Chapter 4

LDR Resources

CHAPTER 4: LDR Resources

Land Disposal Restrictions

Michigan's land disposal restrictions are found in Rule 311 (MAC R 299.9311) of the Part 111 rules of Act 451, the Michigan Natural Resource and Environmental Protection Act. They adopt the federal land disposal restrictions found in 40 CFR, Part 268. The land disposal restrictions (LDRs) require most hazardous waste to be treated prior to being disposed. The LDRs apply to hazardous waste generated by small and large quantity generators of hazardous waste. They do not apply to hazardous waste generated by conditionally exempt small quantity generators of hazardous waste.

The land disposal restrictions require that small and large quantity generators of hazardous waste provide an initial notice for each hazardous waste shipped to a treatment, storage and disposal facility. The notice must state whether the waste must be treated prior to being land disposed and identify the underlying hazardous constituents (UHCs) in the waste. Notification is required even if the waste is destined for non-land based disposal (e.g. incineration). Most disposal vendors assist generators with completion of their LDR notifications. However, it is ultimately the responsibility of the generator to complete the notice.

To determine whether treatment is required and identify the UHCs for a waste, review the standards found in 40 CFR 268.40 for hazardous waste, 40 CFR 268.45 for contaminated debris, or 40 CFR 268.49 for contaminated soil. For each waste stream, the generator must review the hazardous waste codes associated with each waste listed in the relevant LDR table, identify the UHCs associated with the waste, and whether the waste meets or exceeds the limits and requires treatment prior to land disposal.

LDR records must be maintained on-site for at least three years from the date the waste was last shipped for disposal. See the excerpt from 40 CFR 268.40, the LDR notification certification form, and LDR UHC form for additional details.

(3) The wastes meet the applicable alternate treatment standards established pursuant to a petition granted under § 268.44;

(4) Persons have been granted an extension to the effective date of a prohibition pursuant to § 268.5, with respect to these wastes covered by the extension.

(g) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in § 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains constituents in excess of the applicable Subpart D levels, the waste is prohibited from land disposal, and all requirements of this part 268 are applicable, except as otherwise specified.

[61 FR 15663, Apr. 8, 1996, as amended at 61 FR 33683, June 28, 1996; 62 FR 1997, Jan. 14, 1997; 62 FR 32979, June 17, 1997; 62 FR 37699, July 14, 1997; 63 FR 51264, Sept. 24, 1998]

Subpart D—Treatment Standards

§ 268.40 Applicability of treatment standards.

(a) A prohibited waste identified in the table "Treatment Standards for Hazardous Wastes" may be land disposed only if it meets the requirements found in the table. For each waste, the table identifies one of three types of treatment standard requirements:

(1) All hazardous constituents in the waste or in the treatment residue must be at or below the values found in the table for that waste ("total waste standards"); or

(2) The hazardous constituents in the extract of the waste or in the extract of the treatment residue must be at or below the values found in the table ("waste extract standards"); or

(3) The waste must be treated using the technology specified in the table ("technology standard"), which are described in detail in § 268.42, Table 1—Technology Codes and Description of Technology-Based Standards.

(b) For wastewaters, compliance with concentration level standards is based on maximums for any one day, except for D004 through D011 wastes for which the previously promulgated treatment standards based on grab samples remain in effect. For all nonwastewaters, compliance with concentration level standards is based on grab sampling. For wastes covered by the waste extract standards, the test Method 1311, the Toxicity Characteristic Leaching Procedure found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, as incorporated by reference in § 260.11, must be used to measure compliance. An exception is made for D004 and D008, for which either of two test methods may be used: Method 1311, or Method 1310B, the Extraction Procedure Toxicity Test. For wastes covered by a technology standard, the wastes may be land disposed after being treated using that specified technology or an equivalent treatment technology approved by the Administrator under the procedures set forth in § 268.42(b).

(c) When wastes with differing treatment standards for a constituent of concern are combined for purposes of treatment, the treatment residue must meet the lowest treatment standard for the constituent of concern.

(d) Notwithstanding the prohibitions specified in paragraph (a) of this section, treatment and disposal facilities may demonstrate (and certify pursuant to 40 CFR 268.7(b)(5)) compliance with the treatment standards for organic constituents specified by a footnote in the table "Treatment Standards for Hazardous Wastes" in this section, provided the following conditions are satisfied:

(1) The treatment standards for the organic constituents were established based on incineration in units operated in accordance with the technical requirements of 40 CFR part 264, subpart O, or based on combustion in fuel substitution units operating in accordance with applicable technical requirements;

(2) The treatment or disposal facility has used the methods referenced in paragraph (d)(1) of this section to treat the organic constituents; and

(3) The treatment or disposal facility may demonstrate compliance with organic constituents if good-faith analytical efforts achieve detection limits for the regulated organic constituents that do not exceed the treatment standards specified in this section by an order of magnitude.

(e) For characteristic wastes (D001–D043) that are subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," and are not managed in a wastewater treatment system that is regulated under the Clean Water Act (CWA), that is CWA-equivalent, or that is injected into a Class I nonhazardous deep injection well, all underlying hazardous constituents (as defined in §268.2(i)) must meet Universal Treatment Standards, found in §268.48, Table Universal Treatment Standards, prior to land disposal as defined in §268.2(c) of this part.

(f) The treatment standards for F001–F005 nonwastewater constituents carbon disulfide, cyclohexanone, and/or methanol apply to wastes which contain only one, two, or three of these constituents. Compliance is measured for these constituents in the waste extract from test Method 1311, the Toxicity Characteristic Leaching Procedure found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW–846, as incorporated by reference in §260.11. If the waste contains any of these three constituents along with any of the other 25 constituents found in F001–F005, then compliance with treatment standards for carbon disulfide, cyclohexanone, and/or methanol are not required.

(g) Between August 26, 1996 and March 4, 1999 the treatment standards for the wastes specified in 40 CFR 261.32 as EPA Hazardous Waste numbers K156–K161; and in 40 CFR 261.33 as EPA Hazardous Waste numbers P127, P128, P185, P188–P192, P194, P196–P199, P201–P205, U271, U277–U280, U364–U367, U372, U373, U375–U379, U381–U387, U389–U396, U400–U404, U407, and U409–U411; and soil contaminated with these wastes; may be satisfied by either meeting the constituent concentrations presented in the table "Treatment Standards for Hazardous Wastes" in this section, or by treating the waste by the following technologies: combustion, as defined by the technology code CMBST at §268.42 Table 1, for nonwastewaters; and, biodegradation as defined by the technology code BIODG, carbon adsorption as defined by the technology code CARBN, chemical oxidation as defined by the technology code CHOXD, or combustion as defined as technology code CMBST at §268.42 Table 1, for wastewaters.

(h) Prohibited D004–D011 mixed radioactive wastes and mixed radioactive listed wastes containing metal constituents, that were previously treated by stabilization to the treatment standards in effect at that time and then put into storage, do not have to be re-treated to meet treatment standards in this section prior to land disposal.

(i) [Reserved]

(j) Effective September 4, 1998, the treatment standards for the wastes specified in 40 CFR 261.33 as EPA Hazardous Waste numbers P185, P191, P192, P197, U364, U394, and U395 may be satisfied by either meeting the constituent concentrations presented in the table "Treatment Standards for Hazardous Wastes" in this section, or by treating the waste by the following technologies: combustion, as defined by the technology code CMBST at §268.42 Table 1 of this Part, for nonwastewaters; and, biodegradation as defined by the technology code BIODG, carbon adsorption as defined by the technology code CARBN, chemical oxidation as defined by the technology code CHOXD, or combustion as defined as technology code CMBST at §268.42 Table 1 of this Part, for wastewaters.

TREATMENT STANDARDS FOR HAZARDOUS WASTES

[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory [1]	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS [2] number	Concentration [3] in mg/L; or Technology Code [4]	Concentration [5] in mg/kg unless noted as "mg/L TCLP"; or Technology Code [4]
D001 [9]	Ignitable Characteristic Wastes, except for the § 261.21(a)(1) High TOC Subcategory.	NA	NA	DEACT and meet § 268.48 standards [8]; or RORGS; or CMBST	DEACT and meet § 268.48 standards [8]; or RORGS; or CMBST
	High TOC Ignitable Characteristic Liquids Subcategory based on 40 CFR 261.21(a)(1)—Greater than or equal to 10% total organic carbon. (Note: This subcategory consists of nonwastewaters only.)	NA	NA	NA	RORGS; CMBST; or POLYM
D002 [9]	Corrosive Characteristic Wastes.	NA	NA	DEACT and meet § 268.48 standards [8]	DEACT and meet § 268.48 standards [8]
D002, D004, D005, D006, D007, D008, D009, D010, D011	Radioactive high level wastes generated during the reprocessing of fuel rods. (Note: This subcategory consists of nonwastewaters only.)	Corrosivity (pH) Arsenic Barium Cadmium Chromium (Total) Lead Mercury Selenium Silver	NA 7440–38–2 7440–39–3 7440–43–9 7440–47–3 7439–92–1 7439–97–6 7782–49–2 7440–22–4	NA NA NA NA NA NA NA NA NA	HLVIT HLVIT HLVIT HLVIT HLVIT HLVIT HLVIT HLVIT HLVIT
D003 [9]	Reactive Sulfides Subcategory based on 261.23(a)(5).	NA	NA	DEACT	DEACT
	Explosives Subcategory based on 261.23(a)(6),(7), and (8).	NA	NA	DEACT and meet § 268.48 standards [8]	DEACT and meet § 268.48 standards [8]
	Unexploded ordnance and other explosive devices which have been the subject of an emergency response.	NA	NA	DEACT	DEACT
	Other Reactives Subcategory based on 261.23(a)(1).	NA	NA	DEACT and meet § 268.48 standards [8]	DEACT and meet § 268.48 standards [8]

	Water Reactive Subcategory based on 261.23(a)(2), (3), and (4). (Note: This subcategory consists of nonwastewaters only).	NA	NA	NA	DEACT and meet § 268.48 standards [8]
	Reactive Cyanides Subcategory based on 261.23(a)(5).	Cyanides (Total)[7] Cyanides (Amenable)[7]	57–12–5 57–12–5	Reserved 0.86	590 30
D004[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for arsenic based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Arsenic	7440–38–2	1.4 and meet § 268.48 standards [8]	5.0 mg/L TCLP and meet § 268.48 standards [8]
D005[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for barium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Barium	7440–39–3	1.2 and meet § 268.48 standards [8]	21 mg/L TCLP and meet § 268.48 standards [8]
D006[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for cadmium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Cadmium	7440–43–9	0.69 and meet § 268.48 standards [8]	0.11 mg/L TCLP and meet § 268.48 standards [8]
	Cadmium Containing Batteries Subcategory. (Note: This subcategory consists of nonwastewaters only).	Cadmium	7440–43–9	NA	RTHRM
	Radioactively contaminated cadmium containing batteries. (**Note:** This subcategory consists of nonwastewaters only)	Cadmium	7440–43–9	NA	Macroencapsulation in accordance with 40 CFR 268.45
D007[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for chromium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Chromium (Total)	7440–47–3	2.77 and meet § 268.48 standards [8]	0.60 mg/L TCLP and meet § 268.48 standards [8]
D008[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for lead based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Lead	7439–92–1	0.69 and meet § 268.48 standards [8]	0.75 mg/L TCLP and meet § 268.48 standards [8]
	Lead Acid Batteries Subcategory (Note: This standard only applies to lead acid batteries that are identified as RCRA hazardous wastes and that are not excluded elsewhere from regulation under the land disposal restrictions of 40 CFR 268 or exempted under other EPA regulations (see 40 CFR 266.80). This subcategory consists of nonwastewaters only.)	Lead	7439–92–1	NA	RLEAD
	Radioactive Lead Solids Subcategory (Note: These lead solids include, but are not limited to, all forms of lead shielding and other elemental forms of lead. These lead solids do not include treatment residuals such as hydroxide sludges, other wastewater treatment residuals, or incinerator ashes that can undergo conventional pozzolanic stabilization, nor do they include organo-lead materials that can be incinerated and stabilized as ash. This subcategory consists of nonwastewaters only.)	Lead	7439–92–1	NA	MACRO

TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued

[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory [1]	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS [2] number	Concentration [3] in mg/L; or Technology Code [4]	Concentration [5] in mg/kg unless noted as "mg/L TCLP"; or Technology Code [4]
D009 [9]	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that also contain organics and are not incinerator residues. (High Mercury-Organic Subcategory)	Mercury	7439–97–6	NA	IMERC; OR RMERC
	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that are inorganic, including incinerator residues and residues from RMERC. (High Mercury-Inorganic Subcategory)	Mercury	7439–97–6	NA	RMERC
	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are residues from RMERC only. (Low Mercury Subcategory)	Mercury	7439–97–6	NA	0.20 mg/L TCLP and meet § 268.48 standards [8]
	All other nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are not residues from RMERC. (Low Mercury Subcategory)	Mercury	7439–97–6	NA	0.025 mg/L TCLP and meet § 268.48 standards [8]
	All D009 wastewaters.	Mercury	7439–97–6	0.15 mg/L TCLP and meet § 268.48 standards [8]	NA
	Elemental mercury contaminated with radioactive materials. (Note: This subcategory consists of nonwastewaters only.)	Mercury	7439–97–6	NA	AMLGM
	Hydraulic oil contaminated with Mercury Radioactive Materials Subcategory. (Note: This subcategory consists of nonwastewaters only.)	Mercury	7439–97–6	NA	IMERC
	Radioactively contaminated mercury containing batteries. **(Note:** This subcategory consists of nonwastewaters only)	Mercury	7439–97–6	NA	Macroencapsulation in accordance with 40 CFR 268.45.

D010[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for selenium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Selenium	7782–49–2	0.82 and meet § 268.48 standards [8]	5.7 mg/L TCLP and meet § 268.48 standards [8]
D011[9]	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for silver based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Silver	7440–22–4	0.43 and meet § 268.48 standards [8]	0.14 mg/L TCLP and meet § 268.48 standards [8]
	Radioactively contaminated silver containing batteries. **Note:** This sub-category consists of nonwastewaters only).	Silver	7440–22–4	NA	Macroencapsulation in accordance with 40 CFR 268.45.
D012[9]	Wastes that are TC for Endrin based on the TCLP in SW846 Method 1311.	Endrin	72–20–8	BIODG; or CMBST	0.13 and meet § 268.48 standards [8]
		Endrin aldehyde	7421–93–4	BIODG; or CMBST	0.13 and meet § 268.48 standards [8]
D013[9]	Wastes that are TC for Lindane based on the TCLP in SW846 Method 1311.	alpha-BHC	319–84–6	CARBN; or CMBST	0.066 and meet § 268.48 standards [8]
		beta-BHC	319–85–7	CARBN; or CMBST	0.066 and meet § 268.48 standards [8]
		delta-BHC	319–86–8	CARBN; or CMBST	0.066 and meet § 268.48 standards [8]
		gamma-BHC (Lindane)	58–89–9	CARBN; or CMBST	0.066 and meet § 268.48 standards [8]
D014[9]	Wastes that are TC for Methoxychlor based on the TCLP in SW846 Method 1311.	Methoxychlor	72–43–5	WETOX or CMBST	0.18 and meet § 268.48 standards [8]
D015[9]	Wastes that are TC for Toxaphene based on the TCLP in SW846 Method 1311.	Toxaphene	8001–35–2	BIODG or CMBST	2.6 and meet § 268.48 standards [8]
D016[9]	Wastes that are TC for 2,4-D (2,4-Dichlorophenoxyacetic acid) based on the TCLP in SW846 Method 1311.	2,4,-D (2,4-Dichlorophenoxyacetic acid)	94–75–7	CHOXD, BIODG, or CMBST	10 and meet § 268.48 standards [8]
D017[9]	Wastes that are TC for 2,4,5-TP (Silvex) based on the TCLP in SW846 Method 1311.	2,4,5-TP (Silvex)	93–72–1	CHOXD or CMBST	7.9 and meet § 268.48 standards [8]

TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued

[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory [1]	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS [2] number	Concentration [3] in mg/L; or Technology Code [4]	Concentration [5] in mg/kg unless noted as "mg/L TCLP"; or Technology Code [4]
D018 [9]	Wastes that are TC for Benzene based on the TCLP in SW846 Method 1311.	Benzene	71–43–2	0.14 and meet § 268.48 standards [8]	10 and meet § 268.48 standards [8]
D019 [9]	Wastes that are TC for Carbon tetrachloride based on the TCLP in SW846 Method 1311.	Carbon tetrachloride	56–23–5	0.057 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D020 [9]	Wastes that are TC for Chlordane based on the TCLP in SW846 Method 1311.	Chlordane (alpha and gamma isomers)	57–74–9	0.0033 and meet § 268.48 standards [8]	0.26 and meet § 268.48 standards [8]
D021 [9]	Wastes that are TC for Chlorobenzene based on the TCLP in SW846 Method 1311.	Chlorobenzene	108–90–7	0.057 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D022 [9]	Wastes that are TC for Chloroform based on the TCLP in SW846 Method 1311.	Chloroform	67–66–3	0.046 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D023 [9]	Wastes that are TC for o-Cresol based on the TCLP in SW846 Method 1311.	o-Cresol	95–48–7	0.11 and meet § 268.48 standards [8]	5.6 and meet § 268.48 standards [8]
D024 [9]	Wastes that are TC for m-Cresol based on the TCLP in SW846 Method 1311.	m-Cresol (difficult to distinguish from p-cresol)	108–39–4	0.77 and meet § 268.48 standards [8]	5.6 and meet § 268.48 standards [8]
D025 [9]	Wastes that are TC for p-Cresol based on the TCLP in SW846 Method 1311.	p-Cresol (difficult to distinguish from m-cresol)	106–44–5	0.77 and meet § 268.48 standards [8]	5.6 and meet § 268.48 standards [8]
D026 [9]	Wastes that are TC for Cresols (Total) based on the TCLP in SW846 Method 1311.	Cresol-mixed isomers (Cresylic acid) (sum of o-, m-, and p-cresol concentrations)	1319–77–3	0.88 and meet § 268.48 standards [8]	11.2 and meet § 268.48 standards [8]
D027 [9]	Wastes that are TC for p-Dichlorobenzene based on the TCLP in SW846 Method 1311.	p-Dichlorobenzene (1,4-Dichlorobenzene)	106–46–7	0.090 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]

D028[9]	Wastes that are TC for 1,2-Dichloroethane based on the TCLP in SW846 Method 1311.	1,2-Dichloroethane	107–06–2	0.21 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D029[9]	Wastes that are TC for 1,1-Dichloroethylene based on the TCLP in SW846 Method 1311.	1,1-Dichloroethylene	75–35–4	0.025 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D030[9]	Wastes that are TC for 2,4-Dinitrotoluene based on the TCLP in SW846 Method 1311.	2,4-Dinitrotoluene	121–14–2	0.32 and meet § 268.48 standards [8]	140 and meet § 268.48 standards [8]
D031[9]	Wastes that are TC for Heptachlor based on the TCLP in SW846 Method 1311.	Heptachlor	76–44–8	0.0012 and meet § 268.48 standards [8]	0.066 and meet § 268.48 standards [8]
		Heptachlor epoxide	1024–57–3	0.016 and meet § 268.48 standards [8]	0.066 and meet § 268.48 standards [8]
D032[9]	Wastes that are TC for Hexachlorobenzene based on the TCLP in SW846 Method 1311.	Hexachlorobenzene	118–74–1	0.055 and meet § 268.48 standards [8]	10 and meet § 268.48 standards [8]
D033[9]	Wastes that are TC for Hexachlorobutadiene based on the TCLP in SW846 Method 1311.	Hexachlorobutadiene	87–68–3	0.055 and meet § 268.48 standards [8]	5.6 and meet § 268.48 standards [8]
D034[9]	Wastes that are TC for Hexachloroethane based on the TCLP in SW846 Method 1311.	Hexachloroethane	67–72–1	0.055 and meet § 268.48 standards [8]	30 and meet § 268.48 standards [8]
D035[9]	Wastes that are TC for Methyl ethyl ketone based on the TCLP in SW846 Method 1311.	Methyl ethyl ketone	78–93–3	0.28 and meet § 268.48 standards [8]	36 and meet § 268.48 standards [8]
D036[9]	Wastes that are TC for Nitrobenzene based on the TCLP in SW846 Method 1311.	Nitrobenzene	98–95–3	0.068 and meet § 268.48 standards [8]	14 and meet § 268.48 standards [8]
D037[9]	Wastes that are TC for Pentachlorophenol based on the TCLP in SW846 Method 1311.	Pentachlorophenol	87–86–5	0.089 and meet § 268.48 standards [8]	7.4 and meet § 268.48 standards [8]
D038[9]	Wastes that are TC for Pyridine based on the TCLP in SW846 Method 1311.	Pyridine	110–86–1	0.014 and meet § 268.48 standards [8]	16 and meet § 268.48 standards [8]

TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued

[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory [1]	Regulated hazardous constituent: Common name	Regulated hazardous constituent: CAS [2] number	Wastewaters: Concentration [3] in mg/L, or Technology Code [4]	Nonwastewaters: Concentration [5] in mg/kg unless noted as "mg/L TCLP"; or Technology Code [4]
D039 [9]	Wastes that are TC for Tetrachloroethylene based on the TCLP in SW846 Method 1311.	Tetrachloroethylene	127–18–4	0.056 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D040 [9]	Wastes that are TC for Trichloroethylene based on the TCLP in SW846 Method 1311.	Trichloroethylene	79–01–6	0.054 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
D041 [9]	Wastes that are TC for 2,4,5-Trichlorophenol based on the TCLP in SW846 Method 1311.	2,4,5-Trichlorophenol	95–95–4	0.18 and meet § 268.48 standards [8]	7.4 and meet § 268.48 standards [8]
D042 [9]	Wastes that are TC for 2,4,6-Trichlorophenol based on the TCLP in SW846 Method 1311.	2,4,6-Trichlorophenol	88–06–2	0.035 and meet § 268.48 standards [8]	7.4 and meet § 268.48 standards [8]
D043 [9]	Wastes that are TC for Vinyl chloride based on the TCLP in SW846 Method 1311.	Vinyl chloride	75–01–4	0.27 and meet § 268.48 standards [8]	6.0 and meet § 268.48 standards [8]
F001, F002, F003, F004, & F005	F001, F002, F003, F004 and/or F005 solvent wastes that contain any combination of one or more of the following spent solvents: acetone, benzene, n-butyl alcohol, carbon disulfide, carbon tetrachloride, chlorinated fluorocarbons, chlorobenzene, o-cresol, m-cresol, p-cresol, cyclohexanone, o-dichlorobenzene, 2-ethoxyethanol, ethyl acetate, ethyl benzene, ethyl ether, isobutyl alcohol, methanol, methylene chloride, methyl ethyl ketone, methyl isobutyl ketone, nitrobenzene, 2-nitropropane, pyridine, tetrachloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, trichloroethylene, trichlorofluoromethane, and/or xylenes [except as specifically noted in other subcategories]. See further details of these listings in § 261.31.	Acetone	67–64–1	0.28	160
		Benzene	71–43–2	0.14	10
		n-Buthyl alcohol	71–36–3	5.6	2.6
		Carbon disulfide	75–15–0	3.8	NA
		Carbon tetrachloride	56–23–5	0.057	6.0
		Chlorobenzene	108–90–7	0.057	6.0
		o-Cresol	95–48–7	0.11	5.6
		m-Cresol (difficult to distinguish from p-cresol)	108–39–4	0.77	5.6
		p-Cresol (difficult to distinguish from m-cresol)	106–44–5	0.77	5.6
		Cresol-mixed isomers (Cresylic acid) (sum of o-, m-, and p-cresol concentrations)	1319–77–3	0.88	11.2
		Cyclohexanone	108–94–1	0.36	NA
		o-Dichlorobenzene	95–50–1	0.088	6.0
		Ethyl acetate	141–78–6	0.34	33
		Ethyl benzene	100–41–4	0.057	10
		Ethyl ether	60–29–7	0.12	160

		Isobutyl alcohol	78–83–1	5.6	170
		Methanol	67–56–1	5.6	NA
		Methylene chloride	75–9–2	0.089	30
		Methyl ethyl ketone	78–93–3	0.28	36
		Methyl isobutyl ketone	108–10–1	0.14	33
		Nitrobenzene	98–95–3	0.068	14
		Pyridine	110–86–1	0.014	16
		Tetrachloroethylene	127–18–4	0.056	6.0
		Toluene	108–88–3	0.080	10
		1,1,1-Trichloroethane	71–55–6	0.054	6.0
		1,1,2-Trichloroethane	79–00–5	0.054	6.0
		1,1,2-Trichloro-1,2,2-trifluoroethane	76–13–1	0.057	30
		Trichloroethylene	79–01–6	0.054	6.0
		Trichlorofluoromethane	75–69–4	0.020	30
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330–20–7	0.32	30
	F003 and/or F005 solvent wastes that contain any combination of one or more of the following three solvents as the only listed F001–5 solvents: carbon disulfide, cyclohexanone, and/or methanol. (formerly 268.41(c))	Carbon disulfide	75–15–0	3.8	4.8 mg/L TCLP
		Cyclohexanone	108–94–1	0.36	0.75 mg/L TCLP
		Methanol	67–56–1	5.6	0.75 mg/L TCLP
	F005 solvent waste containing 2-Nitropropane as the only listed F001–5 solvent.	2-Nitropropane	79–46–9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
	F005 solvent waste containing 2-Ethoxyethanol as the only listed F001–5 solvent.	2-Ethoxyethanol	110–80–5	BIODG; or CMBST	CMBST
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	Cadmium	7440–43–9	0.69	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total)[7]	57–12–5	1.2	590
		Cyanides (Amenable)[7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F007	Spent cyanide plating bath solutions from electroplating operations.	Cadmium	7440–43–9	NA	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total)[7]	57–12–5	1.2	590
		Cyanides (Amenable)[7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	Cadmium	7440–43–9	NA	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total)[7]	57–12–5	1.2	590
		Cyanides (Amenable)[7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP

TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued

[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory [1]	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS [2] number	Concentration [3] in mg/L; or Technology Code [4]	Concentration [5] in mg/kg unless noted as "mg/L TCLP"; or Technology Code [4]
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	Cadmium	7440–43–9	NA	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total) [7]	57–12–5	1.2	590
		Cyanides (Amenable) [7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	Cyanides (Total) [7]	57–12–5	1.2	590
		Cyanides (Amenable) [7]	57–12–5	0.86	NA
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	Cadmium	7440–43–9	NA	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total) [7]	57–12–5	1.2	590
		Cyanides (Amenable) [7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	Cadmium	7440–43–9	NA	0.11 mg/L TCLP
		Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total) [7]	57–12–5	1.2	590
		Cyanides (Amenable) [7]	57–12–5	0.86	30
		Lead	7439–92–1	0.69	0.75 mg/L TCLP
		Nickel	7440–02–0	3.98	11 mg/L TCLP
		Silver	7440–22–4	NA	0.14 mg/L TCLP
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.	Chromium (Total)	7440–47–3	2.77	0.60 mg/L TCLP
		Cyanides (Total) [7]	57–12–5	1.2	590
		Cyanides (Amendable) [7]	57–12–5	0.86	30

§ 268.42 Treatment standards expressed as specified technologies.

NOTE: For the requirements previously found in this section in Table 2—Technology-Based Standards By RCRA Waste Code, and Table 3—Technology-Based Standards for Specific Radioactive Hazardous Mixed Waste, refer to § 268.40.

(a) The following wastes in the table in § 268.40 "Treatment Standards for Hazardous Wastes," for which standards are expressed as a treatment method rather than a concentration level, must be treated using the technology or technologies specified in the table entitled "Technology Codes and Description of Technology-Based Standards" in this section.

TABLE 1—TECHNOLOGY CODES AND DESCRIPTION OF TECHNOLOGY-BASED STANDARDS

Technology code	Description of technology-based standards
ADGAS:	Venting of compressed gases into an absorbing or reacting media (i.e., solid or liquid)—venting can be accomplished through physical release utilizing valves/piping, physical penetration of the container, and/or penetration through detonation.
AMLGM:	Amalgamation of liquid, elemental mercury contaminated with radioactive materials utilizing inorganic reagents such as copper, zinc, nickel, gold, and sulfur that result in a nonliquid, semi-solid amalgam and thereby reducing potential emissions of elemental mercury vapors to the air.
BIODG:	Biodegradation of organics or non-metallic inorganics (i.e., degradable inorganics that contain the elements of phosphorus, nitrogen, and sulfur) in units operated under either aerobic or anaerobic conditions such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the biodegradation of many organic constituents that cannot be directly analyzed in wastewater residues).
CARBN:	Carbon adsorption (granulated or powdered) of non-metallic inorganics, organo-metallics, and/or organic constituents, operated such that a surrogate compound or indicator parameter has not undergone breakthrough (e.g., Total Organic Carbon can often be used as an indicator parameter for the adsorption of many organic constituents that cannot be directly analyzed in wastewater residues). Breakthrough occurs when the carbon has become saturated with the constituent (or indicator parameter) and substantial change in adsorption rate associated with that constituent occurs.
CHOXD:	Chemical or electrolytic oxidation utilizing the following oxidation reagents (or waste reagents) or combinations of reagents: (1) Hypochlorite (e.g., bleach); (2) chlorine; (3) chlorine dioxide; (4) ozone or UV (ultraviolet light) assisted ozone; (5) peroxides; (6) persulfates; (7) perchlorates; (8) permangantes; and/or (9) other oxidizing reagents of equivalent efficiency, performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the oxidation of many organic constituents that cannot be directly analyzed in wastewater residues). Chemical oxidation specifically includes what is commonly referred to as alkaline chlorination.
CHRED:	Chemical reduction utilizing the following reducing reagents (or waste reagents) or combinations of reagents: (1) Sulfur dioxide; (2) sodium, potassium, or alkali salts or sulfites, bisulfites, metabisulfites, and polyethylene glycols (e.g., NaPEG and KPEG); (3) sodium hydrosulfide; (4) ferrous salts; and/or (5) other reducing reagents of equivalent efficiency, performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Halogens can often be used as an indicator parameter for the reduction of many halogenated organic constituents that cannot be directly analyzed in wastewater residues). Chemical reduction is commonly used for the reduction of hexavalent chromium to the trivalent state.
CMBST:	High temperature organic destruction technologies, such as combustion in incinerators, boilers, or industrial furnaces operated in accordance with the applicable requirements of 40 CFR part 264, subpart O, or 40 CFR part 265, subpart O, or 40 CFR part 266, subpart H, and in other units operated in accordance with applicable technical operating requirements, and certain non-combustive technologies, such as the Catalytic Extraction Process.
DEACT:	Deactivation to remove the hazardous characteristics of a waste due to its ignitability, corrosivity, and/or reactivity.
FSUBS:	Fuel substitution in units operated in accordance with applicable technical operating requirements.
HLVIT:	Vitrification of high level mixed radioactive wastes in units in compliance with all applicable radioactive protection requirements under control of the Nuclear Regulatory Commission.
IMERC:	Incineration of wastes containing organics and mercury in units operated in accordance with the technical operating requirements of 40 CFR part 264 subpart 0 and part 265 subpart 0. All wastewater and nonwastewater residues derived from this process must then comply with the corresponding treatment standards per waste code with consideration of any applicable subcategories (e.g., High or Low Mercury Subcategories).
INCIN:	Incineration in units operated in accordance with the technical operating requirements of 40 CFR part 264 subpart 0 and part 265 subpart 0.
LLEXT:	Liquid-liquid extraction (often referred to as solvent extraction) of organics from liquid wastes into an immiscible solvent for which the hazardous constituents have a greater solvent affinity, resulting in an extract high in organics that must undergo either incineration, reuse as a fuel, or other recovery/reuse and a raffinate (extracted liquid waste) proportionately low in organics that must undergo further treatment as specified in the standard.

TABLE 1—TECHNOLOGY CODES AND DESCRIPTION OF TECHNOLOGY-BASED STANDARDS—Continued

Technology code	Description of technology-based standards
MACRO:	Macroencapsulation with surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Macroencapsulation specifically does not include any material that would be classified as a tank or container according to 40 CFR 260.10.
NEUTR:	Neutralization with the following reagents (or waste reagents) or combinations of reagents: (1) Acids; (2) bases, or (3) water (including wastewaters) resulting in a pH greater than 2 but less than 12.5 as measured in the aqueous residuals.
NLDBR:	No land disposal based on recycling.
POLYM:	Formation of complex high-molecular weight solids through polymerization of monomers in high-TOC D001 non-wastewaters which are chemical components in the manufacture of plastics.
PRECP:	Chemical precipitation of metals and other inorganics as insoluble precipitates of oxides, hydroxides, carbonates, sulfides, sulfates, chlorides, fluorides, or phosphates. The following reagents (or waste reagents) are typically used alone or in combination: (1) Lime (i.e., containing oxides and/or hydroxides of calcium and/or magnesium; (2) caustic (i.e., sodium and/or potassium hydroxides; (3) soda ash (i.e., sodium carbonate); (4) sodium sulfide; (5) ferric sulfate or ferric chloride; (6) alum; or (7) sodium sulfate. Additional flocculating, coagulation or similar reagents/processes that enhance sludge dewatering characteristics are not precluded from use.
RBERY:	Thermal recovery of Beryllium.
RCGAS:	Recovery/reuse of compressed gases including techniques such as reprocessing of the gases for reuse/resale; filtering/adsorption of impurities; remixing for direct reuse or resale; and use of the gas as a fuel source.
RCORR:	Recovery of acids or bases utilizing one or more of the following recovery technologies: (1) Distillation (i.e., thermal concentration); (2) ion exchange; (3) resin or solid adsorption; (4) reverse osmosis; and/or (5) incineration for the recovery of acid—Note: this does not preclude the use of other physical phase separation or concentration techniques such as decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RLEAD:	Thermal recovery of lead in secondary lead smelters.
RMERC:	Retorting or roasting in a thermal processing unit capable of volatilizing mercury and subsequently condensing the volatilized mercury for recovery. The retorting or roasting unit (or facility) must be subject to one or more of the following: (a) a National Emissions Standard for Hazardous Air Pollutants (NESHAP) for mercury; (b) a Best Available Control Technology (BACT) or a Lowest Achievable Emission Rate (LAER) standard for mercury imposed pursuant to a Prevention of Significant Deterioration (PSD) permit; or (c) a state permit that establishes emission limitations (within meaning of section 302 of the Clean Air Act) for mercury. All wastewater and nonwastewater residues derived from this process must then comply with the corresponding treatment standards per waste code with consideration of any applicable subcategories (e.g., High or Low Mercury Subcategories).
RMETL:	Recovery of metals or inorganics utilizing one or more of the following direct physical/removal technologies: (1) Ion exchange; (2) resin or solid (i.e., zeolites) adsorption; (3) reverse osmosis; (4) chelation/solvent extraction; (5) freeze crystalization; (6) ultrafiltration and/or (7) simple precipitation (i.e., crystalization)—*Note:* This does not preclude the use of other physical phase separation or concentration techniques such as decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RORGS:	Recovery of organics utilizing one or more of the following technologies: (1) Distillation; (2) thin film evaporation; (3) steam stripping; (4) carbon adsorption; (5) critical fluid extraction; (6) liquid-liquid extraction; (7) precipitation/crystalization (including freeze crystallization); or (8) chemical phase separation techniques (i.e., addition of acids, bases, demulsifiers, or similar chemicals);—Note: this does not preclude the use of other physical phase separation techniques such as a decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RTHRM:	Thermal recovery of metals or inorganics from nonwastewaters in units identified as industrial furnaces according to 40 CFR 260.10 (1), (6), (7), (11), and (12) under the definition of "industrial furnaces".
RZINC:	Resmelting in high temperature metal recovery units for the purpose of recovery of zinc.
STABL:	Stabilization with the following reagents (or waste reagents) or combinations of reagents: (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust)—this does not preclude the addition of reagents (e.g., iron salts, silicates, and clays) designed to enhance the set/cure time and/or compressive strength, or to overall reduce the leachability of the metal or inorganic.
SSTRP:	Steam stripping of organics from liquid wastes utilizing direct application of steam to the wastes operated such that liquid and vapor flow rates, as well as temperature and pressure ranges, have been optimized, monitored, and maintained. These operating parameters are dependent upon the design parameters of the unit, such as the number of separation stages and the internal column design, thus, resulting in a condensed extract high in organics that must undergo either incineration, reuse as a fuel, or other recovery/reuse and an extracted wastewater that must undergo further treatment as specified in the standard.
VTD:	Vacuum thermal desorption of low-level radioactive hazardous mixed waste in units in compliance with all applicable radioactive protection requirements under control of the Nuclear Regulatory Commission.
WETOX:	Wet air oxidation performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the oxidation of many organic constituents that cannot be directly analyzed in wastewater residues).

TABLE 1—ALTERNATIVE TREATMENT STANDARDS FOR HAZARDOUS DEBRIS [1]—Continued

Technology description	Performance and/or design and operating standard	Contaminant restrictions [2]
3. *Sealing:* Application of an appropriate material which adheres tightly to the debris surface to avoid exposure of the surface to potential leaching media. When necessary to effectively seal the surface, sealing entails pretreatment of the debris surface to remove foreign matter and to clean and roughen the surface. Sealing materials include epoxy, silicone, and urethane compounds, but paint may not be used as a sealant.	Sealing must avoid exposure of the debris surface to potential leaching media and sealant must be resistent to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).	None.

[1] Hazardous debris must be treated by either these standards or the waste-specific treatment standards for the waste contaminating the debris. The treatment standards must be met for each type of debris contained in a mixture of debris types, unless the debris is converted into treatment residue as a result of the treatment process. Debris treatment residuals are subject to the waste-specific treatment standards for the waste contaminating the debris.

[2] Contaminant restriction means that the technology is not BDAT for that contaminant. If debris containing a restricted contaminant is treated by the technology, the contaminant must be subsequently treated by a technology for which it is not restricted in order to be land disposed (and excluded from Subtitle C regulation).

[3] "Clean debris surface" means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area.

[4] Acids, solvents, and chemical reagents may react with some debris and contaminants to form hazardous compounds. For example, acid washing of cyanide-contaminated debris could result in the formation of hydrogen cyanide. Some acids may also react violently with some debris and contaminants, depending on the concentration of the acid and the type of debris and contaminants. Debris treaters should refer to the safety precautions specified in Material Safety Data Sheets for various acids to avoid applying an incompatible acid to a particular debris/contaminant combination. For example, concentrated sulfuric acid may react violently with certain organic compounds, such as acrylonitrile.

[5] If reducing the particle size of debris to meet the treatment standards results in material that no longer meets the 60 mm minimum particle size limit for debris, such material is subject to the waste-specific treatment standards for the waste contaminating the material, unless the debris has been cleaned and separated from contaminated soil and waste prior to size reduction. At a minimum, simple physical or mechanical means must be used to provide such cleaning and separation of nondebris materials to ensure that the debris surface is free of caked soil, waste, or other nondebris material.

[6] Dioxin-listed wastes are EPA Hazardous Waste numbers FO20, FO21, FO22, FO23, FO26, and FO27.

[7] Thermal desorption is distinguished from Thermal Destruction in that the primary purpose of Thermal Desorption is to volatilize contaminants and to remove them from the treatment chamber for subsequent destruction or other treatment.

[8] The demonstration "Equivalent Technology" under § 268.42(b) must document that the technology treats contaminants subject to treatment to a level equivalent to that required by the performance and design and operating standards for other technologies in this table such that residual levels of hazardous contaminants will not pose a hazard to human health and the environment absent management controls.

[9] Any soil, waste, and other nondebris material that remains on the debris surface (or remains mixed with the debris) after treatment is considered a treatment residual that must be separated from the debris using, at a minimum, simple physical or mechanical means. Examples of simple physical or mechanical means are vibratory or trommel screening or water washing. The debris surface need not be cleaned to a "clean debris surface" as defined in note 3 when separating treated debris from residue; rather, the surface must be free of caked soil, waste, or other nondebris material. Treatment residuals are subject to the waste-specific treatment standards for the waste contaminating the debris.

[57 FR 37277, Aug. 18, 1992, as amended at 59 FR 48103, Sept. 19, 1994; 63 FR 28738, May 26, 1998; 71 FR 40279, July 14, 2006]

§ 268.46 Alternative treatment standards based on HTMR.

For the treatment standards previously found in this section, refer to § 268.40.

[59 FR 48103, Sept. 19, 1994]

§ 268.48 Universal treatment standards.

(a) Table UTS identifies the hazardous constituents, along with the nonwastewater and wastewater treatment standard levels, that are used to regulate most prohibited hazardous wastes with numerical limits. For determining compliance with treatment standards for underlying hazardous constituents as defined in § 268.2(i), these treatment standards may not be exceeded. Compliance with these treatment standards is measured by an analysis of grab samples, unless otherwise noted in the following Table UTS.

UNIVERSAL TREATMENT STANDARDS

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
Organic Constituents			
Acenaphthylene	208–96–8	0.059	3.4
Acenaphthene	83–32–9	0.059	3.4
Acetone	67–64–1	0.28	160
Acetonitrile	75–05–8	5.6	38
Acetophenone	96–86–2	0.010	9.7
2-Acetylaminofluorene	53–96–3	0.059	140
Acrolein	107–02–8	0.29	NA
Acrylamide	79–06–1	19	23
Acrylonitrile	107–13–1	0.24	84
Aldrin	309–00–2	0.021	0.066
4-Aminobiphenyl	92–67–1	0.13	NA
Aniline	62–53–3	0.81	14
o-Anisidine (2-methoxyaniline)	90–04–0	0.010	0.66
Anthracene	120–12–7	0.059	3.4
Aramite	140–57–8	0.36	NA
alpha-BHC	319–84–6	0.00014	0.066
beta-BHC	319–85–7	0.00014	0.066
delta-BHC	319–86–8	0.023	0.066
gamma-BHC	58–89–9	0.0017	0.066
Benzene	71–43–2	0.14	10
Benz(a)anthracene	56–55–3	0.059	3.4
Benzal chloride	98–87–3	0.055	6.0
Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205–99–2	0.11	6.8
Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207–08–9	0.11	6.8
Benzo(g,h,i)perylene	191–24–2	0.0055	1.8
Benzo(a)pyrene	50–32–8	0.061	3.4
Bromodichloromethane	75–27–4	0.35	15
Bromomethane/Methyl bromide	74–83–9	0.11	15
4-Bromophenyl phenyl ether	101–55–3	0.055	15
n-Butyl alcohol	71–36–3	5.6	2.6
Butyl benzyl phthalate	85–68–7	0.017	28
2-sec-Butyl-4,6-dinitrophenol/Dinoseb	88–85–7	0.066	2.5
Carbon disulfide	75–15–0	3.8	4.8 mg/l TCLP

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
Carbon tetrachloride	56–23–5	0.057	6.0
Chlordane (alpha and gamma isomers)	57–74–9	0.0033	0.26
p-Chloroaniline	106–47–8	0.46	16
Chlorobenzene	108–90–7	0.057	6.0
Chlorobenzilate	510–15–6	0.10	NA
2-Chloro-1,3-butadiene	126–99–8	0.057	0.28
Chlorodibromomethane	124–48–1	0.057	15
Chloroethane	75–00–3	0.27	6.0
bis(2-Chloroethoxy)methane	111–91–1	0.036	7.2
bis(2-Chloroethyl)ether	111–44–4	0.033	6.0
Chloroform	67–66–3	0.046	6.0
bis(2-Chloroisopropyl)ether	39638–32–9	0.055	7.2
p-Chloro-m-cresol	59–50–7	0.018	14
2-Chloroethyl vinyl ether	110–75–8	0.062	NA
Chloromethane/Methyl chloride	74–87–3	0.19	30
2-Chloronaphthalene	91–58–7	0.055	5.6
2-Chlorophenol	95–57–8	0.044	5.7
3-Chloropropylene	107–05–1	0.036	30
Chrysene	218–01–9	0.059	3.4
p-Cresidine	120–71–8	0.010	0.66
o-Cresol	95–48–7	0.11	5.6
m-Cresol (difficult to distinguish from p-cresol)	108–39–4	0.77	5.6
p-Cresol (difficult to distinguish from m-cresol)	106–44–5	0.77	5.6
Cyclohexanone	108–94–1	0.36	0.75 mg/l TCLP
o,p′-DDD	53–19–0	0.023	0.087
p,p′-DDD	72–54–8	0.023	0.087
o,p′-DDE	3424–82–6	0.031	0.087
p,p′-DDE	72–55–9	0.031	0.087
o,p′-DDT	789–02–6	0.0039	0.087
p,p′-DDT	50–29–3	0.0039	0.087
Dibenz(a,h)anthracene	53–70–3	0.055	8.2
Dibenz(a,e)pyrene	192–65–4	0.061	NA
1,2-Dibromo-3-chloropropane	96–12–8	0.11	15
1,2-Dibromoethane/Ethylene dibromide	106–93–4	0.028	15

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
Dibromomethane	74–95–3	0.11	15
m-Dichlorobenzene	541–73–1	0.036	6.0
o-Dichlorobenzene	95–50–1	0.088	6.0
p-Dichlorobenzene	106–46–7	0.090	6.0
Dichlorodifluoromethane	75–71–8	0.23	7.2
1,1-Dichloroethane	75–34–3	0.059	6.0
1,2-Dichloroethane	107–06–2	0.21	6.0
1,1-Dichloroethylene	75–35–4	0.025	6.0
trans-1,2-Dichloroethylene	156–60–5	0.054	30
2,4-Dichlorophenol	120–83–2	0.044	14
2,6-Dichlorophenol	87–65–0	0.044	14
2,4-Dichlorophenoxyacetic acid/2,4-D	94–75–7	0.72	10
1,2-Dichloropropane	78–87–5	0.85	18
cis-1,3-Dichloropropylene	10061–01–5	0.036	18
trans-1,3-Dichloropropylene	10061–02–6	0.036	18
Dieldrin	60–57–1	0.017	0.13
Diethyl phthalate	84–66–2	0.20	28
p-Dimethylaminoazobenzene	60–11–7	0.13	NA
2,4-Dimethylaniline (2,4-xylidine)	95–68–1	0.010	0.66
2,4-Dimethyl phenol	105–67–9	0.036	14
Dimethyl phthalate	131–11–3	0.047	28
Di-n-butyl phthalate	84–74–2	0.057	28
1,4-Dinitrobenzene	100–25–4	0.32	2.3
4,6-Dinitro-o-cresol	534–52–1	0.28	160
2,4-Dinitrophenol	51–28–5	0.12	160
2,4-Dinitrotoluene	121–14–2	0.32	140
2,6-Dinitrotoluene	606–20–2	0.55	28
Di-n-octyl phthalate	117–84–0	0.017	28
Di-n-propylnitrosamine	621–64–7	0.40	14
1,4-Dioxane	123–91–1	12.0	170
Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122–39–4	0.92	13
Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86–30–6	0.92	13
1,2-Diphenylhydrazine	122–66–7	0.087	NA
Disulfoton	298–04–4	0.017	6.2

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
Endosulfan I	959–98–8	0.023	0.066
Endosulfan II	33213–65–9	0.029	0.13
Endosulfan sulfate	1031–07–8	0.029	0.13
Endrin	72–20–8	0.0028	0.13
Endrin aldehyde	7421–93–4	0.025	0.13
Ethyl acetate	141–78–6	0.34	33
Ethyl benzene	100–41–4	0.057	10
Ethyl cyanide/Propanenitrile	107–12–0	0.24	360
Ethyl ether	60–29–7	0.12	160
bis(2-Ethylhexyl)phthalate	117–81–7	0.28	28
Ethyl methacrylate	97–63–2	0.14	160
Ethylene oxide	75–21–8	0.12	NA
Famphur	52–85–7	0.017	15
Fluoranthene	206–44–0	0.068	3.4
Fluorene	86–73–7	0.059	3.4
Heptachlor	76–44–8	0.0012	0.066
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	35822–46–9	0.000035	.0025
1,2,3,4,6,7,8-Heptachlorodibenzofluran (1,2,3,4,6,7,8-HpCDF)	67562–39–4	0.000035	.0025
1,2,3,4,7,8,9–Heptachlorodibenzofluran (1,2,3,4,7,8,9–HpCDF)	55673–89–7	0.000035	.0025
Heptachlor epoxide	1024–57–3	0.016	0.066
Hexachlorobenzene	118–74–1	0.055	10
Hexachlorobutadiene	87–68–3	0.055	5.6
Hexachlorocyclopentadiene	77–47–4	0.057	2.4
HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
Hexachloroethane	67–72–1	0.055	30
Hexachloropropylene	1888–71–7	0.035	30
Indeno(1,2,3-c,d) pyrene	193–39–5	0.0055	3.4
Iodomethane	74–88–4	0.19	65
Isobutyl alcohol	78–83–1	5.6	170
Isodrin	465–73–6	0.021	0.066
Isosafrole	120–58–1	0.081	2.6
Kepone	143–50–0	0.0011	0.13
Methacrylonitrile	126–98–7	0.24	84

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
Methanol	67–56–1	5.6	0.75 mg/l TCLP
Methapyrilene	91–80–5	0.081	1.5
Methoxychlor	72–43–5	0.25	0.18
3-Methylcholanthrene	56–49–5	0.0055	15
4,4-Methylene bis(2-chloroaniline)	101–14–4	0.50	30
Methylene chloride	75–09–2	0.089	30
Methyl ethyl ketone	78–93–3	0.28	36
Methyl isobutyl ketone	108–10–1	0.14	33
Methyl methacrylate	80–62–6	0.14	160
Methyl methanesulfonate	66–27–3	0.018	NA
Methyl parathion	298–00–0	0.014	4.6
Naphthalene	91–20–3	0.059	5.6
2-Naphthylamine	91–59–8	0.52	NA
o-Nitroaniline	88–74–4	0.27	14
p-Nitroaniline	100–01–6	0.028	28
Nitrobenzene	98–95–3	0.068	14
5-Nitro-o-toluidine	99–55–8	0.32	28
o-Nitrophenol	88–75–5	0.028	13
p-Nitrophenol	100–02–7	0.12	29
N-Nitrosodiethylamine	55–18–5	0.40	28
N-Nitrosodimethylamine	62–75–9	0.40	2.3
N-Nitroso-di-n-butylamine	924–16–3	0.40	17
N-Nitrosomethylethylamine	10595–95–6	0.40	2.3
N-Nitrosomorpholine	59–89–2	0.40	2.3
N-Nitrosopiperidine	100–75–4	0.013	35
N-Nitrosopyrrolidine	930–55–2	0.013	35
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3268–87–9	0.000063	0.005
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001–02–0	0.000063	0.005
Parathion	56–38–2	0.014	4.6
Total PCBs (sum of all PCB isomers, or all Aroclors) [9]	1336–36–3	0.10	10
Pentachlorobenzene	608–93–5	0.055	10
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001
PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001
Pentachloroethane	76–01–7	0.055	6.0

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS[1] number	Wastewater standard	Nonwastewater standard
		Concentration[2] in mg/l	Concentration[3] in mg/kg unless noted as "mg/l TCLP"
Pentachloronitrobenzene	82–68–8	0.055	4.8
Pentachlorophenol	87–86–5	0.089	7.4
Phenacetin	62–44–2	0.081	16
Phenanthrene	85–01–8	0.059	5.6
Phenol	108–95–2	0.039	6.2
1,3-Phenylenediamine Phorate	108–45–2 298–02–2	0.010 0.021	0.66 4.6
Phthalic acid	100–21–0	0.055	28
Phthalic anhydride	85–44–9	0.055	28
Pronamide	23950–58–5	0.093	1.5
Pyrene	129–00–0	0.067	8.2
Pyridine	110–86–1	0.014	16
Safrole	94–59–7	0.081	22
Silvex/2,4,5-TP	93–72–1	0.72	7.9
1,2,4,5-Tetrachlorobenzene	95–94–3	0.055	14
TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
1,1,1,2-Tetrachloroethane	630–20–6	0.057	6.0
1,1,2,2-Tetrachloroethane	79–34–5	0.057	6.0
Tetrachloroethylene	127–18–4	0.056	6.0
2,3,4,6-Tetrachlorophenol	58–90–2	0.030	7.4
Toluene	108–88–3	0.080	10
Toxaphene	8001–35–2	0.0095	2.6
Tribromomethane/Bromoform	75–25–2	0.63	15
1,2,4-Trichlorobenzene	120–82–1	0.055	19
1,1,1-Trichloroethane	71–55–6	0.054	6.0
1,1,2-Trichloroethane	79–00–5	0.054	6.0
Trichloroethylene	79–01–6	0.054	6.0
Trichlorofluoromethane	75–69–4	0.020	30
2,4,5-Trichlorophenol	95–95–4	0.18	7.4
2,4,6-Trichlorophenol	88–06–2	0.035	7.4
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93–76–5	0.72	7.9
1,2,3-Trichloropropane	96–18–4	0.85	30
1,1,2-Trichloro-1,2,2-trifluoroethane	76–13–1	0.057	30

UNIVERSAL TREATMENT STANDARDS—Continued

[Note: NA means not applicable]

Regulated constituent common name	CAS [1] number	Wastewater standard	Nonwastewater standard
		Concentration [2] in mg/l	Concentration [3] in mg/kg unless noted as "mg/l TCLP"
tris-(2,3-Dibromopropyl) phosphate	126–72–7	0.11	0.10
Vinyl chloride	75–01–4	0.27	6.0
Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330–20–7	0.32	30
Inorganic Constituents			
Antimony	7440–36–0	1.9	1.15 mg/l TCLP
Arsenic	7440–38–2	1.4	5.0 mg/l TCLP
Barium	7440–39–3	1.2	21 mg/l TCLP
Beryllium	7440–41–7	0.82	1.22 mg/l TCLP
Cadmium	7440–43–9	0.69	0.11 mg/l TCLP
Chromium (Total)	7440–47–3	2.77	0.60 mg/l TCLP
Cyanides (Total) [4]	57–12–5	1.2	590
Cyanides (Amenable) [4]	57–12–5	0.86	30
Fluoride [5]	16984–48–8	35	NA
Lead	7439–92–1	0.69	0.75 mg/l TCLP
Mercury—Nonwastewater from Retort	7439–97–6	NA	0.20 mg/l TCLP
Mercury—All Others	7439–97–6	0.15	0.025 mg/l TCLP
Nickel	7440–02–0	3.98	11 mg/l TCLP
Selenium [7]	7782–49–2	0.82	5.7 mg/l TCLP
Silver	7440–22–4	0.43	0.14 mg/l TCLP
Sulfide [5]	18496–25–8	14	NA
Thallium	7440–28–0	1.4	0.20 mg/l TCLP
Vanadium [5]	7440–62–2	4.3	1.6 mg/l TCLP
Zinc [5]	7440–66–6	2.61	4.3 mg/l TCLP

FOOTNOTES TO TABLE UTS

1 CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with it's salts and/or esters, the CAS number is given for the parent compound only.

2 Concentration standards for wastewaters are expressed in mg/l and are based on analysis of composite samples.

3 Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, inpart, based upon incineration in units operated in accordance with the technical requirements of 40 CFR part 264, subpart O or 40 CFR part 265, subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

FOOTNOTES TO TABLE UTS—Continued

4 Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010C or 9012B, found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, as incorporated by reference in 40 CFR 260.11, with a sample size of 10 grams and a distillation time of one hour and 15 minutes.

5 These constituents are not "underlying hazardous constituents" in characteristic wastes, according to the definition at § 268.2(i).

6 [Reserved]

7 This constituent is not an underlying hazardous constituent as defined at § 268.2(i) of this Part because its UTS level is greater than its TC level, thus a treatment selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

8 This standard is temporarily deferred for soil exhibiting a hazardous characteristic due to D004–D011 only.

[59 FR 48103, Sept. 19, 1994, as amended at 60 FR 302, Jan. 3, 1995; 61 FR 15654, Apr. 8 1996; 61 FR 33690, June 28, 1996; 62 FR 7596, Feb. 19, 1997; 63 FR 24626, May 4, 1998; 63 FR 28739, May 26, 1998; 63 FR 47417, Sept. 4, 1998; 64 FR 25417, May 11, 1999; 65 FR 14475, Mar. 17, 2000; 70 FR 34590, June 14, 2005; 70 FR 9178, Feb. 24, 2005; 71 FR 40279, July 14, 2006; 75 FR 13008, Mar. 18, 2010; 76 FR 34156, June 13, 2011]

§ 268.49 Alternative LDR treatment standards for contaminated soil.

(a) *Applicability.* You must comply with LDRs prior to placing soil that exhibits a characteristic of hazardous waste, or exhibited a characteristic of hazardous waste at the time it was generated, into a land disposal unit. The following chart describes whether you must comply with LDRs prior to placing soil contaminated by listed hazardous waste into a land disposal unit:

If LDRs	And if LDRs	And if	Then you
Applied to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	.....	Must comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	The soil is determined to contain the listed waste when the soil is first generated.	Must comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	The soil is determined not to contain the listed waste when the soil is first generated.	Needn't comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Don't apply to the listed waste now.	.....	Needn't comply with LDRs.

*For dates of LDR applicability, see 40 CFR Part 268 Appendix VII. To determine the date any given listed hazardous waste contaminated any given volume of soil, use the last date any given listed hazardous waste was placed into any given land disposal unit or, in the case of an accidental spill, the date of the spill.

(b) Prior to land disposal, contaminated soil identified by paragraph (a) of this section as needing to comply with LDRs must be treated according to the applicable treatment standards specified in paragraph (c) of this section or according to the Universal Treatment Standards specified in 40 CFR 268.48 applicable to the contaminating listed hazardous waste and/or the applicable characteristic of hazardous waste if the soil is characteristic. The treatment standards specified in paragraph (c) of this section and the Universal Treatment Standards may be modified through a treatment variance approved in accordance with 40 CFR 268.44.

(c) *Treatment standards for contaminated soils.* Prior to land disposal, contaminated soil identified by paragraph (a) of this section as needing to comply with LDRs must be treated according to all the standards specified in this paragraph or according to the Universal Treatment Standards specified in 40 CFR 268.48.

LAND DISPOSAL RESTRICTION NOTIFICATION AND CERTIFICATION FORM

Generator Name: _____

Manifest Number: _____ LDR Continuation Page? ☐No ☐Yes ____ of ____

Applicable Certification/Notification Statement (found on reverse side) : A

F001 – F005 SPENT SOLVENTS

CONSTITUENT	WW	NWW	CONSTITUENT	WW	NWW
Acetone – F003			Methylene chloride – F002		
Benzene – F005 *(D018)*			Methyl ethyl ketone – F005 *(D035)*		
n-Butyl alcohol – F003			Methyl isobutyl ketone – F003		
Carbon disulfide – F005			Nitrobenzene – F004 *(D036)*		
Carbon tetrachloride – F001 *(D019)*			2-Nitropropane – F005		
Chlorobenzene – F002 *(D021)*			Pyridine – F005 *(D038)*		
m- & p-Cresol – F004 *(D024 & D025)*			Tetrachloroethylene – F001 *(D039)*		
o-Cresol – F004 *(D023)*			Tetrachloroethylene – F002 *(D039)*		
Cyclohexanone – F003			Toluene – F005		
1,2-Dichlorobenzene – F002			1,1,1-Trichloroethane – F001		
2-Ethoxyethanol – F005			1,1,1-Trichloroethane – F002		
Ethyl acetate – F003			1,1,2-Trichloroethane – F002		
Ethyl benzene – F003			1,1,2-Trichloro-1,2,2-trifluoroethane – F002		
Ethyl ether – F003			Trichloroethylene – F001 *(D040)*		
Isobutanol – F005			Trichloroethylene – F002 *(D040)*		
Methanol – F003			Trichlorofluoromethane - F002		
Methylene chloride - F001			Xylene - F003		

Shaded areas indicate waste that can carry D waste numbers also. D waste numbers shown in parenthesis are for reference only.

OTHER RESTRICTED WASTES

EPA Hazardous Waste No.	WW	NWW	Subcategory of Waste	EPA Hazardous Waste No.	WW	NWW	Subcategory of Waste
D001			High TOC-Ignitable Liquid (≥10%)				
D001			Ignitable Waste in non-CWA/SDWA				
D002			Corrosive Waste in non-CWA/SDWA				
D003			Reactive Cyanides				
D003			Reactive Sulfides				
D003			Water Reactive				
D003			Other Reactive				
D009			High Mercury – Inorganic (≥260 mg/kg)				
D009			High Mercury – Organic (≥260 mg/kg)				
D009			Low Mercury (<260 mg/kg)				
			None				None

HAZARDOUS DEBRIS

☐ This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45.
The contaminants subject to treatment are indicated on the attached *Underlying Hazardous Constituent* form.

UNDERLYING HAZARDOUS CONSTITUENTS (UHCs)

For D001 [except High (>10%) TOC Subcategory], D002 - D043, and F039 wastes; UHCs, which can reasonably be expected to be present at the point of generation at a concentration above the constituent-specific Universal Treatment Standard, must be indicated on the Underlying Hazardous Constituents Form. UHCs need not be determined for lab packs managed under the alternative treatment standards for lab packs.

☐ No UHCs ☐ UHCs identified on attached Underlying Hazardous Constituents Form

CERTIFICATION STATEMENTS

A. RESTRICTED WASTE REQUIRING TREATMENT

I am the initial generator of the restricted waste(s) listed on the reverse side which must be treated to the applicable treatment standard prior to land disposal.

B. RESTRICTED WASTE MEETING TREATMENT STANDARDS AT THE POINT OF GENERATION

I am the initial generator of the EPA hazardous waste number(s) listed on the reverse side. I have determined that the waste meets all applicable treatment standards set forth in 40 CFR Part 268 and therefore, can be land disposed without further treatment.

"I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR part 268 subpart D. I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

C. LAB PACKS MANAGED UNDER ALTERNATIVE TREATMENT STANDARDS

The lab packs identified on the reverse side do not contain any of the wastes specified in Appendix IV and are managed under the alternative treatment standards in 40 CFR 268.42(c).

"I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only wastes that have not been excluded under appendix IV to 40 CFR part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR 269.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment."

D. RESTRICTED WASTE CONSISTING OF CONTAMINATED SOIL NOT MEETING TREATMENT STANDARDS

The contaminated soil identified on the reverse side does not meet the soil treatment standard in 40 CFR 268.49(c).

"I certify under penalty of law that I personally have examined this contaminated soil and it [does/does not] contain listed hazardous waste and [does/does not] exhibit a characteristic of hazardous waste and requires treatment to meet the soil treatment standards as provided by 268.49(c)."

E. DECHARACTERIZED WASTE CONTAINING UNDERLYING HAZARDOUS CONSTITUENTS REQUIRING FURTHER TREATMENT

The decharacterized hazardous waste listed on the reverse side contain underlying hazardous constituents requiring further treatment.

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet universal treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

F. RESTRICTED WASTE SUBJECT TO A VARIANCE OR EXEMPTION

The waste identified on the reverse side is exempt from LDR standards and subject to a nationwide variance which expires on _____.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

_____ _____

Generator Signature Date

*Concentration through TCLP

UNDERLYING HAZARDOUS CONSTITUENTS FORM

Generator Name:			Manifest Number:		
ORGANIC CONSTITUENTS	WW(mg/l)	NWW(mg/kg)	ORGANIC CONSTITUENTS	WW(mg/l)	NWW(mg/kg)
Acenaphthylene	0.059	3.4	o,p'-DDT	0.0039	0.087
Acenaphthene	0.059	3.4	p,p'-DDT	0.0039	0.087
Acetone	0.28	160	Dibenz(a,h)anthracene	0.055	8.2
Acetonitrile	5.6	38	Dibenz(a,e)pyrene	0.061	NA
Acetophenone	0.01	9.7	1,2-Dibromo-3-chloropropane	0.11	15
2-Acetylaminofluorene	0.059	140	1,2-Dibromoethane/Ethylene dibromide	0.028	15
Acrolein	0.29	NA	Dibromomethane	0.11	15
Acrylamide	19	23	m-Dichlorobenzene	0.036	6
Acrylonitrile	0.24	84	o-Dichlorobenzene	0.088	6
Aldicarb sulfone[e]	0.056	0.28	p-Dichlorobenzene	0.09	6
Aldrin	0.021	0.066	Dichlorodifluoromethane	0.23	7.2
4-Aminobiphenyl	0.13	NA	1,1-Dichloroethane	0.059	6
Aniline	0.81	14	1,2-Dichloroethane	0.21	6
o-Anisidine	0.01	0.66	1,1-Dichloroethylene	0.025	6
Anthracene	0.059	3.4	trans-1,2-Dichloroethylene	0.054	30
Aramite	0.36	NA	2,4-Dichlorophenol	0.044	14
alpha-BHC	0.00014	0.066	2,6-Dichlorophenol	0.044	14
beta-BHC	0.00014	0.066	2,4-Dichlorophenoxyacetic acid/2,4-D	0.72	10
delta-BHC	0.023	0.066	1,2-Dichloropropane	0.85	18
gamma-BHC	0.0017	0.066	cis-1,3-Dichloropropylene	0.036	18
Barban[e]	0.056	1.4	trans-1,3-Dichloropropylene	0.036	18
Bendiocarb[e]	0.056	1.4	Dieldrin	0.017	0.13
Benomyl[e]	0.056	1.4	Diethyl phthalate	0.2	28
Benzene	0.14	10	p-Dimethylaminoazobenzene	0.13	NA
Benz(a)anthracene	0.059	3.4	2,4-Dimethylaniline	0.01	0.66
Benzal chloride	0.055	6	2,4-Dimethyl phenol	0.036	14
Benzo(b)fluoranthene	0.11	6.8	Dimethyl phthalate	0.047	28
Benzo(k)fluoranthene	0.11	6.8	Di-n-butyl phthalate	0.057	28
Benzo(g,h,i)perylene	0.0055	1.8	1,4-Dinitrobenzene	0.32	2.3
Benzo(a)pyrene	0.061	3.4	4,6-Dinitro-o-cresol	0.28	160
Bromodichloromethane	0.35	15	2,4-Dinitrophenol	0.12	160
Bromomethane/Methyl bromide	0.11	15	2,4-Dinitrotoluene	0.32	140
4-Bromophenyl phenyl ether	0.055	15	2,6-Dinitrotoluene	0.55	28
n-Butyl alcohol	5.6	2.6	Di-n-octyl phthalate	0.017	28
Butylate[e]	0.042	1.4	Di-n-propylnitrosamine	0.4	14
Butyl benzyl phthalate	0.017	28	1,4-Dioxane	12	170
2-sec-Butyl-4,6-dinitrophenol/Dinoseb	0.066	2.5	Diphenylamine	0.92	13
Carbaryl[e]	0.006	0.14	Diphenylnitrosamine	0.92	13
Carbenzadim[e]	0.056	1.4	1,2-Diphenylhydrazine	0.087	NA
Carbofuran[e]	0.006	0.14	Disulfoton	0.017	6.2
Carbofuran phenol[e]	0.056	1.4	Dithiocarbamates (total)[e]	0.028	28
Carbon disulfide	3.8	4.8[m]	Endosulfan I	0.023	0.066
Carbon tetrachloride	0.057	6	Endosulfan II	0.029	0.13
Carbosulfan[e]	0.028	1.4	Endosulfan sulfate	0.029	0.13
Chlordane (a&g isomers)	0.0033	0.26	Endrin	0.0028	0.13
p-Chloroaniline	0.46	16	Endrin aldehyde	0.025	0.13
Chlorobenzene	0.057	6	EPTC[e]	0.042	1.4
Chlorobenzilate	0.1	NA	Ethyl acetate	0.34	33
2-Chloro-1,3-butadiene	0.057	0.28	Ethyl benzene	0.057	10
Chlorodibromomethane	0.057	15	Ethyl cyanide/Propanenitrile	0.24	360
Chloroethane	0.27	6	Ethyl ether	0.12	160
bis(2-Chloroethoxy)methane	0.036	7.2	Ethyl methacrylate	0.14	160
bis(2-Chloroethyl)ether	0.033	6	Ethylene oxide	0.12	NA
Chloroform	0.046	6	bis(2-ethylhexyl)phthalate	0.28	28
bis(2-Chloroisopropyl)ether	0.055	7.2	Famphur	0.017	15
p-Chloro-m-cresol	0.018	14	Fluoranthene	0.068	3.4
2-Chloroethyl vinyl ether	0.062	NA	Fluorene	0.059	3.4
Chloromethane/Methyl chloride	0.19	30	Formetanate hydrochloride[e]	0.056	1.4
2-Chloronaphthalene	0.055	5.6	Heptachlor	0.0012	0.066
2-Chlorophenol	0.044	5.7	1,2,3,4,6,7,8-HpCDD	0.000035	0.0025
3-Chloropropylene	0.036	30	1,2,3,4,6,7,8-HpCDF	0.000035	0.0025
Chrysene	0.059	3.4	1,2,3,4,7,8,9-HpCDF	0.000035	0.0025
p-Cresidine	0.01	0.66	Heptachlor epoxide	0.016	0.066
o-Cresol	0.11	5.6	Hexachlorobenzene	0.055	10
m-Cresol	0.77	5.6	Hexachlorobutadiene	0.055	5.6
p-Cresol	0.77	5.6	Hexachlorocyclopentadiene	0.057	2.4
m-Cumenyl methylcarbamate[e]	0.056	1.4	HxCDDs (All Hexachlorodibenzo-p-dioxins)	0.000063	0.001
Cyclohexanone	0.36	0.75[n]	HxCDFs (All Hexachlorodibenzofurans)	0.000063	0.001
o,p'-DDD	0.023	0.087	Hexachloroethane	0.055	30
p,p'-DDD	0.023	0.087	Hexachloropropylene	0.035	30
o,p'-DDE	0.031	0.087	Indeno(1,2,3-c,d) pyrene	0.0055	3.4
p,p'-DDE	0.031	0.087	Iodomethane	0.19	65

UNDERLYING HAZARDOUS CONSTITUENTS FORM

ORGANIC CONSTITUENTS	WW(mg/l)	NWW(mg/kg)
Isobutyl alcohol	5.6	170
Isodrin	0.021	0.066
Isosafrole	0.081	2.6
Kepone	0.0011	0.13
Methacrylonitrile	0.24	84
Methanol	5.6	0.75*
Methapyrilene	0.081	1.5
Methiocarb[c]	0.056	1.4
Methomyl[c]	0.028	0.14
Methoxychlor	0.25	0.18
3-Methylcholanthrene	0.0055	15
4,4-Methylene bis(2-chloroaniline)	0.5	30
Methylene chloride	0.089	30
Methyl ethyl ketone	0.28	36
Methyl isobutyl ketone	0.14	33
Methyl methacrylate	0.14	160
Methyl methanesulfonate	0.018	NA
Methyl parathion	0.014	4.6
Metolcarb[c]	0.056	1.4
Mexacarbate[c]	0.056	1.4
Molinate[c]	0.042	1.4
Naphthalene	0.059	5.6
2-Naphthylamine	0.52	NA
o-Nitroaniline	0.27	14
p-Nitroaniline	0.028	28
Nitrobenzene	0.068	14
5-Nitro-o-toluidine	0.32	28
o-Nitrophenol	0.028	13
p-Nitrophenol	0.12	29
N-Nitrosodiethylamine	0.4	28
N-Nitrosodimethylamine	0.4	2.3
N-Nitroso-di-n-butylamine	0.4	17
N-Nitrosomethylethylamine	0.4	2.3
N-Nitrosomorpholine	0.4	2.3
N-Nitrosopiperidine	0.013	35
N-Nitrosopyrrolidine	0.013	35
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.000063	0.005
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.000063	0.005
Oxamyl[c]	0.056	0.28
Parathion	0.014	4.6
Total PCBs (sum of all PCB isomers, or all	0.1	10
Pebulate[c]	0.042	1.4
Pentachlorobenzene	0.055	10
PeCDDs (All Pentachlorodibenzo-p-dioxins)	0.000063	0.001
PeCDFs (All Pentachlorodibenzofurans)	0.000035	0.001
Pentachloroethane	0.055	6
Pentachloronitrobenzene	0.055	4.8
Pentachlorophenol	0.089	7.4
Phenacetin	0.081	16
Phenanthrene	0.059	5.6
Phenol	0.039	6.2
1,3-Phenylenediamine	0.01	0.66
Phorate	0.021	4.6
Phthalic acid	0.055	28
Phthalic anhydride	0.055	28
Physostigmine	0.056	1.4
Physostigmine salicylate[c]	0.056	1.4
Promecarb[c]	0.056	1.4
Pronamide	0.093	1.5
Propham[c]	0.056	1.4
Propoxur[c]	0.056	1.4
Prosulfocarb[c]	0.042	1.4
Pyrene	0.067	8.2
Pyridine	0.014	16
Safrole	0.081	22
Silvex/2,4,5-TP	0.72	7.9
1,2,4,5-Tetrachlorobenzene	0.055	14
TCDDs (All Tetrachlorodibenzo-p-dioxins)	0.000063	0.001
TCDFs (All Tetrachlorodibenzofurans)	0.000063	0.001
1,1,1,2-Tetrachloroethane	0.057	6
1,1,2,2-Tetrachloroethane	0.057	6
Tetrachloroethylene	0.056	6
2,3,4,6-Tetrachlorophenol	0.03	7.4
Thiodicarb[c]	0.019	1.4
Thiophanate-methyl[c]	0.056	1.4
Toluene	0.08	10
Toxaphene	0.0095	2.6
Triallate[c]	0.042	1.4
Tribromomethane/Bromoform	0.63	15
1,2,4-Trichlorobenzene	0.055	19
1,1,1-Trichloroethane	0.054	6
1,1,2-Trichloroethane	0.054	6
Trichloroethylene	0.054	6
Trichlorofluoromethane	0.02	30
2,4,5-Trichlorophenol	0.18	7.4
2,4,6-Trichlorophenol	0.035	7.4
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	0.72	7.9
1,2,3-Trichloropropane	0.85	30
1,1,2-Trichloro-1,2,2-trifluoroethane	0.057	30
Triethylamine[c]	0.081	1.5
(tris-(2,3-Dibromopropyl) phosphate	0.11	0.1
Vernolate[c]	0.042	1.4
Vinyl chloride	0.27	6
Xylenes-mixed isomers (sum of o-, m-, and p-	0.32	30

INORGANIC CONSTITUENTS	WW(mg/l)	NWW(mg/kg)
Antimony	1.9	1.15*
Arsenic	1.4	5.0*
Barium	1.2	21*
Beryllium	0.82	1.22*
Cadmium	0.69	0.11*
Chromium (Total)	2.77	0.60*
Cyanides (Total)[c]	1.2	590
Cyanides (Amenable)[c]	0.86	30
Fluoride[c]	35	NA
Lead	0.69	0.75*
Mercury—Nonwastewater from Retort	NA	0.20*
Mercury—All Others	0.15	0.025*
Nickel	3.98	11*
Selenium[c]	0.82	5.7*
Silver	0.43	0.14*
Sulfide[c]	14	NA
Thallium	1.4	0.20*
Vanadium[c]	4.3	1.6*
Zinc[c]	2.61	4.3*

**Concentration in mg/l TCLP*