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ECOLOGY
State of Washington

Final Cost-Benefit and Least-Burdensome Alternative Analyses

Chapter 173-351 WAC
Criteria for Municipal Solid Waste Landfills

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Chapter 173-351 WAC
Criteria for Municipal Solid Waste Landfills

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Executive Summary

This report presents the economic analyses performed by the Washington State Department of Ecology ("Ecology") to estimate the costs and benefits of adopted amendments to the *Criteria for Municipal Solid Waste Landfills* rule (chapter 173-351 WAC; "the rule"). These analyses – the Cost-Benefit Analysis (CBA) and Least-Burdensome Alternative Analysis (LBA) – are based on the best available information at the time of publication.

The adopted rule amendment adds two chemicals to the Appendix III list in WAC 173-351-990. These chemicals are 2,3,7,8 TCDD (2,3,7,8-Tetrachlorodibenzo-p-dioxin, CAS 1746-01-6) and Phentermine (alpha,alpha-Dimethylphenethylamine, CAS 122-09-8). No other changes are part of this adoption. When a municipal solid waste landfill finds a statistically significant increase in a contaminant listed in Appendix I of WAC 173-351-990, during routine *detection* monitoring, the landfill must then perform additional *assessment* monitoring for the expanded list of potential pollutants in Appendix III.

We conclude, based on reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the adopted rule, that the benefits of the adopted rule amendments are greater than the costs.

Costs:

Total costs of the adopted rule compared to the baseline:

Annual Costs		**20-year Present Value Costs**	
Low	High	Low	High
$168,600	**$180,800**	**$3 million**	**$3.2 million**

We emphasize that Ecology sees this as a very conservative, high-end estimate. Landfills that do not enter assessment monitoring or that are able to cease assessment monitoring will not incur costs. Additionally, landfills that perform assessment monitoring will not incur costs unless they find dioxin as a result of annual assessment monitoring.

Benefits:

- Improve compliance with federal program requirements, thus avoiding potential liability associated with simple failure to comply.
- Reduce the-risk of more extensive contamination from the two added chemicals, resulting in reduced costs of liability and cleanup.
- Support full federal approval of the state program, allowing for use of RD&D permits, resulting in improved flexibility and cost savings for businesses and communities that fund landfills using these permits.
- Potential development of better technologies for control of multiple contaminants, that could benefit landfills developing them as well as landfills that use them in the future.

- Increased ability to identify trends in contamination with the added contaminants, reducing risk and liability of significant contamination.

Ecology assessed alternatives to elements of the adopted rule, and determined whether they met the goals and objectives of the authorizing statutes. Of those that would meet these goals and objectives, Ecology determined that those chosen for the adopted rule were the least burdensome.

This analysis has not changed from the Proposed Cost-Benefit and Least-Burdensome Alternative Analyses issued at the rule proposal. No comments were received on the analysis, and the adopted rule content is the same as the proposed rule.

Chapter 1: Background and Introduction

1.1 Introduction

This report presents the economic analyses performed by the Washington State Department of Ecology ("Ecology") to estimate the costs and benefits of the adopted amendments to the *Criteria for Municipal Solid Waste Landfills* rule (chapter 173-351 WAC; "the rule"). These analyses – the Cost-Benefit Analysis (CBA) and Least-Burdensome Alternative Analysis (LBA) – are based on the best available information at the time of publication.

The Washington Administrative Procedure Act (APA; RCW 34.05.328) requires Ecology to evaluate significant legislative rules to "determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the law being implemented." Chapters 1 through 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

This analysis has not changed from the Proposed Cost-Benefit and Least-Burdensome Alternative Analyses issued at the rule proposal. No comments were received on the analysis, and the adopted rule content is the same as the proposed rule.

1.2 Description of the adopted rule amendments

The adopted rule amendments add two chemicals to the Appendix III list in WAC 173-351-990. These chemicals are 2,3,7,8 TCDD (2,3,7,8-Tetrachlorodibenzo-p-dioxin, CAS 1746-01-6) and Phentermine (alpha,alpha-Dimethylphenethylamine, CAS 122-09-8). No other changes are being adopted.

When a the operator of a municipal solid waste landfill finds a statistically significant increase in a contaminant listed in Appendix I of WAC 173-351-990, during routine *detection* monitoring, the landfill must then perform additional *assessment* monitoring for the expanded list of potential pollutants in Appendix III.

1.3 Reasons for the adopted rule amendments

Ecology previously amended the rule in 2012, but did not include the complete list of Appendix III chemicals as would have been consistent with the federal rule (40 CFR Part 258). Due to this omission:

- Ecology could not obtain full federal approval of the state program as planned. Without full approval, EPA cannot authorize our provision for Research, Development, and Demonstration (RD&D) permits allowing for use of new or innovative technologies, and any associated financial benefits or incentives.
- There is potential for ongoing contamination with these two chemicals, including contaminating groundwater or causing the establishment of a cleanup site under the Model Toxics Control Act law and Cleanup rule ("MTCA"; chapter 70.105D RCW and 173-240 WAC).
- Landfills which omit required monitoring for these pollutants because they are not reflected in the state program, will be out of compliance with federal requirements.

Ecology is therefore adopting amendments that would bring the state rule in line with the federal rule, allow for full federal approval of the state program, and ensure federally compliant monitoring at sites where assessment monitoring is required.

1.4 Document organization

The remainder of this document is organized in the following chapters.

- Baseline and the adopted rule amendments (Chapter 2): Description and comparison of the baseline (what would occur in the absence of the adopted rule amendments) and the adopted changes to rule requirements.
- Likely costs of the adopted rule amendments (Chapter 3): Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the adopted rule amendments.
- Likely benefits of the adopted rule amendments (Chapter 4): Analysis of the types and size of benefits we expect to result from the adopted rule amendments.
- Cost-benefit comparison and conclusions (Chapter 5): Discussion of the complete implications of the CBA, and comments on the results.
- Least-Burdensome Alternative Analysis (Chapter 6): Analysis of considered alternatives to the contents of the adopted rule amendments.

Chapter 2: Baseline and the Adopted Rule Amendments

2.1 Introduction

We analyzed the impacts of the adopted rule relative to the baseline of the existing rule, within the context of all existing requirements (federal and state laws and rules). This context for comparison is called the baseline, and reflects the most likely regulatory circumstances that municipal solid waste landfills would face if the adopted rule were not adopted. It is discussed in detail in Section 2.2, below.

2.2 Baseline

The baseline for our analyses generally consists of existing rules and laws, and their requirements. For economic analyses, the baseline also includes the implementation of those regulations, including any guidelines and policies that result in behavior changes and real impacts. This is what allows us to make a consistent comparison between the state of the world with or without the adopted rule amendments. In this case we will assume that landfills required to perform assessment monitoring have already incurred an obligation from the federal rules to perform an annual monitoring event, and semi-annual monitoring for any constituents identified in the annual event. Therefore the increment resulting from adopted changes in state program rules will be two analytical events per year, as the state requires quarterly instead of semiannual monitoring. For this rulemaking, we discuss the baseline below, including the:

- Federal rule: Criteria for Municipal Solid Waste Landfills (40 CFR Part 258).
- State law: Solid Waste Management – Reduction and Recycling (chapter 70.95 RCW).
- Existing state rule: Criteria for Municipal Solid Waste Landfills (chapter 173-351).
- Other regulations pertaining, e.g., to cleanup in the event a landfill becomes a cleanup site, such as the MTCA statute (chapter 70.105D RCW) and its implementing rule, the MTCA Cleanup regulation (chapter 173-240 WAC).

2.2.1 Federal rule

The federal rule (40 CFR Part 258) sets out requirements for municipal solid waste landfills (MSWLFs), including requirements for groundwater monitoring.

As is specifically significant to this rulemaking, the federal rule requires an annual assessment monitoring of an expanded list of potential pollutants at MSWLFs that find statistically significant increases in a smaller set of potential pollutants they are required to routinely monitor. Any pollutant found as a result of the annual event must be monitored semiannually. This is addressed further in section 2.3 of this document.

In 2004, the U.S Environmental Protection Agency (EPA) amended the federal rule to allow MSWLFs to obtain Research, Development, and Demonstration (RD&D) permits for new, existing, and lateral expansions. The purpose of the RD&D component is to expand the variance authority for innovative or new technologies or methods beyond the authority that already exists in state rules for MSWLF criteria. RD&D permits provide a variance from existing requirements for run-on control systems, liquid restrictions, and the final cover requirements.

2.2.2 State law

The state law (chapter 70.95 RCW) directs Ecology to adopt rules establishing minimum functional standards for solid waste handling. Ecology has determined that compliance with federal requirements is necessary in order to achieve federal approval of the state program and avoid a potential bifurcation in the regulatory system.

2.2.3 State rule

The state rule (chapter 173-351 WAC) sets out specific behaviors, processes, and standards that regulate MSWLFs, including:

- Definitions
- Consideration of other local, state, and federal laws
- Location restrictions
- Operating criteria
- Plan of operation
- Design criteria
- Groundwater monitoring systems and remedial action
- Performance standards for groundwater monitoring system designs
- Groundwater sampling and analysis requirements
- Groundwater reporting
- Statistical methods for groundwater reporting
- Detection monitoring program
- Assessment monitoring program
- Alternate groundwater monitoring programs
- Role of jurisdictional health departments
- Role of the Department of Ecology
- Groundwater modeling
- Hydrogeologic report contents
- Closure and post-closure care
- Financial assurance criteria
- Permitting requirements
- Research, development, and demonstration permits
- Permit application procedures
- Contents of applications
- Permit issuance criteria
- Permit provisions
- Appeals

As is specifically significant to this adopted rulemaking, when assessment monitoring is required, the existing state rule requires quarterly monitoring of any potential pollutants identified in the annual assessment. This is addressed further in section 2.3 of this document.

2.3 Adopted rule amendments

The adopted rule amendments are intended to make the list of contaminants that MSWLFs must monitor under assessment monitoring (if they trigger it) consistent with the list in the federal rule. Specifically, the adopted rule would add 2,3,7,8-Tetrachlorodibenzo-p-dioxin (CAS 1746-01-6) and alpha,alpha-Dimethylphenethylamine (CAS 122-09-8) to the Appendix III list of contaminants.

Only one requirement of the adopted and existing state rules differs from the federal rule: *quarterly rather than twice-yearly assessment monitoring*. The adopted amendments mean that a landfill that triggers assessment monitoring **and** finds one or both contaminants in its initial assessment or during an annual assessment thereafter, would have to analyze for them twice more per year than the minimum under the federal rules. . Landfills that do not find these potential pollutants in their preliminary or annual assessment monitoring are not required to analyze for them quarterly during the rest of the year. All of the other requirements of the adopted rule are the same as those in the existing rule, and we do not expect any additional changes in behavior to result from the adopted rule.

The likely costs and benefits of the additional twice-yearly (quarterly rather than only two times each year) monitoring behavior are discussed in chapters 3 and 4 of this document.

Chapter 3: Likely Costs of the Adopted Rule Amendments

3.1 Introduction

We estimated the likely costs associated with the adopted rule amendments, as compared to the baseline. Amendments and the baseline are discussed in detail in Chapter 2 of this document. Only one change in behavior is expected as a result of the adopted rule, and it is likely to generate monitoring costs – labor and testing costs – at the subset of facilities that trigger assessment monitoring.

3.2 Monitoring costs

There are 25 landfills operating in Washington State that might be, or are, presently subject to groundwater assessment monitoring under the baseline. These landfills are open and accepting municipal solid waste, or were closed under the baseline rule, and are subject to post-closure care requirements that include groundwater monitoring. Of these 25 facilities, 12 are currently performing assessment monitoring.

As discussed in Chapter 2, the adopted rule will potentially generate only one change in behavior: an increase in monitoring of two events per year (four quarterly rather than two annual) for the two potential pollutants Ecology is adopting to add to Appendix III of the state rule. Ecology made a very conservative assumption that all landfills presently in assessment monitoring would in fact be obligated to monitor for the two pollutants on a quarterly basis. Ecology believes most facilities will not find them during preliminary or annual assessment monitoring, and will not be required to monitor for them quarterly.

3.2.1 Number of wells

Monitoring occurs at wells, and the number of wells varies by facility. It is, in practice, difficult to determine the total number of wells impacted by this rulemaking, due to the existence of:

- Wells that are not part of a monitoring network.
- Closed cells of a landfill where existing wells monitor both closed and open cells.
- Wells that are down-gradient and/or up-gradient from other wells.
- Abandoned wells.

For this analysis, we used a conservatively inclusive number of wells at the 25 landfills that might be affected by the adopted rule. Regional hydrogeologists in the Waste 2 Resources Program reviewed facility files and identified 235 wells potentially subject to monitoring:

- 167 down-gradient
- 68 up-gradient

Of the above 25 landfills, 12 are currently performing assessment monitoring, representing a subset of 160 wells including:

- 119 down-gradient
- 41 up-gradient

None of the facilities have been identified as routinely monitoring for either of the potential pollutants as part of assessment monitoring.

Table 1 summarizes the numbers and circumstances of wells for this analysis:

Table 1: Landfill monitoring wells

	Number of Wells
All wells at 25 facilities	235
Assessment monitoring currently in place	160
No current assessment monitoring	75

3.2.2 Testing costs

We contacted six labs requesting typical retail costs for analysis of 2,3,7,8-TCDD and Phentermine. Only two labs provided costs, consistent with one another and Ecology's general expectation from professional experience. The estimated incremental costs were:

- Phentermine: This chemical is typically analyzed in conjunction with other pollutants of similar character. Labs performing assessment monitoring would be able to provide data with no significant additional cost.
- 2,3,7,8-TCDD: One lab estimated the cost of this testing at $425, while the other gave a range between $500 and $570. The actual costs would vary depending on the matrix, the number of samples, the level of detection required, and the response time requested from the lab. For this analysis, we used the median estimate of $500 per test.

If we assume that all facilities currently performing assessment monitoring will find dioxin in annual assessment monitoring events, then an additional 160 wells would be included at an additional $500 cost twice per year. Ecology looks at a 20-year timeframe in its analysis (to include short- and long-term impacts), and this additional $160 thousand annual cost translates to

approximately **$2.8 million in present value cost over 20 years** (2016 through 2035), at a real discount rate of 1.21 percent.[1]
There are 75 remaining wells at facilities that are not currently performing assessment monitoring. While Ecology believes it is unlikely that these additional wells will all enter assessment monitoring in the future, an additional 75 wells would increase costs proportionally by 47 percent, or $1.3 million in present value testing costs over 20 years. For illustration, each additional well entering assessment monitoring would increase costs by less than 1 percent.

3.2.3 Labor costs

Monitoring requires additional professional and administrative effort as well, including:

- Taking samples
- Analytic costs
- Reporting and recordkeeping

Sampling costs

We assumed that a professional engineer or environmental technician would require between 15 and 30 minutes per well to take samples. As additional monitoring would only be necessary at landfills that are already performing assessment monitoring, we did not include costs such as travel to the landfill, as they would already be incurred under the baseline. It is important to note that only 2,3,7,8-TCDD monitoring would require additional sampling, as sampling for Phentermine testing would already be covered by existing sampling for semi-volatile contaminants under the baseline.

The median wage for environmental engineers is currently $43.36 per hour, and is $31.74 per hour for environmental technicians.[2] As this activity is likely to be performed as part of regular internal job duties, we did not include an overhead premium.

Total sampling costs for 160 wells at the wages and times above lead to an estimated annual cost of approximately $2.500 to $6,900 per year. Ecology looks at a 20-year timeframe in its analysis (to include short- and long-term impacts), and this additional annual cost translates to an approximate **$45 thousand to $123 thousand in present value cost over 20 years** (2016 through 2035), at a real discount rate of 1.21 percent.[3]

There are 75 remaining wells at facilities that are not currently performing assessment monitoring. While Ecology believes it is unlikely that these additional wells will all enter assessment monitoring in the future, an additional 75 wells would increase costs proportionally

[1] 1.21 is the average risk-free rate of return on inflation-adjusted I-Bonds issued by the US Treasury Department, since 1998. This time period includes various economic circumstances, including times of both exceptionally high and low rates of return that have occurred during good and bad economic times.

[2] US Bureau of Labor Statistics (2014). May 2014 State Occupational Employment and Wage Estimates for Washington. Inflation adjustment of -0.08 percent from $43.71 and $32, respectively.

[3] 1.21 is the average risk-free rate of return on inflation-adjusted I-Bonds issued by the US Treasury Department, since 1998. This time period includes various economic circumstances, including times of both exceptionally high and low rates of return that have occurred during good and bad economic times.

by 47 percent, or $21 thousand to $57 thousand in present value sampling costs over 20 years. For illustration, each additional well entering assessment monitoring would increase costs by less than 1 percent.

Analytical costs

Analytical labor costs for this analysis were assumed to be included in lab costs, discussed above in section 3.2.2. The lab would perform all necessary analytical work for the landfill.

Reporting and recordkeeping costs

We conservatively assumed an environmental technician or professional engineer would require an additional 30 minutes to one hour, per well, per additional monitoring event, for recordkeeping and reporting.

The median wage for environmental engineers is currently $43.36 per hour, and is $31.74 per hour for environmental technicians.[4] As this activity is likely to be performed as part of regular internal job duties, we did not include an overhead premium.

Total recordkeeping and reporting costs for 160 wells at the wages and times above lead to an estimated annual cost of approximately $5,100 to $13,900 per year. Ecology looks at a 20-year timeframe in its analysis (to include short- and long-term impacts), and this additional annual cost translates to an approximate **$90 thousand to $245 thousand in present value cost over 20 years** (2016 through 2035), at a real discount rate of 1.21 percent.[5]

There are 75 remaining wells at facilities that are not currently performing assessment monitoring. While Ecology believes it is unlikely that these additional wells will all enter assessment monitoring in the future, an additional 75 wells would increase costs proportionally by 47 percent, or $42 thousand to 115 thousand in present value reporting and recordkeeping costs over 20 years. For illustration, each additional well entering assessment monitoring would increase costs by less than 1 percent.

3.3 Summary of the likely costs of the adopted rule amendments

We estimated the costs of requiring an additional two samples per year under assessment monitoring for the two pollutants adopted to be added to the state rule. There are two important assumptions here. First, we did not speculate on landfills that might be required to monitor in the future. While this may under predict costs, we also did not account for landfills that would complete assessment monitoring and drop out of the calculation. Further, it seems unlikely that all facilities will eventually be required to perform assessment monitoring, and even if so, certainly not for dioxin in every case. Secondly, for those landfills currently performing

[4] US Bureau of Labor Statistics (2014). May 2014 State Occupational Employment and Wage Estimates for Washington. Inflation adjustment of -0.08 percent from $43.71 and $32, respectively.

[5] 1.21 is the average risk-free rate of return on inflation-adjusted I-Bonds issued by the US Treasury Department, since 1998. This time period includes various economic circumstances, including times of both exceptionally high and low rates of return that have occurred during good and bad economic times.

assessment monitoring, we assumed that all wells not currently analyzed for dioxin would have to be analyzed an additional two times per year. The reality is that we expect few to find dioxin and therefore the estimates below are very conservative (high end costs). Table 2 summarizes those costs of the adopted rule.

Table 2: Costs of the adopted rule compared to the baseline

Cost	Annual		20-year Present Value	
	Low	**High**	**Low**	**High**
Lab analysis	$160,000	$160,000	$2.8 million	$2.8 million
Sampling	$2,500	$6,900	$45 thousand	$123 thousand
Recordkeeping and reporting	$5,100	$13,900	$90 thousand	$245 thousand
TOTAL	**$168,600**	**$180,800**	**$3 million**	**$3.2 million**

Chapter 4: Likely Benefits of the Adopted Rule Amendments

4.1 Introduction

We estimated the likely benefits associated with the adopted rule amendments, as compared to the baseline (both described in Chapter 2 of this document). The APA requires inclusion of quantifiable and qualitative impacts of the adopted rule. We could not quantify the benefits of the adopted rule with a sufficient degree of confidence, so we describe the benefits qualitatively in this chapter.

4.2 Consistency with the federal rule

The adopted addition of two chemicals to bring the state rule in line with the federal rule would allow for full approval of the state program. In turn, that will allow EPA to officially approve the state's RD&D program (below). Under the baseline, landfills could omit testing for 2,3,7,8-TCDD and Phentermine under assessment monitoring, even though it is required by federal rule. This would put them out of compliance with federal program requirements even if they are complying with the state program.

If landfills fail to catch these contaminants on site, they risk contamination that could lead to liability to adjacent properties, as well as increasing the likelihood the landfill becomes a cleanup site. Becoming a cleanup site could limit activity at the landfill, and incur costs of comprehensive cleanup and institutional controls.

4.3 RD&D permits

A fully federally approved state MSWLF program allows for Research, Development, and Demonstration provisions. These permit variances allow for use of new or innovative technologies, and may include associated financial incentives for landfills that use them. Cost savings from RD&D flexibility depends on the specifics of the landfill and innovative technology, and EPA was also not able to quantify this benefit.[6]

An additional aspect of this benefit is its prospective contribution to evaluation and development of more-efficient technologies at landfills, resulting in cost-savings to the businesses and communities that develop them, as well as those that later use them.

[6] EPA final rule issuance fact sheet (2003).

4.4 Improved seasonal coverage of contaminants

By requiring quarterly monitoring of the added contaminants, the adopted rule is likely to cause timelier identification of contamination at MSWLFs. Groundwater quality can vary seasonally, so quarterly monitoring is the standard for facilities under state jurisdiction. Quarterly monitoring is more likely to identify trends that might otherwise be overlooked with less-frequent monitoring. If landfills are more able to identify significant contamination with 2,3,7,8 TCDD and Phentermine earlier, or identify trends in contamination that should receive added attention, they are more likely to avoid significant site contamination, and the liability and risk associated with it.

4.5 Summary of the likely benefits of the adopted rule amendments

From the qualitative discussion and results above, we determined that the adopted rule amendments would:

- Improve compliance with federal program requirements, thus avoiding potential liability associated with simple failure to comply
- Reduce the-risk of more extensive contamination from the two added chemicals, resulting in reduced costs of liability and cleanup.
- Support full federal approval of the state program, allowing for use of RD&D permits, resulting in improved flexibility and potential cost savings for businesses and communities that fund landfills using these permits.
- Potential development of better technologies for control of multiple contaminants, that could benefit landfills developing them as well as landfills that use them in the future.
- Increased ability to identify trends in contamination with the added contaminants, reducing risk and liability of significant contamination.

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of the costs and benefits of the adopted rule amendments

Ecology determined that, compared to the baseline discussed in Chapter 2 of this document, the adopted rule has the following costs and benefits:

Costs:

Table 3: Total costs of the adopted rule compared to the baseline

Annual Costs		20-year Present Value Costs	
Low	High	Low	High
$168,600	**$180,800**	**$3 million**	**$3.2 million**

Again, we emphasize that Ecology sees this as a very conservative, high end estimate. Landfills that do not enter assessment monitoring or that are able to cease assessment monitoring will not incur costs. Additionally, landfills that perform assessment monitoring will not incur costs unless they find dioxin as a result of annual assessment monitoring.

The estimates above reflect possible costs for 160 wells at facilities currently performing assessment monitoring. There are 75 additional wells that are not currently part of assessment monitoring Ecology believes it is unlikely that all of these wells will become part of assessment monitoring, but for illustration, each additional well that is part of assessment monitoring increases costs (and implicitly benefits) by less than one percent.

Benefits:

- Improve compliance with federal program requirements, thus avoiding potential liability associated with simple failure to comply
- Reduce the-risk of more extensive contamination from the two added chemicals, resulting in reduced costs of liability and cleanup.
- Support full federal approval of the state program, allowing for use of RD&D permits, resulting in improved flexibility and cost savings for businesses and communities that fund landfills using these permits.
- Potential development of better technologies for control of multiple contaminants, that could benefit landfills developing them as well as landfills that use them in the future.
- Increased ability to identify trends in contamination with the added contaminants, reducing risk and liability of significant contamination.

5.2 Conclusion

We conclude, based on reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the adopted rule, that the benefits of the adopted rule amendments are greater than the costs.

Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05328(1)(e) requires Ecology to "…[d]etermine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection." The referenced subsections are:

(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements.

(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule.

(c) Provide notification in the notice of adopted rule making under RCW 34.05.320 that a preliminary cost-benefit analysis is available. The preliminary cost-benefit analysis must fulfill the requirements of the cost-benefit analysis under (d) of this subsection. If the agency files a supplemental notice under RCW 34.05.340, the supplemental notice must include notification that a revised preliminary cost-benefit analysis is available. A final cost-benefit analysis must be available when the rule is adopted under RCW 34.05.360.

In other words, Ecology is required to determine that the contents of the rule are the least burdensome set of requirements that still achieve the goals and objectives of the authorizing statute(s).

Ecology assessed alternatives to elements of the adopted rule, and determined whether they met the goals and objectives of the authorizing statutes. Of those that would meet these goals and objectives, Ecology determined whether those chosen for the adopted rule were the least burdensome.

6.2 Goals and objectives of authorizing statutes

6.2.1 Solid Waste Management – Reduction and Recycling (chapter 70.95 RCW)

Goals and objectives of the statute include, but are not limited to:

- Establish a comprehensive statewide program for solid waste handling, and solid waste recovery and/or recycling which will prevent land, air, and water pollution and conserve the natural, economic, and energy resources of this state.

- To assign primary responsibility for adequate solid waste handling to local government, reserving to the state, however, those functions necessary to assure effective programs throughout the state.
- To provide for the adoption and enforcement of basic minimum performance standards for solid waste handling, including that all sites where recyclable materials are generated and transported from shall provide a separate container for solid waste.

6.3 Alternatives considered and why they were not included

As part of this rulemaking, Ecology considered alternatives to the rule content being adopted. These include:

- Not amending the existing rule.

  Not amending the existing rule would have prevented full federal approval of the state program, including federal approval of RD&D permits. This would not be effective to "prevent land, air, and water pollution and conserve the natural, economic, and energy resources of this state."

- Adding additional chemicals to Appendix III.

  Ecology chose the two chemicals it is adopting to add to Appendix III of the adopted rule language, based on the list in Appendix II of the federal rule. This should be all that is necessary to bring the two rules in line and put Ecology in position to obtain federal approval of the rule. Adding additional chemicals beyond the two identified would have increased burden on landfills, and is not necessary to achieve federal approval.

- Adding only one of the two additional chemicals to Appendix III.
  Like not amending the existing rule at all, adding only one of the two chemicals (regardless of which one) would have resulted in the state rule remaining inconsistent with the federal rule, preventing full program approval and EPA's approval of our Research, Development and Demonstration program. This would not be consistent with statutory goals, and would not be effective to "prevent land, air, and water pollution and conserve the natural, economic, and energy resources of this state." It would also not have met multiple objectives that encourage development and effective disposal, limit cost burden, or use private industry to encourage development of programs.

6.4 Conclusion

After considering alternatives to the adopted rule's contents, as well as the goals and objectives of the authorizing statute, Ecology determined that the adopted rule represents the least-burdensome alternative of possible rule contents meeting these goals and objectives.