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SEVERAL ORGANIC PARAMETERS ON UNDERLYING HAZARDOUS CONSTITUENTS LIST CAN NOT BE MEASURED AT THE UNIVERSAL TREATMENT STANDARDS

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ABSTRACT

The Idaho National Engineering and Environmental Laboratory (INEEL) has several permitted treatment, storage and disposal facilities. The INEEL Sample Management Office (SMO), operated by Lockheed Martin Idaho Technologies Company (LMITCO), conducts all analysis subcontracting activities for Department of Energy Environmental Management programs at the INEEL. In this role, the INEEL SMO has had the opportunity to subcontract the analyses of various wastes (including ash from an interim status incinerator) requesting a target analyte list equivalent to the constituents listed in 40 Code of Federal Regulations (CFR) § 268.48. Per 40 CFR § 268.40, these analyses are required to ensure that treated wastes do not contain underlying hazardous constituents (UHC) at concentrations greater than the universal treatment standards (UTS) prior to land disposal. The language in 40 CFR § 268.40 (d) (3) states that, "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."

The INEEL SMO has conducted this "good-faith effort" by negotiating with several commercial laboratories to identify the lowest possible quantitation and detection limits that can be achieved for the organic UHC analytes. The results of this negotiating effort has been the discovery that no single laboratory (currently under subcontract with the INEEL SMO) can achieve a detection level that is within an order of magnitude of the UTS for all organic parameters on a clean sample matrix (e.g., sand). This indicates that for a typical waste sample, the chances of the order of magnitude requirement not being met for many more than just the "problem analytes" is likely. This does not mean that there is no laboratory that can achieve the order of magnitude requirements for all organic UHCs on a clean sample matrix. The negotiations held to date indicate that it is likely that no laboratory can achieve the order of magnitude requirements for a difficult sample matrix (e.g., an incinerator ash). The authors suggest that the regulation needs to be

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revised to address the disparity between what is achievable in the laboratory and the regulatory levels required by the UTS.

INTRODUCTION

The INEEL SMO conducts all analysis subcontracting activities for the Department of Energy Environmental Management programs at the INEEL. Contracted analyses are primarily in the following analytical disciplines; radiological, inorganic, organic and physical properties testing. Within each discipline numerous analytical tests are requested on a large variety of sample matrices. Analytical test requirements range from field screening or processing information to data required to satisfy U.S. Environmental Protection Agency (EPA) and Idaho Division of Environmental Quality (ID-DEQ) requirements. The INEEL SMO subcontracts analytical work on a variety of wastes (including ash from an interim status incinerator). Analytical requests have included a target analyte list equivalent to the constituents listed in 40 CFR § 268.48. Per 40 CFR § 268.40, these analyses are required to ensure that treated wastes do not contain UHCs at concentrations greater than the UTS prior to land disposal. The language in 40 CFR § 268.40 (d) states:

> "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."

The INEEL SMO has sought this "good-faith effort" by negotiating with several commercial laboratories to identify the lowest possible quantitation or detection limits that can be achieved for the organic UHCs. The primary emphasis has been on the nonwastewater standard. At this time, the wastewater standard for the organic UHCs has not been performed by all of the INEEL SMO contracted laboratories. The results of this

negotiating effort has been the discovery that no single laboratory (currently under subcontract with the INEEL SMO) can achieve the detection level of the UTS for all organic parameters of the UHC list on a clean sample matrix (e.g., sand). This indicates that for a typical waste sample, the chances of the order of magnitude requirement not being met for many more than just the "problem analytes" is likely. This does not mean that there is no laboratory that can achieve the order of magnitude requirements for all organic UHCs on a clean sample matrix. The INEEL SMO continues to seek laboratory capability to analyze for the UHCs to the UTS in a cost-effective manner. Additionally, the regulated community should be aware that the "order-of-magnitude" provision might not be allowed on incinerator ash from an interim status incinerator. In the September 19, 1994 final rule, the "order-of-magnitude" provision is only applicable where incinerated wastes were treated in permitted (Part 264 Subpart O) units.

Within the capabilities of the current INEEL SMO subcontracted laboratories, no two laboratories analyze the UHCs to the UTS the same way. In the guidelines of USEPA SW-846 a variety of approved methods can be used to analyze for the various constituents. The SW-846 methods being used to analyze for the complete UHC list by the laboratories currently contracted through the INEEL SMO are:

- Method 1311 Toxicity Characteristic Leaching Procedure
- Method 8015A Nonhalogenated Volatile Organics by Gas Chromatography
- Method 8015M (modified) Nonhalogenated Volatile Organics
- Method 8080A Organochlorine Pesticides And Polychlorinated Biphenyls By Gas Chromatography
- Method 8081 Organochlorine Pesticides, Halowaxes And PCBs As Aroclors By Gas Chromatography: Capillary Column Technique
- Method 8081A Organochlorine Pesticides (PCBs) By Gas Chromatography
- Method 8082 Polychlorinated Biphenyls By Gas Chromatography
- Method 8140 Organophosphorus Pesticides
- Method 8141 Organophosphorus Compounds By Gas Chromatography: Capillary Column Technique
- Method 8150 Chlorinated Herbicides By Gas Chromatography
- Method 8151 Chlorinated Herbicides By GC Using Methylation Or Pentafluorobenzylation Derivatization: Capillary Column Technique
- Method 8260A Volatile Organic Compounds By Gas Chromatography Mass Spectrometry (GC/MS): Capillary Column Technique
- Method 8270B Semivolatile Organic Compounds By Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Column Technique
- Method 8310 Polynuclear Aromatic Hydrocarbons
- Method 8316 Acrylamide, Acrylonitrile And Acrolein By High Performance Liquid Chromatography (HPLC)

The UHC list is extensive and there are many "problem analytes" to analyze. The methodology is left to the capability of the laboratory and the laboratory's discretion. It would not be practical or reasonable for the INEEL SMO to specify to a laboratory a required method for every constituent. Under the fixed contracts, obsolete methods are still listed but current methodology is used whenever possible, incorporating the June 13, 1997 promulgated methods from the Third Edition of the EPA-approved test methods manual "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods."

To procure UHC organic analyses, it becomes necessary to negotiate with each contracted laboratory concerning achievable detection and quantitation limits for the entire UHC list. The negotiations held to date indicate that it is likely that no laboratory can achieve the order of magnitude requirements for a difficult sample matrix (e.g., an incinerator ash). When negotiating with commercial laboratories that are under fixed price subcontracts government contractors like LMITCO have difficulty authorizing additional financial support, for the "research project" samples. Analytical difficulties arise when dealing with complex matrices such as an incinerator fly ash. For example, alternate solvent system extractions may be more effective for the semivolatile organic compounds. Laboratories currently contracted through the INEEL SMO routinely extract semivolatiles using acetone/hexane or acetone/methylene chloride systems. They have found fewer fly ash matrix interferences when they substituted a methylene chloride only extraction system. The alternate solvent system also requires additional calibration with a resulting burden on the laboratory under a fixed price contract.

The organic UHC list is extensive and standards are hard to locate for the entire list. For example, one of the contracted laboratories had difficulty initially procuring a standard for 4,4'-Methylene-bis-(*o*-chloroaniline) CAS# 101-14-4. No laboratory contracted through the INEEL SMO has determined quantitation limits or calibrated for the 40 additional analytes that will become "underlying hazardous constituents" August 26, 1998. Commercial laboratories contracted through the INEEL SMO have expressed concerns about the effort and expense that will be required to obtain standards, conduct MDL determinations, etc. in order to analyze for the added constituents. The 40 additional constituents are identified in Table 1 UTS.

SUMMARY

The current INEEL SMO contracted laboratories operate within the highly competitive commercial laboratory industry. With laboratory capacity available to DOE (i.e. possessing a NRC license to receive radioactively contaminated samples) limited nationwide, extensive "non-routine" analytical requests on complex matrices are not

desired by the laboratories. Obtaining the full suite of UHC analyses can be difficult. The inability to determine if a treated waste has achieved the required treatment standard concentrations can place programs in a position subject to violation of regulatory requirements. The authors' suggest that the regulation needs to be revised to address the disparity between what is achievable in the laboratory and the regulatory levels required by the UTS.

The authors' poster delineates the achievable detection limits for organic UHC parameters at several commercial laboratories. The intent of the poster is to bring this issue to the attention of the regulators and regulated community. Another benefit is to discuss analytical approaches used by other laboratories that may achieve greater sensitivities for the difficult organic analytes on the UHC list.

Table 1 UTS identifies the organic hazardous constituents, along with the nonwastewater and wastewater treatment standard levels. 40 CFR § 268.48 also states: "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 1 UTS". Included in the table are the negotiated quantitation limits for the nonwastewater standard from three INEEL SMO contracted laboratories (A, B, and C). These limits can be compared to the listed regulatory nonwastewater standard concentration. Presently the most difficult ash samples are requiring five to ten fold dilutions -in addition to alternate solvent system extractions- which further limit the ability of the laboratory to achieve quantitation limits at (or below) the UTS for all of the UHCs. The negotiated quantitation limits are the laboratories "ideal" quantitation limits on a clean matrix (e.g., sand) and do not represent the current achievable limits on difficult sample matrices (e.g., incinerator fly ash). When the laboratories quantitation limit is at the treatment standard concentration, the INEEL SMO requires the laboratory to have the instrument detection limit for that analyte less than 0.33 times the treatment standard. This limit is also specified in the task order statement of work between the laboratory and the INEEL SMO.

Table 1 UTS
Universal Treatment Standards
[Note: NA means not applicable.]

Regulated constituent/common name Organic Constituents	CAS {1} Number	Wastewater standard Concentration in mg/l {2}	Nonwastewater standard Concentration in mg/kg {3} unless noted as "mg/l TCLP"	Negotiated Nonwastewater Quantitation Limit INEEL SMO contracted Laboratory A	Negotiated Nonwastewater Quantitation Limit INEEL SMO contracted Laboratory B	Negotiated Nonwastewater Quantitation Limit INEEL SMO contracted Laboratory C
A2213 {6}	30558-43-1	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Acenaphthylene	208-96-8	0.059	3.4	0.33	0.67	3.4
Acenaphthene	83-32-9	0.059	3.4	0.33	0.67	3.4
Acetone	67-64-1	0.28	160	0.01	0.01	160
Acetonitrile	75-05-8	5.6	38	0.02	0.05	38
Acetophenone	96-86-2	0.010	9.7	0.33	0.67	9.7
2-Acetylaminofluorene	53-96-3	0.059	140	0.33	0.67	140
Acrolein	107-02-8	0.29	NA	0.01	NA	NA
Acrylamide	79-06-1	19	23	**50**	23	23
Acrylonitrile	107-13-1	0.24	84	0.01	0.05	84
Aldicarb sulfone {6}	1646-88-4	0.056	0.28	**undetermined**	**undetermined**	**undetermined**
Aldrin	309-00-2	0.021	0.066	.005	0.066	0.066
4-Aminobiphenyl	92-67-1	0.13	NA	0.33	NA	NA
Aniline	62-53-3	0.81	14	0.33	0.67	14
Anthracene	120-12-7	0.059	3.4	0.33	0.67	3.4
Aramite	140-57-8	0.36	NA	0.66	NA	NA
alpha-BHC	319-84-6	0.00014	0.066	.005	0.002	0.066
beta-BHC	319-85-7	0.00014	0.066	.005	0.004	0.066
delta-BHC	319-86-8	0.023	0.066	.005	0.006	0.066
gamma-BHC	58-89-9	0.0017	0.066	.005	0.0027	0.066
Barban {6}	101-27-9	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Bendiocarb {6}	22781-23-3	0.056	1.4	**undetermined**	**undetermined**	**undetermined**

Bendiocarb phenol {6}	22961-82-6	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Benomyl {6}	17804-35-2	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Benzene	71-43-2	0.14	10	.005	.005	10
Benz(a)anthracene	56-55-3	0.059	3.4	0.33	0.67	3.4
Benzal chloride	98-87-3	0.055	6.0	1.65	0.05	6.0
Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8	0.33	0.67	6.8
Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8	0.33	0.67	6.8
Benzo(g,h,i)perylene	191-24-2	0.0055	1.8	0.33	0.67	1.8
Benzo(a)pyrene	50-32-8	0.061	3.4	0.33	0.67	3.4
Bromodichloromethane	75-27-4	0.35	15	.005	0.05	15
Bromomethane/Methyl bromide	74-83-9	0.11	15	.01	0.05	15
4-Bromophenyl phenyl ether	101-55-3	0.055	15	0.33	0.67	15
n-Butyl alcohol	71-36-3	5.6	2.6	0.5	2.6	2.6
Butylate {6}	2008-41-5	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Butyl benzyl phthalate	85-68-7	0.017	28	0.33	0.67	28
2-sec-Butyl-4,6-dinitrophenol/Dinoseb	88-85-7	0.066	2.5	1.65	1.3	2.5
Carbaryl {6}	63-25-2	0.006	0.14	**undetermined**	**undetermined**	**undetermined**
Carbenzadim {6}	10605-21-7	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Carbofuran {6}	1563-66-2	0.006	0.14	**undetermined**	**undetermined**	**undetermined**
Carbofuran phenol {6}	1563-38-8	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Carbon disulfide	75-15-0	3.8	4.8 mg/l TCLP	.005 mg/l TCLP	4.8 mg/l TCLP	4.8 mg/l TCLP
Carbon tetrachloride	56-23-5	0.057	6.0	.005	.005	6.0
Carbosulfan {6}	55285-14-8	0.028	1.4	**undetermined**	**undetermined**	**undetermined**
Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26	.005	.009	0.26
p-Chloroaniline	106-47-8	0.46	16	0.33	0.67	16
Chlorobenzene	108-90-7	0.057	6.0	.005	.005	6.0
Chlorobenzilate	510-15-6	0.10	NA	0.33	NA	NA
2-Chloro-1,3-butadiene	126-99-8	0.057	0.28	0.01	0.05	0.28
Chlorodibromomethane	124-48-1	0.057	15	.005	.005	15
Chloroethane	75-00-3	0.27	6.0	0.01	0.05	6.0
bis(2-Chloroethoxy)methane	111-91-1	0.036	7.2	0.33	0.67	7.2
bis(2-Chloroethyl)ether	111-44-4	0.033	6.0	0.33	0.67	6.0

Chloroform	67-66-3	0.046	6.0	.005	.005	6.0
bis(2-Chloroisopropyl)ether	39638-32-9	0.055	7.2	0.33	0.67	7.2
p-Chloro-m-cresol	59-50-7	0.018	14	0.33	0.67	14
2-Chloroethyl vinyl ether	110-75-8	0.062	NA	0.01	NA	NA
Chloromethane/Methyl chloride	74-87-3	0.19	30	0.01	0.05	30
2-Chloronaphthalene	91-58-7	0.055	5.6	0.33	0.67	5.6
2-Chlorophenol	95-57-8	0.044	5.7	0.33	0.67	5.7
3-Chloropropylene	107-05-1	0.036	30	0.02	0.05	30
Chrysene	218-01-9	0.059	3.4	0.33	0.67	3.4
o-Cresol	95-48-7	0.11	5.6	0.33	0.67	5.6
m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6	Reported as p-cresol	Reported as p-cresol	Reported as p-cresol
p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6	0.33	0.67	5.6
m-Cumenyl methylcarbamate {6}	64-00-6	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Cyclohexanone	108-94-1	0.36	0.75 mg/l TCLP	0.1 mg/l TCLP	0.75 mg/l TCLP	0.75 mg/l TCLP
o,p'-DDD	53-19-0	0.023	0.087	0.01	0.087	0.087
p,p'-DDD	72-54-8	0.023	0.087	0.01	0.087	0.087
o,p'-DDE	3424-82-6	0.031	0.087	0.01	0.087	0.087
p,p'-DDE	72-55-9	0.031	0.087	0.01	0.087	0.087
o,p'-DDT	789-02-6	0.0039	0.087	0.01	0.087	0.087
p,p'-DDT	50-29-3	0.0039	0.087	0.01	0.087	0.087
Dibenz(a,h)anthracene	53-70-3	0.055	8.2	0.33	0.67	8.2
Dibenz(a,e)pyrene	192-65-4	0.061	NA	0.01	NA	NA
1,2-Dibromo-3-chloropropane	96-12-8	0.11	15	0.02	0.05	15
1,2-Dibromoethane/Ethylene dibromide	106-93-4	0.028	15	0.02	0.05	15
Dibromomethane	74-95-3	0.11	15	0.01	0.05	15
m-Dichlorobenzene	541-73-1	0.036	6.0	0.33	0.67	6.0
o-Dichlorobenzene	95-50-1	0.088	6.0	0.33	0.67	6.0
p-Dichlorobenzene	106-46-7	0.090	6.0	0.33	0.67	6.0
Dichlorodifluoromethane	75-71-8	0.23	7.2	0.01	0.05	7.2
1,1-Dichloroethane	75-34-3	0.059	6.0	.005	.005	6.0
1,2-Dichloroethane	107-06-2	0.21	6.0	.005	.005	6.0
1,1-Dichloroethylene	75-35-4	0.025	6.0	.005	.005	6.0
trans-1,2-Dichloroethylene	156-60-5	0.054	30	.005	.005	30
2,4-Dichlorophenol	120-83-2	0.044	14	0.33	0.67	14

2,6-Dichlorophenol	87-65-0	0.044	14	0.33	0.67	14
2,4-Dichlorophenoxyacetic acid/2,4-D	94-75-7	0.72	10	10	10	10
1,2-Dichloropropane	78-87-5	0.85	18	.005	.005	18
cis-1,3-Dichloropropylene	10061-01-5	0.036	18	.005	.005	18
trans-1,3-Dichloropropylene	10061-02-6	0.036	18	.005	.005	18
Dieldrin	60-57-1	0.017	0.13	0.01	0.01	0.13
Diethylene glycol, dicarbamate {6}	5952-26-1	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Diethyl phthalate	84-66-2	0.20	28	0.33	0.67	28
p-Dimethylaminoazobenzene	60-11-7	0.13	NA	0.33	NA	NA
2,4-Dimethyl phenol	105-67-9	0.036	14	0.33	0.67	14
Dimethyl phthalate	131-11-3	0.047	28	0.33	0.67	28
Dimetilan {6}	644-64-4	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Di-n-butyl phthalate	84-74-2	0.057	28	0.33	0.67	28
1,4-Dinitrobenzene	100-25-4	0.32	2.3	1.65	1.6	2.3
4,6-Dinitro-o-cresol	534-52-1	0.28	160	1.65	3.3	160
2,4-Dinitrophenol	51-28-5	0.12	160	1.65	3.3	160
2,4-Dinitrotoluene	121-14-2	0.32	140	0.33	0.67	140
2,6-Dinitrotoluene	606-20-2	0.55	28	0.33	0.67	28
Di-n-octyl phthalate	117-84-0	0.017	28	0.33	0.67	28
Di-n-propylnitrosamine	621-64-7	0.40	14	0.33	0.67	14
1,4-Dioxane	123-91-1	12.0	170	0.33	0.5	0.1
Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	0.92	13	0.33	13	13
Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	13	0.33 cannot be separated from Diphenylamine	13 reported as Diphenylamine	13 reported as Diphenylamine
1,2-Diphenylhydrazine	122-66-7	0.087	NA	0.33	NA for nonwastewater, reported as decomposition product azobenzene for wastewater	NA
Disulfoton	298-04-4	0.017	6.2	0.02	0.035	6.2
Dithiocarbamates (total) {6}	137-30-4	0.028	28	**undetermined**	**undetermined**	**undetermined**

Endosulfan I	959-98-8	0.023	0.066	.005	0.066	0.066
Endosulfan II	33213-65-9	0.029	0.13	0.01	0.13	0.13
Endosulfan sulfate	1031-07-8	0.029	0.13	0.01	0.13	0.13
Endrin	72-20-8	0.0028	0.13	0.01	0.13	0.13
Endrin aldehyde	7421-93-4	0.025	0.13	0.01	0.13	0.13
EPTC {6}	759-94-4	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Ethyl acetate	141-78-6	0.34	33	0.01	33	33
Ethyl benzene	100-41-4	0.057	10	.005	.005	10
Ethyl cyanide/Propanenitrile	107-12-0	0.24	360	0.25	360	360
Ethyl ether	60-29-7	0.12	160	0.01	160	160
bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28	0.33	0.67	28
Ethyl methacrylate	97-63-2	0.14	160	0.33	0.05	160
Ethylene oxide	75-21-8	0.12	NA	10	NA	NA
Famphur	52-85-7	0.017	15	0.1	1.3	15
Fluoranthene	206-44-0	0.068	3.4	0.33	0.67	3.4
Fluorene	86-73-7	0.059	3.4	0.33	0.67	3.4
Formetanate hydrochloride {6}	23422-53-9	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Formparanate {6}	17702-57-7	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Heptachlor	76-44-8	0.0012	0.066	.005	0.002	0.066
Heptachlor epoxide	1024-57-3	0.016	0.066	.005	0.056	0.066
Hexachlorobenzene	118-74-1	0.055	10	0.33	0.67	10
Hexachlorobutadiene	87-68-3	0.055	5.6	0.33	0.67	5.6
Hexachlorocyclopentadiene	77-47-4	0.057	2.4	0.33	0.67	2.4
HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001	.0005	0.001	0.001
HxCDFs (All Hexachlorodibenzo-furans)	NA	0.000063	0.001	.0005	0.001	0.001
Hexachloroethane	67-72-1	0.055	30	0.33	0.67	30
Hexachloropropylene	1888-71-7	0.035	30	0.33	0.67	30
Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4	0.33	0.67	3.4
Iodomethane	74-88-4	0.19	65	0.01	0.05	65
Isobutyl alcohol	78-83-1	5.6	170	0.1	5	170
Isodrin	465-73-6	0.021	0.066	0.01	**0.66**	0.066
Isolan {6}	119-38-0	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Isosafrole	120-58-1	0.081	2.6	0.33	0.67	2.6
Kepone	143-50-0	0.0011	0.13	0.05	**1.3**	0.13

Methacrylonitrile	126-98-7	0.24	84	0.02	0.05	84
Methanol	67-56-1	5.6	0.75 mg/l TCLP	**5 mg/l TCLP**	Analyzed as total 10mg/kg, equivalent to 0.5 mg/l TCLP	0.75 mg/l TCLP
Methapyrilene	91-80-5	0.081	1.5	0.33	0.67	1.5
Methiocarb {6}	2032-65-7	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Methomyl {6}	16752-77-5	0.028	0.14	**undetermined**	**undetermined**	**undetermined**
Methoxychlor	72-43-5	0.25	0.18	0.05	0.12	0.18
3-Methylcholanthrene	56-49-5	0.0055	15	0.33	0.67	15
4,4-Methylene bis(2-chloroaniline)	101-14-4	0.50	30	1.65	30	30
Methylene chloride	75-09-2	0.089	30	.005	.005	30
Methyl ethyl ketone	78-93-3	0.28	36	0.01	0.01	36
Methyl isobutyl ketone	108-10-1	0.14	33	0.01	0.01	33
Methyl methacrylate	80-62-6	0.14	160	0.33	0.05	160
Methyl methansulfonate	66-27-3	0.018	NA	0.33	NA	NA
Methyl parathion	298-00-0	0.014	4.6	0.02	0.06	4.6
Metolcarb {6}	1129-41-5	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Mexacarbate {6}	315-18-4	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Molinate {6}	2212-67-1	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Naphthalene	91-20-3	0.059	5.6	0.33	0.67	5.6
2-Naphthylamine	91-59-8	0.52	NA	0.33	NA	NA
o-Nitroaniline	88-74-4	0.27	14	1.65	3.3	14
p-Nitroaniline	100-01-6	0.028	28	1.65	3.3	28
Nitrobenzene	98-95-3	0.068	14	0.33	0.67	14
5-Nitro-o-toluidine	99-55-8	0.32	28	0.33	0.67	28
o-Nitrophenol	88-75-5	0.028	13	0.33	0.67	13
p-Nitrophenol	100-02-7	0.12	29	1.65	3.3	29
N-Nitrosodiethylamine	55-18-5	0.40	28	0.33	0.67	28
N-Nitrosodimethylamine	62-75-9	0.40	2.3	0.33	0.67	2.3
N-Nitroso-di-n-butylamine	924-16-3	0.40	17	0.33	0.67	17
N-Nitrosomorpholine	59-89-2	0.40	2.3	0.33	0.67	2.3
N-Nitrosopiperidine	100-75-4	0.013	35	1.65	1.3	**undetermined**
N-Nitrosomethylethylamine	10595-95-6	0.40	2.3	0.33	0.67	2.3
N-Nitrosopyrrolidine	930-55-2	0.013	35	0.33	0.67	**undetermined**

Oxamyl {6}	23135-22-0	0.056	0.28	**undetermined**	**undetermined**	**undetermined**
Parathion	56-38-2	0.014	4.6	0.02	0.03	4.6
Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3	0.10	10	0.8	10	10
Pebulate {6}	1114-71-2	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Pentachlorobenzene	608-93-5	0.055	10	0.33	0.67	10
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001	.0005	0.001	0.001
PeCDFs (All Pentachlorodibenzo-furans)	NA	0.000035	0.001	.0005	0.001	0.001
Pentachloroethane	76-01-7	0.055	6.0	0.33	0.01	6.0
Pentachloronitrobenzene	82-68-8	0.055	4.8	1.65	0.67	4.8
Pentachlorophenol	87-86-5	0.089	7.4	1.65	3.3	7.4
Phenacetin	62-44-2	0.081	16	0.33	0.67	16
Phenanthrene	85-01-8	0.059	5.6	0.33	0.67	5.6
Phenol	108-95-2	0.039	6.2	0.33	0.67	6.2
o-Phenylenediamine {6}	95-54-5	0.056	5.6	**undetermined**	**undetermined**	**undetermined**
Phorate	298-02-2	0.021	4.6	0.02	0.02	4.6
Phthalic acid	100-21-0	0.055	28	3.3	28 reported as Phthalic anhydride	**undetermined**
Phthalic anhydride	85-44-9	0.055	28	0.66	28	**undetermined**
Physostigmine {6}	57-47-6	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Physostigmine salicylate {6}	57-64-7	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Promecarb {6}	2631-37-0	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Pronamide	23950-58-5	0.093	1.5	0.33	0.67	1.5
Propham {6}	122-42-9	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Propoxur {6}	114-26-1	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Prosulfocarb {6}	52888-80-9	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Pyrene	129-00-0	0.067	8.2	0.33	0.67	8.2
Pyridine	110-86-1	0.014	16	0.33	0.67	16
Safrole	94-59-7	0.081	22	0.33	0.67	22
Silvex/2,4,5-TP	93-72-1	0.72	7.9	7.9	7.9	7.9
1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14	0.33	0.67	14
TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001	.0005	0.001	0.001
TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001	.0005	0.001	0.001
1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0	0.01	0.05	6.0
1,1,2,2-Tetrachloroethane	79-34-5	0.057	6.0	.005	.005	6.0

Tetrachloroethylene	127-18-4	0.056	6.0	.005	.005	6.0
2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4	0.33	0.67	7.4
Thiodicarb {6}	59669-26-0	0.019	1.4	**undetermined**	**undetermined**	**undetermined**
Thiophanate-methyl {6}	23564-05-8	0.056	1.4	**undetermined**	**undetermined**	**undetermined**
Tirpate {6}	26419-73-8	0.056	0.28	**undetermined**	**undetermined**	**undetermined**
Toluene	108-88-3	0.080	10	.005	.005	10
Toxaphene	8001-35-2	0.0095	2.6	0.5	0.16	2.6
Triallate {6}	2303-17-5	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Tribromomethane/Bromoform	75-25-2	0.63	15	.005	.005	15
1,2,4-Trichlorobenzene	120-82-1	0.055	19	0.33	0.67	19
1,1,1-Trichloroethane	71-55-6	0.054	6.0	.005	.005	6.0
1,1,2-Trichloroethane	79-00-5	0.054	6.0	.005	.005	6.0
Trichloroethylene	79-01-6	0.054	6.0	.005	.005	6.0
Trichloromonofluoromethane	75-69-4	0.020	30	.005	.005	30
2,4,5-Trichlorophenol	95-95-4	0.18	7.4	1.65	3.3	7.4
2,4,6-Trichlorophenol	88-06-2	0.035	7.4	0.33	0.67	7.4
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93-76-5	0.72	7.9	7.9	7.9	7.9
1,2,3-Trichloropropane	96-18-4	0.85	30	0.01	0.05	30
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.057	30	0.01	0.05	30
Triethylamine {6}	101-44-8	0.081	1.5	**undetermined**	**undetermined**	**undetermined**
tris-(2,3-Dibromopropyl) phosphate	126-72-7	0.11	0.10	**3.3**	**0.33**	**undetermined**
Vernolate {6}	1929-77-7	0.042	1.4	**undetermined**	**undetermined**	**undetermined**
Vinyl chloride	75-01-4	0.27	6.0	0.01	0.05	6.0
Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	133020-7	0.32	30	.005	.005	30

Footnotes to Universal Treatment Standards Table:

{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, in part, 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 Sec. 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

{4} Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010 or 9012, 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 Sec. 268.2(i).
{6} Between August 26, 1997, and August 26, 1998, these constituents are not "underlying hazardous constituents" as defined at Sec. 268.2(i).

REFERENCES

PROTECTION OF THE ENVIRONMENT, 40 Code of Federal Regulations.

TEST METHODS FOR EVALUATING SOLID WASTE, PHYSICAL/CHEMICAL METHODS SW-846 THIRD EDITION, United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C., December, 1996.

RCRA REGULATIONS AND KEYWORD INDEX, Elsevier Science Inc., New York, New York, 1997 Edition.