Dangerous Waste Regulatory Reform Project

Policy Report

Washington State Department of Ecology
Hazardous Waste and Toxics Reduction Program
January, 1995
Publication #95-403, Part A

Reduce Waste

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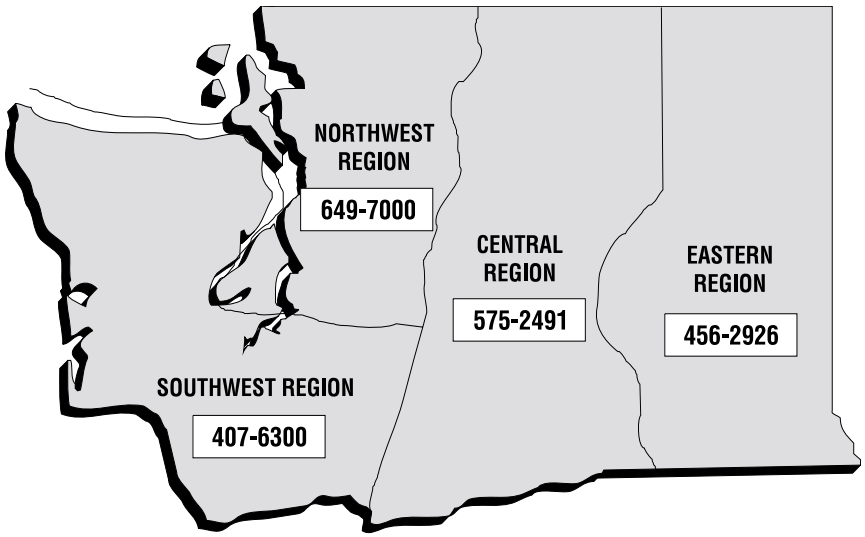

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Executive Summary

Ecology completed the first phase of the Dangerous Waste Regulatory Reform Project in November of 1994. The goals of the project were:

- Simplify the regulations while retaining environmental protection
- Tailor management standards for wastes to the risks associated with the wastes
- Consider cost effective management standards
- Emphasize pollution prevention where possible
- Use current science for waste designation

As a result of the review, Ecology is considering recommendations for significant changes to the *Dangerous Waste Regulations*:

Toxicity

Retain the measure of acute toxicity as a dangerous waste classification. It is a well established, reproducible test. In addition, extensive information on acute toxicity makes it possible to book designate dangerous waste.

Adjust the aquatic bioassay designation level for dangerous waste from 1000 mg/L to 100 mg/L. The level of 100 mg/L represents an equivalent measure of hazard as the rat bioassay designation level of 5000 mg/kg.

Simplify application of the Extremely Hazardous Waste (EHW) term so that 1) the designation level becomes consistent with the EPA's acutely-hazardous waste designation level and 2) the term does not apply to federal waste streams; and 3) it is not a designation step for the vast majority of generators.

Persistence

Retain the persistence classification of dangerous waste, including the halogenated hydrocarbon and polycyclic aromatic hydrocarbon (PAH) test. Update the PAH test with a modern analytical test method.

Carcinogenicity

Eliminate the carcinogenicity classification. Waste stream analysis has shown that the listed carcinogens normally found in wastes also appear in the persistence or toxicity classifications of the *Dangerous Waste Regulations* or the EPA's RCRA Hazardous Waste Rule. The persistence and toxicity classifications will be relied on to capture carcinogenic dangerous waste.

EPA Exclusions not Previously Recognized by Ecology

Waste management practices in Washington and potential environmental effect influence the decision to adopt or not adopt the exclusions. Ecology recommends adopting the following EPA exclusions:

- 10 percent Solvent Rule
- Non-waste water splash condenser residue
- Spent wood preserving solutions that have been reclaimed
- Trivalent Chromium
- Non-terne plated used oil filters
- Used oil re-refining distillation bottoms used to make manufactured asphalt

Ecology recommends not to adopt exclusions for the following wastes:

- Source special nuclear or byproduct material
- Fly ash, bottom ash, slag waste, and flue gas from coal or fossil fuel combustion
- Drilling fluids
- Waste from extraction, beneficiation and processing of ores and minerals
- Cement kiln dust

Polychlorinated biphenyls (PCBs)

Delete the rinsing requirement for electrical equipment to minimize waste generation. Exclude PCB waste managed according to the Toxic Substances Control Act, or the new used oil management standards. Allow de minimis quantities of PCB solids to be managed as special waste.

Solid Corrosives

Retain this classification because of potential hazard to human health and the environment.

Special Waste

Exclude special wastes, which is defined as solid dangerous waste not regulated by the EPA **and** not Extremely Hazardous Waste, from the *Dangerous Waste Regulations* when specific requirements are met. This conditional exclusion creates a tailored management standard for lower hazard wastes. Conditions for the exclusion include performance standards, a time limit for on-site management and transportation, record-keeping, and pollution prevention requirements. In addition, wastes destined for disposal must be managed according to the Municipal Solid Waste Management Facility Standards, Chapter 173-351 WAC.

Accumulation Standards

Raise accumulation levels for small quantity generators from 220 to 2200 pounds. This level will be consistent with EPA's standards, and will make it cost effective for small quantity generators to use a commercial hazardous waste transporter.

Petition Process

Develop guidance for use by Ecology staff and the regulated community to improve the efficiency of the petitions process to exempt or exclude dangerous waste.

Ecology believes that these proposed changes will not significantly impact the environment. Washington has one of the most comprehensive state hazardous waste programs in the nation. The proposed rule revisions will enhance environmental protection by enabling faster, better and more predictable waste management decisions.

Introduction

This report summarizes recommendations from Phase 1 of the Dangerous Waste Regulatory Reform Project. The project was initiated in November 1993, and includes two phases. Phase 1, completed in November 1994, consisted of a policy level review of the waste classifications that exceed minimum federal standards. Phase 2 will amend the *Dangerous Waste Regulations* to carry out the policy recommendations described in this report.

The Department of Ecology (Ecology) made the recommendations in this report by analyzing information collected over the last fifteen years, conducting research, and consulting with a broad-based advisory committee. The committee's advice, questions, concerns and suggestions were extremely valuable to this project. It is important to note, however, that Ecology did not receive consensus recommendations on these issues from the committee. In fact, some members of the committee took strong exception to several of these recommendations. The final recommendations described in this report were decided solely by Ecology, and do not reflect on the individual views of any of the committee members.

Ecology initiated the regulatory reform project for several reasons. The original system was established more than fifteen years ago when very little information was available on classifying wastes. A battery of tests to distinguish between solid wastes and dangerous wastes backed the philosophy behind the system. The federal Resource Conservation and Recovery Act (RCRA) system was established shortly after our state system and was dramatically expanded in 1984. The federal system uses lists of hazardous wastes with a few supplemental tests. Washington State adopted equivalents to the federal regulations in order to carry out the state dangerous waste program.

The standards for managing solid wastes also changed dramatically over the last fifteen years. In the 1970's, regulations allowed the disposal of solid waste in old gravel pits with no engineered protection. Standards for solid waste now resemble the hazardous waste requirements. The addition of liners, leachate collection, monitoring systems, and siting criteria make the solid waste system the "safety net" for wastes not designated as dangerous wastes.

The Dangerous Waste Regulatory Reform Project was initiated because:

- The existing system is over fifteen years old and ready for a thorough tune-up
- Improvements in the federal system call into question the need for some state-only requirements
- The solid waste management "safety net" has improved dramatically
- Melding the original state system with the federal system has produced an extremely complicated regulation that is difficult to consistently implement across the state.

The goals of the project include:

- Simplify the regulations while retaining environmental protection
- Tailor management standards for wastes to the risks associated with the wastes
- Consider cost effective management standards
- Emphasize pollution prevention where possible
- Use current science for waste designation

The *Dangerous Waste* Regulations,

Chapter 173-303 WAC, name the following classifications of waste that are not included in the federal RCRA hazardous waste program: Toxicity, Persistence, Carcinogenicity, Solid Corrosive, PCB, and Federal Exclusions not recognized by Ecology.

In addition to reviewing the existing waste classifications for this study, Ecology also reviewed options for regulating wastes with mutagenic and teratogenic constituents. Reference to these wastes appears in the initial authorizing legislation for dangerous waste (Chapter 70.105 RCW). Practical tests for these constituents were not available in 1987, so no separate tests are currently required. Ecology wanted to review the recent scientific methods to see if practical tests have been developed. Issues for small quantity generators are also addressed.

The report is organized in the same way that Ecology approached the project. One at a time, we studied each waste classification with a description of the existing classification, a summary of implementation problems with the classification, alternative approaches considered, and finally, a rationale for the selected alternative. In addition to this report, an Appendix contains the referenced issue papers and a list of advisory committee members.

The improvements to the *Dangerous Waste Regulations* ensure that Washington

Pollution Prevention

For this regulatory reform project, we considered options for pollution prevention that include market based approaches, educational approaches and regulatory options. Ecology staff and advisory committee members extensively discussed these options.

Washington already has one of the best toxics reduction planning programs in the country. Over 700 commercial facilities prepare plans for source reduction, and implement projects at their discretion. This mandatory reduction and voluntary implementation program already has reduced hazardous waste generation by 23,000,000 pounds per year. We hoped to build additional incentives into the regulations through this project.

However, we agree that most of the pollution prevention options are either difficult to implement or will not significantly decrease pollution. The most practical approach for pollution prevention that surfaced requires all waste conditionally excluded under the Special Waste section to be addressed in pollution prevention plans. In addition, liquid wastes would be ineligible for contingency management.

This is noteworthy in that annual report data submitted to Ecology indicate that virtually all of the special waste currently recycled is liquid. Excluding liquid wastes from contingency management significantly reduces opportunities for disposing waste that otherwise would be treated or recycled.

Ecology is committed to reducing hazardous waste and toxic substances in Washington State. We will continue to look for new ways to preserve our state's environmental quality by emphasizing source reduction, reuse and recycling.

Acute Toxicity Classification

remains a nationwide leader in waste management.

Recommendation:

Maintain a classification of acute toxicity; adjust the fish bioassay designation level to make it equivalent to the rat bioassay designation levels

Existing Toxicity Classification in 173-303 WAC

RCW 70.105 directs Ecology to regulate toxic waste as dangerous waste. Current standards regulate toxic dangerous waste when it fails a fish bioassay test at concentrations of 1000 mg/L or less, or if the waste fails a rat bioassay test at a concentration of 5000 mg/kg or less. Analytical methods are prescribed for both of these tests.

Ecology adopted this toxicity categorization scheme in 1978. It is based on the EPA Hazardous Materials Spill Regulations categorization of aquatic toxicity (Section 311 of P. L. 92-500) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) categorization for pesticides.

The state adapted the Category D level of 5000 mg/kg oral rat from the FIFRA categorization scheme for the floor of the toxicity classification. In 1978, lack of information made it impossible to establish an aquatic toxicity level equivalent to the rat toxicity level. The EPA spill regulation listed 500 mg/L for aquatic toxicity as a level of concern. Ecology rounded this number to 1000 mg/L so waste categories could be divisible by 10, and they could be correlated with the rat bioassay level.

The present categorization scheme for toxic waste in WAC 173-303-100 includes the bioassay categories listed in Table 1.

Substantial literature exists regarding the toxicity of compounds. When the dangerous waste rule was first developed in 1978, book designation was permitted to designate wastes in order to take advantage of this information. Book designation uses literature values to establish the toxicity of constituents in a waste, and sums them to determine the toxicity of the waste.

1. Current Toxic Waste Categorization Scheme 173-303-100 WAC

ToxicCategory	Aquatic LD50 (ppm)	Oral Rat LD50 (mg/kg)
X	<.1	<.5
A	.1 - <1	.5 - <5
B	1 - <10	5 - <50
C	10 - <100	50 - <500
D	100 - <1000	500 - 5000

Originally, Category D toxic wastes (acute oral rat toxicity of 500 mg/kg - 5000 mg /kg) were proposed to be regulated at quantities over 10,000 pounds. It was presumed that wastes of this category only pose a hazard in large quantities. EPA established Quantity Exclusion Limits (Quantity Exclusion Limits) for hazardous waste at 220 pounds. When Ecology adopted these rule changes, we applied this regulatory level to "state-only" Category D wastes, as well as RCRA wastes, to simplify quantity exclusion limit determination. Melding the state and federal systems leaves regulated generators with the requirement of managing any quantity of Category D waste over 220 pounds as a hazardous waste.

Although Ecology used spill cleanup concentrations as a basis to establish waste designation levels, it is important to recognize that designation levels are not synonymous with spill cleanup levels. The line between hazardous and solid waste, the hazardous waste designation

level, is not related to releases of wastes to the environment. Rather, it determines the requirements for the management of solid versus hazardous waste. Neither type of waste can legally enter the environment. The levels of toxicity in the spill regulation, however, can form a legitimate starting point for developing a waste classification rule.

Waste Streams Affected

Approximately one-half of the recurrent dangerous waste (waste generated as part of a continual production process) generated in Washington State is "state-only" waste. EPA does not define it as hazardous waste, but it is considered dangerous waste under the standards of the *Dangerous Waste Regulations*, Chapter 173-303 WAC. Of this state-only waste, approximately ninety percent - 40,000 to 100,000 tons per year - falls under the toxicity criteria of Chapter 173-303 WAC, (Appendix A, Issue Paper 1). These wastes are generated primarily by the primary metals, equipment manufacturing, chemical, and transportation and utilities industries.

Implementation Problems with the Current Level of Toxicity

Problem 1

Recent scientific literature and Ecology staff analysis shows that the existing regulatory level for the fish bioassay of 1000 mg/L does not correlate well with the waste concentration level for the rat bioassay of 5000 mg/kg. Adjusting the waste concentration for the fish bioassay to 100 mg/L offers the closest approximate equivalent to the rat bioassay.

Problem 2

The current waste concentration of 1000 mg/L level deters generators from testing their wastes. Our surveys show that less than five percent of waste streams that designate as dangerous under the toxicity classification have gone through fish bioassay testing.

Problem 3

The *Dangerous Waste Regulations* regulate small quantities of moderately toxic wastes (Category D). Original rule writers intended to regulate these wastes only in quantities greater than 10,000 lbs. The design features of new municipal solid waste landfills make them possible to accommodate these wastes at substantially reduced costs (see contingency management alternatives in Section 8).

Recommendation: Continue to Use Acute Toxicity as a Dangerous Waste Classification

Ecology elects to continue using acute toxicity as the cornerstone of the dangerous waste classification system. A significant quantity of waste is regulated as dangerous through this classification. Much of this waste equals the toxicity level of waste regulated through the federal RCRA hazardous waste rule (Appendix 4, Issue Paper 1). Ecology considered alternative measures of toxicity, such as chronic toxicity, but rejects them because book designation remains the primary means of waste designation in Washington. There is far more published information on acute toxicity than other measures of toxicity. In addition, there is precedence for this approach. Waste classification systems established by EPA and other states (California, Minnesota, Oregon, Rhode Island, Alaska) use acute toxicity as a basis for their classifications (Environmental Resource Center, 1992).

Alternatives for Measuring Acute Toxicity

Alternative 1. No change. Continue to use the fish bioassay screening level of 1000 mg/L

By selecting alternative 1, Washington continues to regulate wastes that are less

hazardous than the regulatory benchmark level of 5000 mg/L oral rat. Most generators of dangerous waste will continue to estimate the toxicity of their waste by using reference information. For generators that choose to conduct a bioassay, wastes that fail the bioassay at the present level of 1000 mg/L will continue to be managed as dangerous waste, although the hazard is beyond the recognized benchmark level.

Alternative 2. Reduce the fish bioassay level to a level that corresponds with the rat bioassay level.

Hodson (1985) demonstrates that the fish bioassay is twenty-five to one hundred times (on average forty-five times) more sensitive for a waste constituent than the rat bioassay (Appendix A, Issue Paper 3 addendum). Other researchers report that the fish bioassay ranges from one to several orders of magnitude more sensitive than the rat bioassay. Ecology staff work supports these findings (Issue Paper 3 Addendum) and indicates that a fish bioassay with a waste concentration of 100 mg/L correlates most closely with a rat bioassay with concentrations of 5000 mg/kg.

EPA and other agencies use the 5000 mg/L rat bioassay is a benchmark measure of toxicity. Ecology always intended the fish bioassay to be an equivalent test to the rat bioassay. In 1978, the data were not available to align the bioassays. If data had been available, the fish bioassay would not have been established at 1000 mg/L.

Recommendation: Reduce the fish bioassay level to a level that corresponds with the rat bioassay level.

This approach aligns the fish and rat levels to create equivalence between "book designation" and testing, and removes the disincentive for conducting a bioassay to designate waste. Lowering the waste concentration requirements of the fish bioassay level would provide a more technically defensible regulation than the existing level. It also removes some of the disincentive for testing the waste.

This alternative ensures that hazardous waste management capacity will not be taken up by material generally recognized as nonhazardous.

Effect on Enviromental Protection

Some waste streams that tested as dangerous with the fish bioassay waste concentration level at 1000 mg/L will not test as dangerous with the level of 100 mg/L. However, Ecology originally intended only to regulate wastes equivalent in their hazard to those that fail the rat bioassay at 5000 mg/kg. New information demonstrates that wastes that would fail the fish bioassay at concentrations between 100 and 1000 mg/L do not represent hazardous material as Ecology defines them (Category D). Their hazard class compares to other solid wastes, and they should be managed accordingly.

With a disincentive for testing removed, Ecology expects that generators will test some wastes instead of book designating them. This gives greater certainty in waste designation, provides more actual data on wastes, and produces a net benefit to the environment.

Issue Paper 1 (Appendix A) states that the vast majority of generators use referencable data to book designate their wastes. Even with this adjustment of the fish bioassay level, it is still likely that the majority of waste streams will continue to be designated in this way. The new option will not affect them since the book designation level of 5000 mg/kg remains

Mutagenicity

the same.

The mutation of somatic cells can lead to cancer. Mutating germ cells, the cells from which new organisms may develop, can lead to teratogenesis. Therefore, mutagens are of concern because they can potentially develop into carcinogens and teratogens, more commonly called developmental toxins. Mutagenicity is addressed in the carcinogenicity and developmental

Carcinogenicity

toxicity sections.

Recommendation:

Regulate carcinogens through the toxic and persistence classifications. Discontinue the use of a separate list of carcinogens regulated at 100 ppm.

Existing Carcinogen Rule

Ecology implements the state-only criteria of carcinogenicity by referring to a list of carcinogens that appear on both the International Agency for Research on Carcinogens (IARC) list and the Integrated Risk Information Management Systems and Health Assessment Summary Tables (IRIS-HEAST). Ecology regulates carcinogens on the list at 100 ppm. A list of carcinogens was first approved by Ecology in 1982 (WAC 173-303-100 (7)).

Implementation Problems with the Carcinogen Rule

Problem 1

Generators with insufficient knowledge of waste constituents cannot afford to conduct the number of individual tests required for all of the listed compounds. Many of the compounds, particularly the inorganic carcinogens, do not have readily available test methods. Ecology staff spend a considerable amount of time researching test methods and explaining the designation procedures at the expense of higher priority functions.

Problem 2

The regulatory level of 100 ppm is not a risk-based number. For many constituents, it conflicts with cleanup levels (Chapter 173-340 WAC).

Description of the Carcinogenic Waste Stream

Between 1989 and 1991, the three most recent years of data that has been quality reviewed, a total of 1588 tons of wastes were designated solely as carcinogens. Asbestos comprises 1540 tons, or ninety-seven percent, of the total, and it is excluded from the *Dangerous Waste Regulations* [WAC 173-303-071 (3)(m)]. It should have never appeared on Ecology's list of carcinogens. Nevertheless, it appears that generators use the carcinogenicity classification as a convenience when sending asbestos to a hazardous waste landfill. Forty-five separate chemical listings make up the remaining forty-eight tons of wastes captured over the three year period.

However, of those forty-five listings, only four actually appear on the carcinogens list: beryllium, formaldehyde, styrene, and bis- 2 (ethyl hexel) phthalate. These substances totalled less than two tons of waste over the three year period. Apparently, generators confuse the other forty-two waste descriptions with a more appropriate classification, and manifest the wastes as carcinogens.

Alternatives for Managing Carcinogens

Ecology considered four options for managing carcinogens: 1) To rely on the existing or a modified list at 100 ppm; 2) To rely on the existing or a modified list at a risk-based level; 3) To use an assay to assess carcinogenicity, and 4) to regulate carcinogens under the toxicity and persistence classifications (Appendix A Issue Paper 4).

Alternative 1. No change. Continue to regulate the overlap list of IRIS-HEAST and IARC carcinogens (or an expanded list) at 100 ppm.

Lists certainly define the universe of regulated substances, but they also convey a false sense of security. Only the relatively few agents of concern that have been tested actually appear on the list. In addition, lists rely on the properties of pure compounds. Waste mixtures rarely occur or behave as pure compounds.

They usually require testing to verify compliance with the designation level.

The current list of carcinogens is impractical to implement. In addition, practical test methods that isolate many of the compounds on our list are not readily available.

Alternative 2. Listed carcinogens regulated at a risk-based level

Risk-based levels are more rational and supportable than a single generic level of 100 ppm. Two problems arise with setting risk-based levels for a carcinogens list. First, the practicality issue outlined in Alternative 1 applies to this alternative as well. Second, risk levels must be set to model the incremental increase in risk from waste manifested as dangerous waste to waste handled as solid waste. Applying existing risk-based levels, such as those developed under the Model Toxics Control Act (MTCA), would not be appropriate.

Model Toxics Control Act levels specify what contaminant concentrations could safely remain uncontrolled on a site. Hazardous waste levels determine when the management of wastes needs greater controls. Developing new risk-based levels for each constituent take time and money, and would require development of new methodologies and models. This appears to be impractical given the limited reported occurrences of listed carcinogens in waste streams.

Alternative 3. Use a short-term genotoxic assay to assess carcinogenicity

Short-term mutagenic tests, such as the Ames Salmonella test, are available and are relatively inexpensive (Issue Paper 4). However, research indicates that short-term tests offer limited value for assessing the carcinogenicity of wastes. Parodi et al (Mutat. Res. 93 1-24 pg. 188) notes that the predictivity of short-term tests for carcinogenesis is low. Goodman and Wilson (Environmental Health Perspectives, 94, pg. 97, 1991) note that a large proportion of rodent carcinogens are not genotoxic in short-term tests, which underscores the need for developing better tests. In another study of known carcinogens, thirty percent produce false negatives in the Ames Salmonella mutagenic assay. Of known non-carcinogens, thirty percent give false positives (Maltoni et al, 1991, toxicol. Ind. Health, 7(5-6), 63-94). These studies indicate that use of a short-term genotoxic assay is not practical.

Alternative 4. Regulate carcinogens under the toxicity and persistence classifications

An analysis by Ecology staff indicates that, with few exceptions, the toxic and persistence classifications already capture the present list of regulated carcinogens, plus the additional fifty-one compounds on the IRIS-HEAST list. A rat bioassay screening level of 5000 mg/kg and a fish bioassay with a waste concentration as low as 100 mg/L capture those wastes regulated by toxicity (Appendix A, Issue Paper 3 Addendum).

The exception is diethyl hexel adipate which is included on the IRIS-HEAST list, but has an acute toxicity (LD50) greater than 5000 mg/kg oral rat, and is not a persistent compound. No toxicity data is available for the compounds furium, nitrosodiethanolamine, and nickel subsulphide. It is unknown whether these listed carcinogens would fail a rat bioassay at 5000 mg/kg. A review of our waste generation data for the 1989, 1990, and 1991 years of record did not reveal these four compounds among the forty-five reported as carcinogens.

Under this proposal, relatively toxic carcinogens would be regulated more stringently than at present. Less toxic carcinogens would be regulated less stringently, and carcinogens that are halogenated compounds or PAHs (Persistence criteria), would still be regulated at 100 ppm. Evidence shows that more potent carcinogens are often also more toxic (Zeiss et. al. 1986, J. Amer. College Tox.

5(2), 173-152, and Ecology staff work in Appendix D).

By calculating toxic equivalencies in WAC 173-303-100, Ecology would regulate category X toxic carcinogens at 10 ppm, and category A toxic carcinogens at 100 ppm. Each successive category (B through D) would be regulated with one order of magnitude less stringency.

In addition to our list review, recent research sheds some light on the comparisons of acute toxicity bioassay information and carcinogenicity. Parodi et al (1982, Mutat. Res. 93, 1-24) noted that for compounds determined to be carcinogens, a measure of acute toxicity correlates as well or better than any other short-term bioassay.

Recommendation: Regulate carcinogens under the toxicity and persistence classifications

Ecology supports regulating the carcinogens through the toxicity and persistence classifications

It is important to note that Ecology is not suggesting that the toxicity test or persistence classification measures carcinogenicity. Rather, we are looking at the only other alternative for regulating carcinogens - applying a list - and taking advantage of the fact that other tests capture the listed compounds. Ecology will continue to monitor the effectiveness of regulating carcinogens through other classifications. Ecology will also periodically evaluate whether newly discovered carcinogens are likely to be found in wastes.

Effect of Carcinogen Alternatives on Environment Alternatives

Ecology expects no significant environmental effect by regulating carcinogens under the toxic and persistence categories rather than through the present list of carcinogens. Ecology actually expects a net environmental benefit. The rule will be simpler to follow which will promote compliance. In addition, Ecology staff will spend less time explaining the carcinogenicity rule and will have more time available to spend with higher priority waste streams and pollution prevention issues. By maintaining the dangerous waste designation threshold at 5000 mg/kg for oral rat, we continue to regulate hazardous constituents that have carcinogenic effects.

Ecology has “no immediate” concern about the four listed carcinogens potentially missed by the persistence or toxicity criteria. We have not encountered these carcinogens in waste management situations accounted for by the annual report data. Additionally, the solid waste system

Developmental Toxicity

provides a safety net to prevent releases to the environment.

Recommendation:

Regulate developmental toxins through the persistence and toxicity classifications

Existing Statutory Requirments for Developmental Toxins

Chapter 70.105 RCW directs Ecology to regulate dangerous waste in Washington State. The definition of dangerous waste includes wastes which have teratogenic properties (developmental toxins) RCW 70.105.010 (5)(a). A specific dangerous waste classification for developmental toxins has never been developed.

Alternatives Considered

Issue Paper 9 in Appendix A discusses several alternatives for regulating developmental toxins in wastes. The following description summarizes these alternatives.

Alternative 1. No change. Continue to regulate developmental toxins through existing state classifications and the EPA listings process.

The results of two recent studies provide some insight on how useful the existing measure of acute toxicity would be for capturing wastes that may also fall into the developmental toxins category. One paper summarizes the findings of the National Toxicology Program (Schwetz and Harris, 1993, Developmental Tox: Status of the Field, Env. Health Perspectives., 100, 269-282). Although some of the chemicals tested in this study are more toxic to the fetus than the adult, a larger number prove to be more toxic to the adult than the fetus. Boric acid, diethylene glycol dimethyl ether, diethyl hexel phthalate, and ethylene glycol diethyl ether raise special concern because of their greater effect on the developing embryo than the mother in multiple species and with multiple toxic endpoints.

Of the fifty chemicals reviewed in the study, glycols, phthalates, and N-hexane are the only compounds that would elude the oral rat designation level LD50 of 5000 mg/kg.

The General Accounting Office Report on Reproductive and Developmental Toxicity decried the lack of knowledge about developmental toxins and ventured on its own to name thirty chemicals of concern. Many of these compounds are acutely toxic and cause cancer. Our proposed waste classification scheme of persistence and toxicity captures all but two compounds, alcohol and tobacco, if the toxicity screening level is maintained at 5000 mg/kg for oral rat (Issue Paper 9).

In addition, the EPA's hazardous waste rule provides some backdrop for regulating developmental toxins. The EPA considers developmental toxicity, (among other factors), when they determine what wastes to list and regulate as hazardous (40 CFR 261.11(a)(3)).

Alternative 2. Use a short-term assay to predict developmental toxicity

A short-term test would easily and cheaply identify the hazard of a waste. Short-term tests, however, have been found to be of limited value as they produce false positives and false negatives. Faustman (Faustman, E.M. Short-Term Tests for Teratogens. Mutat. Res. 205, 355-384, 1988) extensively evaluated short-term teratogenic tests and concluded that further evaluation of tests is needed before any test can be recommended (Issue Paper 9).

Alternative 3. Regulate Developmental Toxins through a List

Lists define the universe of regulated substances, but they also convey a false sense of security. Only a few chemicals of concern have been tested and appear on the list. In addition, lists rely on the properties of pure compounds. Complex waste mixtures do not behave as pure compounds, so they require extensive field testing. No

useable list of developmental toxins found in waste materials is available.

Alternative 4. Use "Book Designation" Data to Determine Developmental Toxicity

Ecology also considered referencing a toxicology database, Registry of Toxic Effects of Chemical Substances (RTECS), with teratogen toxicity information, and incorporate that in a "book designation scheme". Most generators do not have access to one of these databases. Of those that do, many do not have enough knowledge of toxicology data to designate a dangerous waste by interpreting this information.

Recommendation: Regulate developmental toxins through other classifications and EPA listings

There is little specific information for use in determining how to regulate developmental toxins. Ecology chooses to rely on a measure of **acute toxicity** to regulate wastes with a variety of toxic effects. Neither the current state of knowledge or the numbers of compounds tested justifies a unique approach for waste designation based on developmental toxicity. In addition, the persistence classification and EPA's lists provide a backstop for capturing developmental toxins.

Effect on Environmental Protection

Ecology expects no significant environmental impacts by continuing without a classification for developmental toxicity. Our analysis also shows that many carcinogens, teratogens, and mutagens would not fall under the *Dangerous Waste Regulations* unless we maintain the relatively stringent and environmentally protective designation level of 5000 mg/kg for oral rat (Issue Papers 4 and 9). **These potential chronic effects supply the primary rationale for maintaining the regulatory floor at this conservative level.** This level is two orders of magnitude more stringent than the 50 mg/kg level that the EPA has selected to list toxic wastes as hazardous. The rat bioassay at 5000 mg/kg, along with the halogenated and polycyclic aromatic hydrocarbon tests and the EPA's hazardous waste rule, will capture developmental toxins. The safety net of the solid waste program will prevent releases to the environment. Ecology will continue to monitor the effectiveness

of regulating developmental toxins through other classifications.

Recommendation:

Retain the persistence classification and update the polycyclic aromatic hydrocarbon (PAH) test

Existing Persistent Waste Rule

RCW 70.105 directs Ecology to regulate persistent wastes as dangerous wastes. The existing persistence rule in Chapter 173-303 WAC regulates persistent wastes at one percent of halogenated hydrocarbons and one percent of polycyclic aromatic hydrocarbons with four, five, and six membered rings as Extremely Hazardous Waste. In addition, halogenated hydrocarbons from .01 to 1 percent are regulated as dangerous waste.

Over the last three years of data available for review, the dangerous waste system captured between two and eight percent of all "state-only" wastes as persistent wastes. Generally, facilities generate and report less than one thousand tons of halogens, and from one thousand to two thousand tons of polycyclic aromatic hydrocarbons, each year.

Problems with the Existing Persistent Waste Rule

The current technique of analyzing for PAHs and summing the four, five, and six membered rings is problematic. It is a nonstandard analytical technique. No estimates of precision for the test are available, and the test is difficult to reproduce. This leads to a lack of widespread implementation of the test and excessive use of Ecology staff time trying to justify and explain the test and interpret the test results.

Recommendation to Retain the Existing Persistent Waste Rule

Polycyclic aromatic compounds and halogenated compounds are bioaccumulative, and potentially toxic and carcinogenic. Because their main characteristic is persistence rather than toxicity, many of these compounds do not designate by an acute bioassay test. The state-only dangerous waste criteria appropriately regulate both compounds.

Recommendation: Update the PAH test to a standard analytical technique.

Ecology considered two options for quantification of PAHs. The first uses six surrogates and ties levels to marine sediment standards. Regulatory levels would then link to the chronic effects levels developed for the marine sediment cleanup screening levels of Chapter 173-204 WAC. The proposed regulatory level stands at fifty times the marine sediment chronic effects levels. This approach adds the advantage of tying regulatory levels to the hazard of the PAH rather than applying the one percent level to all PAHs regardless of their hazard.

The other alternative considered sums the sixteen PAH priority pollutants to determine if they exceed one percent of the tested waste. Both alternatives have the advantage of a clearer, more specified test methodology.

After reviewing comments and historic PAH test data, Ecology proposes to move forward with a PAH test method that relies on sampling of discreet compounds rather than a surrogate approach based on the Marine Sediment Standards. Both of the considered alternatives result in protective designation levels equal to the current methodology of adding four, five, and six membered rings and tentatively identified compounds. Summing individual compounds will be more widely understood and accepted than the surrogate approach to measuring PAHs.

Ecology is reviewing the EPA list of PAH priority pollutants and the Agency

for Toxic Substances and Disease Registry toxicity profile for PAHs to compile a list of PAHs that meet the persistence definition of RCW 70.105.010 and find suitable compounds for the PAH analysis.

Effect on Environmental Protection

Updating the test brings a net gain of environmental protection as the PAH dangerous waste classification will be easier to implement. Ecology can provide direction on its use much more easily, and staff resources will be available to work on higher priority projects. The updated test

Special Waste

provides the same level of environmental protection as the existing methods.

Recommendation:

Review of Alternatives to Replace Special Waste Provisions of Chapter 173-303 WAC with a Conditional Exclusion (Contintengy Management)

What does Contingency Management Mean?

Contingency Management relies on the concept that dangerous wastes of relatively low hazard can be disposed of at a solid waste facility designed for these kind of wastes. Certain requirements (contingencies) are met to ensure that the waste is properly managed before disposal.

This approach makes it possible to manage lower risk waste with an intermediate level of care between solid and hazardous waste. This reduces out-of-state transport costs and disposal costs. At the same time, Ecology retains hazardous waste enforcement authority over the waste to ensure proper management.

Ecology broadened the original discussion with the advisory committee to include wastes prior to permitted discharge, treatment, or recycling. The discussion proceeded under the assumption that if a specific category of wastes require fewer on-site handling standards before disposal at a state-of-the-art solid waste facility, they also require fewer on-site handling standards before other management practices are applied.

Existing Contingency Management Provisions in Chapter 173-303 WAC

In 1984, Ecology recognized that some solid state-only dangerous wastes posed less hazard to human health and the environment than other dangerous wastes (WAC 173-303-550 (1)). The provision for these "Special Wastes" was added to the rule. After meeting certain requirements, a dangerous waste facility could apply fewer management standards to these wastes (WAC 173-303-550 and 560; also 170(4)). Ecology intended to allow management standards intermediate between solid and hazardous waste for lower hazard dangerous waste.

Definition of Special Wastes

Ecology defines special wastes as state-only (not federal hazardous waste) solid waste designated in section -090 or -100 of Chapter 173-303 WAC. Special wastes may not be Extremely Hazardous Waste. Special wastes are predominately Category D toxic waste (designation levels of 500 - 5000 mg/kg oral rat), but they also include halogenated hydrocarbons with concentrations between .01 and 1 percent, and solid corrosives.

Annual report data provide the quantities of special waste generated in 1989, 1990, and 1991. The amount of special waste generated during the three years covers a large range: toxic Category D waste: 18,000 to 53,000 tons; solid corrosives: 163 to 358 tons; halogenated hydrocarbons: 423 to 791 tons (Appendix A, Issue Papers 1, 3, 5, & 7).

Ecology proposes expanding the definition of special waste to include solid material with W001 listed waste (PCBs). This addition consists mostly of PCB contaminated materials when the source of the PCBs is salvaged, discarded or rebuilt transformers, capacitors, and bushings.

Our annual report information and experience indicates that the greatest quantity of this type of special waste will be contaminated media with PCB concentrations less than 5 ppm.

Broadening the special waste definition makes low-level, solid PCB disposal from the three activities and sources defining the W001 listing more consistent with the

disposal standards of low-level PCBs from other sources and activities. Low-level PCBs from these other sources are disposed in solid waste landfills.

EPA will continue to regulate solid material with PCB concentrations greater than 50 ppm under 40CFR, part 761. At concentrations over 100 ppm, PCB wastes are subject to the dangerous waste persistant classification, and would not have to be disposed of as dangerous waste. PCB contaminated oil will continue to be regulated down to detection levels per 40CFR, part 761, the W001 listing in the Dangerous Waste Regulations, and the used oil management standards of Chapter 173-354 WAC.

Implentation Problems Remedied by Contingency Management

No hazardous waste facility in the state has successfully implemented the special waste regulations. Hazardous waste facility representatives note that they do not manage special wastes in volumes large enough to make it worthwhile to petition for less stringent management standards.

Cost analysis indicates that selecting one of the proposed contingency management alternatives could save from ten to twenty million dollars in disposal and transportation costs every year (Appendix B).

Elements Common to all Contingency Management Alternatives

All of the alternatives for contingency management share the following elements or conditions, with the exception of the no-change alternative:

- Generators may not accumulate contingently managed waste on-site for more than 180 days.
- Generators must store contingently managed waste in a protective manner with accumulation start dates marked clearly on the top and sides of the container.
- All workers who can potentially come into contact with the waste must know of its hazard.
- Generator and off-site facilities must keep records of contingently managed waste for five years. Records must include quantities, characteristics, and treatment processes or ultimate disposal sites.
- Generators must use a manifest equivalent to transport these wastes.
- Wastes must go directly to any off-site destination (no transfer stations or dumpsters shall be used in transport).
- The treatment and recycling requirements of the *Dangerous Waste Regulations* apply to all contingently managed wastes sent for treatment or recycling (except for WAC 173-303-120(4)a and (b) and 173-303-500 (2)(b).
- Only facilities that meet the requirements of Chapter 173-351 WAC (with the exception of the arid design standards) may accept contingently managed wastes for disposal.
- All wastes considered for contingency management must be addressed in pollution prevention plans as required by Chapter 173-307 WAC, with the exception of remediation wastes.
- Any party not meeting the requirements of these common elements are subject to the enforcement provisions of the *Dangerous Waste Regulations* (WAC 173-

303-950).

Common Elements of Proposed Contingency Management Alternatives Compared to Existing Requirements of Special Waste

WAC 173-303-560 specifies the minimum requirements for managing special wastes. Facilities (e.g., landfills) that manage special waste must get an EPA/State Identification Number (WAC 173-303-060), meet performance standards (WAC 173-303-283), form emergency plans and procedures (173-303-350 & 360), maintain records and manifests (WAC 173-303-370 & 380), and file reports for unmanifested wastes (WAC 173-303-390).

The preceding common elements of the proposed alternatives for contingency management meet these substantive requirements with the exception of maintaining an EPA/State Identification Number. In addition, contingently managed wastes must go to a landfill that meets the requirements of Chapter 173-351 WAC. This condition is not included in Chapter 173-303-560. Chapter 173-351 WAC has extensive standards that exceed federal requirements for landfills including siting criteria, liner design requirements, operating requirements, and ground water monitoring.

WAC 173-303-550 requires that all facilities shipping special wastes off-site meet the generator requirements of WAC 173-303-170 - 230. The common elements of the proposed alternatives meet the substantive requirements of these sections through the accumulation time limit, labelling requirements, and performance standards.

Alternatives Considered

Alternative 1. No Change. Continue to Regulate Special Waste as it Already Appears in WAC 173-303-550-560.

In this alternative, special waste continues to be regulated under WAC 173-303-550 & 560. Implementing this alternative requires no rule change. However, based on Ecology's experience over the past ten years, the section would continue to be unimplemented. Lack of implementation of these sections results in greater costs for waste management in the state. It also shifts more wastes out-of-state, contrary to the "Close-to-Home policy" in the state hazardous waste plan.

Alternative 2. Manage Special Waste Through an Exclusion in WAC 173-303-071.

This alternative would have the common elements of the section entitled "Elements Common to all of the Contingency Management Alternatives", as an exclusion in WAC 173-303-071.

An exclusion would categorically exclude these wastes from regulation under the condition that all contingencies are met. This would be self-implementing for the generator and disposal facility. Ecology could take action to enforce requirements if contingencies are not met.

These wastes meet EPA's definition of industrial wastes, and modern landfill designs make it possible to safely manage these wastes (40 CFR 258.1, 40 CFR 257.1 (c) and 257.2).

Alternative 3. Manage Special Waste Through an Exclusion in WAC 173-303-071, and Expand the Definition of Special Waste to Include Category C Toxins

This alternative is identical to Alternative 2 with an expanded definition of special waste to include Category C toxic waste. This lowers the threshold for toxic special waste to a screening level of 50 mg/kg (with Category D the threshold is 500 mg/kg). As with Alternative 2, these wastes meet the EPA's definition of indus-

trial waste and could be managed safely at solid waste facilities.

This approach defines toxicity consistently with EPA's definition of toxicity. The federal definition forms the basis for the EPA listing of toxic wastes. Additionally, more wastes could be managed in-state. Based on the 1989, 1990, and 1991 annual report data, an estimated additional fifteen to twenty-five thousand tons of waste could qualify for contingency management under this alternative (Appendix A, Issue Paper 1). Under this approach, solid waste workers could risk exposure to wastes of greater hazard.

Alternative 4. Manage Special Waste Through an Exclusion in WAC 173-303-071, and Expand the Definition of Special Waste to Include Liquids.

Alternative 4 also allows for contingent management of liquid waste streams. However, the existing limitations for discharges of dangerous waste to sewer systems remain in effect (WAC 173-303-071(3)(a)). Liquids could be disposed of at municipal solid waste landfill provided the wastes are solidified prior to disposal.

It may make sense to similarly treat liquid and solid wastes posing comparable hazards with regard to on-site management standards. But, several reasons support the idea of limiting contingency management to solid waste only.

Liquids inherently have more of a potential impact when spilled than solids. These liquid wastes are currently managed in-state unlike the solid wastes sent out-of-state for disposal. Because the treatment and discharge requirements would remain the same, the cost savings benefit falls into question. The generator has another class of wastes to manage with its own distinct standards. Probably, few businesses would take advantage of this alternative.

The information from the 1989, 1990, and 1991 dangerous waste annual reports indicates that only a dozen generators generate more than one hundred tons per year of state-only liquid dangerous waste. This total includes recurrent waste and Permit-by-Rule waste streams.

Alternative 5. Expedited Petition Process for any Selected Alternative

Petitions as described in WAC 173-303-910 allow persons to present information on waste streams and propose alternative management standards for wastes. For this alternative, Ecology would adopt a streamlined petition process to implement contingency management in conjunction with any of the preceding alternatives.

This approach allows Ecology flexibility to determine site specific waste management standards and transportation issues. Potentially, it could be implemented without a rule change. A disadvantage of this approach is that it is not self implementing. It would require Ecology staff review before a waste management practice is allowed. The types of waste and the facilities eligible for a contingent management petition, as well as the on-site management and transportation standards, would already be established.

Developing a petition for submittal to Ecology, and review by Ecology staff, should be a relatively simple process. However, in the past, Ecology has had difficulty responding to petitions in a timely manner. In addition, the petition process assesses the hazard of a waste and suitable management standards for a waste. If this can be done for a class of wastes, an individual petition process for each waste stream within that class is unnecessary and duplicative.

Environmental Effects of Alternatives

To assess the environmental and human health risks of the alternatives, Ecology focused on potential for 1) releases to the environment from landfilling and other activities, 2) creating Model Toxics Con-

trol Act (MTCA) sites, and 3) worker exposure.

Hazard from Release to the Environment from Landfilling or Other Management Practices

None of the alternatives produce significant additional threats of releases to the environment. In all of the contingency management alternatives, with the exception of the no change alternative, wastes sent to landfills would be required to be managed in accordance with Chapter 173-351 WAC (with the exception of the arid design standards). Eligible wastes meet the EPA's definition of industrial waste (40 CFR Chapter 258.1). Landfills compliant with Chapter 173-351 WAC can manage these wastes in an environmentally protective manner.

The vast majority of states in the nation are sending all industrial waste not regulated by the EPA's hazardous waste regulations to solid waste facilities that may or may not meet EPA's Subtitle D requirements (Environmental Resource Center, 1992). Chapter 173-351 WAC provides more protection than EPA's Subtitle D requirements by virtue of more extensive siting requirements, ground water monitoring, operating, and liner design equivalency requirements. A summary of the design requirements Chapter 173-351 WAC landfills is in Appendix C.

In all of the alternatives, the treatment, recycling, and discharge requirements of the *Dangerous Waste Regulations* apply to contingently managed wastes in the same way as they do for fully regulated dangerous waste. In addition, the substantive generator storage and handling requirements remain for all alternatives.

Liquid wastes potentially pose the greatest threat to the environment. Poor management practices could result in a release to the environment because a spill would be more difficult to contain than a solid. However, Alternative 4, which allows contingent management of liquids, has the same common elements as the other alternatives, including storing and managing the waste in an environmentally protective manner.

The dangerous waste enforcement provisions also remain to encourage compliance. Ecology may issue penalties of up to $10,000 per day for each violation per WAC 173-303-950.

Because a "cradle to grave" management system is retained for all of the contingency management alternatives, and the *Dangerous Waste Regulations'* enforcement provisions are retained for acts of noncompliance, there are no significant increased opportunities for releases to the environment with any of these alternatives.

Potential to Create a MTCA Cleanup Site

Ecology staff conducted an analysis to determine if disposal of Category C and D toxic waste at in-state landfills compliant with Chapter 173-351 WAC would cause solid waste sites to exceed Model Toxics Control Act cleanup levels (Appendix D). Ecology estimated waste stream dilution by comparing solid waste disposal rates with Category C and D toxic waste reportedly disposed in the 1991 - 1992 annual report data.

They concluded that if any of the alternatives were implemented, and Category D, or Category C and D toxic waste all entered the same landfill (a worst case assumption), carcinogen and noncarcinogen concentrations would not exceed cleanup levels for industrial soils. This level stands at 1 in 100,000 excess risk of lifetime cancer. The hazard quotient would not exceed 1. Therefore, Ecology does not expect disposal of Category D or Category C and D toxic wastes to result in a site requiring cleanup.

Worker Safety Issues

Worker safety issues significantly distinguish the five preceding alternatives. Implementation of Alternative 3, with an expanded definition of toxic waste that could be contingently managed, has the

potential to expose a solid waste worker to wastes with concentrations very near the poison level of an LD50 of 50 mg/kg oral rat. Alternatives 2 and 4 however, specify contingency management of wastes with an LD50 of 500 mg/kg oral rat or up to moderately toxic waste.

Because of the variety and the types of exposures faced by solid waste workers, it would be impractical to develop a risk equation for workers exposed to contingently managed wastes.

Allowing contingency management for wastes with an oral rat LD50 of no lower than 500 mg/kg provides a safety factor that goes beyond the EPA's designation level of 50 mg/kg oral rat LD50, the threshold for the definition of poison, providing greater protection for solid waste workers.

The vast majority of states allow their solid waste facilities to accept all non-EPA hazardous waste. In excluding toxic wastes category X through B from the solid waste system, and requiring worker notification for contingently managed waste (common to all alternatives), Washington State will have a dangerous waste program that is significantly more protective than the national standard, regardless of the alternative chosen.

Recommendation: Manage Special Wastes Through an Exclusion in WAC 173-303-071.

The need to have a tailored waste management system that reflects the relative hazard of the waste, is cost effective and implements our "close to home" policy drives this decision. Concerns related to worker exposure, regulatory complexity, and cost effectiveness weaken the support for the other alternatives.

We rejected Alternative 1, the "No-change alternative," because while it was intended to allow for tailored management standards for lower risk waste when promulgated in 1984, it has not seen implementation. As a result, generators of special waste pay significantly higher costs for waste management of lower hazard special waste (Appendix B). In addition, thousands of tons of special waste generated in Washington State every year cross state borders into Oregon or Idaho when they could be safely managed in-state.

Alternative 3, "Expand the Definition of Special Waste to Include Category C toxic Wastes" was not selected because the level of 50 mg/kg oral rat is the threshold for eligibility for contingently managed waste does not provide the necessary safety for solid waste workers. Selecting this alternative would put solid waste workers at increased risk of exposure of solid waste workers to substances near the level of 50 mg/kg threshold for poison.

Ecology rejected Alternative 4, "Expand the Definition of Special Waste to Include Liquids". It creates another intermediate tier of regulation between solid and hazardous waste, and offers little cost savings advantage to generators. The added complexity of expanding the possibility of contingency management to liquids offsets the limited economic benefits from the proposal.

Alternative 5, "Expedited Petition Process for an Alternative" was not selected because of the use of petitions to assess the hazard of a waste and determine suitable management practices. In 1984, Ecology determined that special wastes can be managed safely with fewer generator and facility management standards. We further tailored this decision during the last six months of Phase 1 by noting specific on site management requirements and the specific management requirements of Chapter 173-351 WAC (excluding arid design standards). Requiring a petition

Ten Percent Solvent Rule

would be an unnecessary redundancy.

Recommendation:

Adopt EPA's Ten Percent Solvent Rule

Existing Regulation

In 1985, the federal RCRA program established a ten percent solvent constituent threshold for regulating listed waste solvents. A waste solvent is not regulated as a federal listed waste solvent if there was not at least ten percent of the solvent constituent in the product prior to use.

Ecology did not adopt the ten percent solvent rule, so the *Dangerous Waste Regulations* continue to regulate waste solvent constituents in any concentration as listed waste.

Waste Streams Affected

Ecology conducted a waste stream analysis study using 1987 waste stream data. The study indicated that Washington State generated 1900 tons of halogenated solvent waste and 6200 tons of nonhalogenated solvent wastes. Because solvents regulated by Chapter 173-303 WAC (less than ten percent solvent constituents) and RCRA (greater than ten percent solvent constituents) both carry the same federal waste code, we do not know what percent of the waste stream is less than ten percent solvent constituents (state-only waste). Dangerous waste facility representatives note that the fact that the solvent falls under federal regulations does not affect management practices for solvents. Most solvent wastes are recycled or fuel blended.

Implementation Problems with the Ten Percent Rule

State-only waste solvents carrying federal waste codes cause problems in interstate commerce. The federal waste code tells the facilities receiving the waste, such as recyclers, that they must manage the waste under RCRA hazardous waste rules. Solvent recyclers explain that this creates a disincentive for recycling.

The RCRA land ban rule requires generators to send notifications with the federal wastes that they ship to receiving facilities. Because generators know that they are shipping a state-only waste solvent, they often fail to prepare the notices. Since the waste solvents carry a federal waste code, the receiving facilities are assumed to be managing a federal waste. They can be found out of compliance if the required generator notices are missing.

Ecology staff note that the biggest problem with not adopting the ten percent solvent rule is that all the problems inherent with a listed waste are present. De minimis quantities or materials, contaminated with minuscule quantities of solvent, must remain regulated as dangerous waste even if they do not threaten the environment. There are strong disincentives to treat listed wastes on-site or use listed wastes to make products.

Alternatives Considered

Alternative 1. Continue Regulating Solvents Below the Ten Percent Constituent Concentrations as Federal Listed Waste

By retaining the present approach, designation of waste solvent remains straight forward. It can be difficult to prove that a solvent's constituent concentrations were below ten percent in the product before it became a waste. But all of the implementation problems described above remain.

Alternative 2. Adopt the Ten Percent Rule, and Create A State Listing for Solvents Below Ten Percent Constituent Concentrations

This alternative eliminates some of the implementation problems described above. State-only waste solvents would carry a state waste code that corresponds

to the new listings. However, implementation of the ten percent rule would be required to properly identify federal wastes, so designation would not be straight forward. Also, the inherent listing problem of regulating de minimis concentrations as dangerous waste would continue.

Alternative 3. Adopt EPA's Ten Percent Solvent Rule and Rely on the State Criteria

In this approach, de minimis concentrations are not regulated as dangerous waste, thus eliminating the implementation problems described above. Waste solvents not on the federal list designate under the other RCRA hazardous waste characteristics, or the persistence or toxicity criteria of Chapter 173-303 WAC.

Recommendation: Adopt EPA's Ten Percent Solvent Rule and Rely on the State Criteria

This approach solves the most implementation problems, and it does not perpetuate the "de minimus" problem of listed wastes. It also aligns with the state's criteria approach that designates dangerous waste based on the hazard of the waste.

Effect on Environmental Protection

Ecology expects no significant environmental impacts from adopting EPA's ten percent solvent rule.

The dangerous waste tests and the EPA hazardous waste characteristics classification provide a backstop for solvent waste streams missed by the federal listings, yet still present a hazard to the environment.

In addition, Ecology will implement the ten percent rule in the same manner as EPA. That is, the rule assumes a solvent waste to be a listed waste unless the generator can prove otherwise.

Finally, a substantial market has grown for solvent wastes for both recycling and

Polychlorinated biphenyls (PCBs)

fuel blending. Adopting the ten percent solvent rule should encourage recycling of solvents wastes.

Recommendation:

Modify the exiting listed state source of PCBs (W001) so that 2 ppm is the threshold for listing. Delete the current rinsing requirements for PCBs in 173-303-9904 WAC, and defer to the draining requirements of 40CFR, part 761. Exclude PCB contaminated oils managed in accordance with the new used oil management standards. Allow media contaminated with listed wastes to be managed according to the special waste rule exclusion explained on page 18 of this report.

Existing PCB Rule

Chapter 70.105 RCW directs Ecology to regulate specific PCB wastes whose disposal is not regulated by the federal Toxic Substances Control Act (TSCA) in 40 CFR, Part 761. Chapter 173-303 WAC implements Chapter 70.105 RCW. It also regulates PCB wastes as W001 listed waste generated from the salvaging, rebuilding or disposal of specific electrical equipment, except when the equipment has been rinsed according to a specific procedure in the rule.

The rule includes several exclusions that apply to wastes meeting the listed W001 description. These exclusions include wastes regulated by, or managed in accordance with, 40 CFR Part 761, and PCB oils with less than detectable concentrations of PCBs. In addition, the special requirements for used oil burned for energy recovery in Chapter 173-303 WAC presently apply to used oils designated by the W001 listing.

The Toxic Substances Control Act comprehensively regulates the management of PCBs, and generally begins regulation at 50 ppm.

Implementation Problems with Existing PCB Rule

Problem 1

The types of equipment identified in the existing W001 listing do not match PCB articles regulated under Toxic Substances Control Act. This leads to confusion and inconsistent application of the rule.

Problem 2

The rinsing procedure for PCB articles in WAC 173-303-9904 generates large quantities of dangerous waste solvent and mineral oil. Ecology has no evidence that it removes significant quantities of residual PCBs from equipment. In addition, it is difficult to confirm that rinsing has been conducted, so there is no guarantee that the equipment no longer falls under W001.

Problem 3

The management requirements for dangerous wastes are similar to those regulated by Toxic Substances Control Act, but are different in subtle ways. These include how regulated waste materials are identified, and the way they are stored and disposed of. These differences confuse the regulated community. They also make it difficult to decide which provisions apply to a specific waste.

Alternatives for Managing PCB Wastes

Appendix A, Issue Paper 8 lists the alternatives considered for managing PCB wastes. These include maintaining the present regulation for managing PCBs, modifying the types of equipment listed in W001, and eliminating the W001 listing and regulating PCB wastes as an addi-

tional persistent dangerous waste.

Alternative 1. No Change. Maintain the Present PCB Rule.

Retaining the present rule minimizes the abuses the legislature intended to control. Unfortunately, the language in WAC 173-303-9904 does not correspond with the EPA's definition of PCB article. This discrepancy creates confusion in interpreting the rule. In addition, the existing rinsing requirement for equipment differs from the Toxic Substances Control Act requirement, so more PCB waste is generated. Ecology has no indication that the equipment is significantly cleaner when the rinsing requirement is implemented.

Alternative 2. Modify the Existing Rule so that W001 Includes All PCB Waste Oils and PCB Articles with PCB Concentration Down to 1 PPM. Exclude these Wastes from Regulation when they are Managed in Accordance With the Toxic Substances Control Act

This approach fulfills the legislative intent of Chapter 70.105 RCW regulating PCB wastes not regulated by the Toxic Substances Control Act. However, the rule is simplified by deferring to Toxic Substances Control Act management standards for those additional wastes, with PCBs less than 50 ppm, that are captured. In addition, PCB waste oil less than 50 ppm is excluded from the regulation if managed according to the off-specification used oil fuel requirements in the proposed used oil management standards (Chapter 173-354 WAC) which will be promulgated in 1995.

This alternative results in less confusion, easier implementation, and decreased generation of PCB contaminated rinsing solutions.

Alternative 3. Eliminate the W001 Listing and Regulate PCB Wastes as an Additional Persistent Dangerous Waste Using a Unique Concentration Level.

This alternative eliminates all confusion about the source of PCBs and clears up the problem of regulatory status. However, it is not a cost effective expansion of the rule. Since the production of PCBs has been discontinued, new PCB wastes are primarily generated when PCB articles are repaired, scrapped or disposed of. In addition, implementing the criteria-based PCB approach would require representative sampling of PCB waste. PCB waste is typically electrical equipment containing PCB oil. Sampling of the equipment to determine the PCB concentration would be impractical and costly.

Alternative 4. Maintain the present PCB rule with modifications

This alternative modifies the PCB listing by setting the listing threshold at 2 ppm. In addition, the alternative deletes the rinsing requirement in 173-303-9904, and excludes PCB contaminated used oil from Chapter 173-303 WAC when managed according to the used oil management standards explained in Chapter 173-354 WAC.

This approach is consistent with the statutory authority of RCW 70.105.105, and results in decreased generation of PCB contaminated rinseate.

Recommendation: Maintain the present PCB rule, with modifications.

In response to comments received from the draft recommendations, Ecology recommends revising the PCB rule pursuant the recommendations. The revised proposal will be easier to implement than the existing rule because it defers to the Toxics Substances Control Act rinsing and draining requirements for transformers and capacitors. Excluding PCB contaminated

used oil when managed according to the new used oil management standards further simplifies the requirements.

Ecology believes this recommendation fulfills the statutory direction provided by RCW 70.105.105. The statute directs management of wastes from the salvaging, rebuilding and discarding of transformers and capacitors. These activities can potentially generate large volumes of low-concentration PCB wastes. It is the most appropriate place to target the *Dangerous Waste Regulations*.

The major advantages of this approach include 1) applying Toxic Substances Control Act draining requirements for PCB-contaminated equipment rather than using the W001 listing requirements which will decrease confusion on the regulatory status of drained transformers; 2) establishing a PCB listing threshold at 2 ppm makes the state regulation consistent with the Toxic Substances Control Act regulatory threshold for PCB-contaminated oil; 3) excluding listed PCB oil when managed according to the used oil management standards acknowledges the ability of a separate regulatory program to manage PCBs.

Effect on Environmental Protection

Modifying the rule improves environmental protection. The universe of regulated PCB wastes will be expanded while, at the same time, the management requirements become simpler and more appropriate for the waste. In addition, changing this rule allows for more efficient implementation of the regulation, resulting in improved environmental protection.

This proposal defers to the Toxic Substances Control Act draining requirements for PCB-contaminated electrical equipment, which reduces the amount of dangerous waste generated as rinseate. In addition, the rule change encourages recycling of the residual metal without the stigma of dangerous waste designation.

Raising the listing threshold to 2 ppm makes the dangerous waste PCB listing consistent with the Toxic Substances Control Act designation for PCB contamination, and has no effect on any applicable cleanup levels because they are independent of designation levels.

Applying special waste standards to PCB-contaminated media conserves hazardous landfill space for higher concentration PCB waste. At the same time, the hazardous waste enforcement provisions can be implemented for conditions of noncompliance.

Other PCB wastes, not designated under this rule, will be regulated under the Toxic Substances Control Act and other environmental regulations. The Toxic Substances Control Act regulates the disposal of all PCB contaminated soil and other debris contaminated with PCBs at concentrations greater than 50 ppm. This is more stringent than the 100 ppm level which causes these materials to designate

Solid Corrosives

as persistent, halogenated hydrocarbon dangerous wastes.

Recommendation:

Continue to regulate solid corrosives as dangerous waste

Existing Regulations and Affected Waste Streams

RCRA regulates liquid corrosive wastes as characteristic hazardous waste. In addition to these wastes, Chapter 173-303 WAC regulates solid corrosives. The *Dangerous Waste Regulations* define solid corrosives as solid materials that produce a solution of pH less than 2 or greater than 12.5 when mixed with an equal weight of water. From one hundred sixty to three hundred seventy tons of corrosives per year were reported as dangerous waste in 1989-1991. This represents 0.3 percent of the dangerous waste stream. The wood and printing industries generate the largest amount of solid corrosives.

Implementation Problems with the Existing Rule

It has been suggested that solid corrosives are relatively inert and should not be subject to the regulatory standard of the *Dangerous Waste Regulations*.

Alternatives Considered

Alternatives include regulating solid corrosives as a solid waste instead of a dangerous waste, and conditionally excluding solid corrosives from the *Dangerous Waste Regulations*.

Recommendation: Retain solid corrosives as dangerous waste.

Ecology recommends retaining solid corrosives as a dangerous waste. Solid corrosives can present a serious contact hazard, and as such, they should have specific management requirements applied to them. Options for managing solid corrosives under a conditional exclusion are discussed in the section of this re-

Federal Exclusions Not Recognized by the State

port discussing special waste.

Background

The state has the option of adopting any federal amendments considered less stringent than the existing federal program; this includes all exclusions. Rather than automatically adopting each exclusion, Ecology considers whether or not each exclusion is appropriate for proper waste management in Washington.

In deciding whether or not to adopt EPA exclusions, Ecology considers: 1) the rationale used by EPA for adopting each exclusion; 2) how EPA rationale applies to specific waste streams in Washington State; 3) compatibility with the state criteria-based approach; and 4) practicality of regulating the waste stream as hazardous based on hazard, occurrence and volume.

The federal exclusions not yet adopted by the state are discussed below with recommendations regarding adoption. Exclusions we recommend not to adopt are addressed first.

Recommendation: Ecology proposes not to adopt the following exclusions:

1) Source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq.

Justification for Existing Rule

This exclusion originally appeared in the RCRA statute because the material falls under the Atomic Energy Act.

Implementation Problem

The definitions of source, special nuclear, and by-product material are not well defined. This lack of definition makes it difficult to exactly identify the impact of adopting the exclusion. This could have enormous effect to the Hanford Tank Waste Remediation System and the Tri-Party Agreement in general.

Also, the state always sought to have the option of regulating mixed wastes, which contain or are comprised of source, special nuclear, and by-product materials if protection of human health and the environment are at stake. Ecology has not yet used this authority to date, but views it as a potential driver for protective waste management practices should other agencies fail to take appropriate action.

Ecology also amended Chapter 173-303 WAC in 1993 to include a definition of mixed waste. This amendment incorporates federal changes to RCRA under the Federal Facilities Compliance Act, and clarifies who could be assessed a fee under the 1992 Mixed Waste Fee Rule. Incorporating this exclusion would complicate application of these existing rules.

2) Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels, except as provided by 40 CFR 266.112 for facilities that burn or process hazardous waste.

Justification for Existing Rule

EPA believes that RCRA is inappropriate for the four waste streams listed above because of the limited risks they pose, and the existence of generally adequate state and federal regulatory programs. These are high volume, low toxicity wastes. EPA feels that the potential for damage from these wastes most often depends on site- or region-specific factors, and that the current state approach to regulation is appropriate. EPA goes on to say that industry and the states should continue to review the appropriate management of these wastes. EPA will consider them during their ongoing as-

sessment of industrial non-hazardous wastes under RCRA Subtitle D.

Implementation Problem

This is a high volume waste in Washington. Three sites in in the state currently generate wastes covered by the exclusion. However, Ecology issued certificates of non-designation to the three sites that proved their ash does not designate as dangerous waste. The certificates of designation assure the facilities that Ecology agrees with their waste determination provided the process does not change, including, in this instance, that the source of coal remains the same.

Ecology agrees with EPA that these wastes should be appropriately managed. While it has been demonstrated that the waste did not designate in the past, the state system of dangerous waste management will ensure that these wastes continue to be managed appropriately. The ash could designate if, for example, a different coal source is burned that contained higher levels of metals. That designation would trigger more protective management standards that would not happen if an exclusion is adopted.

3) Drilling fluids, produced water, and other wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy.

Justification for Existing Rule

This exclusion appears in the original federal regulation (May 18, 1990) along with the other mining waste exclusions. Congress required EPA to conduct a "detailed and comprehensive study and submit a report on the adverse effects, if any, of drilling fluids..."

Implementation Problem

The content of drilling fluids varies greatly depending on the type of substrate drilled. Drilling fluids may contain compounds such as hexavalent chromium or barium, producing wastes that may warrant regulation. While this is not a high volume waste in Washington, there has been an instance when Ecology was able to prevent drilling with hexavalent chromium through a drinking water aquifer because this exclusion does not appear in Chapter 173-303 WAC. These wastes should not be excluded because they could designate as dangerous.

4) Solid waste from the extraction, beneficiation, and processing of ores and minerals (including coal, phosphate rock and overburden from the mining of uranium ore), except as provided by 40 CFR 266.112 for facilities that burn or process hazardous waste. Beneficiation is defined and certain solid waste from the processing of ores and minerals are listed.

Justification for Existing Rule

EPA studied the wastes covered by this exclusion and determined that RCRA Subtitle C regulation is inappropriate for all twenty wastes studied, although these wastes may designate. EPA plans to address eighteen of the wastes under Subtitle D and the other two under the Toxic Substances Control Act.

Implementation Problem

This is a very broad exclusion for wastes that could potentially prove to be long term risks. For example, slag from primary copper processing was used as fill in the Tacoma wetland/tideflat area which resulted in the necessity for a clean-up. The state program provides appropriate waste management for these wastes when/if they designate as dangerous.

5) Cement kiln dust waste, except as provided by 40 CFR 266.112, for facilities that burn or process hazardous waste.

Justification for Existing Rule

In January, 1994, EPA requested public comment for a study on cement kiln dust. This high volume, low toxicity waste is only rarely characteristically hazardous. It poses a potential threat to human health and the environment, considering plausible worst case conditions. EPA has not yet decided whether to retain the exclusion.

Implementation Problem

In addition to the uncertainty of whether or not the exclusion will be retained by EPA, problems appear due to poorly managed cement kiln dust in the northwest and eastern regions of the state. Lead, arsenic, and high pH found in ground water associate with improper lime kiln dust handling and disposal.

6) Injected ground water that is hazardous only because it exhibits the Toxicity Characteristic (Hazardous Waste Codes D018 through D043 only) in 40 CFR 261.24 that is reinjected through an underground injection well pursuant to free phase hydrocarbon recovery operations undertaken at petroleum refineries, petroleum marketing terminals, petroleum bulk plants, petroleum pipelines, and petroleum transportation spill sites until January 25, 1993.

Implementation Problem

This exclusion expired January 25, 1993, so there is no need to adopt.

Recommendation: Ecology proposes to adopt the following exclusions:

1) Spent wood-preserving solutions that have been reclaimed and are reused for their original intended purpose; and wastewaters from the wood preserving process that have been reclaimed and are reused to treat wood.

Justification for Existing Rule

EPA recognizes that certain wastes from wood preserving and surface protection are reclaimed and then returned to the wood preserving process for reuse. The process of reclaiming indicates that the materials are not typically reused directly. Recycling does not take place in a "closed-loop system". EPA did not intend to regulate reclaimed spent preservative and products made with reclaimed spent preservatives, therefore the exclusion was written.

Justification for Adoption

Ecology agrees with EPA's rationale for the exclusion, and agrees that it is appropriate to exclude the reclaimed spent preservatives. There would be no environmental benefit from regulating these wastes that are reclaimed and returned to the process.

2) Nonwastewater splash condenser dross residue (SCDR) from the treatment of K061 in high temperature metals recovery units (HMTR), provided it is shipped in drums (if shipped) and not land disposed before recovery.

Justification for Existing Rule

EPA adopted this exclusion when it finalized treatment standards for land disposal restrictions for a subcategory of K061, nonwastewaters that contain greater than or equal to fifteen percent total zinc. In evaluating the common management of this waste stream, EPA notes that the splash condenser dross residue is collected directly from the splash condenser and drummed. It then goes to storage for short periods, and sold to thermal zinc

processing facilities that use it as a source of zinc. The waste may also remain on-site for reprocessing, since it normally contains fifty to sixty percent zinc, or re-use in the high temperature metals recovery process.

Storage drums are stored indoors in a secure manner. The material is processed for recovery by crushing, grinding, and combining with other feedstocks, as well as by thermal recovery of the zinc. Although small in volume, the waste stream does not exhibit a characteristic of hazardous waste. Most of the toxic metals that originate in K061 do not pass into the dross. RCRA excludes splash condenser dross residue when it is utilized as a source of zinc in zinc recovery operations. EPA requires the high temperature metals recovery facility to maintain a one-time notice in its operating record stating that the splash condenser dross residue is generated, then excluded, and its disposition.

Justification for Adoption

Ecology agrees with EPA's rationale. The careful management of this waste prior to recovery of the zinc under this conditional exclusion will not threaten human health or the environment. Also, this is not a high volume waste in Washington State.

3) Wastes which fail the test for the Toxicity Characteristic test, or appear on the subpart D list due to the presence of chromium, but do not fail the Toxicity Characteristic test or appear on the list for any other constituent, and do not fail the test for any other characteristic, if it is shown that: (A) The chromium in the waste is exclusively (or nearly exclusively) trivalent chromium; and (B) The industrial process generating the waste uses trivalent chromium exclusively (or nearly exclusively) and the process does not generate hexavalent chromium; and (C) The waste is typically and frequently managed in non-oxidizing environments.

Justification for Existing Rule

When EPA listed chromium-bearing waste streams, they determined that it was inappropriate to regulate certain trivalent chromium-bearing wastes. The wastes were unlikely to create a substantial present or potential hazard to human health or the environment when mismanaged. EPA excluded the waste stream so not to impose a significant regulatory burden without achieving any statutory purpose.

Ecology adopted this exclusion, but requires generators submit a petition to obtain the exclusion in order to ensure that they properly characterize their waste. At this time, Ecology recommends revising the "exclusion" so that exclusions no longer require the submission of a petition.

Justification for Adoption

Generators very seldom use this exclusion because facilities in the state generate very little of this waste. In the last five years, only one petition was submitted for the exclusion. It will be more efficient to have this provision be self-implementing.

4) Non-terne plated used oil filters that are not mixed with listed wastes if these oil filters have been gravity hot-drained using one of four specified methods.

Justification for Existing Rule

EPA determines that non-terne used oil filters do not typically and frequently exhibit the Toxicity Characteristic. The source of the hazard is the used oil they

contain prior to being drained. EPA holds that non-terne-plated filters that have been hot-drained of used oil for a minimum of 12 hours after puncturing, hot-drained and crushed, dismantled and drained, or subjected to air pressure for oil removal do not designate.

Justification for Adoption

Ecology agrees with EPA's rationale that properly drained non-terne used oil filters will not designate as dangerous waste, and had earlier adopted this same policy for used oil filters.

5) Used oil re-refining distillation bottoms used as feedstock to manufacture asphalt products.

Justification for Existing Rule

Commenters on the proposed rule submitted information to EPA that indicates that distillation bottoms from re-refining processes do not exhibit the toxicity characteristic. EPA holds no data to refute the claim. It is common practice to use the distillation bottoms as ingredients in asphalt paving and roofing materials. Therefore, EPA sees no reason to prohibit or restrict the use of re-refining distillation bottoms in the production of asphalt ma-

Accumulation Standards for Small Quantity Generators

terials, and therefore excludes used oil residuals.

Justification for Adoption

Ecology agrees with EPA's rationale.

Existing Regulation

Both the RCRA hazardous waste regulations and the state dangerous waste regulations largely exclude small quantity generators (generators of less than 220 pounds of hazardous waste per month) from waste regulations (40 CFR 161.5 and WAC 173-303-070(8)). However, both set accumulation limits for these generators and these limits differ. The state allows accumulation only up to 220 pounds of dangerous waste (or 2.2 pounds of Extremely Hazardous Waste). EPA allows generators to accumulate up to 2200 pounds of waste on site.

EPA's discusses its rationale for establishing generator status based on generation levels in federal preamble (45FR33102), but there is no rationale for accumulation levels.

Implementation Problem

Small quantity generator representatives and county health officials note that small quantity generators have great difficulty arranging commercial transporters to pick up their wastes. The quantities accumulated on site are too small to warrant pick up, particularly in rural areas. Generators who convince transporters to pick up their waste incur a great expense. A study by Ecology (Appendix B), using data supplied by generators, indicates significant differences in costs for small and large generators: larger generators, with over twenty tons of manifested containers, spend $.03 pound for hazardous waste transport while smaller generators, with less than one-tenth of a ton of manifested containers spend $1.00 per pound for transport.

Alternative 1. No Change. Continue to Maintain an Accumulation Limit of 220 pounds for Small Quantity Generators

This alternative retains the present system, and small quantity generators continue to manage dangerous waste at a significantly higher cost than large quantity generators . Exceeding the 220 pound accumulation standard subjects generators to the requirements of 220-2200 pound generators, which include planning and emergency procedure requirements.

Alternative 2. Raise the Accumulation Limit to 2200 Pounds

Raising the accumulation level makes it more cost effective for a dangerous waste transporter to pick up a load of small quantity generator waste. Increasing accumulation levels to 2200 pounds saves an estimated $400 to $1100 per year for small quantity generators (Appendix B). Revising the level to 2200 pounds would be consistent with the federal rule, and create less confusion. A disadvantage of raising the accumulation level is more waste could be accumulated on a small quantity generation site.

Recommendation: Raise the accumulation level to 2200 pounds

This alternative simplifies the rule, reduces small quantity generator dangerous waste management costs, and encourages use of dangerous waste transporters and facilities for managing small quantity generator waste. These benefits outweigh the potential risk of larger quantities of wastes accumulated on site.

Environmental Effects

No significant environmental impact is expected. The selected alternative trans-

fers regulatory authority over some currently regulated generators in the 220-2200 generation rate class to county moderate risk waste programs. Table 2 shows a county by county comparison of large quantity generators that generate more than 2200 pounds of hazardous waste each month, medium quantity generators

2. Comparison of Hazardous Waste and Moderate Risk Waste Generators

Planning Area	Population	Businesses			MQG as % of SQG
		LQGs	MQGs	SQGs	
Asotin-Nez Perce	51,076	0	2	1541	0.130
Bellingham	46,610	(in Whatcom Co)		1144	
Benton-Franklin	150,033	27	57	4200	1.357
Chelan-Douglas	76,600	11	45	1052	4.278
Clallam	54,400	7	28	1836	1.525
Clark-Skamania	222,200	59	62	9000	0.689
Cowlitz-Wahkiakum	87,461	14	33	1855	1.779
Ferry	6,400	3	1	84	1.190
Garfield	2,300	1	1	132	0.758
Grant-Adams-Lincoln	74,100	15	31	246	12.602
Grays Harbor	64,175	6	31	2970	1.044
Island	53,400	3	10	440	2.273
Jefferson	20,406	3	8	1852	0.432
King	1,413,900	415	959	20,000	4.795
Kitsap	177,300	14	72	2376	3.030
Kittitas	26,725	2	6	1159	0.518
Klickitat	16,800	2	4	120	3.333
Lewis	59,200	12	39	2966	1.315
Mason	37,500	3	16	2141	0.747
Okanogan	33,099	1	13	1047	1.242
Pacific	17,064	3	6	331	1.813
Pend Oreille	9,100	0	2	268	0.746
Pierce	565,665	114	293	4015	7.298
San Juan	9,700	0	1	158	0.633
Skagit	79,600	11	35	2534	1.381
Snohomish	429,016	79	233	1927	12.091
Spokane	367,137	72	185	13,000	1.423
Stevens	30,200	2	13	162	8.025
Thurston	149,300	17	108	540	20.000
Walla Walla-Columbia	53,100	10	19	675	2.815
Whatcom	72,490	19	66	1398	2.596
Whitman	39,000	1	7	1013	0.691
Yakima	186,300	26	58	9000	0.644
Total	4,681,357	952	2,444	91,182	2.680

that generate between 220 and 2200 pounds of hazardous waste each month, and small quantity generators that generate less than 220 pounds of hazardous waste each month. The large quantity and medium quantity generator data is based on annual reports received by Ecology. The small quantity generator data is based on county moderate risk waste surveys.

According to this information, if all of the medium quantity generators regulated at that level because of on-site accumulation rather than generation rate became small quantity generators, the small quantity generator universe would increase a total of 2.7 percent. Ecology believes that this percentage represents the likely maximum potential increase in the number of small quantity generators subject to regulation by county moderate risk waste programs. (Note: the selected alternative does not include increasing the generation rate at which an entity becomes subject to Chapter 173-303 WAC. The regulated **generation rate** would continue to be at 220 pounds per month)

The selected alternative also allows greater accumulation of dangerous waste on site. This could potentially increase risk to environment. However, since the unit cost of transportation and management will drop dramatically, more waste will likely be handled properly rather than illegally disposed.

For small quantity generators hauling their own wastes, the proposed alternative decreases frequency of transportation but increases quantities transported per load. We do not see an environmental impact associated with transportation issues. Commercial carrier use would increase and most regulations addressing safe handling and transportation of hazardous materials fall under the U.S. Department of Transportation (DOT). These requirements actually increase with quantities shipped (e.g., additional placarding requirements at 1000 **pounds** (49 CFR 172.504(c)).

Ecology will work with local govern-

ments and other interested parties during rule development to explore options to limit the storage time, transportation, and disposal options in order to mitigate any potential problems associated with the alternative.

Recommendation:

Simplify the regulations by modifying the Extremely Hazardous Waste concept in the following ways:

- Remove the redundant Extremely Hazardous Waste requirements from federal wastes.
- Eliminate or modify the Extremely Hazardous Waste requirements that are no longer effective.
- Designate for Extremely Hazardous Waste only when it may change the proposed management of the wastes.
- Retain the 2.2 pound Quantity Exclusion Limit for state toxic Extremely Hazardous Waste.
- Align state toxic Extremely Hazardous Waste with the widely accepted definition for acutely toxic substances.
- Maintain the definition of persistent Extremely Hazardous Waste.

Existing Extremely Hazardous Waste Requirement in Chapter 173-303 WAC

In 1976, the Extremely Hazardous Waste classification identified wastes that were inappropriate for disposal in the local solid waste systems. At that time Ecology believed that there would be a single disposal site developed on the Hanford Reservation for Extremely Hazardous Waste generated by Washington facilities. The statute "prohibited Extremely Hazardous Waste disposal" at any other site in the state.

In 1980, Ecology adopted RCRA and a definition for dangerous waste that covered a broader universe of waste than Extremely Hazardous Waste. The use of Extremely Hazardous Waste changed somewhat as a result. Dangerous waste defined the wastes inappropriate for solid waste disposal. Extremely Hazardous Waste identified some dangerous waste that represented a "higher risk" by virtue of toxicity, concentration and/or quantity. The quantity thresholds (known as Quantity Exclusion Limit's) which regulated wastes as dangerous waste or Extremely Hazardous Waste reflected the "higher risk" concept.

Ecology envisioned the development of a "two-tiered" waste management system. Under this concept Extremely Hazardous Waste would have more stringent management requirements than dangerous waste. The fundamental difference was that Extremely Hazardous Waste could only be disposed of at Hanford, and dangerous waste disposal sites could be established anywhere in the state.

Ecology adopted some special management requirements for Extremely Hazardous Waste through the early '80's. Most were derived from the "Extremely Hazardous Waste disposal prohibition". However, the "two-tiered" system was never fully established. Neither the Extremely Hazardous Waste disposal site nor any dangerous waste disposal sites were developed in the state. Today, under most waste management scenarios, there is no difference in the way we manage Extremely Hazardous Waste or dangerous waste.

Waste Streams Affected

Toxic Extremely Hazardous Waste

The largest number of **generators** of toxic Extremely Hazardous Waste dispose of low quantities of wastes using lab packs. These include small containers of discarded chemical products from hospitals, school districts, labs, and pesticides.

The largest **quantities** of Extremely Hazardous Waste come from the primary and fabricated metals industry, namely the aluminum industry. Less than six generators account for ninety-eight percent of the total quantity of toxic Extremely Hazardous Waste.

Persistent Extremely Hazardous Waste

Wood and printing industries account for about half of the persistent Extremely Hazardous Waste; for example, pentachlorophenol from wood treating processes (see Issue papers 1 and 3 in Appendix A).

Implementation Problems with the Extremely Hazardous Waste Requirement

The Extremely Hazardous Waste requirements add complexity to the EPA and state-only waste classifications, but in many cases, do not add significant environmental protection. There are a number of problems unique to the waste classifications or specific management requirements where they appear. The waste classification issue papers, the Extremely Hazardous Waste paper, and Appendix F discuss these in detail. In summary they are:

- Definitional differences with the Federal "Listed" wastes that cause confusion.
- Extra lab procedures required to determine Extremely Hazardous Waste concentration.
- Definitional differences with "acute toxicity" that adds uncertainty in the designation process.
- Extra designation steps required even though the waste management will not change.
- Extremely Hazardous Waste management requirements that have become redundant or obsolete.

Alternatives for the Extremely Hazardous Waste Requirements

Three alternatives were considered for the Extremely Hazardous Waste requirements:

Alternative 1: No changes to the Extremely Hazardous Waste classification.

While some of the Extremely Hazardous Waste system works well, much of it deserves streamlining and updating.

Alternative 2: Drop the classification of Extremely Hazardous Waste from the state *Dangerous Waste Regulations*.

This runs counter to the legislative mandate and eliminates a Quantity Exclusion Limit of 2.2 pounds for some highly toxic wastes that warrant regulation at lower levels than 220 pounds.

Alternative 3: Select specific adjustments to the Extremely Hazardous Waste scheme.

Some changes remove redundancies with the federal waste management requirements. Others reduce designation steps that do not affect management standards. These adjustments were carefully selected to maintain protective management standards and Quantity Exclusion Limits.

Recommendation: Make specific changes in the Extremely Hazardous classification and management requirements.

This approach meets the statutory re-

quirement for the Extremely Hazardous Waste classification. It also removes redundant management requirements while retaining measures that afford extra protection for more toxic wastes (e.g., the 2.2 Quantity Exclusion Limit and prohibition on burning Extremely Hazardous Waste as used oil). See Appendix F for more details on this scheme .

Environmental Effect

No significant environmental effect is expected from the changes to Extremely Hazardous Waste.

One recommended change involves realigning the Extremely Hazardous Waste requirements with the federal Acutely Hazardous Waste designation level. This effectively changes the Quantity Exclusion Limit for some wastes from 2.2 pounds to 220 pounds. The moderate risk waste line in Table 3 shows the amount of waste and number of generators that could potentially change from the Extremely Hazardous Waste category to the moderate risk waste category by increasing the Quantity Exclusion Limit for toxic Category C waste. This table is based on an evaluation of annual report data.

To arrive at the numbers for the moderate risk waste line, we searched the annual report data for those generators generating toxic Extremely Hazardous Waste - categories X, A, B, and C - with the waste codes WT01 or WL01. Next, we identified generators whose total waste generation appeared to be less than 220 pounds per month or batch. This step was necessary because the regulatory status of toxic Cat-

Table 3. Effect of Extremely Hazardous Waste Revision on Moderate Risk Waste Stream

	1989		1990		1991	
	Tons	Num. of Generators	Tons	Num. of Generators	Tons	Num. of Generators
WT01	33	84	23	108	28	86
[s]	328	78	495	103	186	80
MRW	0.3	18	1.2	27	1.0	22

WT01: Total of all recurrent wastes with a WT01 or WL01 waste code (Issue Paper #1)

[s]: Total of all recurrent wastes with a WT01 or WL01 waste code from the smaller volume generators (Issue Paper #1)

MRW: Total of all wastes (recurrent and nonrecurrent) witha WT01 or WL01 that could have become moderate risk waste.

egory C waste would not change if the facility generated more than 220 pounds of any dangerous waste. We conservatively assumed that all of the toxic Extremely Hazardous Waste from these generators was toxic Category C waste.

With respect to modifications of the management standards, adjustments were made to remove standards that were either duplicative of federal requirements or obsolete because they are universally applied. Management standards that are

Petition Process

needed to protect the environment from Extremely Hazardous Waste were retained.

For specific recommended options for Extremely Hazardous Waste, refer to Appendix F.

Recommendation:

Develop guidance to use with petitions

Existing Rule

WAC 173-303-910 (3) and (4) allows generators to petition Ecology to exempt a waste stream or exclude a category of waste from the *Dangerous Waste Regulations*.

Implementation Problems with the Current Rule

Ecology staff and petitioners share common concerns about the petition process. Ecology never set a standard for accepting or rejecting petitions. Some issues include:

Does waste minimization play a part in the decision to accept or deny a petition?

What is the appropriate level of detail in a petition?

What is the time frame for petition review?

What sampling protocols should be used to characterize waste streams?

In addition, critics note that Ecology provides inadequate public review opportunities for petitions. This lack of clarity for petition requirements slows the process of petition review. Applicants become confused and frustrated with their obligations to provide information to Ecology.

Ecology Commitments

Ecology agrees to develop guidance for petitioners and agency review staff which addresses:

1) The basis for accepting or rejecting petitions including technical detail;

2) Time frames estimated for processing petitions;

3) Waste minimization requirements and responsibilities;

4) Procedures to provide adequate public notice; and

5) Technical issues, including appropriate level of detail.

Draft guidance will be available for review in 1995.

Related Petition Issues

During the last six months, Ecology discussed using the petition process to tailor management standards for dangerous waste in place of contingency management. We reject this approach because a major emphasis of this regulatory reform

Effect of Regulatory Reform Proposal on the Hanford Reservation

effort is to reduce the complexity of the rules, and to empower Ecology staff and the regulated community to make faster, better and more consistent decisions. The petition process is a costly redundancy if decisions can be made on a class of wastes that are more self implementing.

During Phase I of the project, advisory committee members expressed some interest in the effort of the proposals on Hanford waste streams.

Effect on Mixed Waste Stream

The Hanford site generated approximately eleven tons of state-only mixed waste in 1993 (Appendix E). Based on annual report data, one-half ton of WT02 mixed waste could potentially designate as solid waste if the waste did not fail the fish bioassay at 100mg/L. If this waste failed the test, it be managed as low level waste.

Effect on the Dangerous Waste Stream

There was approximately sixty tons of state-only dangerous waste generated at Hanford in 1993 comprising a total of twenty-three separate waste streams. Based on annual report data, the proposed rule revisions do not appear to have an effect on any of these waste streams. They would continue to be regulated as dangerous waste.

This policy report is a companion to the *Dangerous Waste Regulatory Reform Project Responsiveness Summary*, Publication #95-403, Part B.

If you would like to receive a copy of the appendices referenced in this report, please contact:

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