

Rationale for the Development of BAT  
Priority Pollutant Parameters



U. S. ENVIRONMENTAL PROTECTION AGENCY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Rationale for recommended List of  
PRIORITY POLLUTANTS

DATE: NOV 19 1976

FROM: William A. Telliard, Chief  
Energy and Mining Branch

TO: Robert B. Schaffer  
Director  
Effluent Guidelines Division

The following list of compounds are recommended for use in defining Appendix A of the Consent Decree. In compiling this list every attempt has been made to compile with the spirit and language of the Consent Decree, while providing the necessary specificity required in a scientific program. The recommended list of Priority Pollutants contains the following:

1. Every specific compound called for in the agreement is present and marked with an asterisk.
2. The list contains all those compounds which were specifically named or referred to in describing a group or class of compounds.
3. The ambiguous compounds or classes of compounds which were named in the agreement are included in the list. The non-specific groups or classes are underlined. Below each group or class is a recommended specific compounds representative of the group. In selecting the specific compounds the following rational and considerations were used.
  - (a) The frequency of occurrence of the compound in water. In order to make this evaluation the reference ("Frequency of Organic Compounds Identified in Water" by Shackelford and Keith) was used. This compilation is incomplete; reports of compounds found during some monitoring operations were purposely deleted because they would have biased the data, e.g., data on pesticides and PCB's is particularly incomplete. On the other hand, the compilation is biased toward compounds of recent concern in drinking water, such as the halomethanes; there was no practical way to remove this bias. There is also a geographic bias resulting from differences in magnitudes of monitoring activities; e.g., the southeastern U.S. is disproportionately represented. Nevertheless, this data base is currently the most comprehensive list of organic chemicals that

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MAY 24 1977

TO: Robert B. Schaffer, Director  
Effluent Guidelines Division

In the settlement of several cases in the District Court for the District of Columbia, the Environmental Protection Agency has agreed to review and revise regulations based on the Best Available Technology Economically Achievable (BAT), New Source Performance Standards, and Pretreatment Standards for 21 industrial categories.

In this revision, consideration is to be given to the application of limitations of a list of 65 chemicals and chemical classes appearing in Appendix A of the Settlement Agreement with the National Resources Defense Council (NRDC). In order to enable the Division to conduct a scientific study of industrial discharges, the various parameters in Appendix A were further defined. Without this information as a point of reference, the analytical portion of the BAT review would be unmanageable given the limited time schedules and resources of the Agency. This package contains background documents illustrating the rationale of a working list of nonambiguous compounds which are derived from Appendix A. These materials are generally referred to as priority pollutants. The priority pollutants are specific compounds. The Agency has established this unambiguous list of 129 compounds (including those specific compounds named in the consent decree), which it believes fulfills the requirements of the court order and can be analytically determined. Moreover, these memoranda reflect the comments and suggestions made by an Advisory Committee of NRDC (as well as EPA's concerns).

Documents included in this package are: A Rationale for Recommended List of Priority Pollutants, November 19, 1976, with list of 123 priority pollutants; Revised List of Priority Pollutants, April 26, 1977 (the green list) and Selection of Rationale (the blue list). Also included is a memorandum titled, "Defining Asbestos for the BAT Review". This paper recommends a definition of asbestos in effluents for the express purpose of conducting Effluent Guidelines' BAT technical studies.

have been found in water and gives a good indication of the occurrence of most organics. It includes reports of survey analyses of water of all types --effluents, drinking water, surface water, etc. in the U.S. and abroad, and includes 5500 entries of 1296 different organic compounds. The compilation represents 189 different geographic locations or literature references. All the compounds except those specifically designated in the Consent Decree which are marked with an asterisk have been reported with a frequency of 5% or more of the total number of listings for that class of compounds.

- (b) The availability of chemical standards for purpose or quantitations was considered a requirement for inclusion on the list. Therefore, every specific compound shown there is at least one vendor who can available to supply a chemical standard.
- (c) Chemical production and number of plants involved in manufacturing was a consideration made.
- (d) The chemical stability and structure of each specific compound was considered.
- (e) In selection of the specific compound consideration was given so each subclass or group of compounds was specifically included.

4. In addition the following general assumptions were made in compiling the list:

- (a) Polynuclear aromatic hydrocarbons are traditionally considered unsubstituted compounds. Therefore, alkylnaphthalenes and alkylbiphenyls were omitted from this section.
- (b) Chlorobiphenyls were also omitted because they would come under the PCB classification.
- (c) Heterocyclic polynuclear aromatics (e.g., dibenzofuran) were also omitted from consideration because PAH's traditionally contain only carbon and hydrogen.
- (d) Phenol for the purposes of clarity are those compounds which are measured bly the 4-aminoantipyrine method.

- (e) Asbestos is under the fibrous form:
- (f) In addressing the 13 metals noted in the settlement agreement the term and their compounds included organic and inorganic compounds which were taken to.
- (g) Cyanide and its compounds has been considered as total cyanide.

## Recommended List of Priority Pollutants

### Compound Name

1.     \*acenaphthene
2.     \*acrolein
3.     \*acrylonitrile
4.     \*benzene
5.     \*benzidine
6.     \*carbon tetrachloride (tetrachloromethane)

### \*Chlorinated benzenes (other than dichlorobenzenes)

7.           chlorobenzene
8.       1,2,4-trichlorobenzene
9.       hexachlorobenzene

### \*Chlorinated ethanes (including 1,2- dichloroethane, 1,1,1-trichloro- ethane and hexachloroethane)

10.       1,2-dichloroethane
11.       1,1,1-trichloroethane
12.       hexachloroethane

- 13. 1,1-dichloroethane
- 14. 1,1,2-trichloroethane
- 15. 1,1,2,2-tetrachloroethane
- 16. chloroethane

\*Chloroalkyl ethers (chloromethyl,  
chloroethyl and mixed ethers)

- 17. bis(chloromethyl) ether
- 18. bis(2-chloroethyl) ether
- 19. 2-chloroethyl vinyl ether (mixed)

\*Chlorinated naphthalene

- 20. 2-chloronaphthalene

\*Chlorinated phenols (other than those  
listed elsewhere; includes trichloro-  
phenols and chlorinated cresols)

- 21. 2,4,6-trichlorophenol
- 22. panachlorometa cresol
- 23. \*chloroform (trichloromethane)
- 24. \*2-chlorophenol

\*Dichlorobenzenes

- 25. 1,2-dichlorobenzene
- 26. 1,3-dichlorobenzene
- 27. 1,4-dichlorobenzene

\*Dichlorobenzidine

- 28. 3,3'-dichlorobenzidine

\*Dichloroethylenes (1,1-dichloroethylene  
and 1,2-dichloroethylene)

- 29. 1,1-dichloroethylene
- 30. 1,2-trans-dichloroethylene
- 31. \*2,4-dichlorophenol

\*Dichloropropane and dichloropropene

- 32. 1,2-dichloropropane
- 33. 1,3-dichloropropylene (1,3-dichloropropene)
- 34. \*2,4-dimethylphenol

\*Dinitrotoluene

- 35. 2,4-dinitrotoluene
- 36. 2,6-dinitrotoluene
- 37. \*1,2-diphenylhydrazine
- 38. \*ethylbenzene
- 39. \*fluroanthene

\*Haloethers (other than those listed  
elsewhere)

- 40. 4-chlorophenyl phenyl ether
- 41. 4-bromophenyl phenyl ether
- 42. bis(2-chloroisopropyl) ether
- 43. bis(2-chloroethoxy) methane

\*Halomethanes (other than those lised  
elsewhere)

- 44. methylene chloride (dichloromethane)
- 45. methyl chloride (chloromethane)
- 46. methyl bromide (bromomethane)
- 47. bromoform (tribromomethane)



- 48. dichlorobromomethane
- 49. trichlorofluoromethane
- 50. dichlorodifluoromethane
- 51. chlorodibromomethane
- 52. \*hexachlorebutadiene
- 53. \*hexachlorocyclopentadiene
- 54. \*isophorone
- 55. \*naphthalene
- 56. \*nitrobenzene

\*Nitrophenols (including 2,4-dinitrophenol  
and dinitrocresol)

- 57. 2-nitrophenol
- 58. 4-nitrophenol
- 59. \*2,4-dinitrophenol
- 60. 4,6-dinitro-o-cresol

\*Nitrosamines

- 61. N-nitrosodimethylamine
- 62. N-nitrosodiphenylamine
- 63. N-nitrosodi-n-propylamine
- 64. \*pentachlorophenol
- 65. \*phenol

\*Phthalate esters

- 66. bis(2-ethylhexyl) phthalate
- 67. butyl benzyl phthalate
- 68. di-n-butyl phthalate
- 69. diethyl phthalate
- 70. dimethyl phthalate

\*Polynuclear aromatic hydrocarbons

- 71. 1,2-benzanthracene
- 72. benzo (a)pyrene (3,4-benzopyrene)
- 73. 3,4-benzofluoranthene
- 74. 11,12-benzofluoranthene
- 75. chrysene
- 76. acenaphthylene
- 77. anthracene
- 78. 1,12-benzoperylene
- 79. fluorene
- 80. phenanthrene
- 81. 1,2:5,6-dibenzanthracene
- 82. indeno(1,2,3-C,D)pyrene
- 83. pyrene
- 84. \*2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
- 85. \*tetrachloroethylene
- 86. \*toluene
- 87. \*trichloroethylene
- 88. \*vinyl chloride (chloroethylene)

## Pesticides and Metabolites

- 89.    \*aldrin
- 90.    \*dieldrin
- 91.    \*chlordane (technical mixture & metabolites)

### \*DDT and metabolites

- 92.    4,4'-DDT
- 93.    4,4'-DDE (p,p'-DDX)
- 94.    4,4'-DDD (p,p'-TDE)

### \*endosulfan and metabolites

- 95.    -endosulfan
- 96.    -endosulfan
- 97.    endosulfan sulfate

### \*endrin and metabolites

- 98.    endrin
- 99.    endrin aldehyde

### \*heptachlor and metabolites

- 100.   heptachlor
- 101.   heptachlor epoxide

### \*hexachlorocyclohexane (all isomers)

- 102.  $\alpha$ -BHC
- 103.  $\beta$ -BHC
- 104.  $\gamma$ -BHC (lindane)
- 105.  $\delta$ -BHC

\*polychlorinated biphenyls (PCB's)

- 106. PCB-1242 (Arochlor 1242)
- 107. PCB-1254 (Arochlor 1254)

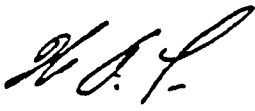
- 108. \*Toxaphene
- 109. \*Antimony (Total)
- 110. \*Arsenic (Total)
- 111. \*Asbestos (Fibrow)
- 112. \*Beryllion(Total)
- 113. \*Cadmium (Total)
- 114. \*Chromium (Total)
- 115. \*Copper (Total)
- 116. \*Cyanide (Total)
- 117. \*Lead (Total)
- 118. \*Mercury (Total)
- 119. \*nickel (Total)
- 120. \*Selenium (Total)
- 121. \*Silver (Total)
- 122. \*Thallium (Total)
- 123. \*Zinc (Total)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Revised List of Priority Pollutants

DATE:

FROM: William Telliard, Chief  
Energy and Mining Branch



MAY 10 1977

TO: Robert B. Schaffer, Director  
Effluent Guidelines Division

With the onset of the BAT Toxic Review, a list of recommended nonambiguous compounds (called priority pollutants) was developed. The purpose of this list was to define the various parameters and compounds of concern in order to carry out a scientific study. This list was then submitted to representatives of the Advisory Committee of NRDC for their comment and their suggestions. Upon review by the Agency of comments and questions received from NRDC the following memo was written to reflect Agency thinking on specific points of interest. Also enclosed is a revised list of priority pollutants which reflects changes resulting from NRDC's comments. It was explained to NRDC at the time of our meeting that the recommended list of priority pollutants was certainly not the total known chemical world and that it was simply being used as a frame of reference for the purpose of the present BAT review. The list was prepared with this thought in mind and with the additional consideration that the Agency intends to save, for further study, the spectral tapes which will result from the screening analysis, together with the extracts from the various samples. Realizing that we have the opportunity to go back and reevaluate some of the earlier decisions made, comments received from NRDC were considered in this light.

We would like to now address the specific points raised by NRDC in our meeting and answer them individually.

1. Comments presented under the heading Chlorinated Benzenes.

There were some questions raised with regard to the absence of 1,2,3,- and 1,3,5-trichlorobenzene from the list of compounds for direct consideration. Both of the compounds in question did not meet the general criteria that was set down for consideration in developing the list. Both the frequency of occurrence and reporting in the environment were far less than five percent of the total reported times (one of the guidelines used in the

selection of the various compounds). It should also be noted that we did include on the list compounds which have similar structure and morphology. If these two particular compounds are present, they could be evaluated at a later date, if necessary. The selection of the gas-chromatographic columns and preparation techniques would certainly remove from solution these two compounds. Therefore they would be available for evaluation either in the extract or on the spectral tape.

## 2. Chloroalkyl Ethers

A question was raised on the absence of 2-chloroethyl methy ether from the list of priority pollutants. It should be noted that this particular compound, at present, has no supplier of an analytical standard. The availability of an analytical standard is one of the prime criterias which has been used for inclusion on the list. Again this sister compound has been included and if present, would be seen on the spectral tapes or in the concentrate. We feel that this is adequately covered at the present time.

## 3. Phthalate Esters

This particular category of organic compounds provoked a number of comments and questions from the Advisory Board. This is a voluminous group of organic compounds. Those that were presented were the most commonly occurring and also probably the most prevalent in the environment. Specific concern was expressed for the following; the first being di-n-octyl phthalate which has been suggested as a substitute for PCB's. Upon review, the Agency finds that this is a valid concern and therefore we have added it to the list of concerned compounds. Also there was an expression of concern over the di-n-propyl phthalate and its exclusion. At the present time there is no analytical standard available for this compound, but since it's sister compound is included we feel that this compound is adequately covered. The question of the diisobutyl phthalate compound which has really only been seen five times in all the literature was questioned. It is not a very common compound and it is not readily available. We feel that it is not one that we are directly concerned with under this initial screening phase of the study. Likewise diisodecyl phthalate compound was only seen twice in the environment from the literature available and we feel that it also doesn't merit addition to the list at this time. Furthermore, the compound diisooctyl phthalate for which there is presently no analytical

standard available, was not included and would not be included at this time.

4. PCB's - The original list of priority pollutants contained two specific arochlor compounds. The Advisory Committee expressed some concern over the lack of one or another additional compounds and felt very strongly that they should be included on the list. Primarily in response to their strong feeling and concern, the Agency feels that the inclusion of the additional five PCB's for review and evaluation under the initial program can be justified. They have now been added to the list.
5. There was a question raised as to the number of compounds that were considered but for which there were no analytical standards available. A list of these compounds is provided in Attachment A of this memo. It should be noted that while analytical standards were not available for these compounds they also did not meet the other criterias established for selection by the Agency at this time. Most of them have occurred at a frequency of less than five percent of the reported times and therefore would not have been included anyhow.
6. It should be noted that the revised list of priority pollutants contains a number of changes in nomenclature. Since the naming of organic compounds takes several forms we have concluded that we shall use the standard reference procedure. The changes in the names to the standard naming procedure is reflected in Attachment B for this particular version of the priority pollutant list. This list of revised priority pollutants is shown in Attachment C. Attachment C reflects the changes made by the Agency in response to NRDC's comments and questions. We feel that it is both inclusive and specific enough that we may carry out the necessary technical evaluations required under the BAT review.

APRIL ,1977  
REVISED

Green List

Recommended List of Priority  
Pollutants

Compound Name

1. \*acenaphthene
2. \*acrolein
3. \*acrylonitrile
4. \*benzene
5. \*benzidine
6. \*carbon tetrachloride (tetrachloromethane)  
    \*Chlorinated benzenes (other than  
    ~~dichlorobenzenes~~)
7. chlorobenzene
8. 1,2,4-trichlorobenzene
9. hexachlorobenzene  
    \*Chlorinated ethanes (including 1,2-  
    dichloroethane, 1,1,1-trichloro-  
    ethane and hexachloroethane)
10. 1,2-dichloroethane
11. 1,1,1-trichloroethane
12. hexachloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
16. chloroethane  
    \*Chloroalkyl ethers (chloromethyl,  
    chloroethyl and mixed ethers)
17. bis(chloromethyl) ether

\*Specific compounds and chemical classes as listed  
in the consent degree.



18. bis(2-chloroethyl) ether
19. 2-chloroethyl vinyl ether (mixed)
- \*Chlorinated naphthalene
20. 2-chloronaphthalene
- \*Chlorinated phenols (other than those listed elsewhere; includes trichlorophenols and chlorinated cresols)
21. 2,4,6-trichlorophenol
22. parachlorometa cresol
23. \*chloroform (trichloromethane)
24. \*2-chlorophenol
- \*Dichlorobenzenes
25. 1,2-dichlorobenzene
26. 1,3-dichlorobenzene
27. 1,4-dichlorobenzene
- \*Dichlorobenzidine
28. 3,3'-dichlorobenzidine
- \*Dichloroethylenes (1,1-dichloroethylene and 1,2-dichloroethylene)
29. 1,1-dichloroethylene
30. 1,2-trans-dichloroethylene
31. \*2,4-dichlorophenol
- \*Dichloropropane and dichloropropene
32. 1,2-dichloropropane
33. 1,2-dichloropropylene (1,3-dichloropropene)
34. \*2,4-dimethylphenol

\*Dinitrotoluene

- 35. 2,4-dinitrotoluene
- 36. 2,6,-dinitrotoluene
- 37. \*1,2-diphenylhydrazine
- 38. \*ethylbenzene

- 39. \*fluoranthene

\*Haloethers (other than those listed elsewhere)

- 40. 4-chlorophenyl phenyl ether
- 41. 4-bromophenyl phenyl ether
- 42. bis(2-chloroisopropyl) ether
- 43. bis(2-chloroethoxy) methane

\*Halomethanes (other than those listed elsewhere)

- 44. methylene chloride (dichloromethane)
- 45. methyl chloride (chloromethane)
- 46. methyl bromide (bromomethane)
- 47. bromoform (tribromomethane)
- 48. dichlorobromomethane
- 49. trichlorofluoromethane
- 50. dichlorodifluoromethane
- 51. chlorodibromomethane
- 52. \*hexachlorobutadiene
- 53. \*hexachlorocyclopentadiene
- 54. \*isophorone

Green List

- 55. \*naphthalene
- 56. \*nitrobenzene
- \*Nitrophenols (including 2,4-dinitrophenol  
                    and dinitrocresol)
- 57. 2-nitrophenol
- 58. 4-nitrophenol
- 59. \*2,4-dinitrophenol
- 60. 4,6-dinitro-o-cresol
- \*Nitrosamines
- 61. N-nitrosodimethylamine
- 62. N-nitrosodiphenylamine
- 63. N-nitrosodi-n-propylamine
- 64. \*pentachlorophenol
- 65. \*phenol
- \*Phthalate esters
- 66. bis(2-ethylhexyl) phthalate
- 67. butyl benzyl phthalate
- 68. di-n-butyl phthalate
- 69. di-n-octyl phthalate
- 70. diethyl phthalate
- 71. dimethyl phthalate
- \*Polynuclear aromatic hydrocarbons
- 72. benzo(a)anthracene (1,2-benzanthracene)

Green List

- 73. benzo (a) pyrene (3,4-benzopyrene)
- 74. 3,4-benzofluoranthene
- 75. benzo(k)fluoranthene (11,12-benzofluoranthene)
- 76. chrysene
- 77. acenaphthylene
- 78. anthracene
- 79. benzo(ghi)perylene (1,12-benzoperylene)
- 80. fluorene
- 81. phenanthrene
- 82. dibenzo (a,h)anthracene (1,2,5,6-dibenzanthracene)
- 83. indeno (1,2,3-cd)pyrene (2,3-o-phenylenepyrene)
- 84. pyrene
- 85. \*tetrachloroethylene
- 86. \*toluene
- 87. \*trichloroethylene
- 88. \*vinyl chloride (chloroethylene)

Pesticides and Metabolites

- 89. \*aldrin
- 90. \*dieldrin
- 91. \*chlordane (technical mixture & metabolites)

\*DDT and metabolites

- 92. 4,4'-DDT
- 93. 4,4'-DDE (p,p'-DDX)
- 94. 4,4'-DDD (p,p'-TDE)

\*endosulfan and metabolites

- 95. a-endosulfan-Alpha
- 96. b-endosulfan-Beta
- 97. endosulfan sulfate

\*endrin and metabolites

- 98. endrin
- 99. endrin aldehyde

\*heptachlor and metabolites

- 100. heptachlor
- 101. heptachlor epoxide

\*hexachlorocyclohexane (all isomers)

- 102. a-BHC-Alpha
- 103. b-BHC-Beta
- 104. r-BHC (lindane)-Gamma
- 105. g-BHC-Delta

\*polychlorinated biphenyls (PCB's)

- 106. PCB-1242 (Arochlor 1242)
- 107. PCB-1254 (Arochlor 1254)
- 108. PCB-1221 (Arochlor 1221)
- 109. PCB-1232 (Arochlor 1232)
- 110. PCB-1248 (Arochlor 1248)
- 111. PCB-1260 (Arochlor 1260)
- 112. PCB-1016 (Arochlor 1016)
- 113. \*Toxaphene
- 114. \*Antimony (Total)
- 115. \*Arsenic (Total)

Green List

- 116.       \*Asbestos (Fibrous)
- 117.       \*Beryllium (Total)
- 118.       \*Cadmium (Total)
- 119.       \*Chromium (Total)
- 120.       \*Copper (Total)
- 121.       \*Cyanide (Total)
- 122.       \*Lead (Total)
- 123.       \*Mercury (Total)
- 124.       \*Nickel (Total)
- 125.       \*Selenium (Total)
- 126.       \*Silver (Total)
- 127.       \*Thallium (Total)
- 128.       \*Zinc (Total)
- 129.       \*\*2,3,7,8 - tetrachlorodibenzo-p-dioxin (TCDD)

\*Specific compounds and chemical classes as listed  
in the consent degree.

\*\*This compound was specifically listed in the consent  
degree. Because of the extreme toxicity (TCDD). We are recommending  
that laboratories not acquire analytical standard for  
this compound.

# Recommended List of Priority Pollutants

## Selection Rationale

Compound Name	Number of Times Reported	Number of Production Sites
1. *acenaphthene	Specifically required	1
2. *acrolein	Specifically required	2
3. *acrylonitrile	Specifically required	5
4. *benzene	Specifically required	43
5. *benzidine	Specifically required	3
6. *carbon tetrachloride (tetrachloromethane)	Specifically required	12
*Chlorinated benzenes (other than dichlorobenzenes)		
7. chlorobenzene	33'	9
8. 1,2,4-trichlorobenzene	26	5
9. hexachlorobenzene	20	
*Chlorinated ethanes (including 1,2-dichloroethane, 1,1,1-trichloroethane and hexachloroethane)		
10. 1,2-dichloroethane	Compound was named in the class	16
11. 1,1,1-trichloroethane	Compound was named in the class	4
12. hexachloroethane	Compound was named in the class	1

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are indicated.

Blue List

## SELECTION RATIONALE

Compound Name	Number of Times Reported	Number of Production Sites
13. 1,1-dichloroethane	11	0
14. 1,1,2-trichloroethane	10	3
15. 1,1,2,2-tetrachloroethane	8	1
16. chloroethane	13	
*Chloroalkyl ethers (chloromethyl, chloroethyl and mixed ethers)		
17. bis(chloromethyl) ether	Compound was named in the class	8
18. bis(2-chloroethyl) ether	Compound was named in the class	0
19. 2-chloroethyl vinyl ether (mixed)	Compound was named in the class	1
*Chlorinated naphthalene		
20. 2-chloronaphthalene	Chosen as representative of the Class	1
*Chlorinated phenols (other than those listed elsewhere; includes trichloro- phenols and chlorinated cresols)		
21. 2,4,6-trichlorophenol	3	1

\*Specific compounds and chemical classes as listed in the consent decree.

\* Ambiguous compounds or classes of compounds are underlined.



# Selection Rational

Compound name	Number of Times Reported	Number of Production Sites
22.    parachlorometa cresol	<u>Compound was named in the class</u>	<u>3</u>
23.    *chloroform (trichloromethane)	<u>Specifically required</u>	<u>7</u>
24.    *2-chlorophenol	<u>Specifically required</u>	<u>3</u>
<u>*Dichlorobenzenes</u>		
25.    1,2-dichlorobenzene	<u>23</u>	<u>10</u>
26.    1,3-dichlorobenzene	<u>16</u>	<u>10</u>
27.    1,4-dichlorobenzene	<u>27</u>	<u>10</u>
<u>*Dichlorobenzidine</u>		
28.    3,3'-dichlorobenzidine	<u>0 Chosen as representative</u>	<u>2</u>
<u>*Dichloroethylenes (1,1-dichloroethylene and 1,2-dichloroethylene)</u>		
29.    1,1-dichloroethylene	<u>Compound was named in the class</u>	<u>3</u>
30.    1,2- <u>trans</u> -dichloroethylene	<u>Compound was named in the class</u>	<u>0</u>
31.    *2,4-dichlorophenol	<u>Specifically required</u>	<u>3</u>

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are underlined.

Blue list

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
<u>*Dichloropropane and dichloropropene</u>		
32. 1,2-dichloropropane	6	5
33. 1,3-dichloropropylene (1,3-dichloropropene)	3	3
34. <u>*2,4-dimethylphenol</u>	<u>Specifically required</u>	4
<u>*Dinitrotoluene</u>		
35. 2,4-dinitrotoluene	3	3
36. 2,6-dinitrotoluene	8	4
37. <u>*1,2-diphenylhydrazine</u>	<u>Specifically required</u>	1
38. <u>*ethylbenzene</u>	<u>Specifically required</u>	16
39. <u>*fluroanthene</u>	<u>Specifically required</u>	0
<u>*Haloethers (other than those listed elsewhere)</u>		
40. 4-chlorophenyl phenyl ether	0	0
41. 4-bromophenyl phenyl ether	5	0
42. bis(2-chloroisopropyl) ether	19	0
43. bis(2-chloroethoxy) methane	2	0

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are underlined.

Blue List

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
<u>*Halomethanes (other than those listed elsewhere)</u>		
44. methylene chloride (dichloromethane)	76	8
45. methyl chloride (chloromethane)	17	11
46. methyl bromide (bromomethane)	3	4
47. bromoform (tribromomethane)	29	2
48. dichlorobromomethane	66	0
49. trichlorofluoromethane	15	11
50. dichlorodifluoromethane	0	12
51. chlorodibromomethane	61	0
52. *hexachlorobutadiene	Specifically required	3
53. *hexachlorocyclopentadiene	Specifically required	3
54. *isophorone	Specifically required	2
55. *naphthalene	Specifically required	17
56. *nitrobenzene	Specifically required	7
<u>*Nitrophenols (including 2,4-dinitrophenol and dinitrocresol)</u>		
57. 2-nitrophenol	6	3

\*Specific compounds and chemical classes as listed in the consent decree

Ambiguous compounds or classes of compounds are underlined.

Blue List

# Selection Rational

Compound Name		Number of Times Reported	Number of Production sites
58.	4-nitrophenol	4	5
59.	*2,4-dinitrophenol	Compound was named in the class	1
60.	4,6-dinitro-o-cresol	Compound was named in the class	1
<u>*Nitrosamines</u>			
61.	N-nitrosodimethylamine	0	0
62.	N-nitrosodiphenylamine	0	3
63.	N-nitrosodi-n-propylamine	0	0
64.	*pentachlorophenol	Specifically required	4
65.	*phenol	Specifically required	18
<u>*Phthalate esters</u>			
66.	bis(2-ethylhexyl) phthalate	18	0
67.	butyl benzyl phthalate	15	1
68.	di-n-butyl phthalate	15	11
69.	di-n-octyl phthalate	Specifically requested by NRDC	
70.	diethyl phthalate	35	4
71.	dimethyl phthalate	12	5

\*Specific compounds and chemical classes as listed in the consent decree.

End of page 100. The following page is a continuation of the list.

Blue List

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
<u>*Polynuclear aromatic hydrocarbons</u>		
72. 1,2-benzanthracene	Compound was named in the class	0
73. benzo (a)pyrene (3,4-benzopyrene)	Compound was named in the class	0
74. 3,4-benzofluoranthene	Compound was named in the class	0
75. 11,12-benzofluoranthene	Compound was named in the class	0
76. chrysene	Compound was named in the class	0
77. acenaphthylene	8	0
78. anthracene	8	1
79. 1,12-benzoperylene	12	0
80. fluroene	9	0
81. phenanthrene	12	0
82. 1,2,5,6-dibenzanthracene	Compound was named in the class	0
83. indeno(1,2,3-C,D)pyrene	Compound was named in the class	0
84. pyrene	15	0
85. *2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	Specifically required	0

\*Specific compounds and chemical classes as listed in the consent decree

Ambiguous compounds or classes of compounds are underlined.

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
86. *tetrachloroethylene	<u>Specifically required</u>	10
87. *toluene	<u>Specifically required</u>	44
88. *trichloroethylene	<u>Specifically required</u>	4
89. *vinyl chloride (chloroethylene)	<u>Specifically required</u>	15

## Pesticides and Metabolites

90. *aldrin	<u>Specifically required</u>	0
91. *dieldrin	<u>Specifically required</u>	0
92. *chlordane (technical mixture & metabolites)	<u>Specifically required</u>	2

## \*DDT and metabolites

93. 4,4'-DDT	<u>Compound was named in the class</u>	1
94. 4,4'-DDE (p,p'-DDX)	<u>7</u>	0
95. 4,4'-DDD (p,p'-TDE)	<u>0 - metabolite</u>	0

## \*endosulfan and metabolites

96. $\alpha$ -endosulfan	<u>Compound was named in the class</u>	2
97. $\beta$ -endosulfan	<u>Compound was named in the class</u>	2
98. endosulfan sulfate	<u>Compound was named in the class-only metabolite known</u>	

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are underlined.

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
<u>*endrin and metabolites</u>		
99. endrin	Compound was named in the class	1
100. endrin aldehyde	8	0
<u>*heptachlor and metabolites</u>		
101. heptachlor	Compound was named in the class	1
102. heptachlor epoxide	7	0
<u>*hexachlorocyclohexane (all isomers)</u>		
103. <u><math>\alpha</math></u> -BHC	Compound was named in the class---isomer	0
104. <u><math>\beta</math></u> -BHC	Compound was named in the class---isomer	0
105. <u><math>\gamma</math></u> -BHC (lindane)	Compound was named in the class---isomer	2
106. <u><math>\delta</math></u> -BHC		

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds are underlined.

# Selection Rational

Compound Name	Number of Times Reported	Number of Production Sites
<u>*polychlorinated biphenyls (PCB's)</u>		
107. PCB-1242 (Arochlor 1242)	1	1
108. PCB-1254 (Arochlor 1254)	6	1
109. PCB-1221 (Arochlor 1221)	Specifically requested by NRDC	
110. PCB-1232 (Arochlor 1232)	Specifically requested by NRDC	
111. PCB-1248 (Arochlor 1248)	Specifically requested by NRDC	
112. PCB-1260 (Arochlor 1260)	Specifically requested by NRDC	
113. PCB-1016 (Arochlor 1016)	Specifically requested by NRDC	
114. *Toxaphene	Specifically required	3
115. *Antimony (Total)	Specifically required	
116. *Arsenic (Total)	Specifically required	
117. *Asbestos ( Fibrous)	Specifically required--Fibrous form only	
118. *Beryllion (Total)	Specifically required	
119. *Cadmium (Total)	Specifically required	
120. *Chromium (Total)	Specifically required	

\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are underlined.

Blue List



Compound Name	Number of Times Reported	Number of Production Sites
121. *Copper (Total)	<u>Specifically required</u>	
122. *Cyanide (Total)	<u>Specifically required</u>	
123. *Lead (Total)	<u>Specifically required</u>	
124. *Mercury (Total)	<u>Specifically required</u>	
125. *Nickel (Total)	<u>Specifically required</u>	
126. *Selenium (Total)	<u>Specifically required</u>	
31 127. *Silver (Total)	<u>Specifically required</u>	
128. *Thallium (Total)	<u>Specifically required</u>	
129. *Zinc (Total)	<u>Specifically required</u>	


\*Specific compounds and chemical classes as listed in the consent decree.

Ambiguous compounds or classes of compounds are underlined.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Defining Asbestos for the BAT Review

DATE: MAY 13 1977

FROM: William A. Telliard  
Chief, Energy and Mining Branch 

TO: Robert B. Schaffer  
Director  
Effluent Guidelines Division

In an attempt to clarify the requirement for the determination and quantification of asbestos in effluent discharges with the consent decree, the Energy and Mining Branch has undertaken the task of attempting to define, for the Division, asbestos as it relates to our program needs. It should be understood that asbestos is a generic term that applies to a variety of commercially useful hydrated silicate minerals which may or may not have a fibrous structure. Table 1 of this memo contains a list of some six common minerals which could be defined as asbestos type minerals. The forms represented in the table express both the fibrous or asbestiform and the nonfibrous form of these minerals. Over the last few years, considerable controversy has arisen as regards the definition of asbestos. The confusion is partially due to the mineralogical and geological definitions versus the environmental and public health use of the term. It is our attempt to define for the purpose of the BAT review a useable definition as it relates to effluent discharges.

A considerable amount of data has been established relating health effects and fibrous asbestos taken in through inhalation by various working groups. However, there is divided medical opinion on the effect of fibrous asbestos as it relates to oral ingestion and the formation of carcinomas. The majority of the data that has been established and presented in the literature does revolve around the asbestos of the fibrous form or asbestiform material. There is a considerable amount of disagreement between various government agencies as well as the industry on what is an asbestos fiber? Therefore, we have a two part definition problem, the first being what shall we consider to be asbestos? and the second dealing with what shall we consider to be a fiber? All of the definitions dealing with the

term fiber have raised a great deal of concern. Many interested parties have contended that the relationship of length and diameter was not adequate enough to determine a fiber and that in fact, what was being observed as a fiber was simply a cleavage fragment resulting from the handling or processing of a nonfibrous crystalline material.

At present there are a number of government agencies who are attempting to regulate asbestos materials. Among these are: the National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), the Mining Enforcement and Safety Administration (MESA), Federal Mine Safety Advisory Committee (FMSAC), and EPA. In addition, supplying technical assistance and evaluation is the U.S. Geological Survey, the U.S. Bureau of Mines, and the Bureau of Standards. All of these agencies have made attempts at defining what constitutes asbestos.

In an attempt to perhaps to sidestep the fiber question, EPA's air programs office uses the commercial asbestos definition which defines those compounds in which asbestos is the primary constituent and not one in which asbestos is a contaminant. While this would lend itself primarily for regulation of asbestos mines and fiber board manufacture, it does not deal with operations such as Reserved Mining.

Since there are so many other government agencies involved in this question, a meeting was held on March 11, sponsored by the Energy and Mining Branch, to attempt to define asbestos. Representatives from the U.S Geological Survey, Bureau of Mines, the Bureau of Standards and representatives from both our Duluth Lab and the Athens Lab (which has been developing a measurement method for asbestos) were present. Table 2 of this memo contains a list of the attendees of that meeting and the agency which they represented. After considerable discussion, one conclusion was reached. There was general agreement that chrysotile was probably the most common form of asbestos and considered by all those present to be the most representative of asbestiform materials.

It becomes apparent then that not only is the question of what is asbestos in dispute, but also the question of what is an asbestos fiber. Both questions are open to scientific and medical discussion at this point. Based on the foregoing conditions and comments we would like to make the following recommendations:

### Recommendations

We recommend that for the purpose of our BAT review the term asbestos shall mean chrysotile. Chrysotile is the most commonly found form of asbestos and at present there are background levels of asbestos in both Canadian and U.S. surface waters that vary between  $10^{-5}$  and  $10^{-7}$  fiber per liter. The majority, if not all of these fibers, are chrysotile. Chrysotile is a fibrous form of serpentine and it accounts for 95% of the world's asbestos consumption. It is the most common form used in construction, and installation. Furthermore, it is the most common form found in the aquatic environment.

While this does not resolve question of what is asbestos, as it relates to mining, I believe by restricting our review of asbestos to chrysotile for the other 20 industries, this would more than adequately cover the field. There are a number of proposed analytical methods for determining chrysotile which could lend themselves to quantifying this particular material. It is therefore, our recommendation that for the purpose of the BAT review that asbestos be defined as chrysotile and that our measurements and quantifications be based on its present or absence.

ASBESTOS MINERAL'S  
FIBROUS vs NON-FIBROUS VARIETY

Fibrous or Asbestiform Variety	Chemical Composition	Non-Fibrous Variety
<u>Serpentine Group</u>		
Chrysotile	$Mg_3(Si_2O_5)(OH)_y$	Antigorite lizardite
<u>Amphibole Group</u>		
Crocidolite	$Na_2Fe_3Fe_2(Si_8O_{22})(OH.F)_2$	Riebeckite
Amosite	$(Mg.Fe)_7(Si_8O_{22})(OH)_2$	Cumington- ite-gronante
Anthophyllite asbestos	$(MgFe)_7(Si_8O_{22})(OH.F)_2$	Anthophyllite
Tremolite asbestos	$Ca_2Mg_5(Si_8O_{22})(OH.F)_2$	Tremolite
Actinolite asbestos	$Ca_2(Mg.Fe)_5(Si_8O_{22})(OH.F)_2$	Actinolite

Name	Organization	Address	Phone
B.M. Jarrett	EPA	401 M St., SW Washington, D.C.	426-4618
Malcolm Ross	U-S-G-S	National Center 959 Reston, Va. 22092	860-6657
Charles H. Anderson	EPA/ATHENS	College Station Road Athens, Ga. 30601	546-3525
Philip M. Cook	EPA/DULUTH	Duluth 55804	727-6692
Charles K. Akers	CALSPAN CORP.	P.O. Box 245 Buffalo, NY 14221	(716) 632-7311
William J. Campbell	BUREAU OF MINES	College Park, Md. 20740	(301) 344-4111
C.S. Thompson	R.T. VANDERBILT	30 Winfield St. Norwalk, Ct. 06855	(203) 853-1111
Kurt F.J. Heinrich	Nat. Bureau of Standards	Bldg. 222 Washington, DC 20234	(301) 921-2311
Bill Telliard	EPA	401 M St., SW Washington, DC	426-4617



publish the list of toxic pollutants consisting of those listed in Table 1 of Committee Print No. 95-30 of the House of Representatives Committee on Public Works and Transportation no later than 30 days after the enactment of the Act. Nine of the 65 listed pollutants (aldrin/dieldrin, benzidine, cyanide, cadmium, DDT, endrin, mercury, PCBs, and toxaphene) were previously listed as toxic pollutants by the Agency (38 FR 24324, September 7, 1973) and toxic pollutant effluent standards have been promulgated for six of these (42 FR 2588, January 12, 1977, and 42 FR 6532, February 2, 1977).

The list of 65 toxic pollutants was developed originally by a multi-disciplinary task force of scientists. Following submission to the Environmental Protection Agency of the conclusions of that task force, the Agency has received no data to indicate that any of these pollutants should be removed from the list. This list has been judicially recognized and accepted by the Federal District Court of the District of Columbia in *NRDC v. Train*, 8, E.R.C. 2120 (1976) and it has been explicitly required by Congress.

The listing of a pollutant pursuant to section 307(a)(1) imposes no direct economic burden. The list does, however, form a basis for the development of effluent limitations for categories of classes of point sources pursuant to section 301(b)(2)(A) and 304(b)(2) of the Act, or section 307(a)(2).

This list has been subjected to administrative, judicial, and legislative review. From time to time the Administrator may revise the list and is authorized to add or remove pollutants taking into account the toxicity of the pollutant, its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the toxic pollutant on such organisms.

The Administrator anticipates that, in the near future, he will propose adding pollutants to this list. To assist the Administrator in the list revision process, public comment is invited and should be directed to Kenneth M. Mackenthum, Director, Criteria and Standards Division (WH-585), 401 M Street SW., Washington, D.C. 20460, telephone 202-755-0100. Petitions for modification of this list should include sufficient information to support the proposed modification.

The list of toxic pollutants is:

1. Acenaphthene.
2. Acrolein.
3. Acrylonitrile.
4. Aldrin/Dieldrin.
5. Antimony and compounds.\*
6. Arsenic and compounds.
7. Benzene.
8. Benzidine.

10. Beryllium and compounds.
11. Cadmium and compounds.
12. Carbon tetrachloride.
13. Chlordane (technical mixture and metabolites).
14. Chlorinated benzenes (other than dichlorobenzenes).
15. Chlorinated ethanes (including 1,2-dichloroethane, 1,1,1-trichloroethane, and hexachloroethane).
16. Chloroalkyl ethers (chloromethyl, chloroethyl, and mixed ethers).
17. Chlorinated naphthalene.
18. Chlorinated phenols (other than those listed elsewhere; includes trichlorophenols and chlorinated cresols).
19. Chloroform.
20. 2-chlorophenol.
21. Chromium and compounds.
22. Copper and compounds.
23. Cyanides.
24. DDT and metabolites.\*
25. Dichlorobenzenes (1,2-, 1,3-, and 1,4-dichlorobenzenes).
26. Dichlorobenzidine.
27. Dichloroethylenes (1,1-, and 1,2-dichloroethylene).
28. 2,4-dichlorophenol.
29. Dichloropropane and dichloropropene.
30. 2,4-dimethylphenol.
31. Dinitrotoluene.
32. Diphenylhydrazine.
33. Endosulfan and metabolites.
34. Endrin and metabolites.\*
35. Ethylbenzene.
36. Fluoranthene.
37. Haloethers (other than those listed elsewhere; includes chlorophenylphenyl ethers, bromophenylphenyl ether, bis(dichloroisopropyl) ether, bis-(chloroethoxy) methane and polychlorinated diphenyl ethers).
38. Halomethanes (other than those listed elsewhere; includes methylene chloride, methylchloride, methylbromide, bromoform, dichlorobromomethane, trichlorofluoromethane, dichlorodifluoromethane).
39. Heptachlor and metabolites.
40. Hexachlorobutadiene.
41. Hexachlorocyclohexane (all isomers).
42. Hexachlorocyclopentadiene.
43. Isophorone.
44. Lead and compounds.
45. Mercury and compounds.
46. Naphthalene.
47. Nickel and compounds.
48. Nitrobenzene.
49. Nitrophenols (including 2,4-dinitrophenol, dinitrocresol).
50. Nitrosamines.
51. Pentachlorophenol.
52. Phenol.
53. Phthalate esters.
54. Polychlorinated biphenyls (PCBs).\*
55. Polynuclear aromatic hydrocarbons (including benzantracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenzanthracenes, and indenopyrenes).
56. Selenium and compounds.
57. Silver and compounds.
58. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).
59. Tetrachloroethylene.
60. Thallium and compounds.
61. Toluene.
62. Toxaphene.\*
63. Trichloroethylene.
64. Vinyl chloride.
65. Zinc and compounds.

\* Effluent standard promulgated (40 CFR Part 129).

\* The term "compounds" shall include organic and inorganic compounds.

Dated: January 25, 1978.

SWEP T. DAVIS,  
Acting Assistant Administrator  
for Water and Hazardous Materials.

[FR Doc. 78-2537 Filed 1-30-78; 8:45 am]

[6560-01]

[FRL 849-5]

# DETERMINATION OF PRIMARY ENFORCEMENT RESPONSIBILITY; STATE OF WISCONSIN

## Public Notice

This public notice is issued under § 1413 of the Safe Drinking Water Act of 1977, Pub. L. 95-190 (amending 42 U.S.C. §§ 300 et. seq.), and 40 CFR § 142.10, National Interim Primary Drinking Water Regulations, published at 41 FR 2918 (January 20, 1976).

An application, dated December 9, 1977, has been received from the Secretary of the Wisconsin Department of Natural Resources, requesting that the Wisconsin Department of Natural Resources be granted primary enforcement responsibility for public water systems in the State of Wisconsin, in accordance with the provisions of this Act.

In response, I have determined, as Regional Administrator of the U.S. Environmental Protection Agency, Region V, that the Wisconsin Department of Natural Resources has met all conditions of the Safe Drinking Water Act, and subsequent regulations for the assumption of primary enforcement responsibility for public water systems in the State of Wisconsin.

The State—(1) Has adopted drinking water regulations which are no less stringent than the National Interim Primary Drinking Water Regulations;

(2) Has adopted and will implement adequate procedures for the enforcement of such State regulations, including adequate monitoring and inspections;

(3) Will keep such records and make such reports as required;

(4) Will issue variances and exemptions in accordance with the provisions of the National Interim Primary Drinking Water Regulations; and

(5) Has adopted and can implement an adequate plan for the provision of safe drinking water under emergency circumstances.

All documents relating to this determination are available for public inspection between the hours of 8 a.m. and 4:30 p.m., Monday through Friday, at the following offices:

Public Water Supply Section, Wisconsin Department of Natural Resources, 4610 University, Madison, Wis. 53707.