration (mg/l)(+)
ARSENIC	0.00005
BARIUM	1.0
CADMIUM	(0.01) <u>0.005</u>
CARBON TETRACHLORIDE	0.0003
CHROMIUM (HEXAVALENT)	0.05
2,4-DICHLOROPHENOXY ACETIC ACID	(0.1) <u>0.07</u>
1,4-DICHLOROBENZENE	0.004
1,2-DICHLOROETHANE	0.0005
1,1DICHLOROETHYLENE	0.007
ENDRIN	0.0002
FLOURIDE	4
LINDANE	0.00006
LEAD	(0.05) <u>0.015</u>
MERCURY	0.002
METHOXYCHLOR	(0.1) <u>0.04</u>
NITRATE	10
SELENIUM	0.01
SILVER	0.05
TOXAPHENE	0.00008
1,1,1-TRICHLOROETHANE	0.20
TRICHLOROETHYLENE	0.003
2,4,5-TRICHLOROPHENOXY ACETIC ACID	0.01
VINYL CHLORIDE	0.00002

Adopted Rule

TABLE 1

CHEMICAL	Maximum (Contaminant Levels MCL) Concentration (mg/l)(+)
ARSENIC	0.00005

Public Comments

The Table 1 value listed for arsenic (0.00005 mg/L) is at least two orders of magnitude below generally applied laboratory method reporting limits (MRLs) for arsenic using standard Environmental Protection Agency (EPA) testing methods (i.e., Methods SW846 6010 and 6020).

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This is true for other constituents listed in Table 1 and, by reference, in WAC 173-200-040 (Water Quality Standards for Groundwaters of the State of Washington). Ecology should instead rely on the Maximum Contaminant Levels (MCL), criteria published in the Model Toxics Control Act (MTCA), or other reasonable values established under appropriate rule-making processes. Establishing criteria that are lower than MRLs, and in many cases are not representative of background conditions in Washington, is not reasonable or practical. There is also a conflict with the reference to practical quantitation limit (PQL) cited in WAC 173-351-410(2) (referenced below in second comment). (Helland, SCS Engineers)

The Arsenic Maximum Contaminant Concentration (MCC) in Table 1 to WAC 173-351-300 is wrong.

Table 1 lists an MCC for arsenic at 0.00005 mg/l; however, the actual federal Maximum Contaminant Level (MCL) for arsenic is 0.01 mg/l. See 40 CFR § 141.62(b). It is not clear why the regulations have included such a low MCC for arsenic when the purported MCC is at least two orders of magnitude below generally applied laboratory method reporting limits (MRLs) for arsenic under EPA standard test methods (e.g., 6010 and 6020). The current federal MCL for arsenic was revised several years ago from the previous level of 0.050 mg/L. It is possible that the arsenic MCC of 0.00005 mg/L listed in Table 1 was based on the former federal MCL for arsenic, but a mistake was made with respect to the correct units. This error may have first appeared in WAC 173-200-040 which shows a groundwater quality standard of 0.05 µ g/L. It appears this value is also in error and should have been 0.05 mg/L (not µ g/L), corresponding to the federal MCL. The apparent error in Table 1 may have resulted from converting the listed water quality standard in WAC 173-200-040 from µg/L to mg/L, which would result in an erroneous value of 0.00005 mg/L.

Ecology should revise Table 1 to include the correct MCC value of 0.01 mg/L to match the federal MCL in 40 CFR § 141.62(b). (Shanley, Waste Management)

Table 1 to WAC 173-351-300 contains a number of other errors and needs clarification.

Table 1 to WAC 173-351-300 contains a number of problems and needs clarification. The Table identifies the "Maximum Contaminant Concentrations" or "MCCs" for a number of compounds. Presumably, Ecology defines MCCs based on the definition in WAC 173-200-020(15), which adopts the federal MCLs in 40 CFR Part 141. Yet, the current and Proposed Revisions to Table 1 differ from the federal MCLs for most of the compounds – as examples only, arsenic, barium, benzene, endrin, lindane, selenium, etc. Hence, the MCCs in Table 1 should be fully reviewed and revised to be consistent with the federal MCLs. (Shanley, Waste Management)

The Arsenic MCL level in WAC 173-351-300 Table 1 seems inaccurate The Table lists the MCL for Arsenic at 0.00005mg/l; however 40 CFR 141.62 (b) lists the MCL for arsenic at 0.01 mg/l. This level is at least two levels of magnitude lower than the Method Reporting Limits for arsenic

under EPA's standard testing methods. WCI believes the limit should be 0.01 mg/l. (Snyder, Waste Connections Inc.)

Ecology's Response to Public Comments

Table 1 in the criteria for alternative municipal solid waste landfill designs was amended to provide concentration levels protective of human health and in conformance with applicable state and federal regulations. The concentrations listed in Table 1 are the lowest of those found in 40 CFR Part 258, Criteria for Municipal Solid Waste Landfills, Chapter 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington, and 40 CFR Part 141, National Primary Drinking Water Regulations.

This rule is intended to conform fully to 40 CFR Part 258, Criteria for Municipal Solid Waste Landfills. The criteria in Chapter 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington, apply to owners and operators of municipal solid waste landfills. The standards in Chapter 173-200 WAC were established to protect human health and maintain drinking water as a beneficial use.

The concentration for arsenic in Table 1 is health-based standard anticipated to result in an incremental human cancer risk of less than one in one million. Health standards are a major consideration in the National Primary Drinking Water Regulations but other criteria, such as treatment technologies, influence the ultimate maximum contaminant level (MCL). The concentrations in Table 1 are meant to ensure municipal solid waste landfill unites are designed and constructed to meet the criteria in Chapter 173-200 WAC as well as federal standards.

It is important to remember how the concentrations shown in Table 1 are used when comparing them to analytical method reporting limits. The maximum concentrations are not limits applied to groundwater at a facility and are not directly related to groundwater sampling and analysis. Those concentrations and methods are established using the procedures found in WAC 173-351-430, detection monitoring program, and WAC 173-351-440, assessment monitoring program. The maximum concentrations in Table 1 are used to evaluate a proposed alternative landfill design by applying contaminant transport modeling while considering a facility's hydrogeology, climate, and known or estimated leachate characteristics. Analyses performed during the use of Table 1 would be directed at leachate where method reporting limits are not generally a constraint.

WAC 173-351-400 Groundwater monitoring systems and remedial action.

Proposed Rule

~~WAC 173-351-400(2) ((Personnel qualifications. For the purposes of this regulation, a "qualified groundwater scientist" must be a hydrogeologist, geologist, engineer, or other scientist who meets all of the following criteria:~~

~~(a) Has received a baccalaureate or post graduate degree in the natural sciences or engineering; and~~

~~(b) Has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to~~

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~~make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.~~

~~(3) A qualified groundwater scientist is required to prepare)~~
The following reports, demonstrations and information must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists:

Public Comments

King County proposes retaining the original language from WAC 173-351-400(e)(2) concerning personnel qualifications. It is unclear why duly authorized professionals who are not geologists or other licensed professionals pursuant to 18.220 RCW are unacceptable to DOE. The emphasis on 18.220 RCW seems to indicate to King County that DOE desires oversight of almost all aspects of landfills to fall under the discipline of geology and that licensing under this specialty is intended to meet regulatory requirements. Unless this new requirement is clarified in the regulation to allow other licensed professionals to perform tasks and/or prepare required reports, King County maintains concerns that this requirement will have over-reaching and long-term financial impacts on how the County operates its facilities. If it is the intent of the regulation to refer to any appropriate license, reference to the applicable state statute should be Chapter 18 RCW rather than Chapter 18.220 RCW (Geologists). Please provide an explanation if DOE elects to retain the revised language. (Kiernan, King County)

Ecology's Response to Public Comments

Chapter 18.220 RCW, Geologists, became effective in 2000. RCW 18.220.020(1) states "It is unlawful for any person to practice, or offer to practice, geology for others in this state, or to use in connection with his or her name or otherwise assume or advertise any title or description tending to convey the impression that he or she is a licensed geologist, or other licensed specialty geologist title, unless the person has been licensed under the provisions of this chapter."

Chapter 18.220 RCW, Geologists, and Chapter 308-15 WAC, Geologic Licensing Services, establish the licensing requirements for persons practicing geology. Ecology no longer has authority to set professional qualifications for persons performing geology. The law is administered by Geologist Licensing Board at the Washington State Department of Licensing. Questions regarding professional requirements under Chapter 18.220 RCW should be directed to Washington Department of Licensing. They can be contacted by phone at 360-664-1497, email at geologist@dol.wa.gov, or by mail at Geologist Licensing Board, Department of Licensing, PO Box 9045, Olympia, WA 98507-9045.

Proposed Rule

WAC 173-351-400 Note: ((~~A hydrogeologist or other qualified groundwater scientist is **NOT** required for the actual groundwater sampling.~~))

Groundwater sampling must be performed by or under the direct supervision of a geologist or other licensed professional in accordance with chapter 18.220 RCW, Geologists.

Adopted Rule

WAC 173-351-400 (~~Note: A hydrogeologist or other qualified groundwater scientist is **NOT** required for the actual groundwater sampling.~~)

Public Comments

Is it the intent of the proposed language within this note to have a licensed professional be physically present during groundwater sampling? Would it be acceptable to delete the "direct" portion of the note to allow trained technicians to sample in accordance with the Sampling and Analysis Plan required in 173-351-410 (2)(b)? ((Main, Regional Disposal Company))

Ecology's Response to Public Comments

Ecology deleted the note in WAC 173-351-400 regarding the professional licensing requirements for groundwater sampling in the final rule. Chapter 18.220 RCW, Geologists, and Chapter 308-15 WAC, Geologic Licensing Services, establish the licensing requirements for persons practicing geology. The law is administered by Geologist Licensing Board at the Washington State Department of Licensing. Questions regarding professional requirements under Chapter 18.220 RCW should be directed to Washington Department of Licensing. They can be contacted by phone at 360-664-1497, email at geologist@dol.wa.gov, or by mail at Geologist Licensing Board, Department of Licensing, PO Box 9045, Olympia, WA 98507-9045.

WAC 173-351-410 Groundwater sampling and analysis requirements.

Proposed Rule

WAC 173-351-410(1) The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells installed in compliance with WAC 173-351-400 and with this section. The owner or operator must submit the sampling and analysis program documentation as a part of the permit application in accordance with WAC 173-351-730

(1)(b)(iii). The program must include procedures and techniques for:

- (a) Sample collection and handling;
- (b) Sample preservation and shipment;
- (c) Analytical procedures;
- (d) Chain-of-custody control;
- (e) Quality assurance and quality control;

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(f) (~~Decontamination~~) Cleansing of drilling and sampling equipment;

Public Comments

King County proposes retaining "decontamination" as a more specific term than cleansing. The term "cleansing" is unclear. For example, does the term cleansing include: soil residuals and materials that could spread contamination? (Kiernan, King County)

Ecology's Response to Public Comments

Ecology agrees that "decontamination" is the term most often used to refer to the proper cleaning of equipment to prevent samples from becoming tainted. "Decontamination" was changed to "cleansing" in this subsection because using the original term could lead to confusion given the definition of "contamination" in WAC 173-351-100. The cleansing procedures used in a sampling and analysis program must ensure that monitoring results provide an accurate representation of groundwater quality.

Proposed Rule

WAC 173-351-410(2) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples or reflect an acceptable practical quantitation limit (PQL). Groundwater samples (~~shall~~) must not be field-filtered (~~for organic constituents~~) prior to laboratory analysis. All analyses must be sent to an accredited laboratory in accordance with chapter 173-50 WAC, Accreditation of environmental laboratories.

WAC 173-351-990 Appendices.

APPENDIX I⁽¹⁾

Appendix I - Constituents for Detection Monitoring

COMMON NAME ⁽²⁾	CAS RN ⁽³⁾
Inorganic Constituents	
1) Antimony	((Dissolved)) Total
2) Arsenic	((Dissolved)) Total
3) Barium	((Dissolved)) Total
4) Beryllium	((Dissolved)) Total
5) Cadmium	((Dissolved)) Total
6) Chromium	((Dissolved)) Total
7) Cobalt	((Dissolved)) Total
8) Copper	((Dissolved)) Total

- 9) Lead ((Dissolved)) Total)
- 10) Nickel ((Dissolved)) Total)
- 11) Selenium ((Dissolved)) Total)
- 12) Silver ((Dissolved)) Total)
- 13) Thallium ((Dissolved)) Total)
- 14) Vanadium ((Dissolved)) Total)
- 15) Zinc ((Dissolved)) Total)

APPENDIX II
Groundwater QUALITY PARAMETERS

Geochemical Indicator Parameters

Calcium (Ca)	Sodium (Na)
Bicarbonate (HCO3)	Chloride (Cl)
Magnesium (Mg)	Potassium (K)
Sulfate (SO4)	Alkalinity (as Ca CO3)
<u>Total suspended</u>	Iron (Fe) <u>(Total)</u>
<u>solids (TSS)</u>	Manganese (Mn) <u>(Total)</u>

Adopted Rule

WAC 173-351-410(2) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples or reflect an acceptable practical quantitation limit (PQL). Groundwater samples ~~((shall))~~ must not be field-filtered ~~((for organic constituents))~~ prior to laboratory analysis except for geochemical indicator parameters used for cation-anion balance evaluations in WAC 173-351-430(5). All analyses must be sent to an accredited laboratory in accordance with chapter 173-50 WAC, Accreditation of environmental laboratories.

WAC 173-351-990 Appendices.

APPENDIX I⁽¹⁾

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COMMON NAME ⁽²⁾ ¹	CAS RN ⁽³⁾ ²
Inorganic Constituents	
1) Antimony	((Dissolved)) Total)
2) Arsenic	((Dissolved)) Total)
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4) Beryllium	((Dissolved)) Total)

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- 5) Cadmium ((Dissolved)) Total)
- 6) Chromium ((Dissolved)) Total)
- 7) Cobalt ((Dissolved)) Total)
- 8) Copper ((Dissolved)) Total)
- 9) Lead ((Dissolved)) Total)
- 10) Nickel ((Dissolved)) Total)
- 11) Selenium ((Dissolved)) Total)
- 12) Silver ((Dissolved)) Total)
- 13) Thallium ((Dissolved)) Total)
- 14) Vanadium ((Dissolved)) Total)
- 15) Zinc ((Dissolved)) Total)

**APPENDIX II
 Groundwater QUALITY PARAMETERS**

Geochemical Indicator Parameters

Calcium (Ca)	Sodium (Na)
Bicarbonate (HCO ₃)	Chloride (Cl)
Magnesium (Mg)	Potassium (K)
Sulfate (SO ₄)	Alkalinity (as Ca CO ₃)
<u>Total suspended</u>	Iron (Fe) <u>(Dissolved)</u>
<u>solids (TSS)</u>	Manganese (Mn) <u>(Dissolved)</u>

Public Comments

King County encourages DOE to retain the phrase 'for organic constituents' in this section. (Kiernan, King County)

Next, with regards to metals analysis, we think that the movement to total metals is not appropriate. We feel that the previous analysis on the dissolved is more indicative as well as a little more accurate from our point of view. It shows definite, basically statistical modeling better. (Taam, Spokane Regional Solid Waste System)

It is SCS's opinion that the propose rule be revised to require analyses of all trace metals for dissolved concentrations to maintain consistency with historical practices (for most metals). The following factors support this opinion.

- *Most existing municipal solid waste (MSW) facilities in Washington have accumulated extensive, historical groundwater databases that include dissolved metals concentrations (including initial background monitoring data to evaluate baseline groundwater quality conditions). As required in WAC 173-351-420 and 173-351-430, the historical data are combined with new data using Ecology-approved statistical methods to identify potentially*

elevated or increasing concentrations that may be indicative of a release from the landfill. By requiring testing for total trace metals concentrations, new groundwater data will not be usable for statistical comparison to historical data that is typically based on dissolved concentrations. In fact, eight to twelve background monitoring events will be required for total trace metals concentrations before statistical evaluations of total trace metals can begin (if these data are not available).

- *Total suspended solids (TSS) is being added to the list of Appendix II constituents in WAC 173-351-990. Groundwater samples collected from monitoring wells that are properly installed, developed, and routinely sampled typically have low TSS concentrations. For groundwater samples with low TSS concentrations (i.e., sample contains primarily dissolved metals), dissolved metals concentrations will generally be very similar to total metals concentrations. The advantage of using dissolved trace metal analysis is that trace metals results for samples with high TSS concentrations are not biased by colloidal transport of trace metals.*

It is SCS's preferred option to change the analytical method for nickel and mercury to dissolved analysis since it would have less of a potential impact on existing background monitoring datasets. (Helland, SCS Engineers)

And then the last one that I would like to talk about is number nine on my letter, which of course is the groundwater monitoring changes. And it was our understanding from the June 14 meeting that in order for the Department of Ecology to get delegation from EPA that we need to change from dissolved to total metals. We continue to think that is going to be a problem for our facilities, so we are asking for consideration in that part of the rule when you take a look at and we look forward to working with the Department of Ecology on the guidance document. (Mifflin, Yakima County Public Services)

WMW strongly discourages Ecology from changing the metals analysis specified in Appendix I and III to "total" metals. This rule change would pose unnecessary burden on the owner or operator by requiring a significant amount of additional groundwater testing in order to establish background conditions for "total" metals. As required by the existing regulations, MSW facilities have accumulated extensive historical databases for dissolved metals for the purpose of establishing background conditions and performing the required statistical analysis for detection monitoring. Switching to total metals would render the existing background datasets for dissolved metals unusable for future statistical comparisons, and would require extensive additional sampling in order to establish new statistical limits for total metals. This change would also create a "domino effect", whereby existing monitoring plans and statistical databases that were developed specifically for performing compliance monitoring statistics on dissolved metals would have to be redone or, in the case of databases, recreated from scratch. Compliance monitoring for metals would be rendered unusable for years until new data and new program plans and databases were put in place.

Additionally, it appears that a key technical point is being overlooked when considering a switch from "dissolved" to "total" metals testing. Groundwater detection monitoring programs at MSW facilities are designed to monitor for "changes" in geochemical conditions that could be associated with landfill operations. This requirement goes above and beyond any simple comparison to a water quality standard. In order to meet the performance standard of providing

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early and reliable indication of a potential change (i.e. release), it is the geochemically-mobile or "dissolved" fraction of a metal that best represents the true release dynamics without interference from the particulates or colloids that are included in a "total" groundwater sample.

Collection of representative samples is critical for groundwater detection monitoring at MSW facilities where rigid statistics are applied to assess for water quality changes. Many years of experience has shown that monitoring of unfiltered (i.e., "total") metals produces results that may be difficult to reproduce, and whose data sets are often plagued by extreme outliers due to the presence of varying levels of particulate matter in the samples. For applications where representative samples are essential for performing proper statistical analysis and achieving the greatest certainty with regard to identifying a potential water quality change, dissolved metals are considered superior. In those cases where a release has already been confirmed and comparison to regulatory standards may be required, testing for total metals may be appropriate.

With respect to mercury and nickel, WMW recognizes the need to make the entire metals sampling regime consistent and therefore recommends that the analysis for mercury and nickel be switched from a totals analysis to a dissolved analysis. While the problem with historical data will arise, switching the analysis for only two metals will pose a less significant burden on the owner/operator. (Shanley, Waste Management)

WCI strongly suggests that Ecology retain the usage of "dissolved metals" as required in the existing rule and contemplate changing to "total metals" for new landfills.

This change would cause an unnecessary burden on owner/operators of landfills who have retained a database of dissolved metals for years and created their background and statistical analysis for detection monitoring on this approach. This change brings no significant improvement for the environment or the public yet compromises the continuity of the ground water monitoring system. This is a critical point for us; we value a high environmental standard and do not wish to lose this critical component. (Snyder, Waste Connections, Inc.)

Pacific Groundwater Group has been involved in groundwater monitoring using both total and dissolved metals under state, federal, and private programs since 1987. Our experience in long term monitoring programs leads us to recommend that the groundwater monitoring required in WAC 173-351 be continued using dissolved metal analyses rather than change to total metal analysis. Our opinion is that the selection of analytes and analytical methods should be selected to maximize the effectiveness of the monitoring program based on the utility of the resulting data. A change to total metals is likely to hamper the identification of increasing concentration trends, reduce the utility of existing long-term monitoring data, complicate statistical analyses, and increase the false-positive rate leading to unnecessary investigation costs for owners and operators.

We provide below a brief comparative analysis of two readily available data sets containing both total and dissolved metals. Data set A was developed using strict low-flow sampling techniques

which should minimize the suspended solids content of samples. In field applications across the state, sampling techniques, equipment, and personnel are generally not as good as for data set A which will result in greater variability than reflected in data set A. This brief analysis indicates that switching to total metals analysis is likely to weaken environmental protection because suspended solids in some samples will obscure changes in groundwater quality that could threaten human health and the environment.

We encourage Ecology to fully analyze the environmental and financial costs and benefits of any change that it proposes. We ask the following questions related to the proposed change:

- *Why was this change made?*
- *What has changed since writing WAC 173-351 that justifies this change?*
- *Can you provide Washington State examples of risks to human health and the environment caused by use of dissolved data?*
- *How will the proposed change affect protection of human health and the environment?*
- *Does Ecology think that total metals data from monitoring wells better represents insitu groundwater quality than dissolved metals data? (If so, please provide the basis of the opinion).*
- *Has Ecology compared statistics of data sets consisting of dissolved versus total metals data and assessed impacts to the statistical power of resulting detection programs?*

Our experience is that field filtration improves data quality by reducing the unavoidable and variable effects of well construction, sampling personnel, sampling equipment, and sampling methods. Under some hydrogeologic conditions, field filtration may also mask the occurrence of metals adsorbed to colloids that move with groundwater, and could therefore pose a risk to human health and the environment. Our experience tells us that risks from colloidal transport are small compared to risks related to decreased statistical power caused by inclusion of immobile solids in groundwater samples.

We understand Ecology's goal of having a consistent standard for groundwater sampling. And, we know that the State's cleanup regulation (MTCA – WAC 173-340), and Groundwater Quality Criteria (WAC 173-200), both of which relate to WAC 173-351 under some circumstances, require collection of total metals samples. Also the Federal solid waste regulation 40 CFR 258 requires analysis of totals metals. At this time we do not know the basis of the requirement for total metals analyses in those regulations. A technical analysis of that basis and comparison to the goals of detection monitoring, assessment monitoring, and corrective action under WAC 173-351 may be warranted as part of this revision process. In our opinion it is not acceptable to simply change the WAC 173-351 requirement because it differs from those other regulations. A scientific and public interest basis is required. With regard to the State's requirement to meet or exceed the Federal requirement, we expect that analysis will reveal that use of dissolved metals data provides greater ability to detect trends, and thus exceeds the Federal standard with regard to protection of human health and the environment.

COMPARISON OF EXISTING TOTAL AND DISSOLVED ANALYSES

Comparison of paired total and dissolved analyses of groundwater samples can inform the decision making process regarding how detection monitoring programs at landfills will change if WAC 173-351 transitions to total metals. Ecology should be prepared to understand if the use of total metals will improve the ability of landfills to detect groundwater changes during detection

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monitoring or degrade it. PGG conducted two reconnaissance-level analyses of existing data sets to illustrate what some impacts to monitoring could be. The two analyses were:

- Comparison of trend detection between total and dissolved metals in a high-quality dataset (data set "A")
- Comparison of total and dissolved concentrations in all paired analyses for selected metals available from the EIM database.

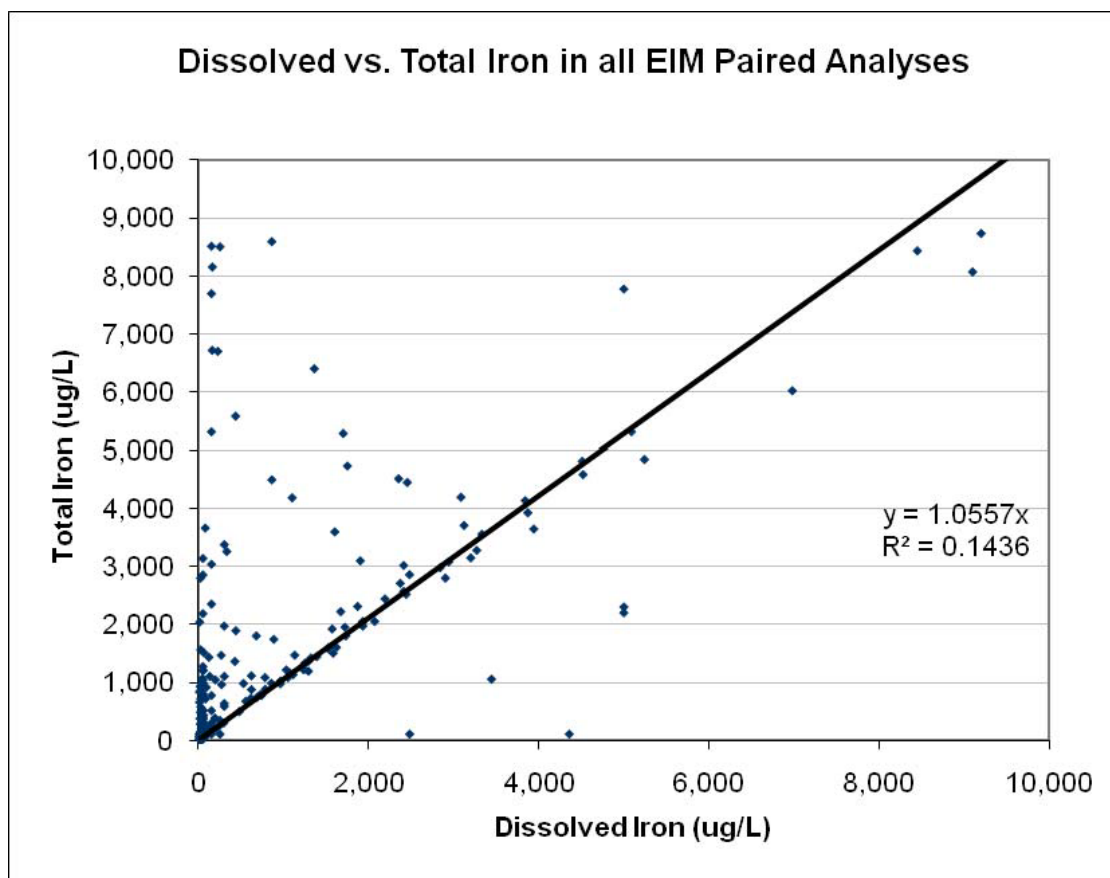
Trend Detection for Data Set A

PGG extracted data from a long term monitoring program which uses EPA low-flow sampling methods, and has CLP Level IV data validation for all monitoring events. All samples were analyzed for both total and dissolved metals. Dissolved metals were field-filtered with a 0.45 micron lab-supplied filter. The monitoring network includes 13 wells that are sampled on a quarterly basis.

Statistical trend tests indicate that a greater number of statistically significant trends were identified using dissolved data. The non-parametric Mann Kendall test for trend identified 69 significant trends in the dissolved data set and 62 in the totals data (out of 169 possible trends of well-constituent pairs). Even with this high quality data set, the results suggest that analysis of dissolved data is more likely to identify an increasing trend than analysis of totals data. This suggests that dissolved analyses are more protective of human health and the environment within a detection monitoring program because they more effectively identify changes in aquifer chemistry. The solid waste data sets across the state vary widely with regard to quality, and are generally not as controlled as data set A – therefore we expect greater degradation of trend detection ability and statistical power for the state as a whole compared to data set A.

Comparison of Total and Dissolved Concentrations in EIM data

Comparison of total and dissolved concentrations show that total concentrations are generally higher, and often do not correlate well with dissolved concentrations. For example, the figure presented below is a plot of all iron data from the EIM for which both totals and dissolved data are available. The plot shows that total concentrations scatter above a 1:1 line with differences of up to several orders of magnitude. This is apparent across the range of dissolved concentrations, and is most pronounced at lower concentrations near the detection limit. This high variability could result in false positive exceedances of GWCLs.



WEAK DETECTION PROGRAMS AND CONFUSION DURING TRANSITION

If detection monitoring programs transition to analyzing total metals, existing data sets will no longer be useful for analysis of landfill performance. New “background” data sets will be required, and for intra-well programs at existing landfills, this background will be developed during landfilling operations. This is one example of the practical difficulties that will ensue with the proposed change. If the proposed change is made, Ecology should provide a method of implementation that minimizes cost to operators. (Ellingson, Pacific Groundwater Group)

All metals should be in "Dissolved" form, not "Total." The change from "dissolved" to "total" metals will make relevant comparison to previous data nearly impossible. Without a program of dedicated pumps, low-flow sampling, frequent well redevelopment and documentation of TSS/Turbidity conditions, data gathered going forward will likely be highly variable and probably useless. (Kierman, King County)

The proposed language replaces the dissolved metals analysis with total metals analysis. As commented on during the informal comment period Regional Disposal Company continues to disagree to the change to total metals analysis without technical justification. "The change in testing will most likely hamper the identification of increasing concentration trends, reduce the utility of existing long-term monitoring data, complicate statistical analyses, and increase the false-positive rate leading to unnecessary investigation costs for owners and operators...field filtration improves data quality by reducing the unavoidable

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and variable effects of well construction, sampling personnel, sampling equipment, and sampling methods." - PGWG July, 2011. (Mains, Regional Disposal Company)

The proposed change could affect existing and new monitoring programs depending on how it is implemented which is not clear. The proposed WAC does not appear parallel to the federal regulation in all respects and we are unclear how Ecology is choosing to deviate from the federal regulation. Low flow monitoring methods are not fully implemented for the Yakima County Landfill monitoring programs because of high horsepower pumps that are required to handle the pumping lifts which are up to 650 feet. Why was this change made? What has changed since writing WAC 173-351 that justifies this change? Can Ecology provide Washington State examples of risks to human health and the environment caused by use of dissolved data? Does Ecology think that metals data from monitoring wells better represents groundwater quality than dissolved data and if so please provide a basis for opinion? Will current programs based on dissolved metals be required to switch? How should total data be compared to background defined by dissolved concentrations? Has Ecology compared statistics of data sets consisting of dissolved versus total metals data and assessed impacts to the statistical power of resulting detection programs? Would centrifuging unpreserved total samples be an acceptable alternative to filtration to reduce turbidity prior to analysis for metals?

It is our understanding that in order for the Department of Ecology to get delegation from EPA that groundwater monitoring data will need to be changed from dissolved to total metals data. At the meeting on June 14, 2012, the Department of Ecology stated that this change would not happen until a permit expires and that a guidance document would be developed that Yakima County Solid Waste would have input to prior to issuance, While we still have the same concerns as outlined above, we look forward to working with the Department of Ecology on the guidance document. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

The 1993 version of the rule provided inconsistent procedures for sampling and analysis of groundwater for metal constituents. Nickel and mercury were specified as 'total metals' while all others except iron and manganese were specified as 'dissolved metals'. The rule did not specify a method for iron and manganese. Ecology wanted to provide clear and consistent procedure for sampling and analysis of groundwater in the revised rule.

Another primary goal of this rule making is to gain full federal approval of Washington's municipal solid waste landfill permitting program. On October 9, 1991, EPA promulgated revised criteria for municipal solid waste landfills, 40 CFR Part 258. Subtitle D of the Resource Conservation and Recovery Act (RCRA) requires states to develop permitting programs to ensure facilities comply with federal criteria under Part 258. On October 15, 1993, Ecology submitted an application for a state program adequacy determination. EPA issued its determination on March 24, 1994, with a partial approval of Washington's program.

Section 4005(a) of RCRA provides that citizens may use the citizen suit provisions of Section 7002 of RCRA to enforce the federal municipal solid waste landfill criteria in 40 CFR Part 258

independent of any state enforcement program. Any owner or operator complying with provisions in a state program approved by EPA is considered to be in compliance with the federal criteria. Ecology wants to ensure through this rule making that any owner or operator of a municipal solid waste landfill unit monitoring groundwater in accordance with Chapter 173-351 WAC is not vulnerable to citizen suits resulting from future partial approvals.

Ecology considered several issues in developing the metals sampling and analysis requirements in the rule. These included the close to twenty years of data collected under the rule and impacts resulting from changing methods, consistency challenges from suspended particles, conformance with the requirements of 40 CFR Part 258 and Chapters 173-200 WAC, harmonization with Chapter 173-340 WAC, and protecting human health and the environment.

In evaluating the impacts of changing methods at facilities with many years of groundwater data, Ecology shares the concerns expressed by the commenters. We expect careful sampling technique and the transition provisions in WAC 173-351-430(2)(b) will alleviate the problems associated with the change in sampling methods at most facilities. However, Ecology understands there will be circumstances where the change will create significant difficulties. Ecology also understands that results obtained from non-filtered samples will introduce greater variability, making the identification of statistically significant increases and trends more difficult

The criteria in the Water Quality Standards for Ground Waters of the State of Washington, Chapter 173-200 WAC, apply to any activity that has the potential to pollute groundwaters of the state. The requirements in WAC 173-351-400 through 490 must ensure that an owner or operator of a MSWLF unit meeting the criteria also conform to criteria in Chapter 173-200 WAC. The previous conflicting methodology for sampling and analysis of metals could cause difficulties implementing assessment monitoring requirements. Owners or operators are required to establish a groundwater protection standard using the criteria in Chapter 173-200 WAC whenever a statistically significant increase over background is detected. Dissolved metals analysis did not provide the information required establish a groundwater protection standard under the rule or determine whether Chapter 173-340 WAC, Model Toxics Control Act Cleanup Regulation was applicable.

Ecology discussed the conflicting methodology for sampling and analysis of metals between the 1993 version of Chapter 173-351 WAC and 40 CFR Part 258 with EPA to determine whether a change to conform with Part 258 would be a condition of approval. EPA was clear, approval would not be granted for a groundwater monitoring program determined to be less stringent than federal requirements. EPA finds groundwater monitoring programs based on filtered (dissolved) metals sampling and analysis to be less stringent than federal standards because they fail to detect mobile colloid contaminants.

After considering all the issues, Ecology believes the benefits of transitioning metals sampling and analysis in groundwater from dissolved to total constituents outweigh the resulting difficulties.

Public Comments

WMW recommends that the requirements regarding field-filtering specified in WAC 173-351-410(2) be modified as follows: "Except as allowed under WAC 173-351-450, groundwater samples must not be field filtered prior to analysis." The regulations contained in WAC 173-351-450(1) allow Ecology and the jurisdictional health department to approve site- specific detection

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monitoring parameters for a given facility. For general water quality parameters that are subjected to routine statistical analysis (such as iron, manganese, etc.), it is important to assess whether unfiltered (i.e. "total") or filtered (i.e. "dissolved") sample results are more suitable for detection monitoring purposes.

Collection of representative samples is critical for groundwater detection monitoring at MSW facilities where rigid statistics are applied. Many years of experience have shown that unfiltered (total) results may be difficult to reproduce, or the datasets are often plagued by outliers due to the presence of varying levels of particulate matter in the samples. EPA acknowledges the problems associated with unfiltered samples in the 2009 Unified Guidance Document for the Statistical Analysis of Groundwater at RCRA Facilities, and they discuss the use of dissolved data extensively. WMW believes that the purpose and intent of the alternative monitoring provisions contained in WAC 173-351-450 is to ensure that the regulations allow for development of the most effective site-specific detection monitoring program for any given facility, and that this alternative groundwater monitoring program could include the use of filtered groundwater sample results. (Shanley, Waste Management)

Ecology's Response to Public Comments

The sampling methods for manganese and iron were changed from the proposed rule to provide for field filtering of parameters used for cation-anion balance evaluations. The constraint on field-filtered groundwater samples is a federal requirement under 40 CFR Part 258.53(b).

Proposed Rule

WAC 173-351-410(3)(b) The orthometric elevation of the top of the well casing is related to a vertical benchmark based on the (~~(national geodetic)~~) North American vertical datum of (~~(1929 (NGVD 29))~~) 1988 (NAVD88) and be established to 3rd order classification standards per federal geodetic control committee (~~(, or its successor, as specified in WAC 332-130-060)~~).

Public Comments

So there are three that I would specifically like to address as public comment and the first one is number four on my comment letter which is the wellheads to be surveyed under NAVD88 datum. We discussed it a little bit on June 14, but again, our solid waste division is again requesting that we be allowed to use our current datum for Terrace Heights land fill and Shane Landfill, and that this adoption would require resurveying of all our wellheads conversion to make sure we are tipped right and redoing all the previous work regarding water level calculations. The reason we are asking that is we are currently using a combination of old level loops, vertical and horizontal datum and NGVD29 so we are not on – because our landfills were built in 1972, we are not on anything that is easily convertible at this time so we are asking for your consideration on that section. (Mifflin, Yakima County Public Services)

Adoption of this change could affect a wide range of previously done engineering work for both Cheyne and Terrace Heights Landfill. Our sites currently use a combination of local horizontal datum and NGVD29 vertical datum. Will the Terrace Heights and Cheyne Landfills be allowed to continue with the current datum used?

Yakima County Public Services – Solid Waste Division is again requesting that we be allowed to use the current datum for Terrace Heights Landfill and Cheyne Landfill. Adoption of this section would require resurveying of all wellheads, conversion to make sure they are tipped right and re-doing all previous work done regarding water level calculations. There is no guarantee that the data will convert correctly as we use a combination of old level loops, vertical/horizontal datum and NGVD 29. (Mifflin, Yakima County Public Services)

Ecology’s Response to Public Comments

With revisions in this rule, owners or operators will submit groundwater monitoring results into Ecology’s Environmental Information Management System (EIM). Ecology requires that wellhead elevations be submitted to EIM in addition to horizontal coordinates. For resource protection wells (per WAC 173-160-400), wellhead elevations are usually measured at the top of the inner well casing. EIM uses wellhead elevations and depth to water measurements to calculate groundwater elevations across the state.

In order to compare water level elevations, wellhead elevations must be surveyed or normalized to a common datum. The Washington State standard is the North American Vertical Datum of 1988 (NAVD88). Its reference point is located in Quebec, Canada.

Ecology recognizes that many sites have commonly used a site-specific or “local” datum for wellhead elevations. A local datum is where one well or other point on the site, known as a benchmark, is assigned an arbitrary elevation. Often times this is 100 feet. Wells on the site are surveyed relative to that benchmark. This is okay for the purposes of that particular site, but when you try and look at water level elevations across multiple sites, it doesn’t work. Therefore, Ecology no longer accepts wellhead elevations surveyed to local datums.

Ecology provides instructional help for converting local elevation datums to NAVD88 which can be obtained by contacting Ecology’s W2R Program or downloaded from Ecology’s EIM website.

WAC 173-351-415 Groundwater reporting.

Proposed Rule

~~WAC 173-351-415(1) ((The annual report shall be included with the facility annual report as required in WAC 173-351-200(11) and shall be on))~~ Each owner or operator must prepare and submit a copy of an annual groundwater report to the jurisdictional health department and the department by April 1st of each year. The groundwater annual report must include completed forms developed by the department ((which will request)) and the following information:

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Public Comments

Please provide the forms for public comment. Additionally, for the purposes of staffing management and work load, we would appreciate the annual report be made due May 1 so it is not due the same day as the quarterly report, as this is a tremendous burden on our staff responsible for this reporting. Many additional regulatory reports are required on April 1, such as federal Tier II reports, discharge monitoring reports, mandatory greenhouse gas reports, etc. the groundwater annual report is a large undertaking that is developed and produced by in house staff. An additional month to prepare it would only improve the product. (Kierman, King County)

Ecology's Response to Public Comments

The form is titled Checklist for Groundwater Reporting, Municipal Solid Waste Landfills, publication number ECY 070-316 (Rev. 6/12), and is available on Ecology's Waste 2 Resources publication website.

The groundwater annual report coincides with the facility annual report on April 1st of each year. The date was established under this rule in 1993. Annual report information is required for Ecology to meet its obligations under RCW 70.95.280 through 295.

Proposed Rule

WAC 173-351-415 (2) A quarterly, or alternate frequency approved in accordance with WAC 173-351-450, groundwater report (~~shall~~) must be submitted to the jurisdictional health department and the department no later than sixty days after the receipt of the (~~quarterly~~) analytical data (~~and shall~~). The groundwater report must include completed forms developed by the department and all of the following:

Public Comments

WMW supports the rule amendment to WAC 173-351-415(2) that allows for the submission of either quarterly groundwater reports or on an alternative frequency approved in accordance with WAC 173-351-450 (alternate groundwater programs). (Shanley, Waste Management)

Please provide the forms for public comment. (Kierman, King County)

Ecology's Response to Public Comments

The form is titled Checklist for Groundwater Reporting, Municipal Solid Waste Landfills, publication number ECY 070-316 (Rev. 6/12), and is available on Ecology's Waste 2 Resources publication website.

Proposed Rule

WAC 173-351-415(3) All groundwater monitoring data must be submitted consistent with procedures specified by the department. Unless otherwise specified by the department, all groundwater monitoring data must be submitted in both printed form and an electronic form capable of being transferred into readily available statistical software and the department's data management system.

Adopted Rule

WAC 173-351-415(3) All groundwater monitoring data must be submitted consistent with procedures specified by the department. Unless otherwise specified by the department, all groundwater monitoring data must be submitted in an electronic form capable of being transferred into the department's data management system.

Public Comments

Ecology should clarify its Proposed Revisions establishing "procedures" for submitting groundwater monitoring data.

The Proposed Revision to WAC 173-351-415(3) requires owners/operators to submit groundwater monitoring data to Ecology "in both printed form and an electronic form capable of being transferred into readily available statistical software and the department's data management system." Ecology does not provide further clarification as to what software is considered to be "readily available statistical software" and how such data can be transfer to "the department's data management system." Without further information, it is difficult to provide meaningful comments on this Proposed Revision. (Shanley, Waste Management)

This section implies that the Department would like uploads to a database, perhaps something like the EIM database. How often would data be required to be uploaded? What are the deadlines for upload? What system will be adopted? Will historic data need to be retroactively compiled and uploaded? Yakima County's concern will be the costs of obtaining data and reports and those costs being shouldered by the citizens without any demonstrated valued or benefit. Does the Department of Ecology have the staff to manage this data?

It appears that our comments above were not considered in the draft rule-making. We again request that if the Department of Ecology does not have adequate staff to manage this data the revisions be made to delete this requirement. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

RCW 43.17.095 requires state agencies to provide an electronic option for submitting information. With this rule revision, Ecology will eliminate the requirement for printed reports

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and specify owners or operators to submit groundwater data to the Department's Environmental Information Management System (EIM). Ecology will be able to provide faster responses and higher quality technical assistance on groundwater evaluations and not experience a significant workload impact due to the change. EIM has several benefits over paper records. These include having all groundwater data readily available to the public, ease of evaluation using readily available statistical software, and the ability to evaluate water level elevations and concentration data across multiple sites.

WAC 173-351-430 Detection monitoring.

Proposed Rule

WAC 173-351-430(2) Background data development.

(a) A minimum of eight independent samples (~~((shall))~~) must be collected for each well (~~((background and downgradient)))~~) and must be collected and analyzed for the Appendix I constituents for the first year of groundwater monitoring.

Public Comments

With regard to this entire section of the code, King County believes this update is a good opportunity to clarify use of the term "background" in the regulations. In places throughout WAC 173-351, the term "background" is used synonymously with upgradient. In contrast, in other places of WAC 173-351 (for example: 173-352-420 (1),- 430(2) and (3)), the term "background" is used to mean initially or early in time. The intent of collecting a minimum of 8 samples in the first year is (or should be) to obtain enough data to make reasonable inferences about the water quality at a given well that are statistically valid, not to create a closed set "gold standard" for future comparisons, which is implied by differentiating data collected after the first year. Furthermore, routine sampling described in WAC 173-351-430(3) adds to the data set over time and can be used in conjunction with the statistical protocols developed under -420 to determine statistically significant increases, evaluate trends and compare to standards. (Kierman, King County)

Ecology's Response to Public Comments

The meaning for the term "background" can be found in WAC 173-351-405(3).

WAC 173-351-440 Assessment monitoring program.

Proposed Rule

WAC 173-351-440(2) Within ninety days of triggering (~~((into))~~) an assessment monitoring program, and (~~((quarterly))~~) annually thereafter, the owner or operator must sample and analyze the groundwater for all constituents identified in Appendix III (~~((of this part))~~). A minimum of one sample from each (~~((downgradient))~~)

well (background and downgradient) must be collected and analyzed during each sampling event. For any constituent detected in (~~(the downgradient)~~) wells as a result of the complete Appendix III analysis, a minimum of four independent samples must be collected from each well (background and downgradient) (~~(must be collected)~~) within a time period of one hundred eighty days, and analyzed to establish background for the constituents. Each independent sample (~~(shall)~~) must be collected no less than one month apart from the previous sampling event.

Public Comments

Appendix III should be modified to include only analytes not listed in Appendix I or Appendix II. It would then make sense to characterize leachate for Appendix III parameters to determine the likelihood of derivation from municipal solid waste and then, in the event of triggering assessment monitoring, analyze groundwater for those Appendix III analytes present in leachate (if any). The initial Appendix III list for Assessment monitoring could be reduced by eliminating compounds that are unlikely to be present in municipal solid waste. The current list contains numerous analytes unjustified by usage patterns and mobility in the environment. Additionally, with regard to "Assessment Monitoring" (AM) -when AM is triggered, it is King County's understanding that the facility owner is required to complete a number of sampling events that test for the constituents identified in Appendix III. Any parameters from that list that are detected are then included in the regular quarterly sampling. The revision of WAC 173-351 Appendix III appears to attempt to clarify that the owner then needs to retest for the entire list of constituents included in Appendix III on an annual basis. If that is accurate, such annual analysis is onerous both due to costs that may be incurred in performing the tests and the potential for false positives, while adding minimal benefit. The analyte list is not based on constituents that would be likely to be leaking from a landfill, particularly with a long history of leakage. Additionally, other subsections of the Assessment Monitoring section have the owner fully characterize the release. (Kierman, King County)

Ecology's Response to Public Comments

The methods for assessment monitoring and the list of parameters in Appendix III are federal requirements. 40 CFR Part 258.56 and Appendix II to Part 258 set the standard for assessment monitoring. WAC 173-351-450(1)(b) provides for an owner or operator to propose a deletion of Appendix III constituents or alternate groundwater monitoring constituents.

WAC 173-351-450 Alternate groundwater monitoring program.

Proposed Rule

WAC 173-351-450(2) All proposed changes in groundwater monitoring frequency must be no less than semiannually for detection (~~(groundwater)~~) monitoring and no less than quarterly for assessment monitoring. The owner or operator must apply for a permit modification under WAC 173-351-720(~~(+5)~~) (6) or must

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apply during the renewal process of WAC 173-351-720 (~~(+1)(i)~~)
(5) for changes in groundwater monitoring frequency making a demonstration based on the following information:

(a) A characterization of the hydrostratigraphic unit(s) including the unsaturated zone, transmissive and confining units and include all of the following:

(i) Hydraulic conductivity; and

(ii) Groundwater flow rates.

(b) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring wells (minimum distance of travel); and

(c) Contaminant fate and transport characteristics.

Public Comments

Frequency of monitoring under an alternate monitoring program should be determined by the demonstration in -450(2)(a), (b) and (c) rather than an arbitrary time interval. (Kierman, King County)

Ecology's Response to Public Comments

An owner or operator may propose an alternative to quarterly monitoring based the information provided in the demonstration.

WAC 173-351-500 Closure and post-closure care.

Public Comments

Is closure of a landfill cell considered to be closure of a MSW landfill unit for closure/post closure liability purposes? (Kiernan, King County)

Ecology's Response to Public Comments

“Landfill cell” is a common term not used in the rule. As commonly used, a “cell” may mean an area within a landfill unit containing one day’s waste, an area within a landfill representing a phase of construction, or mean the same as MSWLF unit as defined in the rule. Following closure of each MSWLF unit, as defined in WAC 173-351-100, the owner or operator must conduct post-closure care. Neither Chapter 173-351 WAC nor 70.95 RCW establish liability.

Public Comments

It is vital that for budgetary long term care funding purposes there be a clear and achievable end-date or end criteria for closed landfill maintenance and also a clear and achievable end-date or end criteria for site cleanup. Without clear directive on these matters it is impossible for agencies with municipal landfill, closed or operating, to adequately plan and manage budgetary responsibilities. (Kiernan, King County)

Ecology's Response to Public Comments

Owners or operators are required to estimate the time required following closure of each MSWLF unit to meet the functional stability criteria in WAC 173-351-500(2)(b)(iii) as part of the post-closure plan. This timeframe is the basis for establishing post-closure financial assurance.

Cost estimates for remedial actions must account for the total costs of activities as described in the cleanup action plan. Given this requirement, cleanup action plans must estimate the time required to meet cleanup objectives.

Public Comments

And then, a general comment – these rules that are in place and that are enhanced are methods to entomb garbage and actually preserve the garbage as is for a longer period of time. That is what the increased cap is, that is what the bottom liner is – to inhibit water from reacting with garbage and creating a by-product, either gas or liquid. And I think it more appropriate on the post closure aspect to make it longer actually, and less of an impact on the general public – especially if it is private company. They should be on the hook for a longer period of time and just because it has stopped making leachate or stopped making gas, at that period in time, doesn't mean it won't happen in the future. So, when you are making cells in the garbage itself, not all of it will act the same. So, I don't think it should be – somebody should be on the hook for much longer – and/or the state should take it over if it feels it needs to do that. But I really don't think it should be that kind of burden – it should be a burden of whoever is developing the landfill at the time and have somebody get paid to watch over what we do. When I looked at our existing landfills and started digging it up, you can go very far back and that was uncovered. You can read the newspaper 30 years ago. You can see the apple core. And the liners aren't forever so you are – when the liner goes, which it will go, that waste is preserved – it isn't reacted. You have to deal with it and it's not total. So I don't think they should be able to get out because you see no leachate and you see no gas. This is common. (Taam, Spokane Regional Solid Waste System)

Ecology's Response to Public Comments

This rule addresses long term care in two ways. First, owners or operators must file an environmental covenant at closure of a MSWLF unit. The environmental covenant establishes enforceable activity or site restrictions to protect the integrity of the cover system and environmental controls. The environmental covenant also establishes the long term end use and site management strategy.

Second, the post-closure care period is established using a performance based method where potential threats are assessed in the context of the proposed end use and long-term site management established by the environmental covenant. The release of constituents from a MSWLF unit can be evaluated for potential adverse impacts to human health and the environment at the point of exposure established by the environmental covenant.

After closure, active maintenance, management, and control are conducted under the provisions of a permit addressing post-closure care requirements. Once the MSWLF unit is demonstrated to be functionally stable, as defined in the rule, long term custodial care and site management is conducted in accordance with the provisions set by the environmental covenant.

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Proposed Rule

WAC 173-351-500(1)(a)(ii) The jurisdictional health department, with the written concurrence of the department, may approve an alternative final cover design equivalent to that specified in (a)(i) of this subsection that includes:

(A) An anti-infiltration layer that achieves an equivalent reduction in infiltration as the anti-infiltration layer specified in (a)(i)(A) and (B) of this subsection;

(B) An anti-erosion layer that provides equivalent protection from wind and water erosion as the anti-erosion layer specified in (a)(i)(C) of this subsection; and

(C) The additional design features of (a)(i)(D) of this subsection.

Adopted Rule

WAC 173-351-500(1)(a)(ii) The jurisdictional health department, with the written concurrence of the department, may approve an alternative final cover design equivalent to that specified in (a)(i) of this subsection that includes:

(A) An anti-infiltration layer that has a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and achieves an equivalent reduction in infiltration as ((the)) an anti-infiltration layer ((specified in (a)(i)(A) and (B) of this subsection)) with a permeability no greater than 1×10^{-5} cm/sec containing at least two feet (60 cm) of earthen material;

(B) An anti-erosion layer that provides equivalent protection from wind and water erosion as ((the anti-erosion layer specified in (a)(i)(C) of this subsection)) a layer that contains a minimum of one foot (30 cm) of earthen material of which at least six inches (15 cm) of the uppermost layer is capable of sustaining native plant growth; and

(C) The additional design features of (a)(i)(D) of this subsection.

Public Comments

And our big comment, of course, is number six on our comment letter and that is under section 173-351-500 i.A. and ii.A., the post closure care and specifically to top cover requirements for permeability. It appears after discussion on the 14th that our comments were not considered in the draft rule making process for our landfills and so we are again requesting that the Department of Ecology allow the use of soil and topsoil cover system as an alternate design for Terrace Heights Landfill and Cheyne Landfill as outlined above in our question and incorporate that into the final rule when adopted and that natural materials such as soil and topsoil provides better and lasting protection compared to a liner system in our climate.

This section changes the requirements for top cover permeability. The current permit for Terrace Heights Landfill approves a final cover system that consists of a 6 inch barrier soil layer having a maximum hydraulic conductivity of 1×10^{-6} cm/sec, overlain by a 30 inch soil/topsoil layer and the Cheyne Landfill has an approved cover system which includes two-feet of compact soil with a hydraulic conductivity of not more than 1×10^{-5} cm/sec and 12 inches of earthen soil with the top six inches of topsoil material for vegetation. Will this previously approved cover be grandfathered/approved as an alternate design for Cheyne and Terrace Heights Landfills? In addition, covers in Central and Eastern Washington have limited generation of leachate by increasing evapotranspiration, which is a different approach than simply lowering permeability. Will this be allowed as an alternative design? We are requesting that the current approved cover systems be grandfathered for both Cheyne and Terrace Heights Landfill.

It appears that our comments above were not considered in the draft rule-making process. We are again requesting that the Department of Ecology all the use of a soil/topsoil cover system, as an alternative design for Terrace Heights Landfill and Cheyne Landfill as outlined above and incorporate this into the final rule when adopted. Natural material such as soil/topsoil provides better and lasting protection compared to a liner system. (Mifflin, Yakima County Public Services)

The language proposed above conflicts with existing and/or new definitions. (Kiernan, King County)

Ecology's Response to Public Comments

The alternative final cover design, having equivalent performance to the composite layer cover system, specified in the proposed rule was unintentional. Ecology understands that incorporating a geomembrane into the final cover design is not always necessary to prevent excess infiltration or exposure of waste from erosion. The adopted rule provides for alternative final cover designs having equivalent performance to the cover systems specified for arid areas in the 1993 version of the rule.

The requirement for a final cover system to have a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present comes from 40 CFR Part 258.60(a)(1). This requirement is meant prevent perpetual leachate generation after closure.

Proposed Rule

(2) Post-closure care requirements.

(a) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must conduct post-closure care. Post-closure care must be conducted for thirty years (~~(7- except)~~) or as long as necessary for the landfill to become functionally stable. A landfill is functionally stable when it does not present a threat to human health or the environment at the point of exposure for humans or environmental receptors. The point of exposure is identified as the closest location at which a receptor could be exposed to contaminants and receive a dose by

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a credible pathway from the MSWLF unit. Potential threats to human health or the environment are assessed by considering leachate quality and quantity, landfill gas production rate and composition, cover system integrity, and groundwater quality. The post-closure care period may be adjusted as provided under (b) of this subsection ((and)). Post-closure care must consist of at least the following:

Public Comments

As a risk based evaluation for post closure care is proposed should the reference to a thirty year post closure period be removed? If the revised language deletes "thirty years or" within the proposed 173-351-500 (2)(a) language will the intent of the risk based analysis be more clear? (Mains, Regional Disposal Company)

Ecology's Response to Public Comments

The thirty year post-closure care period comes from the federal rule. 40 CFR Part 258.61(a) requires an owner or operator to conduct post-closure care for thirty years, except the director of an approved state may decrease the length of the post-closure care period if the reduced period protects human health and the environment or increased if necessary. The thirty year post-closure period is maintained, however, specific criteria for increasing or decreasing the post-closure care period for protecting human health and the environment are included.

An owner or operator may discontinue post-closure care only when it is demonstrated to be functionally stable as described in the rule. The time required may be shorter or substantially longer than thirty years.

Proposed Rule

WAC 173-351-500(2)(b)(iii) The jurisdictional health department and owner or operator will consider at least the following factors when determining when a landfill unit is functionally stable or whether to decrease or increase the post-closure care period:

(A) Leachate. Leachate production and quality must be such that maintenance and operation of the leachate collection system can be ceased beyond the post-closure care period without posing a threat to human health or the environment.

(B) Landfill gas. Landfill gas production and composition must be such that maintenance and operation of the gas collection system can be ceased beyond the post-closure care period while meeting the criteria in WAC 173-351-200 (4)(a)(i) through (iii) and not pose a threat to human health or the environment from methane or nonmethane compounds.

(C) Settlement and cover integrity. The cover system must attain geotechnical stability for slope and settlement. Vegetation and

other erosion controls must prevent exposing waste or otherwise threaten integrity of the cover system. The cover system must stabilize such that no additional care is required beyond the post-closure care period to ensure its integrity from settlement or erosion.

(D) Groundwater quality. Groundwater quality must remain in compliance with the protection standards established in WAC 173-351-440(7) at the relevant point of compliance.

Public Comments

The proposed language calls out the components (e.g. cover stability, leachate, LFG) to determine when post-closure care can be ceased. Would it be suitable to include language for these components that would allow the local jurisdictional health department and owner to evaluate each component and cease post-closure care for that individual component when the demonstration is made that it is functionally stable? (Mains, Regional Disposal Company)

Ecology's Response to Public Comments

Ecology anticipates that the individual components of functional stability (leachate, landfill gas, settlement and cover integrity, and groundwater quality) will be evaluated individually. Activities associated with the components will be adjusted or stopped prior to the MSWLF unit becoming functionally stable. However, the state of one component may have bearing on others.

For example, once leachate production diminishes to a point that operation and maintenance of the leachate collection system can cease there will be no need to continue operation and maintenance of that system but gas production may still require active management. However, a failure of the cover system may require that the leachate collection system be restarted. Groundwater monitoring must continue until all other components are demonstrated to be functionally stable.

Public Comments

These sections are very prescriptive and may not align with alternative designs. Demonstrations of post-closure care may not be the same between traditional and alternative design landfills. DOE should entertain an alternative, risk-based approach method, as well, which are successfully being used in Europe. (Kiernan, King County)

Ecology's Response to Public Comments

The criteria for functional stability are risk-based by nature. Leachate and landfill gas components are evaluated on whether continuing post-closure care is required to protect human health and the environment. Settlement and cover integrity is evaluated to ensure the cover system will not degrade or fail without further maintenance. The groundwater protection standards in WAC 173-351-440(8) are established to protect human health and the environment. The design of the MSWLF unit will be a consideration regarding whether the various components pose a threat whether it be the standard or an alternative design.

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Public Comments

*Are solid waste units closed under WAC 173-304 exempt from these demonstrations?
(Kiernan, King County)*

Ecology's Response to Public Comments

In accordance with WAC 173-351-010(1)(b), the requirements of this rule do not apply to landfill units closed under Chapter 173-304 WAC.

Public Comments

What modeling technique does DOE know of that will predict the time for these criteria to be achieved? It seems technically impossible that landfill gas generation will be reduced to the levels prescribed in this section. How can a reduction of level of effort be approved during the post closure period? (Kiernan, King County)

Ecology's Response to Public Comments

Ecology intends that post-closure period projections will be based on a combination of modeled results and empirical information. Models are useful for predicting leachate and gas generation rates after closure, and contaminant fate and transport in groundwater. Model results can be useful across the criteria as well. For example, settlement rates can be correlated to gas generation. Settlement becomes stable when the majority of gas from a MSWLF unit has been generated with little degradable carbon remaining.

Other criteria may be best addressed with empirical information. Models are not available to predict the ability to establish vegetation to control erosion at a particular site given the variations in climate, soil types, slopes, and other factors. However, there is an extensive body of experience available to draw upon. Predicting changes in leachate constituent concentrations after closure will require reliance on empirical information.

Ecology expects the criteria for functional stability will be easier to achieve than the criteria in WAC 173-304-407(7)(a) (i.e. little or no settlement, gas production, or leachate generation). The criteria will be judged on the potential to pose a threat, ensure integrity of engineered structures, and meet regulatory requirements instead of specific quantitative criteria.

Reductions in effort during the post-closure care period will be approved through the permitting process using the post-closure plan.

Public Comments

WCI would strongly suggest Ecology produce a guidance document for this activity and not require operators/owners to meet this criteria until the guidance is complete. This task could be very expensive and time consuming and still not meet the expectation of the JHD or Ecology with out the guidance. In addition, all operators/owners will be going through the same tasks somewhat blindly for the first time therefore, a procedure would remove some of the uncertainty.

At this point, the owner/operator is now to predict and finance what could be a post-closure of 30-100yrs, this is a wide spectrum. WCI does not disagree with the basic requirement we just desire to get a better handle on the unforeseen consequences. (Snyder, Waste Connections Inc.)

Ecology's Response to Public Comments

Ecology agrees that guidance and involvement by owners or operators and local health jurisdictions are needed for these changes to be successful. These elements are included as part of Ecology's rule implementation plan.

There is a growing body of resources providing information and guidance on this approach to post-closure care at municipal solid waste landfills. This rule is conceptually based on a performance based approach to evaluating post-closure care but adopts provisions that vary in some areas from methods provided in resources on the subject. Currently available resources include the following.

Interstate Technology and Regulatory Council (2006) Technical and Regulatory Guidance for Evaluating, Optimizing, or Ending Post-Closure Care at MSW Landfills based on Site-Specific Data Evaluation. *ITRC ALT-4*, September 2006.

Environmental Research and Education Foundation (2006) Performance-Based System for Post-Closure Care at Municipal Solid Waste Landfills: A Procedure for Providing Long Term Stewardship under RCRA Subtitle D. *Prepared by Geosyntec Consultants, Columbia, MD*, September 2006.

Laner D., Crest M., Scharff H., Morris J.W.F., Barlaz, M.A. (2012) A Review of Approaches for the Long-Term Management of Municipal Waste Landfills. *Waste Management* 32(3), 498-512.

Morris J.W.F. (2012) End of Life, Post-Closure Care, and the Sustainable Landfill. *MSW Management*, May 2012, 46-52.

Proposed Rule

WAC 173-351-500(2)(c) The owner or operator of all MSWLF units must prepare and submit a written post-closure plan (~~(that is approved)~~) for approval by the jurisdictional health department during the permit process of (~~Section 700 and~~) WAC 173-351-700 that includes(~~(, at a minimum,)~~) the following information:

(i) A description of the monitoring and maintenance activities required in (a) of this subsection for each MSWLF unit or all MSWLF units, and the frequency at which these activities will be performed;

(ii) A description of the monitoring performed and an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in (b)(iii) of this subsection;

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Adopted Rule

WAC 173-351-500(2)(c) The owner or operator of all MSWLF units must prepare and submit a written post-closure plan (~~(that is approved by)~~) to the jurisdictional health department (~~(during)~~) through the permit process of (~~(Section 700 and)~~) WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that includes (~~(, at a minimum,)~~) the following information(~~(+)~~). Owners or operators must prepare and submit modifications to existing post-closure plans to incorporate the criteria in (b)(iii) of this subsection or environmental covenants in subsection (1)(h) of this section by November 1, 2013.

(i) A description of the monitoring and maintenance activities required in (a) of this subsection for each MSWLF unit or all MSWLF units, and the frequency at which these activities will be performed;

(ii) A description of the monitoring performed and an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in (b)(iii) of this subsection;

Public Comments

Ecology should clarify post closure duration if owner/operators are unable to estimate the time required after closure to meet the criteria in WAC 173-351-500(2)(b)(iii).

For the owner/operator, determination of a site-specific post-closure care ("PCC") term based upon a functional stability model may in some cases be challenging based upon the circumstances of an individual site. Some sites may have insufficient data, or may not have a methodology acceptable to the department to determine functional stability. In the case that the owner/operator does not identify a methodology acceptable to Ecology or if there is sufficient uncertainty in an acceptable methodologies' outcome, will the current default prescriptive 30- year term be acceptable for purposes of obtaining financial assurance, or is Ecology implying a different course?

Several provisions in the Proposed Revisions require the landfill owner/operator to provide at the time of permitting "an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria" in WAC 173-351-500(2)(b)(iii). See WAC 173-351-500(2)(c)(ii); WAC 173-351-730(5)(d)(iv). Since the time until closure could be many decades into the future, the regulations are, in effect, asking the owner/operator to make predictions on a future physical state (functional stability) rather than a more prescriptive term (30 years). How functional stability is determined has not been fully vetted with Ecology nor have the data necessary to make such a prediction. Given these challenges, it is not only speculative, it is effectively unverifiable as to the accuracy of those estimates. Furthermore, in obtaining a financial assurance instrument, term-specific is a mandatory requirement of the carrier. In light of the fact that it would be difficult, if not impossible, to provide any reasonable estimate

of the time required to meet the WAC 173-351-500(2)(b)(iii) criteria, WMW recommends that the 30-year PCC term be retained in the rule for purposes of obtaining financial assurance. (Shanley, Waste Management)

Ecology's Response to Public Comments

Ecology believes estimates for the post-closure care period for a MSWLF unit based on modeling results and comparable information collected from comparable municipal solid waste landfills will provide a better basis for planning than prescriptive timeframes. Given that closure may be many decades in the future, the estimated post-closure care period may require adjustment as the municipal waste stream evolves, facility operations change, and available modeling tools and the body of experience improves. The permitting process and financial assurance provisions in the rule provide for making changes to a post-closure plan over the active life of a landfill.

Setting the post-closure care period as a prescriptive timeframe simplifies establishing a financial assurance instrument. However, prescriptive timeframes are less likely to ensure sufficient funds will be available to cover the real costs of post-closure care for a landfill given the wide variety of size, climate, operating methods, and active life.

WAC 173-351-600 Financial assurance criteria.

Proposed Rule

WAC 173-351-600(2)(a)(v) During the active life of the MSWLF unit, the owner or operator must review the closure cost estimate by March 1st of each calendar year. The findings of the review, and any adjustments to the closure cost estimate made in accordance with this subsection, must be submitted to the jurisdictional health department and the department by April 1st of each calendar year. The jurisdictional health department will evaluate each cost estimate for completeness, and may accept, or require a revision of the cost estimate in accordance with its evaluation.

WAC 173-351-600(3)(a)(v) During the active life of the MSWLF unit and during the post-closure care period, the owner or operator must review the post-closure cost estimate by March 1st of each calendar year. The findings of the review, and any adjustments to the post-closure cost estimate made in accordance with this subsection, must be submitted to the jurisdictional health department and the department by April 1st of each calendar year. The jurisdictional health department will evaluate each cost estimate for completeness, and may accept, or require a revision of the cost estimate in accordance with its evaluation.

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WAC 173-351-600(4)(a)(iv) While required to undertake a remedial action program under WAC 173-351-440(6), the owner or operator must review the remedial action cost estimate by March 1st of each calendar year. The findings of the review, and any adjustments to the remedial action cost estimate made in accordance with this subsection, must be submitted to the jurisdictional health department and the department by April 1st of each calendar year. The department will evaluate each cost estimate for completeness, and may accept, or require a revision of the cost estimate in accordance with its evaluation.

Adopted Rule

These requirements in the proposed rule were deleted under adopted rule.

Public Comments

Annual reviews under WAC 173-351-600 of closure, post-closure, and remedial cost estimates are unreasonable, duplicative, and unnecessary.

Under the current regulations, owners and operators are required to adjust annually the closure, post-closure, and remedial cost estimates for inflation. WAC 173-351-600(2)(a)(ii), -600(3)(a)(ii), & -600(4)(a)(i). Furthermore, the owner or operator must adjust these cost estimates whenever changes cause an increase in these costs. WAC 173-351-600(2)(a)(iii), -600(3)(a)(iii), & -600(4)(a)(ii). Finally, upon permit renewal every five years, owners and operators must provide to the health department and Ecology information as to any changes to the closure and post-closure cost estimates. WAC 173-351-730(3)(b)(i).

Ecology now seeks to add even greater burdens on owners and operators by requiring annual reviews of these costs estimates, submittal of these reviews to the health departments and Ecology, and then a review and approval by the health departments and Ecology. This annual review process will be required even though the cost estimates were increased for inflation and irrespective of whether there have been any changes at the landfills that would have increased these cost estimates. These annual financial assurance reviews will impose significant additional burdens and costs on landfill owners and operators without any apparent benefit, given the existing requirements. WMW strongly urges Ecology to delete the proposed additions of subsections (2)(a)(v), (3)(a)(v), and (4)(a)(iv) to WAC 173-351-600. (Shanley, Waste Management)

Please define the criteria that will be used to define completeness. (Kiernan, King County Solid Waste Division)

Ecology's Response to Public Comments

Ecology deleted the proposed sections, eliminating the requirement to annually submit findings of reviews performed to determine if cost estimates require adjustment for inflation. Owners or operators must still ensure cost estimates, and associated financial assurance mechanism, are kept current.

The requirement to submit changes in closure and post-closure costs and financial assurance instruments for review and approval by jurisdictional health departments remain, including changes due to inflation. As defined in the proposed rule, "modifications" to permits include changes to financial assurance. Owners or operators must follow the permit modification procedures of WAC 173-351-720(6) and this includes review and approval by jurisdictional health departments.

For changes to remedial action costs, owners or operators must annually adjust costs for inflation, but only a decrease to costs triggers review and approval by Ecology. This is similar to language in the 1993 version of WAC 173-351-600(4).

With deletion of the proposed sections, the term "completeness" is not used in the adopted rule.

Proposed Rule

WAC 173-351-600(3) Financial assurance for post-closure care.
(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to conduct post-closure care for ~~((the MSWLF unit or))~~ all MSWLF units in compliance with the post-closure plan developed under WAC 173-351-500(2). The post-closure cost estimate ~~((used to demonstrate, during the permit process of WAC 173-351-700, financial assurance in (b) of this subsection))~~ must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner or operator must ~~((place))~~ submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 ~~((in order for the jurisdictional health department to determine whether a solid waste permit should be issued))~~.

Adopted Rule

WAC 173-351-600(3) Financial assurance for post-closure care.
(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to conduct post-closure care for ~~((the MSWLF unit or))~~ all MSWLF units in compliance with the post-closure plan developed under WAC 173-351-500(2). The post-closure cost estimate ~~((used to demonstrate, during the permit~~

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~~process of WAC 173-351-700, financial assurance in (b) of this subsection)) must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner or operator must ((place)) submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 ((in order for the jurisdictional health department to determine whether a solid waste permit should be issued)) or through the permit modification process of WAC 173-351-720(6).~~

Public Comments

The post-closure care period is being modified to 30 years or as long as necessary for the landfill to be functionally stable and not present a threat to human health or the environment. Stability criteria include a stable cover system (no settlement, erosion or exposure issues) and low/stabilized gas and leachate production. Also groundwater must meet either WAC 173- 200 groundwater protection standards or background.

The rule change requires owner/operators to prepare financial assurance criteria and set funds aside to conduct post-closure care until the above conditions are achieved (as opposed to a set period of 30 years). Most facilities (particularly those that include older unlined cells) will be challenged to meet these criteria. In addition, the timeframes, or if necessary, additional remedial measures, to meet these criteria will be difficult or impossible to predict in advance, which add significant uncertainty for establishing a meaningful financial assurance criteria and funding.

It is SCS's opinion that the proposed rule is nebulous. The financial assurance criteria should specify that the post-closure care period is 30 years. This provides a reasonable and practical basis for calculating necessary post-closure care funds.

*If Ecology desires the ability to extend the post-closure care period, Ecology should provide specific conditions that would justify the extension. Further, Ecology should provide clarification on how owner/operators are to estimate the duration of the extended post-closure care period, thereby allowing the owner/operator to calculate the necessary post-closure care funds.
(Helland, SCS Engineers)*

Ecology's Response to Public Comments

Financial assurance requirements are intended to ensure sufficient funds are available to cover the costs of post-closure care. The original version of the rule included provisions for decreasing or increasing the post-closure care period to protect human health and the environment, however, no criteria were given to determine when the provisions could or should be used.

The revised rule maintains provisions for decreasing or increasing the post-closure care period to protect human health and the environment and provides criteria to determine the appropriate

length of time. Ecology chose to move from the arbitrary thirty year post-closure period to reduce the financial burden on facilities that are able to achieve functional stability in less time while ensuring sufficient funds will be available to perform required tasks at facilities that may require care for substantially longer periods.

Public Comments

Ecology cannot require closure, post-closure, and remedial cost estimates to be based on the Prevailing Wages for Public Works, Chapter 39.12 RCW.

The Proposed Revisions seek to require that private landfill owners and operators base the closure, post-closure and remedial cost estimates on the Prevailing Wages for Public Works, Chapter 39.12 RCW. WAC 173-351-600(2)(a), (3)(a), & (4)(a). Again, this requirement violates the Governor's rulemaking moratorium and imposes unnecessary and unlawful additional costs on landfill owners and operators.

First, WMW is not aware of any statutory or regulatory basis for Ecology to require that these cost estimates must be based on prevailing wages that are applicable to public contracts. Chapter 39.12 RCW does not apply to privately-owned landfills and does not give Ecology the authority to impose those requirements indirectly. See RCW 39.12.020 ("The hourly wages to be paid to laborers, workers, or mechanics, upon all public works and under all public building service maintenance contracts of the state or any county, municipality or political subdivision created by its laws, shall be not less than the prevailing rate of wage ...").

RCW 70.95.215 gives Ecology the authority to require financial assurance that ensures "adequate revenue available by the projected date of closure." RCW 70.95.215(1). So long as there are adequate funds available at the projected date of closure, the owner/operator has satisfied the statutory criteria. There is nothing in the statute that requires the owner/operator to base the cost estimates on the prevailing wage law. Second, this change is not required by EPA's Subtitle D regulations, 40 CFR Part 258, and therefore exceeds the requirements imposed by EPA. While EPA regulations do require closure and post-closure cost estimates to be based on "the cost of hiring a third party," they do not require that the costs of the third party be based on prevailing wages. Third, requiring compliance with prevailing wage requirements will only increase the costs of maintaining financial assurance, even when a facility has sufficient financial assurance and resources to fully conduct and pay for closure and post-closure maintenance of a landfill.

WMW strongly recommends deleting the requirement to determine closure, post-closure, and remedial costs based on prevailing wages determinations. (Shanley, Waste Management)

WCI would request that Ecology allow owners to use actual mid range of wages from their company rather than prevailing wages. This course of action has been approved and utilized by the local JHD. (Snyder, Waste Connections Inc.)

Ecology's Response to Public Comments

The requirement to use prevailing wages in closure and post-closure cost estimates is because jurisdictional health departments may need to access financial assurance funds to complete

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closure and post-closure work should an owner or operator fail to do so. As a public entity, a jurisdictional health department must pay prevailing wages for such work. The financial assurance funds must be sufficient to cover the costs of closure and post-closure care under these circumstances.

Using prevailing wage is not required by 40 CFR Part 258, but states may impose more stringent regulations than those required federally. The requirement ensures sufficient funds are available for state or local governments subject to state law to complete the required work.

Proposed Rule

WAC 173-351-600(4) Financial assurance for ((~~corrective~~)) remedial action.

(a) An owner or operator of a MSWLF unit ((~~or all MSWLF units~~)) required to undertake a ((~~corrective~~)) remedial action program under WAC 173-351-440(6) must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to perform the ((~~corrective~~)) remedial action in accordance with the program required under WAC 173-351-440(6). The ((~~corrective~~)) remedial action cost estimate must account for the total costs of ((~~corrective~~)) remedial action activities as described in the ((~~corrective~~)) cleanup action plan for the entire ((~~corrective~~)) remedial action period. Cost estimates are not required for interim actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit. The owner or operator must submit the ((~~corrective~~)) remedial action cost estimate to the ((~~jurisdictional health~~)) department for approval.

Adopted Rule

WAC 173-351-600 (4) Financial assurance for ((~~corrective~~)) remedial action.

(a) An owner or operator of a MSWLF unit ((~~or all MSWLF units~~)) required to undertake a ((~~corrective~~)) remedial action program under WAC 173-351-440((~~+6~~))(7) must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to perform the ((~~corrective~~)) remedial action in accordance with the program required under WAC 173-351-440((~~+6~~))(7). The ((~~corrective~~)) remedial action cost estimate must account for the total costs of ((~~corrective~~)) remedial action activities as described in the ((~~corrective~~)) cleanup action plan for the entire ((~~corrective~~)) remedial action period. Cost estimates are not required for interim

actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit. The owner or operator must submit the ((~~corrective~~)) remedial action cost estimate to the ((~~jurisdictional health~~)) department for approval.

Public Comments

This section requires some clarification regarding the closure/post-closure requirements. Is the Department requiring a remedial action reserve account when no remedial action is occurring? When does the remedial action reserve account become required? (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

Financial assurance for remedial actions is not required until a cleanup action plan, as defined, is in place. Only costs associated with the cleanup action plan must be considered.

Proposed Rule

WAC 173-351-600(5)(b) Private companies owning or operating MSWLF units must establish closure, post-closure, and remedial action financial assurance in one of the following ways:

- (i) Cash or investments in a trust fund;
- (ii) Surety bond(s);
- (iii) Letter of credit.

Public Comments

Ecology should allow landfill owners/operators to use insurance or the financial test/corporate guarantee to satisfy their financial assurance requirements.

In addition to the approved mechanisms under WAC 173-351-600, EPA's Subtitle D regulations allow owners/operators of privately-owned landfills to use other mechanisms for meeting their financial assurance obligations, including insurance and the financial test/corporate guarantee. 40 CFR § 258.74(d) & (e). Furthermore, Ecology's own non-MSW landfill regulations also allow the owner/operator to meet its financial assurance obligations through insurance. WAC 173-350-600. Notwithstanding these other authorities, Ecology does not allow either the use of insurance or the financial test for MSW landfills. Ecology needs to revisit this issue and allow for the use of these well-accepted financial assurance mechanisms.

Indeed, in its 2001 "Report to the Legislature on Financial Assurance for Solid Waste Facilities in Washington," Ecology included a statement from the Washington Utilities & Transportation Commission staff endorsing the use of both financial assurance mechanisms:

Financial test and corporate guarantee. The EPA, after thorough analysis, comment, and review adopted rules that allow corporations to satisfy the financial assurance requirements by meeting specific financial tests. EPA rules

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also set forth reporting and monitoring requirements. Staff believes the EPA rules are well reasoned and appropriate.

Ecology, "Report to the Legislature on Financial Assurance for Solid Waste Facilities in Washington," App. A (Feb. 2001). In the Report, Ecology expressly recommended that the financial assurance requirements should be made consistent for all landfills: "Unless there are specific reasons, the rules should be consistent for all solid waste facilities that accept the public's waste." Report at 8.

WMW strongly recommends that Ecology allow MSW landfills to use the same financial assurance mechanisms that are currently allowed under EPA's Subtitle D regulations. (Shanley, Waste Management)

Ecology's Response to Public Comments

RCW 70.95.215(1) requires owners or operators of disposal facilities to establish a reserve account to cover the costs of closure. The allowable financial assurance mechanisms in the rule were included to meet this requirement.

Proposed Rule

WAC 173-351-600(5)(d) The language of the financial assurance mechanisms listed in this section must ensure that the instruments satisfy the following criteria:

(i) The amount of funds assured is sufficient to cover the costs of closure, post-closure, and remedial action for known releases when needed;

(ii) The funds will be available in a timely fashion when needed; and

(iii) The owner or operator must obtain financial assurance by the effective date of these requirements or prior to the initial receipt of solid waste for closure and post-closure, and no later than one hundred twenty days after establishment of the cleanup action plan for remedial action.

Public Comments

It has been King County's practice to have a reserve fund that accrues interest and receives contributions from rates each year in order to have the funds necessary when they are needed. The way DOE has written this new provision seems to require landfill owners/operators to have the necessary balance immediately available (when needed) without bringing in future contributions from disposal revenue. Is this what DOE intended? (Kiernan, King County Solid Waste Division)

Ecology's Response to Public Comments

This is not a new provision. The language was moved from the end of the financial assurance section [WAC 173-351-600(5)(f)] to be included with other universal provisions applicable to financial assurance. Reserve accounts meeting the requirements of WAC 173-351-600 and the budgeting and accounting standards of the Washington State Auditor are acceptable.

Proposed Rule

WAC 173-351-600(5)(f) An owner or operator satisfying the requirements of this section using a reserve account or trust fund must file with the jurisdictional health department and the department audit reports of the financial assurance accounts established for closure, post-closure, and remedial action, and a statement of the percentage of user fees, as applicable, diverted to the financial assurance instruments, for the previous calendar year:

(i) For facilities owned and operated by municipal corporations, the financial assurance accounts must be audited according to the audit schedule of the office of state auditor. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(ii) For facilities not owned or operated by municipal corporations:

(A) Annual audits must be conducted by a certified public accountant licensed in the state of Washington. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(B) The audit must also include, as applicable, calculations demonstrating the proportion of closure, post-closure, or remedial action activities completed during the preceding year as specified in the closure, post-closure, or cleanup action plans.

Public Comments

Ecology should not require annual audits of financial assurance. (WAC 173-351-600(5)(f) and WAC 173-351-200(11)(a)(ix)).

Ecology should not impose an annual financial assurance audit as proposed in WAC 173-351-600(5)(f). Not only is the proposed change contrary to the language and spirit of the Governor's Order 10-06, it is nowhere required under Subtitle D nor imposed in any other State, as far as WMW is aware. The requirement will impose significant annual burdens and costs on landfill owners without there being any demonstrated need for such a requirement. All references to annual financial assurance audits should be deleted.

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WMW recognizes that the annual audit requirement is included in Chapter 173-350 WAC. WMW also feels that it is unduly burdensome and would support its deletion from the non-MSW landfill requirements. (Shanley, Waste Management)

Ecology should not require an annual financial audit. The mechanism is approved by the JHD and the formula for calculating the deposit. The calculation is reviewed and adjusted every year by the JHD, there is no need for the extra financial burden of an annual audit. (Snyder, Waste Connections Inc)

Please define more clearly what constitutes the annual audit of the financial reserve account. This approach/requirement is highly unusual. Section (5)(f) clearly states that audits are to be performed annually, but then subsection (i) of that same regulation states that audits are to be performed on the state auditor's schedule-these provisions conflict and should be clarified. Additionally, it appears that the landfill will be required to collect all the financial assurance criteria data for a calendar year, obtain an audit and then file the audit with the jurisdictional health department by April 1. King County strongly believes that this schedule is very onerous and likely very expensive. Additionally, under financial assurance, when remedial action is first mentioned in the proposed WAC revisions, financial assurance is required for facilities under "remedial action." Later in the section, financial assurance for remedial action is referred to as though all facilities are required to provide this type of information and/or funding. Please clarify DOE's intent concerning financial assurance and protocol for landfill/facility owner/operators such as King County. (Kiernan, King County, Solid Waste Division)

The proposed language is not clear with respect to facilities that are utilizing multiple financial instruments as allowed for in the proposed 173-351-600 (5)(c). Are the trust fund audits required when utilizing multiple mechanisms such as a trust fund with no additional contributions and other financial instruments? (Mains, Regional Disposal Company)

Requiring the annual audit be provided by April 1st is an unreasonable expectation. Yakima County does not receive the annual audit report of our audit until late September of each year. Requiring a statement of the percentage of user fees diverted to the financial assurance instruments is not a Federal requirement that we can find. Why is this language being inserted? Currently Yakima County meets the financial assurance requirements using CFR 258.74 (1) State Approved mechanism. What is driving the Department to mirror the full CFR financial assurance requirements? Yakima County is again concerned with the costs to the citizens with no demonstrated benefit or significant value. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

Owners and operators using reserve accounts and trust funds submit payment schedules and anticipated interest, inflation, and potential fees as part of a permit application to demonstrate conformance with financial assurance requirements. The intent of the auditing requirement is to provide jurisdictional health departments with the information needed to ensure payments are being made as required and that fees and lower than projected interest are not having an adverse impact on the funds accumulated.

Proposed Rule

WAC 173-351-600(6)(b)(viii) The following types of surety bonds are allowed:

(A) Surety bond; or

(B) Surety bond guaranteeing that the owner or operator will perform final closure, post-closure, or remedial action activities.

Public Comments

Ecology should clarify language in WAC 173-351-600(6)(b)(viii)(A) to allow for the use of both performance and payment bonds.

WMW recommends revising the proposed language in WAC 173-351-600(6)(b)(viii)(A) to read as follows: "Surety bond guaranteeing payment into the standby trust fund if the owner or operator fails to perform as guaranteed by the bond." This revision will help to clarify that either a performance or payment bond is acceptable as a financial assurance instrument. Shanley, Waste Management)

Ecology's Response to Public Comments

Financial guarantee and performance bonds meet the requirement. Financial guarantee bonds require the Surety to deposit the sum of the bond into the standby trust agreement in the event of default. Performance bonds require the Surety to either perform the work or deposit the sum of the bond into the standby trust agreement.

Proposed Rule

WAC 173-351-600(6)(a)(ii) Pay-in period. Payments into the trust fund must be made annually by the owner or operator over the duration (as defined in WAC 173-351-750) of the initial or reissued permit or over the remaining life of the MSWLF unit (~~((or all MSWLF units))~~), whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the (~~((corrective))~~) remedial action program in the case of (~~((corrective))~~) remedial action for known releases. This period is referred to as the pay-in period.

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WAC 173-351-750(3) Duration of permits. The jurisdictional health department must specify the duration of the MSWLF permit (~~((not to exceed ten years))~~). Except as provided in WAC 173-351-710(5), permits must be renewed ((annually)) at least every five years on a date established by the jurisdictional health department. If a permit is to be renewed for longer than one year, the jurisdictional health department may hold a public hearing before making a decision. Permits must be renewed according to WAC ((173-351-730(3))) 173-351-710(5) or 173-351-720(5), and reissued according to WAC 173-351-720((+6)) (7).

Public Comments

The pay-in period for trust funds should be revised to be the active life of the landfill, not the duration of the maximum 5-year term of the permit.

As drafted, the current regulations and Proposed Revisions require a landfill owner/operator to fully fund its closure/post-closure trust funds over the "duration" of the initial or reissued permit. WAC 173-351-600(6)(a)(ii). Since the permit term cannot exceed 5 years, this requirement effectively means that the owner/operator must generate and set aside all closure and post-closure costs in 5 years or less even though the landfill might be open, operating, and generating revenue for decades or longer. The pay-in period should be revised to be the "active life of the MSWLF unit." WMW recognizes that the current pay-in period requirement matches the requirement under 40 CFR § 258.74(a)(2); however, EPA never defined in its regulations the length of the "initial permit", but acknowledged that states could allow for pay-in periods longer than 5 years, up to the active life of the landfill:

To minimize the burdens on small owners or operators who may have to set aside funds in a trust to demonstrate financial assurance, States may wish to adopt the approach used under Subtitle C. Under Subtitle C, an owner or operator is allowed to build up the trust fund over the life of the facility or over 20 years (10 years for permitted facilities), whichever is shorter. To meet the performance standard criteria under today's proposal, if a build-up period is allowed for trust funds, the State must require the trust to be fully funded no later than the end of the landfill's active life. States may wish to adopt stricter trust fund requirements (e.g., shorter build-up period, accelerated payments into the trust in the earlier years of operations) to avoid potential shortfalls if the MSWLF is closed earlier than expected. 53 Fed. Reg. 33314 (Aug. 30, 1988). (Shanley, Waste Management)

Ecology's Response to Public Comments

The revised rule removed the ten year limit on the duration of permits. Permits must be renewed at least every five years but the jurisdictional health department may specify any period for the duration of the permit. The duration of the permit may be for the active life of the MSWLF unit and include the post-closure care period.

New Section

WAC 173-351-710 Research, development, and demonstration permits.

Proposed Rule

WAC 172-351-710(1) The jurisdictional health department, with the written concurrence of the department, may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, from which the owner or operator proposes to utilize innovative methods which vary from the following criteria provided that the MSWLF unit has a leachate collection system designed and constructed to maintain less than a one foot (30 cm) depth of leachate on the liner and has not been identified as a potential source of contamination:

- (a) The run-on control system in WAC 173-351-200(7); and
- (b) The liquids restriction in WAC 173-351-200(9).

(2) The jurisdictional health department, with the written concurrence of the department, may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative methods which vary from the final cover criteria of WAC 173-351-500 (1)(a), provided the MSWLF unit owner or operator demonstrates that the MSWLF unit is not a source of contamination and the infiltration of liquid through the alternative cover system will not cause contamination of groundwater or surface water, or cause the leachate depth on the liner to exceed one foot (30 cm).

(refer to adopted rule for complete text of section)

Public Comments

WMW supports the addition of WAC 173-351-710, Research, Development, and Demonstration Permits. (Shanley, Waste Management)

Although King County is supportive of developing this section, additional definitions of terms included within the section are necessary. For example, what is the difference between "R&D" and "alternate design"? Is alternate design a R&D design? Are "Innovative methods" the same as alternate design? Further explanation is necessary and to the extent that undefined terms require definitions, such definitions should also be included in the general "Definitions Section" at the beginning of the regulation. Additionally, in section (6)(h), it states that "No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department." However, no time line is provided for DOE review- King County urges DOE to establish a reasonable time for it to complete permit review to allow appropriate planning by the permit applicant to occur. (Kiernan, King County Solid Waste Division)

WAC 173-351, Criteria for Municipal Solid Waste Landfills Compilation of Comments Received and Ecology's Responses November 2012

Ecology's Response to Public Comments

The new research, development, and demonstration provisions in the rule allow for conditional and temporary (12 year) variances to normal run-on controls, liquids restrictions, and cover system designs. The conditional provisions will allow owners and operators to increase the moisture content of waste placed in the MSWLF unit to enhance microbial activity and more effectively manage leachate. The goals of individual projects may vary but include accelerated stabilization, reduced leachate disposal costs, landfill space gains, increased methane generation for energy recovery, and reducing post-closure care periods.

Research, development, and demonstration provisions are unrelated to landfill design criteria for the most part. Alternative design refers to any landfill design that is not a composite liner and leachate collections system as provided in WAC 173-351-300(2)(a) that is demonstrated to meet the performance requirements of WAC 173-351-300(2)(b). The only way research, development, and demonstration projects and alternative designs are associated in the rule is that under WAC 173-351-200(9)(a)(ii) leachate and gas condensate may be placed in a landfill with a composite liner and leachate collection but not in a landfill constructed with an alternative design.

This rule does not specify a timeframe for Ecology's review of issued permits. However, the timeframe is set by law in RCW 70.95.185(2). In accordance with the provision in the law, Ecology must review permits within thirty days after the issuance by the jurisdictional health department.

Proposed Rule

WAC 173-351-710(5) Any permit issued under this section must not exceed three years and each renewal must not exceed three years. The total term for a project permit including renewals may not exceed twelve years.

Public Comments

The language as proposed does not include an option for projects that have demonstrated beneficial results to be permanently included into the owner/operators permit. Can language be included that allows the local jurisdictional health department and the department the ability to include the activity into the following renewal of the permit after the beneficial demonstration and prior to the 12 year limit? (Mains, Regional Disposal Company)

Ecology's Response to Public Comments

The twelve year term for research, development, and demonstration permits is a federal requirement. 40 CFR Part 258.4(e)(1) limits the total term for a project including renewals to a maximum of twelve years.

WAC 173-351-720 Permit application procedures.

Proposed Rule

WAC 173-351-720(5) Renewal procedures. Except as provided in WAC 173-351-710(6), the owner or operator of a facility must apply for renewal of the MSWLF permit at least thirty days before the renewal date. The owner or operator is authorized to continue activities authorized under the most recent expired permit, if the jurisdictional health department has not rendered a decision on renewal by the renewal date of the current permit.

Public Comments

Ecology should eliminate the requirement to apply for permit renewals under WAC 173-351-720.

Ecology should eliminate the requirement for landfill owners and operators to file applications to renew their solid waste permits prior to the renewal date. Such a revision would make the Chapter 173-351 WAC requirements consistent with the Chapter 173-350 WAC requirements (see WAC 173-350-710(3). and would eliminate an unnecessary procedural step that imposes increased burdens and poses risks should an owner or operator fail to timely apply for a permit renewal. It would also correct the oddity that similar regulations derived from the same statutory authority – RCW 70.95.190(1) – would have such different renewal processes. Since all operating and closed landfills are required to have a valid solid waste permit, virtually every facility will have to apply for a permit renewal – and every health department should also be aware that every facility will be applying to renew its permit. Furthermore, since the health department and Ecology will receive annual reports from the landfill owners and operators, they will have the necessary information to determine whether the permit should be renewed or modified, making the need for a new permit application unnecessary. Even if the health department or Ecology needs additional information, either can request such additional information from the landfill owners and operators.

WMW therefore recommends that Ecology adopt language comparable to WAC 173-350-710(3). (Shanley, Waste Management)

Ecology's Response to Public Comments

Ecology included an informal public comment period in the summer of 2011 as part of this rule making. During the informal comment period we requested stakeholder feedback on whether the rule should maintain the requirement for owners or operators to apply for permit renewal. The requirement for owners or operators to apply for permit renewals has been a requirement in Washington since the effective date of Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling in 1985 (see WAC 173-304-600(4)).

Ecology believes there is significant value in retaining the requirement for owners or operators to submit applications to renew permits for municipal solid waste landfill units. This is based on the comments we received and our experience with the renewal process over the years. The process creates an environment where an owner or operator takes the time to review their current

WAC 173-351, Criteria for Municipal Solid Waste Landfills Compilation of Comments Received and Ecology's Responses November 2012

permit provisions, operation and design, and previous application documents. It also establishes a more formal process for reviewing and addressing a facility's compliance with regulatory and permit provisions.

Proposed Rule

WAC 173-351-720(7) Permit reissuance. (~~(Except for permits during transition under subsection (2) of this section,)~~) Any owner or operator intending to continue construction, operation, or post-closure beyond the permitted duration of a valid MSWLF permit must file a reissuance application at least ninety days before the existing permit expires. Reissuance applications are subject to the public notification process of subsection (1)(b) of this section. A reissuance application must be made on forms authorized by the jurisdictional health department and the department, and must include information identified in WAC 173-351-730(4). The jurisdictional health department will follow the procedures of subsection (1) of this section in reissuing a permit.

Public Comments

Ecology should clarify or eliminate the provision for permit reissuance in WAC 173-351-720(7).

The regulations have historically included requirements for both renewing and reissuing solid waste permits, yet the distinction between reissuance and renewal of a permit is not clear. WMW requests that Ecology clarify the difference between the two processes and their applicability. Furthermore, WMW recommends deleting the permit reissuance requirement altogether, unless it serves a meaningful purpose. As discussed in the prior comment, WMW recommends that Ecology eliminate the need to file an application for a permit renewal. If this recommendation is adopted, the need for a procedure for permit reissuance is even less apparent. (Shanley, Waste Management)

Ecology's Response to Public Comments

The permit renewal and reissuance provisions in Chapter 173-351 WAC have been a point of confusion. Permit renewal is a relatively simple process meant to implement RCW 70.95.190(1). Reissuance is a much more comprehensive procedure that follows the same process as an initial permit application.

Ecology has maintained provisions for reissuance for several reasons. All existing facilities are operating under a permit with a duration of ten years or less as previously required under the rule. Owners and operators and local health jurisdiction will need to reissue those permits. Jurisdictional health departments are required to specify the duration of future permits. Reissuance procedures will be needed if the duration is shorter than the life of the MSWLF unit and post-closure period. Reissuance is also required for large expansions and changes beyond the scope of a modification.

WAC 173-351-730 Contents of applications.

Proposed Rule

WAC 173-351-730(1)(b) Specific requirements for permit applications. In addition to other requirements set forth in this section, complete applications for MSWLF permits must contain the following:

(xii) Any other information as required by the jurisdictional health department.

WAC 173-351-730(3) Modification and renewal applications.

(a) Modification applications. An application (~~(on forms)~~) specified by the jurisdictional health department and the department to modify a valid MSWLF permit issued pursuant to WAC 173-351-700 must include, and address, the following (~~(at a minimum)~~):

(v) Any other information as required by the jurisdictional health department.

(b) Renewal applications. An application (~~(on forms)~~) specified by the jurisdictional health department and the department to renew a permit issued pursuant to WAC 173-351-700 must include and address the following (~~(at a minimum)~~):

(v) Any other information as required by the jurisdictional health department.

Public Comments

King County strongly urges DOE to refrain from extending the authority of the jurisdictional health department beyond statutory boundaries. The phrase 'Any other information' as used in the above-referenced code sections is extremely broad and fails to provide specific guidelines, parameters and compliance with statutory regulations governing the legal authority of jurisdictional health departments. Although it is King County's general belief that based upon their existing regulatory authority jurisdictional health departments intend to require information that is reasonable and pertinent, by broadening this code section to provide a "catch-all" which allows a jurisdictional health department arguably unlimited authority to seek information from applicants unnecessarily imparts significant risk of uncertainty to the regulated community. Accordingly, King County proposes that DOE modify the statements set forth above (and to the extent such language is repeated throughout WAC 173-351) to "Any other information as may be reasonably required by the jurisdictional health department within the limits of its legal authority granted by state law." (Kiernan, King County Solid Waste Division)

WAC 173-351, Criteria for Municipal Solid Waste Landfills Compilation of Comments Received and Ecology's Responses November 2012

Ecology's Response to Public Comments

Local health jurisdictions have broad obligations for ensuring solid waste handling facilities meet applicable state and local regulations, conform to local solid waste management plan, and protect human health and the environment. Ecology's experience supports the view that jurisdictional health departments request additional information that is reasonable and when it is pertinent to the issuance of a permit. The rule provides an appeal process if a proponent believes a local health jurisdiction is abusing its authority.

WAC 173-351-750 Permit provisions.

Proposed Rule

WAC 173-351-750(3) Duration of permits. The jurisdictional health department must specify the duration of the MSWLF permit (~~((not to exceed ten years))~~). Except as provided in WAC 173-351-710(5), permits must be renewed ((annually)) at least every five years on a date established by the jurisdictional health department. If a permit is to be renewed for longer than one year, the jurisdictional health department may hold a public hearing before making a decision. Permits must be renewed according to WAC ((173-351-730(3))) 173-351-710(5) or 173-351-720(5), and reissued according to WAC 173-351-720((+6)) (7).

Public Comments

WMW supports clarifications that permits can be renewed for up to five years and need not be renewed annually.

Under RCW 70.95.190, permits are renewed at least every five years; however, Ecology's regulations have stated that permits must be renewed annually. WMW therefore supports the Proposed Revision – specifically WAC 173-351-720(5)(c) and -750(3) – that will make the regulations consistent with State law and allow for permit renewals for up to five years. Indeed, WMW would support even longer permit terms. Given the huge costs for land acquisition, design, engineering, permitting, construction, operation, closure, and post-closure maintenance of modern landfills, it is critical that owners/operators have permits that provide as much long-term certainty as reasonable to allow for the recovery of these costs. (Shanley, Waste Management)

This change reduces the duration of a landfill permit from 10 years to 5 years. Why is this change being proposed? The State of Minnesota recently went from a 5 year permit to a 10 year permit, the exact opposite of the proposed change in the draft rule. Yakima County requests that the 10 year permit duration be maintained. (Mifflin, Yakima County Public Services)

Ecology's Response to Public Comments

The permit renewal and reissuance provisions in the 1993 version of Chapter 173-351 WAC have been an ongoing point of confusion.

The requirement to renew permits at least every five years comes from RCW 70.95.190(1). The renewal period set by law was annual in 1993.

The ten-year permit duration was introduced in the 1993 version of WAC 173-351-750 to allow owners or operators satisfying financial assurance requirements using a trust fund, ten years to make payments into the fund. 40 CFR Part 258.74(a)(2) and WAC 173-351-600 require payments into the trust fund "over the term of the initial permit or over the remaining life of the MSWLF unit, whichever is shorter." At the time, Ecology did not want to require full funding within the one year limit established by Washington law.

Ecology has changed two provisions regarding the length of permits. First, the renewal period reflects the newer five-year timeframe in RCW 70.95.190(1). Second, Ecology has eliminated the ten-year limit on the duration of a permit. A jurisdictional health department may specify any timeframe for the duration of a permit. The specified duration can be a set timeframe or it can be tied to life of the MSWLF unit and include the post-closure period.

There are two significant impacts from this change when jurisdictional health departments extend the duration of permits beyond ten years. First, the pay-in period for trust funds can be extended beyond the previous ten-year limit. Second, the requirement to reissue a permit will be extended to the specified duration instead of every ten years.

WAC 173-351-990 Appendices.

Proposed Rule

APPENDIX II Groundwater QUALITY PARAMETERS

Geochemical Indicator Parameters

Calcium (Ca)	Sodium (Na)
Bicarbonate (HCO ₃)	Chloride (Cl)
Magnesium (Mg)	Potassium (K)
Sulfate (SO ₄)	Alkalinity (as Ca CO ₃)
<u>Total suspended</u>	Iron (Fe) (<u>Total</u>)
<u>solids (TSS)</u>	Manganese (Mn) (<u>Total</u>)

**WAC 173-351, Criteria for Municipal Solid Waste Landfills
Compilation of Comments Received and Ecology's Responses
November 2012**

Adopted Rule

**APPENDIX II
Groundwater QUALITY PARAMETERS**

Geochemical Indicator Parameters

Calcium (Ca)	Sodium (Na)
Bicarbonate (HCO ₃)	Chloride (Cl)
Magnesium (Mg)	Potassium (K)
Sulfate (SO ₄)	Alkalinity (as Ca CO ₃)
<u>Total suspended</u>	<u>Iron (Fe) (Dissolved)</u>
<u>solids (TSS)</u>	<u>Manganese (Mn) (Dissolved)</u>

Public Comments

Field Turbidity would provide more information than TSS. This type of data is available in real time and can evaluate well-purge stabilization and water quality variability/heterogeneity.(Kiernan, King County Solid Waste Division)

Ecology's Response to Public Comments

Field turbidity would provide information regarding the amount of suspended particulates while sampling groundwater monitoring wells in real time. However, turbidity only provides a qualitative or relative measure of the actual quantity of suspended particulates. Total suspended solids provides a quantitative measure of particulates. Ecology added total suspended solids to Appendix II to provide information needed to evaluate potential influences on unfiltered samples in metals analyses. A person evaluating metals test results can look at total suspended solids values and make judgments about whether, or the degree that, suspended particulates may have contributed to the total metals found in a sample. Turbidity is not sufficiently quantitative to be used in the same manner.

Field turbidity is a valuable tool for evaluating sampling technique and well-purge stabilization in situations where suspended solids are a concern. Ecology did not want to require both total suspended solids and turbidity in the rule. However, nothing in the rule prevents a person from taking turbidity measurements during sampling events.

Commenter Index

The table below lists the names of organizations or individuals who submitted a comment on the rule proposal. References to comments are shown and designated in responses to comments by the name of the individual providing the comment and the organization they represent if applicable [e.g., (*John Smith, Organization*)]. The page number is shown where comments addressing specific issues can be found.

Commenter Name, Organization, & Address	Page #	Commenter Name, Organization, & Address	Page #
Charles T. Ellingson Pacific Groundwater Group 2377 Eastlake Avenue East Seattle, WA 98102	37-40	Wendy Mifflin Yakima County Public Services Solid Waste Division 128 North Second St. Yakima, WA 98901	6, 8, 17-18, 26 36, 41, 43-44, 46, 51-52, 64, 67, 75
		Oral Testimony	137-138
Greg Helland, R.G. SCS Engineers 2405 140 th Ave. NE, Suite 107 Bellevue, WA 98005	28-29, 35-36, 61	Kimberly Shanley Waste Management 720 4 th Ave., Suite 400 Kirkland, WA 98033	14-15, 16-17, 20-21, 23-24, 29, 36-37, 42- 43, 45, 46, 57- 58, 59, 62, 64- 65, 66-67, 68, 69, 70, 72, 73, 75
Kevin Kiernan King County, Solid Waste Division 201 South Jackson St., Suite 701 Seattle, WA 98104-3855	7, 8, 10-11, 12 13, 15, 16, 19, 20, 22, 24, 27, 31, 33, 35, 49, 52, 54, 55, 59, 65, 67, 70, 74, 77	Jody Snyder Waste Connections Inc. Comment via e-mail	29-30, 37, 55- 56, 62, 67
Andrew M. Kenefick Waste Management Washington 720 Fourth Ave., Suite 400 Kirkland, WA 98033	18-19	Damon Taam Spokane Regional Solid Waste System	10, 22, 35, & 50
		Oral testimony	137, 138
Brad Lovaas Washington Refuse and Recycling Association 4160 6 th Ave. SE, Suite 205 Lacey, WA 98503	24-25	Patricia Vandehey 111 SE Lupine Place Shelton, WA	6
		Oral testimony	135-136
Art Mains Regional Disposal Company 500 Roosevelt Grade Road Roosevelt, WA 99356	19, 21, 40-41, 53, 54, 67, 71		

Appendix A: Copies of all written comments

Krafft, Wayne (ECY)

From: Charles Ellingson [pony@PGWG.COM]
Sent: Friday, July 06, 2012 2:06 PM
To: Krafft, Wayne (ECY)
Cc: Steve Swope; Glen Wallace; Glenn Multi-Driscoll; Dawn Chapel
Attachments: letter form comments public review draft july 2012.pdf

Hi Wayne,
Please accept this letter commenting on the proposed rule changes for WAC 173-351.

Thanks,
Pony

PACIFIC groundwater GROUP

July 6, 2012

Washington State Department of Ecology
Eastern Regional Office
4601 N. Monroe Street
Spokane, WA 99205

Attn: Wayne Krafft

Re: Comment on Rule Under Development - Criteria for Municipal Solid Waste Landfills
Chapter 173-351, WAC
Issue: Dissolved or Total Metals for Groundwater Monitoring

Dear Mr. Krafft,

This letter comments on the proposed change to require analysis of “total” concentrations of metals in groundwater for WAC 173-351, Criteria for Municipal Solid Waste Landfills.

Pacific Groundwater Group has been involved in groundwater monitoring using both total and dissolved metals under state, federal, and private programs since 1987. Our experience in long term monitoring programs leads us to recommend that the groundwater monitoring required in WAC 173-351 be continued using dissolved metal analyses rather than change to total metal analysis. Our opinion is that the selection of analytes and analytical methods should be selected to maximize the effectiveness of the monitoring program based on the utility of the resulting data. A change to total metals is likely to hamper the identification of increasing concentration trends, reduce the utility of existing long-term monitoring data, complicate statistical analyses, and increase the false-positive rate leading to unnecessary investigation costs for owners and operators.

We provide below a brief comparative analysis of two readily available data sets containing both total and dissolved metals. Data set A was developed using strict low-flow sampling techniques which should minimize the suspended solids content of samples. In field applications across the state, sampling techniques, equipment, and personnel are generally not as good as for data set A which will result in greater variability than reflected in data set A. This brief analysis indicates that switching to total metals analysis is likely to weaken environmental protection because suspended solids in some samples will obscure changes in groundwater quality that could threaten human health and the environment.

WAC 173-351, Criteria for Municipal Solid Waste Landfills

Copies of Written Comments Received

We encourage Ecology to fully analyze the environmental and financial costs and benefits of any change that it proposes. We ask the following questions related to the proposed change:

- Why was this change made?
- What has changed since writing WAC 173-351 that justifies this change?
- Can you provide Washington State examples of risks to human health and the environment caused by use of dissolved data?
- How will the proposed change affect protection of human health and the environment?
- Does Ecology think that total metals data from monitoring wells better represents insitu groundwater quality than dissolved metals data? (If so, please provide the basis of the opinion).
- Has Ecology compared statistics of data sets consisting of dissolved versus total metals data and assessed impacts to the statistical power of resulting detection programs?

Our experience is that field filtration improves data quality by reducing the unavoidable and variable effects of well construction, sampling personnel, sampling equipment, and sampling methods. Under some hydrogeologic conditions, field filtration may also mask the occurrence of metals adsorbed to colloids that move with groundwater, and could therefore pose a risk to human health and the environment. Our experience tells us that risks from colloidal transport are small compared to risks related to decreased statistical power caused by inclusion of immobile solids in groundwater samples.

We understand Ecology's goal of having a consistent standard for groundwater sampling. And, we know that the State's cleanup regulation (MTCA – WAC 173-340), and Groundwater Quality Criteria (WAC 173-200), both of which relate to WAC 173-351 under some circumstances, require collection of total metals samples. Also the Federal solid waste regulation 40 CFR 258 requires analysis of totals metals. At this time we do not know the basis of the requirement for total metals analyses in those regulations. A technical analysis of that basis and comparison to the goals of detection monitoring, assessment monitoring, and corrective action under WAC 173-351 may be warranted as part of this revision process. In our opinion it is not acceptable to simply change the WAC 173-351 requirement because it differs from those other regulations. A scientific and public interest basis is required. With regard to the State's requirement to meet or exceed the Federal requirement, we expect that analysis will reveal that use of dissolved metals data provides greater ability to detect trends, and thus exceeds the Federal standard with regard to protection of human health and the environment.

COMPARISON OF EXISTING TOTAL AND DISSOLVED ANALYSES

Comparison of paired total and dissolved analyses of groundwater samples can inform the decision making process regarding how detection monitoring programs at landfills will change if WAC 173-351 transitions to total metals. Ecology should be prepared to understand if the use of

total metals will improve the ability of landfills to detect groundwater changes during detection monitoring or degrade it. PGG conducted two reconnaissance-level analyses of existing data sets to illustrate what some impacts to monitoring could be. The two analyses were:

- Comparison of trend detection between total and dissolved metals in a high-quality dataset (data set “A”)
- Comparison of total and dissolved concentrations in all paired analyses for selected metals available from the EIM database.

Trend Detection for Data Set A

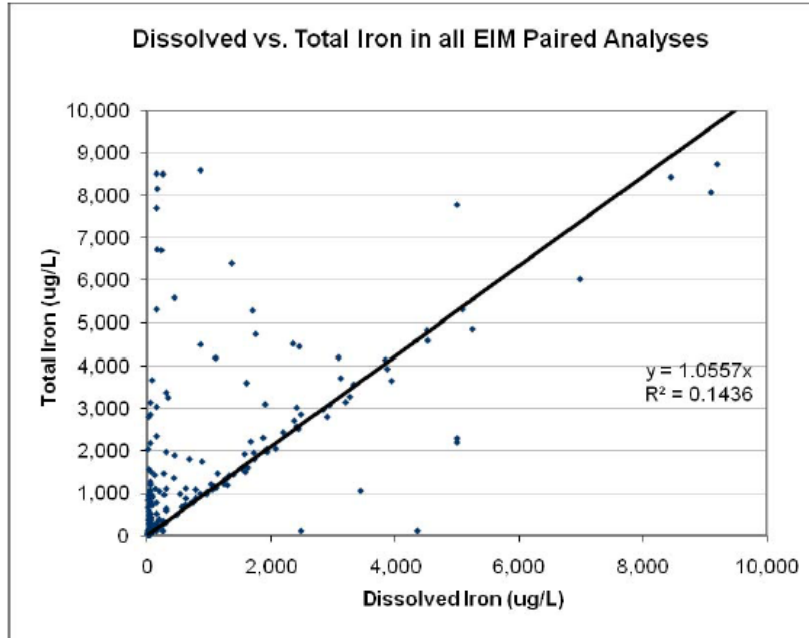
PGG extracted data from a long term monitoring program which uses EPA low-flow sampling methods, and has CLP Level IV data validation for all monitoring events. All samples were analyzed for both total and dissolved metals. Dissolved metals were field-filtered with a 0.45 micron lab-supplied filter. The monitoring network includes 13 wells that are sampled on a quarterly basis.

Statistical trend tests indicate that a greater number of statistically significant trends were identified using dissolved data. The non-parametric Mann Kendall test for trend identified 69 significant trends in the dissolved data set and 62 in the totals data (out of 169 possible trends of well-constituent pairs). Even with this high quality data set, the results suggest that analysis of dissolved data is more likely to identify an increasing trend than analysis of totals data. This suggests that dissolved analyses are more protective of human health and the environment within a detection monitoring program because they more effectively identify changes in aquifer chemistry. The solid waste data sets across the state vary widely with regard to quality, and are generally not as controlled as data set A – therefore we expect greater degradation of trend-detection ability and statistical power for the state as a whole compared to data set A.

Comparison of Total and Dissolved Concentrations in EIM data

Comparison of total and dissolved concentrations show that total concentrations are generally higher, and often do not correlate well with dissolved concentrations. For example, the figure presented below is a plot of all iron data from the EIM for which both totals and dissolved data are available. The plot shows that total concentrations scatter above a 1:1 line with differences of up to several orders of magnitude. This is apparent across the range of dissolved concentrations, and is most pronounced at lower concentrations near the detection limit. This high variability could result in false positive exceedances of GWCLs.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received



WEAK DETECTION PROGRAMS AND CONFUSION DURING TRANSITION

If detection monitoring programs transition to analyzing total metals, existing data sets will no longer be useful for analysis of landfill performance. New "background" data sets will be required, and for intra-well programs at existing landfills, this background will be developed during landfilling operations. This is one example of the practical difficulties that will ensue with the proposed change. If the proposed change is made, Ecology should provide a method of implementation that minimizes cost to operators.

We would be happy to discuss these comments with you if you wish to contact me, Steve Swope, or Glen Wallace in our office.

On behalf of Pacific Groundwater Group

A handwritten signature in blue ink, appearing to read 'C. Ellingson'.

**Charles T. Ellingson
Principal Hydrogeologist**

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

Krafft, Wayne (ECY)

From: Helland, Greg [GHelland@scsengineers.com]
Sent: Friday, July 06, 2012 2:29 PM
To: ECY RE W2R RULE COMMENTS
Subject: Comments on Proposed Rule Changes to Chapter 173-351 WAC
Attachments: 173-351 WAC Proposed Rule Change Comments v1.0 (7-6-12).pdf

Attached please find comments from SCS Engineers.

Thank you.

SCS Engineers
Celebrating 41 Years

Greg Helland, R.G.
Office Director
SCS Engineers
2405 140th Ave NE, Ste 107
Bellevue, WA 98005
425.289.5446 (Direct)
425.785.7269 (Cell)
425.746.6747 (Fax)
ghelland@scsengineers.com

SCS ENGINEERS

MEMORANDUM

DATE: July 6, 2012
TO: Department of Ecology, Waste 2 Resources Program
Via Email: rulecommentsw2r@ecy.wa.gov
FROM: SCS Engineers
SUBJECT: Comments of Proposed Rule Changes to Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills

WAC 173-351-300, Table 1 (Arsenic)

Comment: The Table 1 value listed for arsenic (0.00005 mg/L) is at least two orders of magnitude below generally applied laboratory method reporting limits (MRLs) for arsenic using standard Environmental Protection Agency (EPA) testing methods (i.e., Methods SW846 6010 and 6020). This is true for other constituents listed in Table 1 and, by reference, in WAC 173-200-040 (*Water Quality Standards for Groundwaters of the State of Washington*). Ecology should instead rely on the Maximum Contaminant Levels (MCL), criteria published in the Model Toxics Control Act (MTCA), or other reasonable values established under appropriate rule-making processes. Establishing criteria that are lower than MRLs, and in many cases are not representative of background conditions in Washington, is not reasonable or practical. There is also a conflict with the reference to practical quantitation limit (PQL) cited in WAC 173-351-410(2) (referenced below in second comment).

WAC 173-351-410(2) and WAC 173-351-990 (Appendices I and III)

WAC 173-351-410(2): *The ground water monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in ground water samples or reflect an acceptable practical quantitation limit (PQL). Groundwater samples must not be field-filtered prior to laboratory analysis. All analyses must be sent to an accredited laboratory in accordance with chapter 173-50 WAC, Accreditation of environmental laboratories.*

WAC 173-351-990 (Appendices I and III): *Analysis of trace metals would be for total metals instead of for dissolved analysis, except for nickel and mercury which are currently required to be analysis for total concentrations.*

Comment: This rule would revise the requirement for testing of trace metals from dissolved concentrations to total concentrations. The proposed revision to WAC 173-351-990 (*Appendix II Ground Water Quality Parameters*) from dissolved to total trace metals, except for nickel and mercury, corroborates the proposed revision to WAC 173-351-410(2). As mentioned by Ecology during the July 17, 2011, public comment meeting, Ecology is open to suggestion whether to require that all trace metals be analyzed for dissolved or total concentrations.

WAC 173-351, Criteria for Municipal Solid Waste Landfills

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Department of Ecology – Waste to Resources Program
July 6, 2012
Page 2

Ecology pointed out that the rules currently have a contrasting requirement for nickel and mercury to be analyzed for total concentrations, whereas all other trace metals are required to be analyzed for dissolved concentrations. As a result, it is Ecology's intention to make the testing standard uniform for all trace metals (i.e., either all dissolved or all total concentrations).

It is SCS's opinion that the propose rule be revised to require analyses of all trace metals for dissolved concentrations to maintain consistency with historical practices (for most metals). The following factors support this opinion.

- Most existing municipal solid waste (MSW) facilities in Washington have accumulated extensive, historical groundwater databases that include dissolved metals concentrations (including initial background monitoring data to evaluate baseline groundwater quality conditions). As required in WAC 173-351-420 and 173-351-430, the historical data are combined with new data using Ecology-approved statistical methods to identify potentially elevated or increasing concentrations that may be indicative of a release from the landfill. By requiring testing for total trace metals concentrations, new groundwater data will not be usable for statistical comparison to historical data that is typically based on dissolved concentrations. In fact, eight to twelve background monitoring events will be required for total trace metals concentrations before statistical evaluations of total trace metals can begin (if these data are not available).
- Total suspended solids (TSS) is being added to the list of Appendix II constituents in WAC 173-351-990. Groundwater samples collected from monitoring wells that are properly installed, developed, and routinely sampled typically have low TSS concentrations. For groundwater samples with low TSS concentrations (i.e., sample contains primarily dissolved metals), dissolved metals concentrations will generally be very similar to total metals concentrations. The advantage of using dissolved trace metal analysis is that trace metals results for samples with high TSS concentrations are not biased by colloidal transport of trace metals.

It is SCS's preferred option to change the analytical method for nickel and mercury to dissolved analysis since it would have less of a potential impact on existing background monitoring datasets.

WAC 173-351-600, Financial Assurance Criteria

Comment: The post-closure care period is being modified to 30 years or *as long as necessary for the landfill to be functionally stable and not present a threat to human health or the environment*. Stability criteria include a stable cover system (no settlement, erosion or exposure issues) and low/stabilized gas and leachate production. Also groundwater must meet either WAC 173- 200 groundwater protection standards or background.

The rule change requires owner/operator s to prepare financial assurance criteria and set funds aside to conduct post-closure care until the above conditions are achieved (as opposed to a set period of 30 years). Most facilities (particularly those that include older unlined cells) will be challenged to meet these criteria. In addition, the timeframes, or if necessary, additional

remedial measures, to meet these criteria will be difficult or impossible to predict in advance, which add significant uncertainty for establishing a meaningful financial assurance criteria and funding.

It is SCS's opinion that the proposed rule is nebulous. The financial assurance criteria should specify that the post-closure care period is 30 years. This provides a reasonable and practical basis for calculating necessary post-closure care funds.

If Ecology desires the ability to extend the post-closure care period, Ecology should provide specific conditions that would justify the extension. Further, Ecology should provide clarification on how owner/operators are to estimate the duration of the extended post-closure care period, thereby allowing the owner/operator to calculate the necessary post-closure care funds.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

Krafft, Wayne (ECY)

From: Killinger, Kathryn [Kathryn.Killinger@kingcounty.gov]
Sent: Friday, July 06, 2012 4:59 PM
To: ECY RE W2R RULE COMMENTS
Cc: Kiernan, Kevin
Subject: King County Solid Waste Division's Comments to Revisions to WAC 173-351
Attachments: KCSWD Comments to WAC 173-351 070612.pdf

Attached are King County Solid Waste Division's comments to DOE's proposed revisions to WAC 173-351. A hard copy will follow via U.S. Mail.



King County

Solid Waste Division

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July 6, 2012

Wayne Krafft
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Waste 2 Resources Program
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(or: email to rulecommentsw2r@ecy.wa.gov)

**Washington State Department of Ecology
Proposed Revisions to Washington Administrative Code 173-351
King County Solid Waste Division Comments**

The King County Solid Waste Division (King County) submits the following general and specific informal comments concerning the Washington State Department of Ecology's (DOE) proposed revisions to Washington Administrative Code (WAC) 173-351. In an effort to clearly identify King County's comments, DOE's proposed and/or existing regulations are set forth below in italics and King County's comments are identified as being either "General Comment(s)" or "Specific Comment(s)" in bold type. King County looks forward to future opportunities to work collaboratively with DOE concerning its proposed WAC 173-351 code revisions, as this process proceeds.

General & Specific Comments:

General Comment: All definitions should be included in the same section at the beginning of WAC 173-351 to enable the reader to easily locate and access the applicable information necessary to accurately understand the code terminology.

General Comment: It is vital that for budgetary long term care funding purposes there be a clear and achievable end-date or end criteria for closed landfill maintenance and also a clear

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

and achievable end-date or end criteria for site cleanup. Without clear directive on these matters it is impossible for agencies with municipal landfill, closed or operating, to adequately plan and manage budgetary responsibilities.

WAC 173-351-010 Purpose, applicability, and effective dates. (Page 1)

(2) *Applicability.*

(a) These criteria apply to new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this regulation. ~~at~~ All other solid waste disposal facilities and practices that are not regulated under subtitle C of RCRA and chapter 70.105 RCW are subject to the criteria contained in 40 CFR Part 257, Criteria For Classification of Solid Waste Disposal Facilities, chapter 173-350 WAC, and/or chapter 173-304 WAC as amended.

Specific Comment: The "Applicability" section set forth above does not provide a specific reference concerning the applicability of these regulations to "bioreactor landfills" and "leachate recirculating landfills." In later sections of the code, the regulations refer to "R&D permits." The "Applicability" section needs to clarify whether or not the regulations apply to these additional landfills and permits.

WAC 173-351-100 - Definitions. (Page 5)

"Contaminated" or "contamination" means the alteration of the physical, chemical, biological, or radiological properties of soil or waters of the state such that the soil or water could pose a threat to human health or the environment or the alteration is a violation of any applicable environmental regulation.

Specific Comment: This proposed change allows any analyte to be a contaminant. The newly proposed language is also much broader than the original wording from the code and fails to specify the cause of the alleged contamination, e.g., whether or not it was caused by the owner/operator of the facility, etc. Additionally, changing "groundwater" to "waters of the state" is a large expansion of scope. It is important for DOE to provide a clear definition of "waters of the state" and to identify what is included under that category. Furthermore, how will "a threat to human health or the environment" be determined? Will confined waters that are hydrogeologically independent of beneficial water sources (puddles, leachate ponds) be excluded or included?

Additionally, the change in the definition of "contaminated" uncouples **Maximum Contaminant Levels** and **Statistically Significant Increases** from contamination and replaces them with "threats to human health or the environment" or violation of another regulation. This is much broader than the original wording and more subjective, leading to greater uncertainty on the part of the regulated community.

WAC 173-351-100 - Definitions. (Page 6)

***"Free liquids"** means any portion of waste material passing through and dropping from a filter as determined by Method 9095B (Paint Filter Liquids Test), in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200(9).*

Specific Comment: King County recommends inserting the word 'waste' into this definition as shown above in bold type. The definition of "free liquids" should not include non-waste materials.

WAC 173-351-100 - Definitions. (Pages 5 & 8)

***"Existing MSWLF unit"** means any municipal solid waste landfill unit that is receiving solid waste as of the appropriate dates specified in WAC 173-351-010 (2)(c). Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good waste management practices, including operating plans approved under chapter 173-304 WAC. ~~For the purposes of this rule, any existing horizontal expansion approved by the jurisdictional health department for which as-built plans documenting construction prior to the effective date of this chapter, have been prepared and submitted to the jurisdictional health department shall be considered an existing MSWLF unit.~~*

***"Municipal solid waste landfill unit (MSWLF unit)"** means a discrete area of land or an excavation that receives household waste, and that is not a land application ~~unit~~ site, surface impoundment, injection well, or waste pile, as those terms are defined under chapter 173-350304 WAC, ~~the Minimum functional standards for solid~~ **Solid** waste handling standards or chapter 173-218 WAC, Underground injection control program. A MSWLF unit also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally-exempt small quantity generator waste, and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion.*

***"New MSWLF unit"** means any municipal solid waste landfill unit that has not received waste prior to the November 26, 1993 ~~effective date of this regulation.~~*

Specific Comment: these revised definitions raise a question concerning landfills developed in phases with multiple cells or units – each cell or unit having disparate open and closure periods – are they considered discrete units per the definitions or is the whole landfill the unit?

WAC 173-351-100 - Definitions. (Page 10)

***"Vulnerability"** means the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or assessment of the likelihood*

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and ease for contaminant removal or clean-up, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. See WAC 173-351-140(1)(b).

Specific Comment: King County recommends changing this definition to: *"means the quantifiable risk propensity or likelihood of a"*

WAC 173-351-130 - Location restrictions. (Page 11)

2.(d)(i) "Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

Specific Comment: The definition of "airport" is previously defined in section 100 of WAC 173-352. It does not need to be in both places. King County recommends that this definition be deleted and that a reference to WAC 173-352-130 be inserted into the definition of "airport" within the definitions section of the code.

WAC 173-351-140(b) – Other location restrictions. (Page 16 - 17)

"(a) sole-source aquifers. ... (vi) is prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and "

"(b) Drinking water supply wells...Such a demonstration must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and include:...."

Specific Comment: King County is seeking clarification whether or not the term "licensed professional" includes a professional engineer or if DOE is seeking to preclude professional engineers from performing these tasks? We wish to extend this comment to all new sections referring to 18.220 RCW, Geologists.

WAC 173-351-200 - Operating criteria. (Pages 18-24)

Specific Comment: King County is concerned that important code definitions are being placed within certain code sections and not also provided in the general "Definition Section" of WAC 173-351. King County urges DOE to include all definitions in the general "Definition Section" for greatest clarity and usefulness to the reader. Definitions may also be referenced, included and/or repeated in specific code sections within WAC 173-351, but it is far easier for the regulated community to look in the "Definitions Section" of the regulation for all definitions than to have to look up a reference to various sections seek a specific definition.

(2) Cover material requirements.

(a) Except as provided in (b) of this subsection, the owners or operators of all MSWLF units must cover disposed solid waste with six inches (fifteen centimeters) of earthen material, i.e., soils, at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

Specific Comment: The definition of soils is not specific as the characteristics of soils; there needs to be a specific indication of the characteristics of appropriate cover soil. For example, the California regulations have a good example of the makeup of the aggregate acceptable for soil.

(2)(b) Alternative materials of an alternative thickness other than at least six inches (15 centimeters) of earthen material may be approved by the jurisdictional health department, if the owner or operator demonstrates must demonstrate during the permit process of WAC 173-351-700 that the alternative material and thickness will not present a threat to human health or the environment; will not adversely affect gas or leachate composition or collection; will control disease vectors, fires, odors, blowing litter, and scavenging; and provides adequate access for heavy vehicles, will not adversely affect gas or leachate composition and controls and scavenging without presenting a threat to human health and the environment.

Specific Comment: King County believes that there should be opportunities to propose alternative cover materials during other times of site operation than only during the permitting process. Alternative cover material may become available or practicable years after the permit has been approved, and the opportunity to use these materials should not be restricted to permit application.

(3) Disease vector control.

(a) Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

Specific Comment: Jurisdictional health departments need more guidance on appropriate techniques for protection of human health and the environment. They also need guidance on how to determine what constitutes an acceptable level of vector control. This section is the cause of much conflict between local regulators and landfill operators.

WAC 173-351-210 - Plan of Operation. (Page 24)

(7) How operators will meet each requirement of WAC 173-351-200 and 220;

Specific Comment: Addition of this requirement increases the bureaucratic nature of the operating plan, which is intended to be a document to 'convey to site operating personnel the concept of operation intended by the designer.' Each additional layer of bureaucracy included in the operating plan decreases the likelihood that the operating plan will be used as a functional tool for operating personnel. King County respectfully requests that DOE consider the function of the operating plan and its purpose. For example, is the purpose of the operating plan to satisfy the permitting agency that the facility owner/operator has the ability to develop a document capable of listing all requirements repeatedly, or is it to guide operating personnel in meeting the intent of the designer?

WAC 173-351-300 - Design criteria. (Page 26)

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(i)(a) A With a composite liner as defined in (a)(ii) subsection (3) of this subsection section and a leachate collection system that is designed and constructed to maintain less than a 1 foot (30 cm) depth of leachate over the liner. and less than a 2 foot depth over the leachate pump sump area; or

Specific Comment: What does the word "or" mean at the end of the sentence above? Is it reasonable to infer from the language used that an alternative design can preclude the designated liner, the leachate collection, the leachate depth restrictions, or all three of these systems as long as WAC 173-200 criteria are not exceeded? Please clarify the meaning of the term "or" as it is used in this code section. Additionally, this explanation should be placed in the general "Definitions Section" for greatest clarity and usefulness. Furthermore, as previously stated, while terms may be referenced in the specific code sections, it is most helpful to include a standard definition of a term in the "Definition Section" of WAC 173-352 for ultimate clarity.

(b) In accordance with an alternative design approved by the jurisdictional health department with the department's written consent. Alternative designs must ensure that the maximum contaminant levels listed in Table 1 of this section and the criteria in the Water quality standards for ground waters of the state of Washington, chapter 173-200 WAC, will not be exceeded in the hydrostratigraphic unit(s) identified in the hydrogeologic characterization/report at the relevant point of compliance as specified during the permitting process in WAC 173-351-700. Alternative designs must also sufficiently control methane to meet the criteria in WAC 173-351-200(4)(a).

Specific Comment: The term "alternative design" should be a defined term and placed in the "Definitions Section" of the code. As appropriate, such definition could also be included in the above text, but in all events, the definition should remain constant to provide the reader with ultimate clarity.

WAC 173-351-300 - Design criteria. (Page 28)

(7) Liner separation from ground water. New MSWLF units and lateral expansions may not be designed such that the bottom of the lowest liner component is any less than ten feet (three meters) above the seasonal high level of ground water, unless a demonstration can be made during the permit process of WAC 173-351-700 that a hydraulic gradient control system, or the equivalent, can be installed which prevents the controlled seasonal high level of ground water in the identified water-bearing unit from contacting the bottom of the lowest liner component. For the purposes of this section, ground water includes any water-bearing unit that is horizontally and vertically extensive, hydraulically recharged and volumetrically significant as to harm or endanger the integrity of the liner at any time. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700.

Specific Comment: This section does not provide clarity for perched ground water zones. The definition does not specify what DOE considers to be 'horizontally and vertically extensive' or 'volumetrically significant' ground water, exposing the regulated community to

uncertainty as to whether a specific perched zone will fall under the requirements of this section.

WAC 173-351-400 (e) (2) - Ground water monitoring systems and remedial action. (Page 31)

(3) A qualified ground-water scientist is required to prepare the (2) The following reports, demonstrations and information must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists:

Specific Comment: King County proposes retaining the original language from WAC 173-351-400(e)(2) concerning personnel qualifications. It is unclear why duly authorized professionals who are not geologists or other licensed professionals pursuant to 18.220 RCW are unacceptable to DOE. The emphasis on 18.220 RCW seems to indicate to King County that DOE desires oversight of almost all aspects of landfills to fall under the discipline of geology and that licensing under this specialty is intended to meet regulatory requirements. Unless this new requirement is clarified in the regulation to allow other licensed professionals to perform tasks and/or prepare required reports, King County maintains concerns that this requirement will have over-reaching and long-term financial impacts on how the County operates its facilities. If it is the intent of the regulation to refer to any appropriate license, reference to the applicable state statute should be Chapter 18 RCW rather than Chapter 18.220 RCW (Geologists). Please provide an explanation if DOE elects to retain the revised language.

WAC 173-351-410 (1) (F) - Ground water sampling and analysis requirements. (Page 34)

(1)(f) ~~Decontamination~~ Cleansing of drilling and sampling equipment;

Specific Comment: King County proposes retaining “decontamination” as a more specific term than cleansing. The term “cleansing” is unclear. For example, does the term cleansing include: soil residuals and materials that could spread contamination?

WAC 173-351-410 (2) - Ground water sampling and analysis requirements. (Page 34)

(2) The groundwater monitoring program must include sampling and analytical methods that are appropriate for ground water sampling and that accurately measure hazardous constituents and other monitoring parameters in ground water samples or reflect an acceptable practical quantitation limit (PQL). Ground water samples shall must not be field-filtered for ~~organic constituents~~ prior to laboratory analysis.

Specific Comment: King County encourages DOE to retain the phrase ‘for organic constituents’ in this section.

WAC 173-351-415 (1) - Ground water reporting: (Page 35)

(1) The annual report shall be included with the facility annual report as required in WAC 173-351-200(11) and shall be on Each owner or operator must prepare and submit a copy of

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an annual groundwater report to the jurisdictional health department and the department by April 1st of each year. The ground water annual report must be on forms developed by the department and the following information:

Specific Comment: Please provide the forms for public comment. Additionally, for the purposes of staffing management and work load, we would appreciate the annual report be made due May 1 so it is not due the same day as the quarterly report, as this is a tremendous burden on our staff responsible for this reporting. Many additional regulatory reports are required on April 1, such as federal Tier II reports, discharge monitoring reports, mandatory greenhouse gas reports, etc. the groundwater annual report is a large undertaking that is developed and produced by in house staff. An additional month to prepare it would only improve the product.

WAC 173-351-415 (2) Ground water reporting: (Page 35)

(2) A quarterly, or alternate frequency approved in accordance with WAC173-351-450, groundwater report must be submitted to the jurisdictional health department and the department no later than sixty days after the receipt of the analytical data. ~~and shall~~ The quarterly ground water report must be on forms developed by the department and all of the following:

Specific Comment: Please provide the forms for public comment.

WAC 173-351-430 - Detection monitoring program. (Page 38)

Specific & General Comments: With regard to this entire section of the code, King County believes this update is a good opportunity to clarify use of the term "background" in the regulations. In places throughout WAC 173-351, the term "background" is used synonymously with upgradient. In contrast, in other places of WAC 173-351 (for example: 173-352-420 (1), -430(2) and (3)), the term "background" is used to mean initially or early in time. The intent of collecting a minimum of 8 samples in the first year is (or should be) to obtain enough data to make reasonable inferences about the water quality at a given well that are statistically valid, not to create a closed set "gold standard" for future comparisons, which is implied by differentiating data collected after the first year. Furthermore, routine sampling described in WAC 173-351-430(3) adds to the data set over time and can be used in conjunction with the statistical protocols developed under -420 to determine statistically significant increases, evaluate trends and compare to standards.

WAC 173-351-440 - Assessment monitoring program. (Page 40)

(2) Within ninety days of triggering ~~into~~ an assessment monitoring program, and annually quarterly thereafter, the owner or operator must sample and analyze the ground water for all constituents identified in Appendix III ~~of this part~~. A minimum of one sample from each ~~downgradient~~ well (background and downgradient) must be collected and analyzed during each sampling event.

Specific Comment: Appendix III should be modified to include only analytes not listed in Appendix I or Appendix II. It would then make sense to characterize leachate for Appendix III parameters to determine the likelihood of derivation from municipal solid waste and then, in the event of triggering assessment monitoring, analyze groundwater for those Appendix III analytes present in leachate (if any). The initial Appendix III list for Assessment monitoring could be reduced by eliminating compounds that are unlikely to be present in municipal solid waste. The current list contains numerous analytes unjustified by usage patterns and mobility in the environment. Additionally, with regard to “Assessment Monitoring” (AM) – when AM is triggered, it is King County’s understanding that the facility owner is required to complete a number of sampling events that test for the constituents identified in Appendix III. Any parameters from that list that are detected are then included in the regular quarterly sampling. The revision of WAC 173-351 Appendix III appears to attempt to clarify that the owner then needs to retest for the entire list of constituents included in Appendix III on an annual basis. If that is accurate, such annual analysis is onerous both due to costs that may be incurred in performing the tests and the potential for false positives, while adding minimal benefit. The analyte list is not based on constituents that would be likely to be leaking from a landfill, particularly with a long history of leakage. Additionally, other subsections of the Assessment Monitoring section have the owner fully characterize the release.

WAC 173-351-450 - Alternate ground water monitoring programs. (Page 42)

(2) All proposed changes in ground water monitoring frequency must be no less than semiannually for detection ~~ground water~~ monitoring and no less than quarterly for assessment monitoring. The owner or operator must apply for a permit modification under WAC 173-351-720~~(5)~~~~(6)~~ or must apply during the renewal process of WAC 173-351-720 (5) for changes in ground water monitoring frequency making a demonstration based on the following information:

Specific Comment: Frequency of monitoring under an alternate monitoring program should be determined by the demonstration in -450(2)(a), (b) and (c) rather than an arbitrary time interval.

WAC 173-351-500 - Closure and post-closure care. (Entire section)

Specific Comment: Is closure of a landfill cell considered to be closure of a MSW landfill unit for closure/post closure liability purposes?

WAC 173-351-500 - Closure and post-closure care. (1)(a): (Page 48)

(A) Have a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and minimize ~~Minimize~~ infiltration through the closed MSWLF by the use of an anti-infiltration layer that contains a composite layer as defined in (a)(i)(B) of this subsection;

Specific Comment: The language proposed above conflicts with existing and/or new definitions.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

WAC 173-351-500(2)(b)(iii)(B) and (C) - Closure and post-closure care: (Page 52)

Specific & General Comments: These sections are very prescriptive and may not align with alternative designs. Demonstrations of post-closure care may not be the same between traditional and alternative design landfills. DOE should entertain an alternative, risk-based approach method, as well, which are successfully being used in Europe.

WAC 173-351-500(2)(b)(iii) and (2)(c)(ii) - Closure and post-closure care: (Page 59)

Specific & General Comments: Are solid waste units closed under WAC 173-304 exempt from these demonstrations? What modeling technique does DOE know of that will predict the time for these criteria to be achieved? It seems technically impossible that landfill gas generation will be reduced to the levels prescribed in this section. How can a reduction of level of effort be approved during the post closure period?

WAC 173-351-600 (4)(a)(v) - Financial assurance criteria: (Page 56)

(iv) ...The department will evaluate each cost estimate for completeness, and may accept, or require a revision of the cost estimate in accordance with its evaluation.

Specific & General Comments: Please define the criteria that will be used to define completeness.

WAC 173-352-600(5)(d)(i) – Financial assurance criteria: (Page 58)

The proposed language states: “The amount of funds assured is sufficient to cover the costs of closure, post-closure, and remedial action for known releases when needed.”

Specific & General Comments: It has been King County’s practice to have a reserve fund that accrues interest and receives contributions from rates each year in order to have the funds necessary when they are needed. The way DOE has written this new provision seems to require landfill owners/operators to have the necessary balance immediately available (when needed) without bringing in future contributions from disposal revenue. Is this what DOE intended?

WAC 173-351-600 (5)(f) - Financial assurance criteria: (Page 58)

Specific & General Comments: Please define more clearly what constitutes the annual audit of the financial reserve account. This approach/requirement is highly unusual. Section (5)(f) clearly states that audits are to be performed annually, but then subsection (i) of that same regulation states that audits are to be performed on the state auditor’s schedule – these provisions conflict and should be clarified. Additionally, it appears that the landfill will be required to collect all the financial assurance criteria data for a calendar year, obtain an audit and then file the audit with the jurisdictional health department by April 1. King County strongly believes that this schedule is very onerous and likely very expensive. Additionally,

under financial assurance, when remedial action is first mentioned in the proposed WAC revisions, financial assurance is required for facilities under “remedial action.” Later in the section, financial assurance for remedial action is referred to as though all facilities are required to provide this type of information and/or funding. Please clarify DOE’s intent concerning financial assurance and protocol for landfill/facility owner/operators such as King County.

WAC 173-351-710 (NEW SECTION) - Research, development, and demonstration permits. (Pages 73-75 – Entire Section)

Specific & General Comments: Although King County is supportive of developing this section, additional definitions of terms included within the section are necessary. For example, what is the difference between “R&D” and “alternate design”? Is alternate design a R&D design? Are “Innovative methods” the same as alternate design? Further explanation is necessary and to the extent that undefined terms require definitions, such definitions should also be included in the general “Definitions Section” at the beginning of the regulation. Additionally, in section (6)(h), it states that “*No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.*” However, no time line is provided for DOE review – King County urges DOE to establish a reasonable time for it to complete permit review to allow appropriate planning by the permit applicant to occur.

WAC 173-351-730(1)(b)(xii) - Contents of applications. (Page 73)

WAC 173-351-730(3)(a)(v) – Modification and renewal applications. (Page 73)

WAC 173-352-730(3)(b)(v) – Renewal applications. (Page 74)

(xii) Any other information as required by the jurisdictional health department.

(v) Any other information as required by the jurisdictional health department.

(v) Any other information as required by the jurisdictional health department.

Specific & General Comments (combined): King County strongly urges DOE to refrain from extending the authority of the jurisdictional health department beyond statutory boundaries. The phrase ‘Any other information’ as used in the above-referenced code sections is extremely broad and fails to provide specific guidelines, parameters and compliance with statutory regulations governing the legal authority of jurisdictional health departments. Although it is King County’s general belief that based upon their existing regulatory authority jurisdictional health departments intend to require information that is reasonable and pertinent, by broadening this code section to provide a “catch-all” which allows a jurisdictional health department arguably unlimited authority to seek information from applicants unnecessarily imparts significant risk of uncertainty to the regulated community. Accordingly, King County proposes that DOE modify the statements set forth above (and to the extent such language is repeated throughout WAC 173-351) to “*Any other information as may be reasonably required by the jurisdictional health department within the limits of its legal authority granted by state law.*”

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

WAC 173-351-990 APPENDIX I and II. (Page 82)

Specific & General Comments: All metals should be in "Dissolved" form, not "Total." The change from "dissolved" to "total" metals will make relevant comparison to previous data nearly impossible. Without a program of dedicated pumps, low-flow sampling, frequent well redevelopment and documentation of TSS/Turbidity conditions, data gathered going forward will likely be highly variable and probably useless.

WAC 173-351-900 APPENDIX II –Ground Water Quality Parameters. (Page 85)

Geochemical Indicator

Parameters

<i>Calcium (Ca)</i>	<i>Sodium (Na)</i>
<i>Bicarbonate (HCO₃)</i>	<i>Chloride (Cl)</i>
<i>Magnesium (Mg)</i>	<i>Potassium (K)</i>
<i>Sulfate (SO₄)</i>	<i>Alkalinity (as Ca CO₃)</i>
<i>Total suspended solids (TSS)</i>	<i>Iron (Fe) (Total)</i>
<i>Manganese (Mn) (Total)</i>	

Specific & General Comments: Field Turbidity would provide more information than TSS. This type of data is available in real time and can evaluate well-purge stabilization and water quality variability/heterogeneity.

Sincerely,



Kevin Kiernan
Division Director

Krafft, Wayne (ECY)

From: Kenefick, Andrew M [AKenefick@wm.com]
Sent: Tuesday, June 19, 2012 7:02 PM
To: ECY RE W2R RULE COMMENTS; Krafft, Wayne (ECY)
Subject: Comment on Proposed Rule: WAC 173-351 - Criteria for Municipal Solid Waste Landfills
Attachments: LL to Ecology re Comments on Chapter 173-351-200.pdf

Attached please a comment on the above-referenced proposed rule revision. Please note that Waste Management will be submitting additional comments later.

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WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received



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June 19, 2012

VIA E-MAIL ONLY

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**RE: Comment on Proposed Rule: WAC 173-351
Criteria for Municipal Solid Waste Landfills
Recommendation for Revision to WAC 173-351-200(1)(b)(i)**

Dear Mr. Krafft:

Waste Management of Washington, Inc. ("WMW") appreciates the opportunity to comment on the Department of Ecology's proposed revisions to Chapter 173-351 WAC – Criteria for Municipal Solid Waste Landfills (the "Proposed Revisions"). WMW is preparing its comments on the overall Proposed Revisions and will submit those comments by the end of the public comment period.

WMW does however have one specific recommendation for a revision to WAC 173-351-200(1)(b)(i) to reconcile an inconsistency between Chapter 173-351 WAC and Chapter 173-303 WAC – the Dangerous Waste ("DW") regulations. Specifically, WMW recommends that Ecology revise WAC 173-351-200(1)(b)(i) to include the underlined text below which would read as follows:

(i) "Regulated dangerous waste" means a solid waste that is a dangerous waste as defined in WAC 173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 C.F.R. Part 61, that is not excluded from regulation as a dangerous waste under WAC 173-303-071, or that is not a conditionally excluded special waste under WAC 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070; ...

This revision is necessary because the DW regulations allow for the disposal of certain conditionally excluded special waste in municipal solid waste ("MSW") landfills permitted under Chapter 17-351 WAC, yet the MSW landfill regulations do not include a corresponding authorization. Specially, the DW regulations provide, at WAC 173-303-073:

(1) Purpose. Special wastes pose a relatively low hazard to human health and the environment. The department believes that special wastes can be safely managed with a

LL to Ecology re Comments on Chapter 173-351-200 (6/19/2012)

level of protection that is intermediate between dangerous and nondangerous solid wastes. This section establishes a conditional exclusion for the management of special wastes.

(2) Exclusion. Special wastes are excluded from the requirements of chapter 173-303 WAC, except for WAC 173-303-050; 173-303-060; 173-303-140 (4)(c); 173-303-145; 173-303-960; and 173-303-510 excluding subsections (4)(a), (4)(b)(iii), (5), (6)(c), and (6)(d). In addition, special waste must be treated as dangerous waste for purposes of pollution prevention planning as required in chapters 173-307 and 173-305 WAC. Special wastes will not be considered as dangerous waste, provided they are managed in accordance with the standards in this subsection and provided they are disposed, legitimately recycled, or treated on-site consistent with the requirements of WAC 173-303-170 (3)(c).

....
(g) Disposal of special waste must be in landfill units which:

(i) Are permitted in accordance with chapter 173-351 WAC, provided that an engineered liner is used to meet the requirements of arid landfill design requirements, WAC 173-351-300(2)(b),¹ or are permitted under WAC 173-303-800 through 173-303-840 or if out-of-state under 40 C.F.R. Part 258 or Part 270;

....
Notwithstanding the authorization under the DW regulations to dispose of conditionally excluded special wastes in MSW landfills, the MSW landfill regulations do not allow for the disposal of such wastes because conditionally excluded special wastes are not excluded from the definition of "regulated dangerous waste" under WAC 173-351-200(1), which currently states:

(1) Procedures for excluding the receipt of dangerous waste.

(a) Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of regulated dangerous wastes including polychlorinated biphenyls (PCB) waste as defined in chapter 173-303 WAC, the Dangerous waste regulations. This program must include, at a minimum: ...

(b) For purposes of this subsection:

(i) "Regulated dangerous waste" means a solid waste that is a dangerous waste as defined in WAC 173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 C.F.R. Part 61, that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or was not generated by an exempted small quantity generator as defined in WAC 173-303-070; ...

While the codified exclusion of certain dangerous wastes from "regulated dangerous waste" under WAC 173-303-071 is included, the regulations omit – we believe unintentionally – the exclusion for conditionally excluded special wastes under WAC 173-303-073.

¹ This cross-reference in the DW regulations to the arid landfill design requirements will also need to be revised if the Proposed Revisions to WAC 173-351-300 eliminate the arid landfill design requirements.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

June 19, 2012

WMW believes that the proposed revision is necessary to reconcile the two sets of regulations and is consistent with Ecology's determination "special wastes pose a relatively low hazard to human health and the environment."

* * *

WMW appreciates the opportunity to make this recommendation. If you have any questions, please feel free to call me at (425) 825-2003.

Sincerely,



Andrew M. Kenefick

Krafft, Wayne (ECY)

From: Brad Lovaas [Brad@wrra.org]
Sent: Friday, July 06, 2012 9:54 AM
To: ECY RE W2R RULE COMMENTS
Subject: FW: WRRRA Comments on WAC 173-351 Rule Revisions
Attachments: WRRRA Comments on WAC 173-351 Cirtieria for MSW Landfills 7 6 2012.pdf

From: Brad Lovaas
Sent: Friday, July 06, 2012 9:51 AM
To: 'rulecommentssw2r@ecy.wa.gov'; Krafft, Wayne (ECY)
Subject: WRRRA Comments on WAC 173-351 Rule Revisions

Mr. Wayne Krafft,

Attached are the comments of the Washington Refuse & Recycling Association (WRRRA) on the revisions to WAC 173-351 Criteria for MSW Landfills. Thank you for your efforts on this rule revision. If you have any questions regarding the WRRRA comments please do not hesitate to call me .

Best Regards,

Brad

Brad Lovaas
Executive Director



4160 6th Ave. SE Suite 205

Lacey, WA 98503

Phone: 360-943-8859

Fax: 360-357-6958

Web: www.wrra.org



This message is intended for the sole use of the individual and entity to whom it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If you are not the intended addressee, nor authorized to receive for the intended addressee, you are hereby notified that you may not use, copy, disclose or distribute to anyone the message or any information contained in the message. If you have received this message in error, please immediately advise the sender by reply email and delete the message. Thank you very much.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received



WASHINGTON REFUSE & RECYCLING ASSOCIATION

July 6, 2012

Via e-mail rulecommentssw2r@ecy.wa.gov and first class mail

Mr. Wayne Krafft
Washington Department of Ecology
Eastern Regional Office
4601 N. Monroe St.
Spokane, WA 99205-1295

Re: WAC 173-351 Criteria for MSW Landfills

Dear Mr. Krafft,

Please consider the following to be the comments of the Washington Refuse and Recycling Association (WRRA) regarding the above-referenced rule making. As you know, WRRA represents the vast majority of solid waste and recyclable collection companies in Washington, including members who own and/or operate material recovery and disposal facilities. Those members who own disposal facilities will submit comments on their own, which will be much more focused on the technical aspects of the proposed rules, while our comments will be general in nature.

It appears to WRRA that this rule revision certainly is appropriate in that "updates" to adopt federal regulatory changes and to clarify and harmonize rules are needed at this time. We recognize this has been no small task and appreciate the obvious hard work that has gone into the process.

Our primary area of concern continues to be the existence of, and even planning for, new, unlined landfills. One public witness at the Lacey hearing addressed this concern, as have others in the industry. We simply believe that unlined landfills are unsafe and harmful to the environment and the populace, whether they are for municipal solid waste or other waste streams.

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Web: www.wrra.org • E-Mail: office@wrra.org

We believe that unlined landfills afford those individuals who would skirt other solid waste laws a below market disposal option, encouraging the delivery of more volume and potentially questionable waste streams to these unlined landfills rather than to operators who have expended the full cost of regulatory compliance, and established facilities that are markedly more protective of the environment and public health in our state. We would urge that any existing or new unlined landfills be held to higher standards when it comes to the acceptance of waste, financial assurance and monitoring, and be subject to more regular inspection by regulatory authorities to insure that waste streams accepted are in accordance with permit provisions.

Unlined landfills have and remain a threat to the environment, collection systems and eventually a liability that will be assumed by the ratepayer and/or taxpayer.

We trust that the Department shares our concern and that the proposed rules regarding liner design will be fashioned to eventually eliminate the use of all unlined landfills in our state. New unlined landfills should not be approved, and existing unlined facilities (operational or closed) should be in compliance with the proven science and technology we have now, not that which, if it existed at all, was or was not applied 50 plus years ago.

WRRRA urges you to consider seriously the comments that will be filed by our members who are directly involved in this issue. For our part, we urge you to vigorously enforce any rules and to recognize that the "day" of the unlined or inadequately lined landfill has long since passed, and we all need to recognize this reality.

Thanks again to you and staff for all your hard work on this project. WRRRA and its member companies look forward to working with the Department to see that whatever rule changes are adopted will be appropriately and swiftly implemented.

Sincerely,

WASHINGTON REFUSE AND RECYCLING ASSOCIATION



BRAD LOVAAS
Executive Director

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

Krafft, Wayne (ECY)

From: Mains, Arthur [AMains@republicservices.com]
Sent: Friday, July 06, 2012 12:41 PM
To: ECY RE W2R RULE COMMENTS
Cc: Barry, Kevin (DOHi); Henry, Matthew; Bleeker, Gary (ECY); Kassoy, Stephanie; Krafft, Wayne (ECY)
Subject: WAC 173-351 Comments
Attachments: Regional Disposal Co_173-351 2012 Update_Formal Comments070612_.pdf

Please see attached comments to the proposed Criteria for Municipal Solid Waste Landfills, WAC173-351 language provided by Regional Disposal Company.

Thanks,
Art

Art Mains | Environmental Manager | Republic Services
500 Roosevelt Grade Rd. | Roosevelt, WA 99356
☎ Phone: 509.384.5641 | ☎ Cell: 541.288.6858 | ☎ Fax: 509.384.5881 | ✉ e-Mail: amains@republicservices.com



July 6, 2012

Wayne Krafft
Washington Department of Ecology
Eastern Region Office
Waste 2 Resources Division
4601 N. Monroe St.
Spokane, Washington 99205-1295

RE: Comments regarding Amendments to Criteria for Municipal Solid
Waste Landfills, WAC 173-351

Dear Mr. Krafft:

Regional Disposal Company, owner and operator of the Roosevelt Regional Landfill located near Roosevelt Washington, hereby submits the following comments to the proposed rule revising and amending the Criteria for Municipal Solid Waste Landfills, WAC 173-351.

1. *173-351-200 (2)(a) Except as provided in (b) of this subsection, the owners or operators of all MSWLF units must cover disposed solid waste with six inches (fifteen centimeters) of earthen material, i.e., soils, at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.*
The proposed language does not clearly identify how this requirement applies to a facility that is actively managing waste 24 hours/day. Can language be included that clarifies this language for such a facility?
2. *173-351-200 (9)(a)(ii)(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300(~~((2)(a)(i) and (ii) or (iii))~~)(3); and*
The proposed edit excludes reintroduction of liquids generated by the MSWLF unit over an approved liner system that demonstrates the groundwater quality standards at the relative compliance point(s) will not be exceeded. Should the reference be expanded to include alternate liner systems as approved through 173-351-300 (2)?
3. *173-351-400 Note:~~((A hydrogeologist or other qualified groundwater scientist is NOT required for the actual groundwater sampling.))~~ Groundwater sampling must be performed by or under the direct supervision of a geologist or other licensed professional in accordance with chapter 18.220 RCW, Geologists.*
Is it the intent of the proposed language within this note to have a licensed professional be physically present during groundwater sampling? Would it be acceptable to delete the "direct" portion of the note to allow trained technicians to sample in accordance with the Sampling and Analysis Plan required in 173-351-410 (2)(b)?
4. *173-351-500 (2)(a) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must conduct post-closure care. Post-closure care must be conducted for thirty years~~(or, except))~~ or as long as necessary for the landfill to become functionally stable. A landfill is functionally stable when it does not present a threat to human health or the environment at the point of exposure for humans or environmental receptors.*

As a risk based evaluation for post closure care is proposed should the reference to a thirty year post closure period be removed? If the revised language deletes "thirty years or" within the proposed 173-351-500 (2)(a) language will the intent of the risk based analysis be more clear?
5. *173-351-500 (2)(b)(iii)(A through D)*

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www.rabanco.com

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

July 6, 2012
Page 2

The proposed language calls out the components (e.g. cover stability, leachate, LFG) to determine when post closure care can be ceased. Would it be suitable to include language for these components that would allow the local jurisdictional health department and owner to evaluate each component and cease post closure care for that individual component when the demonstration is made that it is functionally stable?

6. *173-351-600 (5)(f) An owner or operator satisfying the requirements of this section using a reserve account or trust fund must file with the jurisdictional health department and the department audit reports of the financial assurance accounts established for closure, post-closure, and remedial action, and a statement of the percentage of user fees, as applicable, diverted to the financial assurance instruments, for the previous calendar year:*

The proposed language is not clear with respect to facilities that are utilizing multiple financial instruments as allowed for in the proposed 173-351-600 (5)(c). Are the trust fund audits required when utilizing multiple mechanisms such as a trust fund with no additional contributions and other financial instruments?

7. *173-351-710 (5) Any permit issued under this section must not exceed three years and each renewal must not exceed three years. The total term for a project permit including renewals may not exceed twelve years.*

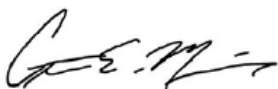
The language as proposed does not include an option for projects that have demonstrated beneficial results to be permanently included into the owner/operators permit. Can language be included that allows the local jurisdictional health department and the department the ability to include the activity into the following renewal of the permit after the beneficial demonstration and prior to the 12 year limit?

8. *173-351-990 Appendices.*

The proposed language replaces the dissolved metals analysis with total metals analysis. As commented on during the informal comment period Regional Disposal Company continues to disagree to the change to total metals analysis without technical justification. "The change in testing will most likely hamper the identification of increasing concentration trends, reduce the utility of existing long-term monitoring data, complicate statistical analyses, and increase the false-positive rate leading to unnecessary investigation costs for owners and operators...field filtration improves data quality by reducing the unavoidable and variable effects of well construction, sampling personnel, sampling equipment, and sampling methods." – PGWG July 2011.

Contact me at the landfill (800) 275-5641 if you have any questions or need any additional information.

Sincerely,
Regional Disposal Company



Art Mains
Environmental Manager

cc: Darlene Frye, Ecology CRO
Kevin Barry, KCDPH



Public Services

128 North Second Street • Fourth Floor Courthouse • Yakima, Washington 98901
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VERN M. REDIFER, P.E. - Director

June 27, 2012

RECEIVED

JUN 27 2012

DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

Wayne Krafft, Section Manager
Department of Ecology
Waste 2 Resources Program
4601 N. Monroe Street
Spokane, WA 99205

**RE: Yakima County Public Services – Solid Waste Division Comments on Rule
Amendment WAC 173-351, Criteria for Municipal Solid Waste Landfills**

Dear Mr. Krafft:

Thank you for the opportunity to comment on the proposed rule update to WAC 173-351, Criteria for Municipal Solid Waste Landfills. On October 10, 2007, the Board of Yakima County Commissioners, met with the Department of Ecology regarding possible rule changes to WAC 173-351. At that meeting, Cullen Stephenson, Manager of the Department of Ecology Solid Waste Program assured Yakima County representatives that Ecology would draft a rule, in cooperation with Yakima County, to allow continued operations of our landfills for both Cheyne and Terrace Heights under an alternative design scenario. Mr. Stephenson noted that there was not a better landfill site in Washington State for the protection of groundwater than the Cheyne Landfill site due to the low annual precipitation, site geology, low permeability of the soils, the great depth to groundwater and the vadose travel time for natural recharge which is estimated to be more than 10,000 years.

On July 18, 2011, the Yakima County Public Services – Solid Waste Division provided comments on the draft rule and on June 14, 2012 a meeting was held in Yakima to discuss the proposed rule and how it affects Terrace Heights Landfill and Cheyne Landfill. Below you will find the original comments submitted to the Department of Ecology on July 18, 2011 and our continued comments as of June 27, 2012:

- 1. WAC 173-351-010 – Effective Date of this Chapter** – The proposed effective date of this chapter is November 26, 1993. Please clarify that Terrace Heights Landfill and Cheyne Landfill will be considered in compliance if the proposed rule is adopted and that only new expansions would be affected by the proposed rule change.

Yakima County ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Yakima County's Title VI Program, you may contact the Title VI Coordinator at 509-574-2300.

If this letter pertains to a meeting and you need special accommodations, please call us at 509-574-2300 by 10:00 a.m. three days prior to the meeting. For TDD users, please use the State's toll free relay service 1-800-833-6388 and ask the operator to dial 509-574-2300.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

Department of Ecology clarified that the Terrace Heights Landfill and Cheyne Landfill would be in compliance if the rule was adopted and that only new expansions would be affected at the meeting on June 14, 2012.

2. **WAC 173-351-140 (b) – Drinking Water Supply Wells** – This change appears to remove a grandfather clause when purchase of land for a future landfill predates the use of a water well. The revised language might impose a limitation on use of portions of current landfill property. Does travel time criterion in the demonstrations proposed include vadose zone travel time? If not, why not? Yakima County requests that the current rule not be changed for this section.

Rule language was modified as requested above by the Department of Ecology.

3. **WAC 173-351-300 (b) – Design Criteria for Liners** - The proposed modifications to the rule delete the arid design which is the approved design standard for both Cheyne and Terrace Heights Landfills and instead allows for an alternate design. Since a demonstration has been made and approved for both Terrace Heights Landfill and Cheyne Landfill it is our understanding that the proposed rule change should not affect current operations at either landfill or future excavations of Cell 2 at Cheyne. Please clarify that our understanding is correct.

The Department of Ecology confirmed that our understanding is correct on June 14, 2012.

4. **WAC 173-351-410 (3) (b) – Wellheads to be surveyed to the NAVD88 datum** - Adoption of this change could affect a wide range of previously done engineering work for both Cheyne and Terrace Heights Landfill. Our sites currently use a combination of local horizontal datum and NGVD29 vertical datum. Will the Terrace Heights and Cheyne Landfills be allowed to continue with the current datum used?

Yakima County Public Services – Solid Waste Division is again requesting that we be allowed to use the current datum for Terrace Heights Landfill and Cheyne Landfill. Adoption of this section would require resurveying of all wellheads, conversion to make sure they are tipped right and re-doing all previous work done regarding water level calculations. There is no guarantee that the data will convert correctly as we use a combination of old level loops, vertical/horizontal datum and NGVD 29.

5. **WAC 173-351-415 (3) – Electronic Submission of Data** – This section implies that the Department would like uploads to a database, perhaps something like the EIM database. How often would data be required to be uploaded? What are the deadlines for upload? What system will be adopted? Will historic data need to be retroactively compiled and uploaded? Yakima County's concern will be the costs of obtaining data and reports and those costs being shouldered by the citizens without

any demonstrated valued or benefit. Does the Department of Ecology have the staff to manage this data?

It appears that our comments above were not considered in the draft rule-making. We again request that if the Department of Ecology does not have adequate staff to manage this data that revisions be made to delete this requirement.

6. **WAC 173-351-500 (i) (A) and (ii) (A) – Closure and Post Closure Care** - This section changes the requirements for top cover permeability. The current permit for Terrace Heights Landfill approves a final cover system that consists of a 6 inch barrier soil layer having a maximum hydraulic conductivity of 1×10^{-6} cm/sec, overlain by a 30 inch soil/topsoil layer and the Cheyne Landfill has an approved cover system which includes two-feet of compact soil with a hydraulic conductivity of not more than 1×10^{-5} cm/sec and 12 inches of earthen soil with the top six inches of topsoil material for vegetation. Will this previously approved cover be grandfathered/approved as an alternate design for Cheyne and Terrace Heights Landfills? In addition, covers in Central and Eastern Washington have limited generation of leachate by increasing evapotranspiration, which is a different approach than simply lowering permeability. Will this be allowed as an alternative design? We are requesting that the current approved cover systems be grandfathered for both Cheyne and Terrace Heights Landfill.

It appears that our comments above were not considered in the draft rule-making process. We are again requesting that the Department of Ecology allow the use of a soil/topsoil cover system, as an alternate design for Terrace Heights Landfill and Cheyne Landfill as outlined above and incorporate this into the final rule when adopted. Natural material such as soil/topsoil provides better and lasting protection compared to a liner system.

7. **WAC 173-351-600 – Financial Assurance Criteria** – This section requires some clarification regarding the closure/post-closure requirements. Is the Department requiring a remedial action reserve account when no remedial action is occurring? When does the remedial action reserve account become required? Requiring the annual audit be provided by April 1st is an unreasonable expectation. Yakima County does not receive the annual audit report of our audit until late September of each year. Requiring a statement of the percentage of user fees diverted to the financial assurance instruments is not a Federal requirement that we can find. Why is this language being inserted? Currently Yakima County meets the financial assurance requirements using CFR 258.74 (1) State Approved mechanism. What is driving the Department to mirror the full CFR financial assurance requirements? Yakima County is again concerned with the costs to the citizens with no demonstrated benefit or significant value.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

It appears that our comments above were not considered in the draft rule-making process. We are again requesting that you incorporate the above comments for inclusion in the final rule.

8. **WAC 173-351-750 (3) – Duration of Permits** – This change reduces the duration of a landfill permit from 10 years to 5 years. Why is this change being proposed? The State of Minnesota recently went from a 5 year permit to a 10 year permit, the exact opposite of the proposed change in the draft rule. Yakima County requests that the 10 year permit duration be maintained.

This comment was incorporated in the final rule.

9. **WAC 173-351-990 – Appendices** – The proposed change could affect existing and new monitoring programs depending on how it is implemented which is not clear. The proposed WAC does not appear parallel to the federal regulation in all respects and we are unclear how Ecology is choosing to deviate from the federal regulation. Low flow monitoring methods are not fully implemented for the Yakima County Landfill monitoring programs because of high horsepower pumps that are required to handle the pumping lifts which are up to 650 feet. Why was this change made? What has changed since writing WAC 173-351 that justifies this change? Can Ecology provide Washington State examples of risks to human health and the environment caused by use of dissolved data? Does Ecology think that metals data from monitoring wells better represents groundwater quality than dissolved data and if so please provide a basis for opinion? Will current programs based on dissolved metals be required to switch? How should total data be compared to background defined by dissolved concentrations? Has Ecology compared statistics of data sets consisting of dissolved versus total metals data and assessed impacts to the statistical power of resulting detection programs? Would centrifuging unpreserved total samples be an acceptable alternative to filtration to reduce turbidity prior to analysis for metals?

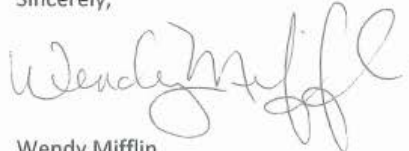
It is our understanding that in order for the Department of Ecology to get delegation from EPA that groundwater monitoring data will need to be changed from dissolved to total metals data. At the meeting on June 14, 2012, the Department of Ecology stated that this change would not happen until a permit expires and that a guidance document would be developed that Yakima County Solid Waste would have input to prior to issuance. While we still have the same concerns as outlined above, we look forward to working with the Department of Ecology on the guidance document.

10. **Financial Impacts to Yakima County by Rule Adoption** – The rule making process for updating WAC 173-351 will have significant financial impacts to Yakima County. We are requesting that the Department of Ecology consult with Yakima County to mitigate these impacts.

Yakima County and the Department of Ecology met on June 14, 2012 to discuss concerns regarding financial impacts to Yakima County.

Thank you for your consideration of our comments and concerns and for meeting with us in Yakima on June 14th. If you have any questions, please feel free to contact me at (509) 574-2455.

Sincerely,

A handwritten signature in cursive script, appearing to read "Wendy Mifflin".

Wendy Mifflin
Solid Waste Manager

Cc: Darlene Frye, Central Region Program Manager
Ted Silvestri, R.S., Yakima Health District

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received



Public Services

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VERN M. REDIFER, P.E. - Director

July 18, 2011

Kathleen Scanlan
Department of Ecology
P.O. Box 47600
Olympia, WA 98504

**RE: Yakima County Public Services – Solid Waste Division Comments on Draft Rule
Amendment WAC 173-351, Criteria for Municipal Solid Waste Landfills**

Dear Ms. Scanlan:

Thank you for the opportunity to comment on the proposed draft rule update to WAC 173-351, Criteria for Municipal Solid Waste Landfills. On October 10, 2007, the Board of Yakima County Commissioners, met with the Department of Ecology regarding possible rule changes to WAC 173-351. At that meeting, Cullen Stephenson, Manager of the Department of Ecology Solid Waste Program assured Yakima County representatives that Ecology would draft a rule, in cooperation with Yakima County, to allow continued operations of our landfills for both Cheyne and Terrace Heights under an alternative design scenario. Mr. Stephenson noted that there was not a better landfill site in Washington State for the protection of groundwater than the Cheyne Landfill site due to the low annual precipitation, low permeability of the soils, the great depth to groundwater and the vadose travel time for natural recharge which is estimated to be more than 10,000 years.

Yakima County Public Services – Solid Waste Division submits the following comments on the proposed rule for clarification and consideration:

- 1. WAC 173-351-010 – Effective Date of this Chapter** – The proposed effective date of this chapter is November 26, 1993. Please clarify that Terrace Heights Landfill and Cheyne Landfill will be considered in compliance if the proposed rule is adopted and that only new expansions would be affected by the proposed rule change.

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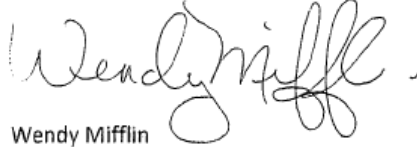
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3. **WAC 173-351-300 (b) – Design Criteria for Liners** - The proposed modifications to the rule delete the arid design which is the approved design standard for both Cheyne and Terrace Heights Landfills and instead allows for an alternate design. Since a demonstration has been made and approved for both Terrace Heights Landfill and Cheyne Landfill it is our understanding that the proposed rule change should not affect current operations at either landfill or future excavations of Cell 2 at Cheyne. Please clarify that our understanding is correct.
4. **WAC 173-351-410 (3) (b) – Wellheads to be surveyed to the NAVD88 datum** - Adoption of this change could affect a wide range of previously done engineering work for both Cheyne and Terrace Heights Landfill. Our sites currently use a combination of local horizontal datum and NGVD29 vertical datum. Will the Terrace Heights and Cheyne Landfills be allowed to continue with the current datum used?
5. **WAC 173-351-415 (3) – Electronic Submission of Data** – This section implies that the Department would like uploads to a database, perhaps something like the EIM database. How often would data be required to be uploaded? What are the deadlines for upload? What system will be adopted? Will historic data need to be retroactively compiled and uploaded? Yakima County's concern will be the costs of obtaining data and reports and those costs being shouldered by the citizens without any demonstrated valued or benefit. Does the Department of Ecology have the staff to manage this data?
6. **WAC 173-351-500 (i) (A) and (ii) (A) – Closure and Post Closure Care** - This section changes the requirements for top cover permeability. The current permit for Terrace Heights Landfill approves a final cover system that consists of a 6 inch barrier soil layer having a maximum hydraulic conductivity of 1×10^{-6} cm/sec, overlain by a 30 inch soil/topsoil layer and the Cheyne Landfill has an approved cover system which includes two-feet of compact soil with a hydraulic conductivity of not more than 1×10^{-5} cm/sec and 12 inches of earthen soil with the top six inches of topsoil material for vegetation. Will this previously approved cover be grandfathered/approved as an alternate design for Cheyne and Terrace Heights Landfills? In addition, covers in Central and Eastern Washington have limited generation of leachate by increasing evapotranspiration, which is a different approach than simply lowering permeability. Will this be allowed as an alternative design? We are requesting that the current approved cover systems be grandfathered for both Cheyne and Terrace Heights Landfill.

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7. **WAC 173-351-600 – Financial Assurance Criteria** – This section requires some clarification regarding the closure/post-closure requirements. Is the Department requiring a remedial action reserve account when no remedial action is occurring? When does the remedial action reserve account become required? Requiring the annual audit be provided by April 1st is an unreasonable expectation. Yakima County does not receive the annual audit report of our audit until late September of each year. Requiring a statement of the percentage of user fees diverted to the financial assurance instruments is not a Federal requirement that we can find. Why is this language being inserted? Currently Yakima County meets the financial assurance requirements using CFR 258.74 (1) State Approved mechanism. What is driving the Department to mirror the full CFR financial assurance requirements? Yakima County is again concerned with the costs to the citizens with no demonstrated benefit or significant value.
8. **WAC 173-351-750 (3) – Duration of Permits** – This change reduces the duration of a landfill permit from 10 years to 5 years. Why is this change being proposed? The State of Minnesota recently went from a 5 year permit to a 10 year permit, the exact opposite of the proposed change in the draft rule. Yakima County requests that the 10 year permit duration be maintained.
9. **WAC 173-351-990 – Appendices** – The proposed change could affect existing and new monitoring programs depending on how it is implemented which is not clear. The proposed WAC does not appear parallel to the federal regulation in all respects and we are unclear how Ecology is choosing to deviate from the federal regulation. Low flow monitoring methods are not fully implemented for the Yakima County Landfill monitoring programs because of high horsepower pumps that are required to handle the pumping lifts which are up to 650 feet. Why was this change made? What has changed since writing WAC 173-351 that justifies this change? Can Ecology provide Washington State examples of risks to human health and the environment caused by use of dissolved data? Does Ecology think that metals data from monitoring wells better represents groundwater quality than dissolved data and if so please provide a basis for opinion? Will current programs based on dissolved metals be required to switch? How should total data be compared to background defined by dissolved concentrations? Has Ecology compared statistics of data sets consisting of dissolved versus total metals data and assessed impacts to the statistical power of resulting detection programs? Would centrifuging unpreserved total samples be an acceptable alternative to filtration to reduce turbidity prior to analysis for metals?
10. **Financial Impacts to Yakima County by Rule Adoption** – The rule making process for updating WAC 173-351 will have significant financial impacts to Yakima County. We are requesting that the Department of Ecology consult with Yakima County to mitigate these impacts.

Thank you for your consideration of our comments and concerns. If you have any questions, please feel free to contact me at (509) 574-2455.

Sincerely,

A handwritten signature in black ink that reads "Wendy Mifflin". The signature is written in a cursive style with a large, looped "W" and "M".

Wendy Mifflin
Solid Waste Manager

Cc: Darlene Frye, Central Region Program Manager
Ted Silvestri, R.S., Yakima Health District

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Krafft, Wayne (ECY)

From: Shanley, Kimberly [kshanle1@wm.com]
Sent: Friday, July 06, 2012 3:33 PM
To: ECY RE W2R RULE COMMENTS
Subject: Comments on Rule Proposal – Criteria for Municipal Solid Waste Landfills, Chapter 173-351 WAC
Attachments: WM Comments to Ecology's Rule Proposal WAC 173-351 MSWLF Criteria.pdf

Mr. Krafft,

Please find attached to this email, Waste Management's comments to the proposed rule amendments of Chapter 173-351 WAC. We appreciate the opportunity to comment on the rule proposal.

Sincerely,

Kimberly Shanley
Regulatory Affairs - Pacific Northwest/British Columbia
720 4th Avenue, Suite 400, Kirkland, WA 98033-8136
(425) 814-7841 - office; (425) 293-9352 - cellular
WM Waste Management

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.



WASTE MANAGEMENT

Pacific Northwest-British Columbia
720 4th Ave, Ste 400
Kirkland WA 98033

July 6, 2012

Sent via Email only to: rulecommentsw2r@ecy.wa.gov

Wayne Krafft
Washington Department of Ecology
Eastern Regional Office
Waste 2 Resources Program
4601 N. Monroe St.
Spokane, WA 99205-1295

**Subject: Comments on Rule Proposal – Criteria for Municipal Solid Waste Landfills,
Chapter 173-351 WAC**

Dear Mr. Krafft:

Waste Management of Washington, Inc. (“WMW”) is pleased to submit comments on the Washington Department of Ecology’s (“Ecology”) proposed revisions (“Proposed Revisions”) amending Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills. As discussed more thoroughly below, WMW has several general concerns with the Proposed Revisions and a number of more specific concerns. Many of these comments were submitted during the publication of the rule pre-proposal in 2011 and the resulting informal comment period; however, we are once again submitting them during this formal comment period. As WMW is an owner and operator municipal solid waste landfills in Washington, WMW appreciates your careful attention and consideration of these comments and concerns. Please note that since the Proposed Revisions change some of the regulation’s subsections, these comments will refer to the revised subsections, not the former subsection numbers.

GENERAL COMMENTS

Comment 1. Some of the Proposed Revisions are contrary to the Governor’s Order 10-06 because Ecology is seeking to adopt regulations that are neither beneficial to nor requested by the regulated entities, local governments or small businesses that they affect.

While WMW supports a number of provisions in the Proposed Revisions, WMW is surprised and concerned that Ecology is seeking to make other changes to the regulations that are inconsistent with the limited exemptions from the Governor’s Order 10-06, which suspended non-critical rule development. The criteria in the Governor’s Order for proceeding with rule

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development are those rules that are (1) required by federal or state law or required to maintain federally delegated or authorized programs; (2) required by court order; (3) necessary to manage budget shortfalls, maintain fund solvency, or for revenue generating activities; (4) necessary to protect public health, safety, and welfare or necessary to avoid an immediate threat to the state's natural resources; or (5) beneficial to or requested or supported by the regulated entities, local governments or small businesses that it affects.

Ecology determined that this rulemaking should proceed apparently based on the first and fifth criteria, having stated, "Ecology needs to adopt new federal regulations into its rules for municipal landfills to ensure full federal approval of Ecology's program. Regulated landfill owners requested Ecology pursue this rule-making to adopt the necessary federal changes." While WMW agrees that it is worthwhile to pursue this rulemaking for the purposes of conforming Washington's regulations to the federal regulations and because landfill owners requested some of these changes, Ecology has included some changes that fit neither criterion. As examples only, WMW is skeptical that any of the following Proposed Revisions were requested by any regulated entity, local government, or small business or meet any of the other criteria:

- WAC 173-351-300 Table 1 (making MCLs more stringent for cadmium, 2,4-dichlorophenoxy acetic acid, lead, and methoxychlor).
- WAC 173-351-600(5)(f) (requiring annual audits of financial assurance).
- WAC 173-351-600(2)(a), (3)(a), & (4)(a) (requiring closure, post-closure, and remedial cost estimates to be based on prevailing wage rules).

WMW therefore requests that Ecology eliminate those Proposed Revisions that do not meet the Governor's Order 10-06 requirements.

Comment 2. The regulations should be revised to allow of variance or alternative compliance designs or procedures to be approved outside of the normal permitting process under WAC 173-351-700.

There are numerous provisions in the current regulations and Proposed Revisions where a landfill owner or operator can seek and obtain regulatory relief from the health department or Ecology, but these opportunities are specifically tied to the permitting process under WAC 173-351-700. For example, WAC 173-351-210 requires that "[e]ach owner or operator must develop, keep, and abide by a plan of operation approved as part of the permitting process in WAC 173-351-700." WAC 173-351-210 (emphasis added). Thus, this provision *could be read to preclude* a landfill owner *from making* any change to the plan of operation – even if approved by the health department – unless the change was made during the permitting process.

While, WMW does not disagree with the need to obtain approvals, the requirement should be made more flexible so that appropriate and approved changes could be made at times other than "during the permitting process in WAC 173-351-700." This change can generally be made by deleting the phrase "during the permitting process in WAC 173-351-700" wherever it appears in Chapter 173-351 WAC. For example, the following sections contain these restrictions and should be revised:

WAC 173-351-130(4)(a)	WAC 173-351-200(10)(a)	WAC 173-351-300(7)
WAC 173-351-130(4)(a)(ii)	WAC 173-351-200(10)(c)	WAC 173-351-405(4)(a)
WAC 173-351-130(4)(a)(ii)(F)	WAC 173-351-200(2)(b)	WAC 173-351-450(4)(a)
WAC 173-351-130(5)(a)	WAC 173-351-200(9)(a)(ii)(B)	WAC 173-351-500(1)(b)
WAC 173-351-130(6)(a)	WAC 173-351-210	WAC 173-351-500(1)(e)
WAC 173-351-130(7)(a)	WAC 173-351-220(9)(c)	WAC 173-351-500(2)(c)
WAC 173-351-140(1)(a)	WAC 173-351-300(2)(b)	
WAC 173-351-140(1)(b)	WAC 173-351-300(6)	

SPECIFIC COMMENTS

Comment 3. The revision to the airport safety location restrictions in WAC 173-351-130(2)(b) are inconsistent with 40 CFR Part 258 and 49 USC § 44718(d).

Without explanation, Ecology has inserted a change to the airport safety restrictions in WAC 173-351-130(2)(b) that increases the notification requirement from five miles to six miles for landfills located near certain airports. While WMW does not dispute that notification is appropriate for siting new landfills within six miles of an airport, it disagrees that this requirement should be imposed on lateral expansions of existing landfills. WMW believes that Ecology has proposed this revision because federal DOT requirements place limitations on the construction of new landfills within six miles of airports. 49 USC § 44718(d)(1) (“No person shall construct or establish a municipal solid waste landfill ... that receives putrescible waste ... within 6 miles of a public airport ... unless the State aviation agency ... requests that the [FAA] exempt the landfill from the application of this subsection and the Administrator determines that such exemption would have no adverse impact on aviation safety.”). This requirement clearly applies to new landfills and clearly does not apply to existing landfills, including expansions of existing landfills. The statute states that the requirement “shall not apply to the construction, establishment, expansion, or modification of, or to any other activity undertaken with respect to, a municipal solid waste landfill if the construction or establishment of the landfill was commenced on or before the date of the enactment of this subsection [April 5, 2000].” 49 USC § 44718(d)(1) (emphasis added).

If the Proposed Revisions are to address this issue, they should be revised to apply only to landfills where the “construction or establishment ... was commenced” after April 5, 2000.

Comment 4. WAC 173-351-200(9)(a)(ii)(A) should allow liquids addition for landfills with an alternative design approved under WAC 173-351-300(2)(b).

As currently drafted, liquids addition under WAC 173-351-200(9) is allowable only if the landfill is designed with a prescriptive liner under WAC 173-351-300(2)(a), but not with an alternative design approved under subsection (2)(b). WAC 173-351-200(9) should be revised to read as follows:

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(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300(2)(a) or an alternative design approved under WAC 173-351-300(2)(b);

While liquids addition would still be subject to the approval of the health department, this revision would remove the limitation that only the prescriptive liner (subsection (2)(a)) could be used even though the alternative liner (subsection (2)(b)) meets or exceeds the liner performance criteria.

In 2000, EPA recognized that this restriction may be unnecessary and began a rulemaking process that would have eliminated the restriction. EPA noted,

Many MSWLF stakeholders (e.g., States, local governments, solid waste associations, and industry) believe that under certain conditions, leachate recirculation should be allowed when alternative liners are used. In fact, some believe that alternative liner technologies can be superior to the composite liner design specified in the criteria. We are trying to determine if it is possible to design and operate MSWLFs safely when alternative liner designs are used and leachate is recirculated. As required by the regulations, such an alternative liner design must assure that the performance standard specified at 40 CFR § 258.40(a)(1) and the requirement to maintain a hydraulic head within the landfill of 30 cm. or less are met.

65 Fed. Reg. 18014, 18017 (Apr. 6, 2000). Unfortunately, EPA suspended this effort and instead addressed the alternative liner design issue under the RD&D rulemaking. 67 Fed. Reg. 39662, 39664 (June 10, 2002).

Comment 5. Ecology should delete the *requirement* in WAC 173-351-300(2)(a) that there can be no more than 2 feet of leachate head over a leachate pump sump area.

Ecology's regulations and Proposed Revisions include a requirement that leachate collection system must be maintained such that the depth of leachate over the leachate pump sump area is no more than two feet. WAC 173-351-300(2)(a). This is not a requirement of Subtitle D and is unnecessary. By specifying the maximum depth of leachate over a sump, the regulations unnecessarily restrict the design and operation of the leachate collection system. The optimal design of the leachate sump can vary from site to site and should not be unnecessarily constrained by such a prescriptive standard. While WMW does not disagree with the requirement to maintain less than one foot of leachate head over the liner, WMW recommends deleting the 2-foot head-over-sump restriction.

Comment 6. The Arsenic Maximum Contaminant Concentration (MCC) in Table 1 to WAC 173-351-300 is wrong.

Table 1 lists an MCC for arsenic at 0.00005 mg/l; however, the actual federal Maximum Contaminant Level (MCL) for arsenic is 0.01 mg/l. See 40 CFR § 141.62(b). It is not clear why the regulations have included such a low MCC for arsenic when the purported MCC is at least two orders of magnitude below generally applied laboratory method reporting limits (MRLs) for arsenic under EPA standard test methods (e.g., 6010 and 6020). The current federal MCL for

arsenic was revised several years ago from the previous level of 0.050 mg/L. It is possible that the arsenic MCC of 0.00005 mg/L listed in Table 1 was based on the former federal MCL for arsenic, but a mistake was made with respect to the correct units. This error may have first appeared in WAC 173-200-040 which shows a groundwater quality standard of 0.05 µg/L. It appears this value is also in error and should have been 0.05 mg/L (not µg/L), corresponding to the federal MCL. The apparent error in Table 1 may have resulted from converting the listed water quality standard in WAC 173-200-040 from µg/L to mg/L, which would result in an erroneous value of 0.00005 mg/L.

Ecology should revise Table 1 to include the correct MCC value of 0.01 mg/L to match the federal MCL in 40 CFR § 141.62(b).

Comment 7. Table 1 to WAC 173-351-300 contains a number of other errors and needs clarification.

Table 1 to WAC 173-351-300 contains a number of problems and needs clarification. The Table identifies the “Maximum Contaminant Concentrations” or “MCCs” for a number of compounds. Presumably, Ecology defines MCCs based on the definition in WAC 173-200-020(15), which adopts the federal MCLs in 40 CFR Part 141. Yet, the current and Proposed Revisions to Table 1 differ from the federal MCLs for most of the compounds – as examples only, arsenic, barium, benzene, endrin, lindane, selenium, etc. Hence, the MCCs in Table 1 should be fully reviewed and revised to be consistent with the federal MCLs.

Comment 8. WMW supports the rule amendment to WAC 173-351-415(2) that allows for the submission of either quarterly groundwater reports or on an alternative frequency approved in accordance with WAC 173-351-450 (alternate groundwater programs).

Comment 9. Ecology should clarify its Proposed Revisions establishing “procedures” for submitting groundwater monitoring data.

The Proposed Revision to WAC 173-351-415(3) requires owners/operators to submit groundwater monitoring data to Ecology “in both printed form and an electronic form capable of being transferred into readily available statistical software and the department’s data management system.” Ecology does not provide further clarification as to what software is considered to be “readily available statistical software” and how such data can be transfer to “the department’s data management system.” Without further information, it is difficult to provide meaningful comments on this Proposed Revision.

Comment 10. Ecology should clarify post closure duration if owner/operators are unable to estimate the time required after closure to meet the criteria in WAC 173-351-500(2)(b)(iii).

For the owner/operator, determination of a site-specific post-closure care (“PCC”) term based upon a functional stability model may in some cases be challenging based upon the circumstances of an individual site. Some sites may have insufficient data, or may not have a methodology acceptable to the department to determine functional stability. In the case that the owner/operator does not identify a methodology acceptable to Ecology or if there is sufficient

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uncertainty in an acceptable methodologies' outcome, will the current default prescriptive 30-year term be acceptable for purposes of obtaining financial assurance, or is Ecology implying a different course?

Several provisions in the Proposed Revisions require the landfill owner/operator to provide at the time of permitting "an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria" in WAC 173-351-500(2)(b)(iii). See WAC 173-351-500(2)(c)(ii); WAC 173-351-730(5)(d)(iv). Since the time until closure could be many decades into the future, the regulations are, in effect, asking the owner/operator to make predictions on a future physical state (functional stability) rather than a more prescriptive term (30 years). How functional stability is determined has not been fully vetted with Ecology nor have the data necessary to make such a prediction. Given these challenges, it is not only speculative, it is effectively unverifiable as to the accuracy of those estimates. Furthermore, in obtaining a financial assurance instrument, term-specific is a mandatory requirement of the carrier. In light of the fact that it would be difficult, if not impossible, to provide any reasonable estimate of the time required to meet the WAC 173-351-500(2)(b)(iii) criteria, WMW recommends that the 30-year PCC term be retained in the rule for purposes of obtaining financial assurance.

Comment 11. Ecology cannot require closure, post-closure, and remedial cost estimates to be based on the Prevailing Wages for Public Works, Chapter 39.12 RCW.

The Proposed Revisions seek to require that private landfill owners and operators base the closure, post-closure and remedial cost estimates on the Prevailing Wages for Public Works, Chapter 39.12 RCW. WAC 173-351-600(2)(a), (3)(a), & (4)(a). Again, this requirement violates the Governor's rulemaking moratorium and imposes unnecessary and unlawful additional costs on landfill owners and operators.

First, WMW is not aware of any statutory or regulatory basis for Ecology to require that these cost estimates must be based on prevailing wages that are applicable to public contracts. Chapter 39.12 RCW does not apply to privately-owned landfills and does not give Ecology the authority to impose those requirements indirectly. See RCW 39.12.020 ("The hourly wages to be paid to laborers, workers, or mechanics, upon all public works and under all public building service maintenance contracts of the state or any county, municipality or political subdivision created by its laws, shall be not less than the prevailing rate of wage ...").

RCW 70.95.215 gives Ecology the authority to require financial assurance that ensures "adequate revenue available by the projected date of closure." RCW 70.95.215(1). So long as there are adequate funds available at the projected date of closure, the owner/operator has satisfied the statutory criteria. There is nothing in the statute that requires the owner/operator to base the cost estimates on the prevailing wage law. Second, this change is not required by EPA's Subtitle D regulations, 40 CFR Part 258, and therefore exceeds the requirements imposed by EPA. While EPA regulations do require closure and post-closure cost estimates to be based on "the cost of hiring a third party," they do not require that the costs of the third party be based on prevailing wages. Third, requiring compliance with prevailing wage requirements will only increase the costs of maintaining financial assurance, even when a facility has sufficient financial assurance and resources to fully conduct and pay for closure and post-closure maintenance of a landfill.

WMW strongly recommends deleting the requirement to determine closure, post-closure, and remedial costs based on prevailing wages determinations.

Comment 12. Ecology should allow landfill owners/operators to use insurance or the financial test/corporate guarantee to satisfy their financial assurance requirements.

In addition to the approved mechanisms under WAC 173-351-600, EPA's Subtitle D regulations allow owners/operators of privately-owned landfills to use other mechanisms for meeting their financial assurance obligations, including insurance and the financial test/corporate guarantee. 40 CFR § 258.74(d) & (e). Furthermore, Ecology's own non-MSW landfill regulations also allow the owner/operator to meet its financial assurance obligations through insurance. WAC 173-350-600. Notwithstanding these other authorities, Ecology does not allow either the use of insurance or the financial test for MSW landfills. Ecology needs to revisit this issue and allow for the use of these well-accepted financial assurance mechanisms.

Indeed, in its 2001 "Report to the Legislature on Financial Assurance for Solid Waste Facilities in Washington," Ecology included a statement from the Washington Utilities & Transportation Commission staff endorsing the use of both financial assurance mechanisms:

Financial test and corporate guarantee. The EPA, after thorough analysis, comment, and review adopted rules that allow corporations to satisfy the financial assurance requirements by meeting specific financial tests. EPA rules also set forth reporting and monitoring requirements. Staff believes the EPA rules are well reasoned and appropriate.

Ecology, "Report to the Legislature on Financial Assurance for Solid Waste Facilities in Washington," App. A (Feb. 2001). In the Report, Ecology expressly recommended that the financial assurance requirements should be made consistent for all landfills: "Unless there are specific reasons, the rules should be consistent for all solid waste facilities that accept the public's waste." Report at 8.

WMW strongly recommends that Ecology allow MSW landfills to use the same financial assurance mechanisms that are currently allowed under EPA's Subtitle D regulations.

Comment 13. Ecology should clarify language in WAC 173-351-600(6)(b)(viii)(A) to allow for the use of both performance and payment bonds.

WMW recommends revising the proposed language in WAC 173-351-600(6)(b)(viii)(A) to read as follows: "Surety bond guaranteeing payment into the standby trust fund if the owner or operator fails to perform as guaranteed by the bond." This revision will help to clarify that either a performance or payment bond is acceptable as a financial assurance instrument.

Comment 14. Annual reviews under WAC 173-351-600 of closure, post-closure, and remedial cost estimates are unreasonable, duplicative, and unnecessary.

Under the current regulations, owners and operators are required to adjust annually the closure, post-closure, and remedial cost estimates for inflation. WAC 173-351-600(2)(a)(ii), -

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600(3)(a)(ii), & -600(4)(a)(i). Furthermore, the owner or operator must adjust these cost estimates whenever changes cause an increase in these costs. WAC 173-351-600(2)(a)(iii), -600(3)(a)(iii), & -600(4)(a)(ii). Finally, upon permit renewal every five years, owners and operators must provide to the health department and Ecology information as to any changes to the closure and post-closure cost estimates. WAC 173-351-730(3)(b)(i).

Ecology now seeks to add even greater burdens on owners and operators by requiring annual reviews of these costs estimates, submittal of these reviews to the health departments and Ecology, and then a review and approval by the health departments and Ecology. This annual review process will be required even though the cost estimates were increased for inflation and irrespective of whether there have been any changes at the landfills that would have increased these cost estimates. These annual financial assurance reviews will impose significant additional burdens and costs on landfill owners and operators without any apparent benefit, given the existing requirements. WMW strongly urges Ecology to delete the proposed additions of subsections (2)(a)(v), (3)(a)(v), and (4)(a)(iv) to WAC 1730-351-600.

Comment 15. Ecology should not require annual audits of financial assurance. (WAC 173-351-600(5)(f) and WAC 173-351-200(11)(a)(ix)).

Ecology should not impose an annual financial assurance audit as proposed in WAC 173-351-600(5)(f). Not only is the proposed change contrary to the language and spirit of the Governor's Order 10-06, it is nowhere required under Subtitle D nor imposed in any other State, as far as WMW is aware. The requirement will impose significant annual burdens and costs on landfill owners without there being any demonstrated need for such a requirement. All references to annual financial assurance audits should be deleted.

WMW recognizes that the annual audit requirement is included in Chapter 173-350 WAC. WMW also feels that it is unduly burdensome and would support its deletion from the non-MSW landfill requirements.

Comment 16. The pay-in period for trust funds should be revised to be the active life of the landfill, not the duration of the maximum 5-year term of the permit.

As drafted, the current regulations and Proposed Revisions require a landfill owner/operator to fully fund its closure/post-closure trust funds over the "duration" of the initial or reissued permit. WAC 173-351-600(6)(a)(ii). Since the permit term cannot exceed 5 years, this requirement effectively means that the owner/operator must generate and set aside all closure and post-closure costs in 5 years or less even though the landfill might be open, operating, and generating revenue for decades or longer. The pay-in period should be revised to be the "active life of the MSWLF unit." WMW recognizes that the current pay-in period requirement matches the requirement under 40 CFR § 258.74(a)(2); however, EPA never defined in its regulations the length of the "initial permit", but acknowledged that states could allow for pay-in periods longer than 5 years, up to the active life of the landfill:

To minimize the burdens on small owners or operators who may have to set aside funds in a trust to demonstrate financial assurance, States may wish to adopt the approach used under Subtitle C. Under Subtitle C, an owner or operator is allowed to build up the trust fund over the life of the facility or over 20 years

(10 years for permitted facilities), whichever is shorter. To meet the performance standard criteria under today's proposal, if a build-up period is allowed for trust funds, the State must require the trust to be fully funded no later than the end of the landfill's active life. States may wish to adopt stricter trust fund requirements (e.g., shorter build-up period, accelerated payments into the trust in the earlier years of operations) to avoid potential shortfalls if the MSWLF is closed earlier than expected.

53 Fed. Reg. 33314 (Aug. 30, 1988).

Comment 17. WMW supports the addition of WAC 173-351-710, Research, Development, and Demonstration Permits.

Comment 18. Ecology should eliminate the requirement to apply for permit renewals under WAC 173-351-720.

Ecology should eliminate the requirement for landfill owners and operators to file applications to renew their solid waste permits prior to the renewal date. Such a revision would make the Chapter 173-351 WAC requirements consistent with the Chapter 173-350 WAC requirements (see WAC 173-350-710(3). and would eliminate an unnecessary procedural step that imposes increased burdens and poses risks should an owner or operator fail to timely apply for a permit renewal. It would also correct the oddity that similar regulations derived from the same statutory authority – RCW 70.95.190(1) – would have such different renewal processes. Since all operating and closed landfills are required to have a valid solid waste permit, virtually every facility will have to apply for a permit renewal – and every health department should also be aware that every facility will be applying to renew its permit. Furthermore, since the health department and Ecology will receive annual reports from the landfill owners and operators, they will have the necessary information to determine whether the permit should be renewed or modified, making the need for a new permit application unnecessary. Even if the health department or Ecology needs additional information, either can request such additional information from the landfill owners and operators.

WMW therefore recommends that Ecology adopt language comparable to WAC 173-350-710(3).

Comment 19. WMW supports clarifications that permits can be renewed for up to five years and need not be renewed annually.

Under RCW 70.95.190, permits are renewed at least every five years; however, Ecology's regulations have stated that permits must be renewed annually. WMW therefore supports the Proposed Revision – specifically WAC 173-351-720(5)(c) and -750(3) – that will make the regulations consistent with State law and allow for permit renewals for up to five years. Indeed, WMW would support even longer permit terms. Given the huge costs for land acquisition, design, engineering, permitting, construction, operation, closure, and post-closure maintenance of modern landfills, it is critical that owners/operators have permits that provide as much long-term certainty as reasonable to allow for the recovery of these costs.

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Comment 20. Ecology should clarify or eliminate the provision for permit reissuance in WAC 173-351-720(7).

The regulations have historically included requirements for both renewing and reissuing solid waste permits, yet the distinction between reissuance and renewal of a permit is not clear. WMW requests that Ecology clarify the difference between the two processes and their applicability. Furthermore, WMW recommends deleting the permit reissuance requirement altogether, unless it serves a meaningful purpose. As discussed in the prior comment, WMW recommends that Ecology eliminate the need to file an application for a permit renewal. If this recommendation is adopted, the need for a procedure for permit reissuance is even less apparent.

Comment 21. Ecology should retain the dissolved metals analysis requirement in Appendix I and III.

WMW strongly discourages Ecology from changing the metals analysis specified in Appendix I and III to “total” metals. This rule change would pose unnecessary burden on the owner or operator by requiring a significant amount of additional groundwater testing in order to establish background conditions for “total” metals. As required by the existing regulations, MSW facilities have accumulated extensive historical databases for dissolved metals for the purpose of establishing background conditions and performing the required statistical analysis for detection monitoring. Switching to total metals would render the existing background datasets for dissolved metals unusable for future statistical comparisons, and would require extensive additional sampling in order to establish new statistical limits for total metals. This change would also create a “domino effect”, whereby existing monitoring plans and statistical databases that were developed specifically for performing compliance monitoring statistics on dissolved metals would have to be redone or, in the case of databases, recreated from scratch. Compliance monitoring for metals would be rendered unusable for years until new data and new program plans and databases were put in place.

Additionally, it appears that a key technical point is being overlooked when considering a switch from “dissolved” to “total” metals testing. Groundwater detection monitoring programs at MSW facilities are designed to monitor for “changes” in geochemical conditions that could be associated with landfill operations. This requirement goes above and beyond any simple comparison to a water quality standard. In order to meet the performance standard of providing early and reliable indication of a potential change (i.e. release), it is the geochemically-mobile or “dissolved” fraction of a metal that best represents the true release dynamics without interference from the particulates or colloids that are included in a “total” groundwater sample.

Collection of representative samples is critical for groundwater detection monitoring at MSW facilities where rigid statistics are applied to assess for water quality changes. Many years of experience has shown that monitoring of unfiltered (i.e., “total”) metals produces results that may be difficult to reproduce, and whose data sets are often plagued by extreme outliers due to the presence of varying levels of particulate matter in the samples. For applications where representative samples are essential for performing proper statistical analysis and achieving the greatest certainty with regard to identifying a potential water quality change, dissolved metals are considered superior. In those cases where a release has already been confirmed and comparison to regulatory standards may be required, testing for total metals may be appropriate.

With respect to mercury and nickel, WMW recognizes the need to make the entire metals sampling regime consistent and therefore recommends that the analysis for mercury and nickel be switched from a totals analysis to a dissolved analysis. While the problem with historical data will arise, switching the analysis for only two metals will pose a less significant burden on the owner/operator.

Comment 22. The groundwater sampling requirements of WAC 173-351-410(2) should be revised to be consistent with WAC 173-351-450.

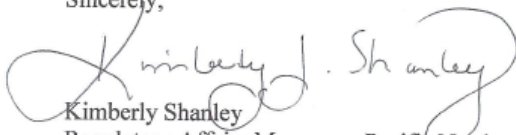
WMW recommends that the requirements regarding field-filtering specified in WAC 173-351-410(2) be modified as follows: “Except as allowed under WAC 173-351-450, groundwater samples must not be field filtered prior to analysis.” The regulations contained in WAC 173-351-450(1) allow Ecology and the jurisdictional health department to approve site-specific detection monitoring parameters for a given facility. For general water quality parameters that are subjected to routine statistical analysis (such as iron, manganese, etc.), it is important to assess whether unfiltered (i.e. “total”) or filtered (i.e. “dissolved”) sample results are more suitable for detection monitoring purposes.

Collection of representative samples is critical for groundwater detection monitoring at MSW facilities where rigid statistics are applied. Many years of experience have shown that unfiltered (total) results may be difficult to reproduce, or the datasets are often plagued by outliers due to the presence of varying levels of particulate matter in the samples. EPA acknowledges the problems associated with unfiltered samples in the 2009 Unified Guidance Document for the Statistical Analysis of Groundwater at RCRA Facilities, and they discuss the use of dissolved data extensively. WMW believes that the purpose and intent of the alternative monitoring provisions contained in WAC 173-351-450 is to ensure that the regulations allow for development of the most effective site-specific detection monitoring program for any given facility, and that this alternative groundwater monitoring program could include the use of filtered groundwater sample results.

* * *

We appreciate Ecology’s full consideration of our comments and concerns on the Proposed Revisions. Should Ecology have any questions regarding our comments or would like to discuss any comments further, please contact me at (425) 814-7841 or Andrew Kenefick at (425) 825-2003.

Sincerely,



Kimberly Shanley
Regulatory Affairs Manager – Pacific Northwest/British Columbia

WAC 173-351, Criteria for Municipal Solid Waste Landfills Copies of Written Comments Received

Krafft, Wayne (ECY)

From: Jody Snyder [JodyS@WasteConnections.com]
Sent: Friday, July 06, 2012 4:09 PM
To: ECY RE W2R RULE COMMENTS
Subject: FW: WCI comments on WAC 173-351

From: Jody Snyder
Sent: Friday, July 06, 2012 4:07 PM
To: 'rulecommentssw2r@ecy.wa.gov'
Cc: Eddie Westmoreland; John Rodgers; George Duvendack; Tom Reilly; Rob Nielsen; Wes Gavett; Steve Young; Jody Snyder
Subject: FW: WCI comments on WAC 173-351

July 6, 2012

via e-mail rulecommentssw2r@ecy.wa.gov

Mr. Wayne Kraft
Washington Department of Ecology
Eastern Regional Office
4601 N. Monroe St.
Spokane, WA 99205-1295

Re: WAC 173-351 Criteria for MSW Landfills

Dear Mr. Kraft,

Thank you for the opportunity to comment on the above-referenced rule making, please consider the following comments from Waste Connections, Inc.(WCI) when drafting your final rule.

Comment 1: The Arsenic MCL level in WAC 173-351-300 Table 1 seems inaccurate

The Table lists the MCL for Arsenic at 0.00005mg/l; however 40 CFR 141.62 (b) lists the MCL for arsenic at 0.01 mg/l. This level is at least two levels of magnitude lower than the Method Reporting Limits for arsenic under EPA's standard testing methods. WCI believes the limit should be 0.01 mg/l.

Comment 2: WAC 173-351-500(2)(b)(iii) Estimating time to follow closure

WCI would strongly suggest Ecology produce a guidance document for this activity and not require operators/owners to meet this criteria until the guidance is complete. This task could be very expensive and time consuming and still not meet the expectation of the JHD or Ecology with out the guidance. In addition, all operators/owners will be going through the same tasks somewhat blindly for the first time therefore, a procedure would remove some of the uncertainty. At this point, the owner/operator is now to predict and finance

what could be a post-closure of 30-100yrs, this is a wide spectrum. WCI does not disagree with the basic requirement we just desire to get a better handle on the unforeseen consequences.

Comment 3: WAC 173-351-600(3)(a) Prevailing wages on public works

WCI would request that Ecology allow owners to use actual mid range of wages from their company rather than prevailing wages. This course of action has been approved and utilized by the local JHD.

Comment 3: WAC 173-351-600(5)(f)(ii)(A) Annual Audits

Ecology should not require an annual financial audit. The mechanism is approved by the JHD and the formula for calculating the deposit. The calculation is reviewed and adjusted every year by the JHD, there is no need for the extra financial burden of an annual audit.

Comment 4: Appendix 1 and 111

WCI strongly suggests that Ecology retain the usage of "dissolved metals" as required in the existing rule and contemplate changing to "total metals" for new landfills. This change would cause an unnecessary burden on owner/operators of landfills who have retained a database of dissolved metals for years and created their background and statistical analysis for detection monitoring on this approach. This change brings no significant improvement for the environment or the public yet compromises the continuity of the ground water monitoring system. This is a critical point for us; we value a high environmental standard and do not wish to lose this critical component.

Our comment list may not be long but they are all very import to WCI, we appreciate you taking the time to review our comments and we thank you for the opportunity to contribute to the finalization of the rule. If you should have any comments please do not hesitate to contact me at 253-377-0362.

Sincerely

Jody L Snyder
Director of Regulatory and Governmental Affairs
Waste Connections Inc.

Cc: Eddie Westmoreland, WCI

Appendix B: Transcripts from public hearings.

Lacey, Washington – June 26, 2012

Hearing Officer: I'm Richelle Perez, the Hearing Officer for this hearing. This afternoon we are to conduct a hearing on the proposed amendments for Chapter 173-351 WAC. Criteria from Municipal Solid Waste Landfills. Let the record show that it's 2:30PM on June 26, 2012 and this hearing is being held at the Washington State Department of Ecology HQ Auditorium ROA-32 at 300 Desmond Dr. SE, Lacey WA 98503.

Legal notices of this hearing were published in the Washington State Register on June 6, 2012, Washington State Register #12-11-097. In addition, notices of the hearing were mailed to about 15 interested people; email notices were sent to 250 interested people in addition to the State's Rule. And a news release was issued on May 30, 2012.

I will be calling people up to provide testimony based on the order your name appears on the sign-in sheet. Once everyone who has indicated that they would like to testify has had the opportunity, I will open it up for others. When I call your name please step up to the front, state your name and address for the record, speak clearly so that we can get a good recording of your testimony. We will begin with Pat Vandehey.

Testimony of Patricia Vandehey:

Patricia Vandehey, 111 SE Lupine Place in Shelton, I am very concerned about what the rules are for the Landfill closures and care. Became interested in that actually, when we found out that Simpson Dayton Wood Ash Landfill was going to be closed and the County was turning it over to Ecology, so they wouldn't have to handle it. Because we requested that there be some kind of a hearing, that there be public input as to what was going on and it was not afforded to us, they just ignored us. It's of particular interest because I was wondering what rules are in effect now are going to apply to landfills that are in existence already. This particular landfill they've been putting in there since, I believe, 1984, and when they were taking ash and residue from a boiler plant that they had, it was the type of boiler plant, as I understand it, and I'm not a scientist or an engineer, or anything, it's just what I've read, that the boiler could not reach a certain temperature. So, because of that dioxin was formed and I have copies of letters and things that they had communicated to the County and to Ecology, and one referenced that in some of the loads they had 35% ash and 65% salt. But they weren't too concerned about the amount of dioxin; they really didn't think it was a lot going to the landfill, because they said most of it was picked up by vapor and put over in Oakland Bay, which seemed to be okay, as long as it didn't go into the landfill. This is a 55 acre unlined landfill, and people are concerned because of all the water issues in Mason County. It seems we have become like a dumping ground and anything can happen because no one seems to care about it. So, our only resource is to try to read about what the rules and regulations are and try to hold the Municipal Government accountable for what they do and how they act. I'm really concerned about the cars, nobody seems to pay attention as to what goes on, the land, and what it's used for and if something happens with our water supply, what do we have. If our air and ground water polluted, the planet is going to become uninhabitable. We just don't seem to have enough care as to what is happening. So, that was one of the things that brought it to my attention. I wanted to find out if any of these rules are going to apply to that; and what do you do with an unlined landfill that's been going on for so long. Does it become a cleanup site? What do they do? Ecology is supposed to be working on it but I haven't heard about anything further going on. We

have actually 3 landfills that are problematic in Mason County, the city, the county, and now the state in one. We would just like to see that whatever is necessary is done, and if when this is closed, it goes beyond the 30 year period that Simpson will be required to put the money into maintain it and to do the water testing. In the last water report that we saw from 2011, it stated in there that there was chromium 6 levels that required clean up. And nobody seemed upset about it, and this upset me terribly. Water is not inexhaustible. We only have a certain limited amount. Our recharge areas are very very important, and I would just like to see more attention paid to that, and people thinking about what they're doing when they are making rules and giving out permits for things for something, not maybe just immediately, but what happens 50 years down the road. Because right now we are inheriting what happened starting with the Industrial Revolution. And all the pollution and things that when on from then, we have now, and we are just compounding it. We're polluting the ocean, the air and our ground water. That's all I have to say.

End of testimony.

Hearing Officer: Thank you very much for your comment. If you would like to send Ecology written comments, please remember the comment period ends July 6, 2012. Send them to Wayne Kraft, WA State Dept of Ecology, ERO, W2R Program at 4601 N Monroe St., Spokane WA 99205-1295 or Rule comments W2R@ecy.wa.gov or give them to staff here this afternoon.

Was there anyone else that wanted to make an oral comment? All testimony received at this hearing as well as another hearing tomorrow afternoon, June 27, 2012 in Moses Lake along with all the written comments submitted before the end of the comment period on July 6, 2012, will be part of the official hearing record for this proposal. Ecology will send notice about the concise explanatory statement or CES Publication to everyone that provided written comments or oral testimony on this rule proposal and submitted contact information, everyone that signed in for today's hearing that provided an email address and other interested parties on the agencies mailing list for this rule. The CES will among other things contain the agency's response to questions and issues of concern that were submitted during the public comment period. If you would like to receive a copy but did not give us your contact information, please let one of the staff at this hearing know or contact Wayne Kraft at the contact information provided for submitting comments. The next step is to review the comments and make a determination whether to adopt the rule. Ecology Director Ted Sturdevent, will consider the rule documentation and staff recommendations and will make a decision about adopting the proposal. Adoption is currently scheduled for October 3, 2012. The proposed rule should be adopted that day and filed with the code reviser; it will go into effect 31 days later. If we can be of further help to you, please do not hesitate to ask. You can contact Wayne Kraft if you have other questions. On behalf of the Department of Ecology, thank you for coming. I appreciate your cooperation and courtesy, let the record show that this hearing is adjourned at 2:40 pm. Thank you.

End of hearing.

Moses Lake, Washington – June 27, 2012

Hearing Officer: Ok, we are going to start the formal portion of the hearing which we will record for the public record. At this time if you want to come and provide testimony, you can. So, again, I am Cynthia Wall – I am the hearing's officer. This hearing is about proposed amendments for Chapter 173-351 which is the Criteria for Municipal Solid Waste Landfills.

WAC 173-351, Criteria for Municipal Solid Waste Landfills Transcripts from Public Hearings

The record shows it is 2:20 on June 27 and this hearing is being held...um, not in Lacey ...in Moses Lake at the Big Bend Community College in the Masto Conference Center. Legal notice for this hearing was published in the Washington State Register on June 6 of this year, the register number WSR #12-11-097. In addition, notices of the hearing were mailed to about 15 interested people, emails to about 250, and a news release issued on May 30 of this year.

I will now be calling people up to provided testimony based on the order of the sign in sheet. When you come up, please come up to the front, state your name and address for the record and speak clearly so we can get a clear recording.

We are going to start with Damon Taam – come on up.

Testimony of Damon Taam:

Damon Taam with the Spokane Regional Solid Waste System. Basically, it felt that the definition of contaminant needs to be further consistent and more specific with regards to what is a contaminant. You have definition of contamination, probably should follow within that same realm of characterization rather than saying does not occur naturally in the environment. I think that is overly broad and reaching. Next, with regards to metals analysis, we think that the movement to total metals is not appropriate. We feel that the previous analysis on the dissolved is more indicative as well as a little more accurate from our point of view. It shows definite, basically statistical modeling better. And then, a general comment – these rules that are in place and that are enhanced are methods to entomb garbage and actually preserve the garbage as is for a longer period of time. That is what the increased cap is, that is what the bottom liner is – to inhibit water from reacting with garbage and creating a by-product, either gas or liquid. And I think it more appropriate on the post closure aspect to make it longer actually, and less of an impact on the general public – especially if it is private company. They should be on the hook for a longer period of time and just because it has stopped making leachate or stopped making gas, at that period in time, doesn't mean it won't happen in the future. So, when you are making cells in the garbage itself, not all of it will act the same. So, I don't think it should be – somebody should be on the hook for much longer – and/or the state should take it over if it feels it needs to do that. But I really don't think it should be that kind of burden – it should be a burden of whoever is developing the landfill at the time and have somebody get paid to watch over what we do. When I looked at our existing landfills and started digging it up, you can go very far back and that was uncovered. You can read the newspaper 30 years ago. You can see the apple core. And the liners aren't forever so you are – when the liner goes, which it will go, that waste is preserved – it isn't reacted. You have to deal with it and it's not total. So I don't think they should be able to get out because you see no leachate and you see no gas. This is common. Thank you.

Hearing Officer: Thank you. Donald, you are not testifying? So, Wendy Mifflin?

Testimony of Wendy Mifflin:

Thank you. For the record, Wendy Mifflin, Yakima County Public Services, Solid Waste Division. I would like to start off by thanking Wayne Krafft and Darlene Fry for meeting with Yakima County on June 14. We really appreciated you coming over and talking to us. It was very helpful for us, so thank you. We've submitted our comment letter and I need to talk a little bit about the format. We originally submitted comment under the draft rule and so you see our full comment letter from July 18 that we submitted and then those things in blue are our continued

comments based on our meeting from June 14 and then our continued comments after that. So there are three that I would specifically like to address as public comment and the first one is number four on my comment letter which is the wellheads to be surveyed under NAVD88 datum. We discussed it a little bit on June 14, but again, our solid waste division is again requesting that we be allowed to use our current datum for Terrace Heights land fill and Shane Landfill, and that this adoption would require resurveying of all our wellheads conversion to make sure we are tipped right and redoing all the previous work regarding waterlevel calculations. The reason we are asking that is we are currently using a combination of old level loops, vertical and horizontal datum and NGVD29 so we are not on – because our landfills were built in 1972, we are not on anything that is easily convertible at this time so we are asking for your consideration on that section. And our big comment, of course, is number six on our comment letter and that is under 173-351-500 i.A. and ii.A., the post closure care and specifically to top cover requirements for permeability. It appears after discussion on the 14th that our comments were not considered in the draft rule making process for our landfills and so we are again requesting that the Department of Ecology allow the use of soil and topsoil cover system as an alternate design for Terrace Hill landfill and Shane landfill as outlined above in our question and incorporate that into the final rule when adopted and that natural materials such as soil and topsoil provides better and lasting protection compared to a liner system in our climate. And then the last one that I would like to talk about is number nine on my letter, which of course is the groundwater monitoring changes. And it was our understanding from the June 14 meeting that in order for the Department of Ecology to get delegation from EPA that we need to change from dissolved to total metals. We continue to think that is going to be a problem for our facilities, so we are asking for consideration in that part of the rule when you take a look at and we look forward to working with the Department of Ecology on the guidance document.

Additional testimony of Damon Taam:

Damon Taam, Spokane Regional Solid Waste System. I guess from the standpoint of performance related versus standard design, I think the previous performance related criteria makes more sense. We are not all the same. Eastern Washington, Central Washington is not the same as Western Washington and I don't think one should be all. In fact, the west side, I think, yeah, they have a lot more rain and a lot more groundwater and all the other water problems and they should have, actually, higher standards that Eastern Washington or Central Washington. So, I think just to get delegation, or to be in compliance with EPA, I guess we don't really care. And, I think it loses the purpose of Ecology to be in compliance with EPA and just because they say so we have to do that. We've had this system here for a long period of time and it's worked just well, so yeah, it would be nice to be consistent, but that is the purpose of the state and the State Department of Ecology. So, that's from our point of view.

End of testimony.

Hearing Officer: Anybody else?

So, I am just going to read some boring, dry comments and we will be done. Let the record show that five people attended the hearing. Written comments – Wayne did tell you the comment period ends July 6, 5 pm. You can send written comments, email comments – you want to send them to Wayne Krafft. His information is up behind me here....or to the rule comments website. Or, you can give them to Wayne.

All the testimony from this hearing as well as the one that was held yesterday in Lacey will be part of the official hearing record for this proposal. We will be sending out a Concise Explanatory

WAC 173-351, Criteria for Municipal Solid Waste Landfills Transcripts from Public Hearings

Statement to everyone that provided written comments or testimony or oral testimony, everyone that signed in for today's hearing and other interested parties. So, the CES is going contain the agency's response to questions and issues of concern that were submitted during the public comment period. So, if you didn't get on this list and you want to receive a copy, let Wayne know and he will make sure you get on the list. The next step, as Wayne discussed, is to review comments and make a determination as to whether we are going to adopt the rule, and our director, Ted Sturdevant will consider the rule adoption and staff recommendations and make a decision about whether to adopt the proposal or not. It looks like adoption is currently scheduled for October 3. That's what It says here, but sometime in October or November would probably be more likely.

If we can help you, please don't hesitate to call Wayne or Cole and on behalf of the Department, thank you for coming. I appreciate your cooperation and courtesy. The record shows it is 2:33.

End of hearing.

Appendix C: Adopted rule highlighting changes from proposed to adopted text.

All changes Ecology made to the text of the proposed rule amendments in the adopted rule are identified below with **yellow highlighting**.

WAC 173-351-010 Purpose, applicability, and effective dates.

(1) Purpose. The purpose of this regulation is to establish minimum statewide standards for all municipal solid waste landfill (MSWLF) units under the authority of chapter 70.95 RCW as amended in order that jurisdictional health departments can enact ordinances equally as or more stringent than this regulation and to have jurisdictional health departments implement such ordinances through a permit system set forth in **((Section 700)) WAC 173-351-700**. It is also the purpose of this regulation to implement rule making by the U.S. Environmental Protection Agency (EPA) under the authority of subtitle D of the Resource Conservation and Recovery Act (RCRA), as amended in 1984, and under the authority of Section 405(d) of the Clean Water Act as amended. The Clean Water Act required EPA "to establish standards for sewage sludge that is co-disposed with municipal solid waste." EPA satisfied both statutory requirements with the publication of 40 C.F.R. Part 258-Criteria For Municipal Solid Waste Landfills on October 9, 1991. These minimum statewide criteria ensure the protection of human health and the environment.

(2) Applicability.

(a) These criteria apply to new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this regulation(~~(+)~~). All other solid waste disposal facilities and practices that are not regulated under subtitle C of RCRA and chapter 70.105 RCW are subject to the criteria contained in 40 C.F.R. Part 257, Criteria For Classification of Solid Waste Disposal Facilities, chapter 173-350 WAC, and/or chapter 173-304 WAC as amended.

Note: These rules do not apply to facilities that receive only inert (~~and~~) waste, demolition waste, wood waste, industrial solid wastes, or other types of solid waste (other than household waste) disposed of in (~~limited purpose~~) landfills regulated in chapter (~~173-304~~) 173-350 WAC, (~~minimum functional standards for~~) Solid waste handling standards. Co-disposal of any solid waste with household waste is governed by these rules.

(b) These criteria do not apply to MSWLF units that do not receive waste on or after (~~the effective date of this chapter~~) November 26, 1993. MSWLF units that stopped receiving waste prior to October 9, 1991, are subject to closure and post-closure rules under chapter 173-304 WAC, the Minimum Functional Standards for Solid Waste Handling. MSWLF units that received waste on and after October 9, 1991, but stop receiving waste prior to (~~the effective date of this rule~~) November 26, 1993:

WAC 173-351, Criteria for Municipal Solid Waste Landfills Highlighted Changes between Proposed and Adopted Rule November 2012

(i) Are also subject to federal closure rules under 40 C.F.R. Part 258.60(a);

(ii) Will be subject to all the requirements of this regulation unless otherwise specified, if such MSWLF units fail to meet the federal closure rules under 40 C.F.R. Part 258.60(a) by April 9, 1994, and the closure standards of chapter 173-304 WAC; except that jurisdictional health departments may grant time extensions to complete closure under 40 C.F.R. Part 258.60(a) by October 9, 1994; and

(iii) Will be subject to the groundwater monitoring and ~~((corrective))~~ remedial action requirements of WAC 173-351-400 and the permitting requirements of WAC 173-351-700 if such MSWLF units are part of a multiunit groundwater monitoring system of WAC 173-351-450(4).

(3) Effective dates.

~~((e))~~ (a) All MSWLF units that receive waste on or after ~~((the effective date of this chapter))~~ November 26, 1993, must comply with this chapter by ~~((the effective date of this chapter))~~ November 26, 1993, unless:

(i) Later effective dates are specified elsewhere in this chapter, such as WAC 173-351-400 (1)(b), groundwater monitoring ~~((and WAC 173-351-600 (4)(e)))~~, WAC 173-351-430 (2)(b), detection monitoring program, WAC 173-351-440(2), assessment monitoring, and WAC 173-351-500 (2)(c), closure and post-closure care; or

(ii) The MSWLF unit is an existing MSWLF unit or an existing lateral expansion of an existing unit that:

(A) Disposed of 100 tons per day or less of solid waste during a representative period prior to ~~((the effective date of this chapter))~~ November 26, 1993;

(B) Does not dispose of more than an average of 100 tons per day of solid waste each month between ~~((the effective date of this chapter))~~ November 26, 1993, and April 9, 1994; and

(C) Is not on the National Priorities List (NPL) as found in Appendix B to 40 C.F.R. Part 300.

~~((d))~~ (b) MSWLF units that meet conditions of ~~((e))~~ (a)(ii) of this subsection are exempt from all requirements of this rule but must meet the final cover requirement specified in 40 C.F.R. 258.60(a) and the requirements of chapter 173-304 WAC. The final cover must be installed by October 9, 1994. Owners or operators of MSWLF units described in ~~((e) and (d))~~ (a)(ii) of this ~~((section))~~ subsection that fail to complete cover installation by October 9, 1994, will be subject to all requirements of this chapter, unless otherwise specified.

~~((e))~~ (c) MSWLF units failing to satisfy these criteria are considered open dumps for purposes of state solid waste management planning under RCRA.

~~((f))~~ (d) MSWLF units failing to satisfy these criteria constitute open dumps, which are prohibited under section 4005 of RCRA.

~~((g))~~ (e) MSWLF units containing sewage sludge and failing to satisfy these criteria violate Sections 309 and 405(e) of the Federal Clean Water Act.

Note: All state codes standards, rules and regulations cited in this chapter are available by writing to the Department of Ecology, P.O. Box 4-7600, Olympia, Washington 98504-7600, or call 1-800-RECYCLE for the location of the nearest regional office of the department.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-010, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-100 Definitions. Unless otherwise noted, all terms contained in this part are defined by their plain meaning. This section contains definitions for terms that appear throughout this regulation; additional definitions appear in the specific sections to which they apply.

"Active area" means that part of a facility that includes the active portion and portions of a facility that recycle, store, treat, or dispose of solid (including liquid) wastes. The active area includes leachate treatment facilities and runoff ponds. It excludes run-on ponds and on-site roads which are used for any purpose; on-site roads are considered part of the buffer zone. See active portion and buffer zone definition below.

"Active life" means the period ~~((of operation))~~ beginning with the initial receipt of solid waste and ending at completion of closure activities in accordance with WAC 173-351-500(1), Closure ~~((and post-closure care))~~ criteria.

"Active portion" means that part of a facility or MSWLF unit that has received or is receiving wastes and that has not been closed in accordance with WAC 173-351-500(1), Closure ~~((and post-closure care))~~ criteria.

"Airport((-))" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities. See WAC 173-351-130 (2)(d)(i).

"Areas susceptible to mass movement((-))" means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the MSWLF unit, because of natural or human-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil

**WAC 173-351, Criteria for Municipal Solid Waste Landfills
Highlighted Changes between Proposed and Adopted Rule
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fluction, block sliding, and rock fall. See WAC 173-351-130 (7)(b)(iv).

~~(("Arid" means locations in the state of Washington having less than twelve inches (30 centimeters) of precipitation annually.))~~

"Biosolids" means municipal sewage sludge that is a primarily organic, semisolid product resulting from the wastewater treatment process, that can be beneficially recycled and meets all requirements under chapter 70.95J RCW. Biosolids includes septic tank sludge, also known as septage, that can be beneficially recycled and meets all requirements of chapter 70.95J RCW.

"Bird hazard((-)" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants. See WAC 173-351-130 (2)(d)(ii).

"Buffer zone" means that part of a facility which lies between the active area and the property boundary.

"Channel migration zone" means the lateral extent of likely movement of a stream or river channel along a stream reach.

"Cleanup action plan" means the document that selects the cleanup action and specifies cleanup standards and other requirements for the cleanup action. These include:

- A final cleanup action plan issued by the department (or a record of decision prepared under the federal cleanup law) meeting the requirements of WAC 173-340-380;

- Cleanup action plans developed by the owner or operator of a MSWLF unit in accordance with the procedures in WAC 173-340-350 through 173-340-390 for independent remedial actions; and

- Plans developed for interim actions conducted under WAC 173-340-430.

"Closure" means those actions taken by the owner or operator of a MSWLF unit or facility to cease disposal operations and to ensure that a MSWLF unit or facility is closed in conformance with applicable regulations at the time of such closures and to prepare the site for the post-closure period. Closure is considered part of operation. See definition of operation.

"Commercial solid waste" means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

"Composite layer." See WAC 173-351-500 (1)(a)(i)(B).

"Composite liner." See WAC 173-351-300 (~~((2)(a)(ii))~~) (3).

"Construction quality assurance" means a planned system of activities that provide assurance that a facility is constructed as specified in the design and that the materials used in

construction are manufactured according to specifications. Construction quality assurance includes inspections, verifications, audits, and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility.

"Construction quality control" means a planned system of activities that is used to directly monitor and control the quality of a construction project. Construction quality controls are the measures under taken by the contractor or installer to determine compliance with requirements for workmanship and materials put forth in the plans and specification for the construction project.

~~("Contaminate" means to allow to discharge a substance into groundwater that would cause:~~

~~The concentration of that substance in the groundwater to exceed the maximum contamination level specified in chapter 173-200 WAC; or~~

~~A statistically significant increase in the concentration of that substance in the groundwater where the existing concentration of that substance exceeds the maximum contaminant level specified in chapter 173-200 WAC; or~~

~~A statistically significant increase above background in the concentration of a substance which:~~

~~Is not specified in chapter 173-200 WAC; and~~

~~Is present in the solid waste; and~~

~~Has been determined to present a substantial risk to human health or the environment in the concentrations found at the point of compliance by the jurisdictional health department in consultation with the department and the department of health.~~

~~"Dangerous wastes" means any solid waste designated as dangerous waste under chapter 173-303 WAC, the Dangerous waste regulations.~~

~~"Demolition waste" means solid waste, largely inert waste resulting from the demolition or razing of buildings, roads and other man-made structures.)~~ "Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally in the environment or that occurs at concentrations greater than natural background levels.

"Contaminated" or "contamination" means the alteration of the physical, chemical, biological, or radiological properties of soil or waters of the state such that the soil or water could pose a threat to human health or the environment or the alteration is a violation of any applicable environmental regulation.

"Demonstration" means a showing by the owner or operator that human health and the environment can be protected as equally as a given requirement in the regulation. A demonstration is made in the application for a permit under WAC 173-351-700 **or through the permit modification process of WAC 173-351-720(6)**. A successful demonstration allows or authorizes an activity authorized for the

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life of the facility unless an alternative time period is approved by the jurisdictional health department.

"Department" means the department of ecology.

"Disease vectors((-))" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans. See WAC 173-351-200 (3)(b).

"Displacement((-))" means the relative movement of any two sides of a fault measured in any direction. See WAC 173-351-130 (5)(b)(ii).

"Disposal" or "deposition" means the discharge, deposit, injection, dumping, leaking, or placing of any solid waste into or on any land or water.

"Establish" means to construct a new or laterally expanded MSWLF unit.

"Existing MSWLF unit" means any municipal solid waste landfill unit that is receiving solid waste as of the appropriate dates specified in WAC 173-351-010 ~~((2)(c)) (3)(a)~~. Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good waste management practices, including operating plans approved under chapter 173-304 WAC. ~~((For the purposes of this rule, any existing horizontal expansion approved by the jurisdictional health department for which as-built plans documenting construction prior to the effective date of this chapter, have been prepared and submitted to the jurisdictional health department shall be considered an existing MSWLF unit.))~~

"Fault((-))" means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side. See WAC 173-351-130 (5)(b)(i).

"Facility" means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

"Flood plain((-))" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood. See WAC 173-351-130 (3)(b)(i).

"Free liquids((-))" means any portion of material passing through and dropping from a filter as determined by Method 9095B (Paint Filter Liquids Test), in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200(9).

"Gas condensate((-))" means the liquid generated as a result of gas recovery processes at the MSWLF unit. See WAC 173-351-200 (9)(c)(ii).

"Groundwater" means water below the land surface in a zone of saturation.

"Holocene((-))" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present. See WAC 173-351-130 (5)(b)(iii).

"Household waste" means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including household hazardous waste) (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). This term does not include commercial, industrial, inert and demolition waste, or wood waste.

Note:Sanitary waste in septic tanks that is not disposed of in a MSWLF unit is subject to other state and federal rules.

"Hydrostratigraphic unit" means any water-bearing geologic unit or units hydraulically connected or grouped together on the basis of similar hydraulic conductivity which can be reasonably monitored; several geologic formations or part of a geologic formation may be grouped into a single hydrostratigraphic unit; perched sand lenses may be considered a hydrostratigraphic unit or part of a hydrostratigraphic unit, for example.

Note:'Hydraulically connected' denotes water-bearing units which can transmit water to other transmissive units.

"Inert waste" means (~~(noncombustible, nondangerous solid wastes that are likely to retain their physical and chemical structure under expected conditions of disposal, including resistance to biological attack and chemical attack from acidic rain water)~~) solid waste identified as inert waste in chapter 173-350 WAC, Solid waste handling standards.

"Industrial solid wastes" means solid waste or waste by-products generated by manufacturing or industrial processes such as scraps, trimmings, packing, pallets, and other discarded materials not otherwise designated as dangerous waste under chapter 173-303 WAC, the Dangerous waste regulations. This term does not include commercial, inert, demolition, construction, woodwaste, mining waste, or oil and gas waste but does include lunch room, office, or other similar waste generated by employees at the industrial facility.

"Jurisdictional health department" means city, county, city-county, or district public health department as defined in chapters 70.05, 70.08, and 70.46 RCW.

"Landfill." See "Facility."

"Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit that is not an existing horizontal expansion. (See also definition of "existing MSWLF unit.")

"Leachate" means a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

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"Lithified earth material((-)" means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface. See WAC 173-351-200 (6)(b)(iii).

"Liquid waste((-)" means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200 (9)(c)(i).

"Lower explosive limit((-)" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at twenty-five degrees C and atmospheric pressure. See WAC 173-351-200 (4)(d).

"Maximum horizontal acceleration in lithified earth material((-)" means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a ninety percent or greater probability that the acceleration will not be exceeded in two hundred fifty years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment. See WAC 173-351-200 (6)(b)(ii).

"Modification" means a substantial change in the design or operational plans including removal of a design element of a MSWLF unit previously set forth in a permit application or a disposal or processing activity that is not approved in the permit. To be considered a substantial change, a modification must be reasonably related to a specific requirement of this rule. A substantial change includes any change in the design, operation, closure, post-closure, financial assurance, environmental monitoring or other aspect of an MSWLF unit that is reasonably related to a specific requirement of this rule and was not previously set forth in a permit application or approved in the permit. Lateral expansions, a fifty percent increase or greater in design volume capacity or changes resulting in significant adverse environmental impacts that have ~~((lead))~~ led a responsible official to issue a declaration of significance under WAC 197-11-736 ~~((shall))~~ are not ~~((be))~~ considered a modification but ~~((would))~~ require permit reissuance under these rules.

"Municipal sewage sludge" means a semisolid substance consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a publicly owned wastewater treatment plant. For the purposes of this rule sewage sludge generated from publicly owned leachate waste treatment

works that receive sewage from on-site sanitary facilities (~~(shall)~~) are not (~~(be considered to be)~~) municipal sewage sludge.

"Municipal solid waste landfill unit (MSWLF unit)" means a discrete area of land or an excavation that receives household waste, and that is not a land application (~~(unit)~~) site, surface impoundment, injection well, or (~~(waste)~~) pile, as those terms are defined under chapter (~~(173-304)~~) 173-350 WAC, (~~(the Minimum functional standards for)~~) Solid waste handling standards or chapter 173-218 WAC, Underground injection control program. A MSWLF unit also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally-exempt small quantity generator waste, and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion.

"Natural background" means the concentration of chemical, physical, biological, or radiological substances consistently present in the environment that has not been influenced by regional or localized human activities. Metals at concentrations naturally occurring in bedrock, sediments and soils due solely to the geologic processes that formed the materials are natural background. In addition, low concentrations of other persistent substances due solely to the global use or formation of these substances are natural background.

"New MSWLF unit" means any municipal solid waste landfill unit that has not received waste prior to (~~(the effective date of this regulation.~~

~~"Nonarid" means locations in the state of Washington having equal to or more than twelve inches (30 centimeters) of precipitation annually))~~ November 26, 1993.

"Nuisance" means unlawfully doing an act, or omitting to perform a duty, which act or omission either annoys, injures, or endangers the comfort, repose, health or safety of others, offends decency, or unlawfully interferes with, obstructs or tends to obstruct, any lake or navigable river, bay, stream, canal, or basin, or any public park, square, street or highway; or in any way renders other persons insecure in life, or in the use of property.

"100-year flood(~~(-)~~)" or "base flood" means a flood that has a one percent or less chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in one hundred years on the average over a significantly long period. See WAC 173-351-130 (3)(b)(ii).

"Open burning" means the combustion of solid waste without:

Control of combustion air to maintain adequate temperature for efficient combustion;

Containment of the combustion reaction in an enclosed device so as to provide sufficient residence time and mixing for complete combustion; and

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Control of the emission of the combustion products.

"Operator" means the person(s) responsible for the overall operation of a facility or part of a facility.

"Operation" means those actions taken by an owner or operator of a facility or MSWLF unit beginning with waste acceptance at a facility or MSWLF unit up to and including closure of the facility or MSWLF unit.

"Owner" means the person(s) who owns a facility or part of a facility.

"Point of compliance." (~~((means the point located on land owned by the owner of the MSWLF unit, and is no more than one hundred fifty meters (four hundred ninety two feet) from the waste management unit boundary; see also WAC 173-351-300 (2)(c).))~~) See WAC 173-351-300(6).

"Poor foundation conditions((-)" means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of a MSWLF unit. See WAC 173-351-130 (7)(b)(ii).

"Post-closure" means those actions taken by an owner or operator of a facility or MSWLF unit after closure.

"Purchase" means execution of a long term lease, securing of options to purchase or execution of agreements to purchase.

~~("Qualified ground-water scientist." See WAC 173-351-400(2).)~~

"Random inspection." See WAC 173-351-200 (1)(b)(ii).

"Regulated dangerous waste((-)" means a solid waste that is a dangerous waste as defined in WAC 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070. See WAC 173-351-200 (1)(b)(i).

"Runoff" means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

"Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

"Saturated zone" means that part of the earth's crust in which all voids are filled with water.

"Scavenging" means the removal of materials at a disposal facility, or intermediate solid waste-handling facility, without the approval of the owner or operator and the jurisdictional health department.

"Seismic impact zone((-)" means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in two hundred fifty years. See WAC 173-351-130 (6)(b)(i).

"Sewage sludge" means a semisolid substance consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a wastewater treatment system, that does not meet the requirements of chapter 70.95J RCW.

"Sludge" means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

"Sole source aquifer((-))" means an aquifer designated by the Environmental Protection Agency pursuant to Section 1424e of the Safe Drinking Water Act (PL 93-523). See WAC 173-351-140 (1)(b)(vii).

"Solid waste" means all putrescible and nonputrescible solid and semisolid wastes including, but not limited to garbage, rubbish, ashes, industrial wastes, commercial waste, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, discarded commodities and recyclable materials.

"Structural components((-))" means liners, leachate collection systems, final covers, run-on/runoff systems, and any other component used in the construction and operation of the MSWLF that is necessary for protection of human health and the environment. See WAC 173-351-130 (7)(b)(ii).

"Unstable area((-))" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, and areas susceptible to mass movements. See WAC 173-351-130 (7)(b)(i).

"Vadose zone" means that portion of a geologic formation in which soil pores contain some water, the pressure of that water is less than atmospheric, and the formation occurs above the zone of saturation.

"Vulnerability((-))" means the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or cleanup, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. See WAC 173-351-140 (1)(b).

"Waste management unit" means a MSWLF unit.

"Waste management unit boundary" means a vertical surface located at the hydraulically down gradient limit of the unit.

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This vertical surface extends down into the hydrostratigraphic unit(s) identified in the hydrogeologic report.

"Waters of the state" means lakes, rivers, ponds, streams, inland waters, ~~((undergroundwaters))~~ underground waters, salt water, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

"Wetlands((-))" means those areas that are defined in 40 C.F.R. 232.2(r): Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas. See WAC 173-351-130 (4)(b).

~~(("Woodwaste" means solid waste consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, handling and storage of raw materials and trees and stumps.))~~

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-100, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-130 Location restrictions. (1) Applicability.

(a) On and after ~~((the effective date of this chapter))~~ November 26, 1993, all MSWLF units ~~((shall))~~ must meet the ~~((locational))~~ location restrictions of this section unless otherwise specified.

(b) Existing MSWLF units that cannot make the demonstration specified in subsection (2)(a) of this section, pertaining to airports, subsection (3)(a) of this section, pertaining to flood plains, subsection (7)(a) of this section, pertaining to unstable areas, must close by October 9, 1996, and conduct post-closure in accordance with WAC 173-351-500, Closure and post-closure care.

(c) The deadline for closure required by (b) of this subsection may be extended up to two years if the owner or operator demonstrates to the jurisdictional health department during the permitting process of WAC 173-351-700 that:

- (i) There is no available alternative disposal capacity; and
- (ii) There is no immediate threat to human health and the environment.

Note: Owners or operators of MSWLFs should be aware that the state department of health has adopted a state wellhead protection program in accordance with section 1428 of the Safe Drinking Water Act. Owners and operators should also be aware of ~~((locational))~~ location restrictions which may exist through the process of designating and implementing Groundwater Management Areas, under chapter 173-100 WAC, and through the Special Protection Areas of chapter 173-200 WAC.

(2) Airport safety.

(a) Owners or operators of new MSWLF units, existing MSWLF units, and/or lateral expansions that are located within ten thousand feet (three thousand forty-eight meters) of any airport runway end used by turbojet aircraft or within five thousand feet (one thousand twenty-four meters) of any airport runway end used by only piston-type aircraft must demonstrate that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft.

(b) Owners or operators proposing to site new MSWLF units ~~((and/))~~ within a six-mile (ten kilometer) radius or lateral expansions within a five-mile (eight kilometer) radius of any airport runway end used by turbojet or piston-type aircraft must notify the effected airport and the Federal Aviation Administration (FAA) and conform to all applicable requirements.

(c) The owner or operator must place the demonstration required by (a) of this subsection in the application for a permit under WAC 173-351-700 ~~((and be issued a solid waste permit by the jurisdictional health department))~~ or through the permit modification process of WAC 173-351-720(6).

(d) For purposes of this subsection:

(i) "Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

(ii) "Bird hazard" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

(3) Flood plains.

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year flood plains must demonstrate that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the flood plain, or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 ~~((and be issued a solid waste permit by the jurisdictional health department))~~ or through the permit modification process of WAC 173-351-720(6).

(b) For purposes of this subsection:

(i) "Flood plain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(ii) "100-year flood" or "base flood" means a flood that has a ~~((one percent))~~ one percent or less chance of recurring in any given year or a flood of a magnitude ~~((equalled))~~ equalled or exceeded once in one hundred years on the average over a significantly long period.

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(iii) "Washout" means the carrying away of solid waste by waters of the base flood.

(4) Wetlands.

(a) New MSWLF units and lateral expansions (~~shall~~) must not be located in wetlands, unless the owner or operator can make the following demonstrations during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6):

(i) The construction and operation of the MSWLF unit will not:

(A) Cause or contribute to violations of chapter 173-201A WAC, Water quality standards for surface waters of the state of Washington and chapter 173-200 WAC, Water quality standards for groundwaters of the state of Washington;

(B) Violate any applicable toxic effluent standard or prohibition under Section 307 of the Federal Clean Water Act or chapter 173-220 WAC, the National Pollutant discharge elimination system permit program;

(C) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Federal Endangered Species Act of 1973; and

(D) Violate any requirement under the Federal Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary;

(ii) The MSWLF unit will not cause or contribute to significant degradation of wetlands. The owner or operator must demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) the integrity of the MSWLF unit and its ability to protect ecological resources by addressing the following factors:

(A) Erosion, stability, and migration potential of native wetland soils, (~~muds~~) mud, and deposits used to support the MSWLF unit;

(B) Erosion, stability, and migration potential of dredged and fill materials used to support the MSWLF unit;

(C) The volume and chemical nature of the waste managed in the MSWLF unit;

(D) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;

(E) The potential effects of catastrophic release of solid waste to the wetland and the resulting impacts on the environment; and

(F) Any additional factors, as necessary, to demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that ecological resources in the wetland are sufficiently protected.

(iii) Where applicable under Section 404 of the Federal Clean Water Act or applicable state wetlands laws and regulations (e.g. chapter 173-22 WAC, Adoption of designations of wetlands associated with shorelines of the state), the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;

(iv) To the extent required under Section 404 of the Federal Clean Water Act steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by:

(A) Avoiding impacts to wetlands to the maximum extent practicable as required by (a)(iii) of this subsection;

(B) Minimizing unavoidable impacts to the maximum extent practicable; and

(C) Finally offsetting remaining unavoidable wetlands impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration and maintenance of existing degraded wetlands or creation of man-made wetlands);

(v) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

(b) For purposes of this subsection, "wetlands" means those areas that are defined in 40 C.F.R. 232.2(r): Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas.

(5) Fault areas.

(a) New MSWLF units and lateral expansions (~~shall~~) must not be located within two hundred feet (sixty meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that an alternative setback distance of less than two hundred feet (sixty meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.

(b) For the purposes of this subsection:

(i) "Fault" means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

(ii) "Displacement" means the relative movement of any two sides of a fault measured in any direction.

(iii) "Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

(6) Seismic impact zones.

(a) New MSWLF units and lateral expansions (~~shall~~) must not be located in seismic impact zones, unless the owner or operator demonstrates during the permit process of WAC 173-351-700 or

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through the permit modification process of WAC 173-351-720(6) to the jurisdictional health department that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 (~~and be issued a solid waste permit by the jurisdictional health department~~) or through the permit modification process of WAC 173-351-720(6).

(b) For the purposes of this subsection:

(i) "Seismic impact zone" means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in two hundred fifty years.

(ii) "Maximum horizontal acceleration in lithified earth material" means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a ninety percent or greater probability that the acceleration will not be exceeded in two hundred fifty years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

(iii) "Lithified earth material" means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface.

(7) Unstable areas.

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must demonstrate that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF units will not be disrupted. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 (~~and be issued a solid waste permit by the jurisdictional health department~~) or through the permit modification process of WAC 173-351-720(6). The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable:

(i) On-site or local soil conditions that may result in significant differential settling;

(ii) On-site or local geologic or geomorphologic features; and

(iii) On-site or local human-made features or events (both surface and subsurface).

(b) For purposes of this subsection:

(i) "Unstable area" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, and areas susceptible to mass movements.

(ii) "Structural components" means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the MSWLF that is necessary for protection of human health and the environment.

(iii) "Poor foundation conditions" means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of a MSWLF unit.

(iv) "Areas susceptible to mass movement" means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the MSWLF unit, because of natural or human-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-130, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-140 Other location restrictions. (1) Groundwater.

~~((a) Liner separation. No new MSWLF unit or lateral expansion shall be located at a site where the bottom of the lowest liner is any less than ten feet (three meters) above the seasonal high level of groundwater in any water bearing unit which is horizontally and vertically extensive, hydraulically recharged and volumetrically significant as to harm or endanger the integrity of the liner at any time, unless a demonstration during the permit process of WAC 173-351-700 can be made that a hydraulic gradient control system or the equivalent can be installed to control groundwater fluctuations and maintain a five foot (1.5 meter) separation between the controlled seasonal high level of groundwater in the identified water bearing unit and the bottom of the lowest liner. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 and be issued a solid waste permit by the jurisdictional health department.~~

~~This demonstration must include:~~

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~~(i) A hydrogeologic report required in WAC 173-351-490 including a discussion showing the effects from subsoil settlement, changes in surrounding land uses affecting groundwater levels, liner leakage or other impacts will not bring any hydrostratigraphic unit to within five feet (1.5 meters) of the bottom of the lowest liner during the active life, closure and post closure of the MSWLF unit;~~

~~(ii) Any currently available ground/surface water quality data for aquifers, springs, or streams in direct hydrologic contact with landfill's active area;~~

~~(iii) A showing that any gradient control discharges to groundwater will not adversely impact existing groundwater/surface water users or the instream flow of surface waters in direct hydrologic contact or continuity with the landfill's hydraulic gradient control system;~~

~~(iv) Conceptual engineering drawings of the proposed MSWLF unit and discussion as to how the hydraulic gradient control system will not affect the structural integrity nor performance of the liner;~~

~~(v) Design specifications for the proposed ground and surface water monitoring systems; and~~

~~(vi) Preliminary engineering drawings of the hydraulic gradient control system (if applicable).~~

~~(b))~~ (a) Sole source aquifers. ~~((No))~~ New MSWLF units ~~((or))~~ and lateral expansions ~~((shall))~~ may not be located over a designated sole source aquifer unless the owner or operator can demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the sole source aquifer is not vulnerable to potential groundwater contamination from the active area. Vulnerability is defined as the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or clean-up, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 ~~((and be issued a solid waste permit by the jurisdictional health department))~~ or through the permit modification process of WAC 173-351-720(6). Such a vulnerability demonstration must

include the submission of a hydrogeologic report as required in WAC 173-351-490 and additionally must meet the following performance criteria:

(i) Demonstrates the presence of confining units or other lithology that will prevent the migration of groundwater contamination;

(ii) Addresses the fate and transport of contaminants, including interactions in the lithologic framework, hydrogeochemical facies, contaminant travel times;

(iii) Defines and summarizes the groundwater budgets for the active area and the sole source aquifer including recharge and discharge areas and includes flow net diagrams;

(iv) Provides a contingency and groundwater assessment plan for the immediate arrest of any groundwater contamination and steps to assess the extent of contamination;

(v) Design specifications for the proposed ground and surface water monitoring systems;

(vi) Is prepared by a ~~((hydrogeologist or other professional groundwater scientist in accordance with WAC 173-351-400(2)))~~ geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists; and

(vii) "Sole source aquifer" means an aquifer designated by the Environmental Protection Agency pursuant to Section 1424e of the Safe Drinking Water Act (PL 93-523).

~~((e))~~ (b) Drinking water supply wells. ((No)) New MSWLF units ~~((or))~~ and lateral expansions active area ~~((shall))~~ may not be located closer than one thousand feet (three hundred meters) to any drinking water supply well, in use and existing at the time of the purchase of the property containing the active area unless the owner or operator can demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the active area is no less than a ninety-day hydraulic travel time to the nearest down-gradient drinking water supply well in the first useable aquifer. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 ~~((and be issued a solid waste permit by the jurisdictional health department))~~ or through the permit modification process of WAC 173-351-720(6). Such a demonstration must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and include:

(i) A hydrogeologic report required in WAC 173-351-490; and the necessary calculations for showing compliance with the ninety-day travel time; the ninety-day travel time ~~((shall))~~ must be based on the peak or full pumping capacity of installed nearby wells and include potentiometric surface maps showing well capture zones and radius of influence;

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(ii) Any (~~currently~~) available ground/surface water quality data for aquifers, springs, or streams in direct hydrologic contact with landfill's active area;

(iii) The waste management unit boundaries at facility closure;
and

(iv) Design specifications for the proposed ground and surface water monitoring systems(~~;~~ and

~~(v) A statement that the demonstration has been prepared by a hydrogeologist or qualified groundwater scientist in accordance with 173-351-400(2)).~~

(2) Surface water. (~~No~~) New MSWLF units (~~or~~) and lateral expansions active area (~~shall~~) may not be located in a channel migration zone or within two hundred feet (sixty-one meters) measured horizontally from the ordinary high water mark, of a shoreline of the state as defined in RCW 90.58.030 (which includes some wetlands associated with waters of the state), nor any public land that is being used by a public water system for watershed control for municipal drinking water purposes in accordance with WAC 246-290-450.

See also wetlands in WAC 173-351-130(4). Local wetlands protection ordinances should be consulted to determine if greater setbacks are required.

(3) Land use. (~~No~~) New MSWLF units (~~or~~) and lateral expansions (~~shall~~) may not be located:

(a) In areas designated by the United States Fish and Wildlife Service or the department of wildlife as critical habitat for endangered or threatened species of plants, fish, or wildlife;

(b) So that the active area is (~~any~~) closer than one hundred feet (thirty meters) to the facility property line for land zoned as nonresidential or (~~for~~) unzoned lands, (~~except that the active area shall be no~~) or closer than two hundred fifty feet (seventy-six meters) to the property line of adjacent land zoned as residential, existing at the time of the purchase of the property containing the active area(~~;~~);

(c) So as to be at variance with any locally-adopted land use plan or zoning requirement unless otherwise provided by local law or ordinance; (~~and~~) or

(d) So that the active area is any closer than one thousand feet (three hundred meters) to any state or national park.

~~(4) (~~Toxic air emissions. See WAC 173-351-200 (5)(a).~~~~

~~(5) Cover material. See WAC 173-351-200 (2)(a).~~

~~(6) Capacity. See WAC 173-351-010 (2)(c).~~

~~(7) Climatic factors. See WAC 173-351-300 (2)(b) for climatic factors.~~

~~(8) Natural soils. See WAC 173-351-300(2) for soil liner standards.))~~ All landfill facilities must comply with the location restrictions specified in RCW 70.95.060.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-140, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-200 Operating criteria. (1) Procedures for excluding the receipt of ~~((dangerous))~~ prohibited waste.

(a) Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of ~~((regulated—dangerous))~~ prohibited wastes ~~((including polychlorinated biphenyls (PCB) waste as defined in chapter 173-303 WAC, the Dangerous waste regulations))~~. This program must include, at a minimum:

(i) Random inspections of incoming loads unless the owner or operator takes other steps (for example, instituting source controls and restricting the type of waste received) to ensure that incoming loads do not contain ~~((regulated—dangerous))~~ prohibited waste ~~((or PCB wastes))~~;

(ii) Records of any inspections;

(iii) Training of facility personnel to recognize ~~((regulated dangerous waste and PCB))~~ prohibited wastes; and

(iv) Immediate notification of the department and the jurisdictional health department if a ~~((regulated dangerous waste or PCB))~~ prohibited waste is discovered at the facility.

(b) For purposes of this subsection:

(i) "~~((Regulated—dangerous))~~ Prohibited waste" means a solid waste that is:

(A) A dangerous waste as defined in WAC ~~((173-303-070, Designation of dangerous waste, including asbestos not managed in accordance to 40 CFR Part 61,))~~ 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 **or 173-303-073**, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070;

(B) Polychlorinated biphenyls (PCBs) regulated under Title 40 C.F.R. Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibition; and

(C) Asbestos not managed in accordance to 40 C.F.R. Part 61.

(ii) "Random inspection" means:

(A) Discharging a random waste load onto a suitable surface. A suitable surface ~~((shall))~~ must be chosen to avoid interference with operations so that sorted waste can be distinguished from other loads of uninspected waste, so as to avoid litter and to contain runoff;

(B) Viewing the contents prior to actual disposal of the waste; and

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(C) Allowing the facility owner or operator to return excluded wastes to the hauler, arrange for disposal of excluded wastes at a facility permitted to manage (~~(dangerous)~~) prohibited waste, or take other measures to prevent disposal of the excluded wastes at the facility.

(2) Cover material requirements.

(a) Except as provided in (b) of this subsection, the owners or operators of all MSWLF units must cover disposed solid waste with six inches (fifteen centimeters) of earthen material, i.e., soils, at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

(b) Alternative materials of an alternative thickness other than at least six inches (15 centimeters) of earthen material may be approved by the jurisdictional health department (~~(if the)~~). The owner or operator must demonstrate(~~(s)~~) during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the alternative material and thickness will not present a threat to human health or the environment; will not adversely affect gas or leachate composition or collection; will control disease vectors, fires, odors, blowing litter, and scavenging; and provide(~~(s)~~) adequate access for heavy vehicles(~~(, will not adversely affect gas or leachate composition and controls and scavenging without presenting a threat to human health and the environment)~~).

(c) The jurisdictional health department may grant a temporary waiver not to exceed three months from the requirement of (a) and (b) of this subsection if the owner or operator demonstrates that there are extreme seasonal climatic conditions that make meeting such requirements impractical.

(3) Disease vector control.

(a) Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

(b) For purposes of this subsection, "disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

(4) Explosive gases control.

(a) Owners or operators of all MSWLF units must ensure that:

(i) The concentration of methane gas generated by the facility does not exceed twenty-five percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components);

(ii) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary or beyond; and

(iii) The concentration of methane gases does not exceed one hundred parts per million by volume of methane in offsite structures.

(b) Owners or operators of all MSWLF units must control explosive gases and implement a routine methane monitoring program to ensure that the standards of (a)(i) and (ii) of this subsection are met.

(i) The explosive gas controls and type and frequency of monitoring must be determined based on the following factors:

(A) Soil conditions;

(B) The hydrogeologic conditions surrounding the facility;

(C) The hydraulic conditions surrounding the facility; (~~and~~)

(D) The location of facility structures and property boundaries; and

(E) The design and operation of the MSWLF unit.

(ii) The minimum frequency of monitoring (~~shall~~) must be quarterly.

Note: All gas monitoring wells (~~shall~~) must be constructed and decommissioned to ensure protection of the groundwater and to prevent groundwater contamination and follow the requirements of chapter 173-160 WAC, Minimum standards for construction and maintenance of wells, unless otherwise approved by the department and the jurisdictional health department.

(c) If methane gas levels exceeding the limits specified in subsection (4)(a)(i) or (ii) of this section are detected, the owner or operator must:

(i) Immediately take all necessary steps to ensure protection of human health including:

(A) Notifying the jurisdictional health department;

(B) Where subsection (4)(a)(ii) of this section is exceeded, monitoring of offsite structures for compliance with subsection (4)(a)(iii) of this section;

(C) Daily monitoring of methane gas levels unless otherwise authorized by the jurisdictional health department; and

(D) Evacuation of buildings affected by landfill gas (~~shall~~) must be determined by the jurisdictional health department and fire department.

(ii) Within seven calendar days of detection, place in the operating record, the methane gas levels detected and a description of the steps taken to protect human health; and

(iii) Within sixty days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the jurisdictional health department that the plan has been implemented. The plan (~~shall~~) must describe the nature and extent of the problem and the remedy.

(iv) The jurisdictional health department may establish alternative schedules for demonstrating compliance with (c)(ii) and (iii) of this subsection.

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(d) For purposes of this subsection, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at twenty-five degrees C and atmospheric pressure.

(5) Air criteria.

(a) Owners or operators of all MSWLF units must ensure that the units not violate any applicable requirements developed under the Washington state implementation plan approved or promulgated by the (~~Federal~~) U.S. Environmental Protection Agency pursuant to Section 110 of the Federal Clean Air Act, as amended.

(b) Open burning of solid waste is prohibited at all MSWLF units, except: For the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees or debris from emergency cleanup operations, provided that such open burning is not inconsistent with policies, regulations, and permits administered by the jurisdictional air pollution control agency or the department under the Washington Clean Air Act, chapter 70.94 RCW. Household waste (~~shall~~) must not be open burned.

(6) Access requirements. Owners or operators of all MSWLF units must control public access and prevent unauthorized vehicular traffic, illegal dumping of wastes, and controls to keep animals out by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment. A lockable gate (~~shall be~~) is required at each entry to the facility.

(7) Run-on/runoff control systems.

(a) Except as allowed under WAC 173-351-710, owners or operators of all MSWLF units must design, construct, and maintain:

(i) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a twenty-five year storm;

(ii) A runoff control system from the active portion of the landfill to collect and control at least the water volume resulting from a twenty-four hour, twenty-five year storm.

(b) Runoff from the active portion of the landfill unit must be handled in accordance with WAC 173-351-200(8).

(8) Surface water requirements. MSWLF units (~~shall~~) must not:

(a) Cause a discharge of pollutants into waters of the state, including wetlands, that violates any requirements of chapter 90.48 RCW, Water pollution control, including, but not limited to, chapter 173-201A WAC, Water quality standards for surface waters of the state of Washington, chapter 173-220 RCW, the National pollutant discharge elimination system permit program and chapter 173-216 WAC, State waste discharge permit program.

(b) Cause the discharge of a nonpoint source of pollution to waters of the state, including wetlands, that violates any requirement of an area-wide or statewide water quality management plan that has been approved under Section 208 or 319 of the Federal Clean Water Act, as amended.

(9) Liquids restrictions.

(a) Except as allowed under WAC 173-351-710, bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:

(i) The liquid waste is household waste other than septic waste; or

(ii) The liquid waste is leachate or gas condensate derived from the MSWLF unit (~~(, or water added in a controlled fashion and necessary for enhancing decomposition of solid waste, as approved during the permitting process of WAC 173-351-700, whether it is a new or existing MSWLF, or lateral expansion and the MSWLF unit)~~) and:

(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300 (~~((2)(a)(i) and (ii) or (iii))~~)(3); and

(B) (~~Is accepting leachate, condensate or water resulting from an emergency in disposing of such liquids.~~)

The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 and be issued a solid waste permit by the jurisdictional health department.) The owner or operator has obtained approval during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) prior to placing liquid waste in the MSWLF unit.

Note: Condensate and leachate are subject to designation to determine whether either is a dangerous waste under chapter 173-303 WAC.

(b) Containers holding liquid waste may not be placed in a MSWLF unit unless:

(i) The container is a small container similar in size to that normally found in household waste;

(ii) The container is designed to hold liquids for use other than storage; or

(iii) The waste is household waste.

(c) For purposes of this subsection:

(i) "Liquid waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846.

(ii) "Gas condensate" means the liquid generated as a result of gas recovery processes at the MSWLF unit.

(10) Recordkeeping requirements.

(a) The owner or operator of a MSWLF unit must record and retain the required information as it becomes available. The

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operating record must be retained at or near the facility in an operating record or in an alternative location approved by the jurisdictional health department during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). The required information includes:

(i) Copies of all initial, renewal, reissued, and modified permit applications including all demonstrations, and issued permits;

(ii) Inspection records, training procedures, and notification procedures required in subsection (1) of this section, Procedures for excluding the receipt of (~~hazardous~~) prohibited waste, and inspection documents associated with the plan of operation, WAC 173-351-210 (~~((1)(b))~~).

(iii) Gas monitoring results from monitoring and any remediation plans required by WAC 173-351-200(4);

(iv) Any demonstration, certification, declaration of construction, finding, monitoring, testing, or analytical data as required by WAC 173-351-400 (Groundwater monitoring systems and (~~corrective~~) remedial action);

(v) Major deviations from the plan of operation required in WAC 173-351-210; and

(vi) Daily records of weights or volumes of solid waste and, if available, types of waste received at the facility.

(b) The owner or operator must notify the jurisdictional health department when the documents from (a) of this subsection have been placed in or added to the operating record, unless:

(i) Such documents have been made a part of a permit application under this regulation;

(ii) Notification occurs under the renewal application requirements of WAC 173-351-730 (3)(b)(iv); or

(iii) The documents are daily records of weights or volumes specified in WAC 173-351-200 (10)(a)(vi).

(c) The jurisdictional health department can set alternative schedules during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) for recordkeeping and notification requirements as specified in (a) and (b) of this subsection, except for the notification requirements in WAC 173-351-130 (2)(b), the Federal Aviation Administration and in WAC 173-351-440 (6)(c), notification of land owners under assessment monitoring.

(d) All information contained in the operating record must be furnished upon request to the jurisdictional health department or be made available at all reasonable times for inspection by the jurisdictional health department and the department.

(11) Annual reports. Each owner or operator (~~shall~~) must prepare and submit a copy of an annual report to the

jurisdictional health department and the department by April 1 of each year. The annual report (~~shall~~) must:

(a) Include information on facility activities during the previous year;

(b) Be on forms supplied by the department; and

(c) Include the following information:

(i) Facility location;

(ii) Facility contact;

(iii) Operational and/or post-closure information;

(iv) Permit status;

(v) Compliance information;

(vi) Facility capacity information;

(vii) Information on groundwater monitoring as required in WAC 173-351-415(1) (~~except, prior to the effective date of the groundwater monitoring requirements of WAC 173-351-400, groundwater monitoring information and existing summaries collected under groundwater monitoring systems installed according to chapter 173-304 WAC~~)).

(viii) Information on violation of ambient standards for surface water and explosive gases whose monitoring is required by chapter 173-351 WAC or performed as part of the permit issued under WAC 173-351-700; (~~and~~)

(ix) Financial assurance audit reports in accordance with WAC 173-351-600 if applicable; and

(x) Other information as required.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-200, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-210 Plan of operation. Each owner or operator (~~shall~~) must develop, keep, and abide by a plan of operation approved as part of the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). The plan of operation (~~shall~~) must describe the facilities' operation and (~~shall~~) must convey to site operating personnel the concept of operation intended by the designer. The plan of operation (~~shall~~) must be available for inspection at the request of the jurisdictional health (~~officer~~) department and the department. The facility must be operated in accordance with the plan of operation or the plan must be so modified with the approval of the jurisdictional health department.

Each plan of operation (~~shall~~) must include:

(1) How solid wastes are to be handled on-site during its active life including transportation, routine filling, grading, cover, and housekeeping;

(2) How inspections are conducted and their frequency;

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- (3) Actions to take if there is a fire or explosion;
- (4) Actions to take for sudden releases (e.g., failure of run-off containment system);
- (5) How equipment such as leachate collection and gas collection equipment are to be operated and maintained;
- (6) A safety plan or procedure; (~~and~~)
- (7) How operators will meet each requirement of WAC 173-351-200 and 173-351-220; and
- (8) Other such details as required by the jurisdictional health department.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-210, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-220 Additional operating criteria. All owners or operators of MSWLF units (~~shall~~) must operate the facility so as to:

- (1) Control road dust;

Note: Operators should carefully select dust suppressants approved by the jurisdictional health departments that do not pose a threat to surface or groundwater quality.

- (2) Collect scattered litter as necessary to prevent vector harborage, a fire hazard, an aesthetic nuisance, or adversely affect wildlife or its habitat;

- (3) Prohibit scavenging;

- (4) Landfill personnel. All landfills (~~shall~~) must:

- (a) Ensure that at least two landfill personnel are on-site with one person at the active portion when the site is open to the public for landfills with a permitted capacity of greater than fifty thousand cubic yards per year; and

- (b) Comply with the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities.

Note: The definition of operators in chapter 173-300 WAC is not the same as the definition of operator in this rule.

- (5) Ensure that reserve operational equipment (~~shall be~~) is available to maintain and meet (~~these standards~~) all operating criteria;

- (6) Clearly mark the active area boundaries authorized in the permit, with permanent posts or (~~using~~) equivalent method (~~(clearly visible for inspection purposes)~~);

(7) Thoroughly compact the solid waste before succeeding layers are added except for the first lift over a liner;

(8) Maintain the monitoring system required in WAC 173-351-400, Groundwater monitoring systems and (~~corrective~~) remedial action, WAC 173-351-200(4), explosive gas monitoring of this regulation and any other monitoring specified in the permit issued in WAC 173-351-700(~~(-)~~);

(9) Require recycling.

(a) All owners and operators (~~shall~~) must provide the opportunity for the general public to conveniently recycle cans, bottles, paper, and other material brought to the landfill site and for which a market exists or as required according to the most recently adopted county comprehensive solid waste management plan:

(i) During the normal hours of operation; and

(ii) In facilities convenient to the public (i.e., near entrance to the gate).

(b) Owners or operators (~~shall~~) must conduct recycling activities in an orderly, sanitary manner and in a way that does not interfere with MSWLF operations.

(c) Owners or operators may demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) alternative means to providing an opportunity to the general public to recycle household solid waste including other conveniently located facilities which offer recycling opportunities.

(10) Prohibiting disposal of municipal sewage sludge or biosolids in MSWLF units.

(a) The disposal of municipal sewage sludge or biosolids or any material containing municipal sewage sludge or biosolids in a MSWLF unit is prohibited unless the municipal sewage sludge or biosolids or material containing municipal sewage sludge or biosolids is not a liquid as defined in this rule, and such disposal is specifically approved as part of a valid NPDES permit, or a valid permit issued in accordance with chapter 70.95J RCW and rules promulgated under that authority.

(b) Notwithstanding WAC 173-351-220 (10)(a), the jurisdictional health department may allow disposal of municipal sewage sludge or biosolids, or any material containing municipal sewage sludge or biosolids in a landfill on a temporary basis if the jurisdictional health department determines that a potentially unhealthful circumstance exists and other management options are unavailable or would pose a threat to human health or the environment.

(c) In accordance with (b) of this subsection upon determination that a potentially unhealthful circumstance exists, the jurisdictional health department (~~shall~~) must notify the department in writing, of its findings and basis for its determination. In its notification, the jurisdictional health department (~~shall~~) must state the date on which disposal is

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approved to commence, any conditions, and the date after which continued disposal (~~shall be~~) is prohibited.

(d) For the purposes of this regulation, the use of sewage sludge or biosolids or any material containing sewage sludge or biosolids, which is subject to regulation under 40 C.F.R. Part 503 and or chapter 70.95J RCW, as daily cover or as an amendment to daily cover (~~shall be~~) is considered disposal.

(11) Disposal of dangerous waste prohibited. Owners or operators of landfills (~~shall~~) must not knowingly dispose, treat, store, or otherwise handle dangerous waste unless the requirements of the Dangerous waste regulation, chapter 173-303 WAC are met(~~-~~);

(12) Jurisdictional health department inspection of activities. In accordance with RCW 70.95.190, employees of the jurisdictional health department or their agents may enter upon, inspect, sample, and move freely about the premises of any MSWLF, after presentation of credentials.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-220, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-300 Design criteria. (1) Applicability. New MSWLF units and lateral expansions must be constructed in accordance with the requirements under subsection (2) of this section. Existing MSWLF units are not subject to this section. Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management, including operating plans approved under chapter 173-304 WAC.

(2) New MSWLF units and lateral expansions (~~shall~~) must be constructed:

(a) (~~For nonarid landfills, in accordance with a standard design as follows:~~

(i)) With a composite liner as defined in ((a)(ii)) subsection (3) of this ((subsection)) section and a leachate collection system that is designed and constructed to maintain less than a 1 foot (30 cm) depth of leachate over the liner(~~-~~

Note: Leachate head in leachate pump sump areas, only, shall not be allowed to exceed two feet (60 cm).

(ii)) and less than a 2-foot depth over the leachate pump sump area; or

(b) In accordance with an alternative design approved by the jurisdictional health department with the department's written consent. Alternative designs must ensure that the concentration values listed in Table 1 of this section and the criteria in the water quality standards for groundwaters of the state of Washington, chapter 173-200 WAC, will not be exceeded in the hydrostratigraphic unit(s) identified in the hydrogeologic characterization/report at the relevant point of compliance as specified during the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Alternative designs must also sufficiently control methane to meet the criteria in WAC 173-351-200 (4)(a).

(3) For the purpose of this section, "composite liner" means a system consisting of two components; the upper component must consist of a minimum of 60 mil thickness high density polyethylene (HDPE) geomembrane. The lower component must consist of at least a two-foot (60 cm) layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The geomembrane must be installed in direct and uniform contact with the compacted soil component. Thinner geomembranes of other than high density polyethylene may be used provided that a demonstration can be made that the alternative has equivalent mechanical strength, permeability, chemical resistance and other factors under conditions of construction and use. Minimum thickness of geomembranes other than high density polyethylene (~~shall~~) must be 30 mils.

~~((iii) Equivalent liner designs and liner materials may be used provided a demonstration during the permitting process of WAC 173-351-700 can be made that the liner is equivalent to the composite liner design:~~

~~(A) With respect to hydraulic effectiveness as shown by the use of the hydraulic evaluation of landfill performance (HELP) model or other approved models or methods;~~

~~(B) With respect to mechanical strength;~~

~~(C) With respect to chemical resistance;~~

~~(D) With respect to potential physical damage during construction and operation;~~

~~(E) With respect to attenuative capacity; and~~

~~(F) And other factors identified by the jurisdictional health department and the department on a case-by-case basis.~~

~~(b) For arid landfills, in accordance with a design that ensures that the maximum contaminant levels listed in Table 1 of this section will not be exceeded in the hydrostratigraphic unit(s) identified in the hydrogeologic characterization/report at the relevant point of compliance as specified during the permitting process in WAC 173-351-700. When approving a design that complies with the arid landfill design of (b) of this subsection, the jurisdictional health department shall consider at least the following factors:~~

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- ~~(i) The hydrogeologic characteristics of the facility and surrounding land;~~
- ~~(ii) The climatic factors of the area; and~~
- ~~(iii) The volume, physical and chemical characteristics of the leachate.~~

Note: When determining the need for a liner in arid settings and its ability to meet the performance standard of this section, considering (b)(i), (ii), and (iii) of this subsection, the owner or operator may use:

~~(A))~~ (4) When demonstrating that a proposed alternative design meets the standards of this section, the owner or operator may use:

(a) Existing information such as vadose zone, groundwater monitoring, or leachate characterization that has previously been conducted at the facility;

~~((B))~~ (b) Contaminant transport modeling in accordance with the requirements of WAC 173-351-480; and/or

~~((C))~~ (c) Other information determined as appropriate and relevant by the jurisdictional health department.

~~((e))~~ (5) When approving an alternative design, the jurisdictional health department must consider at least the following factors:

(a) The hydrogeologic characteristics of the facility and surrounding land;

(b) The climatic factors of the area; and

(c) The volume, physical and chemical characteristics of the leachate.

(6) The relevant point of compliance approved during the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6), ~~((shall))~~ must be no more than one hundred fifty meters (four hundred ninety-two feet) from the waste management unit boundary and ~~((shall))~~ must be located on land owned by the owner of the MSWLF unit. In approving the relevant point of compliance the jurisdictional health department ~~((shall))~~ must consider at least the following factors:

~~((i))~~ (a) The hydrogeologic characteristics of the facility and surrounding land;

~~((ii))~~ (b) The volume, and physical/chemical characteristics of the leachate;

~~((iii))~~ (c) The quantity and quality, and direction~~((τ))~~ of flow of groundwater;

~~((iv))~~ (d) The proximity and withdrawal rate of the groundwater users;

~~((v))~~ (e) The availability of alternative drinking water supplies;

~~((vi))~~ (f) The existing quality of the groundwater, including other sources of contamination and their cumulative impacts on the groundwater, and whether the groundwater is currently used or reasonably expected to be used for drinking water;

~~((vii))~~ (g) Public health, safety, and welfare effects; and

~~((viii))~~ (h) Practical capability of the owner or operator.

(7) Liner separation from groundwater. New MSWLF units and lateral expansions may not be designed such that the bottom of the lowest liner component is any less than ten feet (three meters) above the seasonal high level of groundwater, unless a demonstration can be made during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that a hydraulic gradient control system, or the equivalent, can be installed which prevents the controlled seasonal high level of groundwater in the identified water-bearing unit from contacting the bottom of the lowest liner component. For the purposes of this section, groundwater includes any water-bearing unit that is horizontally and vertically extensive, hydraulically recharged and volumetrically significant as to harm or endanger the integrity of the liner at any time. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). This demonstration must include:

(a) A hydrogeologic report required in WAC 173-351-490 including a discussion showing the effects from subsoil settlement, changes in surrounding land uses affecting groundwater levels, liner leakage or other impacts will not bring any hydrostratigraphic unit in contact with the bottom of the lowest liner during the active life, closure, post-closure, and upon completion of post-closure care of the MSWLF unit;

(b) Any available ground/surface water quality data for aquifers, springs, or streams in direct hydrologic contact with landfill's active area;

(c) A showing that any gradient-control discharges to groundwater will not adversely impact existing groundwater/surface water users or the instream flow of surface waters in direct hydrologic contact or continuity with the landfill's hydraulic gradient control system;

(d) Conceptual engineering drawings of the proposed MSWLF unit and discussion as to how the hydraulic gradient control system will not affect the structural integrity nor performance of the liner during the active life, closure, post-closure, and upon completion of post-closure care of the MSWLF unit;

(e) Design specifications for the proposed ground and surface water monitoring systems;

(f) A discussion of the potential impacts from the gradient control system on the capability of collecting groundwater samples that represent the quality of groundwater passing the relevant point of compliance; and

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(g) Preliminary engineering drawings of the hydraulic gradient control system.

TABLE 1

CHEMICAL	Maximum ((Contaminant Levels (MCL)) Concentration (mg/l)(*))
ARSENIC	0.00005
BARIUM	1.0
BENZENE	0.001
CADMIUM	((0.01))
CARBON TETRACHLORIDE	<u>0.005</u>
CHROMIUM (HEXAVALENT)	0.05
2,4-DICHLOROPHENOXY ACETIC ACID	((0.1)) <u>0.07</u>
1,4-DICHLOROBENZENE	0.004
1,2-DICHLOROETHANE	0.0005
1,1 DICHLOROETHYLENE	0.007
ENDRIN	0.0002
FLUORIDE	4
LINDANE	0.00006
LEAD	((0.05))
MERCURY	<u>0.015</u>
METHOXYCHLOR	((0.1)) <u>0.04</u>
NITRATE	10
SELENIUM	0.01
SILVER	0.05
TOXAPHENE	0.00008
1,1,1-TRICHLOROETHANE	0.20
TRICHLOROETHYLENE	0.003
2,4,5-TRICHLOROPHENOXY ACETIC ACID	0.01
VINYL CHLORIDE	0.00002

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-300, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-400 Groundwater monitoring systems and ((corrective)) remedial action. (1) Applicability.

(a) The requirements of WAC 173-351-400 through WAC 173-351-490 apply to MSWLF units whose owners and operators are required to perform groundwater monitoring under chapter 173-351 WAC.

(b) Owners and operators of MSWLF units must comply with the groundwater monitoring requirements of this regulation according to the following schedule:

(i) Existing MSWLF units and lateral expansions less than one mile (1.6 kilometers) from a drinking water intake (surface or subsurface) must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 by October 9, 1994;

Note: A drinking water intake is any surface water or groundwater intake that is used for the purposes of drinking water i.e., water supply wells.

(ii) Existing MSWLF units and lateral expansions greater than one mile (1.6 kilometers) from a drinking water intake (surface or subsurface) must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 by October 9, 1995;

(iii) New MSWLF units and lateral expansions ((units)) must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 before waste can be placed in the MSWLF unit.

(c) Existing MSWLF units and lateral expansions with groundwater contamination as defined under WAC 173-304-100 and chapter 173-200 WAC must begin an assessment groundwater monitoring program under WAC 173-351-440 by October 9, 1994.

(d) Interim groundwater monitoring programs. Prior to the compliance schedules in (b) of this subsection, all existing MSWLF units and lateral expansions must either:

(i) Continue to monitor under WAC 173-304-490; or

(ii) Begin to monitor under this section.

(e) All MSWLF units closed in accordance with chapter 173-304 WAC must continue to monitor groundwater in accordance with chapter 173-304 WAC.

(2) ((~~Personnel qualifications. For the purposes of this regulation, a "qualified groundwater scientist" must be a~~

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~~hydrogeologist, geologist, engineer, or other scientist who meets all of the following criteria:~~

~~(a) Has received a baccalaureate or post-graduate degree in the natural sciences or engineering; and~~

~~(b) Has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.~~

~~(3) A qualified groundwater scientist is required to prepare))~~
The following reports, demonstrations and information must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists:

(a) The hydrogeologic report(s) of WAC 173-351-490;

(b) The groundwater monitoring program(s) including the groundwater monitoring system design and well placement of WAC 173-351-405; the groundwater sampling and analysis plan of WAC 173-351-410; the detection monitoring program(s) of WAC 173-351-430; and the assessment monitoring program(s) of WAC 173-351-440;

(c) Any demonstration(s) under WAC 173-351-430 (4)(c) (~~((\otimes))~~), 173-351-440 (6)(e), (~~((\otimes))~~) 173-351-140(1), or 173-351-300(7);

(d) Any modification(s) proposals/requests to the approved groundwater monitoring program in accordance with WAC 173-351-450; (~~and~~))

(e) Any groundwater modeling demonstrations made under WAC 173-351-480; and

(f) The groundwater reports required under WAC 173-351-415.

~~((Note: A hydrogeologist or other qualified groundwater scientist is NOT required for the actual groundwater sampling.))~~

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-400, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-405 Performance standards for groundwater monitoring system designs. Groundwater monitoring well placement.

The groundwater monitoring system design (~~shall~~) must meet the following performance criteria:

(1) A sufficient number of wells must be installed at appropriate locations and depths to yield representative groundwater samples from those hydrostratigraphic units which have

been identified as the earliest target hydraulic pathways and conduits of flow for groundwater and contaminant movement, and storage.

(2) The number, spacing, and depths of monitoring wells must be based on the site characteristics including the area of the MSWLF unit and the hydrogeological characterization of WAC 173-351-490, and requires a demonstration based on all of the following information:

(a) A groundwater flow path analysis which supports why the chosen hydrostratigraphic unit best serves the installation of a detection or assessment groundwater monitoring well system capable of providing early warning detection of any groundwater contamination.

(b) Documentation and calculations of all of the following information:

(i) Hydrostratigraphic unit thicknesses including confining units and transmissive units;

(ii) Vertical and horizontal groundwater flow directions including seasonal, man-made, or other short term fluctuations in groundwater flow;

(iii) Stratigraphy and lithology;

(iv) Hydraulic conductivity; and

(v) Porosity and effective porosity.

(3) Hydraulically placed upgradient wells (background wells) must meet the following performance criteria:

(a) Must be installed in groundwater that has not been affected by leakage from a MSWLF unit; or

(b) If hydrogeologic conditions do not allow for the determination of a hydraulically placed upgradient well then sampling at other monitoring wells which provide representative background groundwater quality may be allowed(~~(; and)~~).

(4) Hydraulically placed down-gradient wells (compliance wells) must meet the following performance criteria:

(a) Represent the quality of groundwater passing the relevant point of compliance specified by the jurisdictional health department. The downgradient monitoring system must be installed at the relevant point of compliance specified by the jurisdictional health department during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Additional wells may be required by the jurisdictional health department based upon areal extent of the MSWLF unit, complex hydrogeologic settings or to define the extent of contamination under WAC 173-351-440 and 173-351-450.

(b) When physical obstacles preclude installation of groundwater monitoring wells at the relevant point of compliance at existing units, the downgradient monitoring system may be installed at the closest practicable distance hydraulically down gradient from the relevant point of compliance that ensures

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detection of groundwater contamination in the chosen hydrostratigraphic unit.

(5) All monitoring wells must be cased in a manner that maintains the integrity of the bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of samples. The annular space between the bore hole and well casing above the sampling depth must be sealed to prevent ~~((contamination))~~ corruption of samples and contamination of groundwater. All wells must be constructed in accordance with chapter 173-160 WAC, Minimum standards for construction and maintenance of water wells and chapter 173-162 WAC, Regulation and licensing of well contractors and operators. All wells must be clearly labeled, capped, and locked.

(6) The owner or operator must apply for a permit modification under WAC 173-351-720~~((+5))~~ (6) or must apply during the renewal process of WAC 173-351-720 ~~((+1)(i))~~ (5), for any proposed changes to the design, installation, development, and decommission of any monitoring wells, piezometers, and other measurement, sampling, and analytical devices. Upon completing changes, all documentation, including date of change, new well location maps, boring logs, and well diagrams must be submitted to the jurisdictional health department and must be placed in the operating record of WAC 173-351-200(10).

(7) All monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

(8) The groundwater monitoring system and hydrogeologic report including any changes to the groundwater monitoring system ~~((shall))~~ must be prepared by a ~~((hydrogeologist or other qualified groundwater scientist and include a statement of personnel qualifications))~~ geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists.

(9) The ~~((prepared))~~ groundwater monitoring system design and hydrogeologic report must be made a part of the permit application in accordance with WAC 173-351-730 (1)(b)(iii).

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-405, filed 10/26/93, effective 11/26/93.]

WAC 173-351-410 Groundwater sampling and analysis requirements. (1) The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells installed in compliance with WAC 173-351-400 and with this section. The owner or operator must submit the sampling and analysis program documentation as a part of the permit application in accordance with WAC 173-351-730 (1)(b)(iii). The program must include procedures and techniques for:

- (a) Sample collection and handling;
- (b) Sample preservation and shipment;
- (c) Analytical procedures;
- (d) Chain-of-custody control;
- (e) Quality assurance and quality control;
- (f) ~~((Decontamination))~~ Cleansing of drilling and sampling equipment;
- (g) Procedures to ensure employee health and safety during well installation and monitoring; and
- (h) Well operation and maintenance procedures.

(2) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples or reflect an acceptable practical quantitation limit (PQL). Groundwater samples ~~((shall))~~ must not be field-filtered ~~((for organic constituents))~~ prior to laboratory analysis except for geochemical indicator parameters used for cation-anion balance evaluations in WAC 173-351-430(5). All analyses must be sent to an accredited laboratory in accordance with chapter 173-50 WAC, Accreditation of environmental laboratories.

(3) Groundwater elevations must be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same MSWLF unit must be measured within a period of time short enough to avoid any groundwater fluctuations which could preclude the accurate determination of groundwater flow rate and direction. All groundwater elevations must be determined:

- (a) By a method that ensures measurement to the 0.01 (one/one hundredth) of a foot (3mm) relative to the top of the well casing; and
- (b) The orthometric elevation of the top of the well casing is related to a vertical benchmark based on the ~~((national geodetic))~~

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North American vertical datum of ((1929 (NGVD 29))) 1988 (NAVD88) and be established to 3rd order classification standards per federal geodetic control committee(~~(, or its successor, as specified in WAC 332-130-060)~~).

(4) The owner or operator must establish background groundwater quality in hydraulically placed upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under ~~((this section))~~ WAC 173-351-430, 173-351-440, or 173-351-450. Background groundwater quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if it meets the requirements of WAC 173-351-400 through 173-351-490.

(5) The number of samples collected to establish water quality data must be consistent with the appropriate statistical procedures determined pursuant to WAC 173-351-420. The sampling procedures ~~((shall))~~ must be those specified under WAC 173-351-430 for detection monitoring, WAC 173-351-440 for assessment monitoring, and WAC 173-351-440~~((6) of corrective))~~ (7) for remedial action.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-410, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-415 Groundwater reporting. (1) ~~((The annual report shall be included with the facility annual report as required in WAC 173-351-200(11) and shall be on))~~ Each owner or operator must prepare and submit a copy of an annual groundwater report to the jurisdictional health department and the department by April 1st of each year. The groundwater annual report must include completed forms developed by the department ((which will request)) and the following information:

(a) A brief summary of statistical results and/or any statistical trends including any findings of any statistical increases for the year;

(b) A brief summary of groundwater flow rate and direction for the year, noting any trends or changes;

(c) A ~~((Xerox))~~ copy of all potentiometric surface maps developed for each quarter or approved semi-annual period; and

(d) A summary geochemical evaluation noting any changes or trends in the cation-anion balances, Trilinear diagrams and general water chemistry for each well.

(2) A quarterly, or alternate frequency approved in accordance with WAC 173-351-450, groundwater report ((shall)) must be submitted to the jurisdictional health department and the department no later than sixty days after the receipt of the ((quarterly)) analytical data ((and shall)). The groundwater report must include completed forms developed by the department and all of the following:

(a) All groundwater monitoring data for the sampling period;

(b) A brief summary of statistical results and/or any statistical trends and all statistical calculations ((and summaries));

(c) Notification of any statistical increase and concentrations above ((MCL's)) the criteria in chapter 173-200 WAC, Water quality standards for groundwaters of the state of Washington;

(d) Static water level readings for each monitoring well for each sampling event;

(e) Potentiometric surface elevation maps depicting groundwater flow rate and direction;

(f) Cation-anion balances and Trilinear diagrams; and

(g) Leachate ((analyses)) analysis results if sampled and tested.

(3) All groundwater monitoring data must be submitted consistent with procedures specified by the department. Unless otherwise specified by the department, all groundwater monitoring data must be submitted in an electronic form capable of being transferred into the department's data management system.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-415, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-420 Statistical methods for groundwater monitoring. (1) The owner or operator must calculate and evaluate all of the following statistics ((using)) for background groundwater quality data:

(a) The background mean;

(b) The background variance;

(c) The standard deviation of the background data;

(d) The coefficient of variation of the background data;

(e) The standard error of the background data; and

(f) Other statistics testing for homogeneity of variance and the normality of the background data.

(2) The owner or operator must specify in the permit application in accordance with WAC 173-351-730 (1)(b)(iii) ((one of the following)) appropriate statistical methods to be used in evaluating groundwater monitoring data for each ((hazardous)) constituent. The statistical test chosen ((shall)) must be

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conducted separately for each (~~hazardous~~) constituent in each well. (~~The statistical methods to be used are:~~

~~(a) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit;~~

~~(b) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent;~~

~~(c) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent;~~

~~(d) A control chart approach that gives control limits for each constituent; or~~

~~(e) Another statistical test method that meets the performance standards of this section. The owner or operator must place a justification for this alternative in the permit application in accordance with WAC 173 351 730 (1)(b)(iii). The justification must demonstrate that the alternative method meets the performance standards of this section.~~

~~(3) Any statistical method chosen under this section shall comply with)) The owner or operator must demonstrate that the statistical methods meet the following performance standards, as appropriate:~~

~~(a) The statistical method used to evaluate groundwater monitoring data (~~shall~~) must be appropriate for the distribution of chemical parameters or (~~hazardous~~) constituents. If the distribution of the chemical parameters or (~~hazardous~~) constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data must be evaluated to determine if nonnormal conditions are due to laboratory or sampling error, poor well construction, seasonal or spatial variability, or actual site conditions. Transformed or a distribution-free theory test may be used, upon a determination of why nonnormal conditions exist. If the distributions for the constituents differ, more than one statistical method may be needed.~~

~~(b) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater~~

protection standard, the test (~~(shall)~~) must be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparison procedure is used, the Type I experiment wise error rate for each testing period (~~(shall)~~) must be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

~~(c) ((If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated))~~ Parameter values (~~(shall)~~) must be protective of human health and the environment. The parameters (~~(shall)~~) must be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

~~(d) ((If a tolerance interval or a predictional interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.~~

~~(e))~~ The statistical method (~~(shall)~~) must account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (PQL) that is used in the statistical method (~~(shall)~~) must be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

~~((f))~~ (e) If necessary, the statistical method (~~(shall)~~) must include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

~~((4))~~ (3) The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular groundwater monitoring program that applies to the MSWLF unit after each sampling event and as determined under this section.

(a) In determining whether a statistically significant increase has occurred, the owner or operator must compare the groundwater quality of each parameter or constituent at each monitoring well designated pursuant to WAC 173-351-430 or 173-351-440 to the background value of that constituent, according to the statistical procedures and performance standards specified under this section.

(b) Within thirty days after receipt of the analytical data, the owner or operator must determine whether there has been a statistically significant increase over background at each

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monitoring well (~~((at all hydraulically placed upgradient and downgradient wells))~~)).

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-420, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-430 Detection monitoring program. (1) Detection monitoring (~~(is required)~~) must be conducted at MSWLF units at all groundwater monitoring wells (~~(defined)~~) required under WAC 173-351-405. At a minimum, a detection monitoring program must include ~~((the))~~ monitoring for the constituents listed in Appendix I and II of this regulation.

(2) Background data (~~(development)~~).

(a) Background data development for new MSWLF units.

(i) A minimum of eight independent samples (shall be collected for each well (background and downgradient) and) must be collected from each monitoring well and analyzed for ((the)) Appendix I constituents for the first year of groundwater monitoring unless background data already exists for Appendix I constituents and performance criteria of WAC 173-351-400 are met.

~~((b))~~ (ii) Each independent sampling event (shall) must be no less than one month apart from the previous independent sampling event.

~~((c))~~ (iii) Sampling for Appendix II parameters (shall) must be done quarterly.

~~((d) MSWLF units which have previously developed background for those constituents listed in Appendix I will be waived from (a) of this subsection on a parameter by parameter basis providing all performance criteria of WAC 173-351-400 are met.)~~

(b) Total metals background data development for existing MSWLF units.

(i) An owner or operator must follow the permit modification process in WAC 173-351-720(6) to amend the sampling and analysis program to address (b)(ii) and (iii) of this subsection by May 31, 2013. Amendments must meet the standards of WAC 173-351-410 (1) and (2).

(ii) Beginning at the first sampling event after jurisdictional health department approval of amendments to the sampling and analysis program in (b)(i) of this subsection, independent samples must be collected from each monitoring well and analyzed for the parameters in (ii)(A) and (B) of this subsection. Samples must be collected and analyzed over eight sampling periods, which may be

quarterly or semi-annually to coincide with routine monitoring as approved by the jurisdictional health department.

(A) Total metals from Appendix I Inorganic Constituents 1-15.

(B) Dissolved metals:

Antimony (Dissolved).

Arsenic (Dissolved).

Barium (Dissolved).

Beryllium (Dissolved).

Cadmium (Dissolved).

Chromium (Dissolved).

Cobalt (Dissolved).

Copper (Dissolved).

Lead (Dissolved).

Nickel (Dissolved).

Selenium (Dissolved).

Silver (Dissolved).

Thallium (Dissolved).

Vanadium (Dissolved).

Zinc (Dissolved).

(iii) After collecting and analyzing samples for total and dissolved metals for eight sampling periods, collection and analysis of Appendix I Inorganic Constituents 1-15 (total metals) must continue and collection and analysis of dissolved metals under (b)(ii)(B) of this subsection can cease.

(3) (~~Foreground data development~~) Routine sampling. Except as allowed under WAC 173-351-450, the monitoring frequency for all constituents listed in Appendix I and II (~~shall~~) must be quarterly in each well during the active life of the MSWLF unit including the closure and the post-closure period and begins after (~~the first year of~~) background data development(~~(, for all monitoring wells (upgradient and downgradient))~~).

(Note: Foreground denotes the period of time following the development of the back-ground data set, for all monitoring wells (upgradient and downgradient).)

(4) If the owner or operator determines, pursuant to WAC 173-351-420, that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I, at any monitoring well at the boundary specified under WAC 173-351-405, the owner or operator:

(a) Must, within fourteen days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and send the same notice to the jurisdictional health department and the department; and

(b) Must establish an assessment monitoring program meeting the requirements of WAC-173-351-440 within ninety days except as provided for in (c) of this subsection; or

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(c) May demonstrate that a source other than a MSWLF unit caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be prepared by a ~~((hydrogeologist or other qualified groundwater scientist))~~ geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and approved by the jurisdictional health department and be placed in the operating record. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this section. If, after ninety days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in WAC 173-351-440(~~+~~ and

~~(d) Must submit the assessment monitoring program to the jurisdictional health department at the end of ninety days as provided in (b) of this subsection)).~~

(5) A geochemical evaluation of Appendix II parameters ~~((shall))~~ must be conducted at each well on a quarterly basis and include all of the following methods:

(a) A cation-anion balance evaluating the difference between the cation and anion sums expressed in milliequivalents per liter ~~((+ if a greater than a five to ten percent difference occurs then))~~. If the following threshold limits are exceeded, the owner or operator ((shall)) must provide a summary explanation and examine whether the difference is due to a laboratory error, poor well conditions, or other ions not accounted for in natural or impacted groundwater conditions((+)). A ten percent difference threshold is used if the total cation-anion sums are less than 5.0 meq/liter ((then a ten percent difference threshold, may be used)). A five percent difference threshold is used if the total cation-anion sums are greater than or equal to 5.0 meq/liter.

(b) A plot of cations and anions for each well on a trilinear diagram, as recommended in hydrogeologic texts and/or the department guidance documents.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-430, filed 10/26/93, effective 11/26/93.]

WAC 173-351-440 Assessment monitoring program. (1) Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the Appendix I or in the alternative list approved in accordance with WAC 173-351-450, Alternative groundwater monitoring programs.

(2) Background data development for total metals must be done in accordance with WAC 173-351-430 (2)(b) for existing MSWLF units under assessment monitoring as of November 1, 2012.

(3) Within ninety days of triggering (~~(into)~~) an assessment monitoring program, and (~~(quarterly)~~) annually thereafter, the owner or operator must sample and analyze the groundwater for all constituents identified in Appendix III (~~(of this part)~~). A minimum of one sample from each (~~(downgradient)~~) well (background and downgradient) must be collected and analyzed during each sampling event. For any constituent detected in (~~(the downgradient)~~) wells as a result of the complete Appendix III analysis, a minimum of four independent samples must be collected from each well (background and downgradient) (~~(must be collected)~~) within a time period of one hundred eighty days, and analyzed to establish background for the constituents. Each independent sample (~~(shall)~~) must be collected no less than one month apart from the previous sampling event.

(~~(+3)~~) (4) After obtaining the results from (~~(the)~~) initial or subsequent sampling events required in subsection (~~(+2)~~) (3) of this section, the owner or operator must:

(a) Within fourteen days, notify the jurisdictional health department of the increase, identifying the Appendix III constituent(s) that have been detected and place this notice in the operating record;

(b) Within ninety days, and on a quarterly basis thereafter, resample all wells, conduct analyses for all constituents in Appendix I and II(~~(7)~~) and(~~(7 for those)~~) constituents in Appendix III that are detected in response to subsection (~~(+2)~~) (3) of this section(~~(7)~~). Record their concentrations in the facility operating record and notify the jurisdictional health department. At least one sample from each well (background and downgradient) must be collected and analyzed during these sampling events;

(c) Establish background concentrations for any constituents detected pursuant to subsection (~~(+2)~~) (3) of this section;

(d) Establish groundwater protection standards for all constituents detected pursuant to subsection (~~(+2)~~) (3) or (~~(+3)~~) (4) of this section. The groundwater protection standards (~~(shall)~~) must be established in accordance with subsection (~~(+7)~~) (8) of this section; and

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(e) Continue performing geochemical evaluations in accordance with WAC 173-351-430(5) on a quarterly basis.

~~((4))~~ (5) If the concentrations of all Appendix III constituents are shown to be at or below background values, using the statistical procedures in WAC 173-351-420, for two consecutive sampling events, ~~((and before returning to detection monitoring))~~ the owner or operator ~~((must))~~ may return to detection monitoring after:

(a) ~~((Notify))~~ Notifying the jurisdictional health department of this finding;

(b) ~~((Receive))~~ Receiving approval in writing from the jurisdictional health department; and

(c) ~~((Place))~~ Placing the notice and the approval in (a) and (b) of this subsection in the operating record ~~((of WAC 173-351-200(10)))~~.

~~((5))~~ (6) If the concentrations of any Appendix III constituents are above background values, but all concentrations are below the groundwater protection standard established under subsection ~~((7))~~ (8) of this section, using the statistical procedures in WAC 173-351-420, the owner or operator must continue assessment monitoring in accordance with this section.

~~((6))~~ (7) If one or more Appendix III constituents are detected at statistically significant levels above the groundwater protection standard established under subsection ~~((7))~~ (8) of this section in any sampling event, the owner or operator must, within fourteen days of this finding, notify the jurisdictional health department, the department and all appropriate local government officials of the increase and place a notice in the operating record identifying the Appendix III constituents that have exceeded the groundwater protection standard. The owner or operator also:

(a) Must characterize the chemical composition of the release, the contaminant fate and transport characteristics; the rate and extent of contamination in all groundwater flow paths by installing additional monitoring wells as necessary;

(b) Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with subsection ~~((2))~~ (3) of this section;

(c) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated offsite if indicated by sampling of wells in accordance with subsection ~~((6))~~ (7) of this section; and

(d) Must initiate an assessment, selection, and implementation of ~~((corrective measures as required by))~~ remedial actions in

accordance with chapter 173-340 WAC, the Model Toxics Control Act regulation and continue monitoring in accordance with the assessment monitoring program pursuant to this section; or

(e) May demonstrate that a source other than a MSWLF unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be prepared by a ~~((hydrogeologist or other qualified groundwater scientist and))~~ geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, approved by the jurisdictional health department, and placed in the operating record. If a successful demonstration is made the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the Appendix III constituents are at or below background as specified in subsection ~~((+4))~~ (5) of this section. Until a successful demonstration is made, the owner or operator must comply with this subsection ~~((+6))~~ (7) including initiating an assessment of ~~((corrective measures))~~ remedial actions.

~~((+7))~~ **(8)** The owner or operator:

(a) Must establish a groundwater protection standard using the groundwater quality criteria of chapter 173-200 WAC; and

(b) For constituents for which the background level is higher than the protection standard identified under (a) of this subsection, must use the background concentration for the constituents established from wells in accordance with WAC 173-351-405 through 173-351-430.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-440, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-450 Alternate groundwater monitoring programs.

(1) The owner or operator may propose changes and/or alternate groundwater monitoring programs for detection monitoring after the second year of groundwater monitoring under WAC 173-351-430 **(3)**, or the assessment monitoring program of WAC 173-351-440 as follows:

(a) An alternate groundwater monitoring frequency for sampling and analysis of Appendix I and II constituents ~~((of no less than semiannual monitoring))~~;

(b) A deletion of Appendix I, II, and III constituents or alternate groundwater monitoring constituents ~~((for Appendix I, II and III))~~;

(c) An appropriate subset of wells to be sampled and analyzed for Appendix III under WAC 173-351-440(2).

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(2) All proposed changes in groundwater monitoring frequency must be no less than semiannually for detection (~~(groundwater)~~) monitoring and no less than quarterly for assessment monitoring. The owner or operator must apply for a permit modification under WAC 173-351-720(~~(+5+)~~) (6) or must apply during the renewal process of WAC 173-351-720 (~~((+1)(+1))~~) (5) for changes in groundwater monitoring frequency making a demonstration based on the following information:

(a) A characterization of the hydrostratigraphic unit(s) including the unsaturated zone, transmissive and confining units and include all of the following:

- (i) Hydraulic conductivity; and
- (ii) Groundwater flow rates.

(b) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring wells (minimum distance of travel); and

(c) Contaminant fate and transport characteristics.

(3) The owner or operator must apply for a permit modification under WAC 173-351-720(~~(+5+)~~) (6) or must apply during the renewal process of WAC 173-351-720 (~~((+1)(+1))~~) (5) for all proposed deletions or changes to groundwater monitoring constituents of Appendix I, II, and III based on all of the following information:

Verification that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit, by:

(a) Leachate monitoring results consisting of those parameters listed in Appendix (~~(IV)~~) I and II for deletions or changes to detection monitoring and Appendix III for assessment monitoring. All leachate monitoring (~~(shall)~~) must be quarterly unless otherwise approved by the jurisdictional health department and the department;

(b) The types, quantities, and concentrations of constituents in wastes managed at the MSWLF unit;

(c) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;

(d) The detectability of indicator parameters, waste constituents, and reaction products in the groundwater; and

(e) The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background.

(4) Multiunit groundwater monitoring systems.

An owner or operator may propose during the permitting process of WAC 173-351-700 **or through the permit modification process of WAC 173-351-720(6)** a multiunit groundwater monitoring system instead of separate groundwater monitoring systems for each MSWLF

unit, including MSWLF units which were closed in accordance with chapter 173-351, 173-304, or 173-301 WAC (~~when the facility has several MSWLF units, provided~~). The multiunit system must meet ~~(s)~~ all of the requirements of WAC 173-351-400 through WAC 173-351-490 and will be as protective of human health and environment as individual groundwater monitoring systems for each MSWLF unit. Permit approval for multiunit groundwater monitoring systems and programs will be based on the ability to provide early warning detection of any contaminant releases including:

- (a) Number, spacing, and orientation of the MSWLF units;
- (b) Hydrogeologic setting;
- (c) Site history;
- (d) Engineering design of the MSWLF units;
- (e) Type of waste accepted at the MSWLF units; and
- (f) Leachate analysis as referenced in subsection (3)(a) of this section for MSWLF units with leachate collection systems.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-450, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-460 Role of jurisdictional health department in ~~(corrective)~~ remedial action. The jurisdictional health department:

(1) May ~~(participate)~~ provide input to the department in ~~(all)~~ negotiations, meetings, and correspondence between the ~~(owner and operator)~~ potentially liable person(s) and the department in implementing the Model Toxics Control ~~(action)~~ Act, chapter 70.105D RCW;

(2) May comment upon and participate in all decisions made by the department in assessing, choosing, and implementing a ~~(corrective)~~ remedial action program;

(3) ~~(Shall)~~ Must require the owner or operator to continue closure and post-closure activities as appropriate under these rules, after ~~(corrective)~~ remedial action measures are completed; and

(4) ~~(Shall)~~ Must continue to regulate all MSWLF units during construction, operation, closure and post-closure, that are not ~~(directly impacted by Model Toxics Control Act)~~ exempt from procedural requirements under chapter 70.105D RCW.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-460, filed 10/26/93, effective 11/26/93.]

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AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-465 Role of department of ecology in ~~((corrective))~~ remedial action. The department ~~((shall))~~ will carry out all the responsibilities assigned to it under the Model Toxics Control Act (MTCA), chapter 70.105D RCW, during the ~~((corrective))~~ remedial action process.

((Note: Ecology encourages and will support owners or operators who perform independent corrective action(s) consistent with MTCA.))

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-465, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-480 Groundwater modeling. All groundwater and contaminant fate and transport modeling must meet the following performance standards:

(1) The model ~~((shall))~~ must have supporting documentation that establishes its ability to represent groundwater flow and contaminant transport and any history of previous applications;

(2) The set of equations representing groundwater movement and contaminant transport must be theoretically sound and well documented;

(3) The numerical solution methods must be based upon sound mathematical principles and be supported by verification and checking techniques;

(4) The model must be calibrated and verified against site-specific field data;

(5) A sensitivity analysis ~~((shall))~~ must be conducted to measure the model's responses to changes in the values assigned to major parameters, specified tolerances, and numerically assigned space and time discretizations;

(6) Mass balance calculations on selected elements in the model ~~((shall))~~ must be performed to verify physical validity. Where the model does not prescribe the amount of mass entering the system as a boundary condition, this step may be ignored;

(7) The values of the model's parameters requiring site specific data ~~((shall))~~ must be based upon actual field or laboratory measurements; and

(8) The values of the model's parameters which do not require site specific data ~~((shall))~~ must be supported by laboratory test

results or equivalent methods documenting the validity of the chosen parameter values.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-480, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-490 The hydrogeologic report contents. (1) The hydrogeologic report (~~(shall)~~) must meet all of the following performance standards as follows:

(a) Examine existing site conditions for compliance with groundwater and surface water location restrictions under WAC 173-351-130 (~~(and)~~), 173-351-140, and 173-351-300(7);

(b) Determine existing or background groundwater quality conditions, including any groundwater contamination; and

(c) Define a detection groundwater monitoring program capable of immediate and early warning detection for potential contamination as required in WAC 173-351-400 and the information required in subsection (2) of this section.

(2) The hydrogeologic report contents (~~(shall)~~) must include the following information:

(a) A summary of local and regional geology and hydrology, including faults, zones of joint concentrations, unstable slopes and subsidence areas on site; areas of groundwater recharge and discharge; stratigraphy; erosional and depositional environments and facies interpretation(s);

(b) A borehole program which identifies all performance criteria of WAC 173-351-405 including lithology, soil/bedrock types and properties, preferential groundwater flow paths or zones of higher hydraulic conductivity, the presence of confining unit(s) and geologic features such as fault zones, cross-cutting structures etc., and the target hydrostratigraphic unit(s) to be monitored. The borehole program must meet the following standards:

(i) A minimum of twenty subsurface borings is required for MSWLF sites which are 50 acres or less in aerial extent. For sites greater than fifty acres, twenty borings, plus three borings for each additional ten acres thereafter, is required. Soil borings (~~(shall)~~) must be established in a grid pattern with a boring in each major geomorphic feature such as topographic divides and lowlands;

(ii) Each boring will be of sufficient depth below the proposed grade of the bottom liner as to identify soil, bedrock and hydrostratigraphic unit(s) conditions as required in WAC 173-351-405(~~(-)~~);

(iii) The jurisdictional health department (~~(and)~~), with the written concurrence of the department, may approve alternate

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methods including geophysical techniques, either surface or downhole including electric logging, ~~((some))~~ sonic logging, nuclear logging, seismic profiling, electromagnetic profiling and resistivity profiling in lieu of some of the number of borings required in the subsurface borehole program of (b)(i) of this subsection, provided sufficient hydrogeological site characterization can be accomplished and prior approval is obtained~~((-))~~;

~~((iv))~~ ~~((At))~~ Each boring sample~~((s—shall))~~ must be collected from each lithologic unit and tested for all of the following:

(A) Particle size distribution by both sieve and hydrometer analyses in accordance with approved ASTM methods (D422 and D1120);

(B) Atterburg limits following approved ASTM methods (D4318); and

(C) Classification under the unified soil classification system, following ASTM standard D2487-85.

~~((iv))~~ (v) Each lithologic unit on site will be analyzed for:

(A) Moisture content, following approved ASTM methods (D2216); and

(B) Hydraulic conductivity by an in-situ field method or laboratory method approved by the jurisdictional health department and the department. All samples collected for the determination of permeability ~~((shall))~~ must be collected by standard ASTM procedures.

~~((v))~~ (vi) All boring logs ~~((shall))~~ must be submitted with the following information:

(A) Soil and rock descriptions and classifications;

(B) Method of sampling;

(C) Sample depth;

(D) Date of boring;

(E) Water level measurements;

(F) Soil test data;

(G) Boring location; and

(H) Standard penetration number of ASTM standard D1586-67.

~~((vi))~~ (vii) All borings not converted to monitoring wells or piezometers ~~((shall))~~ must be carefully backfilled, plugged and recorded in accordance with WAC 173-160-420~~((-))~~;

~~((vii))~~ (viii) During the borehole drilling program, any on-site drilling and lithologic unit identification must be performed by a ~~((hydrogeologist,))~~ geologist or other ~~((qualified groundwater scientist))~~ licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, who is trained to sample and identify soils and bedrock lithology.

(c) Depths to groundwater and hydrostratigraphic unit(s) including transmissive and confining units;

- (d) Potentiometric surface elevations and contour maps; direction and rate of horizontal and vertical groundwater flow;
- (e) A description of regional groundwater trends including vertical and horizontal flow directions and rates;
- (f) All elevations and top of well casings (~~shall~~) must be related to the (~~national geodetic~~) North American vertical datum of (~~1929 (NGVD 29)~~) 1988 (NAVD88) and the horizontal datum (~~shall~~) must be in accordance with chapter 58.20 RCW, Washington Coordinate System and as amended per chapter 332-130 WAC(~~(-)~~);
- (g) Quantity, location, and construction (where available) of private and public wells within a two thousand foot (six hundred ten meter) radius of site;
- (h) Tabulation of all water rights for groundwater and surface water within a two thousand foot (six hundred ten meter) radius of the site;
- (i) Identification and description of all surface waters within a one-mile (1.6 kilometer) radius of the site;
- (j) A summary of all previously collected groundwater and surface water analytical data, and for expanded facilities, identification of impacts (~~of~~) from the existing facility (~~of the applicant to date upon~~) on ground and surface waters (~~from landfill leachate discharges~~);
- (k) Calculation of a site water balance;
- (l) Conceptual design of a groundwater and surface water monitoring system, including proposed installation methods for (~~these~~) all devices and well construction diagrams, and where applicable a vadose zone monitoring plan(~~(, including well construction diagrams)~~);
- (m) Land use in the area, including nearby residences; (~~and~~)
- (n) A topographic map of the site and drainage patterns; an outline of the waste management area and MSWLF units, property boundary, the proposed location of groundwater monitoring wells; and
- (o) Geologic cross-sections.
- (3) Groundwater flow path analysis. The hydrogeologic report (~~shall~~) must include a summary groundwater flow path analysis which includes all supportive documentation, and calculations of the performance criteria of WAC 173-351-405.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-490, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-500 Closure and post-closure care. (1) Closure criteria.

(a) (~~Nonarid areas.~~) Owners or operators of all MSWLF (~~units located in areas having mean annual precipitation of~~

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~~equal to or greater than twelve inches,))~~ must install a final cover system that is designed to minimize infiltration and erosion.

(i) The final cover system must be designed and constructed to:

(A) Have a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and minimize infiltration through the closed MSWLF by the use of an anti-infiltration layer that contains a composite layer as defined in (a)(i)(B) of this subsection;

(B) For the purpose of this section, "composite layer" means a system consisting of two components; the upper component must consist of a minimum of 30 mil (0.76 mm) thickness of geomembrane (60 mils (1.5 mm) for high density polyethylene geomembranes). The lower component must consist of at least a two-foot (60 cm) layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-5} cm/sec. The geomembrane must be installed in direct and uniform contact with the compacted soil component;

(C) Minimize erosion of the final cover by use of an anti-erosion layer that contains a minimum of a one-foot (30 cm) layer of earthen material of which at least six inches (15 cm) of the uppermost layer is capable of sustaining native plant growth; and

(D) Address anticipated settlement (with a goal of achieving no less than two to five percent slopes after settlement), drainage and/or the need for drainage layers, gas generation and/or the need for gas layers, freeze-thaw, desiccation and stability and mechanical strength of the design.

(ii) The jurisdictional health department, with the written concurrence of the department, may approve an alternative final cover design equivalent to that specified in (a)(i) of this subsection that includes:

(A) An anti-infiltration layer that has a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and achieves an equivalent reduction in infiltration as ((the)) an anti-infiltration layer ((specified in (a)(i)(A) and (B) of this subsection)) with a permeability no greater than 1×10^{-5} cm/sec containing at least two feet (60 cm) of earthen material;

(B) An anti-erosion layer that provides equivalent protection from wind and water erosion as ((the anti-erosion layer specified in (a)(i)(C) of this subsection)) a layer that contains a minimum of one foot (30 cm) of earthen material of which at least six inches (15 cm) of the uppermost layer is capable of sustaining native plant growth; and

(C) The additional design features of (a)(i)(D) of this subsection.

~~(b) ((Arid areas. Owners or operators of all MSWLF units located in arid areas must install a final cover system that is designed to minimize infiltration and erosion.~~

~~(i) The final cover system must be designed and constructed to:~~

~~(A) Minimize infiltration through the closed MSWLF by the use of an anti infiltration layer that contains at least a two foot (60 cm) layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-5} cm/sec;~~

~~(B) Minimize erosion of the final cover by use of an anti erosion layer that contains a minimum of one foot (30 cm) layer of earthen material of which at least six inches (15 cm) of the uppermost layer is capable of sustaining native plant growth; and~~

~~(C) Address anticipated settlement (with a goal of reaching two to five percent slopes after settlement), drainage and/or the need for drainage layers, gas generation and/or the need for gas layers, freeze thaw, desiccation and stability and mechanical strength of the design.~~

~~(ii) The jurisdictional health department may approve an alternative final cover design to that specified in (b)(i) of this subsection that includes:~~

~~(A) An anti infiltration layer that achieves an equivalent reduction in infiltration as the anti infiltration layer specified in (b)(i)(A) of this subsection;~~

~~(B) An anti erosion layer that provides equivalent protection from wind and water erosion as the anti erosion layer specified in (b)(i)(B) of this subsection; and~~

~~(C) The additional design features of (b)(i)(C) of this subsection.~~

~~(e)) The owner or operator must prepare a written closure plan that describes the steps necessary to close all MSWLF units at any point during its active life. The closure plan must be submitted to and approved by the jurisdictional health department during the permit process of ((Section 700)) WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) and((, at a minimum,)) must include the following information:~~

~~(i) A description of the final cover, designed in accordance with (a) ((or (b))) of this subsection and the methods and procedures to be used to install the cover;~~

~~(ii) An estimate of the largest area of the MSWLF unit or all MSWLF units ever requiring a final cover as required under (a) ((or (b))) of this subsection at any time during the active life;~~

~~(iii) An estimate of the maximum inventory of wastes ever on-site over the active life of the facility; and~~

~~(iv) A schedule for completing all activities necessary to satisfy the closure criteria in this subsection ((1), Closure criteria)) including sequencing of each MSWLF unit and the use of intermediate cover.~~

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~~((d))~~ (c) The owner or operator of existing MSWLF units must no later than ~~((the effective date of this chapter))~~ November 26, 1993:

- (i) Prepare a closure plan;
- (ii) Place the closure plan in the operating record; and
- ~~((d))~~ (c)(iii) Notify the jurisdictional health department that ~~((d))~~ (c)(i) and (ii) of this subsection have occurred.

~~((e))~~ (d) One hundred eighty days (but no sooner than ~~((the effective date of this chapter))~~ November 26, 1993) prior to beginning closure activities of each MSWLF unit or all MSWLF units as specified in ~~((f))~~ (e) of this subsection, the owner or operator must:

- (i) Notify the jurisdictional health department and the financial assurance trustee and/or insurer of the intent to close the MSWLF unit or all MSWLF units according to the approved closure plan; and
- (ii) Submit final engineering closure plans for review, comment, and approval by the jurisdictional health department.

~~((f))~~ (e) The owner or operator must begin closure activities of each MSWLF unit or all MSWLF units in accordance with the closure plan no later than thirty days after the date on which the MSWLF unit or all MSWLF units receives the known final receipt of wastes ~~((or, if))~~. If the MSWLF unit or all MSWLF units has remaining capacity and there is a reasonable likelihood that the MSWLF unit or all MSWLF units will receive additional wastes, the owner or operator must begin closure activities no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the jurisdictional health department if the owner or operator demonstrates during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the MSWLF unit or all MSWLF units has the capacity to receive additional waste and the owner or operator has taken and will continue to take all steps including the application of intermediate cover necessary to prevent threats to human health and the environment from the unclosed MSWLF unit or all MSWLF units.

~~((g))~~ (f) The owner or operator of all MSWLF units must complete closure activities of each MSWLF unit or all MSWLF units in accordance with the closure plan within one hundred eighty days following the beginning of closure as specified in ~~((f))~~ (e) of this subsection. Extensions of the closure period may be granted by the jurisdictional health department if the owner or operator demonstrates that closure will, of necessity, take longer than one hundred eighty days and he/she has taken and will continue to take

all steps to prevent threats to human health and the environment from the unclosed MSWLF unit.

~~((h))~~ (g) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must submit to the jurisdictional health department a certification or declaration of construction signed by an independent registered professional engineer verifying that closure has been completed in accordance with the approved final engineering plans and the closure plan.

~~((i) Notation on the deed.~~

~~(i))~~ (h) Environmental covenant. Following closure of all MSWLF units, the owner or operator must ~~((record a notation on the deed to the facility property, and send a copy of the notation as recorded to the jurisdictional health department.~~

~~(ii) The notation on the deed must in perpetuity notify any potential purchaser of the property that:~~

~~(A) The land has been used as a landfill facility; and~~

~~(B) Its use is restricted under subsection (2)(c)(iii) of this section.~~

~~(j) The owner or operator may request permission from the jurisdictional health department to remove the notation from the deed if all wastes (including any contaminated groundwater and soils) are removed from the facility.)~~ file an environmental covenant conforming to the procedures and requirements of chapter 64.70 RCW, Uniform Environmental Covenants Act. Unless waived in writing by the department, the environmental covenant shall be in a form approved by the department and include at a minimum the following provisions:

(i) State that the document is an environmental covenant executed pursuant to chapter 64.70 RCW;

(ii) Contain a legally sufficient description of the real property subject to the covenant;

(iii) Designate the department, or other person approved by the department, as the holder of the covenant;

(iv) Be signed by the department, every holder, and, unless waived by the department, every owner of a fee simple interest in the real property subject to the covenant;

(v) Identify the name and location of the administrative record for the property subject to the environmental covenant;

(vi) Describe with specificity the activity or use limitations on the real property subject to the covenant. At a minimum, this shall prohibit uses and activities that:

(A) Threatens the integrity of any cover, waste containment, storm water control, gas, leachate, public access control, or environmental monitoring systems;

(B) May interfere with the operation and maintenance, monitoring, or other measures necessary to assure the integrity of the MSWLF unit and continued protection of human health and the environment; and

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(C) May result in the release of solid waste constituents or otherwise exacerbate exposures.

(i) Grant the department and the jurisdictional health department the right to enter the property at reasonable times for the purpose of evaluating compliance with the environmental covenant, including the right to take samples.

(2) Post-closure care requirements.

(a) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must conduct post-closure care. Post-closure care must be conducted for thirty years(~~(, except)~~) or as long as necessary for the landfill to become functionally stable. A landfill is functionally stable when it does not present a threat to human health or the environment at the point of exposure for humans or environmental receptors. The point of exposure is identified as the closest location at which a receptor could be exposed to contaminants and receive a dose by a credible pathway from the MSWLF unit. Potential threats to human health or the environment are assessed by considering leachate quality and quantity, landfill gas production rate and composition, cover system integrity, and groundwater quality. The post-closure care period may be adjusted as provided under (b) of this subsection (~~and~~). Post-closure care must consist of at least the following:

(i) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, maintaining the vegetative cover (including cutting of vegetation when needed) or other events, and preventing run-on and runoff from eroding or otherwise damaging the final cover;

(ii) Maintaining and operating the leachate collection system in accordance with the requirements in WAC 173-351-300 if applicable. The jurisdictional health department may recommend to the department and the department under its authority in chapter 90.48 RCW, the Water Pollution Control Act, may allow the owner or operator to stop managing leachate if the owner or operator demonstrates that leachate no longer poses a threat to human health and the environment;

(iii) Monitoring the groundwater in accordance with the requirements of WAC 173-351-400(~~(, Groundwater monitoring systems and corrective action)~~) and maintaining the groundwater monitoring system(~~(, if applicable)~~); and

(iv) Maintaining and operating the gas monitoring system in accordance with the requirements of WAC 173-351-200(4).

(b) The length of the post-closure care period may be:

(i) Decreased by the jurisdictional health department if the owner or operator demonstrates that the reduced period is

sufficient to protect human health and the environment and this demonstration is approved by the jurisdictional health department; or

(ii) Increased by the jurisdictional health department if the jurisdictional health department determines that the lengthened period is necessary to protect human health and the environment(~~(-)~~);

(iii) The jurisdictional health department and owner or operator will consider at least the following factors when determining when a landfill unit is functionally stable or whether to decrease or increase the post-closure care period:

(A) Leachate. Leachate production and quality must be such that maintenance and operation of the leachate collection system can be ceased beyond the post-closure care period without posing a threat to human health or the environment.

(B) Landfill gas. Landfill gas production and composition must be such that maintenance and operation of the gas collection system can be ceased beyond the post-closure care period while meeting the criteria in WAC 173-351-200 (4)(a)(i) through (iii) and not pose a threat to human health or the environment from methane or nonmethane compounds.

(C) Settlement and cover integrity. The cover system must attain geotechnical stability for slope and settlement. Vegetation and other erosion controls must prevent exposing waste or otherwise threaten integrity of the cover system. The cover system must stabilize such that no additional care is required beyond the post-closure care period to ensure its integrity from settlement or erosion.

(D) Groundwater quality. Groundwater quality must remain in compliance with the protection standards established in WAC 173-351-440(8) at the relevant point of compliance.

(c) The owner or operator of all MSWLF units must prepare and submit a written post-closure plan (~~(that is approved by)~~) to the jurisdictional health department ~~((during))~~ through the permit process of ~~((Section 700 and))~~ WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that includes(~~(- at a minimum,)~~) the following information(~~(+)~~). Owners or operators must prepare and submit modifications to existing post-closure plans to incorporate the criteria in (b)(iii) of this subsection or environmental covenants in subsection (1)(h) of this section by November 1, 2013.

(i) A description of the monitoring and maintenance activities required in (a) of this subsection for each MSWLF unit or all MSWLF units, and the frequency at which these activities will be performed;

(ii) A description of the monitoring performed and an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in (b)(iii) of this subsection;

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(iii) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

~~((iii))~~ (iv) A description of the planned uses of the property during the post-closure period and activity or use limitations placed on the real property by the environmental covenant (1)(h) of this section. Post-closure use of the property ~~((shall))~~ must not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring or control systems unless necessary to comply with the requirements of this regulation. The jurisdictional health department may approve any other disturbance if the owner or operator demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

~~(d) ((The owner or operator of existing MSWLF units must notify the jurisdictional health department that a post-closure plan has been prepared and placed in the operating record no later than the effective date of this regulation.~~

~~(e))~~ Following completion of the post-closure care period for each MSWLF unit or all MSWLF units, the owner or operator must submit to the jurisdictional health department ~~((and the financial assurance trustee and/or insurer))~~ a certification or declaration of construction signed by an independent ~~((registered))~~ licensed professional engineer verifying that post-closure has been completed in accordance with the post-closure plan.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-500, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-600 Financial assurance criteria. (1)
Applicability and effective date.

(a) The requirements of this section apply to owners and operators of all MSWLF units.

(b) The requirements of this section are effective on the effective date of this rule ~~((, except as provided herein))~~.

(2) Financial assurance for closure.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to close the largest area of all MSWLF units ever requiring a final cover as required under WAC 173-351-500(1),

Closure criteria, at any time during the active life in accordance with the closure plan. The owner or operator must ~~((place))~~ submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 ~~((in order for the jurisdictional health department to determine whether a solid waste permit should be issued))~~ or through the permit modification process of WAC 173-351-720(6).

(i) The cost estimate must equal the cost of closing the largest area of ~~((the MSWLF unit or))~~ all MSWLF units ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by ~~((its))~~ the closure plan ~~((see))~~ as required in WAC 173-351-500 (1)((+e+)) (b)(ii).

(ii) During the active life of ~~((the MSWLF unit or))~~ all MSWLF units, the owner or operator must annually adjust the closure cost estimate for inflation.

(iii) The owner or operator must increase the closure cost estimate and the amount of financial assurance provided under (b) of this subsection if changes to the closure plan or MSWLF unit conditions increase the maximum cost of closure at any time during the remaining active life.

(iv) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of ~~((the MSWLF unit or))~~ all MSWLF units. The owner or operator must submit justification for the reduction of the closure cost estimate and the amount of financial assurance to the jurisdictional health department for approval as a condition of the solid waste permit.

(b) The owner or operator of each MSWLF unit ~~((or all MSWLF units))~~ must establish financial assurance for closure of the MSWLF unit ~~((or all MSWLF units))~~ in compliance with ~~((WAC 173-351-600(5), Allowable mechanisms))~~ subsection (5) of this section. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with WAC 173-351-500 (1)((+h+)) (g) and ~~((+i+))~~ (h).

(3) Financial assurance for post-closure care.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to conduct post-closure care for ~~((the MSWLF unit or))~~ all MSWLF units in compliance with the post-closure plan developed under WAC 173-351-500(2). The post-closure cost estimate ~~((used to demonstrate, during the permit process of WAC 173-351-700, financial assurance in (b) of this subsection))~~ must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-

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closure plan over the entire post-closure care period. The owner or operator must ~~((place))~~ submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 ~~((in order for the jurisdictional health department to determine whether a solid waste permit should be issued))~~ or through the permit modification process of WAC 173-351-720(6).

(i) The cost estimate for post-closure care must be based on the most expensive costs of post-closure care during the post-closure care period.

(ii) During the active life of ~~((the))~~ each MSWLF unit ~~((or all MSWLF units))~~ and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation.

(iii) The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided under (b) of this subsection if changes in the post-closure plan or MSWLF unit conditions increase the maximum costs of post-closure care.

(iv) The owner or operator may reduce the post-closure cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must submit justification for the reduction of the post-closure cost estimate and the amount of financial assurance to the jurisdictional health department for approval as a condition of the solid waste permit.

(b) The owner or operator of each MSWLF unit ~~((or all MSWLF units))~~ must establish, in a manner in accordance with subsection (5) of this section, financial assurance for the costs of post-closure care as required under WAC 173-351-500(2). The owner or operator must provide continuous coverage for post-closure care until released from financial assurance requirements for post-closure care by demonstrating compliance with WAC 173-351-500(2)(e).

(4) Financial assurance for ~~((corrective))~~ remedial action.

(a) An owner or operator of a MSWLF unit ~~((or all MSWLF units))~~ required to undertake a ~~((corrective))~~ remedial action program under WAC 173-351-440~~((+6))~~ (7) must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to perform the ~~((corrective))~~ remedial action in accordance with the program required under WAC 173-351-440~~((+6))~~ (7). The ~~((corrective))~~ remedial action cost estimate must account for the total costs of ~~((corrective))~~ remedial action activities as described in the ~~((corrective))~~ cleanup action plan

for the entire ~~((corrective))~~ remedial action period. Cost estimates are not required for interim actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit. The owner or operator must submit the ~~((corrective))~~ remedial action cost estimate to the ~~((jurisdictional health))~~ department for approval.

(i) The owner or operator must annually adjust the estimate for inflation until the ~~((corrective))~~ remedial action program is completed in accordance with WAC 173-351-440 ~~((+6))~~ (7).

(ii) The owner or operator must increase the ~~((corrective))~~ remedial action cost estimate and the amount of financial assurance provided under (b) of this subsection if changes in the ~~((corrective))~~ remedial action program or MSWLF unit conditions increase the maximum costs of ~~((corrective))~~ remedial action.

(iii) The owner or operator may reduce the amount of the ~~((corrective))~~ remedial action cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum remaining costs of ~~((corrective))~~ remedial action. The owner or operator must submit justification for the reduction of the ~~((corrective))~~ remedial action cost estimate and the amount of financial assurance to the ~~((jurisdictional health))~~ department for approval.

~~(b)~~ The owner or operator of each MSWLF unit ~~((or all MSWLF units))~~ required to undertake a ~~((corrective))~~ remedial action program under WAC 173-351-440 ~~((+6))~~ (7), must establish, in a manner in accordance with subsection (5) of this section, financial assurance for the ~~((most recent corrective))~~ costs of remedial actions identified in the cleanup action ~~((program))~~ plan. The owner or operator must provide continuous coverage for ~~((corrective))~~ remedial action until released from ~~((financial assurance requirements for corrective))~~ remedial action under the Model Toxics Control Act regulation, chapter 173-340 WAC. Financial assurance is not required for interim actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit.

~~((c) The requirements of this subsection become effective April 9, 1994.)~~

~~(5) Allowable mechanisms. ((The mechanisms used to demonstrate financial assurance under WAC 173-351-600 must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action for known releases will be available whenever they are needed. Except as otherwise provided herein, owners and operators of MSWLF units must use the financial mechanisms specified in (a) or (b) of this subsection.~~

~~(a) For MSWLF units owned or operated by municipal corporations, the closure, post-closure, and corrective action reserve account shall be handled in one of the following ways:~~

~~(i) Reserve account. Cash and investments accumulated and restricted for closure, post closure, and corrective action for~~

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~~known releases with an equivalent amount of fund balance reserved in the fund accounting for solid waste activity; or~~

~~(ii) The cash and investments held in a nonexpendable trust fund as specified in (c) of this subsection.~~

~~(b) For MSWLF units owned by private disposal companies, the closure, post-closure, and corrective action for known releases financial assurance account shall be a trust account as spelled out in (c) of this subsection, except that established financial assurance accounts shall not constitute an asset of the facility owner or operator.~~

(e)) Owners and operators of MSWLF units must use the financial mechanisms specified in (a), (b), or (c) of this subsection.

(a) Municipal corporations owning or operating MSWLF units must establish closure, post-closure, and remedial action reserve accounts in one of the following ways:

(i) Reserve account. Cash and investments accumulated in a reserve fund restricted for the purpose of closure, post-closure care, or remedial action for known releases;

(ii) Cash and investments in a trust fund;

(iii) Surety bond(s);

(iv) Letter of credit; or

(v) Municipal corporations may satisfy the financial assurance requirements of this section for remedial action in one of the following additional ways:

(A) An interlocal agreement entered into under the Interlocal Cooperation Act, chapter 39.34 RCW, obligating the participating local governments to pay for the remedial action; and

(B) Local government financial test in conformance with 40 C.F.R. 258.74(f). All records required under 40 C.F.R. Part 358.74(f)(3) must be submitted to the jurisdictional health department and the department.

(b) Private companies owning or operating MSWLF units must establish closure, post-closure, and remedial action financial assurance in one of the following ways:

(i) Cash or investments in a trust fund;

(ii) Surety bond(s);

(iii) Letter of credit.

(c) Use of multiple financial mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility. The mechanisms must be as specified in (a) and (b) of this subsection, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure, or remedial action, whichever is applicable. Mechanisms guaranteeing

performance rather than payment may not be combined with other instruments.

(d) The language of the financial assurance mechanisms listed in this section must ensure that the instruments satisfy the following criteria:

(i) The amount of funds assured is sufficient to cover the costs of closure, post-closure, and remedial action for known releases when needed;

(ii) The funds will be available in a timely fashion when needed; and

(iii) The owner or operator must obtain financial assurance by the effective date of these requirements or prior to the initial receipt of solid waste for closure and post-closure, and no later than one hundred twenty days after establishment of the cleanup action plan for remedial action.

(e) The financial assurance mechanisms must be legally valid, binding, and enforceable under state and federal law.

(f) An owner or operator satisfying the requirements of this section using a reserve account or trust fund must file with the jurisdictional health department and the department audit reports of the financial assurance accounts established for closure, post-closure, and remedial action, and a statement of the percentage of user fees, as applicable, diverted to the financial assurance instruments:

(i) For facilities owned and operated by municipal corporations, the financial assurance accounts must be audited according to the audit schedule of the office of state auditor. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(ii) For facilities not owned or operated by municipal corporations:

(A) Annual audits must be conducted by a certified public accountant licensed in the state of Washington. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(B) The audit must also include, as applicable, calculations demonstrating the proportion of closure, post-closure, or remedial action activities completed during the preceding year as specified in the closure, post-closure, or cleanup action plans.

(6) Financial assurance instruments established under this section must meet the following criteria.

(a) Trust fund. An owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of ~~((e))~~ (a)(i) through ~~((xi))~~ (viii) of this subsection.

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(i) The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency. The owner or operator must place a copy of the trust agreement for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 (~~in order for the jurisdictional health department to determine whether a solid waste permit should be issued~~) or through the permit modification process of WAC 173-351-720(6) for closure and post-closure financial assurance and to the department for approval for remedial action financial assurance.

(ii) Pay-in period. Payments into the trust fund must be made annually by the owner or operator over the duration (as defined in WAC 173-351-750) of the initial or reissued permit or over the remaining life of the MSWLF unit (~~or all MSWLF units~~), whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the (~~corrective~~) remedial action program in the case of (~~corrective~~) remedial action for known releases. This period is referred to as the pay-in period.

(iii) For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into (~~each~~) the fund must be at least equal to the current cost estimate for closure or post-closure care, except when using multiple mechanisms as provided in (~~(d)~~) subsection (5)(c) of this (~~subsection~~) section, divided by the number of years in the pay-in period as defined in (~~(e)~~) (a)(ii) of this subsection. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{CE-CV}{Y}$$

where CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(iv) For a trust fund used to demonstrate financial assurance for (~~corrective~~) remedial action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for (~~corrective~~) remedial action, except when using multiple mechanisms as provided in (~~(d)~~) subsection (5)(c) of this (~~subsection~~) section, divided by the number of years in the (~~corrective~~) remedial action pay-in period as defined in

~~((e))~~(a)(ii) of this subsection. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{RB-CV}{Y}$$

where RB is the most recent estimate of the required trust fund balance for ~~((corrective))~~ remedial action (i.e., the total costs that will be incurred during the second half of the ~~((corrective))~~ remedial action period), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(v) The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure and post-closure care, or no later than one hundred twenty days after the ~~((corrective))~~ cleanup action ~~((remedy))~~ plan has been ~~((selected))~~ established in accordance with the requirements of WAC ~~((173-351-480))~~ 173-351-440 (6) and (7).

(vi) If ~~((a municipal corporation owning or operating MSWLF units))~~ the owner or operator establishes a trust fund after having used ~~((cash and investments held in a nonexpendable reserve account specified in (a)(i) of))~~ one or more alternate mechanisms specified in this subsection, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of ~~((this paragraph and (e)))~~ (a)(iii) and (iv) of this subsection as applicable.

(vii) The owner or operator, or other person authorized to conduct closure, post-closure care, or ~~((corrective))~~ remedial action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if:

(A) Sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or ~~((corrective))~~ remedial action;

(B) If justification and documentation of the cost is submitted to the jurisdictional health department for closure and post-closure or the department for remedial action for review and approval; and

(C) The owner or operator has a post-closure permit in effect according to WAC ~~((173-351-730))~~ 173-351-720 (4)(c).

(viii) The trust fund may be terminated by the owner or operator only if:

~~((ix))~~ In the case of a municipal corporation owning or operating MSWLF units, the municipal corporation) (A) The owner or operator substitutes ~~((a reserve account as specified in (a)(i))~~

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~~ef)) alternate financial assurance as specified in this subsection; or~~

~~((~~x~~ Any)) (B) The owner or operator is no longer required to demonstrate financial responsibility in accordance with the requirements of subsection (2)(b), (3)(b), or (4)(b) of this section.~~

~~((d) Use of multiple financial mechanisms. A municipal corporation owning or operating MSWLF units may satisfy the requirements of this section by establishing more than one financial mechanism per facility. The mechanisms must be as specified in (a) and (b) of this subsection, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable.~~

~~(e) For MSWLF units undergoing corrective action, allowable financial assurance mechanisms include:~~

~~(i) Any method approved by EPA under 40 CFR 258.74(f);~~

~~(ii) An interlocal agreement entered into under the Interlocal Cooperation Act, chapter 39.34 RCW, obligating the participating local governments to pay for the corrective action.~~

~~(f) The language of the mechanisms listed in (a) and (b) of this subsection must ensure that the instruments satisfy the following criteria:~~

~~(i) The financial assurance mechanisms must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed;~~

~~(ii) The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed;~~

~~(iii) The financial assurance mechanisms must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than one hundred twenty days after the corrective action remedy has been selected in accordance with the requirements of WAC 173-351-460, until the owner or operator is released from the financial assurance requirements under subsection (2)(b), (3)(b), or (4)(b) of this section.~~

~~(g) The financial assurance mechanisms must be legally valid, binding, and enforceable under state and federal law.) (b) Surety bond guaranteeing payment or performance. An owner or operator may satisfy the requirements of this section with a surety bond guaranteeing payment or performance which conforms to the requirements of (b)(i) through (viii) of this subsection.~~

(i) The owner or operator must place a copy of the bond and standby trust agreement for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) for closure and post-closure financial assurance and the department for approval for remedial action financial assurance.

(ii) The surety company must be listed as acceptable in Circular 570 of the United States Treasury Department.

(iii) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure, or remedial action cost estimate except when using multiple financial mechanisms as provided in subsection (5)(d) of this section.

(iv) The surety must become liable for the bond obligation if the owner or operator fails to perform as guaranteed by the bond.

(v) The owner or operator must also establish a standby trust fund meeting the requirements of (6)(a) of this subsection except for specified initial and subsequent annual payments. Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(vi) The surety may not cancel the bond until at least one hundred twenty days after the owner or operator, the jurisdictional health department, and the department have received notice of cancellation. If the owner or operator has not provided alternate financial assurance conforming to this section within ninety days of the cancellation notice, the surety must pay the amount of the bond into the standby trust fund.

(vii) The owner or operator may cancel the bond only by substituting alternate financial assurance conforming to this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with subsection (2)(b), (3)(b), or (4)(b) of this section.

(viii) The following types of surety bonds are allowed:

(A) Surety bond; or

(B) Surety bond guaranteeing that the owner or operator will perform final closure, post-closure, or remedial action activities.

(c) Irrevocable letter of credit. An owner or operator may satisfy the requirements of this section with an irrevocable letter of credit which conforms to the requirements of (c)(i) through (v) of this subsection. The issuing institution must have the authority to issue letters of credit and its letter of credit operations must be regulated and examined by a federal or state agency.

(i) The owner or operator must also establish a standby trust fund meeting the requirements of (a) of this subsection except for specified initial and subsequent annual payments. Payments made under the terms of the irrevocable letter of credit will be

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deposited by the institution directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(ii) The following must be submitted for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 for closure and post-closure financial assurance, and to the department for approval for remedial action financial assurance:

(A) The letter of credit;

(B) A letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: Name, address of the facility, and the amount of funds assured; and

(C) A copy of the standby trust agreement.

(iii) The letter of credit must be irrevocable and issued for a period of at least one year in an amount at least equal to the current closure, post-closure, or remedial action cost estimate except when using multiple financial mechanisms as provided in subsection (5)(d) of this section. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution notifies the owner or operator, the jurisdictional health department, and the department at least one hundred twenty days before the current expiration date.

(iv) If the owner or operator fails to perform activities according to the closure, post-closure, or cleanup action plans, or if the owner or operator fails to provide alternate financial assurance conforming to this section within ninety days after notification that the letter of credit will not be extended, the issuing institution must deposit the funds from the letter of credit to the standby trust fund.

(v) The owner or operator may cancel the letter of credit only by substituting alternate financial assurance conforming to this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with subsection (2)(b), (3)(b), or (4)(b) of this section.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-600, filed 10/26/93, effective 11/26/93.] AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-700 Permitting requirements. (1) WAC 173-351-700 through 173-351-750 (~~(shall constitute)~~) are the permitting requirements of chapter 173-351 WAC, Criteria for municipal solid waste landfills. Except as provided (~~(for)~~) in subsection (~~(5)~~) (4) of this section, no owner or operator shall construct, operate, close, or perform post-closure activity with respect to a facility except in conformance with a valid MSWLF permit issued pursuant to this chapter.

(2) Transition rules for existing MSWLF units. The following constitute the transition rules for this section:

(a) Existing MSWLF units with valid chapter 173-304 WAC permits expiring before (~~(the effective date of this chapter)~~) November 26, 1993. Owners or operators of existing MSWLF units having valid permits expiring before (~~(the effective date of this chapter)~~) November 26, 1993, must apply for a valid MSWLF permit no later than (~~(ninety days after promulgation of this regulation)~~) January 24, 1994, to continue operation under the terms of this regulation. Each valid chapter 173-304 WAC permit expiring before (~~(the effective date of this chapter)~~) November 26, 1993, is hereby continued until the valid MSWLF permit is issued under these rules. For these transition rules, the owner or operator (~~(shall)~~) must prepare applications according to WAC 173-351-730(4), Reissuance/transition applications. Upon issuance of a valid MSWLF permit, the owner or operator must comply with the requirements of this regulation.

Note:MSWLF units that do not accept waste on or after (~~(the effective date of this chapter)~~) November 26, 1993, and close under chapter 173-304 WAC, Minimum functional standards for solid waste handling, and the federal rules for closure under 40 C.F.R. Part 258.60 would continue to be permitted under chapter 173-304 WAC unless such MSWLF units are part of a multiunit groundwater monitoring system according to WAC 173-351-450(4).

(b) Existing MSWLF units with valid chapter 173-304 WAC permits expiring on or after (~~(the effective date of this chapter)~~) November 26, 1993. Each valid chapter 173-304 WAC permit (for existing MSWLF units) expiring on or after (~~(the effective date of this rule)~~) November 26, 1993, is hereby continued until the expiration date set forth in the permit. Owners and operators must comply with the conditions of the permit and the regulations of chapter 173-304 WAC, in effect on October 8, 1993, for the duration of that permit. Owners or operators of existing MSWLF units with valid chapter 173-304 WAC permits expiring on or after (~~(the effective date of this chapter)~~) November 26, 1993, must apply for a valid MSWLF permit no later than (~~(ninety days after promulgation of this regulation)~~) January 24, 1994. For these transition rules, the owner or operator (~~(shall)~~) must prepare applications according to WAC 173-351-730(4), Reissuance/transition applications. Upon issuance of a valid MSWLF permit, the owner or operator must comply with the requirements of this regulation.

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((Note: See also WAC 173-351-720 (6)(a), filing for reissuance.))

(3) New and laterally expanded MSWLF units. New and laterally expanded MSWLF units receiving waste after ~~((the effective date of this chapter))~~ November 26, 1993, ~~((shall))~~ must meet the requirements of this section before construction has begun and before waste is accepted to the MSWLF unit or lateral expansion.

Note: Any owner or operator planning to incorporate a 50 percent increase or greater in design volume capacity not previously authorized in permit, or unpermitted changes resulting in significant adverse environmental impacts that have ~~((lead))~~ led a responsible official to issue a declaration of significance under WAC 197-11-736 ~~((shall))~~ must meet the requirements of this section before construction has begun and before waste is accepted to the MSWLF unit, or lateral expansion.

(4) Exemptions. The MSWLF units identified in this subsection are exempt from this section:

(a) MSWLF units that are excluded under WAC 173-351-010 (2)(b);

(b) Single family residences and single family farms dumping or depositing solid waste resulting from their own domestic, on-site activities onto or under the surface of land owned or leased by them when such action does not create a nuisance, violate any other statutes, ordinances, regulations, or this regulation, provided that such facilities:

(i) Are fenced or otherwise protected by natural barriers from unauthorized entry by the general public and large animal scavengers; and

(ii) Have placed a monthly soil cover to allow no visible solid waste.

(c) ~~((Corrective))~~ Remedial actions at a MSWLF unit performed by the state and/or in conjunction with the United States Environmental Protection Agency to implement the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), the Model Toxics Control Act or ~~((corrective))~~ remedial actions taken by others to comply with a state and/or federal cleanup order provided that:

(i) The action results in an overall improvement of the environmental impact of the site;

(ii) The action does not require or result in additional waste being delivered to the facility or increase the amount of waste or contamination present at the facility;

(iii) ~~((facility standards of WAC 173-351-300, 173-351-320, and 173-351-500))~~ substantive provisions of this chapter are met; and

(iv) The jurisdictional health department is informed of the actions to be taken and is given the opportunity to review and comment upon the proposed ~~((corrective))~~ remedial action plans.

Note: MSWLF units not covered under ~~((corrective))~~ remedial action are not exempted from permitting under this section.

~~((5) Renewal required. The owner or operator of a facility shall apply for renewal of the facility's permit annually, except for that year that a permit has been or will be reissued under WAC 173-351-720(6).))~~

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-700, filed 10/26/93, effective 11/26/93.]

NEW SECTION

WAC 173-351-710 Research, development, and demonstration permits. (1) The jurisdictional health department, with the written concurrence of the department, may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, from which the owner or operator proposes to utilize innovative methods which vary from the following criteria provided that the MSWLF unit has a leachate collection system designed and constructed to maintain less than a one foot (30 cm) depth of leachate on the liner and has not been identified as a potential source of contamination:

- (a) The run-on control system in WAC 173-351-200(7); and
- (b) The liquids restriction in WAC 173-351-200(9).

(2) The jurisdictional health department, with the written concurrence of the department, may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative methods which vary from the final cover criteria of WAC 173-351-500 (1)(a), provided the MSWLF unit owner or operator demonstrates that the MSWLF unit is not a source of contamination and the infiltration of liquid through the alternative cover system will not cause contamination of groundwater or surface water, or cause the leachate depth on the liner to exceed one foot (30 cm).

(3) The jurisdictional health department and the department must follow the procedures of WAC 173-351-720(1) except **the jurisdictional health department** must not issue a permit if the department recommends against its issuance. Any permit issued under this section must include terms and conditions that are at least as protective as the criteria for municipal solid waste landfills, and assure protection of human health and the environment. Such permits must:

- (a) Include clearly stated and demonstrable project goals;
- (b) Provide for the construction and operation of such facilities as necessary, for not longer than three years, unless renewed as provided in subsections (5) and (6) of this section;
- (c) Provide that the MSWLF unit must receive only those types and quantities of municipal solid waste and nonhazardous waste

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which the jurisdictional health department deems appropriate for the purposes of determining the efficacy and performance capabilities of the technology or process;

(d) Include requirements necessary to protect human health and the environment, including requirements necessary for testing and providing information to the jurisdictional health department with respect to the operation of the facility;

(e) Require the owner or operator of a permitted MSWLF unit under this section to submit an annual report to the jurisdictional health department and the department showing whether and to what extent the site is progressing in attaining project goals. The report will also include a summary of all monitoring and testing results and any other operating information specified by the jurisdictional health department in the permit; and

(f) Require compliance with all criteria in this chapter, except as permitted under this section.

(4) The jurisdictional health department may order an immediate termination of all operations at the facility permitted under this section or other corrective measures any time it determines that the overall goals of the project are not being attained or protecting human health and the environment.

(5) Any permit issued under this section must not exceed three years and each renewal must not exceed three years. The total term for a project permit including renewals may not exceed twelve years.

(6) Permit renewal.

(a) The owner or operator of a MSWLF unit must apply for renewal of a permit under this section at least ninety days before the existing permit expires. The owner or operator must provide the jurisdictional health department two copies of:

(i) A detailed assessment of the project showing the status with respect to achieving project goals;

(ii) A list of problems and status with respect to problem resolutions;

(iii) The information required in WAC 173-351-730 (3)(b); and

(iv) Any other requirements that the jurisdictional health department determines necessary for permit renewal.

(b) Once the jurisdictional health department determines that a renewal application is factually complete, it must refer one copy to the appropriate regional office of the department for review and comment.

(c) Standards for approval. The jurisdictional health department and the department must review the original application and additional information contained in the renewal application to determine whether the facility meets all applicable laws and

regulations and conforms to the most recently adopted comprehensive solid waste management plan.

(d) Fees. The jurisdictional health department may establish reasonable fees for permits and renewal of permits. All permit fees collected by the health department must be deposited in the account from which the jurisdictional health department's operating expenses are paid.

(e) Department's findings. The department will report to the jurisdictional health department its findings on each renewal permit application within thirty days of receipt of a complete application. Additionally, the department must recommend for or against the renewal of each research, demonstration, and demonstration permit by the jurisdictional health department.

(f) Permit approval. When the jurisdictional health department has evaluated all information in the renewal application, it will, with the written concurrence of the department renew the permit for a period not to exceed three years or deny the permit. Every complete renewal application must be approved or disapproved within forty-five days after its receipt by the jurisdictional health department or inform the owner or operator as to the status of the application with a schedule for final determination.

(g) Permit format. Every permit issued by a jurisdictional health department must be on a format prescribed by the department and contain specific requirements necessary for the proper operation of the facility including the requirement that final engineering plans and specifications be submitted for approval by the jurisdictional health department.

(h) Filing permits with the department. The jurisdictional health department must mail all renewed permits to the department no more than seven days after the date of issuance. The department will review and may appeal the permit as set forth in RCW 70.95.185 and 70.95.190. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-720 Permit application procedures. (1) Initial and reissuance procedures.

(a) Forms and complete application. An application for ~~((any))~~ a permit under this regulation must be submitted on a form prescribed by the department. In order to be ~~((determined))~~ complete:

(i) Two or more copies (as determined by the jurisdictional health department) of the application must have been signed by the owner and operator and received by the jurisdictional health department;

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(ii) The application must include evidence of compliance with the State Environmental Policy Act (SEPA) rules, chapter 197-11 WAC; and

(iii) The application must include the plans, reports, and other supporting information required by this regulation.

(b) Notice. Once the jurisdictional health department determines that an application for a permit is ~~((factually))~~ complete, it ~~((shall))~~ will:

(i) Refer one copy to the appropriate regional office of the department for review and comment;

(ii) For all permits except renewal, modified and transition permits give notice of its receipt of a ~~((proposed))~~ complete permit application to the public and to interested persons for public comment for thirty days after the publication date of the notice(~~(+~~

~~(iii) For all permits except renewal, modified and transition permits))~~ and perform the following additional public notification requirements:

(A) Mail the notice to persons who have requested notice in writing;

(B) Mail the notice to state agencies and local governments with a regulatory interest in the proposal;

(C) Include in the public notice a statement that any person may express their views in writing to the jurisdictional health department within thirty days of the last date of publication;

(D) Mail a copy of the MSWLF permit decision to any person who has made written request for such decision; and

(E) Add the name of any person, upon request, to a mailing list to receive copies of notices for all applications(~~(, within the state or within a geographical area))~~).

(c) Standards for approval. The jurisdictional health department ~~((shall))~~ must investigate every application to determine whether the facility meets all applicable laws and regulations, conforms ~~((with))~~ to the most recently adopted comprehensive solid waste management plan in effect at the time of application and complies with all zoning requirements. A land use permit or letter from the jurisdictional zoning authority ~~((shall be))~~ is sufficient ~~((demonstration of))~~ to demonstrate compliance with zoning requirements.

(d) Fees. The jurisdictional health department may establish reasonable fees for permits and renewal of permits. All permit fees collected by the health department ~~((shall))~~ must be deposited in the account from which the jurisdictional health department's operating expenses are paid.

(e) Department's findings. The department ~~((shall))~~ will report to the jurisdictional health department its findings on

each permit application within forty-five days of receipt of a complete application or inform the jurisdictional health department as to the status of the application and when it expects its findings will be transmitted to the jurisdictional health department. Additionally, the department (~~shall~~) must recommend for or against the issuance of each permit by the jurisdictional health department.

(f) Permit approval. When the jurisdictional health department has evaluated all information in the public record, it (~~shall~~) will issue or deny a permit. Every (~~completed solid waste~~) complete permit application (~~shall~~) must be approved or disapproved within ninety days after its receipt by the jurisdictional health department or inform the owner or operator (~~shall be informed~~) as to the status of the application with a schedule for final determination.

(g) Permit format. Every permit issued by a jurisdictional health department (~~shall~~) must be on a format prescribed by the department and (~~shall~~) contain specific requirements necessary for the proper operation of the facility including the requirement that final engineering plans and specifications be submitted for approval (~~to~~) by the jurisdictional health department.

(h) Filing permits with the department. The jurisdictional health department (~~shall~~) must mail all issued permits to the department no more than seven days after the date of issuance. The department (~~shall~~) will review and may appeal the permit as set forth in RCW 70.95.185 and 70.95.190. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

~~((i) Renewal procedures. The owner or operator of a facility shall apply for renewal of the MSWLF permit annually, except for that year that a permit has been or will be reissued under subsection (6) of this section. The owner or operator is authorized to continue all activities authorized under the currently expired permit, if the jurisdictional health department has not rendered a decision on renewal by the yearly renewal date of the current permit. The jurisdictional health department shall annually:~~

~~(A) Review the original application and such additional information as required in WAC 173-351-730 (3)(b) for compliance with these regulations;~~

~~(B) Collect the renewal fee if the jurisdictional health department so chooses;~~

~~(C) If the requirements of (b)(i)(A) of this subsection are met, renew the permit; and~~

~~(D) File the renewed permit with the department no more than seven days after the date of renewal. The department shall review and may appeal the renewal as set forth in RCW 70.95.185 and 70.95.190. See also reissuance under subsection (6) of this section.)~~ (2) SEPA review. The State Environmental Policy Act

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(SEPA), the SEPA rules and ~~((the))~~ local SEPA rules apply to permit decisions made pursuant to this chapter.

(3) Preapplication meetings. Preapplication meetings between the jurisdictional health department and the owner or operator are encouraged to address, among other things, the development of a complete application ~~((pertaining to the owner's or operator's prospective project))~~.

(4) Activities authorized in permits, generally.

(a) Construction. ~~((Issuance of))~~ A valid MSWLF permit entitles the ~~((permittee))~~ owner or operator to construct the MSWLF unit or MSWLF units, subject to ~~((any appropriate))~~ conditions the jurisdictional health department may impose. ~~((If the facility is to be constructed in several or more MSWLF units, the initial application must contain the conceptual design for the entire facility and the information of WAC 173-351-730 (1)(b) for the initial MSWLF unit. In addition, information of WAC 173-351-730 (1)(b) may be submitted covering all other MSWLF units that will be constructed up to the first ten years of facility operation. The permit will identify the extent of each permitted MSWLF unit and the specific time frames for the first MSWLF unit and estimated time frames for subsequent MSWLF units within which construction activities must begin and end for each MSWLF unit.))~~ Authorization to construct each lateral expansion or subsequent MSWLF unit ~~((must, as to that MSWLF unit, contain the detailed construction plans as specified in this regulation, and those plans))~~ is subject to the preconstruction review requirements of WAC 173-351-750(4) and the construction of ~~((that))~~ each lateral expansion or MSWLF unit must comply with all requirements of ~~((the SEPA and of))~~ this regulation and other regulations applicable at the time jurisdictional health department approval is granted.

(b) Operation. Except for MSWLF units governed by the transition rules of WAC 173-351-700(2), the jurisdictional health department's approval to accept solid waste will not be given until the ~~((permittee))~~ owner or operator has demonstrated to the jurisdictional health department's satisfaction that ~~((the))~~ each MSWLF unit has been constructed in accordance with the approved plans and specifications for that MSWLF unit. ~~((If a facility is to be constructed in several or more MSWLF units, the jurisdictional health department must determine that each specific MSWLF unit has been constructed in accordance with the approved permit before operation will be permitted in that specific MSWLF unit.))~~

(c) Post-closure activities. The jurisdictional health department's approval for post-closure activities will not be given until the permittee has demonstrated to the jurisdictional health department's satisfaction that the MSWLF unit or all the

MSWLF units have been closed in accordance with the final engineering plans of WAC 173-351-500 (1)(e)(ii) and the approved closure plan.

Note: Failure to obtain approval for post-closure activities may prevent reimbursement under post-closure financial assurance in WAC 173-351-600.

(5) Renewal procedures. Except as provided in WAC 173-351-710(6), the owner or operator of a facility must apply for renewal of the MSWLF permit at least thirty days before the renewal date. The owner or operator is authorized to continue activities authorized under the most recent expired permit, if the jurisdictional health department has not rendered a decision on renewal by the renewal date of the current permit.

(a) Prior to renewing a permit, the jurisdictional health department will:

(i) Review the original application, modifications, and additional information required in WAC 173-351-730 (3)(b) for compliance with these regulations; and

(ii) Collect the renewal fee if the jurisdictional health department so chooses.

(b) If the facility meets all applicable laws and regulations and conforms to the most recently adopted comprehensive solid waste management plan, the jurisdictional health department may renew the permit for a period not to exceed five years; and

(c) The jurisdictional health department must file the renewed permit with the department no more than seven days after the date of renewal. The department will review and may appeal the renewal as set forth in RCW 70.95.185 and 70.95.190. See also reissuance under subsection (6) of this section. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

(6) Permit modifications.

(a) Any owner or operator intending to modify a valid MSWLF permit must file a modification application at least ~~((thirty))~~ forty-five days before the intended modification. A modification application must be made on forms authorized by the jurisdictional health department and the department, and the forms must include information identified in WAC 173-351-730 (3)(a).

(b) The jurisdictional health department ~~((shall))~~ will follow the procedures of subsection (1) of this section in issuing a permit modification except for the following:

(i) Subsection (1)(b)(ii) and (iii) of this section, public notice; ~~((and))~~

(ii) ~~((Subsection (1)(i) of this section, renewal procedures.))~~ The department will report its findings under subsection (1)(e) of this section within thirty days; and

(iii) The jurisdictional health department will approve or disapprove the modification application within forty-five days

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after its receipt or inform the owner or operator as to the status of the application with a schedule for final determination.

~~((In order))~~ To allow for permit modifications to be authorized at the time of permit renewal, any owner or operator may combine the application required for a permit modification in WAC 173-351-730 (3)(a) with the application required for a renewal permit in WAC 173-351-730 (3)(b)~~((, at the time of permit renewal))~~.

~~((6))~~ (d) Lateral expansions, a fifty percent increase or greater in design volume capacity, or changes resulting in significant adverse environmental impacts that have led a responsible official to issue a declaration of significance under WAC 197-11-736 are not considered a modification but require permit reissuance under these rules.

(7) Permit reissuance. ((Except for permits during transition under subsection (2) of this section,)) Any owner or operator intending to continue construction, operation, or post-closure beyond the permitted duration of a valid MSWLF permit must file a reissuance application at least ninety days before the existing permit expires. Reissuance applications are subject to the public notification process of subsection (1)(b) of this section. A reissuance application must be made on forms authorized by the jurisdictional health department and the department, and must include information identified in WAC 173-351-730(4). The jurisdictional health department will follow the procedures of subsection (1) of this section in reissuing a permit.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-720, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-730 Contents of applications. (1) Applications for MSWLF permits and level of detail~~((, generally))~~.

(a) General requirements for MSWLF permit applications and level of detail.

(i) An application for an MSWLF permit to construct, operate, and conduct post-closure activities at a facility must include all applicable information identified in this section ~~((pertaining to the facility for which the permit is being sought))~~.

(ii) The information in every application submitted under this regulation must be of sufficient detail so as to allow the jurisdictional health department to fulfill its responsibilities under SEPA and this regulation by:

(A) Having detail sufficient to be readily understood by the persons using the documents (~~contained in the application~~) to enable them to determine how the facility will be constructed, operated, and closed and how it will be monitored and maintained after closure;

(B) Providing the jurisdictional health department with sufficient detail to ascertain the environmental impact of the proposed project; and

(C) Providing sufficient detail to demonstrate that the location, design, construction, operation, closure, and post-closure monitoring and maintenance of the MSWLF will be capable of compliance with the applicable requirements of this regulation.

(iii) If the facility is to be constructed in phases, the initial application must contain the conceptual design for the entire facility and the information of subsection (1)(b) of this section for the initial MSWLF unit and other MSWLF units that will be constructed during the active life of the facility.

(iv) Applications for new MSWLF units or lateral expansions must include documentation that all owners of property located within one thousand feet of the facility property boundary have been notified that the proposed facility may impact their ability to construct water supply wells in accordance with chapter 173-160 WAC, Minimum standards for construction and maintenance of wells.

(b) Specific requirements for permit applications. In addition to other requirements set forth in this section, complete applications for MSWLF permits must contain the following:

(i) Engineering plans that set forth the proposed facility's location, property boundaries, adjacent land uses, and detailed construction plans pursuant to subsection (5)(a) of this section;

(ii) How the facility will meet the location standards of WAC 173-351-130 and 173-351-140 (~~including demonstrations~~);

(iii) A hydrogeologic report and water quality monitoring plan prepared in accordance with the provisions of WAC 173-351-400 (~~including all demonstrations~~);

(iv) ~~(The)~~ A plan of operation that ~~(prescribes)~~ describes how the facility will ~~(fulfill)~~ meet the operating requirements set forth in WAC 173-351-200, 173-351-210, and 173-351-220(~~including the demonstrations of this regulation~~);

(v) An engineering report (~~comprehensively~~) describing the existing site conditions and an analysis of the facility, including closure(~~and~~) and post-closure criteria(~~and any necessary demonstrations~~) conforming with subsection (5)(b) of this section;

(vi) A construction quality assurance and quality control plan prepared in accordance with subsection (6) of this section;

(vii) ~~(The)~~ Closure and post-closure plans required by WAC 173-351-500(~~including the schedule of WAC 173-351-500 (1)(c)(iv) and for the submission of final engineering plans for~~

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~~closure six months prior to closure of the facility or the MSWLF unit. See WAC 173-351-500 (1)(e)(ii));~~

(viii) A permit or signed permit application satisfying the applicable requirements for MSWLF units with leachate collection systems:

(A) Discharge under the Water Pollution Control Act, chapter 90.48 RCW;

(B) Either a legal document (contract, local permit, a signed permit application etc.) certifying acceptance of leachate by the operator of a wastewater treatment facility for the discharge of leachate to that facility(~~(, or an application for a National Discharge Elimination System (NPDES) permit pursuant to chapter 173-220 WAC or a state discharge permit (for solar evaporation ponds having no surface water discharge) pursuant to chapter 173-216 WAC or other necessary environmental permit applications (including air quality permit applications) for otherwise managing leachate;~~

~~(ix) For small landfills, the demonstration of WAC 173-351-010 (2)(e));~~

((~~x~~)) (C) Surface impoundments or tanks under WAC 173-350-330; and

(D) Other environmental permits applicable to managing leachate at the facility.

(ix) Cost estimates and mechanisms the owner or operator will use to meet the financial assurance requirements of WAC 173-351-600;

(x) How the owner or operator will meet the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities;

(xi) A demonstration of how the MSWLF conforms (~~with~~) to the approved local comprehensive solid waste management plan in place at the time of application; and

(xii) Any other information as required by the jurisdictional health department.

(2) Combined applications. Owners or operators may file a combined application for MSWLF units and other solid waste handling (~~facilities~~) units, such as surface impoundments, composting facilities, and storage piles regulated under chapter 173-350 WAC, Solid waste handling standards, and MSWLF units closed under and/or regulated by chapter 173-304 WAC, Minimum functional standards for solid waste handling or other rules promulgated under the authority of chapter 70.95 RCW, including this regulation. The combined application must contain information required by each applicable regulation.

(3) Modification and renewal applications.

(a) Modification applications. An application ~~((on forms))~~ specified by the jurisdictional health department and the department to modify a valid MSWLF permit issued pursuant to WAC 173-351-700 must include, and address, the following ~~((at a minimum))~~:

(i) A description of the proposed modification;

(ii) The reasons for the proposed modification;

(iii) A description of the impacts from the proposed modification upon the MSWLF unit or the facility as presently permitted; ~~((and))~~

(iv) A showing that, as modified, the MSWLF unit will be capable of compliance with the applicable requirements of this regulation; and

(v) Any other information as required by the jurisdictional health department.

(b) Renewal applications. An application ~~((on forms))~~ specified by the jurisdictional health department and the department to renew a permit issued pursuant to WAC 173-351-700 must include and address the following ~~((at a minimum))~~:

(i) Any changes in operating methods ~~((, closure cost or post-closure costs))~~ or other changes not falling under the definition of a permit modification;

(ii) Any changes as revealed by inspections, or complaints;

~~(iii) ((Evidence that the annual report of WAC 173-351-200(11) has been submitted;~~

~~(iv))~~ A list of documents added to the operating record according to WAC 173-351-200(10); ~~((and~~

~~(v))~~ (iv) Evidence that all MSWLF unit operators have continued to comply with the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities; and

(v) Any other information as required by the jurisdictional health department.

(4) Reissuance/transition applications. An application to reissue a permit previously issued pursuant to this regulation or to convert a chapter 173-304 WAC permit to a valid MSWLF permit under the transition permit rules of WAC 173-351-700(2) must ~~((, at a minimum,))~~ include and address the following:

(a) Review the original application and permit for compliance with these regulations and submit ~~((such))~~ additional information as follows:

(i) A compliance summary showing how the facility's construction, operation, closure and post-closure activities, as applicable, have been undertaken either in compliance or not in compliance with the terms and conditions of the expiring permit;

(ii) ~~((Specifying))~~ Specify any changes proposed by the owner or operator ~~((, and detailing any changes in circumstance that may affect,))~~ the design, construction, operation, closure, or post-closure care of the facility and describing how

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~~((compliance))~~ the proposed changes will comply with the applicable requirements of this regulation ~~((will be assured))~~.

(b) Review ~~((of))~~ information collected from inspections, complaints, or known changes in the operations including:

(i) Results of groundwater monitoring ~~((taken during the operation (including closure/post closure) of the facility according to WAC 173 351 400 or 173 304 490 as appropriate))~~; and

(ii) Results of surface water and methane monitoring ~~((taken during the operation (including closure/post closure) of the facility))~~.

(5) Engineering plans, reports, and specifications. Unless otherwise specified in chapter 173-351 WAC, all engineering plans, reports, ~~((and))~~ specifications, programs, and manuals must comply with the requirements of this subsection. Engineering plans, reports, specifications, programs, and manuals submitted to the jurisdictional health department or the department must be prepared and certified by an individual licensed to practice engineering in the state of Washington, in engineering disciplines associated with landfill design and construction or with experience in landfill design and construction and to practice engineering ~~((in the state of Washington))~~.

(a) Engineering plans. Unless otherwise specified in this chapter, ~~((the))~~ engineering plans for all MSWLF units must be submitted using the following format:

(i) The sheet size with title blocks must be twenty-two inches by thirty-four inches or twenty-four inches by thirty-six inches.

(ii) The cover sheet must include the project title, owner's and operator's name, sheet index, legend of symbols, and the engineer's name, address, signature, date of signature, and seal.

(iii) The preliminary engineering plans relating the project to its environmental setting must include:

(A) A regional plan or map (having a minimum scale of 1:62,500) and indicate directions and distances to airports within ~~((five))~~ six miles ((eight)) ten kilometers of the facility;

(B) A vicinity plan or map (having a minimum scale of 1:24,000) that ~~((must))~~ shows the area within one mile (1.6 kilometers) of the property boundaries of the facility in terms of, the existing and proposed zoning and land uses within that area; and residences, public and private water supply wells, known private water supply aquifers, sole source aquifers, groundwater management areas, well-head protection zones, special protection areas and surface waters (with quality classifications), access roads, bridges, railroads, airports, historic sites, and other existing and proposed man-made or natural features relating to the facility; and

(C) An overall site plan (having a minimum scale of 1:2,400 with five foot (or one meter) minimum contour intervals) that must show the landfill's property boundaries (as certified by an individual licensed to practice land surveying in the state of Washington), offsite and onsite utilities (such as electric, gas, water, storm, and sanitary sewer systems) and right of way easements; the 100-year flood plain, wetlands, Holocene faults, unstable areas; the names and addresses of contiguous property owners; the location of soil borings, excavations, test pits, gas venting structures, wells (including down-gradient drinking water supply wells within two thousand feet (six hundred ten meters) of the property boundary), lysimeters, piezometers, environmental and facility monitoring points and devices (with each identified in accordance with a numbering system acceptable to the jurisdictional health department and whose horizontal location are accurate to the nearest 0.5 foot (0.15 meter) and all orthometric evaluations should be related to a vertical benchmark based on the (~~national geodetic~~) North American vertical datum of ((1929 (NCVD29)) 1988 (NAVD88) and be established to 3rd order classification standards per federal geodetic control committee, (~~or its successor, as specified in WAC 332-130-060~~) as measured from the ground surface and top of well casing), benchmarks and permanent survey markers, and onsite buildings and appurtenances, fences, gates, roads, parking areas, drainage culverts, and signs; the delineation of the total landfill area including planned staged development of the landfill's construction and operation, and the lateral and vertical limits of previously filled areas; the location and identification of the sources of cover materials; the location and identification of special waste handling areas; a wind rose; and site topography with five foot (or one meter) minimum contour intervals.

Note: All horizontal locations (~~shall~~) must be based upon a control station related to a horizontal datum specified in chapter 58.20 RCW and chapter 332-130 WAC (NAD.83 (~~((1994)))~~)).

(D) Detailed plans of the landfill (~~must~~) that clearly show in plan and cross-sectional views, the original, undeveloped site topography before excavation or placement of solid waste; the existing site topography (if different from the original, undeveloped site topography) including the location and approximate thickness and nature of any existing solid waste; the seasonal high groundwater table; generalized geologic units; known and interpolated bedrock elevations; the proposed limits of excavation and waste placement; the location and placement of each liner system and of each leachate collection system, locating and showing all critical grades and elevations of the collection pipe inverts and drainage envelopes, manholes, cleanouts, valves, sumps, and drainage blanket thicknesses; all berms, dikes, ditches, swales and other devices as needed to divert or collect

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surface water runoff or runoff; the final elevations and grades of the landfill cover system including the grading and gas venting layer, low permeability barrier, topsoil layers; the system used for monitoring and venting the decomposition gases generated within the landfill; groundwater monitoring wells; geophysical and geochemical monitoring devices or structures; leachate storage, treatment and disposal systems including the collection network, sedimentation ponds and any treatment, pretreatment, or storage facilities; typical roadway sections, indicating the pavement type, dimensions, slopes and profiles; the building floor plans, elevations, appurtenances; and plans detailing the landfill entrance area including gates, fences, and signs.

(b) Engineering reports. The engineering reports for a facility must:

(i) Contain a cover sheet, stating the project title and location, the owner's or operator's name, and the engineer's name, address, signature, date of signature, and seal(~~(-)~~);

(ii) Have its text printed on 8 1/2" by 11" pages (paginated consecutively);

(iii) Contain a table of contents or index describing the body of the report and the appendices;

(iv) Include a body of report whose content is described by (c) of this subsection; and

(v) Include all appendices.

(c) An engineering report (~~(containing)~~) must contain a description of the existing site conditions and, at a minimum, an analysis of the proposed facility that must:

(i) Describe current operating practices, expected life and any pending litigation or (~~corrective~~) remedial actions relating to the existing or past facilities;

(ii) Specify the proposed design capacity of the MSWLF unit for which approval is being sought, describing the number, types, and the minimum specifications of all the necessary machinery and equipment needed to effectively operate the landfill at the proposed design capacity;

(iii) Contain a site analysis (~~(of the proposed action)~~) including:

(A) The location of the closest population centers;

(B) A comprehensive description of the primary transportation systems and routes in the facility service area (i.e., highways, airports, railways, etc.);

(C) An analysis of the existing topography, surface water and subsurface geological conditions in accordance with the hydrogeologic report requirements of WAC 173-351-490;

(D) A description of the materials and construction methods used for the placement of each groundwater monitoring well

pursuant to the requirements of WAC 173-351-400 and gas monitoring well pursuant to WAC 173-351-200(4); all gas venting systems; each liner and leachate collection and removal system; leachate storage, treatment, and disposal systems; and cover systems to demonstrate conformance with the design requirements found in WAC 173-351-300, 173-351-320, and 173-351-500. This description also must include a discussion of provisions to be taken to prevent frost action upon each liner system in areas where refuse has not been placed;

(E) An estimate of the expected quantity of leachate to be generated, including:

(I) An annual water budget that estimates leachate generation quantities during (~~initial~~) operation, upon application of intermediate cover, and following MSWLF unit or all MSWLF units closure. At a minimum, the following factors must be considered in the preparation of the water budget to determine the amount of leachate generated as a result of precipitation infiltration into the MSWLF unit or all the MSWLF units: Average monthly temperature, average monthly precipitation, evaporation, evapotranspiration which considers the vegetation type and root zone depth, surface/cover soil conditions and their relation to precipitation runoff which must account for the surface conditions and soil moisture holding capacity and all other sources of moisture contribution to the landfill;

(II) Liner and leachate collection system efficiencies that must be calculated using an appropriate analytical or numerical assessment. The factors to be considered in the calculation of collection system efficiency must include, at a minimum, the saturated hydraulic conductivity of the liner, the liner thickness, the saturated hydraulic conductivity of the leachate collection system, the leachate collection system porosity, the base slope of the liner and leachate collection and removal system interface, the maximum flow distance across the liner and leachate collection and removal system interface to the nearest leachate collection pipe, the estimated leachate generation quantity as computed in accordance with the requirements of (c)(iii)(E)(I) of this subsection; and

(III) Predictions of the static head of leachate on the liners, volume of leachate to be collected, and the volume of leachate that may permeate through the entire liner system, all on a monthly basis. Information gained from the collection efficiency calculations required in (c)(iii)(E)(I) and (II) of this subsection must be used to make these predictions. This assessment also must address the amount of leachate expected to pass through the liner system in gallons per acre per day (liters per square meter per day).

(d) Discuss the closure and post-closure maintenance and operation of the facility which must include, but not be limited to:

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(i) A closure design consistent with the requirements of WAC 173-351-500;

(ii) A post-closure water quality monitoring program consistent with the requirements of WAC 173-351-400 and 173-351-500;

(iii) An operation and closure plan for the leachate collection, treatment, and storage facilities consistent with the requirements of this regulation and chapter 173-350 WAC (~~(173-304-430)~~); (~~and~~)

(iv) An estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in WAC 173-351-500 (2)(b)(iii); and

(v) A discussion of the future use of the facility, including the specific proposed or alternative uses during the post-closure period. Future uses must not adversely affect the final cover system. See WAC 173-351-500 (2)(c)(iii).

(e) Appendices must be submitted as part of an engineering report (~~(submitted)~~) with an application to construct a new or laterally expanded MSWLF unit and must contain:

(i) Appropriate charts and graphs;

(ii) Copies of record forms used at the MSWLF unit;

(iii) Test pit logs, soil boring logs, and geological information (such as stratigraphic sections, geophysical and geochemical surveys, and water quality analyses);

(iv) Engineering calculations (including the raw data from which they were made);

(v) Other supporting data, including literature citations.

(6) Construction quality assurance and construction quality control plans.

The construction quality assurance (QA) and construction quality control (QC) plan must address the construction of the MSWLF unit according to the designs set forth in chapter 173-351 WAC. (Construction QA and construction QC are defined in WAC 173-351-100.) The owner or operator may submit separate construction QA plans and construction QC plans. For each (~~(specified)~~) phase of construction, these plans must include(~~(, but not be limited to)~~):

(a) A delineation of (~~(the)~~) responsibilities for the QA management organization and the QC management organization, including the chain of command of the QA inspectors and contractors and the QC inspectors and contractors; quality assurance (~~(shall)~~) must be performed by a third party organization that is independent of the landfill owner/operator/contractor.

(b) A description of the required level of experience and training for the contractor, his/her crew, and QA and QC inspectors for every (~~(major)~~) phase of construction in sufficient

detail to demonstrate that the approved installation methods and procedures will be properly implemented; and

(c) A description of the QA and QC testing protocols for every major phase of construction, which must include, at a minimum, the frequency of inspection, field testing, sampling for laboratory testing, the sampling and field testing procedures and equipment to be utilized, the calibration of field testing equipment, the frequency of performance audits, the sampling size, the laboratory procedures to be utilized, the calibration of laboratory equipment and QA/QC of laboratory procedures, the limits for test failure, and a description of the corrective procedures to be used upon test failure.

Note: It is intended that owners or operators will select and pay for the independent third party construction quality assurance firm, who will report to the owner or operator.

(7) Signature and verification of applications.

(a) All applications for permits must be accompanied by evidence of authority to sign the application and must be signed by the owner or operator as follows:

(i) In the case of corporations, by a duly authorized principal executive officer of at least the level of vice-president; in the case of a partnership or limited partnership, by:

(ii) A general partner;

(iii) Proprietor; or

(iv) In the case of a sole proprietorship, by the proprietor;

(v) In the case of a municipal, state, or other governmental entity, by a duly authorized principal executive officer or elected official.

(b) Applications must be sworn to by, or on behalf of, the owner or operator, in respect to the veracity all statements therein; or must bear an executed statement by, or on behalf of, the owner or operator to the effect that false statements made therein are made under penalty of perjury.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-730, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-740 Permit issuance criteria. The jurisdictional health department may issue, reissue, or modify a MSWLF permit to a facility, only if:

(1) The application's engineering and hydrogeological data and construction plans and specifications required by this regulation (~~((pertaining to such a MSWLF unit or MSWLF units substantiate))~~) demonstrate that the proposed MSWLF unit or MSWLF units meets the requirements of this regulation;

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(2) The application demonstrates the facility's ability to operate and close in accordance with the requirements of this regulation;

(3) The application demonstrates the facility's ability to conduct post-closure activities in accordance with the requirements of this regulation; ~~((and a form of surety or financial responsibility for post closure activities has been filed with the jurisdictional health department; and))~~

(4) The owner or operator has established a financial assurance mechanism meeting the requirements of this regulation and has submitted, as applicable:

(a) A copy of the ordinance establishing the reserve account;
or

(b) The original signed documents for trust funds, surety bonds, or letters of credit for closure and post-closure financial assurance; and

(5) The application demonstrates the facility's consistency with the local solid waste management plan in effect at the time of application.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-740, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-750 Permit provisions. (1) Mitigation of adverse impacts. The jurisdictional health department may impose conditions in each permit, to assure mitigation of adverse environmental impacts pursuant to SEPA, chapter 43.21C RCW and to ~~((insure))~~ ensure compliance with the requirements ~~((identified in WAC 173-351-130 through 173-351-600, with the applicable sections pertaining to such a MSWLF unit or all MSWLF units,))~~ of this regulation and with other applicable laws and regulations.

(2) Transferability.

(a) All permits issued pursuant to this regulation are transferable only upon prior written approval of the jurisdictional health department and a demonstration that the prospective transferee will be able to comply with applicable laws and regulations, permit conditions, and other requirements to which the prospective transferor is subject.

(b) Upon transfer of ownership of all or part of a facility, a provision must be included in the property deed indicating the period of time during which the facility has been disposing of solid waste, a description of the solid waste contained within, and the fact that the records for the facility have been filed

with the jurisdictional health department. The deed also must reference a map, which must be filed with the county clerk, showing the limits of the active areas as defined in WAC 173-351-100.

(3) Duration of permits. The jurisdictional health department must specify the duration of the MSWLF permit (~~((not to exceed ten years))~~). Except as provided in WAC 173-351-710(5), permits must be renewed ((annually)) at least every five years on a date established by the jurisdictional health department. If a permit is to be renewed for longer than one year, the jurisdictional health department may hold a public hearing before making a decision. Permits must be renewed according to WAC ((173-351-730(3)) 173-351-710(5) or 173-351-720(5), and reissued according to WAC 173-351-720((+6)) (7).

(4) Preconstruction review condition. The jurisdictional health department (~~((shall))~~) must include in each permit for a new MSWLF unit or lateral expansion a condition requiring the owner or operator(~~((r))~~) to submit the following documents sixty days prior to beginning construction, and to obtain the jurisdictional health department's approval that the following documents conform (~~((with))~~) to the engineering report and with the requirements of this chapter:

(a) Final design drawings;
(b) Construction specifications; and
(c) A construction quality assurance manual for the following MSWLF components:

(i) Bottom liner;
(ii) Leachate collection and removal system;
(iii) Landfill gas control system;
(iv) Leachate and landfill gas condensate treatment and disposal system; and
(v) Final cover system.

(5) Supervision and certification or declaration of construction. The construction of a MSWLF unit must be undertaken:

(a) Under the supervision of an individual licensed to practice engineering in the state of Washington; and
(b) In conformance with the construction quality assurance plan of WAC 173-351-730(6).

(6) Preoperation review conditions. Each permit issued under this chapter for a new MSWLF unit or lateral expansion (~~((shall))~~) must contain a condition requiring that upon completion of construction, the licensed (~~((engineered))~~) engineer who supervised construction (~~((shall))~~) must certify or declare in writing that the construction is in accordance with the terms of the applicable permit and tested in accordance with construction quality assurance plans of WAC 173-351-730(6). Except as specified elsewhere in this regulation, this certification or declaration must be submitted to the jurisdictional health department within

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three months after completion of construction and must include recorded construction drawings and specifications. The owner or operator must notify the jurisdictional health department, in writing, of the date when solid waste will be first received at the MSWLF unit.

(7) Cessation of construction or operation activities. If construction or operation activities started under a permit issued pursuant to this chapter cease for a period of twelve consecutive months, the jurisdictional health department may in its discretion revoke the permit. The jurisdictional health department (~~shall~~) must provide notice to the owner or operator in writing explaining the reasons for revocation. The jurisdictional health department (~~shall~~) must not revoke a permit where the cessation of construction or operation is caused by factors beyond the reasonable control of the permittee or when such cessation is in accordance with the provisions of the permit.

(8) Design volume capacity and construction. Every MSWLF permit must (~~set forth~~) specify the facility's approved design volume capacity and identify the extent of each permitted MSWLF unit and the specific time frames for construction of the first MSWLF unit and estimated time frames for construction of subsequent MSWLF units.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-750, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

WAC 173-351-760 Appeals. Whenever the jurisdictional health department denies a permit or suspends a permit for a solid waste disposal site, it (~~shall~~) must, upon request of the application or holder of the permit, grant a hearing on such denial or suspension within thirty days after the request (~~therefor~~) is made. Notice of the hearing (~~shall~~) must be given to all interested parties including the county or city having jurisdiction over the site and the department. Within thirty days after the hearing the health officer (~~shall~~) must notify the applicant or the holder of the permit in writing of (~~his~~) the determination (~~thereof~~). Any party aggrieved by such determination may appeal to the pollution control hearings board by filing with the hearings board a notice of appeal within thirty days after receipt of notice of the determination of the health officer. The hearings board (~~shall~~) will hold a hearing in accordance with the provisions of the Administrative Procedure Act, chapter 34.05 RCW, as now or hereafter amended.

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-760, filed 10/26/93, effective 11/26/93.]

AMENDATORY SECTION (Amending WSR 93-22-016, filed 10/26/93, effective 11/26/93)

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**WAC 173-351-990 Appendices.
APPENDIX I^(†)**

**Appendix I - Constituents for Detection
Monitoring**

COMMON NAME⁽²⁾ 1 _____ CAS RN⁽³⁾ 2
Inorganic Constituents

- | | | |
|-----|-----------|---------------------------------------|
| 1) | Antimony | ((Dissolved)) <u>Total</u> |
| 2) | Arsenic | ((Dissolved)) <u>Total</u> |
| 3) | Barium | ((Dissolved)) <u>Total</u> |
| 4) | Beryllium | ((Dissolved)) <u>Total</u> |
| 5) | Cadmium | ((Dissolved)) <u>Total</u> |
| 6) | Chromium | ((Dissolved)) <u>Total</u> |
| 7) | Cobalt | ((Dissolved)) <u>Total</u> |
| 8) | Copper | ((Dissolved)) <u>Total</u> |
| 9) | Lead | ((Dissolved)) <u>Total</u> |
| 10) | Nickel | ((Dissolved)) <u>Total</u> |
| 11) | Selenium | ((Dissolved)) <u>Total</u> |
| 12) | Silver | ((Dissolved)) <u>Total</u> |
| 13) | Thallium | ((Dissolved)) <u>Total</u> |
| 14) | Vanadium | ((Dissolved)) <u>Total</u> |
| 15) | Zinc | ((Dissolved)) <u>Total</u> |
| 16) | Nitrate | |

Organic Constituents

- | | | |
|-----|----------------------------|----------|
| 17) | Acetone | 67-64-1 |
| 18) | Acrylonitrile | 107-13-1 |
| 19) | Benzene | 71-43-2 |
| 20) | Bromochloromethane | 74-97-5 |
| 21) | Bromodichloromethane | 75-27-4 |
| 22) | Bromoform; Tribromomethane | 75-25-2 |

23)	Carbon disulfide	75-15-0
24)	Carbon tetrachloride	56-23-5
25)	Chlorobenzene	108-90-7
26)	Chloroethane; Ethyl chloride	75-00-3
27)	Chloroform; Trichloromethane	67-66-3
28)	Dibromochloromethane; Chlorodibromomethane	124-48-1
29)	1,2-Dibromo-3-chloropropane; DBCP	96-12-8
30)	1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
31)	o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
32)	p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
33)	trans-1,4-Dichloro-2-butene	110-57-6
34)	1,1-Dichloroethane; Ethylidene chloride	75-34-3
35)	1,2-Dichloroethane; Ethylene dichloride	107-06-2
36)	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
37)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
38)	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
39)	1,2-Dichloropropane; Propylene dichloride	78-87-5
40)	cis-1,3-Dichloropropene	10061-01-5
41)	trans-1,3-Dichloropropene	10061-02-6
42)	Ethylbenzene	100-41-4
43)	2-Hexanone; Methyl butyl ketone	((591-73-6)) 591-78-6
44)	Methyl bromide; Bromomethane	74-83-9
45)	Methyl chloride; Chloromethane	74-87-3
46)	Methylene bromide; Dibromomethane	74-95-3
47)	Methylene chloride; Dichloromethane	75-09-2
48)	Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
49)	Methyl iodide; Iodomethane	74-88-4

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50)	4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
51)	Styrene	100-42-5
52)	1,1,1,2-Tetrachloroethane	630-20-6
53)	1,1,2,2-Tetrachloroethane	79-34-5
54)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
55)	Toluene	108-88-3
56)	1,1,1-Trichloroethane; Methyl chloroform	71-55-6
57)	1,1,2-Trichloroethane	79-00-5
58)	Trichloroethylene; Trichloroethene	79-01-6
59)	Trichlorofluoromethane; CFC-11	75-69-4
60)	1,2,3-Trichloropropane	96-18-4
61)	Vinyl acetate	108-05-4
62)	vinyl chloride	75-01-4
63)	Xylenes	1330-20-7

¹ ((This list contains 47 volatile organics for which possible analytical procedures provided in EPA Report SW-846 "Test Methods for Evaluating Solid Waste," third edition, November 1986, as revised December 1987, includes Method 8260; and 15 metals for which SW-846 provides either Method 6010 or a method from the 7000 series of methods.

²) Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

⁽³⁾ ² Chemical Abstracts Service registry number.

APPENDIX II

Groundwater QUALITY PARAMETERS

Field Parameters

pH
specific
conductance
temperature
static water level

Geochemical Indicator Parameters

Calcium (Ca)	Sodium (Na)
Bicarbonate (HCO ₃)	Chloride (Cl)
Magnesium (Mg)	Potassium (K)
Sulfate (SO ₄)	Alkalinity (as Ca CO ₃)
<u>Total suspended solids (TSS)</u>	Iron (Fe) <u>(Dissolved)</u>
	Manganese (Mn) <u>(Dissolved)</u>

Leachate Indicators

Ammonia (NH₃-N)
Total Organic Carbon (TOC)
Total Dissolved Solids (TDS)

APPENDIX III

List of Hazardous Inorganic and Organic Constituents.(([†]))

Common Name ⁽²⁾¹ ((mg/L) ⁶)	CAS RN ⁽³⁾²	Chemical abstracts service index name ⁽⁴⁾³	((Suggested PQL)) methods ⁵
Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-	((8100 200 8270 10))
Acenaphthylene	208-96-8	Acenaphthylene	((8100 200 8270 10))
Acetone	67-64-1	2-Propanone	((8260 100))
Acetonitrile; Methyl cyanide	75-05-8	Acetonitrile	((8015 100))
Acetophenone	98-86-2	Ethanone, 1-phenyl-	((8270 10))
2-Acetylaminofluorene; 2- AAF	53-96-3	Acetamide, N-9H-fluoren-2- yl-	((8270 20))
Acrolein	107-02-8	2-Propenal	((8030 5 8260 100))
Acrylonitrile	107-13-1	2-Propenenitrile	((8030 5 8260 200))
Aldrin	309-00-2	1,4:5,8- Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4, 4a,5,8,8a-hexahydro- (1 α ,4 α , 4a β ,5 α ,8 α ,8a β)-	((8080 0.05 8270 10))
Allyl chloride	107-05-1	1-Propene, 3-chloro-	((8010 5 8260 10))
4-Aminobiphenyl	92-67-1	[1,1 1 -Biphenyl]-4-amine	((8270 20))
Anthracene	120-12-7	Anthracene	((8100 200 8270 10))
Antimony	((Dissolved)) <u>Total</u>	Antimony	((6010 300 7040 2000 7041 30))
Arsenic	((Dissolved)) <u>Total</u>	Arsenic	((6010 500 7060 10 7061 20))
Barium	((Dissolved)) <u>Total</u>	Barium	((6010 20 7080 1000))
Benzene	71-43-2	Benzene	((8020 2 8021 0.1 8260 5))

Benzo[a]anthracene; Benzanthracene	56-55-3	Benz[a]anthracene	((8100 8270)	200 10))
Benzo[b]fluoranthene	205-99-2	Benz[e]acephenanthrylene	((8100 8270)	200 10))
Benzo[k]fluoranthene	207-08-9	Benzo[k]fluoranthene	((8100 8270)	200 10))
Benzo[ghi]perylene	191-24-2	Benzo[ghi]perylene	((8100 8270)	200 10))
Benzo[a]pyrene	50-32-8	Benzo[a]pyrene	((8100 8270)	200 10))
Benzyl alcohol	100-51-6	Benzenemethanol	((8270)	20))
Beryllium	((Dissolved)) <u>Total</u>	Beryllium	((6010 7090 7091)	3 50 2))
alpha-BHC	319-84-6	Cyclohexane, 1,2,3,4,5,6- hexachloro-, (1 α ,2 α ,3 β ,4 α ,5 β ,6 β)-	((8080 8270)	0.05 10))
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6- hexachloro-, (1,2 β ,3 α ,4 β ,5 α ,6 β)-	((8080 8270)	0.05 20))
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6- hexachloro-, (1 α ,2 α ,3 α ,4 β ,5 α ,6 β)-	((8080 8270)	0.1 20))
gamma-BHC; Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6- hexachloro-, (1 α ,2 α ,3 β ,4 α ,5 α ,6 β)-	((8080 8270)	0.05 20))
Bis(2- chloroethoxy)methane	111-91-1	Ethane, 1,1 1 - [methylenebis(oxy)]bis[2- chloro-	((8110 8270)	5 10))
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4	Ethane, 1,1 1 -oxybis[2- chloro-	((8110 8270)	3 10))
Bis-(2-chloro-1- methylethyl) ether; 2,2 1 - Dichlorodiisopropyl ether; DCIP, See note ((7)) 4	108-60-1	Propane, 2,2 1 -oxybis[1- chloro-	((8110 8270)	10 10))
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	((8060)	20))
Bromochloromethane; Chlorobromomethane	74-97-5	Methane, bromochloro-	((8021 8260)	0.1 5))
Bromodichloromethane; Dibromochloromethane	75-27-4	Methane, bromodichloro-	((8010 8021 8260)	1 0.2 5))

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Bromoform; Tribromomethane	75-25-2	Methane, tribromo-	((8010 8021 8260	2 15 5))
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-	((8110 8270	25 10))
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	((8060 8270	5 10))
Cadmium	((Dissolved)) Total)	Cadmium	((6010 7130 7131	40 50 1))
Carbon disulfide	75-15-0	Carbon disulfide	((8260	100))
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	((8010 8021 8260	1 0.1 10))
Chlordane	See Note ((8)) 5	4,7-Methano-1H-indene, 1,2,4,5, 6,7,8,8-octachloro-2,3,3a,4,7, 7a-hexahydro-	((8080 8270	0.1 50))
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-	((8270	20))
Chlorobenzene	108-90-7	Benzene, chloro-	((8010 8020 8021 8260	2 2 0.1 5))
Chlorobenzilate	510-15-6	Benzeneacetic acid, 4-chloro- α - (4-chlorophenyl)- α -hydroxy-, ethyl ester	((8270	10))
p-Chloro-m-cresol; 4- Chloro-3- methylphenol	59-50-7	Phenol, 4-chloro-3-methyl-	((8040 8270	5 20))
Chloroethane; Ethyl chloride	75-00-3	Ethane, chloro-	((8010 8021 8260	5 1 10))
Chloroform; Trichloromethane	67-66-3	Methane, trichloro-	((8010 8021 8260	0.5 0.2 5))
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-	((8120 8270	10 10))

2-Chlorophenol	95-57-8	Phenol, 2-chloro-	((8040 8270	5 10))
4-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy-	((8110 8270	40 10))
Chloroprene	126-99-8	1,3-Butadiene, 2-chloro-	((8010 8260	50 20))
Chromium	(((Dissolved)) <u>Total</u>	Chromium	((6010 7190 7191	70 500 10))
Chrysene	218-01-9	Chrysene	((8100 8270	200 10))
Cobalt	(((Dissolved)) <u>Total</u>	Cobalt	((6010 7200 7201	70 500 10))
Copper	(((Dissolved)) <u>Total</u>	Copper	((6010 7210 7211	60 200 10))
m-Cresol; 3-methylphenol	108-39-4	Phenol, 3-methyl-	((8270	10))
o-Cresol; 2-methylphenol	95-48-7	Phenol, 2-methyl-	((8270	10))
p-Cresol; 4-methylphenol	106-44-5	Phenol, 4-methyl-	((8270	10))
Cyanide	57-12-5	Cyanide	((9010	200))
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-	((8150	10))
4,4 ((+)) -DDD	72-54-8	Benzene 1,1 1 -(2,2-dichloroethylidene)bis[4-chloro-	((8080 8270	0.1 10))
4,4 ((+)) -DDE	72-55-9	Benzene, 1,1 1 -(dichloroethenylidene)bis[4-chloro-	((8080 8270	0.05 10))
4,4 ((+)) -DDT	50-29-3	Benzene, 1,1 1 -(2,2,2-trichloroethylidene)bis[4-chloro-	((8080 8270	0.1 10))
Diallate	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-,S-(2,3-dichloro-2-propenyl) ester	((8270	10))
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene	((8100 8270	200 10))
Dibenzofuran	132-64-9	Dibenzofuran	((8270	10))
Dibromochloromethane; Chlorodibromomethane	124-48-1	Methane, dibromochloro-	((8010 8021 8260	1 0.3 5))

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1,2-Dibromo-3-chloropropane; DBCP	96-12-8	Propane, 1,2-dibromo-3-chloro-	((8011 8021 8260	0.1 30 25))
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4	Ethane, 1,2-dibromo-	((8011 8021 8260	0.1 10 5))
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester	((8060 8270	5 10))
o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	((8010 8020 8021 8120 8260 8270	2 5 0.5 10 5 10))
m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1	Benzene, 1,3-Dichloro-	((8010 8020 8021 8120 8260 8270	5 5 0.2 10 5 10))
p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	((8010 8020 8021 8120 8260 8270	2 5 0.1 15 5 10))
3,3 (+) -Dichlorobenzidine	91-94-1	[1,1 1 -Biphenyl]-4,4 1 -diamine, 3,3 1 -dichloro-	((8270	20))
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	((8260	100))
Dichlorodifluoromethane; CFC 12;	75-71-8	Methane, dichlorodifluoro-	((8021 8260	0.5 5))
1,1-Dichloroethane; Ethyldidene chloride	75-34-3	Ethane, 1,1-dichloro-	((8010 8021 8260	1 0.5 5))
1,2-Dichloroethane; Ethylene dichloride	107-06-2	Ethane, 1,1-dichloro-	((8010 8021 8260	0.5 0.3 5))
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4	Ethene, 1,1-dichloro-	((8010 8021 8260	1 0.5 5))

cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2	Ethene, 1,2-dichloro-, (Z)-	((8021 8260	0.2 5))
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-	((8010 8021 8260	1 0.5 5))
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-	((8040 8270	5 10))
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-	((8270	10))
1,2-Dichloropropane; Propylene dichloride	78-87-5	Propane, 1,2-dichloro-	((8010 8021 8260	0.5 0.05 5))
1,3-Dichloropropane; Trimethylene dichloride	142-28-9	Propane, 1,3-dichloro-	((8021 8260	0.3 5))
2,2-Dichloropropane; Isopropylidene chloride	594-20-7	Propane, 2,2-dichloro-	((8021 8260	0.5 15))
1,1-Dichloropropene	563-58-6	1-Propene, 1,1-dichloro-	((8021 8260	0.2 5))
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-	((8010 8260	20 10))
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-	((8010 8260	5 10))
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3- b]oxirene, 3,4,5,6,9,9-hexa, chloro-1 α ,2,2 α ,3,6,6 α ,7,7 α - octahydro-, (1 $\alpha\alpha$,2 β ,2 $\alpha\alpha$,3 β ,6 β , 6 $\alpha\alpha$,7 β ,7 $\alpha\alpha$)-	((8080 8270	0.05 10))
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	((8060 8270	5 10))
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin Dimethoate	297-97-2	Phosphorothioic acid, 0,0- diethyl 0-pyrazinyl ester	((8141 8270	5 20))
	60-51-5	Phosphorodithioic acid, 0,0- dimethyl S-[2-(methylamino)- 2-oxoethyl] ester	((8141 8270	3 20))
p- (Dimethylamino)azobenzen e	60-11-7	Benzenamine, N,N-dimethyl- 4-(phenylazo)-	((8270	10))
7,12- Dimethylbenz[a]anthracene	57-97-6	Benz[a]anthracene, 7,12- dimethyl-	((8270	10))
3,3 (+) - Dimethylbenzidine	119-93-7	[1,1 1 -Biphenyl]-4,4 1 - diamine, 3,3 1 -dimethyl-	((8270	10))
2,4-Dimethylphenol; m- Xylenol	105-67-9	Phenol, 2,4-dimethyl-	((8040 8270	5 10))
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester	((8060 8270	5 10))

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m-Dinitrobenzene	99-65-0	Benzene, 1,3-dinitro-	((8270	20))
4,6-Dinitro-o-cresol	534-52-1	Phenol, 2-methyl-4,6-dinitro	((8040	150
Dinitro-2-methylphenol			8270	50))
2,4-Dinitrophenol;	51-28-5	Phenol, 2,4-dinitro-	((8040	150
			8270	50))
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-	((8090	0.2
			8270	10))
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-	((8090	0.1
			8270	10))
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	((8150	1
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	((8060	30
			8270	10))
Diphenylamine	122-39-4	Benzenamine, N-phenyl-	((8270	10))
Disulfoton	298-04-4	Phosphorodithioic acid, 0,0-diethyl S-[2-(ethylthio)ethyl] ester	((8140	2
			8141	0.5
			8270	10))
Endosulfan I	959-98-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexa-chloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide,	((8080	0.1
			8270	20))
Endosulfan II	33213-65-9	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexa-chloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3 α ,5 α ,6 β ,9 β ,9 $\alpha\alpha$)-	((8080	0.05
			8270	20))
Endosulfan sulfate	1031-07-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexa-chloro-1,5,5a,6,9,9a-hexahydro-,3-3-dioxide	((8080	0.5
			8270	10))
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1 α ,2 β ,2a β ,3 α ,6 α ,6a β ,7 β ,7 $\alpha\alpha$)-	((8080	0.1
			8270	20))

Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentane-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1 α ,2 β ,2a β ,4 β ,4a β ,5 β ,6a β ,6b β ,7R*)-	((8080 8270	0.2 10))
Ethylbenzene	100-41-4	Benzene, ethyl-	((8020 8221 8260	2 0.05 5))
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	((8015 8260 8270	5 10 10))
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	((8270	20))
Famphur	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] 0,0-dimethyl ester	((8270	20))
Fluoranthene	206-44-0	Fluoranthene	((8100 8270	200 10))
Fluorene	86-73-7	9H-Fluorene	((8100 8270	200 10))
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	((8080 8270	0.05 10))
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1a α , 1b β , 2 α , 5 α , 5a β , 6 β , 6a α)	((8080 8270	1 10))
Hexachlorobenzene	118-74-1	Benzene, hexachloro-	((8120 8270	0.5 10))
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	((8021 8120 8260 8270	0.5 5 10 10))
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	((8120 8270	5 10))
Hexachloroethane	67-72-1	Ethane, hexachloro-	((8120 8260 8270	0.5 10 10))
Hexachloropropene	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-	((8270	10))
2-Hexanone; Methyl butyl ketone	591-78-6	2-Hexanone	((8260	50))

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Indeno(1,2,3-cd)pyrene	193-39-5	Indeno(1,2,3-cd)pyrene	((8100 8270	200 10))
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-	((8015 8240	50 100))
Isodrin	465-73-6	1,4,5,8-Dimethanonaphthalene,1,2,3,4,10,10- hexachloro-1,4,4a,5,8,8a hexahydro- (1 α ,4 α ,4 $\alpha\beta$,5 β ,8 β ,8 $\alpha\beta$)-	((8270 8260	20 10))
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl-	((8090 8270	60 10))
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	((8270	10))
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	((8270	20))
Lead	((Dissolved)) <u>Total</u>	Lead	((6010 7420 7421	400 1000 10))
Mercury	(Total)	Mercury	((7470	2))
Methacrylonitrile	126-98-7	2-Propenenitrile, 2-methyl-	((8015 8260	5 100))
Methapyrilene	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N 1 -2-pyridinyl-N1/2-thienylmethyl)-	((8270	100))
Methoxychlor	72-43-5	Benzene,1,1 1 -(2,2,2, trichloroethylidene)bis[4-methoxy-	((8080 8270	2 10))
Methyl bromide; Bromomethane	74-83-9	Methane, bromo-	((8010 8021	20 10))
Methyl chloride; Chloromethane	74-87-3	Methane, chloro-	((8010 8021	1 0.3))
3-Methylcholanthrene	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	((8270	10))
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3	2-Butanone	((8015 8260	10 100))
Methyl iodide; Iodomethane	74-88-4	Methane, iodo-	((8010 8260	40 10))

Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester	((8015 8260)	2 30))
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester	((8270)	10))
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-	((8270)	10))
Methyl parathion; Parathion methyl	298-00-0	Phosphorothioic acid, 0,0-dimethyl	((8140 8141 8270)	0.5 1 10))
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1	2-Pentanone, 4-methyl-	((8015 8260)	5 100))
Methylene bromide; Dibromomethane	74-95-3	Methane, dibromo-	((8010 8021 8260)	15 20 10))
Methylene chloride; Dichloromethane	75-09-2	Methane, dichloro-	((8010 8021 8260)	5 0.2 10))
Naphthalene	91-20-3	Naphthalene	((8021 8100 8260 8270)	0.5 200 5 10))
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione	((8270)	10))
1-Naphthylamine	134-32-7	1-Naphthalenamine	((8270)	10))
2-Naphthylamine	91-59-8	2-Naphthalenamine	((8270)	10))
Nickel	(Total)	Nickel	((6010 7520)	150 400))
o-Nitroaniline; 2-Nitroaniline	88-74-4	Benzenamine, 2-nitro-	((8270)	50))
m-Nitroaniline; 3-Nitroaniline	99-09-2	Benzenamine, 3-nitro-	((8270)	50))
p-Nitroaniline; 4-Nitroaniline	100-01-6	Benzenamine, 4-nitro	((8270)	20))
Nitrobenzene	98-95-3	Benzene, nitro-	((8090 8270)	40 10))
o-Nitrophenol; 2-Nitrophenol	88-75-5	Phenol, 2-nitro-	((8040 8270)	5 10))
p-Nitrophenol; 4-Nitrophenol	100-02-7	Phenol, 4-nitro-	((8040 8270)	10 50))
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-	((8270)	10))
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-	((8270)	20))
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-	((8070)	2))

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N-Nitrosodiphenylamine	86-30-6	Benzenamine, N-nitroso-N-phenyl-	((8070	5))
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine	621-64-7	1-Propanamine, N-nitroso-N-propyl-	((8070	40))
N-Nitrosomethylethalamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-	((8270	40))
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-	((8270	20))
N-Nitrosopyrrolidine	930-55-2	Pyrrolidine, 1-nitroso-	((8270	40))
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-	((8270	40))
Parathion	56-38-2	Phosphorothioic acid, 0,0-diethyl 0-(4-nitrophenyl) ester	((8141	0.5
Pentachlorobenzene	608-93-5	Benzene, pentachloro-	8270	10))
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-	((8270	20))
Pentachlorophenol	87-86-5	Phenol, pentachloro-	((8040	5
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenyl)	8270	50))
Phenanthrene	85-01-8	Phenanthrene	((8100	200
Phenol	108-95-2	Phenol	8270	10))
p-Phenylenediamine	106-50-3	1,4-Benzenediamine	((8040	4))
Phorate	298-02-2	Phosphorodithioic acid, 0,0-diethyl S-[(ethylthio)methyl] ester	((8270	10))
Polychlorinated biphenyls; PCBs; Aroclors	See Note ((9)) <u>6</u>	1,1'-Biphenyl, chloro derivatives	((8140	2
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	8141	0.5
Propionitrile; Ethyl cyanide	107-12-0	Propanenitrile	8270	10))
Pyrene	129-00-0	Pyrene	((8080	50
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	8270	200))
Selenium	((Dissolved))	Selenium	8270	10))
<u>Total</u>			((6010	750
			7740	20
			7741	20))

Silver	((Dissolved)) <u>Total</u>	Silver	((6010 7760 7761	70 100 10))
Silvex; 2,4,5-TP	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	((8150	2))
Styrene	100-42-5	Benzene, ethenyl-	((8020 8021 8260	1 0.1 10))
Sulfide	18496-25-8	Sulfide	((9030	4000))
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	((8150	2))
1,2,4,5-Tetrachlorobenzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-	((8270	10))
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	((8010 8021 8260	5 0.05 5))
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	((8010 8021 8260	0.5 0.1 5))
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4	Ethene, tetrachloro-	((8010 8021 8260	0.5 0.5 5))
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-	((8270	10))
Thallium	((Dissolved)) <u>Total</u>	Thallium	((6010 7840 7841	400 1000 10))
Tin	((Dissolved)) <u>Total</u>	Tin	((6010	40))
Toluene	108-88-3	Benzene, methyl-	((8020 8021 8260	2 0.1 5))
o-Toluidine	95-53-4	Benzenamine, 2-methyl-	((8270	10))
Toxaphene	See Note ((40)) 7	Toxaphene	((8080	2))
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-	((8021 8120 8260 8270	0.3 0.5 10 10))
1,1,1-Trichloroethane; Methylchloroform	71-55-6	Ethane, 1,1,1-trichloro-	((8010 8021 8260	0.3 0.3 5))
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	((8010 8260	0.2 5))

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Trichloroethylene; Trichloroethene	79-01-6	Ethene, trichloro-	((8010 8021 8260	4 0.2 5))
Trichlorofluoromethane; CFC-11	75-69-4	Methane, trichlorofluoro-	((8010 8021 8260	10 0.3 5))
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-	((8270	10))
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-	((8040 8270	5 10))
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	((8010 8021 8260	10 5 15))
0,0,0-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, 0,0,0- triethylester	((8270	10))
sym-Trinitrobenzene	99-35-4	Benzene, 1,3,5-trinitro-	((8270	10))
Vanadium	(((Dissolved))) Total)	Vanadium	((6010 7910 7911	80 2000 40))
Vinyl acetate	108-05-4	Acetic acid, ethenyl ester	((8260	50))
Vinyl chloride; Chloroethene	75-01-4	Ethene, chloro-	((8010 8021 8260	2 0.4 10))
Xylene (total)	See Note ((41)) <u>8</u>	Benzene, dimethyl-	((8020 8021 8260	5 0.2 5))
Zinc	(((Dissolved))) Total)	Zinc	((6010 7950 7951	20 50 0.5))

Notes:

- 1) ~~The regulatory requirements pertain only to the list of substances; the right hand columns (Methods and PQL) are given for informational purposes only. See also footnotes 5 and 6. Also, note that the state groundwater quality criteria, chapter 173-200 WAC, takes precedence over these recommended PQL's.~~
- 2) ~~Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.~~
- 3) ~~2 Chemical Abstracts Service registry number. Where "Total" is entered, all species in the groundwater that contain this element are included.~~
- 4) ~~3 CAS index are those used in the 9th Collective Index.~~
- 5) ~~Suggested Methods refer to analytical procedure numbers used in EPA Report SW-846 "Test Methods for Evaluating Solid Waste", third edition, November 1986, as revised, December 1987. Analytical details can be found in SW-846 and in documentation on file at the agency. CAUTION: The methods listed are representative SW-846 procedures and may not always be the most suitable method(s) for monitoring an analyte under the regulations.~~
- 6) ~~Practical Quantitation Limits (PQLs) are the lowest concentrations of analytes in groundwaters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQLs listed are generally stated to one significant figure. PQLs are based on 5 mL samples for volatile organics and 1 L samples for~~

- semivolatile organics. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for individual compounds; PQLs are not a part of the regulation.)
- ((7)) 4 This substance is often called Bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2"-oxybis[2-chloro- (CAS RN 39638-32-9).
 - ((8)) 5 Chlordane: This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6). ((PQL shown is for technical chlordane. PQLs of specific isomers are about 20 µg/L by method 8270.))
 - ((9)) 6 Polychlorinated biphenyls (CAS RN 1336-36-3); this category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN 11104-28-2), Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5). ((The PQL shown is an average value for PCB congeners.))
 - ((10)) 7 Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.
 - ((11)) 8 Xylene (total): This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7). ((PQLs for method 8021 are 0.2 for o-xylene and 0.1 for m- or p-xylene. The PQL for m-xylene is 2.0 µg/L by method 8020 or 8260.

APPENDIX IV

PARAMETERS FOR LEACHATE ANALYSIS

Appendix I[†] Parameters

Appendix II Parameters

Nitrite

Total Coliform

COD

BOD

Cyanide

†All metals analysis should be for total recoverable metals, for the leachate analysis only.

Important Note: All other appendices require dissolved metals (field filtration for metals.)

[Statutory Authority: Chapter 70.95 RCW and 40 CFR 258. 93-22-016, § 173-351-990, filed 10/26/93, effective 11/26/93.]

NOTES:

Reviser's Note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.