

APPENDIX K

LAND DISPOSAL RESTRICTIONS OVERVIEW AND BIBLIOGRAPHY

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Appendix K

Land Disposal Restrictions Overview and Bibliography

K.1 Introduction

The purpose of this appendix is to provide the user with an understanding of RCRA's Land Disposal Restrictions program and rulemakings and to present a bibliography of related documents that may assist the user in evaluating remediation options at Superfund mine sites.

K.2 History of the Land Disposal Restrictions

Hazardous waste managed under the auspices of RCRA are addressed by a two-part regulatory strategy. The first involves technical standards for management units and is intended to ensure that hazardous waste is contained within the units in which it is managed. Undermining this first part of the strategy, however, is the assumption that land-based units are incapable of long-term containment. The LDR program grew out of the second piece of the strategy, which is to treat the wastes going into these management disposal units to ensure that should containment fail the waste will have little impact on human health and the environment. In the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA, Congress specified that land disposal of hazardous waste be prohibited unless the waste meets treatment standards established by EPA. HSWA requires that treatment standards substantially diminish the toxicity or mobility of the hazardous waste, so that short- and long-term threats to human health and the environment are minimized.

K.2.1 LDR Treatment Standards

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

Technology-based Treatment Standards: HSWA requires EPA to promulgate treatment standards that reduce the toxicity or mobility of hazardous constituents so that short-and long-term threats to human health and the environment are minimized. To implement this mandate EPA chose to base treatment standards on technical practicability instead of risk assessment. To this end, EPA conducts extensive research into available treatment technologies. Of all the proven, available technologies, the one that best minimizes the mobility and/or toxicity of hazardous constituents is designated 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 the BDAT. These LDR treatment standards are expressed as either concentration levels or required technologies.

Concentration levels-- When treatment standards are set as concentration levels, treatment is not limited to the 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. After treatment, waste analysis or application of knowledge must

be used to determine if the applicable concentration-based standards in Section 268.40 have been met.

Required Technologies-- When a treatment standard is a required technology, that technology must be used, unless it can be demonstrated that an alternative method can achieve a level of performance equivalent to the required technology. 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 divided the treatment standard for each waste code into two categories: wastewaters and non-wastewaters. The Agency defines these two categories based on the percentages of total organic carbon (TOC) and total suspended solids (TSS) present in a waste (Section 268.2), since these factors commonly impact the effectiveness of treatment methods.

Universal Treatment Standards: Use of BDATs 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 the BDAT on each listed or characteristic wastestream that was evaluated (e.g., non-wastewater 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, an order of magnitude difference). 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 and listed its two treatment standards (wastewater and non-wastewater) in Section 268.48. These standards are known as the Universal Treatment Standards (UTS). Applying these universal treatment standards has not changed the hazardous constituents that must be treated in a particular waste, as only the numeric standards were amended. As a result, a common constituent found in multiple, different wastes will nonetheless carry the same numeric treatment level (e.g., treatment standards for F005 and U019 non-wastewaters continue to address benzene, but the level for each has been adjusted to 10 mg/kg).

Creation of the 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 have already been addressed in the UTS, the Agency will be able to apply the existing BDAT-based numeric standards for those particular constituents. Constituents not already included in the UTS can be evaluated individually and then added to Section 268.48.

Hazardous Debris Standards: Section 268.45 contains alternate treatment standards for manufactured items and environmental media that are contaminated with hazardous waste. These alternative standards were developed 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 Section 268.40. Section 268.45 allows an owner/operator to choose among several types of treatment technologies, based on the type of debris and the waste with which it is contaminated. The alternative treatment standards for debris can be divided 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 Section 268.45. In order to be eligible for land disposal, the debris must meet the specified performance standards in Table 1 of Section 268.45. Once hazardous debris has been treated according to the specification of one of these technologies, it may be land disposed in a hazardous waste unit. If hazardous debris no longer exhibits 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 (Section 261.3(f)).

K.2.2 LDR Rulemakings

Due to the large number of hazardous waste codes that existed prior to HSWA, LDR treatment standards were developed 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: The solvent and dioxin-containing wastes were the first wastes EPA addressed under the LDR program. 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). The final rule published November 7, 1986 (51 FR 40572) established treatment standards for F001-F005 solvent wastes and F020-F023 and F026-F028 dioxin-containing wastes. The 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 as it was compiled from a California Department of Health Services' program. The California list, 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). The targets of the list included cyanides, pH, polychlorinated biphenyls (PCBs), halogenated organic compounds (HOCs), and metals. Certain HOC-containing wastes were also prohibited even when in solid form. As waste code-specific treatment standards subsequently have been issued, the California list prohibitions have been superseded by treatment standards specific to the RCRA waste code addressing the constituent (or property) of concern.

Thirds: Congress required EPA to meet a schedule for establishing treatment standards for all hazardous wastes identified or listed prior to HSWA. EPA was required to rank the listed wastes from high to low priority, based on the wastes' intrinsic hazard and volume generated. High-volume, high-intrinsic hazard wastes were scheduled to be addressed first, while low-volume, lower-hazard wastes, including characteristic waste, 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), followed by the Second-Third wastes (54 FR 26594; June 23, 1989), and Third-Third wastes (55 FR 22520; June 1, 1990).

Treatment Standards for Newly-identified or Newly-listed Wastes: HSWA further requires EPA to establish treatment standards for all hazardous wastes listed or identified after November 8, 1984. EPA is developing treatment standards for these wastes in phases.

The Phase I rule, the first of these rulemakings, was published 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.

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

The Phase III rule was finalized 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, and promulgated new treatment standards for carbamate wastes and spent aluminum potliners.

The Phase IV rule was published on May 26, 1998 and is important to remediation efforts at mine sites as it addresses the previously exempt Bevill wastes (i.e., wastes from mineral processing facilities that were not among the 20 wastestreams retained in the Bevill exemption) and adjusts the treatment standards applicable to wastes that exhibit the toxicity characteristic for a metal constituent.

K.3 Bibliography of Selected Documents

The following is a bibliography of selected documents published in the dockets supporting Land Disposal Restrictions (LDR) Best Demonstrated Available Technology (BDAT) Phase I through Phase IV Rulemakings that may provide information on how Universal Treatment Standards (UTS) can be met at Superfund Mining sites. For ease of reading, the bibliography has been divided into five sections for documents:

- Specific to Toxicity Characteristic (TC) Metals,
- Specific to Mineral Processing,
- Specific to Treatment Technologies ,
- Other BDAT Background Documents (Corrosive Wastes and General), and
- Publications by Other EPA Office or Outside Groups Included in the LDR Dockets.

The bibliography also includes the docket-document number, which identifies the docket and is followed by the document number (i.e., for document number F-96-PH4A-S0054, F-96-PH4A is the docket for the first supplemental Phase IV proposed rule, and -S0054 is the document number). The rule and its status also is indicated, since information in proposed rule dockets may not be finalized or may change prior to promulgation.

A review of history helps in understanding the utility of the documents listed. EPA established treatment standards for Extraction Procedure (EP) metals in the LDR Third Third rule finalized in 1990. In 1992, EPA established treatment standards for hazardous waste contaminated debris, including inherently hazardous debris such as lead pipe. Some remedial wastes may be debris-like and may be subject to debris standards. In 1994, EPA finalized the Universal Treatment Standards and established standards for electric arc furnace dust (K061). In establishing the K061 standard and UTS for metals, EPA changed the basis of the BDAT for

many metals to High Temperature Metals Recovery (HTMR). This has not necessarily resulted in a real change in actual waste treatment technologies used.

EPA staff confirmed that stabilization remains the most common treatment method for non-wastewater forms of metal-bearing wastes. Stabilization data appear in documents supporting the Third Third final rule and the Phase IV proposed and final rule. For wastewater forms of metal-bearing wastes, various technologies can be used. These are best described in the UTS background document for wastewaters and the Phase IV proposed rule background documents. Debris is addressed as a separate waste form with unique alternative treatment standards that apply.

None of the BDAT background documents listed in the bibliography are available online. However, in developing BDAT, EPA uses various sources of data, some of which are available to the public via the Internet. While not included in the bibliography, two databases are available through EPA's Alternative Treatment Technology Information Center (ATTIC): the Treatment Technology Database and the Treatability Study Database. ATTIC is available at <http://www.epa.gov/attic/accessattic.html>. Other online sources of treatment technology and treatability data are available and have been accessed to support LDR rulemakings.

**LAND DISPOSAL RESTRICTIONS (LDR)
BEST DEMONSTRATED AVAILABLE TECHNOLOGY (BDAT)
APPLICATION BIBLIOGRAPHY**

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
U.S. EPA/Office of Solid Waste LDR Publications			
Specific to TC Metals			
F-96-PH4A-S0054, F-95-PH4P-S0285	Phase IV First Supplemental, Phase IV Proposed	Proposed Best Demonstrated Available Technology (BDAT) Background Document for Toxicity Characteristic Metal Wastes D004-D011, U.S. EPA, with Attachments A and B	Provides waste characterization data and information on treatment technologies for developing BDAT standards for wastewater and nonwastewater forms of the eight TC metal wastes (D004 - D011)
F-95-PH4P-S0289	Phase IV Proposed	Metal Treatment Performance Data From Comments to the Phase III Proposed Rule (Excerpts from Public Comments), U.S. EPA, OSW, WTB, with Attachments A through G	Contains metals treatment performance data from commenters on the Phase III Proposed Rule.
F-94-CS2F-S0021	Phase II Final	Memorandum to Lisa Jones, U.S. EPA, Regarding Final Report of Treatment Data for Nickel-Containing Wastes, From Radian Corporation, with Attachments A through J	Provides a compilation of HTMR treatment performance data used to develop previously promulgated BDAT standards for nickel wastes including K061, F006, K048-K052 and F024.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-94-CS2F-S0023	Phase II Final	Memorandum to Lisa Jones, U.S. EPA, Regarding Comparison of Chromium Data, From Radian Corporation	Contains a comparison of waste treatment data used to develop proposed UTSs for chromium waste with treatment data submitted by Occidental Corp. in their comment (CS2P-00143) to the Proposed Phase II LDR. Includes treatment technology information and performance data for nonwastewater chromium wastes (K061).
F-94-CS2F-S0024	Phase II Final	Memorandum to the Administrative Record for Universal Standards for Metals, Regarding the Report on Chromium Treatment and the Development/Derivation of the Universal Standard for Chromium, with Attachments A and B	Provides detailed discussion of the HTMR and stabilization technologies specifically for the K061 rulemaking.
F-95-PH4P-S0190 F-95-PH4P-S0275	Third Third Final	Final Best Demonstrated Available Technology (BDAT) Background Document for K031, K084, K101, K102, Characteristic Arsenic Wastes (D004), Characteristic Selenium Wastes (D010), and P and U Wastes Containing Arsenic and Selenium Listing Constituents, U.S. EPA [From Third Third]	Provides treatment technology information, performance data, and explains the determination of BDAT for arsenic- and selenium-containing wastes: K031, K084, K101, K102, D004, D010 and P and U wastes.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-95-PH4P-S0274	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Documents for D006 Cadmium Wastes, U.S., EPA	Contains waste-specific information, treatment technology information, and performance data for cadmium-containing wastes (D006) .
F-95-PH4P-S0279	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Documents for Barium Wastes (D005 and P013), U.S. EPA	Contains treatment technology information and performance data for barium-containing wastes (D005). Also details the development of the treatment standards for barium cyanide wastes (P013).
F-95-PH4P-S0280	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Documents for Chromium Wastes D007 and U032, U.S. EPA, with Attachment A and B	Provides treatment technology information, performance data, and performance data analyses for chromium wastes (D007). Also details the development of the treatment standards for calcium chromate wastes (U032).

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-95-PH4P-S0281	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Documents for D008 and P and U Lead Wastes, U.S. EPA, with Attachments A and B	Provides treatment technology information, performance data, and performance data analyses for lead-containing wastes (D008). Also discusses lead-containing P- and U-code wastes and details the development of treatment standards for these wastes.
F-95-PH4P-S0282	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Document for Mercury-Containing Wastes D009, K106, P065, P092, and U151, U.S. EPA, With Attachments A and B	Provides treatment technology information, performance data, and performance data analyses for the mercury-containing wastes K106, K071 (nonwastewaters), P065, P092, U151, and mercury TC wastes (D009).
F-95-PH4P-S0283	Third Third Final	Final, Best Demonstrated Available Technology (BDAT) Background Document for Silver-Containing Wastes	Provides treatment technology information and performance data for silver-containing wastes (D011). Also discusses associated silver-containing P-code wastes and details development of treatment standards for these wastes.
Specific to Mineral Processing			

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-96-PH4A-S0036	Phase IV First Supplemental	Best Demonstrated Available Technology (BDAT) Background Document for Mineral Processing Wastes, U.S. EPA	Contains a review of several applicable treatment and recovery technologies, comparative analysis, and performance data for mineral processing wastes characteristic for corrosivity (D002) and/or reactivity (D003)
Specific to Treatment Technologies			
F-96-PH4A-S0033	Phase IV First Supplemental	Letter to Anita Cummings, U.S. EPA, Regarding the Preliminary Assessment of Available Data on Metal Recovery Performances, ICF Inc., including Appendix A: Metal Recovery Technology Performance Summaries	Presents performance data from recovery of the 14 BDAT metals from mineral processing wastes. Focuses on electric arc furnace dusts from steel production (K061). Describes what types of waste INMETCO's recovery processes can handle, i.e., K061, K062, F006, D002, D006, D007, D001 and other wastes.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-96-PH4A-S0037	Phase IV First Supplemental	Profiles of Metal Recovery Technologies for Mineral Processing Wastes and Other Metal-Bearing Hazardous Wastes, U.S. EPA	Contains information on characteristics and performance of 30 metal recovery technologies. Provides a preliminary assessment of whether a particular technology is suited for a specific waste (focused on mineral processing waste).
F-96-PH4A-S0038	Phase IV First Supplemental	Review Sheets for Literature on Metal Recovery Technologies for Mineral Processing Wastes, U.S. EPA	Contains review sheets for articles related to mineral processing. Specific information provided includes: if article is applicable to mineral processing wastes; level of development of technology; type of waste; specific waste application; type of process; metals or other products recovered; and if the article contains generation or characterization data on a mineral processing waste.
F-95-PH4P-S0256	Phase IV Proposed	Treatment Technology Background Document, U.S. EPA, OSW, with Attachments A through E	Contains treatment performance data and treatment technology information that may be used to treat wastewaters and nonwastewaters subject to the LDR.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-95-PH4P-S0259	Phase IV Proposed	Proposed Data Document for Characterization and Performance of High Temperature Metals Recovery Treatment and Stabilization for Metal-Bearing Nonwastewaters, U.S. EPA, with Attachments A through Q	Contains performance and characterization data of HTMR treatment and stabilization for metal-bearing nonwastewaters including K061, K062, F006, F024, K048-K052, K046, K002, K003, K004, K006, K031, D007, D009, and K106.
F-94-CS2F-S0025	Phase II Final	Memorandum to the Administrative Record for Universal Standards for Metals, Regarding the Report on High Temperature Metal Recovery Processes and Stabilization Considered in the Development of Land Disposal Restrictions for K061 Nonwastewaters, U.S. EPA, 1994	Provides detailed discussion of the HTMR and stabilization technologies specifically for the K061 rulemakings.
F-94-CS2F-S0027	Phase II Final	Final Data Document for Characterization and Performance of High Temperature Metals Recovery Treatment and Stabilization for Metal Bearing Nonwastewaters, U.S. EPA	Presents characterization data and treatment performance data for metals in the Universal Standards Final Rule.
F-94-CS2F-S0030	Phase II Final	Memorandum to the Record, Regarding HTMR versus Stabilization, U.S. EPA, 1994	Contains statement saying that stabilization of metals achieves levels slightly higher than recovery of metals via HTMR.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
Other BDAT Background Documents (Corrosive Wastes and General)			
F-93-CS2P-S0156	Third Third Final	Final Best Demonstrated Available Technology (BDAT) Background Document for Characteristic Ignitable Wastes (D001), Characteristic Corrosive Wastes (D002), Characteristic Reactive Wastes (D003), and P and U Wastes Containing Reactive Listing Constituents, (Title Page Only)	Contains applicable treatment technologies, characterization, and performance data for ignitable wastes (D001), corrosive wastes (D002), reactive wastes (D003) and P- and U-code wastes containing reactive listing constituents.
F-94-CS2F-S0028	Phase II Final	Final Best Demonstrated Available Technology (BDAT), Background Document for Universal Standards, Volume A: Universal Standards for Nonwastewater Forms of Listed Hazardous Wastes, U.S. EPA, July 1994.	Provides rationale and technical support including treatment technology information and performance data for selecting constituents for regulation under UTS and for developing UTS for nonwastewater forms of listed hazardous waste.
F-94-CS2F-S0046	Phase II Final	Final, Best Demonstrated Available Technology (BDAT), Background Document for Universal Standards, Volume B: Universal Standards for Wastewater Forms of Listed Hazardous Wastes, U.S. EPA, July 1994.	Contains descriptive text and tables showing performance data for treatment of metals in wastewater.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-95-PH4P-S0284	Phase IV Proposed	Draft, Compilation and Examination of Metal Information, U.S. EPA, with Attachment A through D	Discusses treatment technologies and alternative technologies for metal wastes (D004 - D011). Information is also presented for non-TC metals such as antimony, beryllium, nickel, thallium, vanadium and zinc.
F-92-CD2F-S0113	Phase I Final	Memorandum to Mark Mercer Regarding Information on Immobilization of Hazardous Debris and Highly Contaminated Debris, Radian Corporation, Including Attachments A through E regarding organics interferences.	Contains information on immobilization of hazardous debris and examples of highly contaminated hazardous debris.
F-92-CD2F-S0118	Phase I Final	Hazardous Debris Final Rule Technical Support Document, U.S. EPA, 1992, with Attachments A through C.	Contains detailed descriptions of each treatment technology listed as BDAT for hazardous debris and a description of the performance standards applicable to each technology.
Publications by Other EPA Offices or Outside Groups Included in LDR Dockets			
F-95-PH4P-S0026	Phase IV Proposed	Physical/Chemical Treatment Technology Resource Guide, EPA/542-B-94-008, U.S. EPA, TIO.	Provides sources of physical/chemical treatment technology information and technical assistance such as bulletin boards, catalogs, databases, dockets and hotlines.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
F-95-PH4P-S0222	Phase IV Proposed	Superfund Innovative Technology Evaluation Program: Technology Profiles, Seventh Edition, U.S. EPA, ORD.	Provides descriptions of innovative technologies and what waste they treat (mostly organic but includes heavy metals).
F-92-CD2F-S0061	Phase I Final	Review of In-Place Treatment Techniques for contaminated Surface Soils, Volume 1: Technical Evaluation, U.S. EPA, OSWER, OERR, MERL, and ORD.	Presents information on <i>in-situ</i> treatment technologies applicable to contaminated soils less than 2 feet deep. Includes treatment of heavy metals.
F-92-CD2F-S0062	Phase I Final	Review of In-Place Treatment Techniques for Contaminated Surface Soils, Volume 2: Background Information for <i>In-Situ</i> Treatment, U.S. EPA, OSWER, OERR, MERL, and ORD.	Presents information on <i>in-situ</i> treatment of hazardous waste contaminated soils. Information presented on monitoring to determine treatment effectiveness.
F-92-CD2F-S0064	Phase I Final	Handbook on <i>In-situ</i> Treatment of Hazardous Waste-Contaminated Soils, U.S. EPA, ORD, RREL	Provides an analysis of <i>in-situ</i> treatment of hazardous waste contaminated soils.

Document No.	Rule/Status	Title	Notes (Description of waste codes at end of table)
Description of Waste Codes			
			<p>D001 - Characteristic for ignitability D002 - Characteristic for corrosivity D003 - Characteristic for reactivity D004 - Toxicity characteristic (TC) for arsenic D005 - TC for barium D006 - TC for cadmium D007 - TC for chromium D008 - TC for lead D009 - TC for mercury D010 - TC for selenium D011 - TC for silver</p> <p>F006 - Treatment sludge from electroplating operations F024 - Process wastes including distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes.</p> <p>K002 - Wastewater treatment sludge from production of chrome yellow and orange pigments. K003 - Wastewater treatment sludge from production of molybdate orange pigments. K004 - Wastewater treatment sludge from production of zinc yellow pigments. K006 - Wastewater treatment sludge from production of chrome oxide green pigments (anhydrous and hydrated). K031 - By-product salts generated in the production of MSMA and cacodylic acid. K046 - Wastewater treatment sludge from manufacturing, formulation and loading of lead-based initiating compounds. K048 - Dissolved air floatation (DAF) float from the petroleum refining industry. K049 - Slop oil emulsion solids from the petroleum refining industry. K050 - Heat exchanger bundle cleaning sludge from the petroleum refining industry. K051 - API separator sludge from the petroleum refining industry. K052 - Tank bottoms (leaded) from the petroleum refining industry. K061 - Emission control dust/sludge from the primary production of steel in electric furnaces. K062 - Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332). K071 - Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used. K084 - Wastewater treatment sludge generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds. K101 - Distillation tar residues from distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds. K102 - Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds. K106 - Wastewater treatment sludge from the mercury cell process in chlorine production.</p> <p>P013 - Barium cyanide P065 - Mercury fulminate (R,T) P092 - Mercury, (aceto-o) phenyl-</p> <p>U032 - Calcium chromate U151 - Mercury</p>