

US EPA ARCHIVE DOCUMENT

REGION 5 SKINNER LIST

A “Skinner List” of Appendix VIII Hazardous Constituents applicable to refinery wastes was developed by EPA’s Office of Solid Waste. (Skinner refers to the name of the U.S. EPA official signing the guidance memorandum). Any Appendix VIII constituent believed applicable to refineries was included. In 1985, this list was shortened to a more practical list of constituents and published as “Constituents of Petroleum Refining Wastes” as part of EPA’s guidance for “Petitions to Delist Hazardous Wastes”. This 1985 list of Appendix VIII Hazardous Constituents applicable to refining processes became known as the “Skinner List”, and has been used as the basis for many RCRA Facility Investigation measurements.

In 1993, EPA’s Office of Solid Waste updated the Skinner List through additions to and deletions from the 1985 list as part of new EPA guidance for “Petitions to Delist Hazardous Wastes. The 1993 list is labeled “Constituents of Concern for Wastes from Petroleum Processes”.

In 1997, Region 5's Waste Management Branch melded the 1985 and 1993 Skinner Lists to establish a broader list of refinery process waste constituents, which is identified as the “Region 5 Skinner List” (Attachment 1). The Region 5 Skinner List was developed on the basis of:

1. Combining the 1985 and 1993 Skinner Lists.
2. Hazardous Constituents deleted in 1993 from the 1985 list were retained if they are identified in Superfund’s CLP Target Compound List or Target Analyte List. Multiparameter test procedures such as Methods 8260, 8270, and 6010 are routinely calibrated for TCLs and TALs; therefore, there is no need to discard the data being captured for each sample’s measurements.
3. The 1985 Skinner List constituents deleted in 1993 were also deleted from the Region 5 list (or deemed optional) if they are impossible or impractical analytical measurements (e.g.-methyl chrysene, benzenethiol), if they are not part of Appendix IX or the CLP TCL/TALs.
4. A list of polynuclear aromatic hydrocarbon (PAH) constituents, with low concentration PRGs and common to the 1985 or 1993 lists, was established for low level HPLC/fluorescence measurements.
5. Special considerations for specific constituents are:
 - a. The 1985 constituent *quinoline*, deleted in the 1993 list, was retained by Region 5 because of its relatively toxicity.
 - b. Methyl tertiary butyl ether (MTBE) was added to the Region 5 list because of its wide usage as a gasoline additive. Environmental laboratories usually have this compound in their calibration standards for Method 8015 and 8260.

- c. The 1985 list includes “methyl chrysene”. No distinction is made for its different structural isomers. GC/MS mass spectra for methyl chrysene can not be easily differentiated from closely eluting isomers of methyl dibenz(a, h)anthracene. This constituent was deleted from the optional Region 5 list because inappropriate analytical measurements would occur.
- d. Benzenethiol, or thiophenol, can be found in refinery wastes of caustic pH values. Benzenethiol is unstable in water/soils of neutral or acid pH values. Benzenethiol rapidly degrades in organic solvents used to prepare instrument calibration standards. Benzenethiol is part of Appendix VIII and the 1985 Skinner List, but never made it to Appendix IX to 40 CFR 264, because of its instability in the environment or in analytical standards. It is listed as an optional Region 5 constituent.
- e. Cobalt was deleted from the 1985 list. Silver and zinc were added to the 1993 Skinner List. All three are in the Region 5 Skinner List because their concentrations are captured by commonly used multiparameter ICP emission spectroscopy measurements (Method 6010).

ATTACHMENT 1

**Region 5 Waste Management Branch "Skinner List"
Constituents of Concern for Wastes from Petroleum Processes**

Inorganics

Antimony	Cadmium	Lead	Silver
Arsenic	Chromium	Mercury	Vanadium
Barium	Cobalt	Nickel	Zinc
Beryllium	Cyanide	Selenium	

Volatile Organics

Benzene	1,2-Dichloroethane	Ethylene dibromide (EDB)	1,1,1-Trichloroethane
Carbon disulfide	1,1-Dichloroethane	Methyl ethyl ketone (MEK)	Trichloroethene
Chlorobenzene	1,4-Dioxane	Styrene	Tetrachloroethylene
Chloroform	Ethylbenzene	Toluene	Xylenes (total)

Semivolatile Organics

Acenaphthene	o-Cresol	Diethyl phthalate	Naphthalene
Anthracene	m-Cresol	2,4 Dimethylphenol	4-Nitrophenol
Benzo(a)anthracene	p-Cresol	Dimethyl phthalate	Phenanthrene
Benzo(b)fluoranthene	Dibenz(a,h)anthracene	2,4 Dinitrophenol	Phenol
Benzo(k)fluoranthene	Di-n-butyl phthalate	Fluoranthene	Pyrene
Benzo(a)pyrene	1,2-Dichlorobenzene*	Fluorene	Pyridine
Bis(2-ethylhexyl) phthalate	1,3-Dichlorobenzene*	Indeno(1,2,3-cd)pyrene	Quinoline
Chrysene	1,4-Dichlorobenzene*	Methyl tertiary butyl ether (MTBE)	*- can be tested as a volatile

Low Concentration Polynuclear Aromatic Hydrocarbons (Optional)

Benzo(a)anthracene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Benzo(a)pyrene	Chrysene*	

* added to this group to assist the chromatographic resolution of chrysene from Dibenz(a,h)anthracene in sample extracts

Optional Semivolatile Organics

Indene	Benzenethiol**	Dibenz(a,h)acridine	1-Methylnaphthalene*
--------	----------------	---------------------	----------------------

*Note that 2-Methylnaphthalene is part of Appendix IX and is a CLP TCL organic. 1-Methylnaphthalene is not on these lists.

**Benzenethiol can be detected in certain petroleum refinery wastes. Its measurement must compensate for its instability at neutral and acid pH values during sample preparation and its unstable instrument calibration standards