

## **CHAPTER 2**

### **HAZARDOUS OIL AND GAS WASTE DETERMINATION**

#### **RULE 98 REQUIREMENT**

Rule 98, subsection (e) requires that you determine if any waste you generate is hazardous oil and gas waste. You must also maintain a record of each determination for three years. A hazardous oil and gas waste is a waste that meets all four of the following criteria:

- it is an oil and gas waste regulated by the RRC;
- it is a solid waste as defined by federal hazardous waste regulations;
- it is not specifically exempt from federal hazardous waste regulations in 40 CFR Part 261 (i.e., a “nonexempt waste”); and
- it is either listed as a hazardous waste or exhibits a hazardous waste characteristic.

This chapter takes you through the steps necessary to determine which, if any, of your wastes are hazardous. Each of the criteria listed above is discussed and the relevant Rule 98 requirements are identified.

#### **OIL AND GAS WASTE AND THE E&P EXEMPTION**

##### **Oil and Gas Wastes Regulated by the RRC**

Oil and gas wastes subject to the jurisdiction of the Railroad Commission (RRC) are all wastes, including “E&P nonexempt wastes,” generated in connection with the following activities:

- drilling, operation, and plugging of wells associated with the exploration, development, or production of oil or gas, including oil or gas wells, fluid injection wells used in enhanced recovery projects, and disposal wells;
- separation and treatment of produced fluids in the field or at natural gas processing plants\*;

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\*Note: Exempt and nonhazardous wastes generated at natural gas processing plants are under the jurisdiction of the RRC. Any hazardous waste generated at a natural gas processing plant will remain under TCEQ jurisdiction until the RRC receives authorization from EPA to administer the federal hazardous waste program. At that time, hazardous waste generated at natural gas processing plants will fall under RRC jurisdiction (also see note on page 1-2).

- transportation of crude oil or natural gas by pipeline;
- storage of crude oil before it enters a refinery;
- solution mining of brine; and
- storage, hauling, disposal, or reclamation of wastes generated by these activities.

It is important to note that exempt E&P wastes are but a subset of RRC-regulated oil and gas waste.

### **Solid Waste as Defined by RCRA**

A solid waste is any discarded material as defined in 40 CFR (Code of Federal Regulations) section (§) 261.2. "Solid waste" may be in a solid, semi-solid, liquid, or gaseous form. Discarded materials include: 1) abandoned materials; 2) materials recycled in a manner that constitutes disposal; and 3) certain inherently waste-like materials. Certain wastes that are excluded from the federal definition of solid waste are discussed in "Oil and Gas Wastes Excluded From Regulation or Subject to Reduced Regulation" later in this chapter.

### **Rule 98, RCRA, and the E&P Exemption**

In 1980, recognizing the unique characteristics of oil and gas wastes, Congress specifically exempted "drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy" from regulation under RCRA Subtitle C as hazardous wastes pending further study by EPA. In 1988, EPA completed its study and recommended that the exemption be retained. This exemption is commonly called the "E&P Exemption" and is found in 40 CFR §261.4(b)(5). EPA's "Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes" (53 *Federal Register* 25446-25459 (July 6, 1988)) explains the E&P exemption and is provided in Appendix B.

Rule 98, subsection (e)(1)(C), adopts by reference the E&P exemption. The following section explains how to determine if a waste is exempt or nonexempt. Nonexempt wastes must be evaluated to determine whether or not they are subject to regulation as hazardous waste. Also, note that exempt oil and gas wastes and nonexempt *nonhazardous* oil and gas wastes are subject to the requirements of Statewide Rule 8 (e.g., minor permits, permitted oil and gas waste hauler provisions, and disposal).

**What Is An Exempt Waste?** Exempt wastes are those wastes associated with the exploration, development, and production of oil and gas. To be exempt a waste must be **uniquely associated** with **primary field operations**.

- With respect to **natural gas production**, primary field operations are those activities occurring at or near the wellhead, production facility, or gas plant (including gathering lines to the plant), but before the point of transfer of the gas to a carrier for transport to market.

- With respect to **oil production**, primary field operations include activities occurring at or near the wellhead and production facility, but before the point where the custody of the oil is transferred from an individual field facility to a carrier for transport to a refiner. In the event no custody transfer occurs, the primary field operation ends at the last point of separation of impurities from the oil in the field. Crude oil stock tanks are considered separation devices for the purpose of defining areas of primary field operations.

EPA further describes the oil and gas exemption from hazardous waste regulation in "Clarification of the Regulatory Determination for Wastes from the Exploration, Development and Production of Crude Oil, Natural Gas and Geothermal Energy," (58 *Federal Register* 15284-15287 (Mar. 22, 1993)) (provided in Appendix B) as follows:

In particular, for a waste to be exempt from regulation as a hazardous waste under RCRA Subtitle C, it must be associated with operations to locate or remove oil or gas from the ground or to remove impurities from such substances and it must be intrinsic to and uniquely associated with oil and gas exploration, development or production operations (commonly referred to as exploration and production or E&P); the waste must not be generated by transportation or manufacturing operations ... One common belief is that any wastes generated by, in support of, or intended for use by the oil and gas E&P industry ... are exempt. This is not the case; in fact, only wastes generated by activities uniquely associated with the exploration, development or production of crude oil or natural gas ... (i.e., wastes from down-hole or wastes that have otherwise been generated by contact with the production stream during the removal of produced water or other contaminants from the product) are exempt from regulation under RCRA Subtitle C ...

Clearly, wastes such as produced water and drilling fluid are unique to the oil and gas E&P industry and are therefore exempt. However, certain wastes commonly generated in E&P operations are also used in other types of industries. For example, cleaning wastes, painting wastes, and waste lubricating oil are commonly generated in connection with non-E&P activities and, therefore, are not unique and not covered by the E&P exemption. As a "rule-of-thumb," E&P wastes are RCRA-exempt if they have:

- come from downhole (i.e., brought to the surface) during E&P operations (e.g., when drilling, working over, treating, or producing oil and natural gas wells, including produced water disposal wells and EOR, pressure maintenance, or recycling injection wells); or
- been in contact with the oil and gas production stream during the removal of produced water or other contaminants from the product.

As an example, a spent paraffin solvent used in a well is an exempt oil and gas waste when it is recovered from the wellbore. If that same solvent is used to degrease surface equipment, the resulting spent solvent is not unique to E&P, and therefore is nonexempt, and a hazardous waste determination must be made.

The following additional guidelines clarify the application of the exemption to oil and gas wastes in specific instances:

- The off-site transport of exempt waste from a primary field site for treatment, reclamation, or disposal does not negate the exemption.
- Wastes derived from the treatment of an exempt waste, including any product recovered from an exempt waste (e.g., crude oil reclamation of exempt tank bottoms), generally remain exempt from the requirements of Rule 98 and RCRA.
- Vacuum truck and drum rinsate from trucks and drums transporting or containing exempt wastes is exempt, provided that the trucks or drums only contain E&P-related exempt wastes and that the water or fluid used in the rinsing is not subject to Rule 98 and RCRA (i.e., is itself nonhazardous).
- Wastes generated by a service company (e.g., *unused* frac or stimulation fluids) that are not uniquely associated with oil and gas E&P operations are not exempt from Subtitle C under the oil and gas exemption.
- The treatment of hydrogen sulfide gas at a gas plant to recover elemental sulfur is considered treatment of an exempt waste.
- Wastes uniquely associated with operations to recover natural gas from reservoirs and solution-mined salt caverns used for natural gas storage are covered by the exemption.
- The actual point of waste generation is important in determining whether the exemption applies. For example, if a gas well experiences equipment problems which allow produced water to enter a transportation pipeline to which it is directly tied, the produced water generated from the transportation pipeline is nonexempt because its point of generation is not in primary field operations.

Exempt wastes make up the bulk (over 99.9%) of all wastes that are regulated by the RRC. Table 1 is a partial list of those wastes designated as exempt by EPA.

**What is a nonexempt waste?:** Nonexempt wastes are wastes that EPA has determined are not covered under the exemption and that may be hazardous wastes subject to regulation under the RCRA. Nonexempt wastes include: wastes that are not uniquely associated with an exploration and production activity, such as cleaning wastes or lubricating oil; and all wastes that are not associated with primary field operations, such as wastes associated with transportation or manufacturing (e.g., refining) activities.

Table 2 provides the list of nonexempt wastes identified in EPA's Regulatory Determination. This is a listing of most, but not all, oil and gas wastes that are not exempt from regulation as hazardous wastes.

Not all nonexempt wastes are hazardous wastes. "Hazardous Oil and Gas Wastes" on page 2-7 explains how an operator may determine whether a nonexempt oil and gas waste is hazardous or nonhazardous.

**TABLE 1: OIL AND GAS WASTES EXEMPT FROM RCRA AND  
RULE 98 HAZARDOUS WASTE REGULATION**

- Produced water
- Drilling fluids and drill cuttings
- Drilling fluids and cuttings from offshore operations disposed on-shore
- Rigwash
- Well completion, treatment, and stimulation fluids
- Workover wastes
- Basic sediment & water and other tank bottom sludge from storage facilities that hold product and exempt waste\*
- Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments
- Pit sludges and contaminated bottoms from storage or disposal of exempt wastes
- Gas plant dehydration wastes, including glycol-based compounds, glycol filters, filter media, backwash, and molecular sieves
- Gas plant sweetening wastes for sulfur removal, including amine, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge
- Cooling tower blowdown
- Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream)
- Packing fluids
- Produced sand
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation
- Hydrocarbon-bearing soil (generated in primary field operations)
- Pigging wastes from gathering lines
- Wastes from subsurface gas storage and retrieval
- Constituents removed from produced water before it is injected or otherwise disposed of
- Liquid hydrocarbons removed from the production stream but not from oil refining
- Gases removed from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons
- Materials ejected from a producing well during blowdown
- Waste crude oil from primary field operations and production
- Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment

\* BS&W from primary field operations only.

**TABLE 2: RCRA AND RULE 98 NONEXEMPT OIL AND GAS WASTES**

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers
- Vacuum truck and drum rinsate from trucks and drums transporting or containing nonexempt waste
- Used equipment lubrication oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste solvents
- Waste in transportation pipeline-related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Boiler scrubber fluids, sludges, and ash
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation, and miscellaneous solids

(EPA also included refinery wastes in this list. However, refinery wastes are not under the jurisdiction of the Railroad Commission.)

## **HAZARDOUS OIL AND GAS WASTE**

Once you have determined that a waste is regulated by the RRC, is a solid waste, and is nonexempt, you must determine if it is hazardous. Rule 98, subsection (e)(1)(D), adopts by reference the hazardous waste identification procedures established by EPA. A nonexempt solid waste is classified as a hazardous waste if EPA has specifically listed it as such, or if it tests positive for one of four hazardous waste characteristics.

You may make the hazardous waste determination (for unlisted waste) by testing the waste using approved EPA methods (see “Test Methods”). You also may make the determination by using “**process knowledge.**” Process knowledge is applying knowledge of the hazardous characteristics of the waste in light of the materials or processes used. For example, a material safety data sheet (MSDS) may indicate that a material used in a process contains no hazardous constituents or exhibits no hazardous characteristic. The waste may be determined nonhazardous if the process itself contributes no hazardous constituents and does not result in the waste exhibiting a hazardous characteristic.

### **Listed Hazardous Oil and Gas Wastes**

The first step in determining if a nonexempt oil and gas waste is hazardous is to see if it is listed as a hazardous waste. EPA has listed numerous types or classes of solid wastes as hazardous wastes because they:

- typically exhibit one or more of the characteristics of hazardous waste;
- have been shown to meet certain human toxicity criteria; or
- contain any one of the chemical compounds or substances listed by EPA as hazardous constituents.

EPA's regulations contain four lists of listed hazardous wastes; the F, K, P, and U lists. Table 3, “Listed RCRA Hazardous Oil and Gas Wastes,” provides a brief description of the four lists. Also, Appendix C provides the complete lists of hazardous wastes (40 CFR Part 261, Subpart D) and their respective hazardous waste numbers. These lists contain over 400 hazardous wastes. P-list wastes are considered acutely hazardous wastes, and small amounts are regulated the same way as larger amounts of other hazardous wastes.

If a *nonexempt* oil and gas waste is identified on any of these four lists, the waste must be managed as a listed hazardous oil and gas waste. For example, spent carbon tetrachloride (i.e., waste solvent) from use as a degreaser on surface equipment is nonexempt and is listed as hazardous waste number F001.

**TABLE 3: LISTED RCRA HAZARDOUS OIL AND GAS WASTES**

(Complete lists are provided in Appendix C)

<b>EPA LIST</b>	<b>TYPE OF WASTE</b>	<b>EXAMPLES OF OIL &amp; GAS WASTES THAT MIGHT BE FOUND ON EPA LISTS</b>
F-List	Hazardous wastes from non-specific sources	Spent solvents (trichloroethylene, methylene chloride, tetrachloroethylene, xylene, acetone, benzene, ethyl benzene, methyl ethyl ketone, n-butyl alcohol, methanol, toluene, and solvent mixtures/blends that contain more than 10% of these solvents)
K-List	Hazardous waste from specific sources	None identified
P-List	Commercial chemical products that become acute hazardous wastes when disposed of)	Acrolein, beryllium, carbon disulfide, vanadium pentoxide
U-List	Commercial chemical products that become toxic wastes when disposed of)	Acetone, benzene, carbon tetrachloride, chloroform, chrysene, formaldehyde, formic acid, hydrogen fluoride, hydrogen sulfide, lindane, mercury, methanol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene, xylene

\* Note: Commercial chemical products (P and U lists) are defined as materials which contain either the pure or technical grade of the listed chemical, crude product, or a formulation in which the listed chemical is *the sole active ingredient*. (Please refer to the comment under 40 CFR §261.33(d), which is provided in Appendix C.)

### **Characteristically Hazardous Oil and Gas Wastes**

If the nonexempt oil and gas waste is not identified on any of the lists of hazardous waste, it must be determined whether the waste exhibits one or more of the four hazardous waste characteristics. Typically, characteristic hazardous oil and gas waste will be of more concern to operators of oil and gas exploration and production

facilities. If the nonexempt oil and gas waste is determined to exhibit one or more of the characteristics, it is classified as a characteristically hazardous oil and gas waste. The four characteristics of hazardous waste are ignitability, corrosivity, reactivity, and toxicity.

Table 4 provides a description of the four hazardous waste characteristics. In addition, Appendix C provides the federal definition of characteristically hazardous waste and their respective hazardous waste numbers (40 CFR §§261.20-261.24).

The generator can either test the waste material using an accepted EPA analytical method (see “Test Methods below) or can apply process knowledge in determining whether the waste in question is characteristically hazardous. A generator who relies on process knowledge in determining if a waste is characteristically hazardous should be prepared to demonstrate that this determination is reasonable in terms of the materials and process used. For example, documentation that supports the determination should be on record and include items such as material safety data sheets, other manufacturer’s data, baseline analytical test results, and pertinent operating parameters.

### **Test Methods**

**Ignitability:** The test methods for ignitability are provided by 40 CFR §261.21. Ignitability of a liquid is determined using the Pensky-Martens Closed Cup Tester using: 1) the test method specified in ASTM Standard D-93-79 or D-93-80; or 2) the Setaflash Closed Cup Tester using the test method specified in ASTM Standard D-3278-78.

**Corrosivity:** The test methods for corrosivity are provided by 40 CFR §261.22. Corrosivity of an aqueous solution is determined by a pH meter using Method 9040 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846 (SW-846). Also, a liquid is corrosive if it corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.25 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in SW-846.

**Reactivity:** No specific test methods are cited for reactivity by 40 CFR §261.23. Rather reactivity is defined by properties exhibited by waste.

**Toxicity:** The test method for toxicity is provided by 40 CFR §261.24. Toxicity is determined by using the Toxicity Characteristic Leaching Procedure (TCLP), which is test method 1311 in SW-846. The TCLP is a relatively expensive test method, particularly when all TC-listed constituents are tested. Process knowledge may allow you to determine specific TC constituents that require analysis and eliminate unnecessary testing. However, under certain circumstances, the TCLP may not need to be used. The following discussion explains your alternatives for determining if a waste exhibits the toxicity characteristic.

**TABLE 4: RCRA AND RULE 98 HAZARDOUS WASTE CHARACTERISTICS**

➤ **IGNITABILITY**

- Liquids with a flash point less than 140°F
- Ignitable compressed gas
- Materials other than liquids that at standard conditions are capable of causing fire by spontaneous chemical changes, by absorption of moisture, or through friction.

Examples: certain cleaning solvents (may also be listed hazardous wastes), certain degreasers, certain transportation-pipeline pigging wastes, certain paint wastes

➤ **CORROSIVITY**

- Aqueous materials with a pH of less than or equal to 2.0 or greater than or equal to 12.5.
- Liquid materials that corrode steel (SAE 1020) at a rate greater than 0.250 inch per year at a test temperature of 130°F.

Examples: certain acid or caustic cleaning wastes, unused well acidizing fluids (that have not been down the borehole), certain rust removers, waste battery acid

➤ **REACTIVITY**

- Any waste that reacts violently with water, forms explosive mixtures with water, or generates any toxic fumes with water
- Any waste that is explosive at standard conditions or if heated
- Any waste that contains cyanide or sulfide at a concentration that will emit toxic cyanide or sulfide gases when exposed to a pH of 2.0 to 12.5.

Examples: certain waste oxidizers

➤ **TOXICITY**

- Potential to contaminate ground water by leaching as determined in a laboratory using the Toxicity Characteristic Leaching Procedure (TCLP) Test.

**Table 4 continues on the next page.**

**TABLE 4: RCRA HAZARDOUS WASTE CHARACTERISTICS (CONTINUED)**

TCLP leachable components\* that cause a waste to test hazardous are:

Organics:	Benzene	0.5 mg/1
	Carbon tetrachloride	0.5 mg/1
	Chlordane	0.03 mg/1
	Chlorobenzene	100.0 mg/1
	Chloroform	6.0 mg/1
	o-Cresol	200.0 mg/1
	m-Cresol	200.0 mg/1
	p-Cresol	200.0 mg/1
	Cresol	200.0 mg/1
	2,4-D	10.0 mg/1
	1,4-Dichlorobenzene	7.5 mg/1
	1,2-Dichloroethane	0.5 mg/1
	1,1-Dichloroethylene	0.7 mg/1
	2,4-Dinitrotoluene	0.13 mg/1
	Endrin	0.02 mg/1
	Heptachlor (& its epoxide)	0.008 mg/1
	Hexachlorobenzene	0.13 mg/1
	Hexachlorobutadiene	0.5 mg/1
	Hexachloroethane	3.0 mg/1
	Lindane	0.4 mg/1
	Methoxychlor	10.0 mg/1
	Methyl ethyl ketone	200.0 mg/1
	Nitrobenzene	2.0 mg/1
	Pentachlorophenol	100.0 mg/1
	Pyridine	5.0 mg/1
	Tetrachloroethylene	0.7 mg/1
	Toxaphene	0.5 mg/1
	Trichloroethylene	0.5 mg/1
	2,4,5-Trichlorophenol	400.0 mg/1
	2,4,6-Trichlorophenol	2.0 mg/1
	2,4,5-TP (Silvex)	1.0 mg/1
	Vinyl chloride	0.2 mg/1
Metals:	Arsenic	5.0 mg/1
	Barium	100.0 mg/1
	Cadmium	1.0 mg/1
	Chromium	5.0 mg/1
	Lead	5.0 mg/1
	Mercury	0.2 mg/1
	Selenium	1.0 mg/1
	Silver	5.0 mg/1

Examples of types of wastes that may test hazardous include:

- unused pipe dope (lead)
- unused biocides (chromium)
- cleaning wastes or solvents (benzene)
- transportation pipeline pigging wastes (benzene)

\* Note: When at concentrations equal to or greater than the respective value given in the table.

For certain wastes, you can test waste for total constituent content and apply the "Rule of Twenty" (apply the 20-fold dilution factor inherent in the TCLP method) to determine whether a sample has to be tested using the TCLP method. As noted above, the TCLP test method is generally more expensive than the test required to determine total constituent concentrations.

A TCLP test is not required if total analysis demonstrates that contaminants are not present or are present in such low concentrations they could not possibly exceed the toxicity regulatory limits.

Theoretically, in a total constituent analysis, 100% of the constituent is extracted from a solid sample for analysis using a 1:1 extraction (one part sample to one part extraction fluid). However, for a solid sample, the extraction fluid in the TCLP test method is not designed to have a 100% extraction efficiency, since a relatively weak acid is used as the extraction fluid. Furthermore, for a solid sample, the TCLP test includes a dilution of 20-fold by the extraction fluid. The "Rule of Twenty" refers to the 20-fold dilution.

EPA Method 1311 requires the following:

- For liquid wastes (i.e., those containing less than 0.5% dry solid material), the waste, after filtration through a 0.6 to 0.8 micrometer glass fiber filter, is defined as the TCLP extract. If the waste contains less than 0.5% filterable solids, the waste itself, after filtering, is considered to be the extract.
- For wastes containing greater than or equal to 0.5% solids, the liquid, if any, is separated from the solid phase and stored for later analysis; the particle size of the solid phase is reduced, if necessary. *The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase.* The extraction fluid employed is a function of the alkalinity of the solid phase of the waste. A special extractor vessel is used when testing for volatile analytes. Following extraction, the liquid extract is separated from the solid phase by filtration through a 0.6 to 0.8 micrometer glass fiber filter.
- If compatible (i.e., multiple phases will not form on combination), the initial liquid phase of the waste is added to the liquid extract, and these are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

The assumption in the "Rule of Twenty" is that all of the contaminant of concern is dissolved in the extraction fluid, which is then analyzed. Since this calculation assumes a 100% extraction efficiency of the TCLP, it represents a conservative assumption that the waste is not TC hazardous.

Therefore, if the analytical total concentration of a constituent in a solid is "x," and "x" divided by 20 is still less than the regulatory TCLP concentration, then the solid can be assumed not to fail the TCLP test and not to exhibit the hazardous characteristic of toxicity. **Note that this "rule" will not work for any waste that has greater than or equal to 0.5% liquids.** This calculation can only be used for materials that

are in a solid form since liquids themselves (i.e., wastes containing less than 0.5% dry solid material) are defined as the TCLP extract; hence, the 20-fold dilution factor calculation is not relevant. Therefore, this procedure is acceptable for soils and other wastes in a dry, solid form.

For example: The regulatory limit for mercury is 0.2 mg/l using the TCLP test. Using the “Rule of Twenty,”  $0.2 \text{ mg/l} \times 20 = 4 \text{ mg/l}$  (at these levels mg/l is approximately equivalent to mg/kg.). If the total analysis of a soil sample results in a total mercury concentration of less than 4 mg/kg, the soil sample can be assumed not to fail the TCLP test for mercury (i.e., will not exceed the regulatory limit for mercury).

If this analysis of the waste and rule of thumb calculation demonstrates that the individual analytes are not present in the waste, or that they are present in such low levels that the regulatory levels could not be exceeded, the TCLP need not be run. However, you should perform the TCLP if total analysis results indicate that the TCLP level is close to the regulatory limit for a constituent. In the absence of sufficient process knowledge or inferred evidence using the Rule of Twenty, the TCLP must be used for the toxicity characteristic determination.

#### **MIXING EXEMPT AND NONEXEMPT WASTES**

Mixing exempt and nonexempt wastes creates a special set of problems. Whenever possible, mixing nonexempt wastes with exempt wastes should be avoided, because the resulting mixture may become a hazardous waste and require management under Rule 98 and RCRA Subtitle C regulations. Furthermore, mixing a characteristically hazardous waste with a nonhazardous or exempt waste *for the purpose of rendering the hazardous waste nonhazardous or less hazardous* is considered by EPA to be a treatment process subject to the RCRA Subtitle C hazardous waste regulations (and possibly permitting requirements).

Some basic guidelines for determining the regulatory status of a mixture of exempt and nonexempt wastes are provided below. Also, Table 5 on page 2-15 provides a flowchart that depicts the various mixtures and their regulatory status.

- Mixing a nonhazardous (exempt or nonexempt) waste with an exempt waste results in a mixture that is nonhazardous.

**Example:** If nonhazardous wash water from rinsing road dust off equipment or vehicles is mixed with the contents of a reserve pit containing exempt drilling waste, the wastes in the pit are not subject to hazardous waste regulations regardless of the characteristics of the waste mixture in the pit.

- If, after mixing a nonexempt characteristically hazardous waste with an exempt waste, the resulting mixture exhibits any of the same hazardous characteristics as the hazardous waste (ignitability, corrosivity, reactivity, or toxicity due to a particular constituent), then the mixture is a nonexempt hazardous waste.

**Example:** If nonexempt caustic soda (corrosive) is mixed with exempt waste and the resultant mixture exhibits the hazardous characteristic of corrosivity as determined

from pH or steel corrosion tests, then the entire mixture becomes a nonexempt hazardous waste.

**Example:** If a nonexempt solvent that is characteristically hazardous because of benzene is mixed with an exempt waste, and the resultant mixture exhibits the hazardous characteristic for benzene, then the entire mixture becomes a nonexempt hazardous waste.

- If, after mixing a nonexempt characteristically hazardous waste with an exempt waste, the resulting mixture does not exhibit any of the same hazardous characteristics as the hazardous waste, the mixture is not subject to regulation as a hazardous waste. Even if the mixture exhibits some other characteristic of a hazardous waste, it is still not subject to regulation as a hazardous waste.

**Example:** If, after mixing nonexempt hydrochloric acid (corrosive characteristic only) with an exempt waste, the resultant mixture does not exhibit the hazardous characteristic of corrosivity, then the mixture is not subject to hazardous waste regulation (even if it exhibits some other hazardous characteristic, such as toxicity).

**Example:** If, after mixing a nonexempt waste exhibiting the hazardous characteristic for lead with an exempt waste exhibiting the hazardous characteristic for benzene, the resultant mixture exhibits the hazardous characteristic for benzene but not for lead, then the mixture is not subject to hazardous waste regulation.

- Generally, if a listed hazardous waste is mixed with an exempt waste, regardless of the proportions, the mixture is a nonexempt hazardous waste.

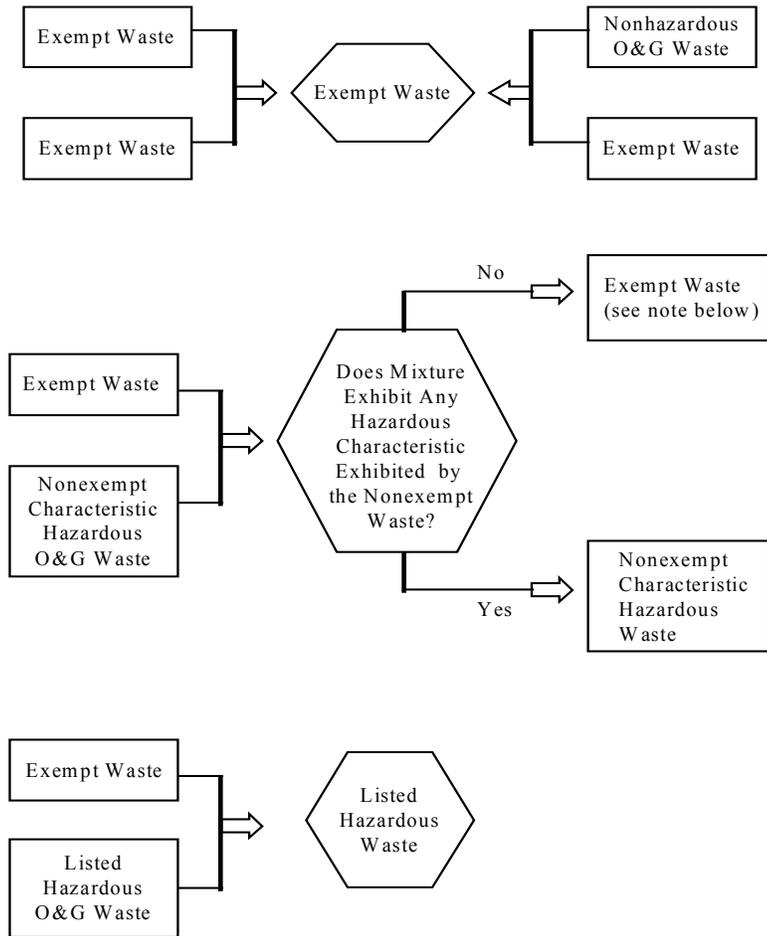
**Example:** Discarding a half-empty container of a listed solvent in a reserve pit would cause the otherwise exempt pit contents to become a listed hazardous waste and result in expensive closing of the pit under RCRA hazardous waste regulations.

An exception to this rule occurs when the listed hazardous waste in the mixture is listed solely because it exhibits a hazardous characteristic (ignitability, corrosivity or reactivity only) and the mixture does not exhibit the characteristic.

**Example:** The use of acetone (listed because of ignitability only) as a solvent and washing it off with fresh water would create a mixture that would be nonhazardous if the mixture did not exhibit the ignitability characteristic.

Note that the mixture in this example is created prior to the point of waste generation. However, remember that the elimination of the hazardous characteristic(s) exhibited by the nonexempt waste as a result of intentionally mixing it with exempt waste may be considered treatment. Treatment of a hazardous waste may require a permit under RCRA regulations or be subject to specific management standards if conducted on the generation site by the generator.

**TABLE 5: WASTE MIXTURES**



Note: This mixture is considered treatment to remove the hazardous characteristic, and, in general, requires a permit. Also, see treatment in accumulation tanks and containers in Chapter 5.

## **DERIVED FROM AND CONTAINED-IN RULES**

EPA's regulations also state that a solid waste (such as sludge or ash) *derived from* (i.e., generated by the treatment, storage, or disposal of) a listed hazardous waste is a hazardous waste. If the waste is “derived from” a characteristic hazardous waste, it is not hazardous if it does not exhibit a characteristic.

In addition, Rule 98 and EPA's regulations require that a waste (such as soil, debris, or absorbent material) that *contains* a listed hazardous waste be managed as if it *were* a hazardous waste. Therefore, if an operator spills a listed hazardous waste, such as unused methanol, the contaminated soil or debris “contains” a listed hazardous waste and must itself be managed as a hazardous waste. In particular, debris may be considered to no longer contain hazardous waste if treated by a required destruction technology (see Rule 98, (e)(3)(B)(v), and 40 CFR Part 268.45). The RRC and EPA may each make a determination that soil or debris no longer “contain” hazardous waste.

## **OIL AND GAS WASTES EXCLUDED FROM REGULATION OR SUBJECT TO REDUCED REGULATION UNDER RULE 98**

Rule 98, subsection (e)(3), adopts by reference the federal exclusions of certain wastes from regulation as hazardous waste. A waste may be either:

- excluded from definition as a solid waste (therefore, excluded from regulation as a hazardous waste);
- defined as a solid waste, but excluded from hazardous waste regulation; or
- a hazardous waste, but excluded from regulation because it is recycled (note this exclusion applies only to certain recycled waste).

In certain instances, a solid waste is excluded from “full regulation,” but instead subject to reduced regulation under RCRA (e.g., see “Universal Waste”). Also, certain wastes are not required to be counted when determining a generation site classification (discussed in Chapter 3). The following discussion highlights the wastes that are applicable to exploration and production operations. You should refer to 40 CFR Part 261 for a complete description of the wastes excluded from hazardous waste regulation.

Some, but not all, of the wastes described below are excluded from regulation under Rule 98. For example, the wastes excluded from regulation under Rule 98 include those under the provisions of subsection (e)(3)(B)(i)-(iii). Rule 98, subsection (e)(3)(B)(i)-(iii), excludes the wastes described in 40 CFR 261.6(a)(2) and (3) and 279.10(b). Note that Rule 98, subsection (z), (relating to LQG and SQG fees) provides that these wastes may still be counted toward the total volume of hazardous oil and gas waste recycled, reclaimed, or reused for the purpose of determining the additional annual fee (see “Additional Fee for Less Than 50% Recycling” in Chapter 7).

Hazardous oil and gas waste that is managed (treated) immediately upon generation only in on-site elementary neutralization units, totally enclosed treatment

units, or wastewater treatment units is not counted as hazardous oil and gas waste in determining a generation site classification. In addition, these wastes may be counted as recycled, reused, or reclaimed waste. These three treatment units are discussed in Chapter 5. It is important to note that the hazardous oil and gas wastes managed in these units *are* subject to the land disposal restrictions of 40 CFR Part 268 (see Land Disposal Restrictions on page 5-26).

**Generator Site Classification and Oil and Gas Wastes Excluded From Regulation or Subject to Reduced Regulation Under Rule 98**

Some of the oil and gas wastes discussed below are not counted when determining a generation site's classification (discussed in Chapter 3). Table 6 provides a summary of these wastes. Please note that these wastes may still be subject to either reduced regulation under RCRA or other federal and state regulations.

**Materials That Are Not Solid Waste**

A material must be a solid waste as defined by 40 CFR 261.2 to be considered a hazardous oil and gas waste. Rule 98 adopts the federal definition of solid waste in subsection (e)(1) and the related definitions of waste and solid waste in subsection (b). Therefore, the following materials that are excluded from definition as solid wastes will not be considered hazardous oil and gas waste subject regulation under Rule 98.

**By-products:** 40 CFR §261.2 specifically excludes from the definition of solid waste by-products that exhibit a hazardous waste characteristic and are reclaimed. A by-product is a material that is not one of the primary products of a production process and is not solely or separately produced by the production process. A by-product is reclaimed if it is processed to recover a usable product or if it is regenerated. An example would be transportation pipeline pigging waste that is primarily paraffin which is reclaimed.

**Commercial Chemical Products:** 40 CFR §261.2 excludes commercial chemical products from the definition of solid waste if they are reclaimed. (Commercial chemical products are listed in 40 CFR §261.33 and discussed in "Listed Hazardous Oil and Gas Wastes" on page 2-7.) For example, an operator who has commercial chemical product that has become unusable can avoid its disposal as a hazardous waste if he sends the commercial chemical product to a facility that legitimately reclaims it.

This exclusion also applies to "commercial chemical products" that are not included in the P-list or the U-list. For example, unused mineral spirits that are not listed as hazardous waste, but would otherwise be characteristically hazardous if disposed of (i.e., for ignitability), would be excluded from the definition of solid waste if reclaimed.

**Recycled Materials:** Also, 40 CFR §261.2 provides that certain materials are not solid wastes when recycled. These include: materials used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed; materials that are used or reused as effective substitutes for commercial products; or materials that are returned to the original process from which they are

generated without first being reclaimed or land disposed (i.e., the material must be returned directly as a substitute for feedstock materials). This exclusion does not apply to materials that are used in a manner constituting disposal, burned for energy recovery (or used in a fuel), accumulated speculatively, or considered “inherently waste-like materials” (inherently waste-like materials are defined in 40 CFR §261.2(d)(1) and (2)).

**Wastewater Discharges:** 40 CFR §261.4(a)(2) provides that industrial wastewater discharges that are point source discharges subject to regulation under section 402 of the Clean Water Act (CWA) are not solid wastes for the purpose of hazardous waste identification. A discharge permit under section 402 of the CWA is known as a NPDES permit (National Pollutant Discharge Elimination System). This exclusion applies only to the actual point discharge and does not exclude wastewaters while they are being collected, stored or treated before discharge. Also, the sludges that are generated by wastewater treatment are not excluded.

**Recovered Oil:** Recovered oil from petroleum refining, exploration and production, and from transportation (i.e., pipelines) is not a solid waste if it is inserted into the petroleum refining process along with normal process streams (40 CFR §261.4(a)(12)). This exclusion does not include used lubricating oil (also see “Used Lubricating Oil” on page 2-20).

### **Solid Waste Excluded From Regulation Under Rule 98**

The most important exclusion is the E&P exemption which is described in this chapter. Rule 98, subsection (e)(1)(C), adopts the E&P exemption in 40 CFR §261.4(b)(5).

Another specific exclusion of solid waste provided by 40 CFR §261.4(b) is non-terne plated used oil filters (terne is an alloy of lead and tin). The exclusion applies to these filters if they have been gravity hot-drained using an approved method (e.g., puncturing the filter anti-drain back valve or the filter dome end).

### **Recycled Wastes Not Subject to Rule 98 or RCRA Regulation**

Rule 98, subsection (e)(3), exempts from regulation as hazardous oil and gas waste certain recycled wastes. Rule 98 adopts by reference this recycling and reclamation exemption from 40 CFR §261.6(a)(2), (3), and (4).

40 CFR §261.6(a)(2) excludes certain recycled wastes from comprehensive hazardous waste regulation, but instead requires that they be managed according to the requirements of 40 CFR Part 266 (“Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities”). Recyclable materials excluded by §261.6(a)(2) include:

- spent lead-acid batteries being reclaimed;
- hazardous wastes burned for energy recovery in boilers and industrial furnaces that are not regulated under 40 CFR Parts 264 or 265; and
- materials from which precious metals are reclaimed.

**Table 6: OIL AND GAS WASTES THAT ARE NOT COUNTED IN DETERMINING GENERATION SITE CLASSIFICATION**

- Drilling fluids, produced waters, and wastes associated with oil and gas exploration and production (the “E&P exemption”).
- Used lubricating oil that is recycled (including certain mixtures of used lubricating oil and hazardous waste).
- Commercial chemical products that are reclaimed.
- By-products that are reclaimed.
- Hazardous oil and gas waste that is reclaimed and reused on the generation site with no prior accumulation or storage. (Note: If accumulated prior to on-site reclamation, the reclaimed waste is counted once per month.)
- Recovered oil from petroleum refining, exploration and production, and from transportation (i.e., pipelines) if it is inserted into the petroleum refining process along with normal process streams.
- Residues of hazardous waste in empty containers and inner liners removed from empty containers.
- Wastewater point source discharges subject to regulation under section 402 of the Clean Water Act (CWA).
- Scrap metal that is recycled.
- Non-terne plated used oil filters (terne is an alloy of lead and tin).
- Universal Waste (used batteries returned for regeneration; mercury thermostats; and pesticides that are suspended or recalled).
- Spent lead-acid batteries being reclaimed (regulated under 40 CFR Part 266).
- Hazardous oil and gas waste that is managed (treated) immediately upon generation only in on-site elementary neutralization units, totally enclosed treatment units, or wastewater treatment units.
- PCB-containing dielectric fluid and electric equipment containing such fluid that is regulated under 40 CFR Part 761.
- Materials used or reused as ingredients in an industrial process to make a product or that are returned to the original process from which they are generated.
- Materials that are used or reused as effective substitutes for commercial products.

40 CFR §261.6(a)(3) provides that the following recyclable materials are not subject to hazardous waste regulation:

- scrap metal;
- fuels produced from oil-bearing hazardous waste (note that the oil-bearing hazardous waste itself is subject to regulation); and
- industrial ethyl alcohol.

**Used Lubricating Oil:** 40 CFR §261.6(a)(4) excludes from hazardous waste regulation used lubricating oil that is recycled and is hazardous solely because it exhibits a hazardous characteristic. Instead, recycled used lubricating oil is subject to the requirements of 40 CFR Part 279 (“Standards for the Management of Used Lubricating Oil”). Note that Part 279 specifies that used lubricating oil that contains more than 1,000 ppm total halogens is presumed to be hazardous waste subject to all hazardous waste regulations (40 CFR §279.10(b)). However, this presumption may be rebutted if the generator can show that the used lubricating oil does not contain any of the halogens listed in 40 CFR Part 261, Appendix VIII (regarding hazardous constituents).

Also, 40 CFR §279.10(b) addresses mixtures of used lubricating oil and hazardous waste. Most mixtures of used lubricating and hazardous waste are subject to full hazardous waste regulation. Two important exceptions that are subject to the Part 279 requirements are: a mixture of used lubricating oil and characteristically hazardous waste(s) (or a listed hazardous waste that is listed solely because it exhibits a characteristic), *if* the mixture does not exhibit the characteristic(s); and a mixture of used lubricating oil and CESQG hazardous waste subject to the reduced requirements of 40 CFR §261.5.

**Empty Containers:** 40 CFR §261.7 provides that residues of hazardous waste in empty containers and inner liners removed from empty containers are excluded from regulation as hazardous waste. “Empty container” is precisely defined.

In general, a hazardous waste container or inner liner (excluding compressed gas and acute hazardous waste containers) is empty if all waste has been removed and no more than one inch of residue remain on the bottom; or if no more than 3% by weight of the total capacity of the container remains if the container is less than or equal to 110 gallons in size, or if no more than 0.3% by weight of the total capacity of the container remains if the container is greater than 110 gallons in size.

For containers that have held a hazardous waste that is a compressed gas, the container is empty when its pressure approaches atmospheric.

For containers or inner liners that have held acute hazardous waste (e.g., P-listed waste), the container is empty only after it has been tripled rinsed using a solvent capable of removing the commercial chemical product. The rinsate itself must be managed as the P-listed hazardous waste.

**PCB Wastes:** 40 CFR §261.8 excludes from hazardous waste regulation the disposal of PCB-containing dielectric fluid and electric equipment containing such fluid that is regulated under 40 CFR Part 761 (“Polychlorinated Biphenyls (PCBs)

Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions”) and that are hazardous only because they fail the toxicity characteristic test (for waste codes D018 through D043 only).

**Universal Waste:** 40 CFR §261.9 specifies three wastes that are regulated under the Universal Waste requirements of 40 CFR Part 273. The three wastes, as defined in Part 273, are not subject to full regulation as hazardous waste. In general, Universal Wastes are: used batteries (except those regulated under 40 CFR Part 266) returned for regeneration; mercury thermostats; and pesticides that are suspended or recalled. You should refer to 40 CFR Part 273 for the specific requirements for managing Universal Waste. Note that oil and gas wastes that are universal wastes are defined in the November 1995 edition of the CFR and do not include hazardous lamps in accordance with more recent federal rule changes.

### **Hazardous Wastes Reclaimed and Reused On-Site**

Hazardous oil and gas waste that is reclaimed on the generation site and reused by the generator may be subject to reduced requirements as provided by 40 CFR §§261.5(c) and (d).

A good example of the 40 CFR §261.5(c) provision is a generator who regenerates (i.e., reclaims) spent solvent using an on-site still and reuses the reclaimed solvent. If the hazardous oil and gas waste (e.g., spent solvent) is not accumulated or stored prior to its reclamation, the reclaimed hazardous oil and gas waste is not counted toward the quantity determination when determining generation site classification (see 40 CFR §261.5(c)(3)). However, the generator is required to provide notification of this activity (see “Notification” in Chapter 4). Note, however, that any residual waste (e.g., sludge or still bottoms) from the reclamation of the hazardous oil and gas waste must be counted toward generator classification and be managed as hazardous oil and gas waste (also see the “derived from” rule discussed on page 2-14).

If a generator accumulates or stores hazardous waste *prior* to its on-site reclamation, he must count it toward the quantity determination as provided by 40 CFR §261.5(d)(2). However, the volume of hazardous oil and gas waste that is accumulated and then reclaimed is counted only once in the particular month it is generated, accumulated, and reclaimed. This quantity is determined on a month-by-month basis. Also, note that since the reclaimed hazardous oil and gas waste has been included in the quantity determination, any residual waste from the reclamation is included in that quantity and need not be recounted.

### **ADDITIONAL GUIDANCE REGARDING DRUMS AND CONTAINERS**

Drums and containers are common to all oil and gas operations. The operator must make a hazardous oil and gas waste determination for each drum and/or container on the generation site that has become a waste. While empty containers may not be subject to regulation as hazardous waste (see “Empty Containers” above), drums and containers which are partially filled or contain unusable chemical or material may be hazardous oil and gas waste if discarded. The operator must demonstrate that the

chemical or material in the drum or container is not discarded and is intended for use; otherwise a hazardous oil and gas waste determination must be made.

Remember that commercial chemical products that are returned to the vendor or a facility for reclamation are not considered solid waste. Therefore, managing excess commercial chemical product in this way can save an operator regulatory compliance concerns and disposal costs.

A hazardous waste determination may require relatively expensive sampling and laboratory analysis. However, proper labeling of commercial chemical product containers in addition to maintaining detailed manufacturer's information (e.g., material safety data sheets) may ensure adequate "process knowledge" in the event a determination must be made (see "process knowledge").

Inventory control is an effective way to reduce the volume of waste chemicals and materials in drums and containers and the associated waste management requirements. An operator who maintains up-to-date records on the locations, volumes, and expiration dates of chemicals and materials can make efficient use of them. And, as noted above, an operator can return known excess or unusable chemical products to the vendor for reclamation. The result is a reduction in the unnecessary purchase of chemicals and the volume of waste chemical that must be disposed of.