

WASTES

List of Acronyms

SW 6010	<i>Inductively Coupled Plasma (ICP) (Analytical Method)</i>	ICP-MS	<i>Inductively Coupled Plasma - Mass Spectrometry</i>
SW 6020	<i>Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) (Analytical Method)</i>	MWMP	<i>Meteoritic Water Mobility Procedure</i>
A	<i>Standard Methods</i>	NIOSH	<i>National Institute of Occupational Safety & Health</i>
AOAC	<i>Association of Official Analytical Chemists</i>	PCBs	<i>Polychlorinated Biphenyls</i>
ASTM	<i>American Society for Testing & Materials</i>	RCRA	<i>Resource Conservation Recovery Act</i>
BTEX	<i>Benzene, Toluene, Ethylbenzene, Xylenes</i>	SW	<i>Solid Waste 846</i>
DRO	<i>Diesel Range Organics</i>	SPLP	<i>Synthetic Precipitation Leaching Procedure</i>
E or EPA	<i>US Environmental Protection Agency</i>	TCLP	<i>Toxicity Characteristic Leaching Procedure</i>
FLAA	<i>Flame Atomic Absorption</i>	TPH	<i>Total Petroleum Hydrocarbons</i>
GRO	<i>Gasoline Range Organics</i>	TPH-IR	<i>Total Petroleum Hydrocarbons - Infrared Spectroscopy</i>
ICP	<i>Inductively Coupled Plasma</i>	VOCs	<i>Volatile Organic Chemicals</i>

The analytical methods listed above are typically referenced for liquid and solid waste regulations.

WASTES

1. RESOURCE CONSERVATION RECOVERY ACT (RCRA) CHARACTERISTICS - IGNITABILITY, CORROSIVITY, REACTIVITY, AND TOXICITY.

PARAMETER	METHOD	REPORTING LIMIT, mg/L
IGNITABILITY , flashpoint	SW1010	° F
CORROSIVITY , pH of solids or liquids	SW9045D/ SW9040C	0.01 std. units
REACTIVITY , reactive cyanide and sulfide		
Reactive Cyanide	SW Sec. 7.3.3.2	0.05 mg/Kg
Reactive Sulfide	SW Sec. 7.3.4.2	20 mg/Kg
TOXICITY - Toxicity Characteristic Leaching Procedure (TCLP)		
TCLP Extractions - Prior to analysis		
TCLP Metals Digestion as Totals for water	SW3010	
TCLP Metals Digestion as Totals for oil matrix	SW3050 / SW7471 (Hg)	
TCLP extraction for metals, base neutrals, acid extractables, pesticides and herbicides.	SW1311	
TCLP zero headspace extraction for volatiles	SW1311	
TCLP METALS	CAS No.	
Arsenic	7440-38-2	SW7062 / SW6010 0.1
Barium	7440-39-3	SW6010 1
Cadmium	7440-43-9	SW6010 0.01
Chromium	7440-47-3	SW6010 0.1
Lead	7439-92-1	SW6010 0.1
Mercury	7439-97-6	SW7470A / SW6010 0.002
Selenium	7782-49-2	SW7742 / SW6010 0.01
Silver	7440-22-4	SW6010 0.02

WASTES

1. RESOURCE CONSERVATION RECOVERY ACT (RCRA) CHARACTERISTICS - IGNITABILITY, CORROSIVITY, REACTIVITY, AND TOXICITY (continued)

PARAMETER	CAS No.	METHOD	REPORTING LIMIT, mg/L
Analysis of TCLP extracts continued			
TCLP BASE NEUTRALS/ACID EXTRACTABLES			
2,4-Dinitrotoluene	121-14-2	SW8270C	0.05
Hexachloro-1,3-Butadiene	87-68-3		0.05
Hexachlorobenzene	118-74-1		0.05
Hexachloroethane	67-72-1		0.05
Nitrobenzene	98-95-3		0.05
Pyridine	110-86-1		0.1
Cresols (m,p,o)	108-39-4, 106-44-5, 95-48-7		0.15
Pentachlorophenol	87-86-5		0.25
2,4,5-Trichlorophenol	95-95-4		0.05
2,4,6-Trichlorophenol	88-06-2		0.05
TCLP PESTICIDES			
Chlordane	57-74-9	SW8081B	0.025
Heptachlor(+hydroxide)	76-44-8		0.0005
Endrin	72-20-8		0.0005
Lindane	58-89-9		0.0005
Methoxychlor	72-43-5		0.0005
Toxaphene	8001-35-2		0.05
TCLP HERBICIDES			
2,4-D	94-75-7	SW8151A	0.01
2,4,5-TP(Silvex)	93-72-1		0.002

WASTES

1. RESOURCE CONSERVATION RECOVERY ACT (RCRA) CHARACTERISTICS - IGNITABILITY, CORROSIVITY, REACTIVITY, AND TOXICITY (continued)

PARAMETER	CAS No.	METHOD	REPORTING LIMIT, mg/L
Analysis of TCLP extracts continued			
TCLP VOLATILES			-
Benzene	71-43-2	SW8260B	0.01
Carbon Tetrachloride	56-23-5		0.01
Chlorobenzene	108-90-7		0.01
Chloroform	67-66-3		0.01
1,4-Dichlorobenzene	106-46-7		0.01
1,2-Dichloroethane	107-06-2		0.01
1,1-Dichloroethylene	75-35-4		0.01
Methyl Ethyl Ketone	78-93-3		0.25
Tetrachloroethylene	127-18-4		0.01
Trichloroethylene	79-01-6		0.01
Vinyl Chloride	75-01-4		0.01
Benzene only in TCLP extract	71-43-2	SW8260B	0.01
TCLP Package Prices Includes Extraction and Analyses			
Complete TCLP			Contact Lab
Complete TCLP less Pesticides and Herbicides			Contact Lab
TCLP Metals only (includes SW1311 extraction for solids, filtering for both solids and liquids and SW3010 digestion)			Contact Lab
TCLP Volatiles only			Contact Lab

2. Waste Oil Characteristics

PARAMETER	CAS No.	METHOD	REPORTING LIMIT, mg/Kg
Arsenic	7440-38-2	SW7062/SW6010	1
Cadmium	7440-43-9	SW6010	0.5
Chromium	7440-47-3	SW6010	0.5
Lead	7439-92-1	SW6010	5
Metals Digestion	-	SW3050	-
Total Halogens	-	SW9076	200
Flashpoint	-	SW1010	-
NOTE: Total Halogens of 4000 mg/Kg is acceptable if it can be proven that the oil was not mixed with a hazardous waste.			
Used Oil Analysis Cost Per Sample			Contact Lab

WASTES

3. 503 ANALYSIS – TEST GROUP PARAMETERS FOR SOLID WASTE/SLURRY ANALYSIS OF WASTEWATER SYSTEM SOLIDS AS PRESCRIBED BY 40CFR PART 503

PARAMETER	METHOD	DETECTION LIMIT, mg/Kg
Arsenic	SW6010	1
Cadmium	SW6010	1
Chromium	SW6010	1
Copper	SW6010	1
Lead	SW6010	1
Nickel	SW6010	1
Mercury	SW7471	1
Molybdenum	SW6010	1
Selenium	SW6010	1
Zinc	SW6010	1
Total Metals Digestion	SW3050 and SW7471	N/A
OTHER ANALYSIS		
Ammonia as Nitrogen	ASA Monograph No. 9, Method 33-7.3.3	1
Fecal Coliform Bacteria, dry	A9222D	100 cfu/g
... or Fecal Coliform Bacteria, dry	A9221E	1 MPN/g
Nitrate plus Nitrite as Nitrogen	ASA Monograph No. 9, Method 33-8.1	1
Percent Solids	Loss @ 105°C	0.1 wt %
Total Kjeldahl Nitrogen	ASA Monograph No. 9, Method 31-3	1
NOTE: Reported detection limit is dependent on the % solids of the sample.		
Total Cost per Sample		Call for Quote

WASTES

4. OTHER ANALYSIS OF WASTES

PARAMETER	METHOD
Digestion for Total Metals	SW3010/SW3050B/ SW7471
Synthetic Precipitation Leaching Procedure (SPLP)	SW1312
Meteoric Water Mobility Procedure (MWMP) Column Leaching Procedure	E2242-13
Modified MWMP Bottle Roll Procedure	MWMP Mod
NOTE: Analysis of the above digestions or extracts are done according to TCLP or Water methods and fees	
Ash	D2974/D482
Density	ASTM E1109
Lead in paint	SW3050 with SW6010/SW6020
Loss on ignition, calculated from % ash	D2974
Moisture and Total Solids	Loss at 105°C/A 2540G/D2974
Paint Filter Test	SW9095
PCBs in transformer oil, 5 µg/g	SW8082A
pH	SW9045D / SW9040C
Sulfur, Total	LECO Combustion IR Detection
Total Organic Halogen (TOX)	SW9020B

TM

WASTES SAMPLING AND PRESERVATION

MEASUREMENT	MATRIX	SAMPLE SIZE/ SAMPLE BOTTLE	PRESERVATIVE ²	HOLDING TIME
Flashpoint	liquid	100 mL P or G	None	NA
pH	water	25 mL P or G	None	analyze as soon as possible
pH	non-aqueous	50 g P or G	None	analyze as soon as possible
Cyanide, Reactive	water	250 mL P or G	NaOH to pH >12	14 days
Cyanide, Reactive	non-aqueous	50 g P or G	None	NA
Sulfide, Reactive	water	250 mL P or G	Zinc Acetate and NaOH to pH >9	7 days
Sulfide, Reactive	non-aqueous	50 g P or G	None	NA
TCLP	water	See individual methods in the <i>water</i> or <i>organics</i> sections.		
TCLP	solids	500 g P or G	None	See chart at the end of this section.
TCLP	multiphasic	Call the laboratory for advice on sampling.		
Metals, total	water	250 mL P or G	HNO ₃ to pH < 2	6 mo. (Hg: 28 days)
Metals, total	non-aqueous	50 g P or G	None (Hg: cooled to 6°C, when possible)	6 mo. (Hg: 28 days)
BTEX	water	3-40 mL VOA vials ³	5-10 drops HCl to pH <2	14 days
BTEX	solids	4oz w/m Amber Glass	None, No headspace	14 days
GRO	water	3-40 mL VOA vials ³	5-10 drops HCl to pH <2	14 days
GRO	solids	4oz w/m Amber Glass	None, No headspace	14 days
DRO	water	2-1000 mL G	H ₂ SO ₄ to pH <2	7 days to extract; 40 to analysis
DRO	solids	4oz w/m Amber Glass	None	14 days to extract; 40 to analysis
VPH	water	3-40 mL VOA vials ³	5-10 drops HCl to pH <2	14 days to analysis
VPH	solids	4oz w/m Amber Glass	None	7 days to extract; 28 days to analysis
EPH	water	2-1000 mL G	H ₂ SO ₄ to pH <2	14 days to extract; 40 to analysis
EPH	solids	4oz w/m Amber Glass	None	14 days to extract; 40 to analysis
TPH, IR	water	1-1000 mL G	H ₂ SO ₄ to pH <2	7 days to extract; 40 to analysis
TPH, IR	solids	4oz w/m Amber Glass	None	14 days to extract; 40 to analysis
TPH, Soxhlet ext.	solids	4oz w/m Amber Glass	None	NA
PCBs, Transformers	Oil	5 mL G	None	40 days
Waste oil analysis	Oil	250 mL P or G	None	Refer to individual parameter
BTU	NA	25 g P or G	None	NA

WASTES

SAMPLING AND PRESERVATION, continued

MEASUREMENT	MATRIX	SAMPLE SIZE/ SAMPLE BOTTLE ¹	PRESERVATIVE ²	HOLDING TIME
Density	solids	500g depends on particle size	None	NA
Loss on ignition	solids	50g P or G	None	NA
Moisture/solids	solids	50g P or G	None	NA
Paint filter test	-	>100g P or G	NA	NA
Lead in paint	solids	5g P or G	NA	NA

NOTES: 1. Sample bottles: P = plastic; G = glass; w/m = wide mouth.

2. Most parameters should be shipped and stored at 6°C.

3. Samples collected for volatiles must be taken with zero headspace. The VOA vial must be completely full, no headspace.

HOLDING TIMES FOR TCLP ANALYSIS (days)

ANALYSIS	SAMPLING TO TCLP EXTRACTION	TCLP EXTRACTION TO METHOD EXTRACTION	METHOD EXTRACTION TO ANALYSIS	TOTAL SAMPLING TO ANALYSIS
Metals (not mercury)	180	NA	180	360
Mercury	28	NA	28	56
Base Neutrals	14	7	40	61
Acid Extractables	14	7	40	61
Pesticides	14	7	40	61
Herbicides	14	7	40	61
Volatiles	14	NA	14	28