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MCRD PARRIS ISLAND
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LETTER REGARDING FEASIBILITY OF CONDUCTING SOIL AND GROUNDWATER ANALYSIS TO SATISFY RESOURCE CONSERVATION AND RECOVER ACT REQUIREMENTS FOR FIELD INVESTIGATIONS AT SITES 1, 2, 3, 15 AND 41 WITH ATTACHMENTS MCRD PARRIS ISLAND SC

3/3/1997

BROWN AND ROOT ENVIRONMENTAL

19.01.00.0001

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Brown & Root Environmental

C-49-03-7-014
March 3, 1997
Project Number 7394

Scott E. Glass, P.E.
Remedial Project Manager
Department of the Navy
SOUTHNAVFACENGCOM
2155 Eagle Drive
Charleston, SC 29406

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 020

Subject: Parris Island, Marine Corps Recruit Depot; South Carolina
RCRA Analysis for Field Investigation

Dear Mr. Glass:

As proposed during the conference call with the Partnering Team on February 21, 1997, four groundwater samples will be analyzed for parameters listed in Appendix IX and four soil samples will be analyzed for parameters listed in Appendix VIII. These analyses have been proposed by the State in lieu of TAL/TCL analysis and will satisfy RCRA requirements for the field investigations at Sites 1/41, 2/15, and 3.

As requested during the conference call, Brown & Root Environmental has evaluated the feasibility of conducting soil and groundwater analysis for Appendix VIII and Appendix IX constituents, respectively. Attachments A, B, C, and D provides supporting information for the evaluation.

Based on the evaluation conducted by Brown & Root Environmental, Appendix IX constituents can readily be analyzed on groundwater samples. The parameters listed in Appendix IX are shown in Attachment A along with the proposed method of analysis. Also shown in Attachment A is a comparison of Appendix IX parameters to the TAL/TCL.

The evaluation also indicated that there are technical concerns in analyzing Appendix VIII parameters. These concerns have been documented in the July 24, 1986 Federal Register (Volume 151 Number 142, pages 26632 through 26642). These concerns are summarized below and are in reference to conducting analysis of Appendix VIII parameters for groundwater:

- Standards for many of these compounds are not commercially available;
- Some compounds are not stable;
- Some compounds degrade immediately in water or exist only in the ionic form in water;
- There are no RCRA (SW-846 methods) methods available (or any other) for analysis; and
- Coelution is a chromatographic problem.

Attachment B contains a copy of the above referenced Federal Register which contains additional details (see section V) on the above concerns. As a result of these concerns, Appendix IX was developed as a subset of Appendix VIII along with several additional chemicals designated by the Regional Administrator. The Federal Register does not discuss the technical feasibility of conducting soil analysis

for the Appendix VIII list. However, it is believed that the above concerns also cause technical problems in soil analysis of Appendix VIII parameters.

Because of the concerns with conducting the Appendix VIII Analysis on soil, a subset of chemicals are proposed for the field investigation at Parris Island. The proposed list consists of the Appendix IX list and those chemicals listed in Attachment C. Those chemicals not proposed from Appendix VIII are shown in Attachment D. These chemicals have not been selected for several reasons which are as follows:

- Lack of established analytical methodologies.
- Chemicals are rare which make standards difficult to obtain.
- Development of analytical methods would be costly.
- Chemicals are specific to a particular manufacturing process which was not conducted at Parris Island.

In summary, Brown & Root Environmental believes it is feasible to test for the following constituents:

- Groundwater: Chemicals contained in Attachment B (Appendix IX)
- Soil : Chemicals contained in Attachment B and C

These issues can be discussed further during the conference call scheduled for 10:00 AM on March 6, 1997. Pricing for the above analysis is anticipated to be costly and will be provided during the conference call.

Should you have any questions please call Jason Brown at 412-921-8401 or myself at 412-921-8916.

Sincerely,

Mark P. Speranza

Mark P. Speranza
Task Order Manager

MPS/dt
Attachments

c: D. Evans-Ripley, SOUTHDIV (w/o attachment)
D. Bradley, MCRD
A. Humphris, USEPA
S. Peterson, DHEC
D. Hargrove, DHEC
K. Atchley, Bechtel
D. Kopeski, Galileo
D. Wroblewski, B&R Environmental (w/o attachment)
J. Brown, B&R Environmental
R. Simcik, B&R Environmental
J. Samchuck, B&R Environmental
G. Wagner, B&R Environmental
K. Johnson, B&R Environmental
File 7394

Attachment A

APPENDIX IX - GROUND WATER MONITORING LIST

Common name	Suggested methods	TCL	TAL
Barium	6010A		X
Beryllium	6010A		X
Cadmium	6010A		X
Chromium	6010A		X
Cobalt	6010A		X
Copper	6010A		X
Nickel	6010A		X
Silver	6010A		X
Thallium	6010A		X
Vandium	6010A		X
Zinc	6010A		X
Antimony	7041		X
Arsenic	7060A		X
Lead	7421		X
Mercury	7470A		X
Selenium	7740		X
Tin	7870		
1,4-Dioxane	8015A		
Acetonitrile; Methyl cyanide	8015A		
Isobutyl alcohol	8015A		
Methacrylonitrile	8015A		
Propionitrile;Ethyl cyanide	8015A		
Acrolein	8030A		
Acrylonitrile	8030A		
Aldrin	8081	X	
alpha-BHC	8081	X	
beta-BHC	8081	X	
delta-BHC	8081	X	
gamma-BHC;Lindane	8081	X	
Chlordane	8081	X	
4,4'-DDD	8081	X	
4,4'-DDE	8081	X	
4,4'-DDT	8081	X	
Diallate	8081		
Dieldrin	8081	X	
Endosulfan I	8081	X	
Endosulfan II	8081	X	
Endosulfan sulfate	8081	X	
Endrin	8081	X	
Endrin aldehyde	8081	X	
Endrin Ketone*	8081	X	
Heptachlor	8081	X	
Heptachlor epoxide	8081	X	
Isodrin	8081		
Kepone	8081		
Methoxychlor	8081	X	
Polychlorinated biphenyls; PCBs	8081	X	
Toxaphene	8081	X	
Methyl parathion; Parathion methyl	8141A		
Disulfoton	8141A		
Phorate	8141A		
Tetraethyl dithiopyrophosphate; Sulfotepp	8141A		
2,4-D; 2,4-Dichlorophenoxyacetic acid	8151		
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	8151		

* Chemical is not contained in Appendix IX; however, it is a TCL compound.

APPENDIX IX - GROUND WATER MONITORING LIST

Common name	Suggested methods	TCL	TAL
Silvex; 2,4,5-TP	8151		
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	8151		
Acetone	8260A	X	
Allyl chloride	8260A		
Benzene	8260A	X	
Bromodichloromethane	8260A	X	
Bromoform; Tribromomethane	8260A	X	
Carbon disulfide	8260A	X	
Carbon tetrachloride	8260A	X	
Chlorobenzene	8260A	X	
Chloroethane; Ethyl chloride	8260A	X	
Chloroform	8260A	X	
Chloroprene	8260A		
Dibromochloromethene; Chlorodibromomethane	8260A	X	
1,2-Dibromo-3-chloropropane; DBCP	8260A		
1,2-Dibromoethane; Ethylene dibromide	8260A		
trans-1,4-Dichloro-2-butene	8260A		
Dichlorodifluoromethane	8260A		
1,1-Dichloroethane	8260A	X	
1,2-Dichloroethane; Ethylene dichloride	8260A	X	
1,1-Dichloroethylene; Vinylidene chloride	8260A	X	
trans-1,2-Dichloroethylene	8260A	X	
1,2-Dichloropropane	8260A	X	
cis-1,3-Dichloropropene	8260A	X	
trans-1,3-Dichloropropene	8260A	X	
Ethylbenzene	8260A	X	
Ethyl methacrylate	8260A		
2-Hexanone	8260A	X	
Methyl bromide; Bromomethane	8260A	X	
Methyl chloride; Chloromethane	8260A	X	
Methylene bromide; Dibromomethane	8260A		
Methylene chloride; Dichloromethane	8260A	X	
Methyl ethyl ketone; 2-Butanone	8260A	X	
Methyl iodide; Iodomethane	8260A		
Methyl methacrylate	8260A		
4-Methyl-2-pentanone; Methyl isobutyl ketone	8260A	X	
Styrene	8260A	X	
1,1,1,2-Tetrachloroethane	8260A		
1,1,2,2-Tetrachloroethane	8260A	X	
Tetrachloroethylene; Perchloroethylene; Tetrachlorothene	8260A	X	
Toulene	8260A	X	
1,1,1-Trichloroethane; Methylchloroform	8260A	X	
1,1,2-Trichloroethane	8260A	X	
Trichloroethylene; Trichloroethene	8260A	X	
Trichlorofluoromethane	8260A		
1,2,3-Trichloropropane	8260A		
Vinyl acetate	8260A		
Vinyl chloride	8260A	X	
Xylene (total)	8260A	X	
Acenaphthene	8270B	X	
Acenaphthylene	8270B	X	
Acetophenone	8270B		

* Chemical is not contained in Appendix IX; however, it is a TCL compound.

APPENDIX IX - GROUND WATER MONITORING LIST

Common name	Suggested methods	TCL	TAL
2-Acetylaminofluorene; 2-AAF	8270B		
4-Aminobiphenyl	8270B		
Aniline	8270B		
Anthracene	8270B	X	
Aramite	8270B		
Benzo[a]anthracene; Benzantracene	8270B	X	
Benzo[b]fluoranthene	8270B	X	
Benzo[k]fluoranthene	8270B	X	
Benzo[ghi]perylene	8270B	X	
Benzo[a]pyrene	8270B	X	
Benzyl alcohol	8270B		
Bis(2-chloroethoxy)methane	8270B	X	
Bis(2-chloroethyl)ether	8270B	X	
Bis(2-chloro-1methylethyl)ether; 2,2'-Dichlorodiisopropyl ether	8270B	X	
Bis(2-ethylhexyl) phthalate	8270B	X	
4-Bromophenyl phenyl ether	8270B	X	
Butyl benzyl phthalate; Benzyl butyl phthalate	8270B	X	
Carbzole*	8270B	X	
p-Chloroaniline; 4-chloroaniline	8270B	X	
Chlorobenzilate	8270B		
p-Chloro-m-cresol; 4-Chloro-3-methylphenol	8270B	X	
2-Chloronaphthalene	8270B	X	
2-Chlorophenol	8270B	X	
4-Chlorophenyl phenyl ether	8270B	X	
Chrysene	8270B	X	
m-Cresol; 2 Methlyphenol	8270B	X	
o-Cresol; 3-Methylphenol	8270B	X	
p-Cresol; 4-Methylphenol	8270B	X	
Dibenz[a,h]anthracene	8270B	X	
Dibenzofuran	8270B	X	
Di-n-butyl phthalate	8270B	X	
o-Dichlorobenzene; 1,2-Dichlorobenzene	8270B	X	
m-Dichlorobenzene; 1,3-Dichlorobenzene	8270B	X	
p-Dichlorobenzene; 1,4-Dichlorobenzene	8270B	X	
3,3'-Dichlorobenzidine	8270B	X	
2,4-Dichlorophenol	8270B	X	
2,6-Dichlorophenol	8270B		
Diethyl phthalate	8270B	X	
O,O-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin	8270B		
Dimethoate	8270B		
p-(Dimethylamino)azobenzene	8270B		
7,12-Dimethylbenz[a]anthracene	8270B		
3,3'-Dimethylbenzidine	8270B		
alpha, alpha-Dimethylphenethylamine	8270B		
2,4-Dimethylphenol	8270B	X	
Dimethyl phthalate	8270B	X	
m-Dinitrobenzene	8270B		
4,6-Dinitro-o-cresol	8270B		
2,4-Dinitrophenol	8270B	X	
2,4-Dinitrotoluene	8270B	X	
2,6-Dinitrotoluene	8270B		

* Chemical is not contained in Appendix IX; however, it is a TCL compound.

APPENDIX IX - GROUND WATER MONITORING LIST

Common name	Suggested methods	TCL	TAL
Di-n-octyl phthalate	8270B	X	
Diphenylamine	8270B		
Endrin aldehyde	8270B	X	
Ethyl methanesulfonate	8270B		
Famphur	8270B		
Fluoranthene	8270B	X	
Fluorene	8270B	X	
Hexachlorobenzene	8270B	X	
Hexachlorobutadiene	8270B	X	
Hexachlorocyclopentadiene	8270B	X	
Hexachloroethane	8270B	X	
Hexachlorophene	8270B		
Hexachloropropene	8270B		
Indeno[1,2,3-cd]pyrene	8270B	X	
Isophorone	8270B	X	
Isosafrole	8270B		
Methapyrilene	8270B		
3-Methylcholanthrene	8270B		
Methyl methanesulfonate	8270B		
2-Methylnaphthalene	8270B	X	
Naphthalene	8270B	X	
1,4-Maphthoquinone	8270B		
1-Naphthylamine	8270B		
2-Naphthylamine	8270B		
o-Nitroaniline; 2-Nitroaniline	8270B	X	
m-Nitroaniline; 3-Nitroaniline	8270B	X	
p-Nitroaniline; 4-Nitroaniline	8270B	X	
Nitrobenzene	8270B	X	
o-Nitrophenol; 3-Nitrophenol	8270B	X	
p-Nitrophenol; 4-Nitrophenol	8270B	X	
4-Nitroquinoline-1-oxide	8270B		
N-Nitrosodi-n-butylamine	8270B		
N-Nitrosodiethylamine	8270B		
N-Nitrosodiphenylamine	8270B	X	
N-Nitrosodipropylamine; Di-n-propyinitrosamine	8270B	X	
N-Nitrosomethylethylamine	8270B		
N-Nitrosomorpholine	8270B		
N-Nitrosopiperidine	8270B		
N-Nitrosopyrrolidine	8270B		
5-Nitro-o-toluidine	8270B		
Parathion	8270B		
Pentachlorobenzene	8270B		
Pentachloroethane	8270B		
Pentachloronitrobenzene	8270B		
Pentachlorophenol	8270B	X	
Phenacetin	8270B		
Phenanthrene	8270B	X	
Phenol	8270B	X	
p-Phenylenediamine	8270B		
2-Picoline	8270B		
Pronamide	8270B		
Pyrene	8270B	X	
Pyridine	8270B		
Safrole	8270B		

* Chemical is not contained in Appendix IX; however, it is a TCL compound.

APPENDIX IX - GROUND WATER MONITORING LIST

Common name	Suggested methods	TCL	TAL
1,2,4,5-Tetrachlorobenzene	8270B		
2,3,4,6-Tetrachlorophenol	8270B		
o-Touidine	8270B		
1,2,4-Trichlorobenzene	8270B	X	
2,4,5-Trichlorophenol	8270B	X	
2,4,6-Trichlorophenol	8270B	X	
O,O,O-Triethyl phosphorothioate	8270B		
sym-Trinitrobenzene	8270B		
Polychlorinated dibenzo-p-dioxins; PCDDs	8280		
Polychlorinated dibenzofurans; PCDFs	8280		
2,3,7,8-TCDD; 2,3,7,8-Tetrachlorodibenzo-p-dioxin	8280		
Cyanide	9010A		X
Sulfide	9030A		

* Chemical is not contained in Appendix IX; however, it is a TCL compound.

Attachment B

federal register

Thursday
July 24, 1986

Part II

Environmental Protection Agency

40 CFR Parts 264 and 270

Hazardous Waste Management System; Ground-Water Monitoring; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 264 and 270

[SW-FRL-3018-5]

Hazardous Waste Management System; Ground-Water Monitoring

AGENCY: Environmental Protection Agency.

ACTION: Proposed Rule and Request for Comments.

SUMMARY: The Environmental Protection Agency is today proposing to amend its regulations concerning ground-water monitoring with regard to analyzing suspected contamination from regulated units at land-based hazardous waste treatment, storage, and disposal facilities. The amendments would replace current requirements to analyze for the general list of all constituents on Appendix VIII to Part 261 with new requirements to analyze for a specific ground-water monitoring list of chemicals (Appendix IX to Part 264), plus additional chemicals designated by the Regional Administrator on a site-specific basis.

DATES: Comments must be submitted on or before September 22, 1986.

ADDRESSES: Comments should be submitted to the RCRA Docket Section (WH-562), U.S. EPA, 401 M Street, SW., Washington, DC 20460 [Attention: Docket No. F-86-GWAP-FFFFF]. The public docket, including the background documents cited in this preamble, is located in Room S-212 and is available for viewing from 9:30 A.M. to 3:30 P.M., Monday through Friday, excluding legal holidays.

FOR FURTHER INFORMATION CONTACT: For general information contact the RCRA Hotline, Office of Solid Waste (WH-562), U.S. EPA, 401 M Street, SW., Washington, DC 20460, (800) 424-9346 or (202) 382-3000.

For information on specific aspects of this proposed rule contact: Dr. Robert April, Office of Solid Waste (WH-565A), U.S. EPA, 401 M Street, SW., Washington, DC 20460, (202) 382-7917.

SUPPLEMENTARY INFORMATION:

I. Authority

These regulations are being proposed under the authority of Sections 2002(a), 3001, 3004, and 3006 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6912, 6921, 6925, and 6926.

II. Background

On May 19, 1980, the Environmental Protection Agency (EPA) promulgated comprehensive regulations implementing the Resource Conservation and Recovery Act (RCRA). A major issue concerning these regulations was how to identify "hazardous" waste. To assist in this identification process, EPA developed a list of chemicals ". . . that have been shown in reputable scientific studies to have toxic, carcinogenic, mutagenic, or teratogenic effects on humans or other life forms . . ." 45 FR 33107, (May 19, 1980). This list was published as Appendix VIII to Part 261 of the regulations.

The Appendix VIII list is actually a composite of several other lists. It includes chemicals such as those identified as priority pollutants under the Clean Water Act, chemicals identified by the Department of Transportation as hazardous to transport, chemicals for which EPA's Carcinogen Assessment Group (CAG) had laboratory evidence of carcinogenicity, and chemicals which the NIOSH Registry of Toxic Effects of Chemical Substances listed as having high acute toxicity (numerically low LD_{50}).

The principal purpose of the list was to define a universe of chemicals of concern. Wastes would be matched against the list to see if they contained any chemicals from this universe. If so, they would be considered for listing as "hazardous".

Appendix VIII deliberately included many listings that are large categories of chemicals. Many of the Appendix VIII listings, especially from the CAG and NIOSH lists, were laboratory curiosities, as opposed to commercial products. Chemicals were listed on Appendix VIII as they would exist in a pure state, as opposed to the forms they would be expected to take after being dispersed in the environment. For waste identification purposes these characteristics of Appendix VIII do not present a problem. In looking for hazardous waste EPA emphasized breadth of coverage. No attempt was made to examine factors such as amount of production or environmental fate in compiling Appendix VIII, although the hazardous waste listing regulations require EPA to consider such factors before listing a waste because it contains an Appendix VIII chemical (see 40 CFR 261.11(a) (3)). As a result, Appendix VIII contains both prevalent, mobile, and toxic chemicals that present major risks in ground water at hazardous waste sites (e.g., trichloroethene), and chemicals which do not present such risks (e.g., aflatoxins), because of factors such as low prevalence or instability in water.

On July 26, 1982, EPA promulgated RCRA regulations that implemented a strategy for ground-water protection for land-based hazardous waste management units operating under RCRA permits. Once ground-water contamination is suspected, the strategy requires an analysis to determine the nature of the contamination. This information is used to assess the problem, determine the appropriate remedy, determine when the remedy is effective, and insure that no new problems arise during the time the remedy is being applied. These regulations are described in greater detail in Section IV of this preamble. In an attempt to be totally comprehensive, the regulations provided that contaminated ground water be analyzed for all constitutents contained in Appendix VIII to Part 261.

Reexamination of that decision now seems necessary. While appropriate for hazardous waste listing purposes, the Appendix VIII list has presented a host of problems when used for purposes of ground-water monitoring. These include practical analytical problems such as listings which are large categories of chemicals, the dissociation or actual decomposition of many Appendix VIII constituents when placed in water, and the lack of analytical standards or suitable analytical methods for many constituents.

EPA has been aware of potential analytical problems with "Appendix VIII analysis" for some time, although the magnitude of the difficulties was not apparent until the analyses were actually attempted. At the time of promulgation of the 1982 regulations EPA acknowledged that it lacked analytical methods for nine of the Appendix VIII constituents. See 47 FR 32296 (July 26, 1982). When owners and operators of hazardous waste facilities began to attempt Appendix VIII analyses, however, EPA learned that analysis would be extremely difficult or impossible for a larger number of contituents.

EPA took several actions intended to mitigate the problems. For example, EPA recommended the use of enforcement discretion for some of the most intractable problems it had identified at the time. See the August 16, 1984 memorandum from Courtney Price and Lee Thomas on "Enforcing Ground-Water Monitoring Requirements in RCRA Part B Permit Applications" (background document 10). Also, in

1984. EPA proposed to eliminate 22 Appendix VIII constituents from the ground-water analysis requirements. 49 FR 38786 (October 1, 1984).

Comments on the October, 1984 proposal raised questions about a number of additional analytical problems. Also, EPA gathered further information from interactions between RCRA permitting authorities, owner/operators, and analytical laboratories. EPA's own experience with conducting ground-water screening analyses for its ground-water monitoring task force and analytical methods development confirmed many of these problems. These experiences demonstrated to EPA that analytical problems with Appendix VIII were far more serious than previously believed. It became clear that previous attempts at solutions had been almost totally inadequate and that a major change was required.

In response to this need, EPA convened a meeting on December 10–13, 1985, of some 30 technical experts. These experts came from EPA offices in Washington and elsewhere, from EPA laboratories, and from State offices and laboratories. The list of meeting participants is contained in background document 24. Many had advanced degrees and/or substantial laboratory experience. Over four days, they evaluated all of Appendix VIII with regard to the feasibility of analysis of the various constituents. They utilized the information contained in background documents 1–23 of this rulemaking and their own extensive experience. They identified a list of specific chemicals, derived from Appendix VIII, which they considered generally suitable for ground-water analyses at all facilities. They recommended that 25 additional chemicals, routinely analyzed in ground water by the Superfund office, also be analyzed.

The results of the December meeting have been summarized in a document entitled "Guidance on Issuing Permits to Facilities Required to Analyze Ground Water for Appendix VIII Constitutents". This document included the core list of chemicals proposed today. A notice of availability and request for comments on this guidance was placed in the **Federal Register** (51 FR 5561 (February 14, 1986)). The comment period closed on March 17, 1986. Comments received were generally favorable to EPA's approach, although some specific concerns were raised. A summary of comments received and EPA's responses follows. The complete comments are contained in background documents 26–41 of this rulemaking.

Comment: The changes to the monitoring requirement are appropriate but should go farther. Monitoring should be limited to those chemicals expected to be present at a given site.

Response: This concept will be evaluated in EPA's next phase of rulemaking involving ground-water monitoring. (See the discussion immediately below these comments, which describes the phases in detail.) In this proposal only analytical feasibility is being addressed. However, EPA generally believes that past waste disposal practices were not sufficiently controlled to allow certain knowledge of what was disposed of at a site.

Comment: The general technical principles used to develop the list are sound, and we agree that High Performance Liquid Chromatography (HPLC) is not currently feasible for unknown chemicals in ground water. However, there are a number of chemicals on the list recommended for analysis for which no standards are available, or, for which the standard analytical methods will not work.

Response: EPA agrees that there are still questions as to the analytical feasibility for some Appendix VIII chemicals. A number of these chemicals are specifically identified below. (See Section VII.A.) EPA is seeking public comment on this issue and will continue to evaluate the feasibility of analysis of chemicals on the core list before promulgation.

Comments: The new list is a reasonable starting point. However, some Appendix VIII chemicals which do not appear can, in fact, be analyzed. Also, some additional representatives of the categories should be added to bring the list closer to that used by the Superfund program.

Response: EPA is requesting comment on additional chemicals which it now believes may be analyzed. (See Section VII.A.) EPA agrees that some additions to the proposed ground-water monitoring list may be appropriate.

Comment: Dioxins should not be included on the core list. At many facilities the hazards of analysis pose a greater threat than the possibility of dioxin presence. Analysis for dioxins should, therefore, be targeted to specific facilities where their presence is suspected.

Response: Generally EPA believes that risks of site contamination outweight any risks of analysis. However, dioxins may be a special case. See Section VII.B., below, requesting comment on this issue.

Comment: The additional chemicals from the Superfund program include several metals which are non-toxic and ubiquitous in ground water. Analysis for these should not be required.

Response: EPA believes that analyses will aid in analyzing ground-water contamination by providing important information on the basic ground-water chemistry. See Section VII.C., below, for details.

Comment: The additional chemicals from the Superfund list are not appropriate for RCRA and should not be included in the RCRA list.

Response: Some Superfund chemicals are useful in characterizing ground-water chemistry, as discussed above. Others are important commercial chemicals frequently found at hazardous waste sites, either Superfund or RCRA and, therefore, useful in the ground-water monitoring program. See Section VII.C., below, for details. As a long range goal, EPA plans to harmonize ground-water monitoring in the Superfund and RCRA programs.

Comment: EPA should set levels of concern for each chemical and not require reporting of values below these levels.

Response: EPA's present regulations are based on the premise that any leakage of hazardous waste from a site may be of concern. If, in a particular situation, an owner/operator feels that the level of chemical that is leaking is small enough to be protective of human health and the environment he may apply for an alternate concentration limit (see 40 CFR 264.94(b)). EPA is gathering information on levels of concern for a variety of purposes and may, at some point, set general levels of concern on a chemical-by-chemical basis. This issue is outside of the scope of this rulemaking.

Comment: EPA needs to provide more detailed information on analytical methodology for these chemicals than presently exists in SW–846. Additionally, EPA should allow the use of the methods developed under section 304(h) of the Clean Water Act.

Response: EPA agrees with this comment and is engaged in a major effort to revise SW–846. A recent list of potential SW–846 methods for the proposed Appendix IX is given in background document 48. Additional information about possible methods is given in background documents 20, 42, and 43. At the present time the specific methods in SW–846 are not mandatory for the ground-water monitoring requirements in the RCRA regulations. Laboratories who wish to use the 304(h) methods, including the quality assurance and quality control procedures, to analyze appropriate

chemicals on the ground-water monitoring list, should generally find the results acceptable to permitting authorities. However, data must be provided for all RCRA chemicals, not merely those on the Clean Water Act priority pollutant list.

Comment: EPA should specify which chemicals on the ground-water monitoring list came from which categories on the Appendix VIII list.

Response: This information is available in background document 24 and the Index to the background documents for this rulemaking. See also section VII.A. and VII.F., below.

Today's proposal represents the first phase of a two-phase project on ground-water monitoring under RCRA. Based on EPA's examination of the analytical problems with Appendix VIII, we are proposing to replace ground-water monitoring of Appendix VIII with monitoring of a ground-water monitoring list of 250 specific chemicals (proposed Appendix IX to Part 264). The Regional Administrator also has the authority to require monitoring of other chemicals as needed on a site-specific basis. The Regional Administrator may impose these requirements by using the new "omnibus" authority for permit conditions needed to protect human health and the environment codified at 40 CFR 270.32(b)(2).

In addition to changes required by analytical problems, a strong case can be made that environmental protection would be enhanced by focusing on a priority list of chemicals. These two factors (analytical problems and environmental effectiveness) caused EPA's National Pollutant Discharge Elimination System (NPDES) program to reduce a list of thousands of "toxic" chemicals to a core list of 129 specific priority pollutants in implementing the NPDES toxic controls. A later proposal will address the issue of increasing the effectiveness of RCRA monitoring by focusing on a set of priority pollutants.

The core list was generated for purposes of general ground-water screening analyses only. It does not affect the use of Appendix VIII for other purposes such as listing hazardous wastes or conducting corrective action for releases to any other environmental medium.

III. Summary of Proposal

Today's proposal resolves the practical problems of conducting a broad ground-water screening by replacing the requirement to monitor for all Appendix VIII constituents with a requirement to monitor for all chemicals on a core list (proposed Appendix IX to Part 264) plus additional chemicals as required by the Regional Administrator on a site-specific basis. The core list was developed at the December 1985 meeting described above. It was derived by adding to Appendix VIII 25 chemicals routinely monitored in ground-water by the Superfund program, by deleting from Appendix VIII chemicals that are unstable in water, not amenable to EPA's standard analytical methods for screening (gas chromatography (GC) or gas chromatography/mass spectrometry (GC/MS) for organics, atomic absorption (AA) or inductively coupled plasma spectroscopy (ICAP) for metals), and by selecting appropriate representatives for ionic compounds and categories. Section V, below, details this process.

The Regional Administrator should consider several factors in deciding whether to require monitoring for additional chemicals. For on-site facilities these factors include whether a particular chemical is a known product or a known or suspected byproduct produced at the site. For off-site facilities they include whether the chemical is known or suspected to have been disposed at the site. In all cases the magnitude of any analytical problems should be considered. Background document 25, EPA's interim guidance on this issue (available through the RCRA Hotline, (800) 429-9346 or (202) 382-3000) will be useful in this regard. It lists the analytical problems identified in the December meeting for each Appendix VIII constituent not on the new Appendix IX to Part 264 list.

IV. Present Requirements for Monitoring Ground Water for Appendix VIII constituents

Regulations in Parts 264 and 270 establish a progressive sequence of ground-water monitoring requirements for land-based hazardous waste treatment storage, or disposal facilities. At specified points in the sequence, the owner or operator of any facility known or suspected to be leaking must analyze ground water for all Appendix VIII constituents to determine the nature and extent of the contamination. Two of those requirements appear in the regulations applying to units operating under RCRA permits. Where no ground-water contamination has been detected prior to permit issuance, the operating standards of Subpart F of Part 264 require the owner/operator to sample for selected indicator parameters under a detection monitoring program. If the owner/operator observes an increase in any indicator parameter, he must analyze immediately for all hazardous constituents listed in Appendix VIII to Part 261. 40 CFR 264.98(h)(2). The EPA Regional Administrator will then set "ground-water protection standards" based on the hazardous constituents found in this analysis. 40 CFR 264.92, 264.93, 264.99(a). The owner/operator must change to a compliance monitoring program focused on measuring increases in constituents for which ground-water protection standards were set. A separate provision in the compliance monitoring program, however, also requires the owner/operator to sample each monitoring well annually for all constituents on the Appendix VIII list. 40 CFR 264.99(f). The purpose of this annual scan is to allow EPA to consider setting additional ground-water protection standards for any new hazardous constituents found. Finally, if the level of a constituent exceeds a ground-water protection standard, the owner or operator must undertake corrective action. 40 CFR 264.100.

The third requirement for a complete Appendix VIII scan appears in the permit application requirements. If a plume of contamination has entered ground water prior to permit issuance, the permit application rules for land-based hazardous waste units require the owner or operator to conduct a full scan for "each" Appendix VIII constituent. 40 CFR 270.14(c)(4). If the scan detects hazardous constituents, the owner or operator must submit all data needed to establish a compliance monitoring or corrective action program. 40 CFR 270.14 (c)(7), (c)(8).

The standards for corrective action in § 264.100 also require owners and operators to implement a ground-water monitoring program that "may be based on the requirements for compliance monitoring under § 264.99 and must be as effective as that program in determining compliance with the ground-water protection standard . . . and in determining the success of the corrective action program . . .". 40 CFR 264.100(d). This provision does not explicity call for analysis of Appendix VIII constituents. It does, however, refer to the compliance monitoring program, which includes a requirement for an annual Appendix VIII scan. That annual Appendix VIII scan, however, is not directed at measuring compliance with the ground-water monitoring standard. Since corrective action monitoring is oriented toward determining compliance with the ground-water protection standard, EPA did not intend to incorporate the Appendix VIII scan from compliance monitoring into corrective action monitoring.

The Regional Administrator, however, may find it necessary in some cases to

require an owner or operator to test for all Appendix VIII constituents to determine the success of the corrective action program. For example, a corrective action program might consist of treatment directed at specific constituents rather than removal of an entire contaminated plume. Under those circumstances, the Regional Administrator might decide it would be necessary to analyze periodically for additional constituents to ensure that constituents which the treatment program did not address had not also started escaping from the hazardous waste unit.

V. Technical Problems and Proposed Solutions

Analyzing ground water for all Appendix VIII constituents is impossible for several reasons. Appendix VIII is ill-defined: some listings are ambiguous and others are indefinitely large classes of compounds. When placed in water some Appendix VIII constituents separate into ions which must be measured as such, while others actually react with water and decompose. Many Appendix VIII constituents are so rare that analytical standards are unavailable. While experience with analysis of many constituents is sparse, preliminary results indicate that many constituents are not measured adequately or even detected at all by EPA's standard analytical methods.

A. Ambiguous listings and categories

Ambiguous listings on Appendix VIII have been clarified with the addition of systematic names which specify the exact chemical structure. These names generally utilize the nomenclature of the Ninth Collective Index of Chemical Abstracts, and are generally known as "9CI" names. Chemical Abstracts Service Registry Numbers have been added.

Each of the categories of compounds was carefully examined. In most cases, some or all members of the category were already listed separately on Appendix VIII, and those separate listings have been chosen to represent the category. In other cases, it was possible to identify a single analyte, generally a metal, that adequately represented the category. In several instances EPA has decided to list as representatives chemicals that EPA earlier identified as priority pollutants under the Clean Water Act or for ground-water analysis under Superfund. EPA feels that such chemicals would make appropriate representatives of Appendix VIII categories because EPA has found that chemicals on these lists generally pose significant environmental threats. The priority pollutant list, for example, was based on production volumes and environmental risks. In a few cases there are no members of a category listed separately on Appendix VIII or on the other two lists. To avoid leaving these categories unrepresented, EPA has selected a common commercial chemical from the category as a representative.

B. Constituents Reactive with Water

Since ionic compounds dissociate in water, Appendix VIII analysis must focus on the inorganic anions and cations that are significant in ground water. Action is based on total levels of, for example, cadmium or cyanide, without regard for what compound was their source. Appendix VIII ionic constituents have, therefore, been replaced by listings of individual ions or elements. Constituents that decompose in water within approximately two days have been excluded from the proposed list.

C. Organometallic constituents

EPA has not found generally applicable and reliable analytical methods for detecting organometallic compounds. Methods EPA normally uses to identify organic compounds do not produce reliable data for chemicals that contain both organic and metallic components. Methods that identify metals can detect the metallic components of these compounds, but they cannot distinguish between these components and metallic ions from inorganic compounds or pure metals. Thus, a positive test for a metal would not allow EPA to conclude that it had identified an organometallic compound and the listing on Appendix VIII was based on the hazards of the compound, not the metal. Consequently, EPA is proposing not to include organometallic constituents on the new ground water monitoring list. All the metals included in these compounds are proposed for inclusion in this list for other reasons, so releases of organometallic compounds will still trigger monitoring and corrective action requirements.

D. Unavailable standards

Constituents without commercially available standards have also been excluded. It is possible to analyze for such constituents using similar chemicals as surrogate standards, but such data are inherently less reliable. For the purpose of this proposal, "unavailability" means that reasonably pure samples of a chemical are not generally available to analytical laboratories. While this decision was based on the difficulty of producing reliable analytical data without standards, EPA believes there will be serendipitous environmental benefits. The absence of commercially available standards means there is no market for the pure chemical. Also, most of the chemicals in this group are so complex as to be unlikely to be accidental byproducts. Consequently, the chemical is unlikely to be sent to hazardous waste facilities for disposal. Were EPA to require widespread analysis of such a chemical, it would create an incentive for a specialty chemical manufacturer to start production of the chemical for laboratory use—clearly an undesirable result.

E. Lack of standardized test methods

Standard methods used in a variety of EPA programs for analysis of large groups of compounds in water are atomic absorption (AA) or inductively coupled plasma (ICP) for metals, gas chromatography/mass spectroscopy (GC/MS) for most organics, and gas chromatography (GC) for high sensitivity pesticide analysis. For some Appendix VIII constituents which are not amenable to these methods, high performance liquid chromatography (HPLC) has been proposed. Single-column HPLC, however, does not positively identify compounds and, therefore, is inappropriate for complex samples containing unknown constituents. These are precisely the conditions that apply when the regulations call for Appendix VIII analyses. This problem limits the usefulness of HPLC in this situation. EPA is actively pursuing research into multiple column HPLC systems or coupling HPLC with mass spectroscopy to address this problem. Until this is accomplished, HPLC analysis of complex ground water samples containing unknown chemicals is not feasible.

Some constituents that EPA preliminarily identified as analyzable by EPA's GC/MS methods have proven not to yield reliable results, so these constituents have been excluded from the new list. EPA is pursuing research into improved GC/MS methods to address this problem. However, EPA has decided not to exclude a number of compounds of limited volatility that do not respond to a conventional GC/MS analysis using conventional purge and trap sample preparation. EPA decided to recommend these compounds for routine analysis because they can be detected by using a heated purge and trap method to prepare for GC/MS. Heated purge and trap occurs in conjunction with GC in the RCRA methods and in

conjunction with GC/MS in other EPA methods. Background document 49 contains a list of Appendix IX chemicals EPA believes might be best analyzed by heated purge and trap. Background documents 20, 42, and 43 also contain some information on this topic.

EPA has received additional laboratory data since the core list was first drafted in December 1985. In the majority of cases this new data has confirmed the December list. In some cases the new data differs from the December list. This is not surprising since there is not much experience with analysis of these chemicals in ground water and laboratories may achieve different results due to subtle differences in analytical methods. Those chemicals for which there are conflicting data are listed in Section VII.A. below.

A series of background documents comprise the material that EPA used to develop the core list. They are available for examination as part of the public docket for this rulemaking. Documents 1–23 were distributed to the participants at the December meeting, and documents 24–49 were obtained after this meeting.

VI. Environmental Impacts

Environmental impacts were not specifically considered in the process which led to the derivation of the new list from Appendix VIII, with the exception of choosing representatives for ionic compounds or for categories. Only analytical feasibility was explicitly considered. However, EPA has recognized a number of environmental implications in the development of the new list.

In order to understand the environmental impacts of today's proposal, it is useful to consider the purpose of monitoring lists in pollution control programs and the nature of the monitoring lists used in other EPA programs. There are more than 70,000 chemicals in production in the U.S. (The Toxic Substances Control Act Inventory lists over 60,000, with several exclusions, such as non-commercial byproducts, pesticides, and drugs.) Many of these "chemicals" are actually complex combinations of individual chemical species (e.g., coal tar, which is a complex combination of hundreds of organic chemicals), so the actual number of unique chemical species produced is probably 2–10 times larger. Any potential monitoring list obviously represents a tiny subset, perhaps .0001 of the total. Therefore, a monitoring list does not attempt to exhaustively analyze pollution but rather seeks to provide an indication of pollution. The implied assumption is that by cleaning up these indicators we will adequately control other toxic chemicals.

This purpose implies a number of desirable characteristics of chemicals placed on monitoring lists. Since it is impractical to search exhaustively, they should be the most important chemicals, i.e., those produced in large volumes and likely to be found at many sites. Since they will be measured and actions will be based upon the results obtained over a period of time they should be able to be measured reliably and reproducibly. They should cover a range of environmental fate and transport characteristics since they will serve as surrogates for the fate and transport of a large number of chemicals. Finally, the list must be long enough to adequately reduce the possibility of a false negative result, where pollution exists that is not indicated by any of the indicators on the monitoring list.

There are insufficient data to quantify the last criteria and specify how long is long enough. However, the practices and experiences of other EPA offices are useful in forming an opinion. The Office of Water routinely monitors a list of 126 priority pollutants. In monitoring industry effluents, the Office generally only finds a fraction of these and has found it necessary to regulate only a smaller fraction, since those regulated also effectively regulate others on the list of 126. The Superfund office has routinely monitored 150 chemicals (the priority pollutants plus 24 additional high volume commercial chemicals) and has found that some of the list of 150 are found at many sites, while others are rarely, if ever, seen. The Offices of Air and Drinking Water routinely regulate fewer than 100 chemicals. At the December meeting, the experts agreed that some of the chemicals listed on the core list would be present at any site contaminated by any Appendix VIII chemical. Based on the experience of other EPA offices and the opinion of the technical experts at the December meeting, EPA has confidence that the new list is long enough to reduce the possibility of false negatives to a negligible level.

EPA did not explicitly consider production or prevalence in waste or ground water in developing the new list. Nevertheless, the new list tends to contain a higher proportion of prevalent chemicals than Appendix VIII does since there is a correlation between increasing availability of analytical methods and increasing occurrence of chemicals in the environment. This is due to a number of factors. The Clean Water Act and Superfund lists, for which analytical methods are available and which are included in toto in the new list, did take production into account when they were generated. Other common chemicals would tend to have analytical methods developed for commercial reasons other than specific EPA requirements. Those chemicals are enough for deletion as having no standard are generally uncommon.

In a few cases (formaldehyde is the most notable example), common chemicals do not appear on the new list because they present major analytical problems. EPA is focusing on these chemicals in its analytical methods research and will consider amending the list as soon as reliable analytical methods become available.

There are environmental benefits to a shorter list. Monitoring for more chemicals, especially with methods of poor reliability, increases the possibility of false positives, results that indicate contamination where there is none. The increased probability of false positives may cause pollution control agencies to take actions, such as providing a larger statistical range of "no action" results, or requiring resampling, which make control programs less effective or delay action. Laboratories, faced with analyzing a list of chemicals that contains some chemicals very difficult to analyze will tend to focus efforts on these chemicals, rather than on providing high quality data on the more easily analyzed (and generally more common) chemicals, such as the priority pollutants. This is because a small error on a common chemical is considerably less embarrassing than a major error on a rare one. However, from an environmental perspective, it may be considerably more important to have more precise data on the more common chemical, since a small change of the common chemical may be the most effective indicator of potential problems. Laboratory resources in this country have already expended considerable effort on trying to analyze some of the very difficult Appendix VIII analytes, when such efforts would be better spent on obtaining better quality results on common chemicals.

The core list proposed today also contains some parameters with very low toxicity (e.g., sodium). These parameters are intended to characterize the ground-water industry chemistry. See Section VII.C. below for details.

The new list was developed on the basis of analytical feasibility. As stated above (Section II. Background), EPA is continuing to evaluate the ground-water monitoring requirements and intends to propose further revisions based on other desirable monitoring characteristics such as those noted in the beginning of

this section. It is quite likely that an optimal monitoring list would be shorter than the 250 compounds proposed today.

VII. Specific Issues for Comment

A. Borderline Chemicals

For the following chemicals, EPA has received conflicting data with regard to analytical feasibility. This information is provided in the background documents. EPA specifically requests laboratory data on appropriate methods, availability of standards, recovery, and precision and accuracy of analysis of these chemicals. Data involving analysis in ground water at ppb levels would be particularly useful, since certain analytical problems arise specifically in such cases. EPA is proposing to include most of these chemicals on the new Appendix IX list, but is concerned because it has data indicating that analysis may be difficult. At the end of the list are approximately ten chemicals identified with asterisks which EPA is proposing to exclude from the new list, but which are being considered for inclusion if additional information indicates they are possible to analyze.

3-Chloropropionitrile	542-76-7
Propanenitrile, 3-chloro-	
Acetonitrile	75-05-8
Acetonitrile	
N-Nitrosomethylethylamine	10595-95-6
Ethanamine, N-methyl-nitroso-	
p-Benzoquinone	106-51-4
2,5-Cyclohexadiene-1,4-dione	
Resorcinol	108-46-3
1,3-Benzenediol	
Tris(2,3-dibromopropyl)phosphate	126-72-7
1-Propanol, 2,3-dibromo-, phosphate (3:1)	
Dibenzo(a,e)pyrene	192-65-4
Naphtho[1,2,3,4-def]chrysene	
Dibenzo(a,h)pyrene	189-64-0
Dibenzo[b,def]chrysene	
Dibenzo(a,i)pyrene	189-55-9
Benzo[rst]pentaphene	
Tetraethyldithiopyrophosphate	3689-24-5
Thiodiphosphonic acid ($[(HO)_2P(S)]_2O$), tetraethyl ester	
Malononitrile	109-77-3
Propanedinitrile	
Allyl alcohol	107-18-6
2-Propen-1-ol	
1,4-Dioxane	123-91-1
1,4-Dioxane	
Ethylene oxide	75-21-8
Oxirane	
2-Propyn-1-ol	107-19-7
2-Propyn-1-ol	
Isosafrole	120-58-1
1,3-Benzodioxole, 5-(1-propenyl)-	
Aniline	62-53-3
Benzenamine	
2-Acetylaminofluorene	53-96-3
Acetamide, N-9H-fluoren-2-yl-	
Benzenethiol	108-98-5
Benzenethiol	
Benzidine	92-87-5
[1,1'-Biphenyl]-4,4'-diamine	
2-Chloro-1,3-butadiene	126-99-8
1,3-Butadiene, 2-chloro-	
3-Chloropropene	107-05-1
1-Propene, 3-chloro-	
Dibromomethane	74-95-3
Methane, dibromo-	
Dichlorodifluoromethane	75-71-8
Methane, dichlorodifluoro-	
Diphenylamine	122-39-4
Benzenamine, N-phenyl-	
Ethyl cyanide	107-12-0
Propanenitrile	
Hexachlorophene	1888-71-7
1-Propene, 1,1,2,3,3,3-hexachloro-	
Iodomethane	74-88-4
Methane, iodo-	
Isobutyl alcohol	78-83-1
1-Propanol, 2-methyl-	
Kepone	143-50-0
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	
alpha, alpha-Dimethylphenethylamine	122-09-8
Benzeneethanamine, α,α-dimethyl-	
2-sec-Butyl-4,6-dinitrophenol	88-85-7
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	
Methacrylonitrile	126-98-7
2-Propenenitrile, 2-methyl-	
Methyl methacrylate	80-62-6
2-Propenoic acid, 2-methyl-, methyl ester	
N-Nitrosodimethylamine	62-75-9
Methanamine, N-methyl-N-nitroso-	
2-Picoline	109-06-8
Pyridine, 2-methyl-	
2-Propyn-1-ol	107-19-7
2-Propyn-1-ol	
2,4-Dichlorophenoxyacetic acid	94-75-7
Acetic acid, (2,4-dichlorophenoxy)-	
Isodrin	465-73-6
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a,-hexahydro-, ($1_\alpha,4_\alpha,4_{a\beta},5_\beta,8_\beta,8_{a\beta}$)-	
Dimethoate [1]	60-51-5
Phosphorodithioic acid, 0,0-dimethyl S-[2-methylamino)-2-oxoethyl]ester	
Diallate [1]	2303-16-4
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	
Crotonaldehyde [1]	4170-30-3
2-Butenal	
Paraldehyde [1]	123-63-7
1,3,5-Trioxane, 2,4,6-trimethyl-	
o-Toluidine [1]	95-53-4
Benzenamine, 2-methyl-	
meta-Cresol [2]	108-39-4
Phenol, 3-methyl-	
Endrin ketone [2]	53494-70-5
2,5,7-Metheno-3H-cyclopenta[a]pentalen-3-one, 3b,4,5,6,6,6a-hexachlorodecahydro-, (2_α, $3a_\beta$, $3b_\beta$, 4_β, 5_β, $6a_\beta$, 7_α, $7a_\beta$, 8R [1])-	
Endosulfan sulfate [2]	1031-07-8
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3,3-dioxide	
Strontium (total) [2]	7440-24-6
Strontium	
1,3-Dichloro-2-propanol [2]	96-23-1
2-Propanol, 1-3-dichloro-	

[1] Not presently on core list because of analytical problems.
[2] Not presently on core list—inorganic ion or part of a category.

B. Dioxin Analysis

Requiring analysis of dioxins may present an environmental risk. To perform these analyses, dioxin standards must be manufactured, handled in the laboratory, and disposed. EPA has published analytical methods for dioxin (49 FR 136 (October 26, 1984)). In these methods, EPA has provided special safety measures for performing these analyses and recommends that only specially equipped laboratories do these analyses. It is possible that overall environmental protection would best be served by limiting these analyses to specific sites. These sites would include all commercial sites that accept off-site wastes and all on-site disposal units that accept wastes from processes known or suspected to create dioxins or dibenzofurans, such as the manufacture of 2,4,5-trichlorophenol. EPA is proposing to include these chemicals on the core list but requests comments on whether they should remain on the core list.

C. Monitoring, Ground-Water Protection Standards, and Corrective Action

Under the existing regulations, the detection of an Appendix VIII constituent in ground water will generally trigger requirements for ground-water protection standards and, if necessary, corrective action (see section IV, above, for details). In proposing Appendix IX as a ground-water monitoring list, EPA envisions a broader use. Some chemicals on Appendix IX (e.g., sodium) are generally not toxic and may be present naturally in high concentrations. The principal purpose of analyzing for these chemicals is to provide valuable information about ground-water chemistry and movement.

The strategy EPA is proposing would generally limit setting ground-water protection standards and requiring corrective action to chemicals listed on Appendix VIII. EPA considers all members of categories on Appendix VIII, including those listed individually on Appendix IX, to be subject to these requirements.

The Appendix IX chemicals not generally subject to these requirements are the 25 additional chemicals routinely analyzed by the Superfund program. EPA has not yet evaluated these chemicals and determined that they are "hazardous", as it has for Appendix VIII. See 47 FR 32298 (July 26, 1982). However, if one of these chemicals is detected and the Regional Administrator can document a threat to human health or the environment he may use the "omnibus" authority of 40 CFR 270.32(b)(2) and section 3005(c)(3) of RCRA, as amended, to set ground-water protection standards and require corrective action.

EPA is also considering including certain common ground-water anions to Appendix IX, to further characterize ground-water chemistry. The anions currently under consideration are chloride, sulfate, nitrate, and bicarbonate.

EPA requests comments on the concept of including chemicals on Appendix IX for purposes of characterizing ground-water chemistry and movement, the addition of the 25 Superfund chemicals, and the list of anions.

D. Discretionary Additions

In today's proposal, EPA is proposing to require monitoring of all constituents

on the new Appendix IX list. This is done with the understanding that the Regional Administrator (RA) may require analysis of chemicals outside Appendix IX under the authority of 40 CFR 270.32(b)(2) and section 3005(c)(3) of RCRA, as amended by the 1984 amendments. Other options under consideration would be to give the RA's explicit discretion in the regulation to add constituents from the Appendix VIII list or to add constituents in or derived from the waste. EPA solicits comments on these options.

E. Ordering of Appendix IX

In the interim guidance document the core list was ordered in the same manner as Appendix VIII. That was approximately by common name, except that representatives of categories were listed in the place where the category was listed on Appendix VIII. In today's proposal, Appendix IX is ordered alphabetically by systematic name. This has the virtues of being easier to search for a specific chemical and of grouping chemicals of similar structure together (e.g., pesticides based on phosphorothioic acid). Another conceivable ordering would be by CAS number, which has the virtue of being the easiest to search, if the CAS number of a chemical is available. EPA requests comments on which of these three ordering schemes to use for the final Appendix IX list.

F. Representatives of Categories

As detailed above in Section V.A., EPA has selected representatives of the categories of chemicals on Appendix VIII. Section VII.A. above lists some additional representatives of categories under consideration for addition to the core list (those chemicals identified by a double asterisk). A detailed account of which chemicals on Appendix IX of Part 264 represent which categories from Appendix VIII of Part 261 is available in background document 24 and the Index to the background documents for this rulemaking. EPA requests comment on its choices of representatives for the categories.

VIII. Regulatory Analysis

A. State Authority

Under Section 3006 of RCRA, EPA may authorize qualified States to administer and enforce their State hazardous waste management programs in lieu of EPA operating the Federal program in those States. Authorization, either interim or final, may be granted to State programs that regulate the identification, generation, transportation, or operation of facilities that treat, store, or dispose of hazardous waste. Upon authorization of the State program, EPA suspends operation within the States of those parts to the ground-water monitoring requirements for land-based hazardous waste management facilities applying for and operating under permits. Since the ground-water monitoring requirements are not imposed under any of the amendments made by the Hazardous and Solid Waste Amendments of 1984, final rules modifying the constituent list would not take effect directly in all States under section 3006(g). Rather, if EPA promulgates this proposal, States that have been granted final authorization will have to revise their programs to cover the additional requirements in today's announcement. Generally, these authorized State programs must be revised within one year of the date of promulgation of such standards, or within two years if the State must amend or enact a statute in order to make the required revision. See 40 CFR 271.21. Since States may always impose requirements which are more stringent or have greater coverage than EPA's programs, States will not be required to revise their regulations to reflect any deletions of constituents from the current monitoring requirements after promulgation, although they may choose to do so. Regulations which are broader in scope, however, may not be enforced as part of the federally-authorized RCRA program.

B. Executive Order 12291—Regulatory Impact

Executive Order 12291 (46 FR 13191, February 9, 1981) requires that a regulatory agency determine whether a new regulation will be "major" and if so, that a Regulatory Impact Analysis be conducted. A major rule is defined as a regulation that is likely to result in:

(1) An annual effect on the economy of $100 million or more;

(2) A major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions; or

(3) Significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Administrator has determined that today's proposal is not a major rule. It should produce a net decrease in the total number of chemicals analyzed at each facility and, thus, imposes no increased costs.

C. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., whenever an agency is required to publish a general notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis which describes the impact of the rule on small entities (i.e., small business, small organizations, and small governmental jurisdiction). The Administrator may certify, however, that the rule will not have a significant economic impact on a substantial number of small entities. As stated above, this proposal will have no adverse impacts on businesses of any size. Accordingly, I hereby certify that this proposed regulation will not have a significant economic impact on a substantial number of small entities. This regulation therefore does not require a regulatory flexibility analysis.

List of Subjects

40 CFR Part 264

Hazardous materials, Reporting and recordkeeping requirements, Waste treatment and disposal, Water supply, Ground water, Environmental monitoring.

40 CFR Part 270

Hazardous materials, Reporting and recordkeeping requirements, Waste treatment and disposal, Water supply, Administrative practice and procedure, Ground water, Environmental monitoring.

Dated: July 14, 1986.

Lee M. Thomas,

Administrator.

For the reasons set out in the preamble it is proposed to amend Title 40 of the Code of Federal Regulations as follows:

PART 264—[AMENDED]

1. The authority citation for Part 264 continues to read as follows:

Authority: Secs. 1006, 2002(a), and 3004 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), and 6924).

2. Section 264.98 is amended by revising paragraphs (h)(2), (h)(3) introductory text and (h)(4)(i) to read as follows:

§ 264.98 Detection monitoring program.

* * * * *

(h) * * *

(2) Immediately sample the ground water in all monitoring wells and determine whether constituents

identified in the list in Appendix IX of Part 264 are present and, if so, at what concentration.

* * * * *

(3) Establish a background value for each constituent that has been found at the compliance point under paragraph (h)(2) of this section, as follows:

* * * * *

(4) * * *

(i) An identification of the concentration of any constituent from Appendix IX to Part 264 found in the ground water at each monitoring well at the compliance point;

* * * * *

3. Section 264.99 is amended by revising paragraph (f) to read as follows:

§ 264.99 Compliance monitoring program.

* * * * *

(f) The owner or operator must analyze samples from all monitoring wells at the compliance point to determine whether constituents identified in the list in Appendix IX to Part 264 of this chapter are present and, if so, at what concentration. The analysis must be conducted at least annually to determine whether additional Appendix IX constituents are present in the uppermost aquifer. If the owner or operator finds constituents from Appendix IX in the ground water that are not already identified in the permit as monitoring constituents, the owner or operator must report the concentration of these additional constituents to the Regional Administrator within seven days after completion of the analysis.

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4. A new Appendix VII and Appendix VIII are added to Part 264 and reserved as follows:

Appendix VII [Reserved]

Appendix VIII [Reserved]

5. A new Appendix IX is added to Part 264 as follows:

APPENDIX IX.—GROUND-WATER MONITORING LIST

Systematic name	CAS RN	Common name
Acenaphthylene	208-96-8	Acenaphthalene.
Acenaphthylene, 1,2-dihydro-	83-32-9	Acenaphthene.
Acetamide, N-(4-ethoxyphenyl)-H	62-44-2	Phenacetin.
Acetamide, N-9H-fluoren-2-yl	53-96-3	2-Acetylaminofluorene.
Acetic acid ethenyl ester	108-05-4	Vinyl acetate.
Acetic acid, (2,4,5-trichlorophenoxy)-	93-76-5	2,4,5-T.
Acetic acid, (2,4-dichlorophenoxy)-	94-75-7	2,4-Dichlorophenoxyacetic acid.
Acetonitrile	75-05-8	Acetonitrile.
Aluminum	7429-90-5	Aluminum (total).
Anthracene	120-12-7	Anthracene.
Antimony	7440-36-0	Antimony (total).
Aroclor 1016	12674-11-2	Aroclor 1016.
Aroclor 1221	11104-28-2	Aroclor 1221.
Aroclor 1232	11141-16-5	Aroclor 1232.
Aroclor 1242	53469-21-9	Aroclor 1242.
Aroclor 1248	12672-29-6	Aroclor 1248.
Aroclor 1254	11097-69-1	Aroclor 1254.
Aroclor 1260	11096-82-5	Aroclor 1260.
Arsenic	7440-38-2	Arsenic (total).
Barium	7440-39-3	Barium (total).
Benz[a]anthracene, 7,12-dimethyl-	57-97-6	7,12-Dimethylbenz[a]anthracene.
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56-49-5	3-Methylcholanthrene.
Benz[e]acephenanthrylene	205-99-2	Benzo[b]fluoranthene.
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950-58-5	Pronamide.
Benz[a]anthracene	56-55-3	Benz[a]anthracene.
Benzenamine	62-53-3	Aniline.
Benzenamine, 2-methyl-5-nitro	99-55-8	5-Nitro-o-toluidine.
Benzenamine, 2-nitro	88-74-4	2-Nitroaniline.
Benzenamine, 3-nitro	99-09-2	3-Nitroaniline.
Benzenamine, 4-chloro-	106-47-8	p-Chloroaniline.
Benzenamine, 4-nitro-	100-01-6	p-nitroaniline.
Benzenamine, 4,4'-methylenebis(2-chloro	101-14-4	4,4'-Methylenebis(2-chloroaniline).
Benzenamine, N-nitroso-N-phenyl-	86-30-6	N-Nitrosodiphenylamine.
Benzenamine, N-phenyl-	122-39-4	Diphenylamine.
Benzenamine, N,N-dimethyl-4-(phenylazo)-	60-11-7	p-Dimethylaminoazobenzene.
Benzene	71-43-2	Benzene.
Benzene, 1-bromo-4-phenoxy-	101-55-3	4-Bromophenyl phenyl ether.
Benzene, 1-chloro-4-phenoxy-	7005-72-3	4-Chlorophenyl phenyl ether.
Benzene, 1-methyl-2,4-dinitro-	121-14-2	2,4-Dinitrotoluene.
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	50-29-3	DDT.
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-	72-43-5	Methoxychlor.
Benzene 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	72-54-8	DDD.
Benzene, 1,1'-(dichloroethenylidene)bis[4-chloro-	72-55-9	DDE.
Benzene, 1,2-dichloro-	95-50-1	o-Dichlorobenzene.
Benzene, 1,2,4-trichloro-	120-82-1	1,2,4-trichlorobenzene.
Benzene, 1,2,4,5-tetrachloro	95-94-3	1,2,4,5-Tetrachlorobenzene.
Benzene, 1,3-Dichloro-	541-73-1	M-Dichlorobenzene.
Benzene, 1,4-dichloro-	106-46-7	p-Dichlorobenzene.
Benzene, 1,4-dinitro-	100-25-4	meta-Dinitrobenzene.
Benzene, 2-methyl-1,3-dinitro-	606-20-2	2,6-Dinitrotoluene.
Benzene, chloro-	108-90-7	Chlorobenzene.
Benzene, dimethyl-	1330-20-7	Xylene (total).
Benzene, ethenyl-	100-42-5	Styrene.
Benzene, ethyl-	100-41-4	Ethyl benzene.
Benzene, hexachloro-	118-74-1	Hexachlorobenzene.
Benzene, methyl	108-88-3	Toluene.
Benzene, nitro-	98-95-3	Nitrobenzene.
Benzene, pentachloro-	608-93-5	Pentachlorobenzene.
Benzene, pentachloronitro-	82-68-8	Pentachloronitrobenzene.
Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy-, ethyl ester	510-15-6	Chlorobenzilate.
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl)ester	117-81-7	Bis(2-ethylhexyl) phthalate.
1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	85-68-7	Butyl benzyl phthalate.
1,2-Benzenedicarboxylic acid, dibutyl ester	84-74-2	Di-n-butyl phthalate.
1,2-Benzenedicarboxylic acid, diethyl ester	84-66-2	Diethyl phthalate.
1,2-Benzenedicarboxylic acid, dimethyl ester	131-11-3	Dimethyl phthalate.
1,2-Benzenedicarboxylic acid, dioctyl ester	117-84-0	Di-n-octyl phthalate.

APPENDIX IX.—GROUND-WATER MONITORING LIST—Continued

Systematic name	CAS RN	Common name
1,3-Benzenediol	108-46-3	Resorcinol.
Benzeneethanamine, α, α-dimethyl-	122-09-8	alpha, alpha-Dimethylphenethylamine.
Benzenemethanol	100-51-6	Benzyl alcohol.
Benzenethiol	108-98-5	Benzenethiol
1,3-Benzodioxole, 5-(1-propenyl)-	120-58-1	Isosafrole.
1,3-Benzodioxole, 5-(2-propenyl)-	94-59-7	Safrole.
Benzo[k]fluoranthene	207-08-9	Benzo(k)fluoranthene
Benzoic acid	65-85-0	Benzoic acid.
Benzo[rst]pentaphene	189-55-9	Dibenzo[a,i]pyrene.
Benzo[ghi]perylene	191-24-2	Benzo(ghi)perylene.
Benzo[a]pyrene	50-32-8	Benzo[a]pyrene.
Beryllium	7440-41-7	Beryllium (total).
1,1'-Biphen[yl]-4,4'-diamine, 3,3'-dichloro-	91-94-1	3,3'-Dichlorobenzidine.
1,1'-Biphen[yl]-4,4'-diamine, 3,3'-dimethoxy-	119-90-4	3,3'-Dimethoxybenzidine.
1,1'-Biphen[yl]-4,4'-diamine, 3,3'-dimethyl-	119-93-7	3,3'-Dimethylbenzidine.
1,1'-Bipenyl[-4-amine	92-67-1	4-Aminobiphenyl.
1,1'-Bipenyl[-4-4-diamine	92-87-5	Benzidine.
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87-68-3	Hexachlorobutadiene.
1,3-Butadiene, 2-chloro-	126-99-8	2-Chloro-1,3-butadiene.
1-Butanamine, N-butyl-N-nitroso-	924-16-3	N-Nitrosodi-n-butylamine.
2-Butanone	78-93-3	Methyl ethyl ketone.
2-Butene, 1,4-dichloro-, (E)-	110-57-6	trans-1,4-Dichloro-2-butene.
Cadmium	7440-43-9	Cadmium (total).
Calcium	7440-70-2	Calcium (total).
Carbon disulfide	75-15-0	Carbon disulfide.
Chromium	7440-47-3	Chromium (total).
Chrysene	218-01-9	Chrysene.
Cobalt	7440-48-4	Cobalt (total).
Copper	7440-50-8	Copper (total).
Cyanide	57-12-5	Cyanide.
2,5-Cyclohexadiene-1,4-dione	106-51-4	p-Benzoquinone.
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3β,4α,5β,6β)-	319-84-6	alpha-BHC.
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2β,3α,4β,5α,6β)-	319-85-7	beta-BHC.
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3α,4β,5α,6β)-	319-86-8	delta-BHC.
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3β,4α,5α,6β)-	58-89-9	gamma-BHC.
2-Cyclohexen-1-one, 3,5,5-trimethyl	78-59-1	Isophorone.
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77-47-4	Hexachlorocyclopentadiene.
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene.
Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro-	1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin.
		Hexachlorodibenzo-p-dioxins.
		Pentachlorodibenzo-p-dioxins.
		Tetrachlorodibenzo-p-dioxins.
Dibenzo[b,def]chrysene	189-64-0	Dibenzo[a,h]pyrene.
Dibenzofuran	132-64-9	Dibenzofuran.
		Hexachlorodibenzofurans.
		Pentachlorodibenzofurans.
		Tetrachlorodibenzofurans.
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, 1aα,2β,2aα,3β,6β,6aα,7β,7aα)-.	60-57-1	Dieldrin.
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, 1aα,,2β,2aβ,3α,6α,6aβ,7β,7aα)-.	72-20-8	Endrin.
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, 1aα,4α,4aβ,5α,8α,8aβ)-	309-00-2	Aldrin.
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, 1aα,4α,4aβ,5β,8β,8aβ)-	465-73-6	Isodrin.
1,4-Dioxane	123-91-1	1,4-Dioxane.
Ethanamine, N-ethyl-N-nitroso-	55-18-5	N-Nitrosodiethylamine.
Ethanamine, N-methyl-N-nitroso-	10595-95-6	N-Nitrosomethylethylamine.
Ethane, 1,1-dichloro-	75-34-3	1,1-Dichloroethane.
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	111-91-1	Bis(2-chloroethoxy)methane.
Ethane, 1,1'-oxybis[2-chloro-	111-44-4	Bis(2-chloroethyl) ether.
Ethane, 1,1'-trichloro-	71-55-6	1,1,1-Trichloroethane.
Ethane, 1,1,1,2-tetrachloro-	630-20-6	1,1,1,2-Tetrachloroethane.
Ethane, 1,1,2-trichloro-	79-00-5	1,1,2-Trichloroethane.
Ethane, 1,1,2,2-tetrachloro-	79-34-5	1,1,2,2-Tetrachloroethane.
Ethane, 1,2-dibromo-	106-93-4	1,2-Dibromoethane.
Ethane, 1,2-dichloro-	107-06-2	1,2-Dichloroethane.
Ethane, chloro-	75-00-3	Chloroethane.
Ethane, hexachloro-	67-72-1	Hexachloroethane.
Ethane, pentachloro-	76-01-7	Pentachloroethane
1,2,-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	91-80-5	Methapyrilene.
Ethanone, 1-phenyl-	98-86-2	Acetophenone.
Ethene, (2-chloroethoxy)-	110-75-8	2-Chloroethyl vinyl ether.
Ethene, 1,1-dichloro-	75-35-4	1,1-Dichloroethylene.
Ethene, 1,2-dichloro-, (E)-	156-60-5	trans-1,2-Dichloroethene.
Ethene, chloro-	75-01-4	Vinyl chloride.
Ethene, tetrachloro-	127-18-4	Tetrachloroethene.
Ethene, trichloro-	79-01-6	Trichloroethene.
Fluoranthene	206-44-0	Fluoranthene.
Fluoride	16984-48-8	Fluoride.
9H-Fluorene	86-73-7	Fluorene.
2-Hexanone	591-78-6	2-Hexanone.
Hydrazine, 1,2-diphenyl-	122-66-7	1,2-Diphenylhydrazine
Indeno[1,2,3-cd]pyrene	193-39-5	Indeno(1,2,3-cd)pyrene.
Iron	7439-89-6	Iron (total).
Lead	7439-92-1	Lead (total).
Manesium	7439-94-4	Magnesium (total).
Manganese	7439-96-5	Manganese (total).
Mercury	7439-97-6	Mercury (total).
Methanamine, N-methyl-N-nitroso-	62-75-9	N-Nitrosodimethylamine.
Methane, bromo-	74-83-9	Bromomethane.
Methane, bromodichloro-	75-27-4	Bromodichloromethane.
Methane, chloro-	74-87-3	Chloromethane.
Methane, dibromo-	74-95-3	Dibromomethane

APPENDIX IX.—GROUND-WATER MONITORING LIST—Continued

Systematic name	CAS RN	Common name
Methane, dibromochloro-	124-48-1	Chlorodibromomethane.
Methane, dichloro-	75-09-2	Dichloromethane.
Methane, dichlorodifluoro-	75-71-8	Dichlorodifluoromethane.
Methane, iodo-	74-88-4	Iodomethane.
Methane, tetrachloro-	56-23-5	Carbon tetrachloride.
Methane, tribromo-	75-25-2	Tribromomethane.
Methane, trichloro-	67-66-3	Chloroform.
Methane, trichlorofluoro-	75-69-4	Trichloromonofluoromethane.
Methanesulfonic acid, methyl ester	66-27-3	Methyl methanesulfonate.
Methanethiol, trichloro-	75-70-7	Trichloromethanethiol.
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro	57-74-9	Chlordane.
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	76-44-8	Heptachlor.
2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aα,1bβ,2α,5α,5aβ,6β,6aα)	1024-57-3	Heptachlor epoxide.
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aβ,6α,9α,9aβ)	959-98-8	Endosulfan I.
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aα,6β,9β,9aα)	33213-65-9	Endosulfan II.
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	143-50-0	Kepone.
1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1α,2β,2aβ,4β,4aβ,5β,6aβ,6bβ,7R*).	7421-93-4	Endrin aldehyde.
Morpholine, 4-nitroso-	59-89-2	N-Nitrosomorpholine.
1-Naphthalenamine	134-32-7	1-Naphthylamine.
2-Naphthalenamine	91-59-8	2-Naphthylamine.
Naphthalene	91-20-3	Naphthalene.
Naphthalene, 2-chloro-	91-58-7	2-Chloronaphthalene.
Naphthalene, 2-methyl-	91-57-6	2-Methylnaphthalene.
1,4-Naphthalenedione	130-15-4	1,4-Naphthoquinone.
Naphtho[1,2,3,4-def]chrysene	192-65-4	Dibenzo[a,e]pyrene.
Nickel	7440-02-0	Nickel (total).
Osmium	7440-04-2	Osmium (total).
Oxirane	75-21-8	Ethylene oxide.
2-Pentanone, 4-methyl-	108-10-1	4-Methyl-2-pentanone.
Phenanthrene	85-01-8	Phenanthrene.
Phenol	108-95-2	Phenol.
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	88-85-7	2-sec-Butyl-4,6-dinitrophenol.
Phenol, 2-chloro-	95-57-8	2-Chlorophenol.
Phenol, 2-methyl-	95-48-7	ortho-Cresol.
Phenol, 2-methyl-4,6-dinitro-	534-52-1	4,6-Dinitro-o-cresol.
Phenol, 2-nitro-	88-75-5	2-Nitrophenol.
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	70-30-4	Hexachlorophene.
Phenol, 2,3,4,6-tetrachloro-	58-90-2	2,3,4,6-Tetrachlorophenol.
Phenol, 2,4-dichloro-	120-83-2	2,4-Dichlorophenol.
Phenol, 2,4-dimethyl-	105-67-9	2,4-Dimethylphenol.
Phenol, 2,4-dimethyl-	105-67-9	2,4-Dimethylphenol.
Phenol, 2,4-dinitro-	51-28-5	2,4-Dinitrophenol.
Phenol, 2,4,5-trichloro-	95-95-4	2,4,5-Trichlorophenol.
Phenol, 2,4,6-trichloro-	88-06-2	2,4,6-Trichlorophenol.
Phenol, 2,6-dichloro-	87-65-0	2,6-Dichlorophenol.
Phenol, 4-chloro-3-methyl-	59-50-7	p-Chloro-m-cresol.
Phenol, 4-methyl-	106-44-5	para-Cresol.
Phenol, 4-nitro-	100-02-7	4-Nitrophenol.
Phenol, pentachloro-	87-86-5	Pentachlorophenol.
Phosphorodithioic acid, 0,0-diethyl S-[(ethylthio)methyl] ester	298-02-2	Phorate.
Phosphorodithioic acid, 0,0-diethyl S-[2-(ethylthio)ethyl] ester	298-04-4	Disulfoton.
Phosphorothioic acid, 0-[4-[(dimethylamino)sulfonyl]phenyl] 0,0-dimethyl ester	52-85-7	Famphur.
Phosphorothioic acid, 0,0-diethyl 0-(4-nitrophenyl) ester	56-38-2	Parathion.
Phosphorothioic acid, 0,0-diethyl 0-pyrazinyl ester	297-97-2	0,0-Diethyl 0-2-pyrazinyl phosphorothioate.
Phosphorothioic acid, 0,0-dimethyl 0-(4-nitrophenyl) ester	298-00-0	Methyl parathion.
Piperidine, 1-nitroso-	100-75-4	N-Nitrosopiperidine.
Potassium	7440-09-7	Potassium (total).
1-Propanamine, N-nitroso-N-propyl-	621-64-7	Di-n-propylnitrosamine.
Propane, 1,2-dibromo-3-chloro-	96-12-8	1,2-Dibromo-3-chloropropane.
Propane, 1,2-dichloro-	78-87-5	1,2-Dichloropropane.
Propane, 1,2,3,-trichloro-	96-18-4	1,2,3-Trichloropropane.
Propane, 2,2'-oxybis[1-chloro-	108-60-1	Bis(2-chloroisopropyl) ether.
Propanedinitrile	109-77-3	Malononitrile.
Propanenitrile	107-12-0	Ethyl cyanide.
Propanenitrile, 3-chloro-	542-76-7	3-Chloropropionitrile.
Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	93-72-1	Silvex.
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126-72-7	Tris(2,3-dibromopropyl) phosphate.
1-Propanol, 2-methyl-	78-83-1	Isobutyl alcohol.
2-propanone	67-64-1	Acetone.
2-Propenal	107-02-8	Acrolein.
1-Propene, 1,1,2,3,3,3-hexachloro-	1888-71-7	Hexachloropropene.
1-Propene, 1,3-dichloro-, (E)-	10061-02-6	trans-1,3-Dichloropropene.
1-Propene, 1,3-dichloro-, (Z)	10061-01-5	cis-1,3-Dichloropropene.
1-Propene, 3-chloro-	107-05-1	3-Chloropropene.
2-Propenenitrile, 2-methyl-	126-98-7	Methacrylonitrile.
2-Propenenitrile	107-13-1	Acrylonitrile.
2-Propenoic acid, 2-methyl-, ethyl ester	97-63-2	Ethyl methacrylate.
2-Propenoic acid, 2-methyl-, methyl ester	80-62-6	Methyl methacrylate.
2-Propen-1-ol	107-18-6	Allyl alcohol.
2-Propyn-1-ol	107-19-7	2-Propyn-1-ol.
Pyrene	129-00-0	Pyrene.
Pyridine	110-86-1	Pyridine.
Pyridine, 2-methyl-	109-06-8	2-Picoline.
Pyrrolidine, 1-nitroso-	930-55-2	N-Nitrosopyrrolidine.
Selenium	7782-49-2	Selenium (total).
Silver	7440-22-4	Silver (total).
Sodium	7440-23-5	Sodium (total).
Sulfide	18496-25-8	Sulfide.
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	Aramite.
Thallium	7440-28-0	Thallium (total).
Thiodiphosphonic acid ($(HO)_2P(S)_2O$), tetraethyl ester	3689-24-5	Tetraethyldithiopyrophosphate.

APPENDIX IX.—GROUND-WATER MONITORING LIST—Continued

Systematic name	CAS RN	Common name
Tin	7440-31-5	Tin (total).
Toxaphene	8001-35-2	Toxaphene.
Vanadium	7440-62-2	Vanadium (total)
Zinc	7440-66-6	Zinc (total).

PART 270—[AMENDED]

6. Section 270.14(c) is amended by revising paragraph (c)(4)(ii) to read as follows:

§ 270.14(c) Contents of Part B: General Requirements.

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(c) * * *

(4) * * *

(ii) Identifies the concentration of each Appendix IX. of Part 264 of this chapter, constituent throughout the plume, or identifies the maximum concentrations of each Appendix IX constituent in the plume.

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[46 FR 4619, Jan. 16, 1981, as amended at 46 FR 27477, May 20, 1981; 49 FR 5312, Feb. 10, 1984; 50 FR 2000, Jan. 14, 1985; 50 FR 42942, Oct. 23, 1985; 51 FR 5330, Feb. 13, 1986; 51 FR 6541, Feb. 25, 1986; 51 FR 37729, Oct. 24, 1986; 53 FR 35421, Sept. 13, 1988; 54 FR 41407, Oct. 6, 1989; 54 FR 50978, Dec. 11, 1989; 55 FR 18505, May 2, 1990; 55 FR 22684, June 1, 1990; 55 FR 46396, Nov. 2, 1990; 55 FR 50483, Dec. 6, 1990]

Appendix VIII – Hazardous Constituents

RCRA 206

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
Acetonitrile	Same	75-05-8	U003
Acetophenone	Ethanone, 1-phenyl	98-86-2	U004
2-Acetylaminefluorene	Acetamide, N-9H-fluoren-2-yl-	53-96-3	U005
Acetyl chloride	Same	75-36-5	U006
1-Acetyl-2-thiourea	Acetamide, N-(aminothioxymethyl)-	591-08-2	P002
Acrolein	2-Propenal	107-02-8	P003
Acrylamide	2-Propenamide	79-06-1	U007
Acrylonitrile	2-Propenenitrile	107-13-1	U009
Aflatoxins	Same	1402-68-2	—
Aldicarb	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	116-06-3	P070
Aldrin	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-,(1alpha,4alpha,4abeta, 5alpha,8alpha,8abeta)-	309-00-2	P004
Allyl alcohol	2-Propen-1-ol	107-18-6	P005
Allyl chloride	1-Propane, 3-chloro	107-18-6	
Aluminum phosphide	Same	20859-73-8	P006
4-Aminobiphenyl	[1,1′-Biphenyl]-4-amine	92-67-1	—
5-(Aminomethyl)-3-isoxazolol	3(2H)-Isoxazolone, 5-(aminomethyl)-	2763-96-4	P007
4-Aminopyridine	4-Pyridinamine	504-24-5	P008
Amitrole	1H-1,2,4-Triazol-3-amine	61-82-5	U011
Ammonium vanadate	Vanadic acid, ammonium salt	7803-55-6	P119
Aniline	Benzenamine	62-53-3	U012
Antimony	Same	7440-36-0	—
Antimony compounds, N.O.S.[1]	—	—	—
Aramite	Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl) phenoxy]-1- methylethyl ester)	140-57-8	—
Arsenic	Same	7440-38-2	—
Arsenic compounds, N.O.S.[1]	—	—	—
Arsenic acid	Arsenic acid H_3AsO_4	7778-39-4	P010
Arsenic pentoxide	Arsenic oxide As_2O_5	1303-28-2	P011
Arsenic trioxide	Arsenic oxide As_2O_3	1327-53-3	P012
Auramine	Benzenamine, 4,4′-carbonimidoylbis[N,N-dimethyl-	492-80-8	U014
Azaserine	L-Serine, diazoacetate (ester)	115-02-6	U015
Barium	Same	7440-39-3	—
Barium compounds, N.O.S.[1]	—	—	—
Barium cyanide	Same	542-62-1	P013
Benz[c]acridine	Same	225-51-4	U016
Benz[a]anthracene	Same	56-55-3	U018
Benzal chloride	Benzene, (dichloromethyl)-	98-87-3	U017
Benzene	Same	71-43-2	U019
Benzenearsonic acid	Arsonic acid, phenyl-	98-05-5	—
Benzidine	[1,1′-Biphenyl]-4,4′-diamine	92-87-5	U021
Benzo[b]fluoranthene	Benz[e]acephenanthrylene	205-99-2	—
Benzo[j]fluoranthene	Same	205-82-3	—
Benzo[k]fluoranthene	Same	207-08-9	—
Benzo[a]pyrene	Same	50-32-8	U022
p-Benzoquinone	2,5-Cyclohexadiene-1,4-dione	106-51-4	U197
Benzotrichloride	Benzene, (trichloromethyl)-	98-07-7	U023
Benzyl chloride	Benzene, (chloromethyl)-	100-44-7	P028
Beryllium	Same	7440-41-7	P015
Beryllium compounds, N.O.S.[1]	—	—	—
Bromoacetone	2-Propanone, 1-bromo-	598-31-2	P017
Bromoform	Methane, tribromo-	75-25-2	U225
4-Bromophenyl phenyl ether	Benzene, 1-bromo-4-phenoxy-	101-55-3	U030
Brucine	Strychnidin-10-one, 2,3-dimethoxy	357-57-3	P018
Butyl benzyl phthalate	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	85-68-7	—
Cacodylic acid	Arsenic acid, dimethyl-	75-60-5	U136
Cadmium	Same	7440-43-9	—
Cadmium compounds, N.O.S.[1]	—	—	—
Calcium chromate	Chromic acid H_2CrO_4, calcium salt	13765-19-0	U032
Calcium cyanide	Calcium cyanide $Ca(CN)_2$	592-01-8	P021
Carbon disulfide	Same	75-15-0	P022
Carbon oxyfluoride	Carbonic difluoride	353-50-4	U033
Carbon tetrachloride	Methane, tetrachloro-	56-23-5	U211
Chloral	Acetaldehyde, trichloro-	75-87-6	U034

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
Chlorambucil	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	305-03-3	U035
Chlordane	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	57-74-9	U036
Chlordane (alpha and gamma isomers)	—	—	U036
Chlorinated benzenes, N.O.S.[1]	—	—	—
Chlorinated ethane, N.O.S.[1]	—	—	—
Chlorinated fluorocarbons, N.O.S.[1]	—	—	—
Chlorinated naphthalene, N.O.S.[1]	—	—	—
Chlorinated phenol, N.O.S.[1]	—	—	—
Chlornaphazine	Naphthalenamine, N,N′-bis(2-chloroethyl)-	494-03-1	U026
Chloroacetaldehyde	Acetaldehyde, chloro-	107-20-0	P023
Chloroalkyl ethers, N.O.S.[1]	—	—	—
p-Chloroaniline	Benzenamine, 4-chloro-	106-47-8	P024
Chlorobenzene	Benzene, chloro-	108-90-7	U037
Chlorobenzilate	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510-15-6	U038
p-Chloro-m-cresol	Phenol, 4-chloro-3-methyl-	59-50-7	U039
2-Chloroethyl vinyl ether	Ethene, (2-chloroethoxy)-	110-75-8	U042
Chloroform	Methane, trichloro-	67-66-3	U044
Chloromethyl methyl ether	Methane, chloromethoxy-	107-30-2	U046
beta-Chloronaphthalene	Napthalene, 2-chloro-	91-58-7	U047
o-Chlorophenol	Phenol, 2-chloro-	95-57-8	U048
1-(o-Chlorophenyl)thiourea	Thiourea, (2-chlorophenyl)-	5344-82-1	P026
Chloroprene	1,3-Butadiene, 2-chloro-	126-99-8	—
3-Chloropropionitrile	Propanenitrile, 3-chloro-	542-76-7	P027
Chromium	Same	7440-47-3	—
Chromium compounds, N.O.S.[1]	—	—	—
Chrysene	Same	218-01-9	U050
Citrus red No. 2	2-Naphthalenol, 1-[(2,5-dimethoxyphenyl)azo]-	6358-53-8	—
Coal tar creosote	Same	8007-45-2	—
Copper cyanide	Copper cyanide CuCN	544-92-3	P029
Creosote	Same	—	U051
Cresol (Cresylic acid)	Phenol, methyl-	1319-77-3	U052
Crotonaldehyde	2-Butenal	4170-30-3	U053
Cyanides (soluble salts and complexes), N.O.S.[1]	—	—	P030
Cyanogen	Ethanedinitrile	460-19-5	P031
Cyanogen bromide	Cyanogen bromide (CN)Br	506-68-3	U246
Cyanogen chloride	Cyanogen chloride (CN)Cl	506-77-4	P033
Cycasin	beta-D-Glucopyranoside, (methyl-ONN-azoxy)methyl	14901-08-7	—
2-Cyclohexyl-4,6-dinitrophenol	Phenol, 2-cyclohexyl-4,6-dinitro-	131-89-5	P034
Cyclophosphamide	2H-1,3,2,-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-,2-oxide	50-18-0	U058
2,4-D	Acetic acid, (2,4-dichlorophenoxy)-	94-75-7	U240
2,4-D, salts, esters	—	—	U240
Daunomycin	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	20830-81-3	U059
DDD	Benzene, 1,1′-(2,2-dichloroethylidene)bis[4-chloro-	72-54-8	U060
DDE	Benzene, 1,1′-(dichloroethenylindene)bis[4-chloro-	72-55-9	—
DDT	Benzene, 1,1′-(2,2,2-trichloroethylidene)bis[4-chloro-	50-29-3	U061
Diallate	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	2303-16-4	U062
Dibenz[a,h]acridine	Same	226-36-8	—
Dibenz[a,j]acridine	Same	224-42-0	—
Dibenz[a,h]anthracene	Same	53-70-3	U063
7H-Dibenzo[c,g]carbazole	Same	194-59-2	—
Dibenzo[a,e]pyrene	Naphtho[1,2,3,4-def]chrysene	192-65-4	—
Dibenzo[a,h]pyrene	Dibenzo[b,def]chrysene	189-64-0	—
Dibenzo[a,i]pyrene	Benzo[rst]pentaphene	189-55-9	U064
1,2-Dibromo-3-chloropropane	Propane, 1,2-dibromo-3-chloro-	96-12-8	U066
Dibutyl phthalate	1,2-Benzenedicarboxylic acid, dibutyl ester	84-74-2	U069
o-Dichlorobenzene	Benzene, 1,2-dichloro-	95-50-1	U070
m-Dichlorobenzene	Benzene, 1,3-dichloro-	541-73-1	U071
p-Dichlorobenzene	Benzene, 1,4-dichloro-	106-46-7	U072
Dichlorobenzene, N.O.S.[1]	Benzene, dichloro-	25321-22-6	—
3,3′-Dichlorobenzidine	[1,1′-Biphenyl]-4,4′-diamine, 3,3′-dichloro-	91-94-1	U073
1,4-Dichloro-2-butene	2-Butene, 1,4-dichloro-	764-41-0	U074
Dichlorodifluoromethane	Methane, dichlorodifluoro-	75-71-8	U075
Dichloroethylene, N.O.S.[1]	Dichloroethylene	25323-30-2	—
1,1-Dichloroethylene	Ethene, 1,1-dichloro-	75-35-4	U07

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Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
1,2-Dichloroethylene	Ethene, 1,2-dichloro-, (E)-	156-60-5	U079
Dichloroethyl ether	Ethane, 1,1′-oxybis[2-chloro-	111-44-4	U025
Dichloroisopropyl ether	Propane, 2,2′-oxybis[2-chloro-	108-60-1	U027
Dichloromethoxy ethane	Ethane, 1,1′-[methylenebis(oxy)]bis[2-chloro-	111-91-1	U024
Dichloromethyl ether	Methane, oxybis[chloro-	542-88-1	P016
2,4-Dichlorophenol	Phenol, 2,4-dichloro-	120-83-2	U081
2,6-Dichlorophenol	Phenol, 2,6-dichloro-	87-65-0	U082
Dichlorophenylarsine	Arsonous dichloride, phenyl-	696-28-6	P036
Dichloropropane, N.O.S.[1]	Propane, dichloro-	26638-19-7	—
Dichloropropanol, N.O.S.[1]	Propanol, dichloro-	26545-73-3	—
Dichloropropene, N.O.S.[1]	1-Propene, dichloro-	26952-23-8	—
1,3-Dichloropropene	1-Propene, 1,3-dichloro-	542-75-6	U084
Dieldrin	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-	60-57-1	P037
1,2:3,4-Diepoxybutane	2,2′-Bioxirane	1464-53-5	U085
Diethylarsine	Arsine, diethyl-	692-42-2	P038
1,4,-Diethyleneoxide	1,4-Dioxane	123-91-1	U108
Diethylhexyl phthalate	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	117-81-7	U028
N,N′-Diethylhydrazine	Hydrazine, 1,2-diethyl-	1615-80-1	U086
O,O-Diethyl S-methyl dithiophosphate	Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288-58-2	U087
Diethyl-p-nitrophenyl phosphate	Phosphoric acid, diethyl 4-nitrophenyl ester	311-45-5	P041
Diethyl phthalate	1,2-Benzenedicarboxylic acid, diethyl ester	84-66-2	U088
O,O-Diethyl O-pyrazinyl phosphorothioate	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	297-97-2	P040
Diethylstilbesterol	Phenol, 4,4′-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-	56-53-1	U089
Dihydrosafrole	1,3-Benzodioxole, 5-propyl-	94-58-6	U090
Diisopropylfluorophosphate (DFP)	Phosphorofluoridic acid, bis(1-methylethyl) ester	55-91-4	P043
Dimethoate	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	60-51-5	P044
3,3′-Dimethoxybenzidine	[1,1′-Biphenyl]-4,4′-diamine, 3-3′-dimethoxy-	119-90-4	U091
p-Dimethylaminoazobenzene	Benzenamine, N,N-dimethyl-4-(phenylazo)-	60-11-7	U093
7,12-Dimethylbenz[a]anthracene	Benz[a]anthracene, 7,12-dimethyl-	57-97-6	U094
3,3′-Dimethylbenzidine	[1,1′-Biphenyl]-4,4′-diamine, 3,3′-dimethyl-	119-93-7	U095
Dimethylcarbamoyl chloride	Carbamic chloride, dimethyl-	79-44-7	U097
1,1-Dimethylhydrazine	Hydrazine, 1,1-dimethyl-	57-14-7	U098
1,2-Dimethylhydrazine	Hydrazine, 1,2-dimethyl-	540-73-8	U099
alpha,alpha-Dimethylphenethylamine	Benzeneethanamine, alpha,alpha-dimethyl-	122-09-8	P046
2,4-Dimethylphenol	Phenol, 2,4-dimethyl-	105-67-9	U101
Dimethyl phthalate	1,2-Benzenedicarboxylic acid, dimethyl ester	131-11-3	U102
Dimethyl sulfate	Sulfuric acid, dimethyl ester	77-78-1	U103
Dinitrobenzene, N.O.S.[1]	Benzene, dinitro-	25154-54-5	—
4,6-Dinitro-o-cresol	Phenol, 2-methyl-4,6-dinitro	534-52-1	P047
4,6-Dinitro-o-cresol salts	—	—	P047
2,4-Dinitrophenol	Phenol, 2,4-dinitro-	51-28-5	P048
2,4-Dinitrotoluene	Benzene, 1-methyl-2,4-dinitro-	121-14-2	U105
2,6-Dinitrotoluene	Benzene, 2-methyl-1,3-dinitro-	606-20-2	U106
Dinoseb	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	88-85-7	P020
Di-n-octylphthalate	1,2-Benzenedicarboxylic acid, dioctyl ester	117-84-0	U017
Diphenylamine	Benzenamine, N-phenyl-	122-39-4	—
1,2-Diphenylhydrazine	Hydrazine, 1,2-diphenyl-	122-66-7	U109
Di-n-propylnitrosamine	1-Propanamine, N-nitroso-N-propyl-	621-64-7	U111
Disulfoton	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	298-04-4	P039
Dithiobiuret	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$	541-53-7	P049
Endosulfan	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	115-29-7	P050
Endothall	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	145-73-3	P088
Endrin	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-	72-20-8	P051
Endrin metabolites	—	—	P051
Epichlorohydrin	Oxirane, (chloromethyl)-	106-89-8	U041
Epinephrine	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-	51-43-4	P042
Ethyl carbamate (urethane)	Carbamic acid, ethyl ester	51-79-6	U238
Ethyl cyanide	Propanenitrile	107-12-0	P101
Ethylenebisdithiocarbamic acid	Carbamodithioic acid, 1,2-ethanediylbis-	111-54-6	U114
Ethylenebisdithiocarbamic acid, salts and esters	—	—	U114
Ethylene dibromide	Ethane, 1,2-dibromo-	106-93-4	U067
Ethylene dichloride	Ethane, 1,2-dichloro-	107-06-2	U077
Ethylene glycol monoethyl ether	Ethanol, 2-ethoxy	110-80-5	U359

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
Ethyleneimine	Aziridine	151-56-4	P054
Ethylene oxide	Oxirane	75-21-8	U115
Ethylenethiourea	2-Imidazolidinethione	96-45-7	U116
Ethylidene dichloride	Ethane, 1,1-dichloro-	75-34-3	U076
Ethyl methacrylate	2-Propenoic acid, 2-methyl-, ethyl ester	97-63-2	U118
Ethyl methanesulfonate	Methanesulfonic acid, ethyl ester	62-50-0	U119
Famphur	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester	52-85-7	P097
Fluoranthene	Same	206-44-0	U120
Fluorine	Same	7782-41-4	P056
Fluoroacetamide	Acetamide, 2-fluoro-	640-19-7	P057
Fluoroacetic acid, sodium salt	Acetic acid, fluoro-, sodium salt	62-74-8	P058
Formaldehyde	Same	50-00-0	U122
Formic acid	Same	64-18-6	U123
Glycidylaldehyde	Oxiranecarboxyaldehyde	765-34-4	U126
Halomethanes, N.O.S.[1]	—	—	—
Heptachlor	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	76-44-8	P059
Heptachlor epoxide	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aalpha,1bbeta,2alpha,5alpha,5abeta,6beta,6aalpha)-	1024-57-3	—
Heptachlor epoxide (alpha, beta, and gamma isomers)	—	—	—
Heptachlorodibenzofurans	—	—	—
Heptachlorodibenzo-p-dioxins	—	—	—
Hexachlorobenzene	Benzene, hexachloro-	118-74-1	U127
Hexachlorobutadiene	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87-68-3	U128
Hexachlorocyclopentadiene	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77-47-4	U130
Hexachlorodibenzo-p-dioxins	—	—	—
Hexachlorodibenzofurans	—	—	—
Hexachloroethane	Ethane, hexachloro-	67-72-1	U131
Hexachlorophene	Phenol, 2,2′-methylenebis[3,4,6-trichloro-	70-30-4	U132
Hexachloropropene	1-Propene, 1,1,2,3,3,3-hexachloro-	1888-71-7	U243
Hexaethyl tetraphosphate	Tetraphosphoric acid, hexaethyl ester	757-58-4	P062
Hydrazine	Same	302-01-2	U133
Hydrogen cyanide	Hydrocyanic acid	74-90-8	P063
Hydrogen fluoride	Hydrofluoric acid	7664-39-3	U134
Hydrogen sulfide	Hydrogen sulfide H_2S	7783-06-4	U135
Indeno[1,2,3-cd]pyrene	Same	193-39-5	U137
Isobutyl alcohol	1-Propanol, 2-methyl-	78-83-1	U140
Isodrin	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-	465-73-6	P060
Isosafrole	1,3-Benzodioxole, 5-(1-propenyl)-	120-58-1	U141
Kepone	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	143-50-0	U142
Lasiocarpine	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S- [1alpha(Z),7(2S*,3R*),7aalpha]]-	303-34-1	U143
Lead	Same	7439-92-1	—
Lead compounds, N.O.S.[1]	—	—	—
Lead acetate	Acetic acid, lead(2+) salt	301-04-2	U144
Lead phosphate	Phosphoric acid, lead(2+) salt (2:3)	7446-27-7	U145
Lead subacetate	Lead, bis(acetato-O)tetrahydroxytri-	1335-32-6	U146
Lindane	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-	58-89-9	U129
Maleic anhydride	2,5-Furandione	108-31-6	U147
Maleic hydrazide	3,6-Pyridazinedione, 1,2-dihydro-	123-33-1	U148
Malononitrile	Propanedinitrile	109-77-3	U149
Melphalan	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	148-82-3	U150
Mercury	Same	7439-97-6	U151
Mercury compounds, N.O.S.[1]	—	—	—
Mercury fulminate	Fulminic acid, mercury(2+) salt	628-86-4	P065
Methacrylonitrile	2-Propenenitrile, 2-methyl-	126-98-7	U152
Methapyrilene	1,2-Ethanediamine, N,N-dimethyl-N′-2-pyridinyl-N′-(2-thienylmethyl)-	91-80-5	U155
Methomyl	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester	16752-77-5	P066
Methoxychlor	Benzene, 1,1′-(2,2,2-trichloroethylidene)bis[4-methoxy-	72-43-5	U247
Methyl bromide	Methane, bromo-	74-83-9	U029
Methyl chloride	Methane, chloro-	74-87-3	U045
Methyl chlorocarbonate	Carbonochloridic acid, methyl ester	79-22-1	U156
Methyl chloroform	Ethane, 1,1,1-trichloro-	71-55-6	U226
3-Methylcholanthrene	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56-49-5	U157
4,4-Methylenebis(2-chloroaniline)	Benzenamine, 4,4′-methylenebis[2-chloro-	101-14-4	U158
Methylene bromide	Methane, dibromo-	74-95-3	U068

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Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
Methylene chloride	Methane, dichloro-	75-09-2	U080
Methyl ethyl ketone (MEK)	2-Butanone	78-93-3	U159
Methyl ethyl ketone peroxide	2-Butanone, peroxide	1338-23-4	U160
Methyl hydrazine	Hydrazine, methyl-	60-34-4	P068
Methyl iodide	Methane, iodo-	74-88-4	U138
Methyl isocyanate	Methane, isocyanato-	624-83-9	P064
2-Methyllactonitrile	Propanenitrile, 2-hydroxy-2-methyl-	75-86-5	P069
Methyl methacrylate	2-Propenoic acid, 2-methyl-, methyl ester	80-62-6	U162
Methyl methanesulfonate	Methanesulfonic acid, methyl ester	66-27-3	—
Methyl parathion	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298-00-0	P071
Methylthiouracil	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56-04-2	U164
Mitomycin C	Azirino[2′,3′:3,4]pyrrolo[1,2-a] indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta,8aalpha,8balpha)]-	50-07-7	U010
MNNG	Guanidine, N-methyl-N′-nitro-N-nitroso-	70-25-7	U163
Mustard gas	Ethane, 1,1′-thiobis[2-chloro-	505-60-2	—
Naphthalene	Same	91-20-3	U165
1,4-Naphthoquinone	1,4-Naphthalenedione	130-15-4	U166
alpha-Naphthylamine	1-Naphthalenamine	134-32-7	U167
beta-Naphthylamine	2-Naphthalenamine	91-59-8	U168
alpha-Naphthylthiourea	Thiourea, 1-naphthalenyl-	86-88-4	P072
Nickel	Same	7440-02-0	—
Nickel compounds, N.O.S.[1]	—	—	—
Nickel carbonyl	Nickel carbonyl, $Ni(CO)_4$, (T-4)-	13463-39-3	P073
Nickel cyanide	Nickel cyanide $Ni(CN)_2$	557-19-7	P074
Nicotine	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-	54-11-5	P075
Nicotine salts	—	—	P075
Nitric oxide	Nitrogen oxide NO	10102-43-9	P076
p-Nitroaniline	Benzenamine, 4-nitro-	100-01-6	P077
Nitrobenzene	Benzene, nitro-	98-95-3	U169
Nitrogen dioxide	Nitrogen oxide NO_2	10102-44-0	P078
Nitrogen mustard	Ethanamine, 2-chloro-N-(2-chloroethyl)-N-methyl-	51-75-2	—
Nitrogen mustard, hydrochloride salt	—	—	—
Nitrogen mustard N-oxide	Ethanamine, 2-chloro-N-(2-chloroethyl)-N-methyl-, N-oxide	126-85-2	—
Nitrogen mustard, N-oxide, hydrochloride salt	—	—	—
Nitroglycerin	1,2,3-Propanetriol, trinitrate	55-63-0	P081
p-Nitrophenol	Phenol, 4-nitro-	100-02-7	U170
2-Nitropropane	Propane, 2-nitro-	79-46-9	U171
Nitrosamines, N.O.S.[1]	—	35576-91-1	—
N-Nitrosodi-n-butylamine	1-Butanamine, N-butyl-N-nitroso-	924-16-3	U172
N-Nitrosodiethanolamine	Ethanol, 2,2′-(nitrosoimino)bis-	1116-54-7	U173
N-Nitrosodiethylamine	Ethanamine, N-ethyl-N-nitroso-	55-18-5	U174
N-Nitrosodimethylamine	Methanamine, N-methyl-N-nitroso-	62-75-9	P082
N-Nitroso-N-ethylurea	Urea, N-ethyl-N-nitroso-	759-73-9	U176
N-Nitrosomethylethylamine	Ethanamine, N-methyl-N-nitroso-	10595-95-6	—
N-Nitroso-N-methylurea	Urea, N-methyl-N-nitroso-	684-93-5	U177
N-Nitroso-N-methylurethane	Carbamic acid, methylnitroso-, ethyl ester	615-53-2	U178
N-Nitrosomethylvinylamine	Vinylamine, N-methyl-N-nitroso-	4549-40-0	P084
N-Nitrosomorpholine	Morpholine, 4-nitroso-	59-89-2	—
N-Nitrosonornicotine	Pyridine, 3-(1-nitroso-2-pyrrolidinyl)-, (S)-	16543-55-8	—
N-Nitrosopiperidine	Piperidine, 1-nitroso-	100-75-4	U179
N-Nitrosopyrrolidine	Pyrrolidine, 1-nitroso-	930-55-2	U180
N-Nitrososarcosine	Glycine, N-methyl-N-nitroso-	13256-22-9	—
5-Nitro-o-toluidine	Benzenamine, 2-methyl-5-nitro-	99-55-8	U181
Octamethylpyrophosphoramide	Diphosphoramide, octamethyl-	152-16-9	P08
Osmium tetroxide	Osmium oxide OsO_4, (T-4)-	20816-12-0	P087
Paraldehyde	1,3,5-Trioxane, 2,4,6-trimethyl-	123-63-7	U182
Parathion	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56-38-2	P089
Pentachlorobenzene	Benzene, pentachloro-	608-93-5	U183
Pentachlorodibenzo-p-dioxins	—	—	—
Pentachlorodibenzofurans	—	—	—
Pentachloroethane	Ethane, pentachloro-	76-01-7	U184
Pentachloronitrobenzene (PCNB)	Benzene, pentachloronitro-	82-68-8	U185
Pentachlorophenol	Phenol, pentachloro-	87-86-5	See F027
Phenacetin	Acetamide, N-(4-ethoxyphenyl)-	62-44-2	U187
Phenol	Same	108-95-2	U188
Phenylenediamine	Benzenediamine	25265-76-3	—
Phenylmercury acetate	Mercury, (acetato-O)phenyl-	62-38-4	P092
Phenylthiourea	Thiourea, phenyl-	103-85-5	P093
Phosgene	Carbonic dichloride	75-44-5	P095
Phosphine	Same	7803-51-2	P096

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
Phorate	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	298-02-2	P094
Phthalic acid esters, N.O.S.[1]	—	—	—
Phthalic anhydride	1,3-Isobenzofurandione	85-44-9	U190
2-Picoline	Pyridine, 2-methyl-	109-06-8	U191
Polychlorinated biphenyls, N.O.S.[1]	—	—	—
Potassium cyanide	Potassium cyanide K(CN)	151-50-8	P098
Potassium silver cyanide	Argentate(1-), bis(cyano-C)-, potassium	506-61-6	P099
Pronamide	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950-58-5	U192
1,3-Propane sultone	1,2-Oxathiolane, 2,2-dioxide	1120-71-4	U193
n-Propylamine	1-Propanamine	107-10-8	U194
Propargyl alcohol	2-Propyn-1-ol	107-19-7	P102
Propylene dichloride	Propane, 1,2-dichloro-	78-87-5	U083
1,2-Propylenimine	Aziridine, 2-methyl-	75-55-8	P067
Propylthiouracil	4(1H)-Pyrimidinone, 2,3-dihydro-6-propyl-2-thioxo-	51-52-5	—
Pyridine	Same	110-86-1	U196
Reserpine	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5- trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-	50-55-5	U200
Resorcinol	1,3-Benzenediol	108-46-3	U201
Saccharin	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81-07-2	U202
Saccharin salts	—	—	U202
Safrole	1,3-Benzodioxole, 5-(2-propenyl)-	94-59-7	U203
Selenium	Same	7782-49-2	—
Selenium compounds, N.O.S.[1]	—	—	—
Selenium dioxide	Selenious acid	7783-00-8	U204
Selenium sulfide	Selenium sulfide SeS_2	7488-56-4	U205
Selenourea	Same	630-10-4	P103
Silver	Same	7440-22-4	—
Silver compounds, N.O.S.[1]	—	—	—
Silver cyanide	Silver cyanide Ag(CN)	506-64-9	P104
Silvex (2,4,5-TP)	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	93-72-1	See F027
Sodium cyanide	Sodium cyanide Na(CN)	143-33-9	P106
Streptozotocin	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)carbonyl]amino]-	18883-66-4	U206
Strychnine	Strychnidin-10-one	57-24-9	P108
Strychnine salts	—	—	P108
TCDD	Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro-	1746-01-6	—
1,2,4,5-Tetrachlorobenzene	Benzene, 1,2,4,5-tetrachloro-	95-94-3	U207
Tetrachlorodibenzo-p-dioxins	—	—	—
Tetrachlorodibenzofurans	—	—	—
Tetrachloroethane, N.O.S.[1]	Ethane, tetrachloro-, N.O.S.	25322-20-7	—
1,1,1,2-Tetrachloroethane	Ethane, 1,1,1,2-tetrachloro-	630-20-6	U208
1,1,2,2-Tetrachloroethane	Ethane, 1,1,2,2-tetrachloro-	79-34-5	U209
Tetrachloroethylene	Ethene, tetrachloro-	127-18-4	U210
2,3,4,6,-Tetrachlorophenol	Phenol, 2,3,4,6-tetrachloro-	58-90-2	See F027
Tetraethyldithiopyrophosphate	Thiodiphosphoric acid, tetraethyl ester	3689-24-5	P109
Tetraethyl lead	Plumbane, tetraethyl-	78-00-2	P110
Tetraethyl pyrophosphate	Diphosphoric acid, tetraethyl ester	107-49-3	P111
Tetranitromethane	Methane, tetranitro-	509-14-8	P112
Thallium	Same	7440-28-0	—
Thallium compounds, N.O.S.[1]	—	—	—
Thallic oxide	Thallium oxide Tl_2O_3	1314-32-5	P113
Thallium(I) acetate	Acetic acid, thallium(1+) salt	563-68-8	U214
Thallium(I) carbonate	Carbonic acid, dithallium(1+) salt	6533-73-9	U215
Thallium(I) chloride	Thallium chloride TlCl	7791-12-0	U216
Thallium(I) nitrate	Nitric acid, thallium(1+) salt	10102-45-1	U217
Thallium selenite	Selenious acid, dithallium(1+) salt	12039-52-0	P114
Thallium(I) sulfate	Sulfuric acid, dithallium(1+) salt	7446-18-6	P115
Thioacetamide	Ethanethioamide	62-55-5	U218
Thiofanox	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl] oxime	39196-18-4	P045
Thiomethanol	Methanethiol	74-93-1	U153
Thiophenol	Benzenethiol	108-98-5	P014
Thiosemicarbazide	Hydrazinecarbothioamide	79-19-6	P116
Thiourea	Same	62-56-6	U219
Thiram	Thioperoxydicarbonic diamide, $[(H_2N)C(S)]_2S_2$, tetramethyl-	137-26-8	U244
Toluene	Benzene, methyl-	108-88-3	U220
Toluenediamine	Benzenediamine, ar-methyl-	25376-45-8	U221
Toluene-2,4-diamine	1,3-Benzenediamine, 4-methyl-	95-80-7	—
Toluene-2,6-diamine	1,3-Benzenediamine, 2-methyl-	823-40-5	—
Toluene-3,4-diamine	1,2-Benzenediamine, 4-methyl-	496-72-0	—
Toluene diisocyanate	Benzene, 1,3-diisocyanatomethyl-	26471-62-5	U223
o-Toluidine	Benzenamine, 2-methyl-	95-53-4	U328
o-Toluidine hydrochloride	Benzenamine, 2-methyl-, hydrochloride	636-21-5	U222

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Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
p-Toluidine	Benzenamine, 4-methyl-	106-49-0	U353
Toxaphene	Same	8001-35-2	P123
1,2,4-Trichlorobenzene	Benzene, 1,2,4-trichloro-	120-82-1	—
1,1,2-Trichloroethane	Ethane, 1,1,2-trichloro-	79-00-5	U227
Trichloroethylene	Ethene, trichloro-	79-01-6	U228
Trichloromethanethiol	Methanethiol, trichloro-	75-70-7	P118
Trichloromonofluoromethane	Methane, trichlorofluoro-	75-69-4	P121
2,4,5-Trichlorophenol	Phenol, 2,4,5-trichloro-	95-95-4	See F027
2,4,6-Trichlorophenol	Phenol, 2,4,6-trichloro-	88-06-2	See F027
2,4,5-T	Acetic acid, (2,4,5-trichlorophenoxy)-	93-76-5	See F027
Trichloropropane, N.O.S.[1]	—	25735-29-9	—
1,2,3-Trichloropropane	Propane, 1,2,3-trichloro-	96-18-4	—
O,O,O-Triethyl phosphorothioate	Phosphorothioic acid, O,O,O-triethyl ester	126-68-1	—
1,3,5-Trinitrobenzene	Benzene, 1,3,5-trinitro-	99-35-4	U234
Tris(1-aziridinyl)phosphine sulfide	Aziridine, 1,1′,1″-phosphinothioylidynetris-	52-24-4	—
Tris(2,3-dibromopropyl) phosphate	1-Propanol, 2,3-dibromo-, phosphate (3:1)	126-72-7	U235
Trypan blue	2,7-Naphthalenedisulfonic acid, 3,3′-[(3,3′-dimethyl[1,1′-biphenyl]-4,4′-diyl)bis(azo)]-bis[5-amino-4-hydroxy-, tetrasodium salt	72-57-1	U236
Uracil mustard	2,4(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66-75-1	U237
Vanadium pentoxide	Vanadium oxide V_2O_5	1314-62-1	P120
Vinyl chloride	Ethene, chloro-	75-01-4	U043
Warfarin	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, when present at concentrations less than 0.3%	81-81-2	U248
Warfarin	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, when present at concentrations greater than 0.3%	81-81-2	P001
Warfarin salts, when present at concentrations less than 0.3%	—	—	U248
Warfarin salts, when present at concentrations greater than 0.3%	—	—	P001
Zinc cyanide	Zinc cyanide $Zn(CN)_2$	557-21-1	P121
Zinc phosphide	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10%	1314-84-7	P122
Zinc phosphide	Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less	1314-84-7	U249

[1] The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this appendix.

[53 FR 13388, Apr. 22, 1988, as amended at 53 FR 43881, Oct. 31, 1988; 54 FR 50978, Dec. 11, 1989; 55 FR 50483, Dec. 6, 1990; 56 FR 7568, Feb. 25, 1991]

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Appendix VI—Political Jurisdictions[1] in Which Compliance With § 264.18(a) Must Be Demonstrated

ALASKA
- Aleutian Islands
- Anchorage
- Bethel
- Bristol Bay
- Cordova-Valdez
- Fairbanks-Fort Yukon
- Juneau
- Kenai-Cook Inlet
- Ketchikan-Prince of Wales
- Kodiak
- Lynn Canal-Icy Straits
- Palmer-Wasilla-Talkeena
- Seward
- Sitka
- Wade Hampton
- Wrangell Petersburg
- Yukon-Kuskokwim

ARIZONA
- Cochise
- Graham
- Greenlee
- Yuma

CALIFORNIA
- All

COLORADO
- Archuleta
- Conejos
- Hinsdale
- Mineral
- Rio Grande
- Saguache

HAWAII
- Hawaii

IDAHO
- Bannock
- Bear Lake
- Bingham
- Bonneville
- Caribou
- Cassia
- Clark
- Franklin
- Fremont
- Jefferson
- Madison
- Oneida
- Power
- Teton

MONTANA
- Beaverhead
- Broadwater
- Cascade
- Deer Lodge
- Flathead
- Gallatin
- Granite
- Jefferson
- Lake
- Lewis and Clark
- Madison
- Meagher
- Missoula
- Park
- Powell
- Sanders
- Silver Bow
- Stillwater
- Sweet Grass
- Teton
- Wheatland

NEVADA
- All

NEW MEXICO
- Bernalillo
- Catron
- Grant
- Hidalgo
- Los Alamos
- Rio Arriba
- Sandoval
- Sante Fe
- Sierra
- Socorro
- Taos
- Torrance
- Valencia

UTAH
- Beaver
- Box Elder
- Cache
- Carbon
- Davis
- Duchesne
- Emery
- Garfield
- Iron
- Juab
- Millard
- Morgan
- Piute
- Rich
- Salt Lake
- Sanpete
- Sevier
- Summit
- Tooele
- Utah
- Wasatch
- Washington
- Wayne
- Weber

WASHINGTON
- Chelan
- Clallam
- Clark
- Cowlitz
- Douglas
- Ferry
- Grant
- Grays Harbor
- Jefferson
- King
- Kitsap
- Kittitas
- Lewis
- Mason
- Okanogan
- Pacific
- Pierce
- San Juan Islands
- Skagit
- Skamania
- Snohomish
- Thurston
- Wahkiakum
- Whatcom
- Yakima

WYOMING
- Fremont
- Lincoln
- Park
- Sublette
- Teton
- Uinta
- Yellowstone National Park

[1] These include counties, city-county consolidations, and independent cities. In the case of Alaska, the political jurisdictions are election districts, and, in the case of Hawaii, the political jurisdiction listed is the island of Hawaii.

[46 FR 57285, Nov. 23, 1981; 47 FR 953, Jan. 8, 1982]

Appendices VII—VIII [Reserved]

Appendix IX—Ground-Water Monitoring List

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APPENDIX IX—GROUND-WATER MONITORING LIST[1]

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-	8100 8270	200 10
Acenaphthylene	208-96-8	Acenaphthylene	8100 8270	200 10
Acetone	67-64-1	2-Propanone	8240	100
Acetophenone	98-86-2	Ethanone, 1-phenyl	8270	10
Acetonitrile; Methyl cyanide	75-05-8	Acetonitrile	8015	100
2-Acetylaminofluorene; 2-AAF	53-96-3	Acetamide, N-9H-fluoren-2-yl-	8270	10
Acrolein	107-02-8	2-Propenal	8030 8240	5 5
Acrylonitrile	107-13-1	2-Propenenitrile	8030 8240	5 5
Aldrin	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1α,4α,4aβ,5α,8α,8aβ)-	8080 8270	0.05 10
Allyl chloride	107-05-1	1-Propene, 3-chloro-	8010 8240	5 100

APPENDIX IX—GROUND-WATER MONITORING LIST[1]—Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (µg/L)[6]
4-Aminobiphenyl	92-67-1	[1,1'-Biphenyl]-4-amine	8270	10
Aniline	62-53-3	Benzenamine	8270	10
Anthracene	120-12-7	Anthracene	8100	200
			8270	10
Antimony	(Total)	Antimony	6010	300
			7040	2,000
			7041	30
Aramite	140-57-8	Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester)	8270	10
Arsenic	(Total)	Arsenic	6010	500
			7060	10
			7061	20
Barium	(Total)	Barium	6010	20
			7080	1,000
Benzene	71-43-2	Benzene	8020	2
			8240	5
Benzo[a]anthracene; Benzantracene	56-55-3	Benz[a]anthracene	8100	200
			8270	10
Benzo[b]fluoranthene	205-99-2	Benz[e]acephenanthrylene	8100	200
			8270	10
Benzo[k]fluoranthene	207-08-9	Benzo[k]fluoranthene	8100	200
			8270	10
Benzo[ghi]perylene	191-24-2	Benzo[ghi]perylene	8100	200
			8270	10
Benzo[a]pyrene	50-32-8	Benzo[a]pyrene	8100	200
			8270	10
Benzyl alcohol	100-51-6	Benzenemethanol	8270	20
Beryllium	(Total)	Beryllium	6010	3
			7090	50
			7091	2
alpha-BHC	319-84-6	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1α,2α,3β,4α,5β,6β)-	8080	0.05
			8250	10
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1α,2β,3α,4β,5α,6β)-	8080	0.05
			8250	40
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1α,2α,3α,4β,5α,6β)-	8080	0.1
			8250	30
gamma-BHC; Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1α,2α,3β,4α,5α,6β)-	8080	0.05
			8250	10
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	8270	10
Bis(2-chloroethyl) ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro-	8270	10
Bis(2-chloro-1methylethyl)ether; 2,2'-Dichlorodiisopropyl ether	108-60-1	Propane, 2,2'-oxybis[1-chloro-	8010	100
			8270	10
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl)ester	8060	20
			8270	10
Bromodichloromethane	75-27-4	Methane, bromodichloro-	8010	1
			8240	5
Bromoform; Tribromomethane	75-25-2	Methane, tribromo-	8010	2
			8240	5
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-	8270	10
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	8060	5
			8270	10
Cadmium	(Total)	Cadmium	6010	40
			7130	50
			7131	1
Carbon disulfide	75-15-0	Carbon disulfide	8240	5
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	8010	1
			8240	5
Chlordane	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro	8080	0.1
			8250	10
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-	8270	20

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APPENDIX IX—GROUND-WATER MONITORING LIST[1]—Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
Chlorobenzene	108-90-7	Benzene, chloro-	8010	2
			8020	2
			8240	5
Chlorobenzilate	510-15-6	Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy,ethyl ester	8270	10
p-Chloro-m-cresol	59-50-7	Phenol, 4-chloro-3-methyl-	8040	5
			8270	20
Chloroethane; Ethyl chloride	75-00-3	Ethane, chloro-	8010	5
			8240	10
Chloroform	67-66-3	Methane, trichloro-	8010	0.5
			8240	5
2-Chloronaphthalene	91-58-7	Napthalene, 2-chloro-	8120	10
			8270	10
2-Chlorophenol	95-57-8	Phenol, 2-chloro-	8040	5
			8270	10
4-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy	8270	10
Chloroprene	126-99-8	1,3-Butadiene,2-chloro-	8010	50
			8240	5
Chromium	(Total)	Chromium	6010	70
			7190	500
			7191	10
Chrysene	218-01-9	Chrysene	8100	200
			8270	10
Cobalt	(Total)	Cobalt	6010	70
			7200	500
			7201	10
Copper	(Total)	Copper	6010	60
			7210	200
m-Cresol	108-39-4	Phenol, 3-methyl-	8270	10
o-Cresol	95-48-7	Phenol, 2-methyl-	8270	10
p-Cresol	106-44-5	Phenol, 4-methyl-	8270	10
Cyanide	57-12-5	Cyanide	9010	40
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-	8150	10
4,4'-DDD	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	8080	0.1
			8270	10
4,4'-DDE	72-55-9	Benzene, 1,1'-(dichloroethylidene)bis[4-chloro-	8080	0.05
			8270	10
4,4'-DDT	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	8080	0.1
			8270	10
Diallate	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	8270	10
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene	8100	200
			8270	10
Dibenzofuran	132-64-9	Dibenzofuran	8270	10
Dibromochloromethane; Chlorodibromomethane	124-48-1	Methane, dibromochloro-	8010	1
			8240	5
1,2-Dibromo-3-chloropropane; DBCP	96-12-8	Propane, 1,2-dibromo-3-chloro-	8010	100
			8240	5
			8270	10
1,2-Dibromoethane; Ethylene dibromide	106-93-4	Ethane, 1,2-dibromo-	8010	10
			8240	5
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester	8060	5
			8270	10
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	8010	2
			8020	5
			8120	10
			8270	10
m-Dichlorobenzene	541-73-1	Benzene, 1,3-dichloro-	8010	5
			8020	5
			8120	10
			8270	10

APPENDIX IX – GROUND-WATER MONITORING LIST[1] – Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
p-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	8010 8020 8120 8270	2 5 15 10
3,3'-Dichlorobenzidine	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	8270	20
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	8240	5
Dichlorodifluoromethane	75-71-8	Methane, dichlorodifluoro-	8010 8240	10 5
1,1-Dichloroethane	75-34-3	Ethane, 1,1-dichloro-	8010 8240	1 5
1,2-Dichloroethane; Ethylene dichloride	107-06-2	Ethane, 1,2-dichloro-	8010 8240	0.5 5
1,1-Dichloroethylene; Vinylidene chloride	75-35-4	Ethene, 1,1-dichloro-	8010 8240	1 5
trans-1,2-Dichloroethylene	156-60-5	Ethene, 1,2-dichloro-, (E)-	8010 8240	1 5
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-	8040 8270	5 10
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-	8270	10
1,2-Dichloropropane	78-87-5	Propane, 1,2-dichloro-	8010 8240	0.5 5
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-	8010 8240	20 5
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-	8010 8240	5 5
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-,(1aα,2β,2aα,3β,6β,6aα, 7β,7aα)-	8080 8270	0.05 10
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	8060 8270	5 10
O,O-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	8270	10
Dimethoate	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	8270	10
p-(Dimethylamino)azobenzene	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-	8270	10
7,12-Dimethylbenz[a]anthracene	57-97-6	Benz[a]anthracene, 7,12-dimethyl-	8270	10
3,3'-Dimethylbenzidine	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	8270	10
alpha, alpha-Dimethylphenethylamine	122-09-8	Benzeneethanamine, α,α-dimethyl-	8270	10
2,4-Dimethylphenol	105-67-9	Phenol, 2,4-dimethyl-	8040 8270	5 10
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester	8060 8270	5 10
m-Dinitrobenzene	99-65-0	Benzene, 1,3-dinitro-	8270	10
4,6-Dinitro-o-cresol	534-52-1	Phenol, 2-methyl-4,6-dinitro-	8040 8270	150 50
2,4-Dinitrophenol	51-28-5	Phenol, 2,4-dinitro-	8040 8270	150 50
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-	8090 8270	0.2 10
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-	8090 8270	0.1 10
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	8150 8270	1 10
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	8060 8270	30 10
1,4-Dioxane	123-91-1	1,4-Dioxane	8015	150
Diphenylamine	122-39-4	Benzenamine, N-phenyl-	8270	10
Disulfoton	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	8140 8270	2 10

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APPENDIX IX – GROUND-WATER MONITORING LIST[1] – Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
Endosulfan I	959-98-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aβ,6α,9α,9aβ)-	8080 8250	0.1 10
Endosulfan II	33213-65-9	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aα,6β,9β,9aα)-	8080	0.05
Endosulfan sulfate	1031-07-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3,3-dioxide	8080 8270	0.5 10
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-,(1aα,2β,2aβ,3α,6α,6aβ, 7β,7aα)-	8080 8250	0.1 10
Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-,(1α,2β,2aβ,4β,4aβ,5β,6aβ,6bβ,7R[8])-	8080 8270	0.2 10
Ethylbenzene	100-41-4	Benzene, ethyl-	8020 8240	2 5
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	8015 8240 8270	10 5 10
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	8270	10
Famphur	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl]-O,O-dimethyl ester	8270	10
Fluoranthene	206-44-0	Fluoranthene	8100 8270	200 10
Fluorene	86-73-7	9H-Fluorene	8100 8270	200 10
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	8080 8270	0.05 10
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aα,1bβ,2α,5α,5aβ,6β,6aα)	8080 8270	1 10
Hexachlorobenzene	118-74-1	Benzene, hexachloro-	8120 8270	0.5 10
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	8120 8270	5 10
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	8120 8270	5 10
Hexachloroethane	67-72-1	Ethane, hexachloro-	8120 8270	0.5 10
Hexachlorophene	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-	8270	10
Hexachloropropene	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-	8270	10
2-Hexanone	591-78-6	2-Hexanone	8240	50
Indeno[1,2,3-cd]pyrene	193-39-5	Indeno[1,2,3-cd]pyrene	8100 8270	200 10
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-	8015	50
Isodrin	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1α,4α,4aβ,5β,8β,8aβ)-	8270	10
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl	8090 8270	60 10
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	8270	10
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	8270	10
Lead	(Total)	Lead	6010 7420 7421	40 1,000 10
Mercury	(Total)	Mercury	7470	2
Methacrylonitrile	126-98-7	2-Propanenitrile, 2-methyl-	8015 8240	5 5
Methapyrilene	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	8270	10
Methoxychlor	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-	8080 8270	2 10

APPENDIX IX – GROUND-WATER MONITORING LIST[1] – Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (µg/L)[6]
Methyl bromide; Bromomethane	74-83-9	Methane, bromo-	8010 8240	20 10
Methyl chloride: Chloromethane	74-87-3	Methane, chloro-	8010 8240	1 10
3-Methylcholanthrene	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	8270	10
Methylene bromide; Dibromomethane	74-95-3	Methane, dibromo-	8010 8240	15 5
Methylene chloride; Dichloromethane	75-09-2	Methane, dichloro-	8010 8240	5 5
Methyl ethyl ketone; MEK	78-93-3	2-Butanone	8015 8240	10 100
Methyl iodide; Iodomethane	74-88-4	Methane, iodo-	8010 8240	40 5
Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester	8015 8240	2 5
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester	8270	10
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-	8270	10
Methyl parathion; Parathion methyl	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	8140 8270	0.5 10
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1	2-Pentanone, 4-methyl-	8015 8240	5 50
Naphthalene	91-20-3	Naphthalene	8100 8270	200 10
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione	8270	10
1-Naphthylamine	134-32-7	1-Naphthalenamine	8270	10
2-Naphthylamine	91-59-8	2-Naphthalenamine	8270	10
Nickel	(Total)	Nickel	6010 7520	50 400
o-Nitroaniline	88-74-4	Benzenamine, 2-nitro-	8270	50
m-Nitroaniline	99-09-2	Benzenamine, 3-nitro-	8270	50
p-Nitroaniline	100-01-6	Benzenamine, 4-nitro-	8270	50
Nitrobenzene	98-95-3	Benzene, nitro-	8090 8270	40 10
o-Nitrophenol	88-75-5	Phenol, 2-nitro	8040 8270	5 10
p-Nitrophenol	100-02-7	Phenol, 4-nitro-	8040 8270	10 50
4-Nitroquinoline-1-oxide	56-57-5	Quinoline, 4-nitro-, 1-oxide	8270	10
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-	8270	10
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-	8270	10
N-Nitrosodimethylamine	62-75-9	Methamine, N-methyl-N-nitroso-	8270	10
N-Nitrosodiphenylamine	86-30-6	Benzenamine, N-nitroso-N-phenyl-	8270	10
N-Nitrosodipropylamine; Di-n-propylnitrosamine	621-64-7	1-Propanamine, N-nitroso-N-propyl	8270	10
N-Nitrosomethylethylamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-	8270	10
N-Nitrosomorpholine	59-89-2	Morpholine, N-nitroso-	8270	10
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-	8270	10
N-Nitrosopyrrolidine	930-55-2	Pyrrolidine, 1-nitroso-	8270	10
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-	8270	10
Parathion	56-38-2	Phosphorothioic acid, O,O-diethyl-O-,(4-nitrophenyl) ester	8270	10
Polychlorinated biphenyls; PCBs	Note 7	1,1'-Biphenyl, chloroderivatives	8080 8250	50 100
Polychlorinated dibenzo-p-dioxins; PCDDs	Note 8	Dibenzo[b,e][1,4]dioxin, chloro derivatives	8280	0.01
Polychlorinated dibenzofurans; PCDFs	Note 9	Dibenzofuran, chloro derivatives	8280	0.01
Pentachlorobenzene	608-93-5	Benzene, pentachloro-	8270	10
Pentachloroethane	76-01-7	Ethane, pentachloro-	8240 8270	5 10
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-	8270	10

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APPENDIX IX – GROUND-WATER MONITORING LIST[1] – Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (µg/L)[6]
Pentachlorophenol	87-86-5	Phenol, pentachloro-	8040 8270	5 50
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenyl)-	8270	10
Phenanthrene	85-01-8	Phenanthrene	8100 8270	200 10
Phenol	108-95-2	Phenol	8040 8270	1 10
p-Phenylenediamine	106-50-3	1,4-Benzenediamine	8270	10
Phorate	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	8140 8270	2 10
2-Picoline	109-06-8	Pyridine, 2-methyl-	8240 8270	5 10
Pronamide	23950-58-5	Benzamide, 3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)-	8270	10
Propionitrile; Ethyl cyanide	107-12-0	Propanenitrile	8015 8240	60 5
Pyrene	129-00-0	Pyrene	8100 8270	200 10
Pyridine	110-86-1	Pyridine	8240 8270	5 10
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	8270	10
Selenium	(Total)	Selenium	6010 7740 7741	750 20 20
Silver	(Total)	Silver	6010 7760	70 100
Silvex; 2,4,5-TP	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	8150	2
Styrene	100-42-5	Benzene, ethenyl-	8020 8240	1 5
Sulfide	18496-25-8	Sulfide	9030	10,000
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	8150	2
2,3,7,8-TCDD; 2,3,7,8-Tetrachloro-dibenzo-p-dioxin	1746-01-6	Dibenxo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro-	8280	0.005
1,2,4,5-Tetrachlorobenzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-	8270	10
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	8010 8240	5 5
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	8010 8240	0.5 5
Tetrachloroethylene; Perchloroethylene; Tetrachlorothene	127-18-4	Ethene, tetrachloro-	8010 8240	0.5 5
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-	8270	10
Tetraethyl dithiopyrophosphate; Sulfotepp	3689-24-5	Thiodiphosphoric acid, ($[(HO)_2P(S)]_2O$), tetraethyl ester	8270	10
Thallium	(Total)	Thallium	6010 7840 7841	400 1,000 10
Tin	(Total)	Tin	7870	8,000
Toluene	108-88-3	Benzene, methyl-	8020 8240	2 5
o-Toluidine	95-53-4	Benzenamine, 2-methyl-	8270	10
Toxaphene	8001-35-2	Toxaphene	8080 8250	2 10
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-	8270	10
1,1,1-Trichloroethane; Methylchloroform	71-55-6	Ethane, 1,1,1-trichloro-	8240	5
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	8010 8240	0.2 5
Trichloroethylene; Trichloroethene	79-01-6	Ethene, trichloro	8010 8240	1 5
Trichlorofluoromethane	75-69-4	Methane, trichlorofluoro-	8010 8240	10 5

APPENDIX IX—GROUND-WATER MONITORING LIST[1]—Continued

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-	8270	10
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-	8040	5
			8270	10
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	8010	10
			8240	5
O,O,O-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, O,O,O-triethyl ester	8270	10
sym-Trinitrobenzene	99-35-4	Benzene, 1,3,5-trinitro-	8270	10
Vanadium	(Total)	Vanadium	6010	80
			7910	2,000
			7911	40
Vinyl acetate	108-05-4	Acetic acid, ethenyl ester	8240	5
Vinyl chloride	75-01-4	Ethene, chloro-	8010	2
			8240	10
Xylene (total)	1330-20-7	Benzene, dimethyl-	8020	5
			8240	5
Zinc	(Total)	Zinc	6010	20
			7950	50

[1] The regulatory requirements pertain only to the list of substances; the right hand columns (Methods and PQL) are given for informational purposes only. See also footnotes 5 and 6.

[2] Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

[3] Chemical Abstracts Service registry number. Where "Total" is entered, all species in the ground water that contain this element are included.

[4] CAS index names are those used in the 9th Cumulative Index.

[5] Suggested Methods refer to analytical procedure numbers used in EPA Report SW-846 "Test Methods for Evaluating Solid Waste", third edition, November 1986. Analytical details can be found in SW-846 and in documentation on file at the agency. CAUTION: The methods listed are representative SW-846 procedures and may not always be the most suitable method(s) for monitoring an analyte under the regulations.

[6] Practical Quantitation Limits (PQLs) are the lowest concentrations in ground waters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQLs listed are generally stated to one significant figure. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for individual compounds; PQLs are not a part of the regulation.

[7] Polychlorinated biphenyls (CAS RN 1336-36-3); this category contains congener chemicals, including constituents of Aroclor-1016 (CAS RN 12674-11-2); Aroclor-1221 (CAS RN 11104-28-2), Aroclor-1232 (CAS RN 11141-16-5), Aroclor-1242 (CAS RN 53469-21-9), Aroclor-1248 (CAS RN 12672-29-6), Aroclor-1254 (CAS RN 11097-69-1), and Aroclor-1260 (CAS RN 11096-82-5). The PQL shown is an average value for PCB congeners.

[8] This category contains congener chemicals, including tetrachlorodibenzo-p-dioxins (see also 2,3,7,8-TCDD), pentachlorodibenzo-p-dioxins, and hexachlorodibenzo-p-dioxins. The PQL shown is an average value for PCDD congeners.

[9] This category contains congener chemicals, including tetrachlorodibenzofurans, pentachlorodibenzofurans, and hexachlorodibenzofurans. The PQL shown is an average value for PCDF congeners.

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Attachment C

APENDIX VIII CHEMICALS - NOT SELECTED

Common name	Common name
Acetyl chloride	Coal tar creosote
1-Acetyl-2-thiourea	Copper cyanide
Acrylamide	Creosote
Aflatoxins	Cyanogen
Allyl alcohol	Cyanogen bromide
Aluminum Phosphide	Cyanogen chloride
5-(Aminomethyl)-3-isoxazolol	Cycasin
4-Aminopyridine	2-Cyclohexyl-4,6-dinitrophenol
Amitrole	Cyclophosphamide
Ammonium vanadate	Daunomycin
Antimony compounds, N.O.S.	Dibenz(a,h)acridine
Arsenic compounds, N.O.S	Dibenz(a,j)acridine
Arsenic acid	7H-Dibenzo[c,g]carbazole
Arsenic pentoxide	Dibenzo(a,e)pyrene
Arsenic trioxide	Dichloroethyl ether
Auramine	Dichloroisopropyl ether
Azaserine	Dichloromethoxy ethane
Barium compounds, N.O.S.	Dichloromethyl ether
Barium cyanide	Dichlorophenylarsine
Barium cyanide	1,2:3,4-Diepoxybutane
Benzal Chloride	Diethylarsine
Benz[c]acridine	O,O'-Diethyl S-methyl dithiophosphate
Benzidine	Diethyl-p-nitrophenyl phosphate
Benzo(j)fluoranthene	Diethylstilbesterol
Benzenearsonic acid	Dihydrosafrole
p-Benzoquinone	Diisopropylfluorophosphate (DFP)
Benzotrichloride	Dimethylcarbamoyl chloride
Benzyl chloride	1,1-Dimethylhydrazine
Beryllium compounds, M.O.S.	1,2-Dimethylhydrazine
Bromoacetone	3,3'-Dimethoxybenzidine
Brucine	4,6-Dinitro-o-cresol salts
Cacodylic acid	Dimethyl sulfate
Cadmium compounds, N.O.S.	Dithiobiuret
Calcium chromate	Endothall
Calcium cyanide	Epichlorohydrin
Carbon oxyfluoride	Epinephrine
Chlorambucil	Ethylenebisdithiocarbamic acid
Chlorinated fluorocarbons, N.O.S.	Ethylenebisdithiocarbamic acid, salts and esters
Chlorinated naphthalene, N.O.S.	Ethylene glycol monoethyl ether
Chlornaphazine	Ethyleneimine
Chloroalkyl ethers, N.O.S.	Ethylenethiourea
2-Chloroethyl vinyl ether	Ethylene oxide
3-Chloropropionitrile	Fluorine
Chloromethyl methyl ether	Fluoroacetamide
1-(o-Chlorophenyl)thiourea	Fluoroacetic acid, sodium salt
Cirtis red No. 2	Hexaethyl tetraphosphate

The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this appendix.

APENDIX VIII CHEMICALS - NOT SELECTED

Common name	Common name
Hydrazine	N,N'-diethylhydrazine
Hydrogen cyanide	N-Nitrososarcosine
Hydrogen fluoride	Octamethylpyrophosphormide
Hydrogen sulfide	Osmium tetroxide
Lasiocarpine	Phenylmercury acetate
Lead compounds, N.O.S.	Phebylthiourea
Lead acetate	Phosgene
Lead phosphate	Phosphine
Lead subacetate	Potassium cyanide
Maleic anhydride	Potassium silver cyanide
Maleic hydrazide	1,3-Propane sultone
Malononitrile	Propargyl alcohol
Melphalan	n-Propylamine
Mercury compounds, N.O.S.	1,2-Propylenimine
Mercury fulminate	Propylthiouracil
Methomyl	Reserpine
Methyl chlorocarbonate	Resorcinol
Methyl ethyl ketone peroxide	Saccharin
Methyl hydrazine	Saccharin salts
Methyl isocyanate	Selenium compounds, N.O.S.
4,4-Methylenebis(2-chloroaniline)	Selenium dioxide
2-Methyllactonitrile	Selenium sulfide
Methylthiouracil	Selenourea
Mitomycin C	Silver compounds, N.O.S.
MNNG	Silver cyanide
Mustard gas	Streptozotocin
alpha-Naphthylthiourea	Strychnine
Nickel compounds, N.O.S.	Strychnine salts
Nickel carbonyl	Tetraethyl lead
Nickel cyanide	Tetrenitromethane
Nicotine	Tetraethyl pyrophosphate
Nicotine salts	Thallium compounds, N.O.S.
Nitric oxide	Thallic oxide
Nitrogen dioxide	Thallium(I) acetate
Nitrogen mustard	Thallium(I) carbonate
Nitrogen mustard, hydrochloride salt	Thallium(I) chloride
Nitrogen mustard N-oxide	Thallium(I) nitrate
Nitrogen mustard N-oxide, hydrochloride salt	Thallium selenite
2-Nitropropane	Thallium(I) sulfate
N-Nitrosodiethanolamine	Thioacetamide
N-Nitroso-N-ethylurea	Thiofanox
N-Nitroso-N-methylura	Thiomethanol
N-Nitroso-N-methylurethane	Thiophenol
N-Nitrosomethylvinylamine	Thiosemicarbazide
N-Nitrosonornicotine	Thiourea

The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this appendix.

APENDIX VIII CHEMICALS - NOT SELECTED

Common name
Thiram
Toluene diisocyanate
Toluenediamine
Toluene-2,4-diamine
Toluene-2,6-diamine
Toluene-3,4-diamine
o-Toluidine hydrochloride
Trichloromethanethiol
Tris(1-aziridinyl)phosphine sulfide
Tris(2,3-dibromopropyl) phosphate
Trypan blue
Uracil mustard
Vandium pentoxide
Warfarin
Warfarin salts, when present at concentrations less than 0.3%
Warfarin salts, when present at concentrations greater than 0.3%
Zinc cyanide
Zinc phosphide

The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this appendix.

Attachment D

APENDIX VIII CHEMICALS - SELECTED
(DOES NOT INCLUDE APPENDIX IX CHEMICALS)

Common name	Suggested Method
Nitroglycerine	8015A
Chloral	8315
Chloroacetylaldehyde	8315
Crotonaldehyde	8315
Formaldehyde	8315
Formic acid	8315
Glycidaldehyde	8315
Paraldehyde	8315
Aldicarb (temik)	8318
Aldicarb sulfone	8318
Ethyl carbamate	8318
Methomyl (lannate)	8318