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# **RCRA, Superfund & EPCRA Hotline Training Module**

**Introduction to:**

**Land Disposal Restrictions  
(40 CFR Part 268)**

**Updated October 1999**

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# LAND DISPOSAL RESTRICTIONS

## CONTENTS

1. Introduction .....	1
2. Regulatory Summary .....	2
2.1 LDR and EPA's Groundwater Protection Strategy .....	2
2.2 Applicability .....	3
2.3 Treatment Standards.....	4
2.4 Alternative Treatment Standards.....	7
2.5 Variances, Extensions, and Exemptions .....	10
2.6 Other Prohibitions .....	13
2.7 Tracking and Recordkeeping Requirements.....	14
2.8 Characteristic Hazardous Wastes.....	17
2.9 History of the LDR Program .....	19
2.10 Summary Table: Wastes Subject to Dilution Prohibition.....	22
3. Regulatory Developments.....	23
4. Special Issues.....	24
4.1 Point of Generation.....	24
4.2 Dioxin-Containing Waste.....	24
4.3 TC v. EP .....	24
4.4 LDR Applicability and Remediation Wastes .....	25

## 1. INTRODUCTION

The primary goal of the Resource Conservation and Recovery Act (RCRA) Subtitle C program is to protect human health and the environment from the dangers associated with generation, transportation, treatment, storage, and disposal of hazardous waste. Disposal of hazardous waste on the land is a practice of particular concern to the RCRA program. Land disposal units, such as landfills and surface impoundments, must comply with stringent requirements for liners, leak detection systems, and groundwater monitoring. The land disposal restrictions (LDR) provide a second measure of protection from threats posed by hazardous waste disposal. LDR provides that a hazardous waste cannot be placed on the land until the waste is treated (or meets specific treatment standards) to reduce the mobility or toxicity of the hazardous constituents in the waste. This training module presents an overview of the land disposal restrictions program.

When you have completed this module, you will be able to describe the LDR requirements. Specifically, you will be able to:

- Define the basic terms and describe the structure of the LDR regulations
- Identify the statutory basis for LDR
- Describe the applicability of LDR
- Explain how EPA sets treatment standards
- Identify treatment standards for wastes subject to land disposal restrictions and cite the CFR section
- Describe and identify how extensions and variances from treatment requirements are obtained, including Federal Register citations
- Define generator and treatment, storage, and disposal facility (TSDF) requirements under the LDR program
- Summarize the schedule of existing restrictions and the plan for restricting newly identified wastes.

Use this list of objectives to check your knowledge of this topic after you complete the training session.

## 2. REGULATORY SUMMARY

The LDR program found at 40 CFR Part 268 requires waste handlers to treat hazardous waste or meet specified levels for hazardous constituents before disposing of the waste on the land. This is called the disposal prohibition. To ensure proper treatment, EPA establishes for each type of hazardous waste a treatment standard; the Agency lists these treatment standards in Part 268, Subpart D. The Agency expresses treatment standards either as required treatment technologies that must be applied to the waste or contaminant concentration levels that must be met. EPA bases treatment standards on the performance of the best demonstrated available technology (BDAT) that is able to substantially diminish the toxicity of a waste or to reduce the mobility of the hazardous constituents in a hazardous waste. Wastes that do not meet treatment standards can not be land disposed unless EPA has granted a variance, extension, or exclusion (or the waste is managed in a "no-migration unit"). In addition to the disposal prohibition, there are prohibitions and limits in the LDR program regarding the dilution and storage of wastes. The program also requires tracking and recordkeeping to ensure proper management and safe land disposal of hazardous wastes.

### 2.1 LDR AND EPA'S GROUNDWATER PROTECTION STRATEGY

A large part of the hazardous waste management regulatory program, including the LDR program, is designed to protect groundwater. Hazardous waste can pollute groundwater through the process known as leaching, in which precipitation percolating through the ground draws contaminants out of buried waste and carries them into groundwater. Placing barriers between wastes and underground water sources is one way to prevent migration of hazardous contaminants into groundwater. Thus, many RCRA regulations focus on requiring hazardous waste containment. For example, RCRA regulations require installation of impermeable liners beneath hazardous waste landfills. Such barriers separate vulnerable groundwater from hazardous constituents likely to leach from the buried wastes.

A different groundwater protection principle provides the basis for LDR. Instead of requiring barriers between groundwater and hazardous wastes, LDR requires that hazardous wastes undergo fundamental physical or chemical changes so that they pose less of a threat to groundwater. For example, many of the chemicals capable of contaminating groundwater are organic compounds. Incineration or burning can destroy these organic compounds, usually breaking them down into less dangerous by-products like carbon dioxide and water. Thus, incineration of organic-bearing

hazardous wastes can protect groundwater by destroying organic contaminants before they have a chance to enter underground water supplies. The obvious advantage of such hazardous waste treatment is that it provides a more permanent and lasting form of groundwater protection than does simple hazardous waste containment. Structural barriers separating hazardous contaminants from groundwater can eventually break down or leak. In contrast, treatment that destroys harmful contaminants or reduces a waste's toxicity before it enters the environment is a permanent groundwater protection solution.

Treatment, however, cannot destroy all types of contaminants found in hazardous waste. In particular, metal elements, which are common toxic contaminants, cannot be broken down through combustion. Treatment techniques other than incineration, however, can be used for such wastes. For example, through a process called stabilization or immobilization, metal contaminants can be chemically and physically bound into the wastes that contain them. Although this process does not reduce the overall concentration of toxic metals in a hazardous waste, it does immobilize these constituents, making them less likely to leach from the waste. Reducing the mobility or leachability of hazardous constituents in a waste is another means of permanently achieving LDR's groundwater protection goal.

Congress understood that hazardous waste could be made less dangerous to groundwater in two main ways: by reducing a waste's toxicity through destruction or removal of harmful contaminants, or by reducing a waste's leachability by immobilizing hazardous contaminants. When directing EPA to establish the LDR program in RCRA §3004(m), Congress specified that EPA should "promulgate regulations specifying those levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste." To implement that goal, Congress gave EPA very specific directions for establishing the LDR program. In particular, Congress required that EPA specify how hazardous wastes should be treated to satisfy LDR's goal of groundwater protection. The rules EPA promulgated governing how different hazardous wastes must be treated are known as treatment standards. Treatment standards are simply instructions on how a hazardous waste should be treated. This module will explain how to identify the treatment standard applicable to a hazardous waste and the methodology EPA used to develop treatment standards.

## **2.2 APPLICABILITY**

To be subject to the land disposal restrictions, a waste must first be a RCRA hazardous waste. Unless a waste meets the definition of a solid and hazardous waste, its disposal will not be subject to the LDR program.

Once listed or identified, a hazardous waste becomes restricted, or subject to LDR, when the Agency establishes treatment standards that the waste must meet before it can be land disposed. RCRA §3004(g) requires that EPA restrict hazardous wastes from land disposal within six months of promulgating a new listing or characteristic. Until the Agency establishes a treatment level, newly listed or identified wastes are not subject to LDR and they may continue to be land disposed. Once EPA promulgates final treatment requirements specifically restricting a waste, however, waste handlers must manage it in accordance with all the requirements of Part 268 and cannot land dispose the waste until it meets the treatment level.

## EXCLUSIONS

While the LDR program generally applies to all persons who generate, transport, treat, store, or dispose of a restricted hazardous waste, EPA excludes certain wastes from the applicability of Part 268. The following hazardous wastes are not subject to the requirements of LDR (§268.1(e)):

- Waste generated by conditionally exempt small quantity generators as defined at §261.5
- Waste pesticide and container residues disposed of by farmers on their own land pursuant to §262.70
- Newly identified or listed hazardous wastes for which EPA has yet to promulgate land disposal treatment standards
- Certain low volume releases, known as de minimis losses, and laboratory wastes that are mixed with a facility's wastewater and are discharged to the facility's wastewater treatment or pretreatment facility.

Waste handlers may continue to land dispose wastes meeting any of these descriptions without being subject to the LDR program. They must manage other restricted hazardous wastes in compliance with the requirements of Part 268 unless explicitly exempted by another part of the RCRA program.

## 2.3 TREATMENT STANDARDS

LDR requires waste handlers to fundamentally change the threat posed by hazardous waste before it is land disposed. Waste-specific restrictions are manifested as thresholds for adequate treatment, known as treatment standards. EPA expresses these treatment standards as either numeric concentration levels for hazardous constituents, or as a required technology. Once EPA restricts a waste and issues a treatment

standard, the waste may be land disposed only after it meets the appropriate treatment standard.

## **ESTABLISHMENT OF TREATMENT STANDARDS**

Section 3004(m) of the Hazardous and Solid Waste Amendments requires EPA to promulgate treatment standards that reduce the toxicity or mobility of hazardous constituents to minimize the short and long-term threats to human health and the environment. To implement this mandate, EPA chose to base treatment standards on technical practicability instead of risk assessment. To this end, EPA conducts research into available treatment technologies. Of all the proven, available technologies, EPA designates the ones that best minimize the mobility and/or toxicity of hazardous constituents as the Best Demonstrated Available Technology (BDAT) for that waste. The Agency then establishes a waste code-specific treatment standard based on the performance of BDAT, incorporating any existing constituent treatment levels specified as universal treatment standards (UTS), discussed later in this section. EPA expresses these treatment standards as either concentration levels or required technologies.

When EPA sets treatment standards as concentration levels, they do not limit the allowable method of treatment to BDAT used to establish the treatment standard; instead, the Agency uses BDAT to determine what is the appropriate level of treatment for each hazardous constituent commonly found in the waste. The regulated community may then use any method or technology (except for impermissible dilution) to meet the treatment standard. The generator or facility treating the waste must analyze the waste or apply their knowledge to determine that the waste meets the applicable concentration-based standards in §268.40.

When a treatment standard is a required technology, the generator or facility treating the waste must use that technology, unless they can demonstrate that an alternative method can achieve a level of performance equivalent to the required technology (discussed in Section 2.4). Whenever possible, EPA prefers to use numeric treatment standards in order to stimulate innovation and development of alternative treatment technologies.

Since the physical and chemical composition of a waste significantly impacts the effectiveness of a given treatment technology, EPA divides the treatment standard for each waste code into two categories: wastewaters and nonwastewaters. The Agency defines these two categories based on the percentages of total organic carbon (TOC) and total suspended solids (TSS) present in a waste, since these factors commonly impact the effectiveness of treatment methods. Wastewaters contain less than 1 percent TOC by weight and less than 1 percent TSS by weight (§268.2). Nonwastewaters include wastes that do not meet the definition of wastewater.



EPA also set alternative treatment standards for soil, debris, and lab pack wastes. The alternative treatment standards will be discussed in the "Alternative Treatment Standards" section of this module.

## CONSOLIDATED TABLE OF TREATMENT STANDARDS

EPA originally presented the treatment standards for hazardous wastes in multiple tables, but replaced these with a single consolidated table for wastewaters and nonwastewaters. If EPA restricts a hazardous waste from land disposal, the treatment standard for both wastewaters and nonwastewaters appears in §268.40. Section 268.40 expresses treatment standards in three ways:

- Constituent concentrations in mg/kg of the waste
- Constituent concentrations in an extract of the waste expressed in mg/l
- Treatment standards expressed as specified technologies and represented by a five-letter code (described in §268.42).

EPA commonly expresses numeric standards in mg/kg when BDAT is a destruction or extraction technology such as incineration. Waste handlers measure compliance with these treatment standards by analyzing a representative sample of the waste for the total concentration of each hazardous constituent identified in the treatment standard, and comparing it to the level given for the waste code.

EPA also expresses concentration-based treatment standards in mg/l. For wastewaters, waste handlers demonstrate compliance by comparing the concentration of hazardous constituents found in a composite sample of the waste with the regulatory level. For nonwastewaters, the waste handler prepares an extract that reflects the potential of hazardous constituents to leach from the waste. The waste meets the treatment standard if the concentration of regulated constituents in the liquid extract fall below the regulatory levels given for the waste code. EPA requires the use of the Toxicity Characteristic Leaching Procedure (TCLP) to obtain the waste extract. (The older and less sensitive Extraction Procedure (EP) was available for use until August 24, 1998.)

EPA also expresses treatment standards in §268.40 as specified technologies for certain wastes. Waste handlers must treat these wastes using the specified technology. Table 1 in §268.42 provides full descriptions of the technologies represented by the five letter codes used in §268.40. Examples include incineration (INCIN), fuel substitution (FSUBS), and mercury retorting (RMERC). In most cases, once treated by the required technology, wastes can be land disposed without being tested. There are, however, some exceptions. For example, all F024 wastes must be incinerated. Following

incineration, the remaining residues must then also meet the concentration levels specified in §268.40.

## UNIVERSAL TREATMENT STANDARDS

Use of BDAT to set treatment standards for hazardous wastes gave rise to an unintended consequence: the numeric treatment standard applied to an individual hazardous constituent, like benzene, could vary depending on the performance of BDAT on each listed or characteristic wastestream that EPA evaluated. For example, nonwastewater forms of the listed wastes F005 and U019 both require treatment for benzene; however, the treatment standard originally set for benzene in the spent solvent was 3.7 mg/kg, while the standard originally set for unused, discarded benzene was 36 mg/kg.

To simplify the LDR program and eliminate this lack of consistency between standards, the Agency examined the range of numeric standards applied to each hazardous constituent found in restricted hazardous wastes. Based on the range, EPA assigned a single numeric value to each constituent for its respective wastewater and nonwastewater forms. A consolidated list of each constituent and its treatment standards (wastewater and nonwastewater) appears in §268.48 and is known as the UTS table. EPA used the values assigned to hazardous constituents in UTS to adjust numeric levels found in the treatment standards table of §268.40. Applying these universal treatment standards has not changed the hazardous constituents that waste handlers must treat in a particular waste, as EPA only amended the numeric standards. As a result, a common constituent found in multiple, different wastes will nonetheless carry the same numeric treatment level. The treatment standards found in §268.40 for F005 and U019 nonwastewaters, therefore, continue to address benzene, but EPA has adjusted the level for each to 10 mg/kg.

Creation of UTS significantly simplifies the process of assigning treatment standards to wastes that are newly identified or listed in the future. When a new waste contains hazardous constituents that EPA has already addressed in UTS, the Agency will apply the existing BDAT-based numeric standards for those particular constituents. EPA can evaluate individually constituents not already included in UTS and add them to §268.48.

## 2.4 ALTERNATIVE TREATMENT STANDARDS

In addition to these waste code or site-specific exception procedures, the Agency also created a number of broad alternative treatment standards that facilities may choose to use in lieu of meeting the waste code-specific treatment standards. These alternative treatment standards are only available for certain forms of restricted wastes.

## TREATMENT STANDARDS FOR CONTAMINATED SOIL

Remediation of hazardous waste sites will often produce contaminated soil that the generator must handle as hazardous waste if it contains a listed hazardous waste or if it exhibits a characteristic of hazardous waste. These remediation wastes, due to either their large volume or unique properties, are not always amenable to the treatment standards for hazardous wastewater and nonwastewater. Because of this, EPA designated soil as a unique treatability group and promulgated alternative soil-specific treatment standards in the Phase IV Final Rule (63 FR 28556; May 26, 1998). As with hazardous waste, RCRA prohibits the land disposal of hazardous soil until the soil has been treated to meet LDR standards.

A facility may treat contaminated soil to meet the waste-specific treatment standard in §268.40, i.e., the same standard the waste would have to meet if it was newly generated rather than found in soil, or to meet the soil-specific standards in §268.49. The soil standards mandate reduction of hazardous constituents by 90 percent, capped at ten times UTS. This means that if 90 percent reduction of a particular constituent would bring the constituent concentration to below ten times the UTS level, treatment can stop once the soil reaches ten times UTS for that constituent. If the 90 percent reduction is higher than ten times UTS, treatment can stop at 90 percent reduction. For example, a contaminated soil contains 400 mg/l nickel. Reducing this by 90 percent would mean treating the waste to 40 mg/l. However, the UTS for nickel is 11 mg/l, so ten times UTS would be 110 mg/l. Therefore, this soil would only require treatment to 110 mg/l to meet the LDR soil treatment standards.

Waste handlers may treat soils that exhibit a characteristic of hazardous waste to these soil standards. Following treatment, the soil may still exhibit a characteristic of hazardous waste, since the ten times UTS level is sometimes above the hazardous waste characteristic level (e.g., ten times UTS for lead is 7.5 mg/l while the characteristic level is 5 mg/l). Because these soils would still be hazardous wastes, they would require disposal in a Subtitle C facility. Soils that are no longer characteristic may be sent to a Subtitle D facility. Soils contaminated with listed wastes carry the listed code and must be managed in Subtitle C facilities even after meeting the LDR treatment standards, unless the facility gets a site-specific ruling from their implementing agency. Because of the site-specific nature of remediation activities, facilities should work with their implementing agency to facilitate the cleanup process.

Like all LDR treatment standards, the soil treatment standards are promulgated pursuant to the Hazardous and Solid Waste Amendments of 1984 (HSWA). Because the soil treatment standards are generally less stringent than current federal requirements, they will not go into effect in authorized states until the states adopt and

become authorized for them – even though the soil treatment standards are promulgated pursuant to HSWA.

If a state is authorized to implement the LDR treatment standards for any given waste or constituent, and that waste or constituent is contained in contaminated soil that is subject to LDR, generally the more stringent treatment standard for the as-generated industrial waste or constituent applies to contaminated soil until the state adopts and becomes authorized for the soil treatment standards. This would not be the case if the state implements state waiver authorities or other state laws to allow compliance with the soil treatment standards in advance of adoption or authorization. (See EPA guidance memorandum from J. Winston Porter to EPA Regional Administrators, "RCRA Permit Requirements for State Superfund Actions," November 16, 1987, OSWER Directive 9522.00-2.) Similarly, if a state has adopted, under state law, an authorization for the requirement, and that waste or constituent is contained in contaminated soil that is subject to LDRs, the more stringent state requirement continues to apply until the state adopts, under state law, the soil treatment standards. Once again, the state may implement state waiver authorities or other state laws to allow compliance with the soil treatment standards in advance of adoption or authorization. Therefore, it would be wise to contact the state regulatory agency before undertaking soil remediation to see if the alternative treatment standards are available in your state.

## DEBRIS

Section 268.45 contains alternate treatment standards for manufactured items and environmental media of a certain size that are contaminated with hazardous waste. EPA developed these alternative standards because materials such as rocks, bricks, and industrial equipment (known generically as debris) contaminated with hazardous waste may not be amenable to the waste code-specific treatment standards in §268.40.

Section 268.45 allows a waste handler to choose among several types of treatment technologies, based on the type of debris and the waste with which it is contaminated. EPA divided the alternative treatment standards for debris into three categories: extraction, destruction, and immobilization technologies. When using an alternate debris treatment standard, the waste handler must ensure that the treatment process meets the design and operating requirements established in §268.45, and that he or she treats for each contaminant, or hazardous constituent, subject to treatment, as defined in §268.45(b). In order to be eligible for land disposal, the debris must meet the specified performance standards in Table 1 of §268.45. For example, a contaminated boulder that is sandblasted to remove surface contamination must be treated to a "clean debris surface" and at least 0.6 centimeters of the surface layer of the boulder must be removed.

Once the waste handler has treated hazardous debris according to the specification of one of these technologies, it may be land disposed. If treated hazardous debris does not exhibit any characteristic following treatment with an extraction (e.g., sandblasting) or destruction (e.g., incineration) technology, it is eligible for land disposal and can be disposed of as nonhazardous or simply returned to the environment (§261.3(f)).

Hazardous debris treated with an immobilization technology (e.g., macroencapsulation), that is no longer characteristic can be disposed of as nonhazardous only after a determination from the Regional Administrator (§261.3(f)(2)).

## **LAB PACK WASTES**

Laboratories commonly generate small volumes of many different listed and characteristic wastes. Rather than manage all these disparate wastes individually, laboratories commonly take advantage of regulatory provisions that allow them to overpack many small containers of hazardous waste into a larger drum. These containers are known as lab packs. EPA has assigned them an alternative treatment standard, incineration, that allows generators to apply one treatment standard for the entire lab pack rather than applying the treatment standard for each individual waste code contained within the lab pack (§268.42(c)). The primary condition for application of this alternative, however, is that the lab pack may not contain any of the heavy metal-bearing waste codes identified in Part 268, Appendix IV.

## **2.5 VARIANCES, EXTENSIONS, AND EXEMPTIONS**

If a restricted waste does not meet the appropriate treatment standard, it is ineligible for land disposal. Restricted wastes that waste handlers cannot land dispose because they do not yet meet their treatment standards are termed “prohibited” wastes. Although most prohibited wastes become eligible for land disposal through treatment to the appropriate standards, this may not be possible in all cases. As a result, EPA created procedures that allow waste handlers to land dispose otherwise prohibited wastes under special circumstances. The following exemptions, variances, and extensions established under Part 268 allow wastes for which treatment standards have been promulgated to be land disposed without meeting treatment standards, or to be treated to a less stringent level or by a different technology:

- National capacity variance (§3004(h)(2))
- Case-by-case extension to an effective date (§268.5)
- No-migration variance (§268.6)
- Variance from a treatment standard (§268.44)
- Equivalent treatment method variance (§268.42(b))
- Surface impoundment treatment exemption (§268.4).

While wastes subject to any of these provisions continue to be restricted under LDR, they are not prohibited from land disposal under these limited conditions.

### **NATIONAL CAPACITY VARIANCE**

When developing a treatment standard, EPA reviews treatment, recovery, and disposal capacity to see if it is adequate for current and future waste management needs. If there is inadequate capacity for certain waste codes, EPA may grant a nationwide extension of the prohibition deadline for up to two years (RCRA §3004(h)(2)). This extension is known as a national capacity variance. To make capacity determinations, EPA compares the quantity of the restricted waste generated with the nationally available treatment, recovery, or protective disposal capacity at permitted and interim status facilities which will be in operation by the effective date. If there is a significant shortage of capacity, EPA will establish an alternative effective date based on the earliest date such capacity will be available. Waste handlers can land dispose waste that benefits from a national capacity variance without meeting the treatment standards. However, if they dispose of the waste in a landfill or surface impoundment, the disposal unit must be in compliance with the minimum technological requirements of RCRA §3004(o).

### **CASE-BY-CASE EXTENSION**

Regional or local conditions may create a lack of adequate treatment capacity in a particular area. In this situation, EPA may extend the effective date of a treatment standard on a case-by-case basis. EPA grants case-by-case extensions for one year, when waste handlers appropriately demonstrate need as enumerated in §268.5, and can renew these extensions for an additional year. Individual extensions cannot exceed a total of 24 months (RCRA §3004(h)(3)).

If waste handlers dispose of hazardous wastes benefiting from a case-by-case extension to an effective date in landfills or surface impoundments, these disposal units must meet the minimum technological requirements for liners and leak-detection and be in compliance with groundwater monitoring requirements (RCRA §3004(o)).

Although case-by-case extensions usually apply to only the waste generated at the individual facility that sought an extension, EPA has, at times, granted "generic" case-by-case extensions with broad applicability. The last of these generic case-by-case extensions to an LDR effective date, a limited extension for the disposal of hazardous debris, expired May 8, 1994.

## **NO-MIGRATION VARIANCE**

Waste handlers can land dispose hazardous wastes subject to LDR in a land-based unit without meeting treatment standards, if a petitioner can demonstrate that there will be no migration of hazardous constituents from the unit for as long as the waste remains hazardous (§268.6). EPA interprets “no migration” to mean that constituents will not leave the unit boundary at concentrations above Agency-approved health-based levels. EPA may grant a no-migration variance for up to 10 years, but may not extend the variance beyond the term of the particular disposal unit's RCRA permit.

No-migration petitions must include a site description, waste characterization, and monitoring plans for evaluation by the Agency. The regulated community must also submit for review long-term modeling estimates of concentrations in the ground's unsaturated zone and the air pathway.

EPA has granted the majority of no-migration petitions to underground wells that inject hazardous waste deep beneath the surface. A notable exception is the conditional no-migration variance granted for the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) in New Mexico. This variance permits DOE to dispose of untreated mixed radioactive and hazardous wastes in an underground salt dome for the duration of a test period.

## **VARIANCE FROM A TREATMENT STANDARD**

Under certain circumstances, generators or TSDFs may petition the Agency for a variance from using a required technology or from meeting a concentration-based treatment standard. EPA established this variance from a treatment standard to account for those wastes for which applicable treatment standards are unachievable or inappropriate (§268.44). In most cases, petitioners must demonstrate that the waste is significantly different from the wastes evaluated by EPA when developing the codified treatment standard or that such method or standard is unachievable or inappropriate for the waste. A treatability variance may apply generically to all waste meeting a certain description or it may be narrower in scope, applying only to a specific waste generated at a particular site (55 FR 22526; June 1, 1990).

With the establishment of soil-specific standards, EPA promulgated an additional provision in §268.44 for contaminated soil. Under §268.44(h)(3), variances from otherwise applicable LDR treatment standards may be approved if it is determined that compliance with the treatment standard would result in treatment beyond the point at which short- and long-term threats to human health and the environment are minimized. This allows a site-specific, risk-based determination to supersede the technology-based LDR treatment standards under certain circumstances, allowing regulators to align cleanup levels and treatment levels. Alternative LDR treatment



standards established through site-specific risk-based variances should be within the range of values the Agency generally finds acceptable for risk-based cleanup levels. Decisions to grant or deny these variances will be made by EPA Regions or authorized states.

### **EQUIVALENT TREATMENT METHOD VARIANCE**

Generally, waste handlers must treat waste to which EPA has assigned a technology-based treatment standard in §268.40 using that method of treatment prior to disposal. A person may, however, submit an application to the Regional Administrator demonstrating that an alternate treatment method can achieve a performance equivalent to that of the specified treatment standard and can protect human health and the environment (§268.42(b)). If EPA approves the petition, they grant an equivalent method variance, and the alternate method may be used in lieu of the specified technology.

### **SURFACE IMPOUNDMENT TREATMENT EXEMPTION**

The management of liquid wastes in surface impoundments often serves as a means of treatment. Typically, particulates suspended in liquid wastes settle to the bottom of impoundments, forming sludges in which contaminants concentrate. This precipitation process may result in the generation of sludges that are hazardous wastes. Since management of wastes in surface impoundments is considered land disposal, even though the waste is not permanently disposed in the unit, such generation and placement of hazardous sludges on the land without prior treatment would normally be inconsistent with LDR's disposal prohibition. Section 268.4 allows this practice, however, by providing an exemption for wastes treated in surface impoundments. Waste handlers may treat hazardous waste in surface impoundments without first meeting treatment standards provided that (1) the surface impoundment meets certain technological requirements, (2) the treatment residues that do not meet applicable standards are removed from the impoundment annually, and (3) the removed residues are not managed in another surface impoundment.

## **2.6 OTHER PROHIBITIONS**

In addition to prohibiting the land disposal of wastes that do not meet treatment standards, the LDR program includes two other important prohibitions. One forbids the storage of wastes as a substitute for meeting the required treatment standards. The other prohibits the dilution of wastes as a substitute for legitimate treatment. Like the prohibition on land disposal, these prohibitions no longer apply once a waste meets its waste code-specific treatment standard.



## STORAGE PROHIBITION

EPA promulgated the storage prohibition in order to prevent waste handlers from storing hazardous waste in lieu of proper treatment (§268.50). EPA forbids the storage of waste subject to a treatment standard unless the waste is being stored in order to accumulate such quantities as are necessary to facilitate proper recycling, treatment, or disposal. During the first year of storage, EPA bears the burden of proving that the waste handlers is storing in order to avoid meeting treatment standards rather than to facilitate legitimate recycling, treatment, or disposal. There is no strict time limit on legitimate waste storage; however, after the first year of storage, the burden of proof for showing that waste is indeed being legally accumulated to facilitate proper future management shifts from EPA to the waste handler.

Generators accumulating waste on-site in accordance with §262.34 and transporters storing waste at a transfer facility for 10 days or less are exempt from the storage prohibition. The storage prohibition also does not apply to wastes which qualify for an exemption from a treatment standard such as a case-by-case extension under §268.5, a no-migration petition under §268.6, a national capacity variance, or to wastes that were placed in storage prior to the effective date of a prohibition on land disposal.

## DILUTION PROHIBITION

EPA generally prohibits dilution of wastes as a substitute for appropriate treatment (§268.3). For example, a waste handler may not, in most cases, achieve compliance with a numeric treatment standard by simply mixing hazardous waste with another material that fails to reduce the mobility or toxicity of the hazardous constituents in the waste. Similarly, EPA may consider waste to be impermissibly diluted when a waste handler treats with an inappropriate technology. For example, it is often impermissible to incinerate metal-bearing, inorganic wastes because incineration fails to destroy or immobilize the hazardous metal constituents.

There are, however, certain cases where EPA permits dilution. Dilution is inherent in some types of legitimate waste handling, such as the aggregation of similar wastes to facilitate subsequent treatment. As a general rule, if aggregated wastes are all legitimately amenable to the same treatment, the aggregation step does not constitute impermissible dilution. In addition, waste handlers may dilute certain characteristic wastes that are managed in Clean Water Act-regulated treatment systems (§268.3(b)). As well, certain characteristic wastes may be diluted to render them nonhazardous before disposal in a deep injection well regulated under the Safe Drinking Water Act (§268.19(c)(3)). The table found in Section 2.10 may be used to determine if a particular waste is subject to a prohibition against dilution when handled in a particular manner.

## 2.7 TRACKING AND RECORDKEEPING REQUIREMENTS

EPA requires generators and TSDFs managing wastes that are subject to LDR (restricted wastes) to meet certain notification, certification, waste analysis, and recordkeeping requirements under §268.7. Much like a hazardous waste manifest, the LDR notification and certification paperwork helps hazardous waste handlers and EPA enforcers ensure that wastes are properly managed. A notification accompanies the initial shipment of each waste that is subject to LDR and includes such information as the waste code(s), the hazardous constituents present in the waste, and waste analysis data. EPA requires subsequent notification only when the waste or the receiving facility changes. Additionally, if a waste can be land disposed without further treatment, a certification to that effect must accompany the notification. EPA requires waste handlers to retain such paperwork in order to track wastes that are subject to LDR and to ensure that those wastes receive proper treatment prior to disposal. Section 268.7(a) contains the tracking requirements for generators, §268.7(b) specifies the requirements for treatment facilities, §268.7(c) contains the regulations applicable to disposal facilities, and §268.7(d) contains special notification and certification requirements that apply to hazardous debris, and §268.7(e) contains special notification requirements for contaminated soil.

### GENERATORS

Generators must determine if their hazardous waste is subject to LDR at the point of generation. They may make this determination by testing or applying knowledge. If a waste is subject to LDR and does not meet applicable treatment standards, generators must notify the treatment facility in writing (§268.7(a)(2)). This notice accompanies the manifest and must include the following information:

- EPA hazardous waste code(s)
- Identification of the waste as a wastewater or nonwastewater
- Manifest number associated with the waste shipment
- Waste analysis data (if available)
- For characteristic wastes, any additional hazardous constituents present
- When hazardous debris is to be treated by an alternative technology under §268.45, a statement to that effect and the contaminants subject to treatment
- For contaminated soil, a list of the constituents subject to treatment and a statement that the soil does or does not meet LDR standards.

If a generator's waste already meets applicable treatment standards, the generator, in accordance with §268.7(a)(3), must submit a signed certification stating that the waste

meets the applicable treatment standards. This certification accompanies a copy of the notification statement described above.

If a generator's waste qualifies for an exemption from a treatment standard, such as a national capacity variance, case-by-case extension, or no-migration exemption, the generator must submit to the disposal facility a notification similar to that given in §268.7(a)(2), except that it must also identify the date that the waste will become subject to LDR prohibitions (§268.7(a)(4)).

Generators may treat hazardous waste in accumulation tanks, containers, or containment buildings provided the units are in compliance with certain standards applicable to TSDFs (§262.34). EPA believes that generators should have the same recordkeeping and documentation responsibilities that apply to TSDFs when treating wastes to meet LDR treatment standards. Therefore, §268.7(a)(5) requires generators to prepare a waste analysis plan (WAP) when treating wastes to meet LDR. The WAP must justify the frequency of testing based on a detailed analysis of a representative sample of the waste. The plan must contain all information necessary for proper treatment of the waste in accordance with Part 268, and must be retained in the facility's records (55 FR 22670; June 1, 1990). Generators conducting treatment in exempt units, such as wastewater treatment units (WWTUs), elementary neutralization units (ENUs), or totally-enclosed treatment units (TETUs) must also prepare WAPs. Generators who are conducting partial treatment, but not treating to meet treatment standards are not required to have a WAP.

## **TREATMENT FACILITIES**

The tracking and recordkeeping requirements that apply to treatment facilities are found at §268.7(b). EPA requires hazardous waste treaters to test treated waste to ensure that all applicable treatment standards are met. The TSDF must perform these tests as specified in their WAP (all TSDFs must have WAPs under §§264/265.13). If a facility ships treated waste off-site for disposal, a notification similar to the generator's notice must accompany the initial shipment of the waste to the disposal facility. The treater's notice must include relevant waste codes, additional hazardous constituents present, manifest information, and waste analysis data (§268.7(b)(3)). The treater must also include a certification that the shipment of waste meets treatment standards (§268.7(b)(4)). If the waste or a residue of the waste will be sent for further treatment or storage at another facility, the treater must comply with the notification and certification requirements for a generator.

## **LAND DISPOSAL FACILITIES**

Section 268.7(c) enumerates the paperwork requirements that apply to the final link in the cradle-to-grave management of hazardous waste, the land disposal facilities.

Hazardous waste disposers must ensure that incoming wastes or residues meet the applicable treatment standards by testing the waste in accordance with their facility's WAP. Additionally, disposers must maintain records on site of all notifications and certifications received from generators and treatment facilities.

### **SPECIAL REQUIREMENTS FOR TREATED DEBRIS**

Generators or treaters of hazardous debris who claim that their hazardous debris is excluded from the definition of hazardous waste under §261.3(f) are required to comply with certain notification and certification requirements (§268.7(d)). Since these wastes are no longer hazardous, the paperwork will not be sent to the disposal facility. Instead, relevant notices and certifications are submitted to EPA and retained on site by the original generator or treater on a one-time basis.

## **2.8 CHARACTERISTIC HAZARDOUS WASTES**

Just like listed wastes, restricted characteristic wastes must also meet treatment standards before they are eligible for land disposal. Since the land disposal restrictions attach at the point of generation, waste handlers cannot circumvent treatment standards applicable to characteristic wastes by simply removing the characteristic. Once a waste handler both decharacterizes and treats the waste to meet the treatment standard that applied at the point of generation, however, the waste may be land disposed in a nonhazardous, RCRA Subtitle D landfill.

### **TREATMENT STANDARDS**

EPA established special requirements for wastes that exhibit a characteristic (§268.9). As a general principle, a hazardous waste must meet all applicable treatment standards before land disposal. For purposes of LDR, a generator with a listed hazardous waste must determine if the waste also exhibits any hazardous waste characteristics (§262.11(c)). If a listed waste also exhibits a characteristic of hazardous waste, the waste must meet the treatment standard for both waste codes. An exception occurs, however, when the treatment standard for the listed waste specifically includes a standard for the constituent that causes the waste to exhibit the characteristic. In this case, compliance with the treatment standard for the listed waste will satisfy both requirements, as the standard for the listed waste will operate in lieu of the treatment standard for the characteristic waste code.

### **PAPERWORK REQUIREMENTS**

While characteristic wastes are subject to the standard notification requirements of §268.7, EPA subjects wastes from which the characteristic has been removed to special

provisions. When these wastes meet treatment standards and no longer exhibit any characteristic, LDR notification and certification paperwork need not accompany the shipment to a Subtitle D facility. Instead, §268.9(d) requires the waste handler to file a one-time notice and certification with the implementing agency and maintain a copy on site. Subsequent shipments of similar waste require additional notice except on an annual basis, or if the process or recipient facility changes.

## **DILUTION OF CHARACTERISTIC WASTES AND TREATMENT OF UNDERLYING HAZARDOUS CONSTITUENTS**

When EPA first promulgated treatment standards for characteristic wastes, they initially determined that removal of the hazardous waste characteristic alone would adequately protect human health and the environment. Thus, the treatment standards for these wastes appeared as the specified technology, "DEACT," or deactivation. While Part 268, Appendix VI, recommends particular methods of treatment to accomplish deactivation, simple dilution with soil or water was an acceptable means to achieve compliance. Dilution of this kind was not considered impermissible under §268.3, since it was performed as part of a specified technology.

However, in the case, *Chemical Waste Management, Inc., et al. v. EPA*, the plaintiffs won a judgment against the Agency alleging, among other things, that deactivation via dilution failed to meet the statutory mandates of RCRA §3004(m) because dilution does not reduce the mobility or toxicity of the hazardous constituents present in the wastes. On September 25, 1992, the DC Circuit Court of Appeals immediately vacated the treatment standards for ignitable (D001) and corrosive (D002) wastes, and remanded the treatment standards applicable to many other characteristic wastes.

In response to the court decision, EPA published revised treatment standards for D001 and D002 wastes in the May 24, 1993, Federal Register (58 FR 29860). These revised standards require that certain ignitable and corrosive wastes not only be deactivated to remove the hazardous characteristic, but that they also be legitimately treated to meet numeric concentration levels for any constituents also present in the wastes above the UTS levels. These constituents are known as "underlying hazardous constituents" because they require treatment to meet LDR standards, but nonetheless do not cause the waste to exhibit a characteristic.

On September 19, 1994, when EPA promulgated treatment standards for the newly identified toxicity characteristic (TC) organic wastes (D018-D043) and revised the standards for some previously restricted characteristic wastes (D012-D017), the Agency also required treatment for underlying hazardous constituents beyond that necessary for removal of the characteristic. When EPA promulgated revised treatment standards for metal wastes on May 26, 1998, the new metal standards also required waste handlers to treat for underlying hazardous constituents (63 FR 28556). The creation of

the UTS in §268.48 gave the Agency an easy source for the list of constituents and appropriate treatment levels. Wastes requiring treatment for underlying hazardous constituents must meet the numeric treatment levels enumerated in the UTS to be eligible for land disposal. Wastes subject to treatment for underlying hazardous constituents are easily identified since their treatment standards in §268.40 require that they comply with the characteristic level "and meet §268.48 standards."

Part of the settlement agreement and consent decree with Chemical Waste Management, Inc. et al., required EPA to ensure that waste handlers effectively treat characteristic wastewaters that are managed in certain CWA and SDWA systems; to merely decharacterize or dilute these wastes would not satisfy Congress's mandate to substantially diminish the toxicity of hazardous waste. As a result, on April 8, 1996 (61 FR 15566), EPA finalized treatment standards for characteristic wastes injected into deep SDWA wells, managed in non-hazardous surface impoundments prior to CWA discharge, or discharged to land following CWA-equivalent management. Specifically, these regulations would have required that such wastes undergo RCRA-equivalent treatment not only to remove the characteristic, but also to destroy or immobilize underlying hazardous constituents.

Despite the finalization of these treatment standards for characteristic wastewaters managed in certain CWA- and SDWA-systems, these provisions were immediately affected by the Land Disposal Program Flexibility Act of 1996. The new law removed the requirement that characteristic wastewaters be treated to remove, destroy, or immobilize hazardous constituents. As a result, characteristic wastewaters managed in certain CWA or SDWA-systems need only be decharacterized before land disposal, and dilution may be used to satisfy this requirement. Consequently, the Agency published, in the same Federal Register that contained the new treatment standards, a notice to rescind those regulations, and require only decharacterization for characteristic wastewaters in accordance with the provisions of the new Land Disposal Program Flexibility Act (61 FR 15661). See additional discussion of the statutorily mandated study of decharacterized waste disposed of in surface impoundments in Section 3 of this module, entitled "Regulatory Developments."

## 2.9 HISTORY OF THE LDR PROGRAM

The Hazardous and Solid Waste Amendments of 1984 (HSWA) established EPA's authority for the LDR program. Due to the large number of hazardous waste codes that existed prior to HSWA, EPA developed LDR treatment standards were in stages. In HSWA, Congress set a time frame for the implementation of treatment standards for all wastes listed or identified as hazardous on or before November 8, 1984. Congress set specific prohibition dates for certain high-risk and high-volume wastes and established a three-part schedule with specific deadlines for EPA to develop treatment standards

for the remaining listed and characteristic wastes. Wastes identified subsequent to HSWA are considered newly identified or listed. Additional rulemakings, promulgated in "phases," have since begun to address these new wastes. This section highlights some especially pertinent parts of those rulemakings and identifies and explains certain complex areas.

## **SOLVENT AND DIOXIN-CONTAINING WASTE**

EPA first addressed under the LDR program solvent and dioxin-containing wastes. Congress set a statutory deadline for EPA to establish treatment standards for these wastes because they are generated either in high volumes (solvent wastes), or are considered highly toxic (dioxin-containing wastes). EPA published a final rule on November 7, 1986 (51 FR 40572), establishing effective dates and treatment standards for F001-F005 solvent wastes (§268.30) and F020-F023 and F026-F028 dioxin-containing wastes (§268.31). The November 7, 1986, final rule also established the basic framework for the land disposal restrictions program.

## **CALIFORNIA LIST WASTE**

A second group of hazardous wastes for which Congress set a specific LDR deadline is known as the California list. This list was compiled from a program established by California's Department of Health Services. The California list, which became effective July 8, 1987, prohibited the land disposal of liquid hazardous wastes containing certain toxic constituents or exhibiting certain properties unless subjected to prior treatment (52 FR 25760; July 8, 1987). The targets of the list included cyanides, polychlorinated biphenyls (PCBs), halogenated organic compounds (HOCs), and metals. Certain HOC-containing wastes were also prohibited even when in solid form.

Waste code-specific treatment standards addressing the constituent (or property) of concern have superseded the California list prohibitions. For example, the treatment standard for toxicity characteristic (D008) supersedes the California list prohibition on liquid hazardous wastes containing lead. In the May 12, 1997, Federal Register (62 FR 25998), EPA removed all references to California list wastes because all the treatment standards for these wastes had been superseded by more specific treatment standards.

## **THIRDS**

HSWA §3004(g)(4) required EPA to prepare a plan by November 8, 1986, to meet the Congressionally mandated schedule for establishing treatment standards for all hazardous wastes identified or listed on or before November 8, 1984. When developing the plan, EPA was required to rank the listed wastes from high to low priority, based on the wastes' intrinsic hazard and volume generated. The Agency scheduled high-volume, high-intrinsic hazard wastes first, while low-volume, lower-



hazard wastes (including characteristic wastes) were to have treatment standards established last. Wastes with treatment standards promulgated in the first portion of the three-part schedule are known as First Third wastes (53 FR 31138; August 17, 1988), wastes addressed in the second portion of the schedule are known as Second Third wastes (54 FR 26594; June 23, 1989), and wastes in the third category are known as Third Third wastes (55 FR 22520; June 1, 1990).

## **TREATMENT STANDARDS FOR NEWLY IDENTIFIED OR LISTED WASTES**

HSWA also requires EPA to establish treatment standards for all hazardous wastes listed or identified after November 8, 1984. EPA developed treatment standards for these wastes in phases. EPA published the first of these rulemakings, termed Phase I, in the Federal Register on August 18, 1992 (57 FR 37194). In addition to promulgating restrictions for certain new wastes, Phase I finalized the alternative treatment standards for hazardous debris.

EPA finalized the Phase II Rule in the Federal Register on September 19, 1994 (59 FR 47982). This final rule consolidated the existing treatment standards into §268.40, created the UTS, and promulgated treatment standards for TC organic wastes, coke by-products, and chlorotoluenes.

EPA finalized the Phase III Rule and subsequent partial rescission in the Federal Register on April 8, 1996 (61 FR 15566 and 15660). These final rules modified treatment standards for reactive wastes and decharacterized wastewaters (see Section 2.8 for a complete discussion on the status of wastewaters), and promulgated new treatment standards for carbamate wastes and spent aluminum potliners. Even though Phase III promulgated treatment standards for these newly-identified carbamate wastes, in the case, *Dithiocarbamate Task Force v. EPA*, the DC Circuit Court of Appeals vacated several carbamate hazardous waste listings, thus nullifying their corresponding LDR treatment standards (62 FR 32974; June 17, 1997).

EPA finalized the first half of the Phase IV Rule on May 12, 1997 (62 FR 25998). This final rule promulgated treatment standards for the wood preserving wastes and streamlined the LDR notification requirements. EPA promulgated part two of the Phase IV Rule on May 26, 1998 (63 FR 28556). This rule finalized treatment standards for several metal wastes and certain newly-identified mineral processing wastes, and revised the universal treatment standards for twelve metal constituents. The rule also created a new treatability group, soil, and established soil-specific alternative treatment standards.



## 2.10 SUMMARY TABLE: WASTES SUBJECT TO DILUTION PROHIBITION

Type of Waste	Yes	No
Characteristic Wastes Managed in Clean Water Act-Regulated Treatment Systems (§268.3(b))		✓
Characteristic Wastes Disposed of in Safe Drinking Water Act Underground Injection Control Wells (§268.1(c)(3))		✓
Wastes Subject to a National Capacity Variance (§3004(h)(2))		✓
Wastes Disposed of in a Unit With a No-Migration Variance (§268.6)		✓
Wastes Subject to a Case-by-Case Extension to an Effective Date (§268.5)		✓
Newly Identified or Listed Wastes for Which EPA Has Not Yet Established a Treatment Standard (§268.1(e)(3))		✓
Wastes that Meet All Applicable Treatment Standards and Prohibition Levels		✓
Metal-Bearing Hazardous Wastes That Are Incinerated (§268.3(c))	✓	
Waste Managed in a Corrective Action Management Unit (CAMU) or Temporary Unit (TU) <sup>1</sup>		✓
Wastes from Conditionally Exempt Small Quantity Generators Regulated Under §261.5 <sup>2</sup> (§268.1(e)(1))		✓
Farmers Disposing of Waste On Their Own Land Under §262.70 <sup>2</sup> (§268.1(e)(2))		✓

<sup>1</sup> For more information about these provisions, see the module entitled RCRA Corrective Action.

<sup>2</sup> For more information about these provisions, see the module entitled Generators.

### 3. REGULATORY DEVELOPMENTS

With the completion of the "Thirds," EPA had addressed all hazardous wastes that were identified or listed before November 8, 1984. Similarly, with the completion of Phase IV, EPA addressed all hazardous wastes that were newly-identified or listed after November 8, 1984. Since EPA has fulfilled its requirements to establish treatment standards for all hazardous wastes through the Thirds and the Phases (as required by the Statute), in the future, the Agency will propose LDR treatment standards when hazardous wastes are proposed for listing. On November 20, 1995, EPA began this process by proposing LDR treatment standards for petroleum refining process wastes in the same rule that proposed to list such wastes as hazardous (60 FR 57747). The petroleum listings and their LDR treatment standards were finalized August 6, 1998 (63 FR 42110). All future waste treatment standards will be promulgated with the waste listing.

EPA is also in the process of gathering information on existing portions of the LDR regulations. On May 28, 1999, EPA announced in an advanced notice of proposed rulemaking (ANPRM) a comprehensive review of the LDR treatment standards for mercury-bearing hazardous wastes (64 FR 28949). EPA sought comments and available data on potential impacts of reducing the number of mercury-bearing wastes requiring incineration, the comparative impacts of retorting versus disposal, and source reduction options.

Additionally, Section 3004(g)(10) of the RCRA Statute, as amended by the Land Disposal Program Flexibility Act of 1996, requires EPA to characterize the risks associated with managing nonhazardous and decharacterized wastewaters in surface impoundments. EPA has selected study participants and will collect data to determine whether the existing regulations adequately address risks that may be present. EPA will estimate the potential human health and ecological risks by using mathematical models to represent the transport and transformation of chemicals introduced into these systems.

## 4. SPECIAL ISSUES

The following four points discuss LDR issues of special note or concern.

### 4.1 POINT OF GENERATION

Generators are required to classify their solid wastes as soon as they are subject to regulation in order to ensure that hazardous wastes will always be safely managed. Since LDR applies additional limits to the ways in which waste may be managed, it is also necessary to immediately determine if a hazardous waste is subject to LDR. Generators must, therefore, fully characterize their wastes at the point of generation to determine if their hazardous waste is subject to LDR (§262.11). If a waste is restricted at the point of generation, all Part 268 requirements continue to apply to the waste, even if it is subsequently de-characterized or excluded from the definition of hazardous or solid waste.

### 4.2 DIOXIN-CONTAINING WASTE

EPA bases the §268.40 treatment standards for dioxin-containing wastes on a BDAT of incineration. While any technology short of dilution is permissible for achieving the required contaminant levels, only incineration has been able to achieve them. Currently there is only one commercial facility in the United States permitted to burn dioxin-containing wastes and thus there is likely to be a shortfall in capacity. In the interim, these listed wastes must be exported or stored until treatment capacity becomes available.

### 4.3 TC V. EP

When the TC superseded the EP, it added the organic constituents (D018-D043). Since the TC is more sensitive than the EP, it also increased the number of wastes considered characteristically hazardous for metals (D004-D011) and pesticides (D012-D017). Wastes that exhibited the TC for the new organic constituents, and wastes that exhibited the TC for D004-D017 but did not also fail the EP, were both considered newly identified since the TC rule was promulgated after November 8, 1984. While HSWA requires EPA to set treatment standards for any newly identified or listed waste within six months of the identification of the waste, there is no statutory provision that automatically prohibits land disposal if EPA fails to set treatment standards within the Congressionally mandated time frame. With the Phase II Rule, EPA promulgated

treatment standards for the newly identified TC organics and pesticides (59 FR 47982; September 19, 1994). In the second part of the Phase IV Rule, EPA promulgated treatment standards for TC metals (D004-D011).

#### **4.4 LDR APPLICABILITY AND REMEDIATION WASTES**

In order to ensure that site cleanups and remediation are conducted in a timely and cost-effective fashion, EPA has designed special standards for the management of certain remediation wastes. In the February 16, 1993, Federal Register (58 FR 8658), EPA promulgated regulations on the use of corrective action management units (CAMUs) and temporary units (TUs) to manage remediation waste generated during a site cleanup. To facilitate the cleanup process, these regulations effectively waive the requirement that wastes managed in CAMUs or TUs meet LDR prior to storage or disposal on the land. Additionally, on November 30, 1998, EPA finalized standards for a new type of unit, called a staging pile, into which a waste handler can place solid, non-flowing remediation waste without meeting LDR (63 FR 65874; 65916; §264.554). (See also the module entitled RCRA Corrective Action).