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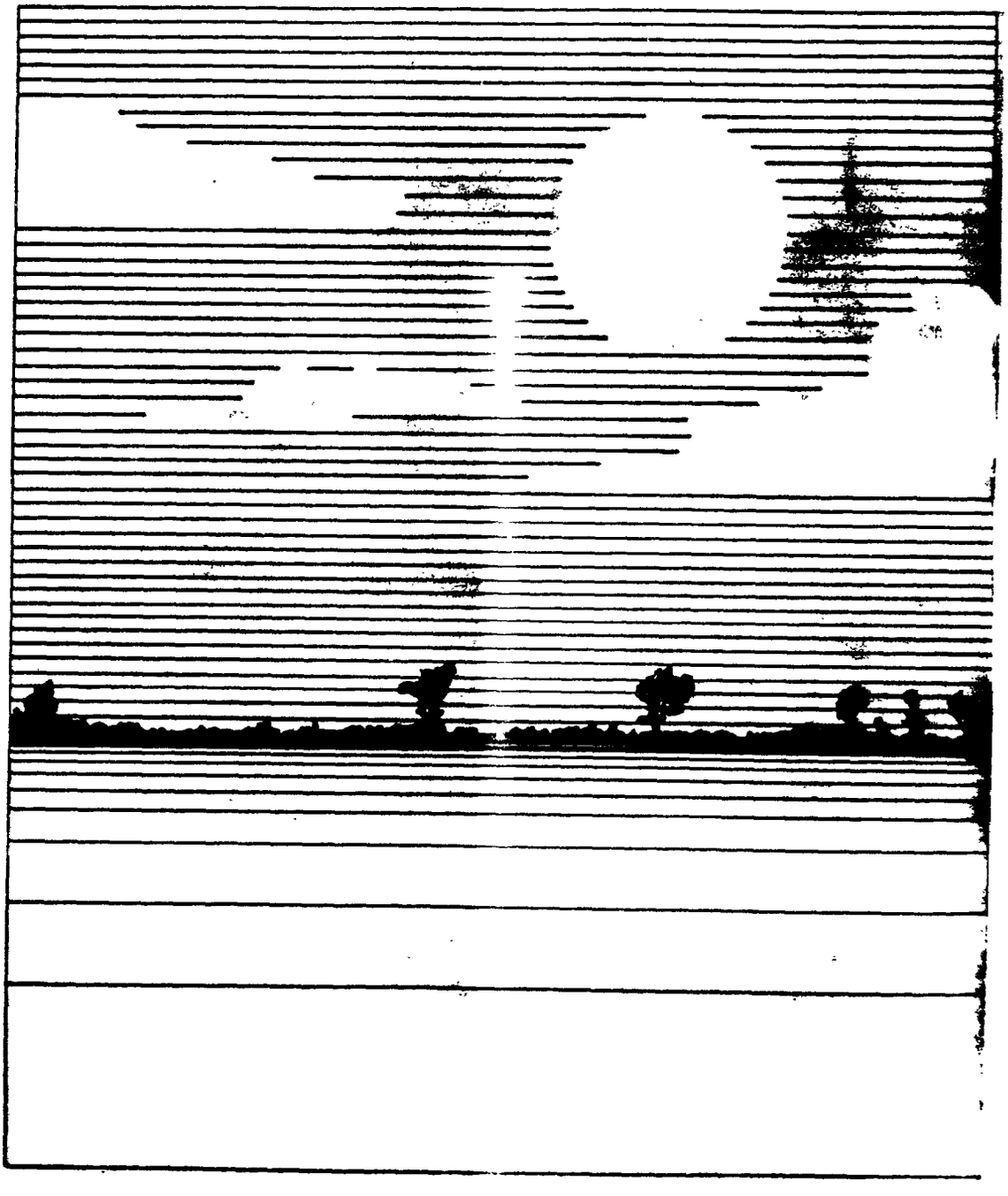
Land Disposal Restrictions Summary

Volume II

California List Wastes



LAND DISPOSAL RESTRICTIONS SUMMARY

VOLUME 2

CALIFORNIA LIST WASTES

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(Continued)

1. INTRODUCTION

The subject of this booklet is the July 8, 1987 final rule, which establishes land disposal restrictions for certain "California List" hazardous wastes and slightly modifies the framework for implementing the land disposal restrictions. This is the second in a series of booklets designed to summarize the restrictions on land disposal of hazardous wastes. The booklets are geared to individuals who are somewhat familiar with EPA's hazardous waste regulatory program. While they summarize the land disposal restrictions program, the booklets are not intended to provide a comprehensive review of all regulatory issues addressed in the associated EPA rules.

For further information, contact the RCRA/Superfund Hotline at (800) 424-9346 (toll free) or (202) 382-3000 in the Washington, D.C. metropolitan area. A limited number of the Land Disposal Restrictions booklets, Volumes I and II, are available.

The remainder of this introduction provides background information on the July 8, 1987 final rule.

Congressional Mandate: The Hazardous and Solid Waste Amendments

The Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) were enacted on November 8, 1984. Among other things, these far-reaching amendments require EPA to evaluate all hazardous wastes according to a strict schedule to determine whether land disposal of these wastes is protective of human health and the environment. When EPA promulgates prohibitions restricting wastes from land disposal, the amendments require EPA to set levels or methods of treatment which substantially diminish the waste's toxicity or reduce the likelihood that the waste's hazardous constituents will migrate. Beyond specified dates, restricted wastes that do not meet the treatment standards (or are otherwise exempt as discussed in this booklet) are prohibited from land disposal (see Table 1). According to HSWA, if EPA fails to set treatment standards for a particular waste by the specified deadlines, that waste is automatically prohibited from land disposal.

TABLE 1

SCHEDULE FOR LAND DISPOSAL PROHIBITIONS

November 7, 1986	Dioxin-containing wastes (F020, F021, F022, F023, F026, F027, F028) Spent solvents (F001, F002, F003, F004, F005)
July 8, 1987	California list wastes
August 8, 1988	At least one-third of all listed hazardous wastes Wastes disposed of in injection wells
November 8, 1988	Contaminated soil and debris from CERCLA Section 104 or 106 response actions, and RCRA corrective actions
June 8, 1989	At least two-thirds of all listed hazardous wastes
May 8, 1990	All remaining listed hazardous wastes All characteristic hazardous wastes
Within 6 months of listing or identification (these wastes are not subject to the automatic land disposal prohibition)	Newly listed wastes

Phase One: Solvents and Dioxins Land Disposal Restrictions

On November 7, 1986, EPA promulgated the first phase of the land disposal restrictions program (51 FR 40572). This final rule established the framework for implementing the land disposal restrictions program and established specific treatment standards and effective dates for the first category of wastes subject to the restrictions: spent solvent wastes (F001-F005), and dioxin-containing wastes (F020-F023 and F026-F028).

The November 7, 1986 final rule defined land disposal to include, but not be limited to, any placement of hazardous waste in landfills, surface impoundments, waste piles, injection wells, land treatment facilities, salt domes or salt bed formations, underground mines or caves, and placement in concrete vaults or bunkers intended for disposal purposes. The rule covers hazardous wastes placed in land disposal units after the effective dates of the prohibitions. Both interim status and permitted facilities are subject to the land disposal restrictions rule.

Wastes disposed of before November 7, 1986 do not have to be removed from land disposal for treatment. If wastes are removed from land disposal, however, they must meet the applicable treatment standards before subsequent new placement in or on the land, or they must be the subject of a variance or extension.

Contaminated soil and debris from Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104 and 106 response actions and RCRA corrective actions are not subject to land disposal restrictions until November 8, 1988. In addition, wastes disposed of in underground injection wells are not subject to the land disposal restrictions until August 8, 1988. Small quantity generators of less than 100 kg/month of hazardous waste (or less than 1 kg/month of acute hazardous waste) are not subject to the restrictions.

The November 7, 1986 final rule outlined the Agency's approach to implementing the congressionally mandated restrictions on land disposal of hazardous waste. The rule includes procedures to set treatment standards, obtain variances from the treatment standards, obtain extensions to the effective dates of the land disposal restrictions on a case-by-case basis, and obtain a "no migration" variance from the land disposal restrictions.

It also includes provisions to allow restricted wastes to be treated in surface impoundments, to prohibit dilution as a substitute for adequate treatment, to prohibit the storage of restricted hazardous wastes in certain circumstances, and to modify permits. In addition, the final rule sets out requirements for testing and recordkeeping, and specific treatment standards for certain dioxin-containing and spent solvent-containing wastes.

In May 1987, EPA published a booklet entitled Land Disposal Restrictions Summary, Volume I, Solvents and Dioxins (EPA/530-SW-87-019A). That booklet summarizes the 1986 rulemaking and describes the key regulatory requirements pertaining to treatment standards, variances, and extensions. The booklet also outlines the new responsibilities of generators, treatment facilities, and disposal facilities under the rule. Finally, it provides an overview of the specific treatment standards for solvent- and dioxin-containing wastes.

Phase Two: The California List Land Disposal Restrictions

The final California list land disposal restrictions rule was published in the Federal Register on July 8, 1987 (52 FR 25760). The action was taken in response to RCRA, as amended by HSWA, which requires EPA to restrict the land disposal of hazardous wastes containing the California list constituents above certain concentrations.

The final rule promulgates treatment standards and corresponding effective dates for the California list wastes containing polychlorinated biphenyls (PCBs) and certain halogenated organic compounds (HOCs). In addition, it codifies the statutory prohibition on certain corrosive wastes, establishes methods for determining compliance with the regulatory requirements, and modifies portions of the land disposal restrictions framework promulgated in the November 7, 1986 final rule.

Chapter 2 of this booklet summarizes the provisions of the California list final rule. Chapters 3 - 6 provide detailed discussions of the land disposal restrictions for each California list waste. These restrictions are also summarized in a tabular format in Appendix A. Chapter 7 provides a discussion of the major modifications to the framework of the land disposal restrictions program.

2. SUMMARY OF THE CALIFORNIA LIST LAND DISPOSAL RESTRICTIONS

Definition of the California List Hazardous Wastes

The California list hazardous wastes consist of the following:

- o Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1,000 mg/l.

- o Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below:

  - Arsenic and/or compounds (as As), 500 mg/l
  - Cadmium and/or compounds (as Cd), 100 mg/l
  - Chromium VI and/or compounds (as Cr VI), 500 mg/l
  - Lead and/or compounds (as Pb), 500 mg/l
  - Mercury and/or compounds (as Hg), 20 mg/l
  - Nickel and/or compounds (as Ni), 134 mg/l
  - Selenium and/or compounds (as Se), 100 mg/l
  - Thallium and/or compounds (as Tl), 130 mg/l.

- o Liquid hazardous wastes having a pH less than or equal to two.

- o Liquid hazardous wastes containing polychlorinated biphenyls (PCBs) at concentrations greater than or equal to 50 ppm.

- o Hazardous wastes containing halogenated organic compounds (HOCs) in total concentrations greater than or equal to 1,000 mg/kg.

Collectively, these hazardous wastes are referred to as the California list because the State of California developed regulations to restrict the land disposal of hazardous wastes containing these constituents. Congress subsequently incorporated these prohibitions into the 1984 Amendments to RCRA.

Physical Form Requirement

- RCRA prohibits the land disposal of California list wastes only if such wastes exist in liquid form. An exception is HOCs, which are prohibited from land disposal in both liquid and nonliquid form.

- EPA has required use of method 9095, "Paint Filter Liquids Test" (PFLT), found in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Publication SW-846), to determine whether a California list waste is liquid or nonliquid at the point of generation.

- The entire waste (not just the liquid portion) is prohibited if the concentration of California list constituents exceeds the applicable levels.

Hazardous Waste Requirement

RCRA states that the California list land disposal prohibition applies to hazardous wastes which:

- Are listed as hazardous under 40 CFR Part 261; **OR**

- Exhibit one or more of the characteristics of hazardous waste identified in Part 261, i.e., ignitability, corrosivity, reactivity, or EP toxicity; **AND**

- Also contain a California list constituent.

Concentration Levels Prohibited From Land Disposal

- o PCBs and other HOCs - The final rule promulgates land disposal prohibitions and effective dates for liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm, and most liquid and nonliquid hazardous wastes containing HOCs in total concentrations greater than or equal to 1,000 mg/kg.

- o Corrosives - EPA codified the statutory prohibition on land disposal of liquid hazardous wastes with a pH less than or equal to two.

- o Metals and Free Cyanides - The final rule does not establish prohibition levels, treatment standards, or effective dates for the California list liquid hazardous wastes containing metals or free cyanides. A final decision as to more stringent land disposal prohibitions for these wastes will be made at a later date. Until then, the statutory prohibitions established by Congress will apply.

- o HOC-specific treatment standards - Where treatment standards and prohibition effective dates are promulgated for California list HOC wastes that are also covered under the November 7, 1986 solvents and dioxins final rule, the treatment standards and effective dates for the specific HOCs promulgated on November 7, 1986 apply.

Determination of Prohibition Levels

In establishing the following testing requirements for determining whether a waste meets the specified prohibition levels, EPA evaluated whether it was more appropriate to analyze the concentration levels in the filtrate from the Paint Filter Liquids Test (PFLT) or to analyze the total constituents in the waste itself.

- o Analysis of a representative sample of the total waste must be performed to determine pH of liquid hazardous wastes for purposes of the corrosives prohibition.

- o Total constituent analysis must be performed on liquid hazardous wastes containing PCBs.

- o Total constituent analysis must be performed on nonliquid and liquid hazardous wastes containing HOCs.

- o Only the filtrate generated from the PFLT currently must be tested in liquid hazardous wastes containing free cyanides or the specified metals. When testing the filtrate, EPA recommends use of the applicable methods in "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, November, 1986.

- o Generators may also determine whether their wastes are restricted using knowledge of the waste, but must maintain all supporting data used to make such a determination on-site.

Elaboration on the "Point of Generation" Approach

EPA has adhered to the interpretation in the November 7, 1986 solvents and dioxins rule which states that initial generators are to determine at the point of generation whether their hazardous wastes are prohibited from land disposal. Therefore, the following must be done at the point of generation:

- o Determine whether a California list waste is liquid (except HOCs which may be nonliquid).

- o Determine whether the waste exceeds the applicable concentrations of hazardous constituents.

- Initiate generator notification and certification requirements.

Treatment Standards and Effective Dates

Effective July 8, 1987 the following hazardous wastes are prohibited from land disposal:

- Dilute HOC wastewaters - All liquid hazardous wastes that are primarily water and contain HOCs in total concentrations greater than or equal to 1,000 mg/l and less than 10,000 mg/l must be treated to below the 1,000 mg/l prohibition level prior to land disposal.

- PCBs - Liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm must be treated in accordance with the technical requirements of the existing TSCA thermal treatment regulations under 40 CFR Part 761.

- Treatment standards were not established for metals, free cyanides, and corrosive California list wastes. However, these wastes must be treated to levels below the statutory prohibition levels or rendered nonliquid prior to land disposal.

Effective July 8, 1989, the following hazardous wastes are prohibited from land disposal:

- HOCs - All liquid and nonliquid hazardous wastes containing HOCs in total concentrations greater than or equal to 1,000 mg/l (except dilute wastewaters) must be incinerated in accordance with requirements in 40 CFR Part 264 Subpart O or Part 265 Subpart O. Due to a lack of incineration capacity, EPA promulgated a two-year variance; therefore, these wastes may be land disposed until the July 8, 1989 effective date.

Permissible Land Disposal of California List Wastes

After July 8, 1987, the only circumstances under which California list wastes may be land disposed are:

- When California list metal- and free cyanide-containing wastes, corrosive wastes, and dilute HOC wastewaters have been treated to a level below the statutory prohibition level or rendered nonliquid
- When California list corrosive wastes have been treated to a pH greater than two
- When California list PCB and liquid and nonliquid HOC wastes have been treated by the required technologies or by an EPA-approved alternative treatment method
- When a California list waste is subject to a two-year national capacity variance
- When a California list waste has been granted a petition pursuant to "no migration" standards
- When a California list waste has been granted a case-by-case extension of the effective date
- When a California list waste has been granted a variance from the treatment standard

Modifications to the Regulatory Framework

In addition to addressing the land disposal of California list wastes, the final rule modifies portions of the land disposal restrictions framework promulgated as part of the solvents and dioxins final rule on November 7, 1986. The modified framework applies to both California list wastes and all other restricted wastes. The modifications are discussed in Chapter 7 of this booklet.

3. DETAILED DISCUSSION OF FREE CYANIDES AND METALS

Definition and Testing Requirements

The statutory language of RCRA prohibits disposal of liquid hazardous waste, including free liquids associated with any solid or sludge containing free cyanides at concentrations of 1,000 mg/l or more. EPA is not currently requiring the use of a particular test to determine free cyanide concentrations, but is recommending the use of Method 9010, "Cyanides Amenable to Chlorination" in EPA Publication SW-846. For purposes of complying with the prohibitions, this test need only be performed on the filtrate from the Paint Filter Liquids Test.

For purposes of the RCRA prohibition, the California list metals are defined with reference to the periodic table of elements. This requirement applies both to individual constituents and to the relevant metal portion of any compounds containing such metals. EPA is not currently requiring the use of a particular test to determine metal concentrations, but is recommending that the appropriate method in Chapter 3, "Metallic Analytes," in EPA Publication SW-846 be used to determine concentrations. For purposes of complying with the prohibitions, only the filtrate from the PFLT need be tested.

Prohibition Levels and Treatment Standards

The final rule does not establish concentration levels for prohibition of land disposal of the California list wastes containing free cyanides or metals. Nor does it establish treatment standards for these wastes. These determinations will be made in a separate rulemaking at a later date.

However, on July 8, 1987 the statutory prohibition levels of metal-bearing and free cyanide-containing wastes automatically became effective. Therefore, land disposal of these wastes is prohibited if the concentrations in the PFLT filtrate equals or exceeds the following levels:

Constituent	Concentration
Free cyanides	1000 mg/l
Arsenic (As)	500 mg/l
Cadmium (Cd)	100 mg/l
Chromium (CrVI)	500 mg/l
Lead (Pb)	500 mg/l
Mercury (Hg)	20 mg/l
Nickel (Ni)	134 mg/l
Selenium (Se)	100 mg/l
Thallium (Tl)	130 mg/l

In order to be land disposed, these wastes must either be treated to levels below the statutory prohibition level or be rendered nonliquid.

Prohibition Effective Dates and Capacity Determination

No national capacity variance was granted for the California list metal and free cyanide wastes. To the extent that there are shortages in capacity, case-by-case extensions may be granted pursuant to the requirements of 40 CFR 268.5.

Part 268 and Related RCRA Subtitle C Requirements

The regulatory framework promulgated on November 7, 1986, is applicable to all of the California list wastes, including metal-bearing and free cyanide-containing wastes. Therefore, the tracking, notification, and certification requirements in §268.7 and the related waste analysis requirements in §264.13 and §265.13 apply to these wastes.

4. DETAILED DISCUSSION OF CORROSIVES

Definition and Testing Requirements

EPA has adopted the statutory definition of corrosive wastes; that is, liquid wastes having a pH less than or equal to two. As with the other California list wastes, the PFLT method is used to determine whether the corrosive waste is a liquid. The final rule requires that corrosive waste samples (not the PFLT filtrate) be tested in accordance with the procedures specified in 40 CFR 261 22(a)(1) to determine whether their pH is less than or equal to two. Knowledge of the waste may also be used and all supporting documentation must be placed in on-site files.

Prohibition Level and Treatment Standard

The Agency codified the statutory prohibition level but did not promulgate a treatment standard for wastes with a pH less than or equal to two. Since EPA is not specifying a technology-based treatment standard, corrosive wastes may be neutralized to a pH greater than two or rendered nonliquid by chemical fixation or other treatment methods, and be land disposed. If a waste is hazardous solely because of the characteristic of corrosivity, rendering it nonliquid also renders it nonhazardous because the characteristic of corrosivity based on low pH only applies to aqueous wastes.

Prohibition Effective Date and Capacity Determination

The prohibition on land disposal of corrosive wastes became effective on July 8, 1987. To the extent that there are shortages in capacity, case-by-case extensions may be granted pursuant to the requirements of 40 CFR 268.5.

5. DETAILED DISCUSSION OF POLYCHLORINATED BIPHENYLS (PCBs)

Definition and Testing Requirements

For purposes of the California list final rule, PCBs are defined as "any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination of substances which contain such substance." In addition, inadvertently generated non-Aroclor PCBs are defined as "the total PCBs calculated following division of the quantity of monochlorinated biphenyls by 50 and dichlorinated biphenyls by 5." This was inserted in the TSCA regulations in recognition that monochlorinated biphenyls are less toxic and less persistent than dichlorinated biphenyls, which are themselves less toxic and less persistent than polychlorinated biphenyls with greater than two chlorines.

The final rule requires that once a hazardous waste containing PCBs is determined to be a liquid using the Paint Filter Liquids Test, then the total waste (not an extract or filtrate) must be analyzed to determine compliance with the California list land disposal restrictions.

Hazardous Waste Requirements

Since PCBs are not listed as hazardous wastes under RCRA, PCB-containing wastes are only subject to the California list prohibitions if they are mixed with or otherwise contained in wastes that are listed as hazardous under 40 CFR Part 261, or if the mixture exhibits one or more of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or EP toxicity).

For example, transformers often contain both PCBs and hazardous constituents listed in Part 261. However, if the waste containing these constituents is not a listed or characteristic waste, the California list prohibition does not apply.

It should be noted that regulations promulgated pursuant to TSCA currently address the land disposal of PCB wastes which are not mixed with RCRA hazardous wastes. Several provisions in HSWA, which are not contained in the existing TSCA or RCRA regulations, also impose restrictions on the

land disposal of PCB wastes. The final rule integrates a number of the TSCA requirements into the RCRA framework in order to ensure that where there is an inconsistency between TSCA and RCRA standards, the more stringent regulations will govern. For example, liquid wastes containing PCBs at concentrations greater than or equal to 500 ppm, are not eligible for a "no migration" exemption.

It should also be noted that liquid hazardous wastes may contain both PCBs and other hazardous constituents for which EPA has established different treatment standards or prohibition effective dates. An example would be solvent wastes and PCB wastes mixed in a single matrix. In this circumstance, the waste must meet the treatment standards for both the spent solvent wastes and PCB wastes and must do so by the required technology, incineration.

Prohibition Level and Treatment Standards

EPA codified the statutory 50 ppm prohibition levels for PCB wastes and established treatment standards that are consistent with existing requirements under TSCA. Liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm and less than 500 ppm may be burned in either high efficiency boilers or in incinerators pursuant to the operating standards set forth under TSCA (see 40 CFR 761.60 and 761.70). Liquid wastes containing PCBs at concentrations greater than or equal to 500 ppm must be incinerated in accordance with §761.70.

Alternative equivalent methods (e.g., chemical dechlorination) may be used provided they are approved by the EPA Administrator as being able to achieve a measure of performance equivalent to that achievable by methods EPA has specified. Applications for approval of alternative equivalent methods should be submitted to the EPA Administrator. Where such applications involve PCB-containing wastes, copies should also be sent to the Director, Exposure Evaluation Division, Office of Toxic Substances, and to the Chief, Waste Treatment Branch, Office of Solid Waste.

Prohibition Effective Date and Capacity Determination

EPA has determined that there is not a nationwide shortage of capacity to treat liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm. For the liquid wastes containing PCBs at concentrations greater than or equal to 500 ppm, the TSCA regulations already require incineration. Therefore, the California list prohibitions do not add any incremental demand to a capacity analysis. As a result, the statutory effective date of July 8, 1987 was applied to the California list PCB wastes. To the extent that isolated shortages of capacity occur, applicants may apply for case-by-case extensions of the effective date.

6. HALOGENATED ORGANIC COMPOUNDS (HOCs)

Definition and Testing Requirements

HOCs are compounds with a carbon-halogen bond in their molecular formula. Halogens include the five nonmetallic elements in Group VIIA of the periodic table: fluorine (F), chlorine (Cl), bromine (BR), iodine (I), and astatine (At).

In determining whether a hazardous waste contains HOCs in concentrations above the California list prohibition level, only those HOCs which are listed in Part 268 Appendix III must be included in the calculation. Appendix III was added to Part 268 in the July 8, 1987 final rule. It consists of all HOCs that EPA currently analyzes in establishing section 3004(m) treatment standards expressed as performance levels for which test methods exist. The Agency has also added to this Appendix those additional PCBs covered under the existing TSCA regulations. Part 268 Appendix III is reproduced in this booklet as Appendix B. In finalizing the HOC prohibition, EPA reiterated that compounds such as polyvinyl chlorides (PVCs), even if contained in hazardous wastes, are not within the scope of the California list prohibitions, because PVCs are not included in Appendix III to Part 268. Monomeric vinyl chloride, however, is subject to the restrictions because it is listed in Part 268 Appendix III.

In testing for HOCs, EPA has required the use of a total constituent analysis. Thus, a representative sample of the entire waste (not an extract) must be tested in order to determine the concentrations of the California list HOCs.

Prohibition Level and Treatment Standards

EPA established incineration as the treatment standard for liquid and nonliquid hazardous wastes containing HOCs in total concentrations greater than or equal to 1,000 mg/l (except dilute HOC wastewaters). The incineration method must achieve 99.99 percent destruction and removal efficiency (four 9s DRE), in accordance with the existing requirements of 40 CFR Part 264 Subpart O or 40 CFR Part 265 Subpart O. If, however, a facility

demonstrates that a restricted waste, due to physical or chemical properties that alter its treatabilty, cannot be incinerated in compliance with these requirements, the facility may petition EPA for a variance from the treatment standard. Also a facility may petition for approval to use an alternative equivalent treatment method.

Dilute HOC wastewaters, defined as liquid hazardous wastes that are primarily water and contain less than one percent HOCs or HOCs in total concentration less than 10,000 mg/l, need not be incinerated. These dilute wastewaters must be treated to a level below the 1,000 mg/l prohibition level prior to land disposal; however, no particular methods for achieving this level are specified.

EPA determined in the November 7, 1986 solvents and dioxins final rule that wastewater treatment technologies such as biological treatment, activated carbon adsorption, and steam stripping should form the basis for concentration-based treatment standards applicable to the F001-F005 solvent wastewaters. Application of these treatment technologies may be effective for many HOC wastes; however, a generalization that one or all of them constitutes Best Demonstrated Available Technology (BDAT) for such a wide variety of compounds is not possible at this time.

It should be noted that if an HOC-containing waste already is subject to a treatment standard for a specified HOC (e.g., an F001 or F002 spent solvent, or a prohibited dioxin- or PCB-containing waste), the treatment standard and effective date for the more specific HOC waste would control.

Where a hazardous waste contains both California list HOCs and non-HOC constituents (e.g., prohibited levels of a California list metal in liquid form), the waste would be prohibited from land disposal until it is in compliance with the treatment standards for both the HOC and the non-HOC constituents. The general principle here is that where different constituents are present in the same waste (as opposed to one constituent appearing on two lists, e.g., an F001-F002 solvent which is also an HOC), all of the constituents in the waste must be in compliance with, or be treated to comply with, all specified treatment standards or prohibition levels. Likewise, the prohibition effective date for each constituent would be applicable, unless EPA specifically states otherwise in one of its regulations.

Capacity Determination and Effective Dates

EPA has granted a two-year nationwide variance from the July 8, 1987 statutory effective date for the California list HOC wastes requiring incineration. These HOC wastes are not subject to the land disposal restrictions until July 8, 1989. The variance has been granted based on EPA's determination that, due in large part to the additional demand placed on incinerators as a result of the November 7, 1986 solvent restrictions, there is a nationwide lack of incineration capacity.

The dilute HOC wastewaters, however, are prohibited from land disposal as of July 8, 1987. EPA decided not to grant a national capacity variance for dilute HOC wastewaters because the Agency's estimates are that these wastes are generated in low volumes, and most of these wastes are believed to contain less than the statutory HOC prohibition level. In addition, there is some available commercial capacity to treat these wastes.

Relationship to Waste-Specific Prohibitions

The California list was intended as a starting point in the land disposal restrictions. Therefore, where waste-specific data are available, they are likely to be more reliable since they may more directly address the characteristics of the specific wastes. Also, EPA prefers to establish concentration-based treatment standards rather than treatment standards expressed as specified technologies because this provides the regulated community with greater flexibility in meeting treatment standards and encourages the development of more efficient and innovative technologies.

Consistent with these principles, the HOC treatment standards promulgated in the California List final rule are only applicable to those HOCs that are not covered by other land disposal restrictions rulemakings. EPA has stipulated that treatment standards established for wastes containing individual California list constituents will supersede the treatment standards promulgated in the California list final rule. Similarly, the prohibition effective date established for the more specific HOC waste is applicable; not the prohibition effective date established in the California list final rule.

EPA cautions, however, that these principles for waste-specific versus the more generic wastes only apply where waste-specific treatment standards and prohibition effective dates exist. The wastes currently affected by this overlap are the prohibited solvent, dioxin, and PCB wastes, which are waste-specific subsets of the broad category of HOCs. Several examples of the Agency's approach in such cases are provided in Appendix C.

Relationship to California List Prohibition on PCBs

Because PCBs are also halogenated organic compounds, EPA reads the PCB prohibition as placing an upper limit of 50 ppm on the concentration of PCBs that may be contained in a liquid hazardous waste which also contains HOCs and is being land disposed. In such cases, the treatment standards and prohibition effective dates for the PCB-containing wastes are the more waste-specific determinations. They therefore supersede the HOC treatment standards and effective dates. It should be noted, however, that the limitation of 50 ppm is only applicable to liquid hazardous wastes containing PCBs. Therefore, a nonliquid hazardous waste containing PCBs at concentrations greater than or equal to 50 ppm, may be land disposed without violating the California list PCB prohibition on HOCs, as long as the total concentration of HOCs does not exceed 1,000 mg/kg.

On the other hand, if the total concentration of HOCs in either a liquid or nonliquid hazardous waste is greater than or equal to 1,000 mg/kg, the waste is prohibited from land disposal, even if the concentration of PCBs is below 50 ppm. Also, a nonliquid hazardous waste containing 400 mg/kg PCBs and 700 mg/kg HOCs other than PCBs (i.e., over 1,000 mg/kg total) is prohibited from land disposal despite the fact that existing regulations promulgated under TSCA would allow disposal of such nonliquid PCB wastes in an approved landfill.

Relationship to Dilute Solvent Wastewaters

EPA determined in the November 7, 1986 solvents final rule that there is a nationwide lack of capacity to treat dilute F001-F005 solvent

wastewaters. Therefore, these wastes were granted a two-year national capacity variance until November 8, 1989.

As long as a wastewater is regulated as hazardous because of F001-F005 solvent constituents, the national capacity variance for F001-F005 solvent-containing wastewaters will continue to apply. This is true even if the solvent wastes also contain over 1,000 mg/l HOCs. EPA has already addressed these specific solvent wastes on November 7, 1986 and has indicated in the California list final rule that such waste-specific determinations supersede the California list determinations. However, if the solvent-HOC hazardous wastewater is not regulated as hazardous by virtue of being an F001-F005 solvent, then it does not meet the definition of those wastes addressed in the November 7, 1986 final rule. Therefore, it is subject to the prohibition effective date promulgated for the dilute HOC wastewaters. As a result, the hazardous waste would be prohibited effective July 8, 1987 even if it contains unregulated concentrations of the constituents specified in the F001-F005 listings.

7. MODIFICATIONS TO THE LAND DISPOSAL RESTRICTIONS FRAMEWORK

Introduction

The California list final rule makes some modifications to the land disposal restrictions framework promulgated in the solvents and dioxins final rule on November 7, 1986 (51 FR 40572). These changes apply to all wastes subject to the land disposal restrictions. Among these are changes to strengthen the dilution prohibition, a new prohibition on the evaporation of hazardous constituents for purposes of obtaining a treatment in surface impoundment exemption, increased flexibility in permit modification procedures, as well as other changes to the final framework. The major changes to the framework are discussed below.

Dilution Prohibition (§268.3)

- The California list strengthens the existing prohibition on dilution of restricted wastes by amending §268.3 to prohibit dilution as a means of avoiding the land disposal restrictions. Thus, dilution of wastes to concentrations below the applicable level is prohibited, as is dilution to circumvent the effective date of a prohibition.

- Solidification, defined as treatment that renders a hazardous waste nonliquid, is appropriate treatment in many cases where it does not merely constitute dilution. Many treatment methods require the addition of reagents that produce physical or chemical changes and do not merely dilute the hazardous constituents into a larger volume of waste so as to lower the constituent concentration. Where such physical or chemical changes do not occur, or where the hazardous constituents are not otherwise immobilized, solidification techniques may be considered to be dilution as a substitute for adequate treatment within the meaning of the §268.3 prohibition.

- Solidification may be appropriate when treatment standards have not been promulgated. In cases where treatment standards have been established, solidification will have to achieve those treatment levels. Where treatment standards have been expressed as specified technologies, those technologies must be utilized.

- Legitimate aggregation of waste streams to facilitate centralized treatment is permissible. Artificial aggregation of wastes, however, to avoid a land disposal prohibition standard, or mixing prohibited wastes with substances that do not need to be treated or which do not aid in treatment, would be considered impermissible dilution.

Treatment Surface Impoundment Exemption: Evaporation Prohibition (§268.4)

- The July 8, 1987 final rule prohibits evaporation of hazardous constituents as the principal means of treatment to obtain an exemption under §268.4 (§268.4 allows treatment of otherwise prohibited wastes in surface impoundments). Only impoundments used to treat restricted wastes to reduce their toxicity or mobility, and not just to transfer hazardous constituents and their associated risks from the land to the air, are eligible for the §268.4 exemption. However, evaporation incidental to properly operated and effective treatment methods is allowed.

- Evaporation of water or other compounds not on the list of hazardous constituents in 40 CFR 261, Appendix VIII is not covered by the evaporation prohibition. A treatment process involving the evaporation of water as the principal means of treatment, such as dewatering liquid metal-bearing waste to facilitate resource recovery, is currently eligible for a §268.4 exemption.

Minor Modifications of Permits and Changes During Interim Status (§270.42 and §270.72)

- The July 8, 1987 final rule allows permitted facilities to use the minor modification process, under certain conditions, to obtain approval to change their facilities in order to treat or store restricted wastes in tanks or containers as necessary to comply with the land disposal restrictions. Specifically, the minor permit modification process may be used to obtain approval to make changes, provided the permittee complies with the following conditions: first, the owner or operator must submit a complete major permit modification application; second, the applicant must demonstrate that changes in a unit to treat or store restricted wastes in tanks or containers are necessary to comply with the land disposal restrictions; and third, the applicant must ensure that such units comply with the applicable Part 265 standards until the major modification request is granted, or until Part 265 closure and post closure responsibilities are fulfilled.

- Prior to the July 8, 1987 final rule, owners or operators of interim status facilities needing expansion by more than 50 percent, in terms of capital investment, were required to defer such changes until a permit was issued. The California list final rule changed the regulatory framework by waiving the 50 percent reconstruction limit for interim status facilities. Such facilities are required to file a revised Part A application prior to such changes. Applicants must also demonstrate that the changes are necessary to comply with the land disposal restrictions of Part 268. Facilities allowed to expand their operations by more than 50 percent continue to be subject to the Part 265 standards.

General Waste Analysis (§264.13 and §265.13)

- Where no treatment standards have been established, as for some of the California list wastes, residues not meeting the applicable prohibition levels are subject to the annual removal requirement for surface impoundments. Waste analysis requirements are also revised accordingly.

Purpose, Scope and Applicability of Part 268 (§268.1)

- Section 268.1(d) cross-references an existing regulatory exemption (40 CFR 262.70) which provides that a farmer disposing of waste pesticides from his own use on his own farm in accordance with the disposal instructions on the pesticide label, is not subject to the land disposal prohibitions.

- The revised definition of "land disposal" clarifies that placement in concrete vaults or bunkers is considered land disposal only when waste is placed there for disposal purposes.

Case-by-Case Extensions (§268.5)

- Where no treatment standards have been established, applicants for an extension must demonstrate that the treatment capacity being provided will meet the underlying statutory standard of being protective of human health and the environment.

- Section 268.5(h)(2) references the RCRA Section 3005(j)(1) provision which states that existing interim status surface impoundments must be in compliance with the minimum technological requirements applicable to new impoundments by November 8, 1988.

- The final rule states that a landfill disposing of containerized liquid hazardous wastes containing PCBs during the period of an extension, must be in compliance with both the TSCA regulations for chemical waste landfills at 40 CFR 761.75 and the Part 264 and 265 requirements.

"No Migration" Petitions to Allow Continued Land Disposal (§268.6)

- Liquid wastes containing PCBs at concentrations greater than or equal to 500 ppm are not eligible for a "no migration" exemption.

Waste Analysis and Recordkeeping (§268.7)

- The notice and certification provisions are modified to require reference to the applicable prohibition levels where no treatment standards are established.

Treatment Standards Expressed as Specified Technologies (§268.42)

- The language in §268.42(b) is modified to indicate that if an equivalency petition does not have general applicability and effect, it amounts to an individualized variance, and rulemaking procedures may not be required. The determination of whether or not the equivalency petition has general applicability and effect will be made by the EPA when evaluating each petition.

- The language in §268.42(b) requiring petitioners to demonstrate that their treatment method does not pose an "unreasonable risk" is removed. EPA is substituting the RCRA standard which requires a demonstration that the alternative treatment method is "protective of human health and the environment." Since the equivalency petition is made with respect to PCB-containing wastes also regulated under TSCA, the applicant would also have to satisfy the "unreasonable risk" standard as required under the TSCA regulations.

Prohibitions on Storage of Restricted Wastes (§268.50)

- The exemption from the storage prohibition for wastes that meet the treatment standards was modified to extend this principle to wastes for which treatment standards are not specified.

- Section 268.50 was modified to require that California list PCB wastes may only be stored in accordance with 40 CFR 761.65(b) requirements, and such storage is limited to one year. For convenience, the §761.65(b) requirements have been incorporated in §268.50, specifying certain physical characteristics at PCB storage facilities such as adequate roofing and walls, and floors with curbing.

APPENDIX A

SUMMARY TABLE OF CALIFORNIA LIST LAND DISPOSAL RESTRICTIONS

APPENDIX A: SUMMARY TABLE OF CALIFORNIA LIST LAND DISPOSAL RESTRICTIONS*

Constituents and Prohibition Levels	Effective Date	Specified Test Methods	Treatment Method Standards
Free Cyanides (≥1,000 mg/l)	July 8, 1987	Test PFLT filtrate (r) Use Method 9010 -- "Cyanides Amenable to Chlorination Test," SW-846 (r)	Stabilization (A) Alkaline Chlorination (A) Chlorination by Sodium Hydroxide or Sodium Hypochlorite (A)
Metals (as elements or compounds) ≥ Arsenic (500 mg/l) Cadmium (100 mg/l) Chromium (500 mg/l) Lead (500 mg/l) Mercury (20 mg/l) Nickel (134 mg/l) Selenium (100 mg/l) Thallium (130 mg/l)	July 8, 1987	Test PFLT filtrate (r) Use Chapter 3 - "Metallic Analytes," SW-846 (r)	Chemical Precipitation (A) Stabilization (A) Hexavalent Chromium Reduction (A)
Corrosives (pH ≤ 2.0)	July 8, 1987	Test the total waste, not filtrate (R) Test in accordance with 40 CFR 261.22(a)(1) (R)	Neutralization to a pH of greater than 2.0 (A) Chemical Fixation (A)
Polychlorinated Biphenyls (≥50 ppm)	July 8, 1987	Test the total waste, not filtrate (R)	If less than 500 ppm: Incineration (761.60) or high efficiency boilers (761.60) (R). If ≥ 500 ppm: Incineration in accordance with 761.70 (R).
Halogenated Organic Compounds Dilute Wastewater (≥1,000 mg/l)	July 8, 1987	Test the total waste, not filtrate (R)	Biological Treatment (A) Activated Carbon Adsorption (A) Steam Stripping (A)
Other HOCs (≥1,000 mg/kg)	July 8, 1989	Test the total waste, not filtrate (R)	Incineration in accordance with 40 CFR Part 264 Subpart O or 265, Subpart O (R)

* Restrictions apply only when constituents are contained in liquid hazardous wastes, with the exception of HOCs. The restrictions apply to HOCs contained in both liquid and nonliquid hazardous wastes. The prohibition levels and effective dates for free cyanides and metals are the statutory restrictions established by Congress which are automatically in effect. EPA may decide to establish more stringent prohibition levels.

(R) - Required testing or treatment method (r) - Recommended testing or treatment method

(A) - Available methods identified by EPA in the July 8, 1987 Final Rule. Other methods achieving the desired results are also acceptable at this time.

APPENDIX B

PART 268 APPENDIX III--LIST OF HALOGENATED ORGANIC COMPOUNDS REGULATED UNDER §268.32

Appendix B

PART 268 APPENDIX III--LIST OF HALOGENATED ORGANIC COMPOUNDS REGULATED UNDER §268.32

In determining the total concentration of HOCs in a hazardous waste for purposes of the §268.32 land disposal prohibition, the HOCs that must be included in the calculation are those compounds having a carbon-halogen bond which are listed in Appendix III to Part 268. The following listing has been reproduced from Part 268 Appendix III:

Volatiles

Bromodichloromethane
Bromomethane
Carbon Tetrachloride
Chlorobenzene
2-Chloro-1,3-butadiene
Chlorodibromomethane
Chloroethane
2-Chloroethyl vinyl ether
Chloroform
Chloromethane
3-Chloropropene
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane
Dibromomethane
Trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
Trans-1,2-Dichloroethane
1,2-Dichloropropane
Trans-1,3-Dichloropropene
cis-1,3-Dichloropropene
Iodomethane
Methylene chloride
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Tribromomethane
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichloromonofluoromethane
1,2,3-Trichloropropane
Vinyl chloride

Phenoxyacetic Acid Herbicides

2,4-Dichlorophenoxyacetic acid	Silvex
	2,4,5-T

PCBs

Aroclor 1016	Aroclor 1248
Aroclor 1221	Aroclor 1254
Aroclor 1232	Aroclor 1260
Aroclor 1242	PCBs not otherwise specified

Dioxins and Furans

Hexachlorodibenzo-p-dioxins	Tetrachlorodibenzo-p-dioxins
Hexachlorodibenzofuran	Tetrachlorodibenzofuran
Pentachlorodibenzo-p-dioxins	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Pentachlorodibenzofuran	

APPENDIX C

EXAMPLES ILLUSTRATING INTEGRATION OF THE JULY 8, 1987 FINAL RULE WITH OTHER LAND DISPOSAL RESTRICTIONS RULES

Appendix C

EXAMPLES ILLUSTRATING INTEGRATION OF THE JULY 8, 1987 FINAL RULE WITH OTHER LAND DISPOSAL RESTRICTIONS RULES

The following examples demonstrate EPA's interpretation of the operation of the final rule. (These examples assume that none of the exemptions in sections 268.4, 268.5, and 268.6 apply.)

Example 1: Generator A generates a liquid hazardous waste containing 2,000 ppm HOCs, some of which are F001 hazardous waste solvents.

EPA Interpretation: Effective November 8, 1988, the waste must meet the applicable treatment standard for the F001 solvent constituents. The treatment standards and prohibition effective dates for spent solvent wastes control here because F001 solvents are a subset of HOCs and were already addressed in the November 7, 1986 final rule. However, §268.30(a)(3) states that solvent wastes containing less than 1% total F001-F005 constituents as initially generated are prohibited effective November 8, 1988.

Example 2: Generator B generates a nonliquid hazardous waste containing 12,000 ppm HOCs, over 10,000 ppm (1%) of which are F001 solvents.

EPA Interpretation: For the same reasons as the previous example, the waste must meet the treatment standards for F001 solvents, but it need not be incinerated to do so. This is because the treatment standards for F001-F005 solvents are expressed as concentration levels rather than as a technology. The land disposal prohibition for F001 wastes containing greater than or equal to 1% total F001-F005 solvent constituents has been in effect since November 8, 1986. This interpretation assumes that the waste is not generated by a small quantity generator, a CERCLA response action, or a RCRA corrective action.

Example 3: Generator C, a small quantity generator (SQG) of 100-1,000 kg per month of hazardous waste, generates a spent solvent waste containing 20,000 ppm of F001 solvents and 25,000 ppm of other HOCs.

EPA Interpretation: The treatment standard for F001 solvents will apply as of November 8, 1988 because EPA has determined that there is currently insufficient nationwide treatment capacity for such spent solvent wastes generated by SQGs. (See § 268.30(a)(1) of 51 FR 40641.) As the SQG F001 solvents are a subset of HOCs and were already addressed in the November 7, 1986 final rule, the SQG F001 treatment standards and prohibition effective date will control.

Example 4: Generator D, a large quantity generator, generates a non-CERCLA liquid hazardous waste containing 600 ppm PCBs and 11,000 ppm hazardous waste, spent chlorinated solvents.

EPA Interpretation: The waste must meet the treatment standard and prohibition effective dates for both solvents and PCBs, and must do so by incineration. Solvents and PCBs are considered to be different constituents and, therefore, both sets of treatment standards and prohibition effective dates (November 8, 1986 and July 8, 1987, respectively) apply. Examples 1-3 illustrated that the HOC prohibitions are superseded by prohibitions on more specific types of HOCs. However, in this case (Example 4), solvents are not a subset of PCBs or vice versa.

Example 5A: Generator E, a small quantity generator (100-1,000 kg/mo), generates the same waste as Generator D in the previous example.

EPA Interpretation: Because EPA has not found any shortage in nationwide PCB treatment capacity, EPA ruled that this waste would have to be incinerated as of July 8, 1987.

Example 5B: Same facts as the previous example, except the waste is not a liquid.

EPA Interpretation: Only the treatment standards and November 8, 1986 prohibition effective date for the solvent apply because nonliquid PCB wastes are not prohibited in today's final rule. Therefore, several treatment options are available in order to meet the solvent standards.

Example 6: Generator F generates a liquid hazardous waste containing 11,000 mg/l HOCs and 600 mg/l lead.

EPA Interpretation: The HOC portion of the waste is not prohibited until July 8, 1989. The metal portion of the waste is prohibited immediately. Therefore, until July 8, 1989, it is necessary only to treat the waste such that the metal concentrations are below the established treatment standards or the waste is no longer a liquid. Once the HOC prohibition becomes effective, the waste cannot be land disposed until it has been incinerated. The residue from incineration may be land disposed if it is a nonliquid (e.g., an ash). It may also be land disposed if it is still a liquid (e.g., a scrubber water), provided it contains less than 500 ppm lead (or more stringent levels that may be specified in the future). The general principle here is that where a waste contains different constituents, none of which is a subset of another, the waste must meet the treatment standards and prohibition effective dates for each constituent.