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Emergency Response

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# **Background Document to Support The Notice of Proposed Rulemaking Pursuant to CERCLA Section 102 (b)**

**A Report to  
Oil and Hazardous  
Materials Spills Branch**

**Office of Research and Development  
and to  
Emergency Response Division**

**Office of Emergency  
and Remedial Response**

**Under Contract No. 68-03-3014**

BACKGROUND DOCUMENT TO SUPPORT THE NOTICE OF PROPOSED  
RULEMAKING PURSUANT TO CERCLA SECTION 102(b)

A Report to  
OIL AND HAZARDOUS MATERIALS SPILLS BRANCH  
OFFICE OF RESEARCH AND DEVELOPMENT  
AND TO  
EMERGENCY RESPONSE DIVISION  
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE  
U.S. ENVIRONMENTAL PROTECTION AGENCY

Under  
Contract No. 68-03-3014

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This document was prepared in support of the May 1983 Notice of Proposed Rulemaking for Superfund Notification Requirements and Reportable Quantity Adjustments.

## FOREWORD

This draft report was submitted to the Oil and Hazardous Materials Spills Branch, Office of Research and Development, Edison, New Jersey, and the Emergency Response Division of the Office of Emergency and Remedial Response of the U.S. Environmental Protection Agency to provide the technical base for adjustment of reportable quantities (RQs) for the hazardous substances defined in CERCLA Section 101(14). It was prepared by the technical staff of Rockwell International's Environmental Monitoring & Services Center. Principal authors are F.C. Gunderloy, Jr., M. Kirsch, G. Ricci, F.J. Stephens, and B.L. Tuffly.

The guidance of many members of the Environmental Protection Agency staff was provided not only in a continuous fashion, but also in special working group meetings and by written and oral comments. The assistance of Dr. K. Jack Kooyoomjian, Mr. John Riley, and Ms. Barbara Hostage of the Emergency Response Division was especially helpful.

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## EXECUTIVE SUMMARY

The purpose of this report is to provide the U.S. Environmental Protection Agency with the technical background required to adjust the reportable quantities (RQs) of hazardous substances designated in Section 101(14) of the "Comprehensive Environmental Response, Compensation and Liability Act of 1980" ("CERCLA," or "Superfund").

### BACKGROUND

Section 103\* requires immediate notification from any person in charge of a vessel or an offshore or an onshore facility who releases an amount of a hazardous substance equal to or greater than its RQ. Under Section 102(b), the RQ of any hazardous substance defined in Section 101(14) is 1 lb unless a different RQ has been established pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act. This is the statutory RQ for each hazardous substance unless and until the Administrator of the EPA promulgates "regulations establishing that quantity of any hazardous substance the release of which shall be reported\*\* pursuant to" Section 103. CERCLA also permits EPA to establish a single RQ for each hazardous substance regardless of the environmental medium into which the substance is released.

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\* Unless otherwise specified, section numbers refer to CERCLA.

\*\* The terms "notification" and "report" are used interchangeably in this document.

EPA is proposing to adjust the RQs of the hazardous substances designated in Section 101(14). This report addresses the strategy for adjusting the RQs of the 607 hazardous substances in Section 101(14). A companion report discusses the economic and regulatory effects of this strategy.

#### THE SECTION 101(14) LIST

CERCLA Section 101(14) defines hazardous substances as:

- A. Any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,
- B. Any element, compound, mixture, solution, or substance designated pursuant to Section 102 of CERCLA,
- C. Any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act,
- D. Any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,
- E. Any hazardous air pollutant listed under Section 112 of the Clean Air Act, and
- F. Any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to Section 7 of the Toxic Substances Control Act.

Accordingly, the 297 chemicals designated as hazardous substances pursuant to Section 311 of the Clean Water Act (CWA), and listed in 40 CFR Part 116, are hazardous substances for purposes of Superfund. So are the 65 compounds and classes of compounds that have been listed in connection with the consent decree pursuant to CWA Section 307(a) and the 126 priority pollutants

developed in implementing Section 307(a) of the Clean Water Act. The seven hazardous air pollutants that have been identified pursuant to the Clean Air Act (CAA), Section 112, are also hazardous substances for Superfund purposes. No imminently hazardous chemical substances have yet been published pursuant to Section 7 of the Toxic Substances Control Act. All of the hazardous wastes that have been identified in 40 CFR Part 261 pursuant to Section 3001 of the Solid Waste Disposal Act (more commonly referred to as RCRA) are also hazardous substances. These wastes include the 233 U-wastes, the 107 P-wastes, the 13 F- and 76 K-waste streams, and the unlisted wastes designated only because they exhibit the characteristic of ignitability, corrosivity, reactivity, or extraction procedure (EP) toxicity.

The CERCLA Section 101(14) list consists of the following.

1. Section 311 (CWA) (40 CFR Part 117) - 297 chemicals with RQs assigned based on aquatic toxicity.
2. Section 307(a) CWA - 65 compounds and classes of compounds are designated under CWA Section 307(a). The EPA has identified 126 specific compounds as priority pollutants that fall within these 65 compounds and classes of compounds. Under CERCLA, RQs have been adjusted as indicated in this report only for the 126 specific priority pollutants, because some of the broad classes encompass hundreds of specific compounds. Therefore it would be virtually impossible for the Agency to develop a reportable quantity for a generic class of compounds that would take into account the characteristics of all the specific compounds.
3. Section 112 (CAA) - Seven chemicals (six of which are also on the CWA Section 307(a) list) are designated under Section 112 of the CAA. See 40 CFR Part 61. (National Emission Standards have been promulgated only for asbestos, beryllium, mercury, and vinyl chloride.)

4. TSCA - no entries.

5. Section 3001 of RCRA - 40 CFR Part 261, consisting of

A. Specific chemical wastes:

"P" List - 107 acute hazardous wastes

"U" List - 233 toxic wastes

B. Waste streams:

"F" List - 13 hazardous wastes from nonspecific sources

"K" List - 76 hazardous wastes from specific sources

The entire CERCLA Section 101(14) list comprises a total of 607 identifiable separate substances. Many chemicals and specific chemical wastes are duplicates, although they appear in the various lists under different names.

In addition to these 607 hazardous substances, there is another group of wastes in RCRA, the so-called unlisted or ICRE wastes (Ignitability, Corrosivity, Reactivity, EP Toxicity) that meet specific tests described in 40 CFR Part 261. The number of substances that fall into this category cannot be quantified. The strategy for adjusting RQs to be discussed herein also applies to these wastes.

#### CANDIDATE STRATEGIES

Various strategies may be considered for assigning RQs, as follows:

### Preferred Strategy

Adjust the Section 101(14) statutory RQs using Selected Criteria Processing (SCP), described in more detail in Section 2 of this report. SCP consists of selecting six primary criteria for adjusting RQs: ignitability, reactivity, carcinogenicity, aquatic toxicity, acute mammalian toxicity (oral, dermal, inhalation), and chronic toxicity. (Chronic toxicity, for the purposes of this report, is defined as toxicity due to repeated or continuous exposure from a single release or multiple releases of a designated hazardous substance.) For each criterion, a five-tiered rating scale is set up corresponding with RQ values of 1, 10, 100, 1000, and 5000 lbs (X, A, B, C, D). Since this five-tiered system was successfully used in the CWA and the regulated community is familiar with it, CERCLA uses this methodology. Unlike the CWA, CERCLA addresses all media, not only water. Therefore, while the strategy selected to adjust the RQs of the designated hazardous substances pursuant to Section 101(14) of CERCLA was based on the precedence established in assigning RQs pursuant to the CWA, instead of using aquatic toxicity as the sole criterion for establishing RQs, health and welfare effects for other media were also used to adjust the RQs. Each hazardous substance is evaluated according to the primary criteria and an RQ value is determined for each applicable criterion.

The "primary criteria" RQ for each hazardous substance is the lowest value of all the applicable criteria. For example, if for a particular hazardous substance its ignitability corresponds to an RQ of 1000 lbs, its chronic toxicity to an RQ of 5000 lbs, its aquatic toxicity to 10 lbs, its mammalian toxicity to 100 lbs, and its reactivity to 1000 lbs, the proposed RQ is 10 lbs, based on its aquatic toxicity. Carcinogenicity is not being used at present to determine RQs pending evaluation of the Carcinogen Assessment Group's (CAG) methodology.

The Agency then evaluates each substance according to biodegradation, hydrolysis, photolysis. The "primary criteria" RQ is then raised one level if an analysis of these secondary criteria indicates that the substance naturally dissipates when released into the environment by biodegradation, hydrolysis, or photolysis.

This strategy was chosen for adjusting the RQs of the 607 hazardous substances, and is referred to as the SCP strategy.

To date, EPA has fully assessed 64 of 224 substances that must be assessed for chronic toxicity.

The advantages of the SCP strategy are numerous. First, it is technically and scientifically sound. Much of the germane data are readily available. It provides flexibility in that as new data are generated, the RQ can be adjusted if necessary. The strategy is simple, understandable, workable, and implementable, since the regulated community is familiar with the notification scheme under the CWA.

A modification of the SCP strategy which was also considered, but not used to adjust the RQs, is to adjust the RQ to 1 lb for those substances that are clearly extremely hazardous and adjust all others to some much larger RQ such as 1000 lbs. This approach would have the advantage of providing a rather simple system of adjusting RQs. It suffers from the rather severe disadvantage, however, that many substances would likely fall in an intermediate range between those that are obviously extremely hazardous and those that pose relatively little, but yet significant, hazard. It would therefore be difficult in many cases to make the decision whether the particular hazardous substance should fall in the category of a 1-lb RQ or a 1000-lb RQ.

## Summary of Adjustments

The table below summarizes the proposed RQ adjustments. The number of substances is given for each of five categories. In addition, the number of substances that remain to be assessed for chronic toxicity and carcinogenicity is given.

<u>RQ (lbs)</u>	<u>No. of Substances with Specified RQs</u>	
	<u>Statutory RQ</u>	<u>Proposed RQ</u>
1	334	46
10	27	40
100	41	89
1000	111	95
5000	94	91
CARC TBA		86
CHRON TBA		91
CARC/CHRON TBA		69

Of the total of 607 designated hazardous substances, RQs have been adjusted for 361 under CERCLA, raising 162, lowering 28, and leaving 171 others unchanged. Adjustments to the statutory RQs for the remaining 246 substances will be proposed when further analysis is complete (if such adjustments are deemed appropriate).

## Alternate Strategies

1. Leave all RQs as statutorily defined. For all hazardous substances except the 263 whose RQ pursuant to the CWA Section 311 is larger than 1 lb, the RQ would then remain at 1 lb. Reporting all releases at or above 1 lb would not only subject the regulated community to an

increased reporting burden, but might also flood the National Response Center with many telephone calls that would not warrant federal response.

2. Adapt RQs based on administrative feasibility. The Senate Committee Report (96-848) states (p. 29):

"The provision intentionally omits from the requirement to determine "reporting" quantities any reference to harm or hazard. A single quantity is to be determined for each hazardous substance, and this single quantity requires notification upon release into any environmental medium. It would be virtually impossible to determine a single quantity applicable to all media while at the same time linking such quantity to any subjective concept of harm.

"It is essential that such quantities be relatively simple for those subject to notification requirements to understand and comply with. Since releases in such quantities trigger notification requirements, but do not, in and of themselves, give rise to other liabilities under this Act, the President's broad discretion to select quantities will not unfairly burden those persons subject to the Act.

"In determining reportable quantities under this paragraph, the President may consider any factors deemed relevant to administering the reporting requirements or the President's other responsibilities under this Act. Administrative feasibility and practicality should be primary factors. In addition, the President may revise such regulations from time to time if under-reporting or over-reporting is occurring under existing regulations."

EPA is considering basing the RQ adjustments on technical criteria, while leaving open the option of further revision of the RQs based on administrative feasibility as experience dictates. Administrative considerations are discussed at greater length in Section 4.

3. Adjust the RQs for all the hazardous substances based primarily on aquatic toxicity considerations. This Aquatic Toxicity approach has the advantage of being not only consistent with, but identical to that used in arriving at the RQs for the CWA Section 311 hazardous substances. The Agency has determined that additional characteristics that may pose environmental harm should be taken into

account.

4. Adopt suitable scenarios to arrive at the RQ. This alternative strategy employs part fact and part assumption to arrive at an appropriate RQ based on the potential of the hazardous substance to cause harm via multimedia pathways. Scenarios are useful ways to relate basic data to a set of assumed conditions, events, and circumstances. The scenario is built up by assuming reasonable conditions for the release and reasonable conditions that produce a threat to human health or welfare or the environment. The choice of the conditions is at the discretion of the individual or group developing the scenario, and therein lies the weakness of the scenario approach. Broad agreement that a particular scenario is the most realistic that can be developed is not likely.
5. Use the detailed results of fate and effects research on each of the designated hazardous substances to assign an RQ based exclusively on the results of the research. This approach involves a complete understanding of how each designated hazardous substance interacts with the environment, what products may be formed under various circumstances, and how the designated hazardous substance and its environmentally produced products each potentially affect the public health or welfare or the environment. A major disadvantage of the fate and effects approach is that it demands extensive data collection and analysis. The data required are not available to the Agency. Furthermore, pursuing this approach for RQ adjustments would be very resource-intensive and time-consuming.
6. Develop a hazard index that takes into account all the individual potential hazards to which releases of a hazardous substance may expose the public or the environment. The hazard index is a composite scoring system designed to assess the relative potential threat to human health and to the environment of chemical substances

released to the air, water, and soil. The system consists of delineating various rating factors used to examine the types of hazards that may result, and, to the extent possible, the degree of hazard or potential for hazard. Each rating factor has a defined rating scale by which chemicals receive numerical scores based on known data. The rating factors are combined in an equation or algorithm format to arrive at a single number that is used to rank a chemical relative to other chemicals processed through the same equation or algorithm. This scheme is analogous to that employed in producing a site-ranking model for determining remedial action priorities among uncontrolled hazardous waste sites.

This scoring technique has some very definite advantages over other approaches: (a) the hazard index can relate to all media, (b) it can include a wide range of criteria that link the substance to a concept of potential harm or hazard, (c) it can provide an impartial, objective, and uniform mechanism that can be applied to a wide variety and to a large number of hazardous substances, and (d) it is a simple and direct way to evaluate a large data base with respect to intrinsic properties.

The major disadvantage of the hazard index approach is that many individual combinations can be set up involving different judgments of the relative importance of single hazard factors. Any one finally selected combination connecting the individual rating factors may be subjected to logical criticism on the basis of a different perception of the relative importance of those factors. Further, gaps in the data base may make it difficult, if not impossible, to compare all of the designated hazardous substances on the same objective basis.

## SECTION 1

### INTRODUCTION

The release of a hazardous substance in an amount equal to or greater than its reportable quantity (RQ) obligates the releaser to notify the National Response Center (NRC) by telephone in a timely fashion. The purpose of assigning RQs to hazardous substances is to allow the NRC to decide whether an immediate government response is warranted and necessary to prevent escalation of and to mitigate the problem resulting from the release of hazardous substances.

In principle, the RQ should be high enough to eliminate unnecessary telephone calls to the NRC, but low enough to trigger early response to a release that may otherwise pose a threat to the public health or welfare or to the environment. The Agency has used this principle as the basis for its RQ adjustments.

This report describes the selected strategy for adjusting the RQs of the hazardous substances defined in CERCLA Section 101(14). Alternative strategies considered by the Agency are also discussed. In the development of the selected strategy, many alternatives were explored, and comments on these alternatives were solicited from industry, environmental groups, and from personnel within other federal agencies. Whenever possible, the suggestions of the commenters have been incorporated into this final draft.

### STATUTORY HISTORY

The major purpose of this document is to provide the U.S. Environmental Protection Agency (EPA) with the technical background required to adjust the RQs of hazardous substances designated in Public Law 96-510, the "Comprehensive Environmental Response, Compensation, and Liability Act of

1980" (more commonly known as CERCLA or Superfund). Section 101(14) defines hazardous substances as:

- A. Any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,
- B. Any element, compound, mixture, solution, or substance designated pursuant to Section 102 of this Act,
- C. Any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress),
- D. Any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,
- E. Any hazardous air pollutant listed under Section 112 of the Clean Air Act, and
- F. Any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to Section 7 of the Toxic Substances Control Act.

It should be noted that the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance. The term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Final regulations listing hazardous substances have been promulgated pursuant to the Clean Water Act, the Clean Air Act, and RCRA. The 297 chemicals designated as hazardous substances pursuant to Section 311 of the Clean Water

Act (CWA), and listed in 40 CFR Part 116 are hazardous substances for purposes of Superfund. The implementing regulations on designation appear in 40 CFR Part 116 and the RQs in 40 CFR Part 117. The RQs promulgated under CWA Section 311 are all essentially based on aquatic toxicity. The 297 hazardous substances are classified into five categories depending on their aquatic toxicity. The categories are designated X, A, B, C, and D, with corresponding RQs of 1, 10, 100, 1000, and 5000 lbs, respectively. It should be emphasized that the primary scientific basis for the RQ assigned is the aquatic toxicity of the substance, as measured in screening tests using fresh water or marine species. (Aquatic toxicity is discussed in detail in Section 5.)

The 65 substances and groups of compounds that have been listed pursuant to CWA Section 307(a) are hazardous substances. This list could include thousands of pollutants if all compounds in each class and all organometallic compounds were considered. To implement CWA Section 307(a), the Agency chose 129 individual compounds as priority pollutants (three of these have since been removed from the list). Under CERCLA, RQs have been adjusted as indicated in this report only for the 126 specific priority pollutants, because some of the broad classes encompass hundreds of specific compounds. Therefore, it would be virtually impossible for the Agency to develop an RQ for a generic class of compounds that would take into account the characteristics of all the specific compounds.

The seven hazardous air pollutants that have been identified pursuant to the Clean Air Act (CAA), Section 112, are also hazardous substances for Superfund purposes. National emission standards have been promulgated for four hazardous air pollutants--asbestos, beryllium, mercury, and vinyl chloride--in 40 CFR Part 61. Benzene, radionuclides, and inorganic arsenic have been listed as hazardous air pollutants, but no national emission standards have yet been promulgated.

All of the hazardous wastes that have been identified in 40 CFR Part 261 pursuant to Section 3001 of the Solid Waste Disposal Act (more commonly referred to as RCRA) are also hazardous substances. 40 CFR Part 261 identifies several types of hazardous wastes, contains a number of lists of different classes of hazardous wastes. Some of the lists are specific; some are not. The P- list consists of 107 acute hazardous wastes; the U- list contains 233 commercial chemical products or manufacturing chemical intermediates that are identified as toxic wastes unless otherwise designated. The F- list contains 13 hazardous wastes from nonspecific sources. F001, for example, is described as the following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; and sludges from the recovery of these solvents in degreasing operations. The K- list consists of 76 hazardous wastes from specific sources. 40 CFR Section 261.20 to 261.24 identify materials that exhibit the characteristic of EP (extraction procedure) toxicity, ignitability (I), corrosivity (C), and reactivity (R), but does not identify particular compounds.

To date, no action has produced a list of hazardous substances pursuant to Section 7 of the Toxic Substances Control Act.

Section 102 of the Act states:

(a) The Administrator shall promulgate and revise as may be appropriate, regulations designating as hazardous substances, in addition to those referred to in Section 101(14) of this title, such elements, compounds, mixtures, solutions, and substances which, when released into the environment may present substantial danger to the public health or welfare or the environment, and shall promulgate regulations establishing that quantity of any hazardous substance the release of which shall be reported pursuant to Section 103 of this title. The Administrator may determine that one single quantity shall be the reportable quantity for any hazardous substance regardless of the medium into which the hazardous substance is released.

(b) Unless and until superseded by regulations establishing a reportable quantity under subsection (a) of this section for any hazardous substance as defined in Section 101(14) of this title, (1) a quantity of one pound, or (2) for those hazardous substances for which reportable quantities have been established pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act, such reportable quantity, shall be deemed that quantity, the release of which requires notification pursuant to Section 103(a) or (b) of this title.

Under CERCLA the list of 297 chemicals designated as hazardous substances pursuant to the CWA Section 311(b)(2)(A) are assigned RQs pursuant to the CWA Section 311(b)(4). For all other substances the statute requires that the RQs shall be 1 lb.

#### ORGANIZATION OF REPORT

Section 2 contains a discussion of the scientific and technical strategies for adjusting the RQs and a description of some strategies that may be implemented later. It includes a discussion of the use of the primary criteria (ignitability, reactivity, aquatic toxicity, mammalian toxicity, chronic toxicity, and carcinogenicity) and the secondary criteria (biodegradability, hydrolysis, and photolysis). It also includes a table of the 607 chemically separate and distinct designated hazardous substances, with synonyms and proposed RQs. Section 3 contains a description of an alternative method for adjusting RQs, the Hazard Index approach. Administrative considerations are discussed in Section 4. Sections 5 and 6 provide technical discussions on aquatic toxicity and mammalian toxicity, respectively. Section 7 describes the data management system employed in determining the basis for proposing RQs for the hazardous substances. Section 8 contains the data tables for the chemicals supporting the proposed RQs displayed in Section 2. Section 9 contains similar data tables for the RCRA hazardous wastes.

## SUMMARY OF RQ ADJUSTMENTS

RQs for many of the substances have been adjusted. The technical basis for those RQ adjustments is included in this report. For some of the hazardous substances with RQs pursuant to the CWA, it has been found necessary to recommend that the RQ be adjusted downward. The primary reason for this is that the RQs established pursuant to Section 311 of the CWA were assigned based on the aquatic toxicity exhibited by the hazardous substance. Since Superfund evaluates additional criteria, the RQ may be lower for some substances. Most of the RQs for hazardous substances have been raised from the 1-lb level. The net effect of the use of Selected Criteria Processing for adjusting the RQ is to decrease the number of hazardous substances with 1-lb RQs from 334 to 46, as indicated below.

### No. of Substances with Specified RQs

<u>RQ (lbs)</u>	<u>Statutory RQ</u>	<u>Proposed RQ</u>
1	334	46
10	27	40
100	41	89
1000	111	95
5000	94	91
CARC TBA		86
CHRON TBA		91
CARC CHRON TBA		69

The last three items are hazardous substances for which RQs are still to be determined because the data for many of these substances are being evaluated. The CARC TBA refers to carcinogens to be assessed by the EPA's Carcinogen Assessment Group (CAG), the CHRON TBAs are the chronically toxic substances to be assessed by the Environmental Criteria Assessment Office (ECAO). The CARC/CHRON TBA are the substances to be assessed for both chronic toxicity and carcinogenicity.

## SECTION 2

### STRATEGY FOR RQ ADJUSTMENT AND ASSIGNMENTS TO THE CERCLA 101(14) LIST

Table 2-1 lists all of the CERCLA hazardous substances, together with the statutory RQ and any proposed RQ (if one is available) for each hazardous substance. The list is arranged alphabetically and identifies by numerical code in the Statutory Code column the statutory source for designation under CERCLA Section 101(14). (The hazardous substances designated under CWA Sections 311(b)(4) and 307(a), the hazardous air pollutants designated under CAA Section 112, and the hazardous wastes listed under RCRA Section 3001). The codes are explained in the footnotes to the table. In addition, since many chemicals are regulated by more than one statute and may be identified under different names in the different statutes, all possible names have been listed and the synonyms included in the Regulatory Synonyms column. Each hazardous substance is uniquely identified by its Chemical Abstracts Service (CAS) registry number.

Additional CAS registry numbers are included for the CWA Section 311 designated hazardous substance families, hydrates, esters (e.g., 2,4,5-T esters) and solutions. For those substances designated under RCRA Section 3001 the appropriate P and U waste numbers are listed in the RCRA Waste Number column. The generic groups of chemicals designated under CWA Section 307(a) such as "SILVER AND COMPOUNDS" are printed in all-capital letters and have only the statutory 1-lb RQ assigned to them.

CERCLA statutory 1-lb RQs are distinguished from CWA Section 311 1-lb RQs by the symbol 1\*. Potential carcinogens for which no RQs are being proposed at this time are identified in the Proposed RQ column by the symbol #. Hazardous substances that remain to be assessed for chronic toxicity are identified in the same column by the symbols ##. Those hazardous substances that remain to

TABLE 2-1  
LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Acenaphthene	83329		1*	2			#
Acenaphthylene	208968		1*	2			#
Acetaldehyde	75070	Ethanal	1000	1,4	U001	C	1000(454)
Acetaldehyde, chloro-	107200	Chloroacetaldehyde	1*	4	P023	C	1000(454)
Acetaldehyde, trichloro-	75876	Chloral	1*	4	U034		#
Acetamide, N-(aminothioxomethyl)-	591082	1-Acetyl-2-thiourea	1*	4	P002	C	1000(454)
Acetamide, N-(4-ethoxyphenyl)-	62442	Phenacetin	1*	4	U187		#
Acetamide, N-9H-fluoren-2-yl-	53963	2-Acetylaminofluorene	1*	4	U005		#
Acetamide, 2-fluoro-	640197	Fluoroacetamide	1*	4	P057	B	100(45.4)
Acetic acid	64197		1000	1		D	5000(2270)
Acetic acid, ethyl ester	141786	Ethyl acetate	1*	4	U112	D	5000(2270)
Acetic acid, fluoro-, sodium salt	62748	Fluoroacetic acid, sodium salt	1*	4	P058	A	10(4.54)
Acetic acid, lead salt	301042	Lead acetate	5000	1,4	U144		###
Acetic acid, thallium(I) salt	563688	Thallium(I) acetate	1*	4	U214		##
Acetic anhydride	108247		1000	1		D	5000(2270)
Acetimidic acid, N-[(methylcarbamoyl)oxylthio-, methyl ester	16752775	Methomyl	1*	4	P066	C	1000(454)
Acetone	67641	2-Propanone	1*	4	U002	D	5000(2270)
Acetone cyanohydrin	75865	2-Methylactonitrile	10	1,4	P069	A	10(4.54)
		Propanenitrile, 2-hydroxy-2-methyl-					
Acetonitrile	75058	Ethanenitrile	1*	4	U003	C	1000(454)
3-(alpha-Acetylbenzyl)-4-hydroxycoumarin and salts	81812	Warfarin	1*	4	P001	B	100(45.4)
Acetophenone	98862	Ethanone, 1-phenyl-	1*	4	U004	D	5000(2270)
2-Acetylaminofluorene	53963	Acetamide, N-9H-fluoren-2-yl-	1*	4	U005		#
Acetyl bromide	506967		5000	1		D	5000(2270)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Acetyl chloride	75365	Ethanoyl chloride	5000	1,4	U006	D	5000(2270)
1-Acetyl-2-thiourea	591082	Acetamide, N-(aminothioxomethyl)-	1*	4	P002	C	1000(454)
Acrolein	107028	2-Propenal	1	1,2,4	P003	X	1(0.454)
Acrylamide	79061	2-Propenamide	1*	4	U007	D	5000(2270)
Acrylic acid	79107	2-Propenoic acid	1*	4	U008	D	5000(2270)
Acrylonitrile	107131	2-Propenenitrile	100	1,2,4	U009		###
Adipic acid	124049		5000	1		D	5000(2270)
Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	148823	Melphalan	1*	4	U150		#
Aldicarb	116063	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	1*	4	P070	A	10(4.54)
Aldrin	309002	1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene	1	1,2,4	P004	X	1(0.454)
Allyl alcohol	107186	2-Propen-1-ol	100	1,4	P005	B	100(45.4)
Allyl chloride	107051		1000	1		D	5000(2270)
Aluminum phosphide	20859738		1*	4	P006	B	100(45.4)
Aluminum sulfate	10043013		5000	1		D	5000(2270)
5-(Aminomethyl)-3-isoxazolol	2763964	3(2H)-Isoxazolone, 5-(aminomethyl)-	1*	4	P007	C	1000(454)
4-Aminopyridine	504245	4-Pyridinamine	1*	4	P008	C	1000(454)
Amitrole	61825	1H-1,2,4-Triazol-3-amine	1*	4	U011		#
Ammonia	7664417		100	1			##
Ammonium acetate	631618		5000	1		D	5000(2270)
Ammonium benzoate	1863634		5000	1		D	5000(2270)
Ammonium bicarbonate	1066337		5000	1		D	5000(2270)
Ammonium bichromate	7789095		1000	1			###
Ammonium bifluoride	1341497		5000	1			##

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code	RCRA Waste Number	Category	Pounds(Kg)
Ammonium bisulfite	10192300		5000	1		D	5000(2270)
Ammonium carbamate	1111780		5000	1		D	5000(2270)
Ammonium carbonate	506876		5000	1		D	5000(2270)
Ammonium chloride	12125029		5000	1		D	5000(2270)
Ammonium chromate	7788989		1000	1			#
Ammonium citrate, dibasic	3012655		5000	1		D	5000(2270)
Ammonium fluoborate	13826830		5000	1		D	5000(2270)
Ammonium fluoride	12125018		5000	1		B	100(45.4)
Ammonium hydroxide	1336216		1000	1		C	1000(454)
Ammonium oxalate	6009707 5972736 14258492		5000	1		D	5000(2270)
Ammonium picrate	131748	Phenol, 2,4,6-trinitro-, ammonium salt	1*	4	P009	A	10(4.54)
Ammonium silicofluoride	16919190		1000	1		C	1000(454)
Ammonium sulfamate	7773060		5000	1		D	5000(2270)
Ammonium sulfide	12135761		5000	1		B	100(45.4)
Ammonium sulfite	10196040		5000	1		D	5000(2270)
Ammonium tartrate	14307438 3164292		5000	1		D	5000(2270)
Ammonium thiocyanate	1762954		5000	1		D	5000(2270)
Ammonium thiosulfate	7783188		5000	1		D	5000(2270)
Ammonium vanadate	7803556	Vanadic acid, ammonium salt	1*	4	P119	C	1000(454)
Amyl acetate	628637		1000	1		D	5000(2270)
iso-	123922						
sec-	626380						
tert-	625161						
Aniline	62533	Benzenamine	1000	1,4	U012	D	5000(2270)
Anthracene	120127		1*	2			#

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Antimony †	7440360		1*	2			##
ANTIMONY AND COMPOUNDS			1*	2			**
Antimony pentachloride	7647189		1000	1		C	1000(454)
Antimony potassium tartrate	28300745		1000	1		B	100(45.4)
Antimony tribromide	7789619		1000	1		C	1000(454)
Antimony trichloride	10025919		1000	1		C	1000(454)
Antimony trifluoride	7783564		1000	1		C	1000(454)
Antimony trioxide	1309644		5000	1		C	1000(454)
Aroclor 1016	12674112		1*	2		X	1(0.454)
Aroclor 1221	11104282		1*	2		X	1(0.454)
Aroclor 1232	11141165		1*	2		X	1(0.454)
Aroclor 1242	53469219		1*	2		X	1(0.454)
Aroclor 1248	12672296		1*	2		X	1(0.454)
Aroclor 1254	11097691		1*	2		X	1(0.454)
Aroclor 1260	11096825		1*	2		X	1(0.454)
Arsenic †	7440382		1*	2,3			###
Arsenic acid	1327522 7778394		1*	4	P010		###
ARSENIC AND COMPOUNDS			1*	2			**
Arsenic disulfide	1303328		5000	1			###
Arsenic(III) oxide	1327533	Arsenic trioxide	5000	1,4	P012		###
Arsenic(V) oxide	1303282	Arsenic pentoxide	5000	1,4	P011		###
Arsenic pentoxide	1303282	Arsenic(V) oxide	5000	1,4	P011		###
Arsenic trichloride	7784341		5000	1			###
Arsenic trioxide	1327533	Arsenic(III) oxide	5000	1,4	P012		###

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Arsenic trisulfide	1303339		5000	1			###
Arsine, diethyl-	692422	Diethylarsine	1*	4	P038		###
Asbestos	1332214		1*	2,3			###
Auramine	492808	Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	1*	4	U014		#
Azaserine	115026	L-Serine, diazoacetate (ester)	1*	4	U015		#
Aziridine	151564	Ethylenimine	1*	4	P054		#
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-	50077	Mitomycin C	1*	4	U010		#
Barium cyanide	542621		10	1,4	P013	A	10(4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56495	3-Methylcholanthrene	1*	4	U157		#
Benz[c]acridine	225514	3,4-Benzacridine	1*	4	U016		#
3,4-Benzacridine	225514	Benz[c]acridine	1*	4	U016		#
Benzal chloride	98873	Benzene, dichloromethyl-	1*	4	U017	D	5000(2270)
Benz[a]anthracene	56553	1,2-Benzanthracene	1*	2,4	U018		###
1,2-Benzanthracene	56553	Benz[a]anthracene	1*	2,4	U018		###
1,2-Benzanthracene, 7,12-dimethyl-	57976	7,12-Dimethylbenz[a]anthracene	1*	4	U094		#
Benzenamine	62533	Aniline	1000	1,4	U012	D	5000(2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	492808	Auramine	1*	4	U014		#
Benzenamine, 4-chloro-	106478	p-Chloroaniline	1*	4	P024	C	1000(454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	3165933	4-Chloro-o-toluidine, hydrochloride	1*	4	U049		#
Benzenamine, N,N-dimethyl-4-phenylazo-	60117	Dimethylaminoazobenzene	1*	4	U093		#
Benzenamine, 4,4'-methylenebis(2-chloro-	101144	4,4'-Methylenebis(2-chloroaniline)	1*	4	U158		#
Benzenamine, 2-methyl-, hydrochloride	636215	o-Toluidine hydrochloride	1*	4	U222		#

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Benzenamine, 2-methyl-5-nitro-	99558	5-Nitro-o-toluidine	1*	4	U181		#
Benzenamine, 4-nitro-	100016	p-Nitroaniline	1*	4	P077	D	5000(2270)
Benzene	71432		1000	1,2,3,4	U019		###
Benzene, 1-bromo-4-phenoxy-	101553	4-Bromophenyl phenyl ether	1*	2,4	U030	A	10(4.54)
Benzene, chloro-	108907	Chlorobenzene	100	1,2,4	U037	B	100(45.4)
Benzene, chloromethyl-	100447	Benzyl chloride	100	1,4	P028		#
Benzene, 1,2-dichloro-	95501	1,2-Dichlorobenzene	1*	2,4	U070	B	100(45.4)
		o-Dichlorobenzene					
Benzene, 1,3-dichloro-	541731	1,3-Dichlorobenzene	1*	2,4	U071	B	100(45.4)
		m-Dichlorobenzene					
Benzene, 1,4-dichloro-	106467	1,4-Dichlorobenzene	1*	2,4	U072	B	100(45.4)
		p-Dichlorobenzene					
Benzene, dichloromethyl-	98873	Benzal chloride	1*	4	U017	D	5000(2270)
Benzene, 1,3-diisocyanatomethyl-	584849	Toluene diisocyanate	1*	4	U223	B	100(45.4)
Benzene, hexachloro-	118741	Hexachlorobenzene	1*	2,4	U127		###
Benzene, hexahydro-	110827	Cyclohexane	1000	1,4	U056	C	1000(454)
Benzene, hydroxy-	108952	Phenol	1000	1,2,4	U188		##
Benzene, methyl-	108883	Toluene	1000	1,2,4	U220	C	1000(454)
Benzene, 1-methyl-2,4-dinitro-	121142	2,4-Dinitrotoluene	1*	2,4	U105	B	100(45.4)
Benzene, 1-methyl-2,6-dinitro-	606202	2,6-Dinitrotoluene	1*	2,4	U106	B	100(45.4)
Benzene, 1,2-methylenedioxy-4-allyl-	94597	Safrole	1*	4	U203		#
Benzene, 1,2-methylenedioxy-4-propenyl-	120581	Isosafrole	1*	4	U141		#
Benzene, 1,2-methylenedioxy-4-propyl-	94586	Dihydrosafrole	1*	4	U090		#
Benzene, 1-methylethyl-	98828	Cumene	1*	4	U055	D	5000(2270)
Benzene, nitro-	98953	Nitrobenzene	1000	1,2,4	U169	C	1000(454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Benzene, pentachloro-	608935	Pentachlorobenzene	1*	4	U183		##
Benzene, pentachloronitro-	82688	Pentachloronitrobenzene	1*	4	U185		###
Benzene, 1,2,4,5-tetrachloro-	95943	1,2,4,5-Tetrachlorobenzene	1*	4	U207	D	5000(2270)
Benzene, trichloromethyl-	98077	Benzotrichloride	1*	4	U023	C	1000(454)
Benzene, 1,3,5-trinitro-	99354	sym-Trinitrobenzene	1*	4	U234		##
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156	Ethyl 4,4'-dichlorobenzilate	1*	4	U038		#
1,2-Benzenedicarboxylic acid anhydride	85449	Phthalic anhydride	1*	4	U190	D	5000(2270)
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	117817	Bis(2-ethylhexyl)phthalate	1*	2,4	U028	D	5000(2270)
1,2-Benzenedicarboxylic acid, dibutyl ester	84742	n-Butyl phthalate Di-n-butyl phthalate	100	1,2,4	U069	B	100(45.4)
1,2-Benzenedicarboxylic acid, diethyl ester	84662	Diethyl phthalate	1*	2,4	U088	B	100(45.4)
1,2-Benzenedicarboxylic acid, dimethyl ester	131113	Dimethyl phthalate	1*	2,4	U102	D	5000(2270)
1,2-Benzenedicarboxylic acid, di-n-octyl ester	117840	Di-n-octyl phthalate	1*	2,4	U107	D	5000(2270)
1,3-Benzenediol	108463	Resorcinol	1000	1,4	U201	D	5000(2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]-	51434	Epinephrine	1*	4	P042	C	1000(454)
Benzenesulfonic acid chloride	98099	Benzenesulfonyl chloride	1*	4	U020	B	100(45.4)
Benzenesulfonyl chloride	98099	Benzenesulfonic acid chloride	1*	4	U020	B	100(45.4)
Benzenethiol	108985	Thiophenol	1*	4	P014	B	100(45.4)
Benzidine	92875	(1,1'-Biphenyl)-4,4'diamine	1*	2,4	U021		###
1,2-Benzisothiazolin-3-one, 1,1-dioxide, and salts	81072	Saccharin and salts	1*	4	U202		#
Benzo[b]fluoranthene	205992		1*	2			###

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Benzo(k)fluoranthene	207089		1*	2			#
Benzo[j,k]fluorene	206440	Fluoranthene	1*	2,4	U120		#
Benzoic acid	65850		5000	1		D	5000(2270)
Benzonitrile	100470		1000	1		D	5000(2270)
Benzo[ghi]perylene	191242		1*	2			#
Benzo[a]pyrene	50328	3,4-Benzopyrene	1*	2,4	U022		###
3,4-Benzopyrene	50328	Benzo[a]pyrene	1*	2,4	U022		###
p-Benzoquinone	106514	1,4-Cyclohexadienedione	1*	4	U197		##
Benzotrichloride	98077	Benzene, trichloromethyl-	1*	4	U023	C	1000(454)
Benzoyl chloride	98884		1000	1		C	1000(454)
1,2-Benzphenanthrene	218019	Chrysene	1*	2,4	U050		###
Benzyl chloride	100447	Benzene, chloromethyl-	100	1,4	P028		#
Beryllium †	7440417	Beryllium dust	1*	2,3,4	P015		###
BERYLLIUM AND COMPOUNDS			1*	2			**
Beryllium chloride	7787475		5000	1			###
Beryllium dust	7440417	Beryllium	1*	2,3,4	P015		###
Beryllium fluoride	7787497		5000	1			###
Beryllium nitrate	13597994 7787555		5000	1			###
alpha - BHC	319846		1*	2		X	1(0.454)
beta - BHC	319857		1*	2		X	1(0.454)
delta - BHC	319868		1*	2		X	1(0.454)
gamma - BHC	58899	Hexachlorocyclohexane (gamma isomer)	1	1,2,4	U129	X	1(0.454)
		Lindane					
2,2'-Bioxirane	1464535	1,2:3,4-Diepoxybutane	1*	4	U085		#

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
(1,1'-Biphenyl)-4,4'diamine	92875	Benzidine	1*	2,4	U021		###
(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-	91941	3,3'-Dichlorobenzidine	1*	2,4	U073		###
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethoxy-	119904	3,3'-Dimethoxybenzidine	1*	4	U091		#
(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl-	119937	3,3'-Dimethylbenzidine	1*	4	U095		#
Bis(2-chloroethoxy) methane	111911	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	1*	2,4	U024	C	1000(454)
Bis (2-chloroethyl) ether	111444	Dichloroethyl ether	1*	2,4	U025		#
		Ethane, 1,1'-oxybis[2-chloro-					
Bis(2-chloroisopropyl) ether	108601	Propane, 2,2'-oxybis[2-chloro-	1*	2,4	U027	C	1000(454)
Bis(chloromethyl) ether	542881	Methane, oxybis(chloro-	1*	4	P016		###
Bis(dimethylthiocarbamoyl) disulfide	137268	Thiram	1*	4	U244	A	10(4.54)
Bis(2-ethylhexyl)phthalate	117817	1,2-Benzenedicarboxylic acid, [[bis(2-ethylhexyl)] ester	1*	2,4	U028	D	5000(2270)
Bromine cyanide	506683	Cyanogen bromide	1*	4	U246	C	1000(454)
Bromoacetone	598312	2-Propanone, 1-bromo-	1*	4	P017	C	1000(454)
Bromoform	75252	Methane, tribromo	1*	2,4	U225	B	100(45.4)
4-Bromophenyl phenyl ether	101553	Benzene, 1-bromo-4-phenoxy-	1*	2,4	U030	A	10(4.54)
Brucine	357573		1*	4	P018	A	10(4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683	Hexachlorobutadiene	1*	2,4	U128		###
1-Butanamine, N-butyl-N-nitroso-	924163	N-Nitrosodi-n-butylamine	1*	4	U172		#
Butanoic acid, 4-[[bis(2-chloroethyl) amino]benzene-	305033	Chlorambucil	1*	4	U035		#
1-Butanol	71363	n-Butyl alcohol	1*	4	U031	D	5000(2270)
2-Butanone	78933	Methyl ethyl ketone	1*	4	U159	C	1000(454)
2-Butanone peroxide	1338234	Methyl ethyl ketone peroxide	1*	4	U160	A	10(4.54)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
2-Butenal	123739 4170303	Crotonaldehyde	100	1,4	U053	B	100(45.4)
2-Butene, 1,4-dichloro-	764410	1,4-Dichloro-2-butene	1*	4	U074	X	1(0.454)
Butyl acetate	123864		5000	1		D	5000(2270)
iso-	110190						
sec-	105464						
tert-	540885						
n-Butyl alcohol	71363	1-Butanol	1*	4	U031	D	5000(2270)
Butylamine	109739		1000	1		D	5000(2270)
iso-	78819						
sec-	513495						
sec-	13952846						
tert-	75649						
Butyl benzyl phthalate	85687		1*	2		D	5000(2270)
n-Butyl phthalate	84742	1,2-Benzenedicarboxylic acid, dibutyl ester	100	1,2,4	U069	B	100(45.4)
		Di-n-butyl phthalate					
Butyric acid	107926		5000	1		D	5000(2270)
iso-	79312						
Cacodylic acid	75605	Hydroxydimethylarsine oxide	1*	4	U136		#
Cadmium †	7440439		1*	2			###
Cadmium acetate	543908		100	1			###
CADMIUM AND COMPOUNDS			1*	2			**
Cadmium bromide	7789426		100	1			###
Cadmium chloride	10108642		100	1			###
Calcium arsenate	7778441		1000	1			###
Calcium arsenite	52740166		1000	1			###
Calcium carbide	75207		5000	1		A	10(4.54)
Calcium chromate	13765190	Chromic acid, calcium salt	1000	1,4	U032		###
Calcium cyanide	592018		10	1,4	P021	A	10(4.54)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Calcium dodecylbenzene sulfonate	26264062		1000	1		C	1000(454)
Calcium hypochlorite	7778543		100	1		A	10(4.54)
Camphene, octachloro-	8001352	Toxaphene	1	1,2,4	P123	X	1(0.454)
Captan	133062		10	1			##
Carbamic acid, ethyl ester	51796	Ethyl carbamate (Urethan)	1*	4	U238		#
Carbamic acid, methylnitroso-, ethyl ester	615532	N-Nitroso-N-methylurethane	1*	4	U178		#
Carbamide, N-ethyl-N-nitroso-	759739	N-Nitroso-N-ethylurea	1*	4	U176		#
Carbamide, N-methyl-N-nitroso	684935	N-Nitroso-N-methylurea	1*	4	U177		#
Carbamide, thio-	62566	Thiourea	1*	4	U219		#
Carbamimidoseleonic acid	630104	Selenourea	1*	4	P103		##
Carbamoyl chloride, dimethyl-	79447	Dimethylcarbamoyl chloride	1*	4	U097		#
Carbaryl	63252		100	1		B	100(45.4)
Carbofuran	1563662		10	1		A	10(4.54)
Carbon disulfide	75150		5000	1,4	P022		##
Carbonic acid, dithallium (I) salt	6533739	Thallium(I) carbonate	1*	4	U215		##
Carbonochloridic acid, methyl ester	79221	Methyl chlorocarbonate	1*	4	U156	C	1000(454)
Carbon oxyfluoride	353504		1*	4	U033	C	1000(454)
Carbon tetrachloride	56235	Methane, tetrachloro- Tetrachloromethane	5000	1,2,4	U211		###
Carbonyl chloride	75445	Phosgene	5000	1,4	P095	C	1000(454)
Chloral	75876	Acetaldehyde, trichloro-	1*	4	U034		#
Chlorambucil	305033	Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-	1*	4	U035		#
4-Chloro-m-cresol	59507	p-Chloro-m-cresol Phenol, 4-chloro-3-methyl-	1*	2,4	U039	D	5000(2270)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
p-Chloro-m-cresol	59507	4-Chloro-m-cresol	1*	2,4	U039	D	5000(2270)
		Phenol, 4-chloro-3-methyl-					
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)			1*	2			**
Chlordane	57749	Chlordane, technical	1	1,2,4	U036	X	1(0.454)
		4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-					
Chlordane, technical	57749	Chlordane	1	1,2,4	U036	X	1(0.454)
		4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-					
CHLORINATED BENZENES			1*	2			**
CHLORINATED ETHANES			1*	2			**
CHLORINATED NAPHTHALENE			1*	2			**
CHLORINATED PHENOLS			1*	2			**
Chlorine	7782505		10	1		A	10(4.54)
Chlorine cyanide	506774	Cyanogen chloride	10	1,4	P033	A	10(4.54)
Chlornaphazine	494031	2-Naphthylamine, N,N-bis(2-chloroethyl)-	1*	4	U026		#
Chloroacetaldehyde	107200	Acetaldehyde, chloro-	1*	4	P023	C	1000(454)
CHLOROALKYL ETHERS			1*	2			**
p-Chloroaniline	106478	Benzenamine, 4-chloro-	1*	4	P024	C	1000(454)
Chlorobenzene	108907	Benzene, chloro-	100	1,2,4	U037	B	100(45.4)
Chlorodibromomethane	124481		1*	2		B	100(45.4)
1-Chloro-2,3-epoxypropane	106898	Epichlorohydrin	1000	1,4	U041		###
		Oxirane, 2-(chloromethyl)-					
Chloroethane	75003		1*	2			##
2-Chloroethyl vinyl ether	110758	Ethene, 2-chloroethoxy-	1*	2,4	U042	C	1000(454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Chloroform	67663	Methane, trichloro-	5000	1,2,4	U044		#
Chloromethyl methyl ether	107302	Methane, chloromethoxy-	1*	4	U046		###
beta-Chloronaphthalene	91587	2-Chloronaphthalene	1*	2,4	U047	D	5000(2270)
		Naphthalene, 2-chloro-					
2-Chloronaphthalene	91587	beta-Chloronaphthalene	1*	2,4	U047	D	5000(2270)
		Naphthalene, 2-chloro-					
2-Chlorophenol	95578	o-Chlorophenol	1*	2,4	U048	B	100(45.4)
		Phenol, 2-chloro-					
o-Chlorophenol	95578	2-Chlorophenol	1*	2,4	U048	B	100(45.4)
		Phenol, 2-chloro-					
4-Chlorophenyl phenyl ether	7005723		1*	2		D	5000(2270)
1-(o-Chlorophenyl)thiourea	5344821	Thiourea, (2-chlorophenyl)-	1*	4	P026	B	100(45.4)
3-Chloropropionitrile	542767	Propanenitrile, 3-chloro-	1*	4	P027	C	1000(454)
Chlorosulfonic acid	7790945		1000	1		C	1000(454)
4-Chloro-o-toluidine, hydrochloride	3165933	Benzenamine, 4-chloro-2-methyl-, hydrochloride	1*	4	U049		#
Chlorpyrifos	2921882		1	1		X	1(0.454)
Chromic acetate	1066304		1000	1			##
Chromic acid	11115745		1000	1			###
Chromic acid, calcium salt	13765190	Calcium chromate	1000	1,4	U032		###
Chromic sulfate	10101538		1000	1			##
Chromium †	7440473		1*	2			##
CHROMIUM AND COMPOUNDS			1*	2			**
Chromous chloride	10049055		1000	1			##
Chrysene	218019	1,2-Benzphenanthrene	1*	2,4	U050		###

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Cobaltous bromide	7789437		1000	1		C	1000(454)
Cobaltous formate	544183		1000	1		C	1000(454)
Cobaltous sulfamate	14017415		1000	1		C	1000(454)
Copper †	7440508		1*	2		C	1000(454)
COPPER AND COMPOUNDS			1*	2			**
Copper cyanides	544923		1*	4	P029	A	10(4.54)
Coumaphos	56724		10	1		A	10(4.54)
Creosote	8001589		1*	4	U051		###
Cresols	1319773	Cresol	1000	1,4	U052		##
m-	108394						
o-	95487	Cresylic acid					
p-	106445						
Cresylic acid	1319773	Cresol	1000	1,4	U052		##
m-	108394						
o-	95487	Cresols					
p-	106445						
Crotonaldehyde	123739	2-Butenal	100	1,4	U053	B	100(45.4)
	4170303						
Cumene	98828	Benzene, 1-methylethyl-	1*	4	U055	D	5000(2270)
Cupric acetate	142712		100	1		B	100(45.4)
Cupric acetoarsenite	12002038		100	1			###
Cupric chloride	7447394		10	1			##
Cupric nitrate	3251238		100	1		B	100(45.4)
Cupric oxalate	5893663		100	1		B	100(45.4)
Cupric sulfate	7758987		10	1			##
Cupric sulfate ammoniated	10380297		100	1		B	100(45.4)
Cupric tartrate	815827		100	1			##
CYANIDES (soluble salts and complexes), N.O.S.	57125		1*	2,4	P030	A	10(4.54)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Cyanogen	460195		1*	4	P031	B	100(45.4)
Cyanogen bromide	506683	Bromine cyanide	1*	4	U246	C	1000(454)
Cyanogen chloride	506774	Chlorine cyanide	10	1,4	P033	A	10(4.54)
1,4-Cyclohexadienedione	106514	p-Benzoquinone	1*	4	U197		##
Cyclohexane	110827	Benzene, hexahydro-	1000	1,4	U056	C	1000(454)
Cyclohexanone	108941		1*	4	U057	D	5000(2270)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474	Hexachlorocyclopentadiene	1	1,2,4	U130	X	1(0.454)
Cyclophosphamide	50180	2H-1,3,2-Oxazaphosphorine, 2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide	1*	4	U058		#
2,4-D Acid	94757	2,4-D, salts and esters	100	1,4	U240	B	100(45.4)
		2,4-Dichlorophenoxyacetic acid, salts and esters					
2,4-D Esters	94111		100	1		B	100(45.4)
	94791						
	94804						
	1320189						
	1928387						
	1928616						
	1929733						
	2971382						
	25168267						
	53467111						
2,4-D, salts and esters	94757	2,4-D Acid	100	1,4	U240	B	100(45.4)
		2,4-Dichlorophenoxyacetic acid, salts and esters					
Daunomycin	20830813	5,12-Naphthacenedione, (8s-cis)-8-acetyl-10- [3-amino-2,3,6-trideoxy- $\alpha$ -L-lyxo- (hexopyranoxyl)oxyl-7,8,9,10-tetrahydro- 6,8,11-trihydroxy-1-methoxy-	1*	4	U059		#
DDD	72548	Dichloro diphenyl dichloroethane	1	1,2,4	U060	X	1(0.454)
		TDE					
DDE	72559		1*	2		X	1(0.454)
DDT	50293	Dichlorodiphenyl trichloroethane	1	1,2,4	U061	X	1(0.454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
DDT AND METABOLITES			1*	2			**
Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta [c,d]-pentalen-2-one	143500	Kepone	1	1,4	U142	X	1(0.454)
Diallate	2303164	S-(2,3-Dichloroallyl) diisopropylthiocarbamate	1*	4	U062		#
Diamine	302012	Hydrazine	1*	4	U133		#
2,4-Diaminotoluene	95807	Toluene-2,4-diamine	1*	4	U221		#
Diazinon	333415		1	1		A	10(4.54)
Dibenz[a,h]anthracene	53703	1,2:5,6-Dibenzanthracene	1*	2,4	U063		###
		Dibenzo[a,h]anthracene					
1,2:5,6-Dibenzanthracene	53703	Dibenz[a,h]anthracene	1*	2,4	U063		###
		Dibenzo[a,h]anthracene					
Dibenzo[a,h]anthracene	53703	Dibenz[a,h]anthracene	1*	2,4	U063		###
		1,2:5,6-Dibenzanthracene					
1,2:7,8-Dibenzopyrene	189559	Dibenz[a,i]pyrene	1*	4	U064		#
Dibenz[a,i]pyrene	189559	1,2:7,8-Dibenzopyrene	1*	4	U064		#
1,2-Dibromo-3-chloropropane	96128	Propane, 1,2-dibromo-3-chloro-	1*	4	U066		#
Di-n-butyl phthalate	84742	1,2-Benzenedicarboxylic acid, dibutyl ester	100	1,2,4	U069	B	100(45.4)
		n-Butyl phthalate					
Dicamba	1918009		1000	1		C	1000(454)
Dichlobenil	1194656		1000	1		C	1000(454)
Dichlone	117806		1	1		X	1(0.454)
S-(2,3-Dichloroallyl) diisopropylthiocarbamate	2303164	Diallate	1*	4	U062		#
3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	23950585	Pronamide	1*	4	U192	D	5000(2270)
1,4-Dichloro-2-butene	764410	2-Butene, 1,4-dichloro-	1*	4	U074	X	1(0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Dichloro diphenyl dichloroethane	72548	DDD	1	1,2,4	U060	X	1(0.454)
		TDE					
Dichlorobenzene	25321226		100	1		B	100(45.4)
1,2-Dichlorobenzene	95501	Benzene, 1,2-dichloro- o-Dichlorobenzene	1*	2,4	U070	B	100(45.4)
1,3-Dichlorobenzene	541731	Benzene, 1,3-dichloro- m-Dichlorobenzene	1*	2,4	U071	B	100(45.4)
1,4-Dichlorobenzene	106467	Benzene, 1,4-dichloro- p-Dichlorobenzene	1*	2,4	U072	B	100(45.4)
m-Dichlorobenzene	541731	Benzene, 1,3-dichloro- 1,3-Dichlorobenzene	1*	2,4	U071	B	100(45.4)
o-Dichlorobenzene	95501	Benzene, 1,2-dichloro- 1,2-Dichlorobenzene	1*	2,4	U070	B	100(45.4)
p-Dichlorobenzene	106467	Benzene, 1,4-dichloro- 1,4-Dichlorobenzene	1*	2,4	U072	B	100(45.4)
DICHLOROBENZENES			1*	2			**
DICHLOROBENZIDINE			1*	2			**
3,3'-Dichlorobenzidine	91941	(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-	1*	2,4	U073		###
Dichlorobromomethane	75274		1*	2		B	100(45.4)
Dichlorodifluoromethane	75718	Methane, dichlorodifluoro-	1*	4	U075	D	5000(2270)
Dichlorodiphenyl trichloroethane	50293	DDT	1	1,2,4	U061	X	1(0.454)
1,1-Dichloroethane	75343	Ethane, 1,1-dichloro- Ethylidene dichloride	1*	2,4	U076	C	1000(454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
1,2-Dichloroethane	107062	Ethane, 1,2-dichloro- Ethylene dichloride	5000	1,2,4	U077		###
1,1-Dichloroethylene	75354	Ethene, 1,1-dichloro- Vinylidene chloride	5000	1,2,4	U078		###
1,2-trans-Dichloroethylene	156605	trans-1,2-Dichloroethylene Ethene, trans-1,2-dichloro-	1*	2,4	U079	C	1000(454)
DICHLOROETHYLENES			1*	2			**
Dichloroethyl ether	111444	Bis (2-chloroethyl) ether Ethane, 1,1'-oxybis[2-chloro-	1*	2,4	U025		#
2,4-Dichlorophenol	120832	Phenol, 2,4-dichloro-	1*	2,4	U081	B	100(45.4)
2,6-Dichlorophenol	87650	Phenol, 2,6-dichloro-	1*	4	U082	B	100(45.4)
2,4-Dichlorophenoxyacetic acid, salts and esters	94757	2,4-D Acid 2,4-D, salts and esters	100	1,4	U240	B	100(45.4)
Dichlorophenylarsine	696286	Phenyl dichloroarsine	1*	4	P036		###
Dichloropropane	26638197		5000	1		C	1000(454)
1,2-Dichloropropane	78875	Propylene dichloride	1*	2,4	U083	C	1000(454)
Dichloropropane - Dichloropropene mixture	8003198		5000	1		B	100(45.4)
1,3-Dichloropropene	542756	Propene, 1,3-dichloro-	1*	2,4	U084	B	100(45.4)
Dichloropropene(s)	26952238		5000	1		B	100(45.4)
2,2-Dichloropropionic acid	75990		5000	1		D	5000(2270)
Dichlorvos	62737		10	1		A	10(4.54)
Dieldrin	60571	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene	1	1,2,4	P037	X	1(0.454)
1,2,3,4-Diepoxybutane	1464535	2,2'-Bioxirane	1*	4	U085		#
Diethylamine	109897		1000	1		C	1000(454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Diethylarsine	692422	Arsine, diethyl-	1*	4	P038		###
1,4-Diethylene dioxide	123911	1,4-Dioxane	1*	4	U108		#
N,N'-Diethylhydrazine	1615801	Hydrazine, 1,2-diethyl-	1*	4	U086		#
O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate	298044	Disulfoton	1	1,4	P039	X	1(0.454)
O,O-Diethyl S-Methyl Dithiophosphate	3288582	Phosphorodithioic acid, O,O-diethyl S-methyl ester	1*	4	U087	D	5000(2270)
Diethyl-p-nitrophenyl phosphate	311455	Phosphoric acid, diethyl p-nitrophenyl ester	1*	4	P041	B	100(45.4)
Diethyl phthalate	84662	1,2-Benzenedicarboxylic acid, diethyl ester	1*	2,4	U088	B	100(45.4)
O,O-Diethyl O-pyrazinyl phosphorothioate	297972	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	1*	4	P040	B	100(45.4)
Diethylstilbestrol	56531	4,4'-Stilbenediol, alpha,alpha'-diethyl-	1*	4	U089		#
1,2-Dihydro-3,6-pyridazinedione	123331	Maleic hydrazide	1*	4	U148	D	5000(2270)
Dihydrosafrole	94586	Benzene, 1,2-methylenedioxy-4-propyl-	1*	4	U090		#
Diisopropyl fluorophosphate	55914	Phosphorofluoric acid, bis(1-methylethyl) ester	1*	4	P043	B	100(45.4)
Dimethoate	60515	Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	1*	4	P044	A	10(4.54)
3,3'-Dimethoxybenzidine	119904	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethoxy-	1*	4	U091		#
Dimethylamine	124403	Methanamine, N-methyl-	1000	1,4	U092		##
Dimethylaminoazobenzene	60117	Benzenamine, N,N-dimethyl-4-phenylazo-	1*	4	U093		#
7,12-Dimethylbenz[a]anthracene	57976	1,2-Benzanthracene, 7,12-dimethyl-	1*	4	U094		#
3,3'-Dimethylbenzidine	119937	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl-	1*	4	U095		#
alpha,alpha-Dimethylbenzylhydroperoxide	80159	Hydroperoxide, 1-methyl-1-phenylethyl-	1*	4	U096	A	10(4.54)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime	39196184	Thiofanox	1*	4	P045	B	100(45.4)
Dimethylcarbamoyl chloride	79447	Carbamoyl chloride, dimethyl-	1*	4	U097		#
1,1-Dimethylhydrazine	57147	Hydrazine, 1,1-dimethyl-	1*	4	U098		#
1,2-Dimethylhydrazine	540738	Hydrazine, 1,2-dimethyl-	1*	4	U099		#
O,O-Dimethyl O-p-nitrophenyl phosphorothioate	298000	Methyl parathion	100	1,4	P071		##
Dimethylnitrosamine	62759	N-Nitrosodimethylamine	1*	2,4	P082		#
alpha,alpha-Dimethylphenethylamine	122098	Ethanamine, 1,1-dimethyl-2-phenyl-	1*	4	P046	D	5000(2270)
2,4-Dimethylphenol	105679	Phenol, 2,4-dimethyl-	1*	2,4	U101	B	100(45.4)
Dimethyl phthalate	131113	1,2-Benzenedicarboxylic acid, dimethyl ester	1*	2,4	U102	D	5000(2270)
Dimethyl sulfate	77781	Sulfuric acid, dimethyl ester	1*	4	U103		#
Dinitrobenzene (mixed)	25154545		1000	1		B	100(45.4)
m-	99650						
o-	528290						
p-	100254						
4,6-Dinitro-o-cresol and salts	534521	4,6-Dinitro-o-cresol	1*	2,4	P047	B	100(45.4)
		Phenol 2,4-dinitro-6-methyl-, and salts					
4,6-Dinitro-o-cyclohexylphenol	131895	Phenol, 2-cyclohexyl-4,6-dinitro-	1*	4	P034	B	100(45.4)
Dinitrophenol	25550587		1000	1		B	100(45.4)
2,5-	329715						
2,6-	573568						
2,4-Dinitrophenol	51285	Phenol, 2,4-dinitro-	1*	2,4	P048	B	100(45.4)
Dinitrotoluene	25321146		1000	1,2		B	100(45.4)
2,4-Dinitrotoluene	121142	Benzene, 1-methyl-2,4-dinitro-	1*	2,4	U105	B	100(45.4)
2,6-Dinitrotoluene	606202	Benzene, 1-methyl-2,6-dinitro-	1*	2,4	U106	B	100(45.4)
Dinoseb	88857	Phenol, 2,4-dinitro-6-(1-methylpropyl)-	1*	4	P020	C	1000(454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Di-n-octyl phthalate	117840	1,2-Benzenedicarboxylic acid, di-n-octyl ester	1*	2,4	U107	D	5000(2270)
1,4-Dioxane	123911	1,4-Diethylene dioxide	1*	4	U108		#
DIPHENYLHYDRAZINE			1*	2			**
1,2-Diphenylhydrazine	122667	Hydrazine, 1,2-diphenyl-	1*	2,4	U109		###
Diphosphoramidate, octamethyl-	152169	Octamethylpyrophosphoramidate	1*	4	P085	B	100(45.4)
Dipropylamine	142847	1-Propanamine, N-propyl-	1*	4	U110	D	5000(2270)
Di-n-propylnitrosamine	621647	N-Nitrosodi-n-propylamine	1*	2,4	U111		#
Diquat	85007 2764729		1000	1		C	1000(454)
Disulfoton	298044	O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate	1	1,4	P039	X	1(0.454)
2,4-Dithiobiuret	541537	Thioimidodicarbonic diamide	1*	4	P049	B	100(45.4)
Dithiopyrophosphoric acid, tetraethyl ester	3689245	Tetraethyldithiopyrophosphate	1*	4	P109	B	100(45.4)
Diuron	330541		100	1		B	100(45.4)
Dodecylbenzenesulfonic acid	27176870		1000	1		C	1000(454)
Endosulfan	115297	5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro, cyclic sulfite	1	1,2,4	P050	X	1(0.454)
alpha - Endosulfan	959988		1*	2		X	1(0.454)
beta - Endosulfan	33213659		1*	2		X	1(0.454)
ENDOSULFAN AND METABOLITES			1*	2			**
Endosulfan sulfate	1031078		1*	2		X	1(0.454)
Endothall	145733	7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid	1*	4	P088	C	1000(454)
Endrin	72208	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene	1	1,2,4	P051	X	1(0.454)
Endrin aldehyde	7421934		1*	2		X	1(0.454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
ENDRIN AND METABOLITES			1*	2			**
Epichlorohydrin	106898	1-Chloro-2,3-epoxypropane Oxirane, 2-(chloromethyl)-	1000	1,4	U041		###
Epinephrine	51434	1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]-	1*	4	P042	C	1000(454)
Ethanal	75070	Acetaldehyde	1000	1,4	U001	C	1000(454)
Ethanamine, 1,1-dimethyl-2-phenyl-	122098	alpha,alpha-Dimethylphenethylamine	1*	4	P046	D	5000(2270)
Ethanamine, N-ethyl-N-nitroso-	55185	N-Nitrosodiethylamine	1*	4	U174		#
Ethane, 1,2-dibromo-	106934	Ethylene dibromide	1000	1,4	U067		#
Ethane, 1,1-dichloro-	75343	1,1-Dichloroethane Ethylidene dichloride	1*	2,4	U076	C	1000(454)
Ethane, 1,2-dichloro-	107062	1,2-Dichloroethane Ethylene dichloride	5000	1,2,4	U077		###
Ethane, 1,1,1,2,2,2-hexachloro-	67721	Hexachloroethane	1*	2,4	U131		###
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro	111911	Bis(2-chloroethoxy) methane	1*	2,4	U024	C	1000(454)
Ethane, 1,1'-oxybis-	60297	Ethyl ether	1*	4	U117	B	100(45.4)
Ethane, 1,1'-oxybis[2-chloro-	111444	Bis (2-chloroethyl) ether Dichloroethyl ether	1*	2,4	U025		#
Ethane, pentachloro-	76017	Pentachloroethane	1*	4	U184		##
Ethane, 1,1,1,2-tetrachloro-	630206	1,1,1,2-Tetrachloroethane	1*	4	U208		###
Ethane, 1,1,2,2-tetrachloro-	79345	1,1,2,2-Tetrachloroethane	1*	2,4	U209		###
Ethane, 1,1,2-trichloro-	79005	1,1,2-Trichloroethane	1*	2,4	U227		###
Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)	72435	Methoxychlor	1	1,4	U247	X	1(0.454)
1,2-Ethanedithiolbiscarbamodithioic acid, salts and esters	111546	Ethylenebis(dithiocarbamic acid), salts and esters	1*	4	U114	D	5000(2270)
Ethanenitrile	75058	Acetonitrile	1*	4	U003	C	1000(454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Ethanethioamide	62555	Thioacetamide	1*	4	U218		#
Ethanol, 2,2'-(nitrosoimino)bis-	1116547	N-Nitrosodiethanolamine	1*	4	U173		#
Ethanone, 1-phenyl-	98862	Acetophenone	1*	4	U004	D	5000(2270)
Ethanoyl chloride	75365	Acetyl chloride	5000	1,4	U006	D	5000(2270)
Ethenamine, N-methyl-N-nitroso-	4549400	N-Nitrosomethylvinylamine	1*	4	P084		#
Ethene, chloro-	75014	Vinyl chloride	1*	2,3,4	U043		###
Ethene, 2-chloroethoxy-	110758	2-Chloroethyl vinyl ether	1*	2,4	U042	C	1000(454)
Ethene, 1,1-dichloro-	75354	1,1-Dichloroethylene	5000	1,2,4	U078		###
		Vinylidene chloride					
Ethene, 1,1,2,2-tetrachloro-	127184	Tetrachloroethene	1*	2,4	U210		###
		Tetrachloroethylene					
Ethene, trans-1,2-dichloro-	156605	1,2-trans-Dichloroethylene	1*	2,4	U079	C	1000(454)
		trans-1,2-Dichloroethylene					
Ethion	563122		10	1			##
Ethyl acetate	141786	Acetic acid, ethyl ester	1*	4	U112	D	5000(2270)
Ethyl acrylate	140885	2-Propenoic acid, ethyl ester	1*	4	U113	D	5000(2270)
Ethylbenzene	100414		1000	1,2		C	1000(454)
Ethyl carbamate (Urethan)	51796	Carbamic acid, ethyl ester	1*	4	U238		#
Ethyl cyanide	107120	Propanenitrile	1*	4	P101	A	10(4.54)
Ethyl 4,4'-dichlorobenzilate	510156	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	1*	4	U038		#
Ethylene dibromide	106934	Ethane, 1,2-dibromo-	1000	1,4	U067		#
Ethylene dichloride	107062	1,2-Dichloroethane	5000	1,2,4	U077		###
		Ethane, 1,2-dichloro-					
Ethylene oxide	75218	Oxirane	1*	4	U115	B	100(45.4)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Ethylenebis(dithiocarbamic acid), salts and esters	111546	1,2-Ethanedithiylbiscarbamodithioic acid, salts and esters	1*	4	U114	D	5000(2270)
Ethylenediamine	107153		1000	1		D	5000(2270)
Ethylenediamine tetraacetic acid (EDTA)	60004		5000	1		D	5000(2270)
Ethylenethiourea	96457	2-Imidazolidinethione	1*	4	U116		#
Ethylenimine	151564	Aziridine	1*	4	P054		#
Ethyl ether	60297	Ethane, 1,1'-oxybis-	1*	4	U117	B	100(45.4)
Ethylidene dichloride	75343	1,1-Dichloroethane Ethane, 1,1-dichloro-	1*	2,4	U076	C	1000(454)
Ethyl methacrylate	97632	2-Propenoic acid, 2-methyl-, ethyl ester	1*	4	U118	C	1000(454)
Ethyl methanesulfonate	62500	Methanesulfonic acid, ethyl ester	1*	4	U119		#
Famphur	52857	Phosphorothioic acid, O,O-dimethyl O-[p-(dimethylamino)-sulfonyl] phenyl] ester	1*	4	P097	C	1000(454)
Ferric ammonium citrate	1185575		1000	1		C	1000(454)
Ferric ammonium oxalate	2944674 55488874		1000	1		C	1000(454)
Ferric chloride	7705080		1000	1		C	1000(454)
Ferric dextran	9004664	Iron dextran	1*	4	U139		#
Ferric fluoride	7783508		100	1		B	100(45.4)
Ferric nitrate	10421484		1000	1		C	1000(454)
Ferric sulfate	10028225		1000	1		C	1000(454)
Ferrous ammonium sulfate	10045893		1000	1		C	1000(454)
Ferrous chloride	7758943		100	1		B	100(45.4)
Ferrous sulfate	7720787 7782630		1000	1		C	1000(454)
Fluoroacetic acid, sodium salt	62748	Acetic acid, fluoro-, sodium salt	1*	4	P058	A	10(4.54)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Fluoranthene	206440	Benzo[j,k]fluorene	1*	2,4	U120		#
Fluorene	86737		1*	2			#
Fluorine	7782414		1*	4	P056	A	10(4.54)
Fluoroacetamide	640197	Acetamide, 2-fluoro-	1*	4	P057	B	100(45.4)
Formaldehyde	50000	Methylene oxide	1000	1,4	U122		##
Formic acid	64186	Methanoic acid	5000	1,4	U123	D	5000(2270)
Fulminic acid, mercury(II)salt	628864	Mercury fulminate	1*	4	P065		##
Fumaric acid	110178		5000	1		D	5000(2270)
Furan	110009	Furfuran	1*	4	U124	B	100(45.4)
Furan, tetrahydro-	109999	Tetrahydrofuran	1*	4	U213	C	1000(454)
2-Furancarboxaldehyde	98011	Furfural	1000	1,4	U125	C	1000(454)
2,5-Furandione	108316	Maleic anhydride	5000	1,4	U147	D	5000(2270)
Furfural	98011	2-Furancarboxaldehyde	1000	1,4	U125	C	1000(454)
Furfuran	110009	Furan	1*	4	U124	B	100(45.4)
D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	18883664	Streptozotocin	1*	4	U206		#
Glycidylaldehyde	765344	1-Propanal, 2,3-epoxy-	1*	4	U126		#
Guanidine, N-nitroso-N-methyl-N'-nitro-	70257	N-Methyl-N'-nitro-N-nitrosoguanidine	1*	4	U163		#
Guthion	86500		1	1		X	1(0.454)
HALOETHERS			1*	2			**
HALOMETHANES			1*	2			**
Heptachlor	76448	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a, 4,7,7a-tetrahydro-	1	1,2,4	P059	X	1(0.454)
HEPTACHLOR AND METABOLITES			1*	2			**
Heptachlor epoxide	1024573		1*	2		X	1(0.454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ++	RCRA Waste Number	Category	Pounds(Kg)
Hexachlorobenzene	118741	Benzene, hexachloro-	1*	2,4	U127		###
Hexachlorobutadiene	87683	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1*	2,4	U128		###
HEXACHLOROCYCLOHEXANE all isomers)	(N.A.)		1*	2			**
Hexachlorocyclohexane (gamma isomer)	58899	gamma - BHC Lindane	1	1,2,4	U129	X	1(0.454)
Hexachlorocyclopentadiene	77474	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	1	1,2,4	U130	X	1(0.454)
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene	72208	Endrin	1	1,2,4	P051	X	1(0.454)
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene	60571	Dieldrin	1	1,2,4	P037	X	1(0.454)
Hexachloroethane	67721	Ethane, 1,1,1,2,2,2-hexachloro-	1*	2,4	U131		###
Hexachlorohexahydro-endo,endo-dimethanonaphthalene	465736	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene	1*	4	P060	X	1(0.454)
1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene	465736	Hexachlorohexahydro-endo,endo-dimethanonaphthalene	1*	4	P060	X	1(0.454)
1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene	309002	Aldrin	1	1,2,4	P004	X	1(0.454)
Hexachlorophene	70304	2,2'-Methylenebis(3,4,6-trichlorophenol)	1*	4	U132		##
Hexachloropropene	1888717	1-Propene, 1,1,2,3,3,3-hexachloro-	1*	4	U243	C	1000(454)
Hexaethyl tetraphosphate	757584	Tetraphosphoric acid, hexaethyl ester	1*	4	P062	B	100(45.4)
Hydrazine	302012	Diamine	1*	4	U133		#
Hydrazine, 1,2-diethyl-	1615801	N,N'-Diethylhydrazine	1*	4	U086		#
Hydrazine, 1,1-dimethyl-	57147	1,1-Dimethylhydrazine	1*	4	U098		#
Hydrazine, 1,2-dimethyl-	540738	1,2-Dimethylhydrazine	1*	4	U099		#
Hydrazine, 1,2-diphenyl-	122667	1,2-Diphenylhydrazine	1*	2,4	U109		###
Hydrazine, methyl-	60344	Methyl hydrazine	1*	4	P068	A	10(4.54)
Hydrazinecarbothioamide	79196	Thiosemicarbazide	1*	4	P116	B	100(45.4)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Hydrochloric acid	7647010		5000	1		D	5000(2270)
Hydrocyanic acid	74908	Hydrogen cyanide	10	1,4	P063	A	10(4.54)
Hydrofluoric acid	7664393	Hydrogen fluoride	5000	1,4	U134	B	100(45.4)
Hydrogen cyanide	74908	Hydrocyanic acid	10	1,4	P063	A	10(4.54)
Hydrogen fluoride	7664393	Hydrofluoric acid	5000	1,4	U134	B	100(45.4)
Hydrogen phosphide	7803512	Phosphine	1*	4	P096	B	100(45.4)
Hydrogen sulfide	7783064	Hydrosulfuric acid	100	1,4	U135		##
		Sulfur hydride					
Hydroperoxide, 1-methyl-1-phenylethyl-	80159	alpha,alpha-Dimethylbenzylhydroperoxide	1*	4	U096	A	10(4.54)
Hydrosulfuric acid	7783064	Hydrogen sulfide	100	1,4	U135		##
		Sulfur hydride					
Hydroxydimethylarsine oxide	75605	Cacodylic acid	1*	4	U136		#
2-Imidazolidinethione	96457	Ethylenethiourea	1*	4	U116		#
Indeno(1,2,3-cd)pyrene	193395	1,10-(1,2-Phenylene)pyrene	1*	2,4	U137		###
Iron dextran	9004664	Ferric dextran	1*	4	U139		#
Isobutyl alcohol	78831	1-Propanol, 2-methyl-	1*	4	U140	D	5000(2270)
Isocyanic acid, methyl ester	624839	Methyl isocyanate	1*	4	P064	B	100(45.4)
Isophorone	78591		1*	2		D	5000(2270)
Isoprene	78795		1000	1			##
Isopropanolamine dodecylbenzene sulfonate	42504461		1000	1		C	1000(454)
Isosafrole	120581	Benzene, 1,2-methylenedioxy-4-propenyl-	1*	4	U141		#
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964	5-(Aminomethyl)-3-isoxazolol	1*	4	P007	C	1000(454)
Kelthane	115322		5000	1		D	5000(2270)
Kepone	143500	Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta [c,d]-pentalen-2-one	1	1,4	U142	X	1(0.454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Lasiocarpine	303344		1*	4	U143		#
Lead †	7439921		1*	2			##
Lead acetate	301042	Acetic acid, lead salt	5000	1,4	U144		###
LEAD AND COMPOUNDS			1*	2			**
Lead arsenate	7784409 7645252 10102484		5000	1			###
Lead chloride	7758954		5000	1			##
Lead fluoborate	13814965		5000	1			##
Lead fluoride	7783462		1000	1			##
Lead iodide	10101630		5000	1			##
Lead nitrate	10099748		5000	1			##
Lead phosphate	7446277	Phosphoric acid, lead salt	1*	4	U145		###
Lead stearate	7428480 1072351 56189094		5000	1			##
Lead subacetate	1335326		1*	4	U146		###
Lead sulfate	15739807 7446142		5000	1			##
Lead sulfide	1314870		5000	1			##
Lead thiocyanate	592870		5000	1			##
Lindane	58899	gamma - BHC Hexachlorocyclohexane (gamma isomer)	1	1,2,4	U129	X	1(0.454)
Lithium chromate	14307358		1000	1			###
Malathion	121755		10	1		B	100(45.4)
Maleic acid	110167		5000	1		D	5000(2270)
Maleic anhydride	108316	2,5-Furandione	5000	1,4	U147	D	5000(2270)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code **	RCRA Waste Number	Category	Pounds (Kg)
Maleic hydrazide	123331	1,2-Dihydro-3,6-pyridazinedione	1*	4	U148	D	5000(2270)
Malononitrile	109773	Propanedinitrile	1*	4	U149	C	1000(454)
Melphalan	148823	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	1*	4	U150		#
Mercaptodimethur	2032657		100	1		A	10(4.54)
Mercuric cyanide	592041		1	1		X	1(0.454)
Mercuric nitrate	10045940		10	1			##
Mercuric sulfate	7783359		10	1			##
Mercuric thiocyanate	592858		10	1			##
Mercurous nitrate	10415755		10	1			##
	7782867						
Mercury	7439976		1*	2,3,4	U151	X	1(0.454)
MERCURY AND COMPOUNDS			1*	2			**
Mercury, (acetato-O)phenyl-	62384	Phenylmercuric acetate	1*	4	P092		##
Mercury fulminate	628864	Fulminic acid, mercury(II)salt	1*	4	P065		##
Methacrylonitrile	126987	2-Propenenitrile, 2-methyl-	1*	4	U152	C	1000(454)
Methanamine, N-methyl-	124403	Dimethylamine	1000	1,4	U092		##
Methane, bromo-	74839	Methyl bromide	1*	2,4	U029	C	1000(454)
Methane, chloro-	74873	Methyl chloride	1*	2,4	U045		##
Methane, chloromethoxy-	107302	Chloromethyl methyl ether	1*	4	U046		###
Methane, dibromo-	74953	Methylene bromide	1*	4	U068	C	1000(454)
Methane, dichloro-	75092	Methylene chloride	1*	2,4	U080	C	1000(454)
Methane, dichlorodifluoro-	75718	Dichlorodifluoromethane	1*	4	U075	D	5000(2270)
Methane, iodo-	74884	Methyl iodide	1*	4	U138		#
Methane, oxybis(chloro-	542881	Bis(chloromethyl) ether	1*	4	P016		###

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Methane, tetrachloro-	56235	Carbon tetrachloride Tetrachloromethane	5000	1,2,4	U211		###
Methane, tetranitro-	509148	Tetranitromethane	1*	4	P112	A	10(4.54)
Methane, tribromo	75252	Bromoform	1*	2,4	U225	B	100(45.4)
Methane, trichloro-	67663	Chloroform	5000	1,2,4	U044		#
Methane, trichlorofluoro-	75694	Trichloromonofluoromethane	1*	4	U121	D	5000(2270)
Methanesulfonic acid, ethyl ester	62500	Ethyl methanesulfonate	1*	4	U119		#
Methanethiol	74931	Methylmercaptan Thiomethanol	100	1,4	U153	B	100(45.4)
Methanesulfonyl chloride, trichloro	594423	Trichloromethanesulfonyl chloride	1*	4	P118	B	100(45.4)
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a, 4,7,7a-tetrahydro-	76448	Heptachlor	1	1,2,4	P059	X	1(0.454)
Methanoic acid	64186	Formic acid	5000	1,4	U123	D	5000(2270)
4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4, 7,7a-tetrahydro-	57749	Chlordane Chlordane, technical	1	1,2,4	U036	X	1(0.454)
Methanol	67561	Methyl alcohol	1*	4	U154	D	5000(2270)
Methapyrilene	91805	Pyridine, 2-[(2-(dimethylamino)ethyl)-2- thenylaminol-	1*	4	U155	D	5000(2270)
Methomyl	16752775	Acetimidic acid, N-[(methylcarbamoyl)oxylthio-, methyl ester	1*	4	P066	C	1000(454)
Methoxychlor	72435	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)	1	1,4	U247	X	1(0.454)
Methyl alcohol	67561	Methanol	1*	4	U154	D	5000(2270)
2-Methylaziridine	75558	1,2-Propylenimine	1*	4	P067		#
Methyl bromide	74839	Methane, bromo-	1*	2,4	U029	C	1000(454)
1-Methylbutadiene	504609	1,3-Pentadiene	1*	4	U186	B	100(45.4)
Methyl chloride	74873	Methane, chloro-	1*	2,4	U045		##

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Methyl chlorocarbonate	79221	Carbonochloridic acid, methyl ester	1*	4	U156	C	1000(454)
Methyl chloroform	71556	1,1,1-Trichloroethane	1*	2,4	U226	C	1000(454)
4,4'-Methylenebis(2-chloroaniline)	101144	Benzenamine, 4,4'-methylenebis(2-chloro-	1*	4	U158		#
2,2'-Methylenebis(3,4,6-trichlorophenol)	70304	Hexachlorophene	1*	4	U132		##
3-Methylcholanthrene	56495	Benz[ <i>jj</i> ]aceanthrylene, 1,2-dihydro-3-methyl-	1*	4	U157		#
Methylene bromide	74953	Methane, dibromo-	1*	4	U068	C	1000(454)
Methylene chloride	75092	Methane, dichloro-	1*	2,4	U080	C	1000(454)
Methylene oxide	50000	Formaldehyde	1000	1,4	U122		##
Methyl ethyl ketone	78933	2-Butanone	1*	4	U159	C	1000(454)
Methyl ethyl ketone peroxide	1338234	2-Butanone peroxide	1*	4	U160	A	10(4.54)
Methyl hydrazine	60344	Hydrazine, methyl-	1*	4	P068	A	10(4.54)
Methyl iodide	74884	Methane, iodo-	1*	4	U138		#
Methyl isobutyl ketone	108101	4-Methyl-2-pentanone	1*	4	U161	D	5000(2270)
Methyl isocyanate	624839	Isocyanic acid, methyl ester	1*	4	P064	B	100(45.4)
2-Methylactonitrile	75865	Acetone cyanohydrin	10	1,4	P069	A	10(4.54)
		Propanenitrile, 2-hydroxy-2-methyl-					
Methylmercaptan	74931	Methanethiol	100	1,4	U153	B	100(45.4)
		Thiomethanol					
Methyl methacrylate	80626	2-Propenoic acid, 2-methyl-, methyl ester	5000	1,4	U162	C	1000(454)
N-Methyl-N'-nitro-N-nitrosoguanidine	70257	Guanidine, N-nitroso-N-methyl-N'-nitro-	1*	4	U163		#
Methyl parathion	298000	O,O-Dimethyl O-p-nitrophenyl phosphorothioate	100	1,4	P071		##
4-Methyl-2-pentanone	108101	Methyl isobutyl ketone	1*	4	U161	D	5000(2270)
Methylthiouracil	56042	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	1*	4	U164		#
Mevinphos	7786347		1	1		A	10(4.54)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Mexacarbate	315184		1000	1		C	1000(454)
Mitomycin C	50077	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-	1*	4	U010		#
Monoethylamine	75047		1000	1			##
Monomethylamine	74895		1000	1		B	100(45.4)
Naled	300765		10	1		A	10(4.54)
5,12-Naphthacenedione, (8s-cis)-8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxohexopyranoxyl)oxyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-	20830813	Daunomycin	1*	4	U059		#
Naphthalene	91203		5000	1,2,4	U165	B	100(45.4)
Naphthalene, 2-chloro-	91587	beta-Chloronaphthalene 2-Chloronaphthalene	1*	2,4	U047	D	5000(2270)
1,4-Naphthalenedione	130154	1,4-Naphthoquinone	1*	4	U166	D	5000(2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	72571	Trypan blue	1*	4	U236		#
Naphthenic acid	1338245		100	1		B	100(45.4)
1,4-Naphthoquinone	130154	1,4-Naphthalenedione	1*	4	U166	D	5000(2270)
1-Naphthylamine	134327	alpha-Naphthylamine	1*	4	U167		#
2-Naphthylamine	91598	beta-Naphthylamine	1*	4	U168		#
alpha-Naphthylamine	134327	1-Naphthylamine	1*	4	U167		#
beta-Naphthylamine	91598	2-Naphthylamine	1*	4	U168		#
2-Naphthylamine, N,N-bis(2-chloroethyl)-	494031	Chlornaphazine	1*	4	U026		#
alpha-Naphthylthiourea	86884	Thiourea, 1-naphthalenyl-	1*	4	P072	B	100(45.4)
Nickel †	7440020		1*	2			###

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
NICKEL AND COMPOUNDS			1*	2			**
Nickel ammonium sulfate	15699180		5000	1			##
Nickel carbonyl	13463393	Nickel tetracarbonyl	1*	4	P073		###
Nickel chloride	7718549 37211055		5000	1			##
Nickel cyanide	557197	Nickel(II) cyanide	1*	4	P074	A	10(4.54)
Nickel(II) cyanide	557197	Nickel cyanide	1*	4	P074	A	10(4.54)
Nickel hydroxide	12054487		1000	1			###
Nickel nitrate	14216752		5000	1			##
Nickel sulfate	7786814		5000	1			##
Nickel tetracarbonyl	13463393	Nickel carbonyl	1*	4	P073		###
Nicotine and salts	54115	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	1*	4	P075	B	100(45.4)
Nitric acid	7697372		1000	1		C	1000(454)
Nitric oxide	10102439	Nitrogen(II) oxide	1*	4	P076	A	10(4.54)
p-Nitroaniline	100016	Benzenamine, 4-nitro-	1*	4	P077	D	5000(2270)
Nitrobenzene	98953	Benzene, nitro-	1000	1,2,4	U169	C	1000(454)
Nitrogen dioxide	10102440	Nitrogen(IV) oxide	1000	1,4	P078	A	10(4.54)
Nitrogen(II) oxide	10102439	Nitric oxide	1*	4	P076	A	10(4.54)
Nitrogen(IV) oxide	10102440	Nitrogen dioxide	1000	1,4	P078	A	10(4.54)
Nitroglycerine	55630	1,2,3-Propanetriol, trinitrate-	1*	4	P081	A	10(4.54)
Nitrophenol (mixed)	25154556		1000	1		B	100(45.4)
m-	554847						
o-	88755						
p-	100027						
p-Nitrophenol	100027	4-Nitrophenol	1*	2,4	U170	B	100(45.4)
		Phenol, 4-nitro-					

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
2-Nitrophenol	88755		1*	2		B	100(45.4)
4-Nitrophenol	100027	p-Nitrophenol	1*	2,4	U170	B	100(45.4)
		Phenol, 4-nitro-					
NITROPHENOLS			1*	2			**
2-Nitropropane	79469	Propane, 2-nitro-	1*	4	U171	C	1000(454)
NITROSAMINES			1*	2			**
N-Nitrosodi-n-butylamine	924163	1-Butanamine, N-butyl-N-nitroso-	1*	4	U172		#
N-Nitrosodiethanolamine	1116547	Ethanol, 2,2'-(nitrosoimino)bis-	1*	4	U173		#
N-Nitrosodiethylamine	55185	Ethanamine, N-ethyl-N-nitroso-	1*	4	U174		#
N-Nitrosodimethylamine	62759	Dimethylnitrosamine	1*	2,4	P082		#
N-Nitrosodiphenylamine	86306		1*	2		B	100(45.4)
N-Nitrosodi-n-propylamine	621647	Di-n-propylnitrosamine	1*	2,4	U111		#
N-Nitroso-N-ethylurea	759739	Carbamide, N-ethyl-N-nitroso-	1*	4	U176		#
N-Nitroso-N-methylurea	684935	Carbamide, N-methyl-N-nitroso	1*	4	U177		#
N-Nitroso-N-methylurethane	615532	Carbamic acid, methylnitroso-, ethyl ester	1*	4	U178		#
N-Nitrosomethylvinylamine	4549400	Ethenamine, N-methyl-N-nitroso-	1*	4	P084		#
N-Nitrosopiperidine	100754	Pyridine, hexahydro-N-nitroso-	1*	4	U179		#
N-Nitrosopyrrolidine	930552	Pyrrole, tetrahydro-N-nitroso-	1*	4	U180		#
Nitrotoluene	1321126		1000	1		C	1000(454)
5-Nitro-o-toluidine	99558	Benzenamine, 2-methyl-5-nitro-	1*	4	U181		#
5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro, cyclic sulfite	115297	Endosulfan	1	1,2,4	P050	X	1(0.454)
Octamethylpyrophosphoramidate	152169	Diphosphoramidate, octamethyl-	1*	4	P085	B	100(45.4)
Osmium oxide	20816120	Osmium tetroxide	1*	4	P087	C	1000(454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory		RCRA Waste Number	Proposed RQ	
			RQ	Code ††		Category	Pounds (Kg)
Osmium tetroxide	20816120	Osmium oxide	1*	4	P087	C	1000(454)
7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid	145733	Endothall	1*	4	P088	C	1000(454)
1,2-Oxathiolane, 2,2-dioxide	1120714	1,3-Propane sultone	1*	4	U193		#
2H-1,3,2-Oxazaphosphorine, 2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide	50180	Cyclophosphamide	1*	4	U058		#
Oxirane	75218	Ethylene oxide	1*	4	U115	B	100(45.4)
Oxirane, 2-(chloromethyl)-	106898	1-Chloro-2,3-epoxypropane Epichlorohydrin	1000	1,4	U041		###
Paraformaldehyde	30525894		1000	1		C	1000(454)
Paraldehyde	123637	1,3,5-Trioxane, 2,4,6-trimethyl-	1*	4	U182	C	1000(454)
Parathion	56382	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester	1	1,4	P089	X	1(0.454)
Pentachlorobenzene	608935	Benzene, pentachloro-	1*	4	U183		##
Pentachloroethane	76017	Ethane, pentachloro-	1*	4	U184		##
Pentachloronitrobenzene	82688	Benzene, pentachloronitro-	1*	4	U185		###
Pentachlorophenol	87865	Phenol, pentachloro-	10	1,2,4	U242	X	1(0.454)
1,3-Pentadiene	504609	1-Methylbutadiene	1*	4	U186	B	100(45.4)
Phenacetin	62442	Acetamide, N-(4-ethoxyphenyl)-	1*	4	U187		#
Phenanthrene	85018		1*	2		D	5000(2270)
Phenol	108952	Benzene, hydroxy-	1000	1,2,4	U188		##
Phenol, 2-chloro-	95578	2-Chlorophenol o-Chlorophenol	1*	2,4	U048	B	100(45.4)
Phenol, 4-chloro-3-methyl-	59507	4-Chloro-m-cresol p-Chloro-m-cresol	1*	2,4	U039	D	5000(2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	131895	4,6-Dinitro-o-cyclohexylphenol	1*	4	P034	B	100(45.4)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Phenol, 2,4-dichloro-	120832	2,4-Dichlorophenol	1*	2,4	U081	B	100(45.4)
Phenol, 2,6-dichloro-	87650	2,6-Dichlorophenol	1*	4	U082	B	100(45.4)
Phenol, 2,4-dimethyl-	105679	2,4-Dimethylphenol	1*	2,4	U101	B	100(45.4)
Phenol, 2,4-dinitro-	51285	2,4-Dinitrophenol	1*	2,4	P048	B	100(45.4)
Phenol, 2,4-dinitro-6-(1-methylpropyl)-	88857	Dinoseb	1*	4	P020	C	1000(454)
Phenol 2,4-dinitro-6-methyl-, and salts	534521	4,6-Dinitro-o-cresol	1*	2,4	P047	B	100(45.4)
		4,6-Dinitro-o-cresol and salts					
Phenol, 4-nitro-	100027	p-Nitrophenol	1*	2,4	U170	B	100(45.4)
		4-Nitrophenol					
Phenol, pentachloro-	87865	Pentachlorophenol	10	1,2,4	U242	X	1(0.454)
Phenol, 2,3,4,6-tetrachloro-	58902	2,3,4,6-Tetrachlorophenol	1*	4	U212	A	10(4.54)
Phenol, 2,4,5-trichloro-	95954	2,4,5-Trichlorophenol	1*	4	U230		##
Phenol, 2,4,6-trichloro	88062	2,4,6-Trichlorophenol	1*	2,4	U231		###
Phenol, 2,4,6-trinitro-, ammonium salt	131748	Ammonium picrate	1*	4	P009	A	10(4.54)
Phenyl dichloroarsine	696286	Dichlorophenylarsine	1*	4	P036		###
1,10-(1,2-Phenylene)pyrene	193395	Indeno(1,2,3-cd)pyrene	1*	2,4	U137		###
Phenylmercuric acetate	62384	Mercury, (acetato-O)phenyl-	1*	4	P092		##
N-Phenylthiourea	103855	Thiourea, phenyl-	1*	4	P093	B	100(45.4)
Phorate	298022	Phosphorodithioic acid, O,O-diethyl S-(ethylthio) methyl ester	1*	4	P094		##
Phosgene	75445	Carbonyl chloride	5000	1,4	P095	C	1000(454)
Phosphine	7803512	Hydrogen phosphide	1*	4	P096	B	100(45.4)
Phosphoric acid	7664382		5000	1		D	5000(2270)
Phosphoric acid, diethyl p-nitrophenyl ester	311455	Diethyl-p-nitrophenyl phosphate	1*	4	P041	B	100(45.4)
Phosphoric acid, lead salt	7446277	Lead phosphate	1*	4	U145		###

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582	O,O-Diethyl S-Methyl Dithiophosphate	1*	4	U087	D	5000(2270)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio) methyl ester	298022	Phorate	1*	4	P094		##
Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	60515	Dimethoate	1*	4	P044	A	10(4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester	55914	Diisopropyl fluorophosphate	1*	4	P043	B	100(45.4)
Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester	56382	Parathion	1	1,4	P089	X	1(0.454)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	297972	O,O-Diethyl O-pyrazinyl phosphorothioate	1*	4	P040	B	100(45.4)
Phosphorothioic acid, O,O-dimethyl O-[p-(dimethylamino)-sulfonyl] phenyl] ester	52857	Famphur	1*	4	P097	C	1000(454)
Phosphorus	7723140		1	1		X	1(0.454)
Phosphorus oxychloride	10025873		5000	1		C	1000(454)
Phosphorus pentasulfide	1314803	Phosphorus sulfide Sulfur phosphide	100	1,4	U189	B	100(45.4)
Phosphorus sulfide	1314803	Phosphorus pentasulfide Sulfur phosphide	100	1,4	U189	B	100(45.4)
Phosphorus trichloride	7719122		5000	1		C	1000(454)
PHthalate Esters			1*	2			**
Phthalic anhydride	85449	1,2-Benzenedicarboxylic acid anhydride	1*	4	U190	D	5000(2270)
2-Picoline	109068	Pyridine, 2-methyl-	1*	4	U191	D	5000(2270)
Plumbane, tetraethyl-	78002	Tetraethyl lead	100	1,4	P110		##
POLYCHLORINATED BIPHENYLS (PCBs)	1336363		10	1,2		X	1(0.454)
POLYNUCLEAR AROMATIC HYDROCARBONS			1*	2			**

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Potassium arsenate	7784410		1000	1			###
Potassium arsenite	10124502		1000	1			###
Potassium bichromate	7778509		1000	1			###
Potassium chromate	7789006		1000	1			###
Potassium cyanide	151508		10	1,4	P098	A	10(4.54)
Potassium hydroxide	1310583		1000	1		C	1000(454)
Potassium permanganate	7722647		100	1		B	100(45.4)
Potassium silver cyanide	506616		1*	4	P099	X	1(0.454)
Pronamide	23950585	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	1*	4	U192	D	5000(2270)
1-Propanal, 2,3-epoxy-	765344	Glycidialdehyde	1*	4	U126		#
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	116063	Aldicarb	1*	4	P070	A	10(4.54)
1-Propanamine	107108	n-Propylamine	1*	4	U194	D	5000(2270)
1-Propanamine, N-propyl-	142847	Dipropylamine	1*	4	U110	D	5000(2270)
Propane, 1,2-dibromo-3-chloro-	96128	1,2-Dibromo-3-chloropropane	1*	4	U066		#
Propane, 2-nitro-	79469	2-Nitropropane	1*	4	U171	C	1000(454)
Propane, 2,2'-oxybis[2-chloro-	108601	Bis(2-chloroisopropyl) ether	1*	2,4	U027	C	1000(454)
1,3-Propane sultone	1120714	1,2-Oxathiolane, 2,2-dioxide	1*	4	U193		#
Propanedinitrile	109773	Malononitrile	1*	4	U149	C	1000(454)
Propanenitrile	107120	Ethyl cyanide	1*	4	P101	A	10(4.54)
Propanenitrile, 3-chloro-	542767	3-Chloropropionitrile	1*	4	P027	C	1000(454)
Propanenitrile, 2-hydroxy-2-methyl-	75865	Acetone cyanohydrin	10	1,4	P069	A	10(4.54)
		2-Methylactonitrile					
1,2,3-Propanetriol, trinitrate-	55630	Nitroglycerine	1*	4	P081	A	10(4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727	Tris(2,3-dibromopropyl) phosphate	1*	4	U235		#

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
1-Propanol, 2-methyl-	78831	Isobutyl alcohol	1*	4	U140	D	5000(2270)
2-Propanone	67641	Acetone	1*	4	U002	D	5000(2270)
2-Propanone, 1-bromo-	598312	Bromoacetone	1*	4	P017	C	1000(454)
Propargite	2312358		10	1		A	10(4.54)
Propargyl alcohol	107197	2-Propyn-1-ol	1*	4	P102	C	1000(454)
2-Propenal	107028	Acrolein	1	1,2,4	P003	X	1(0.454)
2-Propenamide	79061	Acrylamide	1*	4	U007	D	5000(2270)
Propene, 1,3-dichloro-	542756	1,3-Dichloropropene	1*	2,4	U084	B	100(45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717	Hexachloropropene	1*	4	U243	C	1000(454)
2-Propenenitrile	107131	Acrylonitrile	100	1,2,4	U009		###
2-Propenenitrile, 2-methyl-	126987	Methacrylonitrile	1*	4	U152	C	1000(454)
2-Propenoic acid	79107	Acrylic acid	1*	4	U008	D	5000(2270)
2-Propenoic acid, ethyl ester	140885	Ethyl acrylate	1*	4	U113	D	5000(2270)
2-Propenoic acid, 2-methyl-, ethyl ester	97632	Ethyl methacrylate	1*	4	U118	C	1000(454)
2-Propenoic acid, 2-methyl-, methyl ester	80626	Methyl methacrylate	5000	1,4	U162	C	1000(454)
2-Propen-1-ol	107186	Allyl alcohol	100	1,4	P005	B	100(45.4)
Propionic acid	79094		5000	1		D	5000(2270)
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721	Silvex	100	1,4	U233	B	100(45.4)
		2,4,5-TP acid					
Propionic anhydride	123626		5000	1		D	5000(2270)
n-Propylamine	107108	1-Propanamine	1*	4	U194	D	5000(2270)
Propylene dichloride	78875	1,2-Dichloropropane	1*	2,4	U083	C	1000(454)
Propylene oxide	75569		5000	1		B	100(45.4)
1,2-Propylenimine	75558	2-Methylaziridine	1*	4	P067		#
2-Propyn-1-ol	107197	Propargyl alcohol	1*	4	P102	C	1000(454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	(Pounds)(Kg)
Pyrene	129000		1*	2		D	5000(2270)
Pyrethrins	121299 121211		1000	1		C	1000(454)
4-Pyridinamine	504245	4-Aminopyridine	1*	4	P008	C	1000(454)
Pyridine	110861		1*	4	U196		##
Pyridine, 2-[(2-(dimethylamino)ethyl)-2-phenylaminol-	91805	Methapyrilene	1*	4	U155	D	5000(2270)
Pyridine, hexahydro-N-nitroso-	100754	N-Nitrosopiperidine	1*	4	U179		#
Pyridine, 2-methyl-	109068	2-Picoline	1*	4	U191	D	5000(2270)
Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	54115	Nicotine and salts	1*	4	P075	B	100(45.4)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042	Methylthiouracil	1*	4	U164		#
Pyrophosphoric acid, tetraethyl ester	107493	Tetraethyl pyrophosphate	100	1,4	P111		##
Pyrrole, tetrahydro-N-nitroso-	930552	N-Nitrosopyrrolidine	1*	4	U180		#
Quinoline	91225		1000	1		D	5000(2270)
RADIONUCLIDES			1*	3			####
Reserpine	50555	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxyl]-, methyl ester	1*	4	U200	D	5000(2270)
Resorcinol	108463	1,3-Benzenediol	1000	1,4	U201	D	5000(2270)
Saccharin and salts	81072	1,2-Benzisothiazollin-3-one, 1,1-dioxide, and salts	1*	4	U202		#
Safrole	94597	Benzene, 1,2-methylenedioxy-4-allyl-	1*	4	U203		#
Selenious acid	7783008		1*	4	U204		##
Selenium †	7782492		1*	2			##
SELENIUM AND COMPOUNDS			1*	2			**
Selenium dioxide	7446084	Selenium oxide	1000	1,4	U204		##
Selenium disulfide	7488564	Sulfur selenide	1*	4	U205		##

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory		RCRA Waste Number	Proposed RQ	
			RQ	Code ††		Category	Pounds(Kg)
Selenium oxide	7446084	Selenium dioxide	1000	1,4	U204		##
Selenourea	630104	Carbamimidoseleonic acid	1*	4	P103		##
L-Serine, diazoacetate (ester)	115026	Azaserine	1*	4	U015		#
Silver †	7440224		1*	2		C	1000(454)
SILVER AND COMPOUNDS			1*	2			**
Silver cyanide	506649		1*	4	P104	X	1(0.454)
Silver nitrate	7761888		1	1		X	1(0.454)
Silvex	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- 2,4,5-TP acid	100	1,4	U233	B	100(45.4)
Sodium	7440235		1000	1		A	10(4.54)
Sodium arsenate	7631892		1000	1			###
Sodium arsenite	7784465		1000	1			###
Sodium azide	26628228		1*	4	P105	C	1000(454)
Sodium bichromate	10588019		1000	1			###
Sodium bifluoride	1333831		5000	1			##
Sodium bisulfite	7631905		5000	1		D	5000(2270)
Sodium chromate	7775113		1000	1			###
Sodium cyanide	143339		10	1,4	P106	A	10(4.54)
Sodium dodecylbenzene sulfonate	25155300		1000	1		C	1000(454)
Sodium fluoride	7681494		5000	1		C	1000(454)
Sodium hydrosulfide	16721805		5000	1		D	5000(2270)
Sodium hydroxide	1310732		1000	1		C	1000(454)
Sodium hypochlorite	7681529 10022705		100	1		B	100(45.4)
Sodium methylate	124414		1000	1		C	1000(454)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Sodium nitrite	7632000		100	1			##
Sodium phosphate, dibasic	7558794 10039324 10028247 10140655		5000	1		D	5000(2270)
Sodium phosphate, tribasic	7601549 7785844 10101890 10361894 7758294 10124568		5000	1		D	5000(2270)
Sodium selenite	10102188 7782823		1000	1			##
4,4'-Stilbenediol, alpha,alpha'-diethyl-	56531	Diethylstilbestrol	1*	4	U089		#
Streptozotocin	18883864	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1*	4	U206		#
Strontium chromate	7789062		1000	1			#
Strontium sulfide	1314961		1*	4	P107	B	100(45.4)
Strychnidin-10-one, and salts	57249	Strychnine and salts	10	1,4	P108	A	10(4.54)
Strychnine and salts	57249	Strychnidin-10-one, and salts	10	1,4	P108	A	10(4.54)
Styrene	100425		1000	1		C	1000(454)
Sulfur hydride	7783064	Hydrogen sulfide Hydrosulfuric acid	100	1,4	U135		##
Sulfur monochloride	12771083		1000	1		C	1000(454)
Sulfur phosphide	1314803	Phosphorus pentasulfide Phosphorus sulfide	100	1,4	U189	B	100(45.4)
Sulfur selenide	7488564	Selenium disulfide	1*	4	U205		##
Sulfuric acid	7664939		1000	1		C	1000(454)
Sulfuric acid, dimethyl ester	77781	Dimethyl sulfate	1*	4	U103		#
Sulfuric acid, thallium(I) salt	7446186	Thallium(I) sulfate	1000	1,4	P115		##

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
2,4,5-T	93765	2,4,5-T acid	100	1,4	U232	B	100(45.4)
		2,4,5-Trichlorophenoxyacetic acid					
2,4,5-T acid	93765	2,4,5-T	100	1,4	U232	B	100(45.4)
		2,4,5-Trichlorophenoxyacetic acid					
2,4,5-T amines	2008460		100	1		B	100(45.4)
2,4,5-T esters	93798		100	1		B	100(45.4)
	2545597						
	61792072						
	1928478						
	25168154						
2,4,5-T salts	13560991		100	1		B	100(45.4)
TDE	72548	DDD	1	1,2,4	U060	X	1(0.454)
		Dichloro diphenyl dichloroethane					
1,2,4,5-Tetrachlorobenzene	95943	Benzene, 1,2,4,5-tetrachloro-	1*	4	U207	D	5000(2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746016		1*	2		X	1(0.454)
1,1,1,2-Tetrachloroethane	630206	Ethane, 1,1,1,2-tetrachloro-	1*	4	U208		###
1,1,2,2-Tetrachloroethane	79345	Ethane, 1,1,2,2-tetrachloro-	1*	2,4	U209		###
Tetrachloroethene	127184	Ethene, 1,1,2,2-tetrachloro-	1*	2,4	U210		###
		Tetrachloroethylene					
Tetrachloroethylene	127184	Ethene, 1,1,2,2-tetrachloro-	1*	2,4	U210		###
		Tetrachloroethene					
Tetrachloromethane	56235	Carbon tetrachloride	5000	1,2,4	U211		###
		Methane, tetrachloro-					
2,3,4,6-Tetrachlorophenol	58902	Phenol, 2,3,4,6-tetrachloro-	1*	4	U212	A	10(4.54)
Tetraethyldithiopyrophosphate	3689245	Dithiopyrophosphoric acid, tetraethyl ester	1*	4	P109	B	100(45.4)
Tetraethyl lead	78002	Plumbane, tetraethyl-	100	1,4	P110		##

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Tetraethyl pyrophosphate	107493	Pyrophosphoric acid, tetraethyl ester	100	1,4	P111		##
Tetrahydrofuran	109999	Furan, tetrahydro-	1*	4	U213	C	1000(454)
Tetranitromethane	509148	Methane, tetranitro-	1*	4	P112	A	10(4.54)
Tetraphosphoric acid, hexaethyl ester	757584	Hexaethyl tetraphosphate	1*	4	P062	B	100(45.4)
Thallic oxide	1314325	Thallium(III) oxide	1*	4	P113		##
Thallium †	7440280		1*	2			##
THALLIUM AND COMPOUNDS			1*	2			**
Thallium(I) acetate	563688	Acetic acid, thallium(I) salt	1*	4	U214		##
Thallium(I) carbonate	6533739	Carbonic acid, dithallium (I) salt	1*	4	U215		##
Thallium(I) chloride	7791120		1*	4	U216		##
Thallium(I) nitrate	10102451		1*	4	U217		##
Thallium(III) oxide	1314325	Thallic oxide	1*	4	P113		##
Thallium(I) selenide	12039520		1*	4	P114		##
Thallium(I) sulfate	7446186	Sulfuric acid, thallium(I) salt	1000	1,4	P115		##
Thioacetamide	62555	Ethanethioamide	1*	4	U218		#
Thiofanox	39196184	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime	1*	4	P045	B	100(45.4)
Thioimidodicarbonic diamide	541537	2,4-Dithiobiuret	1*	4	P049	B	100(45.4)
Thiomethanol	74931	Methanethiol Methylmercaptan	100	1,4	U153	B	100(45.4)
Thiophenol	108985	Benzenethiol	1*	4	P014	B	100(45.4)
Thiosemicarbazide	79196	Hydrazinecarbothioamide	1*	4	P116	B	100(45.4)
Thiourea	62566	Carbamide, thio-	1*	4	U219		#
Thiourea, (2-chlorophenyl)-	5344821	1-(o-Chlorophenyl)thiourea	1*	4	P026	B	100(45.4)
Thiourea, 1-naphthalenyl-	86884	alpha-Naphthylthiourea	1*	4	P072	B	100(45.4)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Thiourea, phenyl-	103855	N-Phenylthiourea	1*	4	P093	B	100(45.4)
Thiram	137268	Bis(dimethylthiocarbamoyl) disulfide	1*	4	U244	A	10(4.54)
Toluene	108883	Benzene, methyl-	1000	1,2,4	U220	C	1000(454)
Toluene-2,4-diamine	95807	2,4-Diaminotoluene	1*	4	U221		#
Toluene diisocyanate	584849	Benzene, 1,3-diisocyanatomethyl-	1*	4	U223	B	100(45.4)
o-Toluidine hydrochloride	636215	Benzenamine, 2-methyl-, hydrochloride	1*	4	U222		#
Toxaphene	8001352	Camphene, octachloro-	1	1,2,4	P123	X	1(0.454)
2,4,5-TP acid	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- Silvex	100	1,4	U233	B	100(45.4)
2,4,5-TP acid esters	32534955		100	1		B	100(45.4)
1H-1,2,4-Triazol-3-amine	61825	Amitrole	1*	4	U011		#
Trichlorfon	52686		1000	1			##
1,2,4-Trichlorobenzene	120821		1*	2		B	100(45.4)
1,1,1-Trichloroethane	71556	Methyl chloroform	1*	2,4	U226	C	1000(454)
1,1,2-Trichloroethane	79005	Ethane, 1,1,2-trichloro-	1*	2,4	U227		###
Trichloroethene	79016	Trichloroethylene	1000	1,2,4	U228		###
Trichloroethylene	79016	Trichloroethene	1000	1,2,4	U228		###
Trichloromethanesulfonyl chloride	594423	Methanesulfonyl chloride, trichloro	1*	4	P118	B	100(45.4)
Trichloromonofluoromethane	75694	Methane, trichlorofluoro-	1*	4	U121	D	5000(2270)
Trichlorophenol	25167822		10	1			#
2,4,5-Trichlorophenol	95954	Phenol, 2,4,5-trichloro-	1*	4	U230		##
2,4,6-Trichlorophenol	88062	Phenol, 2,4,6-trichloro	1*	2,4	U231		###
2,4,5-Trichlorophenoxyacetic acid	93765	2,4,5-T 2,4,5-T acid	100	1,4	U232	B	100(45.4)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
Triethanolamine dodecylbenzene sulfonate	27323417		1000	1		C	1000(454)
Triethylamine	121448		5000	1		D	5000(2270)
Trimethylamine	75503		1000	1			##
sym-Trinitrobenzene	99354	Benzene, 1,3,5-trinitro-	1*	4	U234		##
1,3,5-Trioxane, 2,4,6-trimethyl-	123637	Paraldehyde	1*	4	U182	C	1000(454)
Tris(2,3-dibromopropyl) phosphate	126727	1-Propanol, 2,3-dibromo-, phosphate (3:1)	1*	4	U235		#
Trypan blue	72571	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	1*	4	U236		#
Unlisted Wastes	(N.A.)		1*	4			
Characteristic of Ignitability			1*	4		B	100(45.4)
Characteristic of Corrosivity			1*	4		B	100(45.4)
Characteristic of Reactivity			1*	4		B	100(45.4)
Characteristic of EP Toxicity			1*	4			
Arsenic D004			1*	4			###
Barium D005			1*	4		C	1000(454)
Cadmium D006			1*	4			###
Chromium(VI) D007			1*	4			##
Lead D008			1*	4			##
Mercury D009			1*	4		X	1(0.454)
Selenium D010			1*	4			##
Silver D011			1*	4		X	1(0.454)
Endrin D012			1	1,4	P051	X	1(0.454)
Lindane D013			1	1,4	U129	X	1(0.454)
Methoxychlor D014			1	1,4	U247	X	1(0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	(Pounds)(Kg)
Toxaphene D015			1	1,4	P123	X	1(0.454)
2,4-D D016			100	1,4	U240	B	100(45.4)
2,4,5-TP D017			100	1,4	U233	B	100(45.4)
Uracil, 5-[bis(2-chloroethyl)amino]-	66751	Uracil mustard	1*	4	U237		#
Uracil mustard	66751	Uracil, 5-[bis(2-chloroethyl)amino]-	1*	4	U237		#
Uranyl acetate	541093		5000	1			##
Uranyl nitrate	10102064 36478769		5000	1			##
Vanadic acid, ammonium salt	7803556	Ammonium vanadate	1*	4	P119	C	1000(454)
Vanadium(V) oxide	1314621	Vanadium pentoxide	1000	1,4	P120		##
Vanadium pentoxide	1314621	Vanadium(V) oxide	1000	1,4	P120		##
Vanadyl sulfate	27774136		1000	1			##
Vinyl acetate	108054		1000	1		D	5000(2270)
Vinyl chloride	75014	Ethene, chloro-	1*	2,3,4	U043		###
Vinylidene chloride	75354	1,1-Dichloroethylene	5000	1,2,4	U078		###
		Ethene, 1,1-dichloro-					
Warfarin	81812	3-(alpha-Acetylbenzyl)-4-hydroxycoumarin and salts	1*	4	P001	B	100(45.4)
Xylene	1330207		1000	1,4	U239	C	1000(454)
m-	108383						
o-	95476						
p-	106423						
Xylenol	1300716		1000	1		C	1000(454)
Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester	50555	Reserpine	1*	4	U200	D	5000(2270)
Zinc †	7440666		1*	2			##
ZINC AND COMPOUNDS			1*	2			**

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Zinc acetate	557346		1000	1			##
Zinc ammonium chloride	52628258		5000	1			##
	14639975						
	14639986						
Zinc borate	1332076		1000	1			##
Zinc bromide	7699458		5000	1			##
Zinc carbonate	3486359		1000	1			##
Zinc chloride	7646857		5000	1			##
Zinc cyanide	557211		10	1,4	P121		##
Zinc fluoride	7783495		1000	1			##
Zinc formate	557415		1000	1			##
Zinc hydrosulfite	7779864		1000	1			##
Zinc nitrate	7779886		5000	1			##
Zinc phenolsulfonate	127822		5000	1			##
Zinc phosphide	1314847		1000	1,4	P122		##
Zinc silicofluoride	16871719		5000	1			##
Zinc sulfate	7733020		1000	1			##
Zirconium nitrate	13746899		5000	1		D	5000(2270)
Zirconium potassium fluoride	16923958		5000	1		C	1000(454)
Zirconium sulfate	14644612		5000	1		D	5000(2270)
Zirconium tetrachloride	10026116		5000	1		D	5000(2270)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
F001 The following spent halogenated solvents used in degreasing and sludges from the recovery of these solvents in degreasing operations:			1*	4			###
(a) Tetrachlorethylene	127184						###
(b) Trichloroethylene	79016						###
(c) Methylene chloride	75092					C	1000(454)
(d) 1,1,1-Trichloroethane	71556					C	1000(454)
(e) Carbon tetrachloride	56235						###
(f) Chlorinated fluorocarbons	(N.A.)					D	5000(2270)
F002 The following spent halogenated solvents and the still bottoms from the recovery of these solvents:			1*	4			###
(a) Tetrachloroethylene	127184						###
(b) Methylene Chloride	75092					C	1000(454)
(c) Trichloroethylene	79016						###
(d) 1,1,1-Trichloroethane	71556					C	1000(454)
(e) Chlorobenzene	108907					B	100(45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	76131					D	5000(2270)
(g) o-Dichlorobenzene	106467					B	100(45.4)
(h) Trichlorofluoromethane	75694					D	5000(2270)
F003 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:			1*	4		B	100(45.4)
(a) Xylene	1330207					C	1000(454)
(b) Acetone	67641					D	5000(2270)
(c) Ethyl acetate	141786					D	5000(2270)
(d) Ethylbenzene	100414					C	1000(454)
(e) Ethyl ether	60297					B	100(45.4)
(f) Methyl isobutyl ketone	108101					D	5000(2270)
(g) n-Butyl alcohol	71363					D	5000(2270)
(h) Cyclohexanone	108941					D	5000(2270)
(i) Methanol	67561					D	5000(2270)

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
F004 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:			1*	4			##
(a) Cresols/Cresylic acid	1319773						##
(b) Nitrobenzene	98953						##
F005 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:			1*	4			##
(a) Toluene	108883					C	1000(454)
(b) Methyl ethyl ketone	78933					C	1000(454)
(c) Carbon disulfide	75150						##
(d) Isobutanol	78831					D	5000(2270)
(e) Pyridine	110861						##
F006 Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum			1*	4			###
F007 Spent cyanide plating bath solutions from electroplating operations (except for precious metals electroplating spent cyanide plating bath solutions)			1*	4		A	10(4.54)
F008 Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges)			1*	4		A	10(4.54)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
F009 Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions)			1*	4		A	10(4.54)
F010 Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges)			1*	4		A	10(4.54)
F011 Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning)			1*	4		A	10(4.54)
F012 Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater treatment sludges)			1*	4		A	10(4.54)
F019 Wastewater treatment sludges from the chemical conversion coating of aluminum			1*	4			##
K001 Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol			1*	4		X	1(0.454)
K002 Wastewater treatment sludge from the production of chrome yellow and orange pigments			1*	4			##
K003 Wastewater treatment sludge from the production of molybdate orange pigments			1*	4			##
K004 Wastewater treatment sludge from the production of zinc yellow pigments			1*	4			##

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code	RCRA Waste Number	Category	Pounds (Kg)
K005 Wastewater treatment sludge from the production of chrome green pigments			1*	4			##
K006 Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated)			1*	4			##
K007 Wastewater treatment sludge from the production of iron blue pigments			1*	4			##
K008 Oven residue from the production of chrome oxide green pigments			1*	4			##
K009 Distillation bottoms from the production of acetaldehyde from ethylene			1*	4			###
K010 Distillation side cuts from the production of acetaldehyde from ethylene			1*	4			###
K011 Bottom stream from the wastewater stripper in the production of acrylonitrile			1*	4			###
K013 Bottom stream from the acetonitrile column in the production of acrylonitrile			1*	4			###
K014 Bottoms from the acetonitrile purification column in the production of acrylonitrile			1*	4			##
K015 Still bottoms from the distillation of benzyl chloride			1*	4			#
K016 Heavy ends or distillation residues from the production of carbon tetrachloride			1*	4			###
K017 Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin			1*	4			###

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K018 Heavy ends from the fractionation column in ethyl chloride production			1*	4			###
K019 Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production			1*	4			###
K020 Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production			1*	4			###
K021 Aqueous spent antimony catalyst waste from fluoromethanes production			1*	4			###
K022 Distillation bottom tars from the production of phenol/acetone from cumene			1*	4			###
K023 Distillation light ends from the production of phthalic anhydride from naphthalene			1*	4		D	5000(2270)
K024 Distillation bottoms from the production of phthalic anhydride from naphthalene			1*	4		D	5000(2270)
K025 Distillation bottoms from the production of nitrobenzene by the nitration of benzene			1*	4		B	100(45.4)
K026 Stripping still tails from the production of methyl ethyl pyridines			1*	4			##
K027 Centrifuge and distillation residues from toluene diisocyanate production			1*	4			#
K028 Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane			1*	4			###
K029 Waste from the product steam stripper in the production of 1,1,1-trichloroethane			1*	4			###

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ††	RCRA Waste Number	Category	Pounds (Kg)
K030 Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene			1*	4			###
K031 By-product salts generated in the production of MSMA and cacodylic acid			1*	4			###
K032 Wastewater treatment sludge from the production of chlordane			1*	4		X	1(0.454)
K033 Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane			1*	4		X	1(0.454)
K034 Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane			1*	4		X	1(0.454)
K035 Wastewater treatment sludges generated in the production of creosote			1*	4			###
K036 Still bottoms from toluene reclamation distillation in the production of disulfoton			1*	4		X	1(0.454)
K037 Wastewater treatment sludges from the production of disulfoton			1*	4		X	1(0.454)
K038 Wastewater from the washing and stripping of phorate production			1*	4			##
K039 Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate			1*	4			##
K040 Wastewater treatment sludge from the production of phorate			1*	4			##

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory		RCRA Waste Number	Proposed RQ	
			RQ	Code ††		Category	Pounds(Kg)
K041 Wastewater treatment sludge from the production of toxaphene			1*	4		X	1(0.454)
K042 Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T			1*	4			###
K043 2,6-Dichlorophenol waste from the production of 2,4-D			1*	4			###
K044 Wastewater treatment sludges from the manufacturing and processing of explosives			1*	4		A	10(4.54)
K045 Spent carbon from the treatment of wastewater containing explosives			1*	4		A	10(4.54)
K046 Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds			1*	4			##
K047 Pink/red water from TNT operations			1*	4		A	10(4.54)
K048 Dissolved air flotation (DAF) float from th petroleum refining industry			1*	4			##
K049 Slop oil emulsion solids from the petroleum refining industry			1*	4			##
K050 Heat exchanger bundle cleaning sludge from the petroleum refining industry			1*	4			##
K051 API separator sludge from the petroleum refining industry			1*	4			##
K052 Tank bottoms (leaded) from the petroleum refining industry			1*	4			##

## LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory		RCRA Waste Number	Proposed RQ	
			RQ	Code ††		Category	Pounds(Kg)
K060 Ammonia still lime sludge from coking operations			1*	4			###
K061 Emission control dust/sludge from the primary production of steel in electric furnaces			1*	4			###
K062 Spent pickle liquor from steel finishing operations			1*	4			##
K069 Emission control dust/sludge from secondary lead smelting			1*	4			###
K071 Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used			1*	4		X	1(0.454)
K073 Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production			1*	4			###
K083 Distillation bottoms from aniline extraction			1*	4			##
K084 Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4			###
K085 Distillation or fractionation column bottoms from the productin of chlorobenzenes			1*	4			###
K086 Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead			1*	4			##

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
			RQ	Code ++	RCRA Waste Number	Category	Pounds(Kg)
K087 Decanter tank tar sludge from coking operations			1*	4			##
K093 Distillation light ends from the production of phthalic anhydride from ortho-xylene			1*	4		D	5000(2270)
K094 Distillation bottoms from the production of phthalic anhydride from ortho-xylene			1*	4		D	5000(2270)
K095 Distillation bottoms from the production of 1,1,1-trichloroethane			1*	4			###
K096 Heavy ends from the heavy ends column from the production of a,a,a-trichloroethane 1,1,1			1*	4			###
K097 Vacuum stripper discharge from the chlordane chlorinator in the productin of chlordane			1*	4		X	1(0.454)
K098 Untreated process wastewater from the production of toxaphene			1*	4		X	1(0.454)
K099 Untreated wastewater from the production of 2,4-D			1*	4			###
K100 Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting			1*	4			###
(Components of this waste are identical with those of K069, immediately preceding)							
K101 Distillation tar residues form the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4			###

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES-continued

Hazardous Substance	CAS No.	Regulatory Synonyms	Statutory		RCRA Waste Number	Proposed RQ	
			RQ	Code ††		Category	Pounds(Kg)
K102 Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4			###
K103 Process residues from aniline extraction from the production of aniline			1*	4			##
K104 Combined wastewater streams generated from nitrobenzene/aniline chlorobenzenes			1*	4			###
K105 Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes			1*	4			###
K106 Wastewater treatment sludge from the mercury cell process in chlorine production			1*	4		X	1(0.454)

- # - indicates this substance is being assessed for carcinogenicity, statutory RQ applies
- ## - indicates this substance is being assessed for chronic toxicity, statutory RQ applies
- ### - indicates this substance is being assessed for both carcinogenicity and chronic toxicity, statutory RQ applies
- #### - the Agency will adjust the RQ for radionuclides in a future rulemaking; until that time the statutory 1 lb. RQ is applicable
- 1\* - indicates the CERCLA statutory 1 pound RQ for all hazardous substances designated under any of the statutory sources other than CWA Section 311 (including all hazardous wastes) and is not to be confused with a 1 pound RQ assigned under CWA section 311
- \*\* - indicates no RQ is being assigned to the generic or broad class
- † - no reporting of releases of massive forms of these substances is required if the diameter of the pieces of the substance released is equal to or exceeds 100 micrometers (0.004 inches)
- †† - indicates the statutory source as defined by 1, 2, 3 or 4 below
- 1 - indicates the statutory source for designation of this substance under CERCLA is CWA Section 311(b)(4)
- 2 - indicates the statutory source for designation of this substance under CERCLA is CWA Section 307(a)
- 3 - indicates the statutory source for designation of this substance under CERCLA is CAA Section 112
- 4 - indicates the statutory source for designation of this substance under CERCLA is RCRA Section 3001

be assessed for both carcinogenicity and chronic toxicity are identified by the symbols ###.

The list also includes the 89 hazardous waste streams designated under 40 CFR Parts 261.31 and 261.32 (RCRA F and K lists). These waste streams contain some CERCLA hazardous substances, and the RQs for these waste streams are based on those hazardous constituents. Many of the waste streams in 40 CFR Parts 261.31 and 261.32 have more than one hazardous constituent. One RQ, which represents the lowest RQ of the hazardous constituents present in the waste stream, is assigned to that waste stream.

For wastes F001 through F005, individual RQs are proposed for each solvent. The wastes F001 through F005 are treated differently because each of these wastes is a collective listing of different individual solvents. A listed waste will be one, but only one of these solvents. RQs are given for each of these solvents. If the releaser knows the solvent involved, he may rely on the RQ given for that solvent. If a releaser does not know what solvent is involved, he must use the RQ for the waste itself, which is set at the lowest RQ of the solvents listed for that waste.

The original regulatory listings have been compiled into the CERCLA 101(14) list in the following manner:

1. CWA Section 311 - 297 chemicals which are listed in 40 CFR Part 117 and which have RQs assigned based on aquatic toxicity. In many cases, the substances listed in 40 CFR Part 117 refer to isomers and multiple compounds of the substances. For instance, if one refers back to the designation rule (40 CFR Part 116, Table 116.4A), one finds not only the entry "Cresol" (CAS No. 1319733), but also the listing of cresol's isomers, i.e., the ortho-, meta-, and para-isomers (CAS Nos. 95487, 108394, and 106445, respectively). Similarly, under the entity "2,4-D Esters," while no specific names are given, CAS numbers for 10 different compounds are listed. Where

isomers and multiplicities of compounds exist for CWA substances, they have been shown and all the individual CAS numbers listed as a part of the entry. See Table 2-1.

2. CWA Section 307(a) - 65 classes of chemicals and 126 specific chemicals (priority pollutants). The 126 pollutants were derived from the original 65 broad generic classes, such as "Chlorinated benzenes," "chlorinated phenols," "haloethers," "halomethanes," and "polychlorinated biphenyls." The 126 specific compounds were arrived at after a series of negotiations between the Agency and the plaintiffs in the case that resulted in what is commonly known as the "Consent Decree."
3. CAA Section 112 - Seven chemicals. 40 CFR Part 61 lists National Emission Standards for four hazardous air pollutants.
4. TSCA - no entries.
5. RCRA Section 3001 - 40 CFR Part 261 lists the following:
  - A. Specific chemical wastes -
    - "U" List - 233 chemicals
    - "P" List - 107 chemicals
  - B. Waste streams -
    - "F" List - 13 wastes
    - "K" List - 76 wastes

Since many substances are listed under more than one environmental statute, there are some duplicate entries. After these duplicate entries are discounted, the CERCLA 101(14) list comprises a total of 607 substances. Of these 607 substances, the 297 materials designated as hazardous substances

pursuant to Section 311 of the Clean Water Act have previously been assigned RQs of 1, 10, 100, 1000, or 5000 lbs, based on their level of acute toxicity to aquatic organisms. For the remaining 310 substances, CERCLA assigns an RQ of 1 lb (CERCLA Section 102(b)). These statutory RQs were intended to be of temporary duration, pending EPA review and adjustment of these RQs. The purpose of this rulemaking is to adjust the statutory RQs based upon specific technical criteria. The adjustments allow the Agency to focus its resources on those releases that are most likely to pose threats to public health and welfare and the environment, and will relieve the regulated community from the burden of reporting releases that are unlikely to pose such threats. The strategy presented herein provides a simple, understandable, and implementable framework to assign RQs.

#### STRATEGY FOR RQ ADJUSTMENT

The selected strategy for RQ adjustment consists of evaluating the intrinsic properties of the hazardous substances designated by definition in CERCLA Section 101(14), and associating these properties with a five-tier ranking scale to arrive at a single adjusted RQ for each substance. The intrinsic properties are ignitability, reactivity, aquatic toxicity, mammalian toxicity (oral, dermal, inhalation), carcinogenicity, and chronic toxicity. For each of these properties (except carcinogenicity, for which a ranking scale is still under development), a ranking scale was set up to permit a substance to be placed at one of five levels where appropriate to indicate the intensity of the property. The Agency associated a specified range of values of each property with a particular RQ value; those substances exhibiting the least severe value of any property being assigned the highest RQ.

Nothing in the properties themselves requires that each of the properties be grouped into five ranges of values or constrains the possible RQs to a specific number of tiers. The association between RQ values and the intrinsic characteristics was derived from the Clean Water Act reportable quantity methodology. The Agency decided it was both feasible and practical to utilize

this CWA methodology.

The final proposed adjusted RQ for a particular substance is the lowest RQ assigned for any of the intrinsic properties. The overall strategy in adjusting the RQs consists of associating the intrinsic physical, chemical, and toxicological properties (i.e., the primary criteria) of the hazardous substances with administratively selected RQ levels to arrive at a primary criteria RQ. Finally, extrinsic dissipative properties (secondary criteria, i.e., biodegradation, hydrolysis, and photolysis) are applied to make final RQ adjustments when appropriate.

The decision has also been made to have a single RQ for each hazardous substance and "this single quantity requires notification upon release into any environmental medium" in accordance with the legislative mandate. Although it is recognized that some substances may pose different hazards when released into different media, for example hydrogen sulfide released into water is an aquatic or oral mammalian toxicity hazard, whereas when released into air it is primarily an inhalation toxicity or ignitability hazard, the legislative history permits, and indeed encourages, the assignment of a single RQ without "linking such quantity to any subjective concept of harm" (see quote on p. 4-1).

The Agency has determined that it is more administratively feasible to have a single quantity for each substance, in order to develop a simple and practical notification system. If multiple RQs that vary in accordance with the environmental media into which the substance is released were established, it would be more difficult for the regulated community to comply with the reporting requirements. Since releases often occur into more than one medium, under a multi-RQ format the releaser would be uncertain as to which RQ would apply. Consequently, the single RQ system is considered the better approach for use by the Agency. This decision also accords with the wording in CERCLA Section 102(a): "The Administrator may determine that one single quantity shall be the reportable quantity for any hazardous substance, regardless of

the medium into which the hazardous substance is released."

#### Selected Criteria Processing

The strategy for adjusting the statutory RQs is known as Selected Criteria Processing (SCP). A chart summarizing the strategy used in arriving at the suggested RQs is shown in Figure 2-1. As noted above, the strategy employed in arriving at the RQ adjustments and assignments suggested in this report for the CERCLA 101(14) list is based on a rating system using six primary criteria: aquatic toxicity, mammalian toxicity, chronic toxicity, ignitability, carcinogenicity, and reactivity. Each material is evaluated pursuant to these primary criteria. The five-level RQ rating system derived for aquatic toxicity under CWA Section 311 is used as a baseline for this analysis. This RQ rating system consists of the following five RQ categories, linked to the specified aquatic toxicity ratings:

<u>Category</u>	<u>RQ (lbs)</u>
X	1
A	10
B	100
C	1000
D	5000

Five-level RQ rating scales were developed for mammalian toxicity, chronic toxicity, ignitability, and reactivity. The methodology for selecting these rating scales will be discussed later in this section. The rating system for mammalian toxicity includes separate scales for oral, dermal, and inhalation toxicities.

For each hazardous substance on the CERCLA 101(14) list, available data for each of the appropriate criteria were tabulated and an RQ was associated with the various data by letter code (i.e., Category X [1 lb], A [10 lbs], B [100

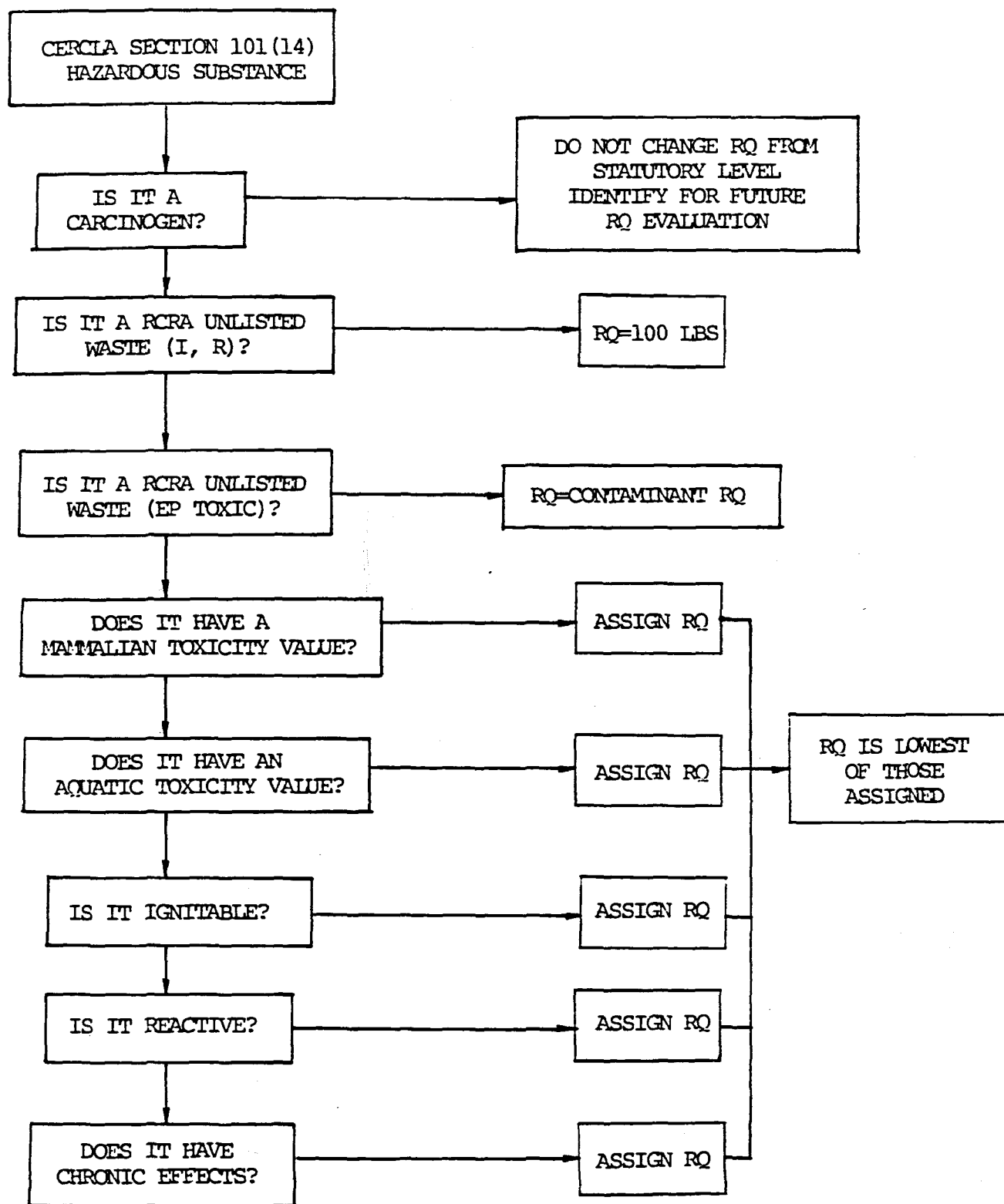


Figure 2-1. RQ Adjustment Strategy

lbs], C [1000 lbs], or D [5000 lbs]). Some substances may not, due to their inherent characteristics, exhibit all the primary criteria. For instance, some substances are not ignitable or reactive. Accordingly, these characteristics are not evaluated.

The primary criteria RQ is the lowest RQ derived from all the characteristics of a compound. For example, the following RQ values were determined for the primary criteria for the compound ammonium sulfide (see Table 8-1, page 8-4).

Aquatic Toxicity	D (5000 lbs)
Mammalian Toxicity	B (100 lbs)
Chronic Toxicity	No rating
Carcinogenicity	No rating
Ignitability	C (1000 lbs)
Reactivity	B (100 lbs)

In this case, the final RQ assigned to ammonium sulfide is 100 lbs, based on the lowest values determined for the individual criterion. A more detailed description of the steps that were followed in the RQ adjustment strategy for all compounds is given below. (Refer also to Figure 2-1.)

1. The aquatic toxicity, mammalian toxicity, ignitability, and reactivity data for each material (where appropriate) were evaluated and the data for that criterion which resulted in the lowest RQ assignment were used as the basis for the suggested RQ. These data are tabulated in Tables 8-1, 9-1, and 9-2.
2. The Environmental Criteria and Assessment Office (ECAO), EPA-Cincinnati, has developed a five-tier chronic toxicity ranking procedure that incorporated a combination of minimum effective dose and severity of effect. The ECAO has currently assessed only 64 substances for chronic toxicity and is still evaluating chronic

toxicity data for another 160 substances. (See Tables 8-1 and 9-1.) The latter substances are marked "TBA" (to be assessed) in the tables.

3. If a material was identified as a carcinogen, it was labeled "TBA" pending development and application of an appropriate ranking method by the Agency's Carcinogen Assessment Group (CAG). CAG's work to date on carcinogen ranking methods, which will probably form the basis for RQ adjustments, can be found in Appendix A.

#### RQ Scale for Aquatic Toxicity

The RQ scale used in the SCP process described here was originally developed by the Agency in promulgating regulations under CWA Section 311. It relates aquatic toxicity to reportable quantities in a five-tier system, as shown below.

<u>Category</u>	<u>Aquatic Toxicity</u>	<u>RQ (lbs)</u>
X	LC <sub>50</sub> <0.1 mg/l	1
A	0.1 mg/l <LC <sub>50</sub> <1 mg/l	10
B	1 mg/l <LC <sub>50</sub> <10 mg/l	100
C	10 mg/l <LC <sub>50</sub> <100 mg/l	1000
D	100 mg/l <LC <sub>50</sub> <500 mg/l	5000

In this table, the term LC<sub>50</sub> stands for the lethal concentration (LC) in water, expressed as milligrams per liter (mg/l) that will kill 50% of a test population of aquatic species. The term TL<sub>m</sub> (median tolerance limit) is sometimes found in the literature, and is equivalent to LC<sub>50</sub>. For a more detailed discussion of aquatic toxicity, see Section 5.

In Tables 8-1 and 9-1, the RQ previously established on the basis of aquatic toxicity in 40 CFR Part 117 under CWA Section 311 is identified in either a column headed "311 RQ," or as the basis for suggesting an RQ, shown as "311." Of the 297 hazardous substances listed under CWA Section 311, the RQs for 28 were lowered; however, assessment of all 297 substances is not yet complete for chronic toxicity and carcinogenicity and therefore the RQs will most likely be lowered for several other CWA Section 311 substances. Such lowering is justified by the fact that characteristics such as mammalian toxicity, chronic toxicity, ignitability, corrosivity, and reactivity must be considered for the purposes of CERCLA (i.e., multimedia releases) and these factors were not considered in arriving at the CWA 311 RQs, which were based on releases to water only. In a few cases, CWA 311 RQs were also adjusted downward on the basis of newer aquatic toxicity data. In the process of such downward adjustments made for the CWA 311 items, aquatic toxicity data appearing in the Ambient Water Quality Criteria Documents were used. Since acute aquatic toxicity is one of the primary ranking factors in this scheme, it became the basis on which the RQ was determined if it resulted in the lowest value from all assessed criteria. This has the effect of maintaining the 311 RQs in the majority of cases. No newer acute aquatic toxicity was revealed that resulted in assigning an RQ higher than that originally assigned under CWA Section 311. A more detailed analysis of the status of the CWA 311 substances is given below.

Aquatic toxicity data from the Oil and Hazardous Materials Technical Assistance Data System (OHMTADS) was accessed via CIS (the Chemical Information System - see Section 7) and was supplemented with values in the Ambient Water Quality Criteria Documents prepared by the Criteria and Standards Division of the EPA Office of Water Regulations and Standards.

As a special case, all cyanide compounds (including the generic class) were assigned a suggested RQ of 10 lbs based on the aquatic toxicity of cyanide as developed under Section 311 of the Clean Water Act. None of the other

criteria, including the inhalation toxicity of hydrogen cyanide, justify a lower RQ to be suggested for other cyanide compounds.

#### Status of Substances Designated Under CWA Section 311—

Several substances (22) originally designated under CWA Section 311 were found to have aquatic toxicity data which, if used as a single criterion in the RQ adjustment process, would place those substances into lower reportable quantity categories than those previously assigned under CWA Section 311. This newer aquatic toxicity data is tabulated in Tables 8-1 and 9-1 and was used for adjustment of RQs accordingly. However, since aquatic toxicity is only one of several criteria used in the RQ adjustment process for the purposes of CERCLA, not all of the substances involved had their RQs lowered on the basis of this newer aquatic toxicity data. The net effect is as follows. Ten of the 22 substances have been placed in the "to be assessed" category for either carcinogenicity and/or chronic toxicity, hence no RQ has been proposed for these substances at this time. The RQs for seven of the substances were lowered exclusively on the basis of the newer aquatic toxicity data, and the RQs for four of the substances were lowered on the basis of the newer aquatic toxicity data in combination with one or more of the remaining adjustment criteria. The remaining substance, acetyl chloride, was initially lowered using the newly available data, but was readjusted upward using the secondary criteria for natural dissipation. The 22 substances are identified in Table 2-2, along with their CWA Section 311 RQs, their CERCLA proposed RQs, and the basis for the proposed RQs.

#### RQ Scales for Mammalian Toxicity

The rating system for mammalian toxicity is shown in Table 2-3. It includes separate scales for oral, dermal, and inhalation toxicities. The toxicity ranges shown are either in LD<sub>50</sub> values (oral and dermal toxicity) or in LC<sub>50</sub> values (inhalation toxicity). The term LD<sub>50</sub> means that lethal dose (LD), expressed as milligrams per kilogram (mg/kg) of body weight of the test animal that will kill 50% of the test animal population. Similarly, the term LC<sub>50</sub>

TABLE 2-2. CWA SECTION 311 DESIGNATED SUBSTANCES  
HAVING NEW AQUATIC TOXICITY DATA

Hazardous Substance	311 RQ (lbs)	Proposed RQ (lbs)	Basis
Acetyl chloride	5000	5000	BHP
Ammonia	100	##	
Arsenic pentoxide	5000	###	
Arsenic trichloride	5000	###	
Arsenic trioxide	5000	###	
Benzene	1000	###	
Beryllium chloride	5000	###	
Carbon tetrachloride	5000	###	
Chloroform	5000	#	
Cresol	1000	##	
Dichloropropane (mixed)	5000	1000	AQTX, I
Dichloropropane-Dichloropropene mixture	5000	100	AQTX
Dichloropropene	5000	100	AQTX
Dinitrophenol	1000	100	AQTX, CTX
Mercaptodimethur	100	10	AQTX
Methyl parathion	100	##	
Naphthalene	5000	100	AQTX
Nitrophenol	1000	100	AQTX
Pentachlorophenol	10	1	AQTX
Phosphorus oxychloride	5000	1000	AQTX, R
Phosphorus trichloride	5000	1000	AQTX, R
PCBs	10	1	AQTX

Abbreviations:

BHP - Biodegradation, hydrolysis, or photolysis

AQTX - Aquatic toxicity

I - Ignitability

CTX - Chronic toxicity

R - Reactivity

# - To be assessed for carcinogenicity

## - To be assessed for chronic toxicity

### - To be assessed for both carcinogenicity and chronic toxicity

TABLE 2-3. MAMMALIAN TOXICITY SCALES FOR REPORTABLE QUANTITY ADJUSTMENTS

Category	Mammalian Toxicity (Oral)	Mammalian Toxicity (Dermal)	Mammalian Toxicity (Inhalation)	RQ (lbs)
X	LD50 < 0.1 mg/kg	LD50 < .04 mg/kg	LC50 < .4 ppm	1
A	0.1 mg/kg $\leq$ LD50 < 1 mg/kg	.04 mg/kg $\leq$ LD50 < .4 mg/kg	.4 ppm $\leq$ LC50 < 4 ppm	10
B	1 mg/kg $\leq$ LD50 < 10 mg/kg	.4 mg/kg < LD50 < 4 mg/kg	4 ppm $\leq$ LC50 < 40 ppm	100
C	10 mg/kg $\leq$ LD50 < 100 mg/kg	4 mg/kg $\leq$ LD50 < 40 mg/kg	40 ppm $\leq$ LC50 < 400 ppm	1000
D	100 mg/kg $\leq$ LD50 < 500 mg/kg	40 mg/kg $\leq$ LD50 < 200 mg/kg	400 ppm $\leq$ LC50 < 2000 ppm	5000

Adapted from 40FR59966, December 30, 1975.

means the lethal concentration (LC) in air, expressed in parts per million (ppm) that will kill 50% of the test animal population. More details on the nature of mammalian toxicity studies are given in Section 6.

In developing the five-tier scales, the first step was to choose an upper limit. That limit was then correlated with an RQ category of D (5000 lbs). The ranges corresponding to categories X, A, B, and C (1, 10, 100, and 1000 lbs) were then selected based on ratios of the upper limit to each lower category range in the same ratios as had been established in prior regulations for the aquatic toxicity scale (see p.2-62 above).

The upper limits for dermal and inhalation toxicity were based on the toxicological selection process used in the screening and evaluation of elements and compounds for designation as hazardous substances in 40 CFR Part 116. The same upper limits have been used in five-tier scales developed by the National Academy of Sciences in their "System for Evaluation of Hazards of Bulk Water Transportation of Industrial Chemicals" (USCG-D-113-74, report to the Department of Transportation, U.S. Coast Guard, February 1974).

The upper limit for oral toxicity was set at 500 mg/kg based on the following considerations. The "standard man" might be exposed to situations that would allow him to inadvertently take one swallow of a hazardous substance. For a substance of unit density, a body weight of 70 kg, and a swallow volume of 21 cubic centimeters, this is equivalent to taking a dose of 300 mg/kg. Allowing for variations in swallow volume, and for material of greater than unit density leads to the selection of 500 mg/kg as the upper limit. Thus, if the standard man takes one swallow of a material whose  $LC_{50}$  is below 500 mg/kg, there is a 50% probability he will die. (It should be noted that these same calculations applied to a small child of 15 kg body weight, 4 to 4.5 cubic centimeters swallow volume, will also result in an upper limit of 500 mg/kg. The set of assumptions was reviewed by one of the nation's foremost authorities on problems of poisoning of children, Dr. Howard Mossensen at the Nassau County Medical Center on Long Island, New York. Dr. Mossensen agreed

that the assumptions were reasonable and would provide a high degree of protection in the event of such an exposure.

In assessing substances under this criterion, LD<sub>50</sub> values from animal studies were used; statistically valid human LD<sub>50</sub> values are available in only isolated cases, since human populations are not generally subjected to deliberate toxicity studies. Data on human toxicity is generally reported as LDLo values. The term LDLo means "low lethal dose," and refers to the lowest dose on record believed to have caused a fatality. Human LDLo data are not especially reliable, since they derive from individual incidents of accidental human poisoning, and generally rely on information reported by the victim, regardless of the validity of such a report. For example, the LD<sub>50</sub> (oral, rat) of sodium chloride (common table salt) is 3000 mg/kg, but the recorded human LDLo is only 500 mg/kg. The Agency clearly does not consider such a commonly used item as sodium chloride a hazardous substance.

When data for more than one mammalian toxicity route were available, the value chosen for the mammalian toxicity criterion represents the lowest of the values derived from the three scales. For example, if inhalation toxicity yields an RQ of 1 lb, while oral and dermal exposures yield values of 10 lbs, then the RQ based on mammalian toxicity would be 1 lb.

Available mammalian toxicity data came from the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) via the Chemical Information System (CIS). RTECS is updated quarterly, and currently contains toxicity information for almost 50,000 compounds.

#### Nonequivalence of Toxicity Scales—

Although the three mammalian toxicity scales and the aquatic toxicity scale are each equated to the same RQ categories and poundage levels, the scales are not equivalent to each other. Each scale represents an independent entity; there is no implication that potential danger to human health, welfare, and the environment are equivalent when substances have the same ranking on

different scales. A 1000-lb RQ assigned, for example, to acetic acid on the basis of aquatic toxicity does not mean that it is equivalent in danger or hazard to lead arsenate, assigned a 1000-lb RQ on the basis of oral toxicity.

### Identification of Carcinogens

Carcinogens will be evaluated for possible RQ values following the development of an appropriate evaluation and ranking scheme. The Carcinogen Assessment Group (CAG) is presently developing an RQ adjustment methodology for carcinogens. This methodology will probably utilize a carcinogen hazard ranking based on a substance's potency as a carcinogen and IARC's (the International Agency for Research on Cancer) classification of strength of evidence of carcinogenicity. The procedure outlined in Appendix A will probably form the basis for this methodology. Potential carcinogens were identified from lists published by the following sources:

1. U.S. Department of Health and Human Services, National Toxicology Program, U.S. Public Health Services
  - A. First Annual Report on Carcinogens, July 1980 - lists 26 substances or classes of substances.
  - B. Second Annual Report on Carcinogens, December 1981 - lists 88 substances or classes of substances
2. International Agency for Research on Cancer, Summary of Monographs 1-2, September 1979 - lists 142 substances

The bases for selecting these materials as potential carcinogens are the IARC "sufficient evidence" criteria: the evidence must indicate a causal association between exposure and human cancer, or if based on animal studies, must show an increased incidence of malignant tumours (a) in multiple species or strains, or (b) in multiple experiments, or (c) show an unusual degree of

incidence, site or type of tumour, or age at onset.

Carcinogens listed in Table 2-1 are not assigned an RQ. They are listed with a symbol showing that they are still to be assessed on the basis of carcinogenicity. However, in the working tables (8-1, 9-1, and 9-2), while they are identified as carcinogens, a suggested RQ is based on whatever other SCP data is available. This is because the carcinogenicity ranking scale cannot be predetermined, and it is possible that some substances may prove to have lower RQs based on other criteria, despite the fact that they are carcinogenic.

The listings given above lead to the identification of 86 substances in Table 2-1 as potential carcinogens.

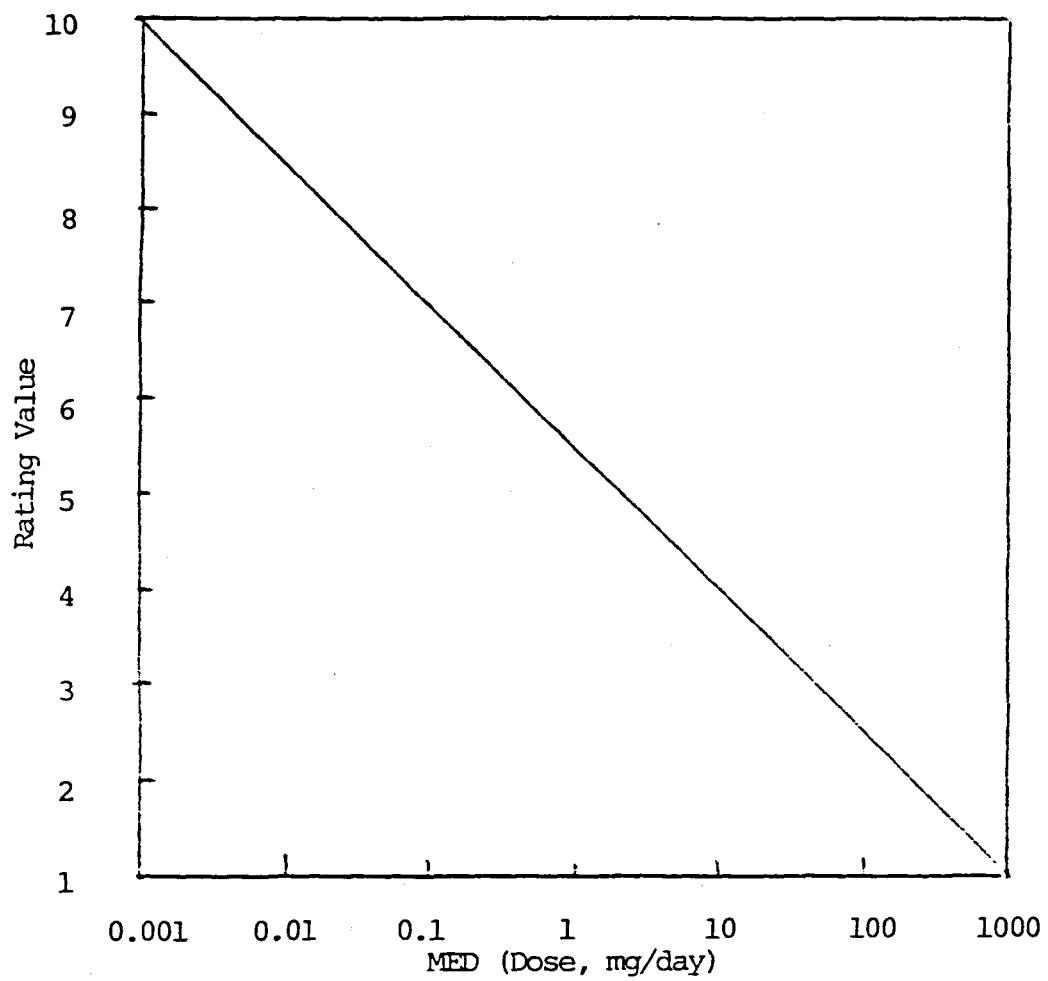
#### RQ Scales for Chronic Toxicity

Tables 8-1 and 9-1 present RQ rankings for 23 chemical substances based on chronic toxicity. For purposes of this report, chronic toxicity is defined as toxicity due to repeated or continuous exposure from a single or multiple dose of a designated substance. These substances were evaluated and had RQs assigned by the ECAO, EPA Cincinnati. The ranking based on chronic toxicity reflects two primary attributes of each chemical:

The minimum effective dose (MED) levels for chronic exposures (mg/day for 70-kg man) via alternative environmental media (air, water, etc.)

Type of effect (liver necrosis, teratogenicity, etc.)

The dose rating for a given chemical is based upon the minimum effective dose transformed to values ranging from 1 to 10 using the graph given in Figure 2-2. Substances having an effect at a low dose (i.e., those that are more highly toxic) will be given a high rating on this graph, while those requiring a high dose (less toxic) will be given a low rating. The rating values range



Note: All MED values of 1000 or greater are assigned a rating value of 1.

Figure 2-2. Dose Index/Rating Scheme

from 1 to 10. Similarly, the effect rating for an individual chemical will range from 1 to 10 depending on severity (Table 2-4), with 10 being the most severe. These values must be assigned on a chemical-by-chemical basis. A final composite score is determined by multiplying the dose rating by the effect rating. The possible range of composite scores is thus 1 to 100. These values are correlated with the scheme for RQs as follows:

<u>Composite Score</u>	<u>RQ (lbs)</u>
81-100	1
41-80	10
21-40	100
6-20	1000
1-5	5000

Using this scheme, only those compounds eliciting what are judged to be the most severe effects at low levels of exposure would fall in the RQ category of 1 lb. Table 2-5 shows the detailed results of applying the above procedures to 23 of the chemical substances. In all, 64 substances have been assessed for chronic toxicity, while 160 are still in progress. Data on all such materials are given in Tables 8-1, 9-1, and 9-2. Those that are still in progress are identified as "TBA" (to be assessed).

#### RQ Scales for Ignitability and Reactivity Evaluations

The starting point for the rating scales for RQ selection based on the parameters of ignitability and reactivity have their origin in work done by the U.S. National Academy of Sciences for the U.S. Coast Guard in 1974 (USCG-D-113-74, System for Evaluation of the Hazards of Bulk Water Transportation of Industrial Chemicals; a Report to the Department of Transportation, U.S. Coast Guard. National Academy of Science - National Research Council, Washington, DC, February 1974). This USCG report describes the development of a five-level system to evaluate these factors, as shown in

TABLE 2-4. RATING VALUES FOR TOXIC EFFECTS

Rating	Effect
1	Enzyme induction or other biochemical change with no pathologic changes and no change in organ weights.
2	Enzyme induction and subcellular proliferation or other changes in organelles but no other apparent effects.
3	Hyperplasia, hypertrophy or atrophy, but no change in organ weights.
4	Hyperplasia, hypertrophy or atrophy with changes in organ weights.
5	Reversible cellular changes: cloudy swelling, hydropic change, or fatty changes.
6	Necrosis, or metaplasia with no apparent decrement of organ function. Any neuropathy without apparent behavioral, sensory, or physiologic changes.
7	Necrosis, atrophy, hypertrophy, or metaplasia with a detectable decrement of organ functions. Any neuropathy with a measurable change in behavioral, sensory, or physiologic activity.
8	Necrosis, atrophy, hypertrophy, or metaplasia with definitive organ dysfunction. Any neuropathy with gross changes in behavior, sensory, or motor performance. Any decrease in reproductive capacity, any evidence of fetotoxicity.
9	Pronounced pathologic changes with severe organ dysfunction. Any neuropathy with loss of behavioral or motor control or loss of sensory ability. Reproductive dysfunction. Any teratogenic effect with maternal toxicity.
10	Death or pronounced life-shortening. Any teratogenic effect without signs of maternal toxicity.

TABLE 2-5. CHRONIC TOXICITY RQ ASSIGNMENTS

Compound	Effect	Dose (mg/day)	RV <sub>e</sub> (Note 1)	RV <sub>d</sub>	Composite Score	RQ
Allyl alcohol	Focal necrosis of liver and kidney	0.61	6	5.8	34.8	100
Ammonium fluoride	Mottled teeth	15.6	5	3.7	18.6	1000
Antimony potassium tartrate	Shortening of life span	11.9	10	3.8	38.0	100
Antimony trioxide	Histological alterations of lung, producing greater susceptibility to pneumonia	132	8	2.3	18.4	1000
Copper and compounds	Elevated serum aspartate trans-aminase levels, jaundice	14.0	5	3.8	19.0	1000
Copper nitrate	By analogy to copper	62.5	5	2.8	14.0	1000
Copper sulfate, ammoniated	By analogy to copper	54	5	2.9	14.5	1000
Cupric acetate	By analogy to copper	44	5	3	15	1000
Dibromochloromethane	Suppression of hepatic and splenic phagocytosis	6.6	6	4.3	25.8	100
1,2-Dichlorobenzene	Increased liver and kidney weights	154	4	2.2	8.8	1000
1,4-Dichlorobenzene	Increased liver and kidney weights, hepatocellular cloudy swelling	277	5	1.8	9.0	1000
Dichloromethane	Hepatic vacuolization	3107	5	1	5	5000
Dinitrobenzene	Testicular atrophy with indications of functional impairment	3.0	7	4.3	28.7	100

Note 1: RV<sub>e</sub> and RV<sub>d</sub> are the "rating values" for effect and minimum effective dose, respectively.

(continued)

TABLE 2-5 (continued)

Compound	Effect	Dose (mg/day)	RV <sub>e</sub> (Note 1)	RV <sub>d</sub>	Composite Score	RQ
Ethyl benzene	Slight changes in liver and kidney weights	61.9	4	2.81	11.24	1000
Hydrofluoric acid	Mottled teeth	8.48	5	4.1	20.5	100
Monochlorobenzene	Increased liver and kidney weight	56	4	2.9	11.6	1000
Silver	Argyria	0.1	1	7	7.0	1000
Sodium fluoride	Mottled teeth	17.8	5	3.6	18.0	1000
1,2,4,5-Tetrachlorobenzene	Elevated alkaline phosphatase and bilirubin levels	205	1	2	2.0	5000
2,3,4,6-Tetrachloro-phenol	Fetotoxicity	10.7	8	4.0	32.0	100
Toluene	CNS dysfunction	2691	7	1	7.0	1000
Tribromomethane	Suppression of hepatic phagocytosis	6.6	6	4.3	25.8	100
1,1,1-Trichloroethane	Histologic changes in hepatocytes	17060	2	1	2.0	5000

Table 2-6. As discussed below, these scales were modified by the Agency.

#### Exclusion of the X (1-lb) RQ Level—

Small releases (i.e., 1 lb) of flammable, reactive, or explosive materials are handled by the spiller, or by state and/or local responders: fire, police, bomb squads, and so on. The EPA will not usually respond to such incidents, and does not intend to regulate such releases. Furthermore, small releases (less than 10 lbs) of ignitable or reactive substances, once ignition or reaction has been initiated, would be consumed so quickly that any federal government response action would be infeasible. Accordingly, it was decided to abandon the RQ Category X level for the ignitability and reactivity scales and set the lowest possible ratings based on these factors equivalent to RQ Category A (10 lbs).

#### Ignitability Scale Adjustment—

The NAS scale (Table 2-6) ignores a very important aspect of ignitability, and one that may be considered even more hazardous than simply having a very low flash point; that is, the characteristic of being able to start a fire on its own. Three types of compounds have this characteristic, and are classed as follows:

Pyrophorics: Those compounds that immediately ignite because of rapid oxidation as soon as they contact oxygen

Spontaneously Ignitable: Those compounds that may not immediately ignite, but that can do so if spread in a thin layer, or brought into contact with iron oxide or other catalysts

Strong Oxidizer: Those compounds that can cause fuel materials to ignite, and support their combustion once they are ignited

TABLE 2-6. ORIGINAL NATIONAL ACADEMY OF SCIENCE HAZARD SCALES

Grade	Level	Fire (Ignitability)	Health (Corrosivity, Skin and Eyes)	Reactivity	
				Water Reaction	Self-Reaction
0	Insignificant Hazard	Noncombustible	All not described below	No appreciable reac- tion	No appreciable self- reaction
1	Slightly Hazardous	FP(cc) > 140°F (60°C)	Corrosive to eyes	e.g., Cl <sub>2</sub>	May polymerize with low heat evolution
2	Hazardous	FP(cc) 100°F-140°F (37.8-60°C)	Corrosive to skin	e.g., NH <sub>3</sub> , HCl	Contamination may cause polymerization, no inhibitor required
3	Highly Hazardous	FP(cc) < 100°F (37.8°C), BP > 100°F (37.8°C)	LD50 = 20-200 mg/ kg/ 24-hr skin contact	e.g., oleum, chlorosulfonic acid	May polymerize, re- quires stabilizer
4	Extremely Hazardous	FP(cc) < 100°F (37.8°C), BP < 100°F (37.8°C)	LD50 < 20 mg, 24-hr skin contact	e.g., SO <sub>3</sub>	Self-reaction may cause explosion or detonation

Notes:

FP(cc) = Flash Point, closed cup

BP = Boiling Point

Accordingly, it was decided to make this category—the ability to start fires—the most hazardous, and to move the other ignitability factors up one level on the table. As a result, the "noncombustible" category was discarded. Discarding this category ("FP >140°F," flash point greater than 140°F) does not present any problem. In fact, with this discarded, the upper limit of the scale (140°F) corresponds with the upper limit used to assess the characteristic of ignitability in the regulations issued under RCRA, 40 CFR Part 261.21.

The three upper numerical categories correspond to National Fire Protection Association (NFPA) classes. (NFPA No. 30, Flammable and Combustible Liquids Code, National Fire Protection Association, 470 Atlantic Avenue, Boston, Massachusetts. This document is updated periodically. The most recent edition was published in 1980. However, the flammability and combustibility classes have not changed in recent editions.) The correspondence is as follows:

<u>Rating Level</u>	<u>Characteristics</u>	<u>NEPA Code</u>
4	FP 100°F-140°F	Combustible, Class II
3	FP < 140°F BP > 100°F	Flammable Liquids
2	FP < 140°F BP < 100°F	
1	Starts fires	—

In a final step, this ranking system was set equivalent to the RQ categories, as follows:

<u>RQ Category (lbs)</u>	<u>Ignitability Scale</u>
D (5000)	FP 100°F-140°F
C (1000)	FP < 100°F, BP > 100°F
B (100)	FP < 100°F, BP < 100°F
A (10)	Starts fires
X (1)	(Not used)

#### Water Reactivity Scale Adjustment—

The NAS water reactivity scale ignores a very important aspect of this characteristic, namely the case of materials that react with water in such a fashion that inflammation of evolved gases occurs. Accordingly, it was decided to reserve the lowest of the four levels (corresponding to RQ Category A, 10 lbs) for such compounds. This includes such substances as sodium, the other alkali metals, calcium carbide, and a number of others that are identified by the U.S. Department of Transportation as Flammable Solids (Dangerous When Wet). Both Reactivity scales, as well as the Ignitability

scale, are shown in Table 2-7, along with the assigned RQ categories. As in the case of Ignitability, the lowest level has been abandoned for Reactivity.

Note that with this change, the two reactivity scales and the ignitability scale become much more self-consistent, in that the lowest category in all three is reserved for substances that lead either to fires or explosions under various conditions of release.

The reactivity rankings take into account all but one of the factors used to assess the characteristic of reactivity (i.e., reactive with water, capable of detonation, normally unstable, explosive decomposition) in the regulations issued under RCRA, 40 CFR Part 261.23. The RCRA factor not covered is that certain wastes mixed with water or acid can generate toxic gases. One case is that of the cyanides, which can be ranked appropriately on the basis of CWA Section 311 ranking for cyanides. Others, such as those that could generate phosphine ( $\text{PH}_3$ ) or hydrogen sulfide ( $\text{H}_2\text{S}$ ) have been treated as special cases of reactivity, and have been addressed as such with individual discussion when ranked.

#### RQs Based on Structural Similarity

Data were available to assign RQs on the basis of the primary criteria for most of the CERCLA hazardous substances. However, six substances that had little available data on the primary criteria were assigned RQs based on the proposed RQs for hazardous substances similar in structure and substituents. The substances are:

1. Methane, dibromo- (methylene bromide)
2. Nitrophenols
3. Dinitrophenol

TABLE 2-7. CATEGORIES FOR REPORTABLE QUANTITY ADJUSTMENT BASED ON IGNITABILITY AND REACTIVITY\*

Category	Ignitability (Fire)	Reactivity		RQ (lbs)
		With Water	Self-Reaction	
D	FP(cc) 100-140°F	Moderate reaction, e.g., NH <sub>3</sub>	Slight; may polymerize with low heat release	5000
C	FP < 100°F BP > 100°F	High reaction, e.g., oleum	Moderate; contamination may cause polymerization; no inhibitor required	1000
B	FP(cc) < 100°F BP < 100°F	Extreme reaction, e.g., SO <sub>3</sub>	High; may polymerize; requires stabilizer	100
A	Pyrophoric or self-ignitable	Inflames	Extreme self-reaction; may cause explosion or detonation	10
X	(Not used)	(Not used)	(Not used)	1

\* Adapted in part from 1975 report to Coast Guard: Hazards of Bulk Water Transportation of Industrial Chemicals. Cited in EPA/530/SW-171, December 1975.

4. Hexachlorocyclohexane (all isomers)

5. Dichloropropane

6. 4-Chlorophenyl phenyl ether

In these six cases the relationship to other compounds is so close that this assignment process is considered completely valid. Thus, data from both monobromo- and tribromomethane are available (Table 9-1) to indicate the RQ to assign to the dibromo- compound. Nitrophenols, dinitrophenol, hexachlorocyclohexane, and dichloropropane are assigned RQs on the basis of their specific isomers that have available data (e.g., dichloropropane is assigned the same RQ as determined for the specific isomer 1,2-Dichloropropane). Finally, 4-chloro-phenyl phenyl ether is assigned an RQ based on the oral mammalian toxicities of bis(chlorophenyl)ether and diphenyl ether. In both these latter cases, the mammalian toxicity would result in assigning RQ Category D (5000 lbs).

#### Summary of the Merits of the SCP Strategy

The Selected Criteria Processing strategy outlined above for RQ adjustments to the CERCLA Section 101(14) list is considered appropriate for the following reasons:

1. For each substance, it focuses on the dangerous property of greatest concern;
2. It provides the necessary link between human health and an RQ;
3. Much of the data required for its application are available;
4. It can provide for further adjustments based on comments, new data, and considerations of administrative feasibility;

5. It uses established strategies for arriving at an RQ (i.e., Section 311 of the Clean Water Act);
6. It permits emphasis on the appropriate medium (air, water, soil);
7. It permits maximum flexibility;
8. It minimizes arbitrariness.

#### Secondary Criteria for Adjusting RQs

The RQs derived using the Selected Criteria Processing (SCP) strategy and its various scientific/technical criteria represent an approach based on the potential effects of hazardous substances on human health, welfare, and the environment. The adjustment of RQs would be incomplete, however, if consideration were not given to evaluating at the same time the potential effects that the environment can have on hazardous substances. There are several chemical, biological, and physical processes that are important for transforming or transporting chemicals in the environment. A few of these processes (biodegradation, hydrolysis, and photolysis) can be considered important in reducing the concentration of certain chemicals when released into the environment and hence ultimately ameliorating the effects of hazardous substance releases.

For those substances that are known to undergo one or more of these transformation processes to less hazardous or innocuous products, less attention would be necessary from a federal emergency response standpoint (i.e., a larger RQ would be justified) and Agency resources could better be focused on those releases of hazardous substances that pose a threat to the public health, welfare, and the environment. At the same time, necessary relief could be provided to the regulated community (i.e., a larger RQ) so

that they are not overburdened with reporting releases of naturally dissipating hazardous substances. For this reason, these secondary criteria factors of biodegradation, hydrolysis, and photolysis have been administratively considered as a basis for "fine-tuning" the RQs derived using the SCP strategy where appropriate.

The processes that have been considered for upward adjustment of RQs are limited to the transformation processes of biodegradation, hydrolysis, and photolysis. The transport processes such as volatilization were not considered to be suitable criteria for upward adjustments since these only represent the transfer of a hazardous substance from one medium to another (i.e., from water or soil to air), not its degradation or transformation to less hazardous products. Sorption of hazardous substances to particulates was also not considered to be a good criterion, since the process is reversible and the suspended or benthic sediment to which hazardous substances may be absorbed may later serve as a source of the chemical from sorption-desorption equilibrium and the chemical in solution can be transferred to the air medium by volatilization.

Many compounds, especially organics, can be biologically degraded over time, either by natural or artificially induced means, and precedents for biodegradation of hazardous substance spills exist. Biodegradation results from the enzyme-catalyzed transformation of chemicals in aquatic and soil environments by microbes that require carbon and energy for their growth and maintenance. Hydrolysis of organic compounds usually results from the reaction of the material with water to split a bond between chemical units, introducing a hydroxyl group (-OH) into the chemical structure and forming a small hydrogen-containing species (i.e.,  $RX + H_2O \rightarrow ROH + HX$ ). Photolysis of a chemical occurs if the chemical absorbs sunlight and then undergoes a transformation reaction from an excited state by any one of several mechanisms (i.e., dissociation, rearrangement, oxidation). Under all three processes, the chemical is transformed into a less hazardous substance.

The upward RQ adjustment strategy is strictly an administrative one which raises the RQ by one level for those substances on the CERCLA 101(14) list that are known to undergo biodegradation, hydrolysis, or photolysis and degrade to less hazardous or relatively innocuous products.

Biological oxygen demand data (BOD) have been used for the primary evaluation of a substance's biodegradability. If the BOD<sub>5</sub> (5-day test at 20°C) value is equal to or greater than 50% theoretical, a substance is considered to be relatively biodegradable. (The theoretical oxygen demand is the stoichiometric oxygen required to completely oxidize a substance to carbon dioxide and water. The percent theoretical oxygen demand is the ratio of the observed test results to the calculated demand.) If the reported BOD<sub>5</sub> values were less than 50% theoretical, and other BOD values (10-, 15-, and 20-day) were greater than 50% theoretical, a substance was still considered to be relatively biodegradable. The importance of the biodegradation process varies according to such factors as concentration, pH, temperature, concentration of microbes, availability of nutrients, and whether the microbes are acclimated to the chemical of interest. Additional evidence concerning the importance of biodegradation, hydrolysis, and photolysis as processes for the 126 priority pollutants designated under Section 307(a) of the CWA was drawn largely from the evaluations documented in the "Water Related Environmental Fate of 129 Priority Pollutants" (EPA-440/4-79-029a and b) as well as from data found in the OHMTADS data base. Half-life data were taken into consideration if listed. It should be noted here that for many of the hazardous substances designated on the CERCLA 101(14) list, the predominant process or processes and the importance of these processes cannot be identified at all or with any reasonable degree of certainty because of a lack of data. Hydrolysis and photolysis data which have been calculated or estimated using theoretical methods are available for certain substances; however, these data have not been confirmed and were not used in this application.

The process of selecting candidates for upward adjustment involved the following. An initial candidate list of 310 hazardous substances was derived from the CERCLA 101(14) list using the following series of elimination criteria:

1. Elimination of all substances with RQs already proposed at 5000 lbs. Under the five-tier notification system, 5000 lbs is the largest RQ that can be assigned for these substances.
2. Elimination of identified carcinogens. Adjustment of RQs on the basis of carcinogenicity is under consideration by the Agency. Since carcinogenesis is one of the most severe forms of chronic effect, substances that exhibit carcinogenicity are not being considered for upward adjustments.

Each hazardous substance on this initial candidate list was then assessed for evidence of biodegradability, hydrolysis, and photolysis. At the same time each substance was assessed to determine if it should be dropped from consideration on the basis of any one or a combination of the following factors:

- A. Biodegradation not pertinent (i.e., substance is not a carbon source)
- B. Evidence of bioaccumulation
- C. Substance resists degradation or is persistent
- D. Substance is highly inhibitory to microbes and not amenable to biological treatment at municipal sewage treatment plants
- E. Evidence of teratogenicity

F. Substance presents unusual hazards (i.e., dangerously reactive, poisonous gas)

G. Hazardous degradation or transformation products are generated

The data base for the review was as follows:

1. Water Related Environmental Fate of 129 Priority Pollutants (EPA-440/4-79-029a and b)
2. "Handbook of Environmental Data on Organic Chemicals" (Karel Verschueren, 1977)
3. Oil and Hazardous Materials Technical Assistance Data System (OHMTADS)

Appendix B summarizes the results of this review for the 310 candidate substances. It lists the BOD data that were available, identifies those substances rejected on the basis of bioaccumulation, persistence, teratogenic properties, reactivity, or hazardous degradation products, and indicates those substances for which no data or insufficient information were available to make an evaluation. Table 2-8 presents the final candidates (37 in number) for which sufficient data are available to justify upward RQ adjustments (one level) on the basis of either biodegradability, hydrolysis, or photolysis. The majority of the candidates were selected because of biodegradability. Also shown in the table are the original RQ assignments derived using the SCP strategy and the basis on which those assignments were made. However, nine of these final candidates have been simultaneously identified as being chronically toxic or are currently being assessed for chronic toxicity. These are identified in Table 2-8 with the entry CHRON\* or CHRON TBA in the projected RQ column. For these nine substances, no upward adjustments are recommended at this time. Upon completing an evaluation of the chronic toxicity data, the Agency may still decide to raise the RQ levels for such of these substances that transform rapidly and that have minor chronic effects.

TABLE 2-8. FINAL CANDIDATE LIST FOR UPWARD RQ ADJUSTMENTS  
(BIODEGRADABILITY, HYDROLYSIS, PHOTOLYSIS)

Hazardous Substance	Basis for Adjustment			Current RQ	Basis	Projected RQ
	B*	H*	P*			
Acetaldehyde (75-07-0)	X			100	I,R	1000
Acetic acid (64-19-7)	X			1000	311	5000
Acetic anhydride (108-24-7)	X	X		1000	311	5000
Acetone (67-64-1)	X			1000	I	5000
Acetyl chloride (75-36-5)		X		1000	AQTX	5000
Allyl alcohol (107-18-6)	X			100	311	CHRON TBA
Allyl chloride (107-05-1)		X		1000	311, T(orl), I	5000
Amyl acetate (628-63-7)	X			1000	311, I	5000
Aniline (62-53-3)	X			1000	T(ihl), 311	5000
Benzonitrile (100-47-0)	X			1000	311	5000
1-Butanol (71-36-3)	X			1000	I	5000
Butyl acetate (123-86-4)	X			1000	AQTX, I	5000
Butylamine (109-73-9)	X			1000	311, I	5000
Captan (133-06-2)		X		10	311	CHRON TBA
Cresol (1319-77-3)	X			100	AQTX	CHRON TBA
Cumene (98-82-8)	X			1000	I	5000
Diazinon (333-41-5)		X		1	311	10
Dipropylamine (142-84-7)	X			1000	I	5000
Ethyl acetate (141-78-6)	X	X		1000	I	5000
Ethyl acrylate (140-88-5)	X	X		1000	I	5000
Ethylenediamine (107-15-3)	X			1000	I, 311	5000

(continued)

TABLE 2-8 (Continued)

Hazardous Substance	Basis for Adjustment			Current RQ	Basis	Projected RQ
	B*	H*	P*			
Formaldehyde (50-00-0)	X			100	I	CHRON TBA
Hexachlorocyclopentadiene (77-47-4)		X	X	1	311	CHRON*
Isobutyl alcohol (78-83-1)	X			1000	I	5000
Malathion (121-75-5)		X		10	311	100
Methanol (67-56-1)	X			1000	I	5000
Methyl ethyl ketone (78-93-3)	X			1000	I	CHRON TBA
Methyl isobutyl ketone (108-10-1)	X			1000	I	5000
Methylmethacrylate (80-62-6)	X			1000	I	CHRON TBA
Mevinphos (7786-34-7)		X		1	311	10
Phenol (108-95-2)	X			1000	311	CHRON TBA
n-Propylamine (107-10-8)	X			1000	I, AQTX	5000
Pyridine (110-86-1)	X			1000	I	CHRON TBA
Quinoline (91-22-5)	X			1000	311	5000
Resorcinol (108-46-3)	X			1000	311	5000
Triethylamine (121-44-8)	X			1000	I, AQTX	5000
Vinyl acetate (108-05-4)	X			1000	I, 311	5000

## NOTES:

\* B refers to biodegradability.

\* H refers to hydrolysis.

\* P refers to photolysis

(continued)

TABLE 2-8 (Continued)

ABBREVIATIONS:

311 Aquatic toxicity as assigned under Section 311 of the Clean Water Act

AQTX Aquatic toxicity, other than a 311 assignment

T(oral) Oral mammalian toxicity

T(ihl) Inhalation mammalian toxicity

T(skn) Skin (dermal) mammalian toxicity

I Ignitability

R Reactivity

CHRON TBA is used to flag those items that are still to be assessed for chronic toxicity by the ECAO

CHRON\* indicates that the material is known to have a chronic effect, but since its RQ has already been set at the 1-lb level on the basis of some other criterion, no further evaluation has been carried out.

Such an evaluation must be delayed, however, until such time as the chronic toxicity candidates have been fully assessed. For the time being, and until other supporting data are made available, the application of this upward adjustment strategy will effectively result in the RQ adjustment for 28 substances. The net effect would be the following:

<u>RQ Adjustment</u>	<u>Number of Hazardous Substances</u>
1 to 10	2
10 to 100	1
100 to 1000	1
1000 to 5000	<u>24</u>
	28

#### UNLISTED WASTES

##### Ignitable, Corrosive, and Reactive (I,C,R) Wastes

The RQ of unlisted wastes that exhibit the characteristics of ignitability, corrosivity, and reactivity (I,C,R), as named in subpart D of RCRA, have been adjusted to 100 lbs. The I,C,R wastes represent an undefinable number of wastes that exhibit the characteristics of ignitability, corrosivity, or reactivity. Since analysis to identify the I,C, or R component(s) cannot be performed, the Agency has assumed that the components present in the hazardous waste will, on average, fall within the middle tier of the five-tier ranking system. Accordingly, they are assigned a 100-lb RQ.

An alternate approach would be to examine the RQs of those listed hazardous wastes for which the RQ has been determined by ignitability or reactivity alone (corrosivity is not one of the primary criteria; see further discussion below). The RQ proposed most often for hazardous wastes on the basis of reactivity is 10 lbs. The RQ proposed most often for hazardous wastes on the basis of ignitability is 1000 lbs. Accordingly, unlisted wastes that are

reactive would be assigned an RQ of 10 lbs, while ignitable unlisted wastes would have 1000-lb RQs. The Agency believes that under this alternate approach, the selected RQ may not adequately reflect the characteristics inherent in a hazardous substance. An unlisted waste is often a mixture of hazardous wastes that may exhibit more than one of the unlisted waste characteristics, and thus it may not be appropriate to base the proposed RQ on one particular characteristic. Therefore, the 100-lb RQ assignment on all unlisted wastes is preferred.

Although the Agency is assigning an RQ to unlisted corrosive wastes, the characteristic of corrosivity was not used as a primary ranking criterion in assigning RQs by the SCP procedure described earlier. This has occurred because no suitable scale has been devised that is readily adaptable to a multi-tier system, with available data that can be used to rank the pure substances.

The National Academy of Sciences developed a five-tier scale for "Health (Corrosivity, Skin and Eyes)." (See Table 2-6.) However, examination of the NAS scale shows that it is a mixture of such criteria as "corrosive to skin" and "corrosive to eyes" are part of the same scale as dermal toxicity LD<sub>50</sub> values for 24-hour skin contact. Dermal toxicity has been treated in a more appropriate fashion as one aspect of mammalian toxicity in the SCP procedure.

The RCRA regulations define the characteristic of corrosivity in terms of pH ranges and rate of attack on steel (40 CFR Part 261.22, 45FR33122, and 46FR35247), choosing the former "because wastes exhibiting low or high pH can cause harm to human tissue," among other things (45FR33109). In effect, the pH scale used by RCRA has only two levels:

Corrosive: pH > 12.5, < 2.0

Noncorrosive: pH 12.5 to 2.0

There are appreciable difficulties in trying to use pH to establish RQs for all hazardous substances. The principal difficulty is, of course, that pH depends on the aqueous solution chemistry of substances rather than on their properties as pure substances. To use pH in selecting RQs, one would have to determine the concentrations for all acids and bases that resulted in the selected pH ranges. In effect, one would be setting RQs based on mixtures with water, while on the other hand, no criteria would be available for setting RQs when the corrosives were mixed with nonaqueous substances, although such mixtures might be of equal or greater corrosivity than the aqueous systems. Furthermore, some substances are irritating or corrosive to human tissue via mechanisms other than attack by acids or caustics.

RTECS reports data from the original version of the Draize tests and minor modifications thereof, which essentially rank skin and eye irritation on three levels each (mild, moderate, and severe), using rabbits as the test species. However, it also reports data from the U.S. Consumer Product Safety Commission version of these tests (16CFR1500.41 and 16CFR1500.42) which simply reports the lowest level producing an effect, regardless of its severity. These latter procedures, while having reasonably strict protocols, are also subject to several modifications, the most common being whether or not the test area is left open to the air or covered during the test period. Trying to develop a tiered RQ scale on the basis of these tests proved to be impractical because the numerous variations did not lend themselves to a consistent ranking process. Furthermore, numerical data is very sparse. For example, there is no question that both hydrofluoric and sulfuric acid can cause destructive skin burns, yet RTECS gives no data on the former, and only eye irritation data on the latter.

A review of the RCRA waste lists shows that only five have been listed as exhibiting corrosivity, and none have been listed exclusively because of corrosivity. These materials are as follows:

U006 Acetyl chloride (C,R,T)  
 U020 Benzenesulfonyl chloride (C,R)  
 U023 Benzotrichloride (C,R,T)  
 U123 Formic acid (T,C)  
 U134 Hydrofluoric acid (T,C)

It was accordingly decided that developing a corrosivity ranking scale would be deferred for the time being and that if they seemed to warrant it, the five materials above would be subjected to individual review and judgment for corrosivity, if their ranking by the other factors seemed unsatisfactory. The RQ status of these substances is as follows:

<u>Substance</u>	<u>Proposed RQ</u>	<u>Basis</u>	<u>Statutory RQ (lbs)</u>
Acetyl chloride	5000	BHP	5000
Benzenesulfonyl chloride	100	T (ihl)	1
Benzotrichloride	1000	T (ihl)	1
Formic acid	5000	311	5000
Hydrofluoric acid	100	CTX	5000

#### EP Toxic Wastes

The characteristic of EP toxicity was designed to identify wastes that would likely contribute to contamination of groundwater by leaching from landfills. There are only 14 substances for which the EP toxicity characteristic can be determined, as listed in 40 CFR Part 261.24. Six of these are specific compounds (pesticides and herbicides), and RQs for these can be assigned based on these specific contaminants. RQs for these specific pesticides and herbicides may be taken from the values already determined for these compounds in Tables 8-1 or 9-1.

The other eight substances, however, while nominally listed as the metal, must actually be determined on the basis of some soluble compound of that metal. The Extraction Procedure (EP) by its very nature dictates that a soluble species containing the specified metal cation must be determined to be present in the waste. The suggested projected RQs are those corresponding to the 311 RQs of the corresponding water-soluble salts when available (i.e., for mercury and silver). The projected RQ for selenium is based on its inhalation toxicity. The projected RQ of barium is derived from the fact that the  $TL_m-96$  of barium hydroxide is given in RTECS as 10-100 ppm, corresponding to an RQ of 1000 lbs. The projected RQ of the other metals listed as EP toxic wastes is TBA, since several of their compounds are carcinogenic. The total list, incorporating all these assignments, is given in Table 2-9.

#### RQs FOR THE F AND K WASTE STREAMS

Table 9-2 lists the waste-stream substances from RCRA regulations 40 CFR Parts 261.31 and 261.32. These are commonly called the "F" and "K" waste streams, referring to the prefix used in the EPA's identifying hazardous waste number.

The RCRA F waste streams (with the exception of F001-F005, which are discussed separately below) are hazardous wastes from nonspecific sources (e.g., F006 wastewater treatment sludges from electroplating operations). The RCRA K waste streams are hazardous wastes from specific sources (e.g., K060 ammonia still lime sludge from coking operations). In order to assign RQs to these waste streams, the EPA will first examine the hazardous constituents in each F and K waste stream (i.e., RCRA Section 261, Appendix VII). The next step will be to identify the RQs associated with each constituent and then assign an RQ to each waste stream. The RQ will be the lowest RQ associated with the individual constituents of the waste stream.

TABLE 2-9. EXTRACTION PROCEDURE (EP) TOXIC WASTES

Hazardous Waste No.	Contaminant	Suggested RQ	Basis
D004	Arsenic (ion)	TBA	Carcinogen
D005	Barium (ion)	1000	Aquatic Toxicity
D006	Cadmium (ion)	TBA	Carcinogen
D007	Chromium (ion)	TBA	Carcinogen
D008	Lead (ion)	TBA	Carcinogen
D009	Mercury (ion)	100 lbs	Mammalian Toxicity, 311 Assignment
D010	Selenium (ion)	1000 lbs	Mammalian Toxicity, 311 Assignment
D011	Silver (ion)	1 lb	Toxicity
D012	Endrin	1 lb	311 Assignment
D013	Lindane	1 lb	311 Assignment
D014	Methoxychlor	1 lb	311 Assignment
D015	Toxaphene	1 lb	311 Assignment
D016	2,4-D	100 lbs	311 Assignment
D017	2,4,5-TP	100 lbs	311 Assignment

For example, assume that RCRA's Appendix VII shows that a K waste stream has three hazardous constituents—X, Y, and Z. The RQs associated with the hazardous constituents are:

X = 10 lbs

Y = 100 lbs

Z = 1000 lbs

The RQ for this K waste stream is, therefore, 10 lbs, the lowest RQ associated with the hazardous constituents in this waste stream.

The RCRA waste streams F001-F005 are collective listings (e.g., six solvents are listed collectively under F001). The EPA will assign RQs to the F001-F005 wastes using a special procedure. The RQ assignment for F001 serves as an example. Six solvents are included under the RCRA F001 listing. RQs will be assigned to each individual solvent as in the previous example. EPA will also assign a generic RQ to the F001 listing as a whole, equal to the lowest RQ assigned to any of these individual solvents. If the releaser is unsure which solvent he has released or if he has released a mixture of F001 solvents, he will use the generic F001 RQ for notification purposes.

#### MIXTURE RULE

Under regulations implementing Section 311 of the CWA, EPA interpreted the application of RQs to mixtures and solutions containing hazardous substances: "[d]ischarges of mixtures and solutions are subject to these regulations only where a component hazardous substance of the mixture or solution is discharged in a quantity equal to or greater than its RQ." [44FR50767, August 29, 1979.] This interpretation will apply to releases of hazardous substances under CERCLA as well. Thus, a release of 10 lbs of solution X which contains 1 lb of hazardous substance A and 9 lbs of nonhazardous substance B is not reportable if the RQ of hazardous substance A is 10 lbs. Furthermore, a

release of a mixture containing 70% of a reportable quantity of hazardous substance A and 60% of a reportable quantity of hazardous substance B is not subject to reporting. As noted in the preamble to 40 CFR Part 117, it is not valid to assume that the toxic properties of all different hazardous substances can be considered additive. (44FR50767, August 29, 1979.)

An alternative approach would be to apply the RQ to the mixture or solution as a whole. Under this approach, a release of 10 lbs of solution X which contains 1 lb of hazardous substance A and 9 lbs of nonhazardous substance B would be reportable, if the RQ of the hazardous substance A was 10 lbs. Similarly the mixture containing 70% of a reportable quantity of hazardous substance A and 60% of a reportable quantity of hazardous substance B would require a report if released. This approach has not been adopted because it would result in over-reporting. The Agency would rather focus its attention on those releases that are potentially more environmentally significant, such as those releases in which the component hazardous substance is released in an amount that equals or exceeds the assigned RQ.

#### RADIONUCLIDES

Radionuclides are hazardous substances under CERCLA because they were generically designated as hazardous air pollutants under Section 112 of the Clean Air Act. The Agency will adjust the RQ for radionuclides in some future rulemaking; until that time, the statutory 1-lb RQ is applicable.

Options for designating and assigning RQs to radionuclides are summarized here. A detailed analysis of the various options is given in Volume II of this report ("Radionuclides"). In order to select an approach, the Agency is considering its own prior experience as well as that of other federal, state, and international agencies.

The Agency is considering several options for future adjustments to radionuclide RQs. Two major related issues are:

- \* The units the Agency should use to measure RQs, and

- \* Whether one RQ should be set for all radionuclides or whether different RQs for specific radionuclides should be used.

EPA recognizes that the pound is not a suitable unit in which to measure the RQ for radionuclides, because releases much smaller than 1 lb can seriously threaten public health and welfare and the environment. EPA is currently considering two alternative types of measurement units for radionuclide RQs: dose-equivalent and activity level. Dose-equivalents (usually measured in rems) is a standard method of comparing biological effects of radiation on tissue. The activity level of a radionuclide (measured in becquerels or curies), on the other hand, is a measure of actual number of disintegrations of radionuclide atoms per unit time.

A list of individual radionuclides which might appropriately be designated would include over 100 specific substances. The Agency is considering whether to set one RQ for all radionuclides, or different RQs for specific individual radionuclides. A generic RQ for all radionuclides might be established in the form of a dose-equivalent. If the Agency lists RQs for specific radionuclides, then the RQs could be listed in the form of activity levels. The effect of a radionuclide depends not only on the number of disintegrations, but also on the kinds of radiation (alpha, beta, or gamma) and the energies of each. Thus, different hazards are posed for radionuclides depending on the different types of radiation emitted and different RQs and activity levels are appropriate if individual radionuclides are listed.

### SECTION 3

#### ALTERNATE STRATEGIES FOR RQ ADJUSTMENTS AND ASSIGNMENTS TO THE CERCLA 101(14) LIST

A number of possible strategies for determining RQ values for the designated substance were briefly discussed earlier (Section ES, pp. ES-5 through ES-9). The reasons for rejecting all but the SCP process are self-evident for the majority of those strategies, and such discussions will not be repeated here. However, one of the strategies, namely the use of a hazard index, was subjected to an extensive study before it was finally eliminated. Hazard indices have often been proposed in various reports and technical papers as a method for comparing hazardous substances, and indeed have been used during other activities under CERCLA (i.e., the "Mitre Model" used to rank waste sites).

The discussion that follows provides a detailed summary of studies exploring the possibility of developing a hazard index suitable for RQ assignments.

#### HAZARD INDEX DEFINITION AND APPLICATION

A hazard index is a scoring system designed to assess the relative potential threat to human health and to the environment of chemical substances released to the air, water, and soil. The system consists of various rating factors used to examine the types of hazards that may result and, to the extent possible, the degree of hazard. Each rating factor has a defined rating scale by which chemicals receive numerical scores based on known data. The rating factors are combined in an equation to arrive at a single number that is used to rank a chemical relative to other chemicals processed through the same equation.

### Analytical Problem

Although the logic for rating hazardous substances appears relatively simple, there are a great many complications that exist and that operate to limit the development of a hazard index. There is not adequate data for each rating factor, and therefore relative rankings on identical bases would be impossible to create. Mathematical combinations and permutations abound, with so many possible alternate formulations of algorithms that there is no general agreement on how to construct a scientifically acceptable hazard. Finally, inherent in the formulation of a hazard index is the need to consider all relevant criteria, and if possible, choose only those that are mutually independent of each other. However, when dealing with intrinsic properties of chemical substances, mutual independence of hazard criteria is difficult, if not impossible, to determine. For example, a material that is acutely toxic to mammals may also be acutely toxic to aquatic organisms through some similarity in the mode of toxic attack.

### Development of Alternate Indices for Comparison

Four alternate algorithms have been derived for rating hazardous substances, and are presented in detail in the following sections. These algorithms differ in logic and in the number of potential health and environmental effects parameters considered. The criteria that have been considered to a greater or lesser extent in development of each of the four alternative algorithms fall into four general categories, as outlined below:

#### A. Health Effects

- o Carcinogenicity
- o Mutagenicity
- o Teratogenicity
- o Toxicity (human and mammalian)

#### B. Human Welfare Effects

- Flammability
- Explosivity
- Corrosivity
- Reactivity
- Aquatic Toxicity

#### C. Aggravating Characteristics

- Persistence
- Bioaccumulation
- Toxic Combustion Products

#### D. Physical and Biological Transformation Characteristics

- Hydrolysis
- Photolysis
- Oxidation
- Biodegradation

#### E. Environmental Mobility

- Volatility
- Solubility

Algorithm I was deliberately designed to rank chemicals entirely on major potential health effects. It is a simple additive algorithm comprised of five components:

$$\text{HI} = (\text{Carcinogenicity}) + (\text{Mutagenicity}) + \\ (\text{Teratogenicity}) + (\text{Human Toxicity}) + \\ (\text{Mammalian Toxicity})$$

Algorithm IIa is slightly more sophisticated in that, in addition to health effects, it permits evaluation of other adverse effects that may occur (fire, explosion, reaction) and aggravating characteristics (persistence and bioaccumulation). In addition, this particular algorithm allows evaluation of mitigating effects. The basic form of the algorithm is additive and consists of the following simplified terms:

$$\begin{aligned} \text{HI} = & \text{Health Effects} + \text{Welfare Effects} + \text{Aggravating Effects} \\ & - \text{Mitigating Effects} \end{aligned}$$

Algorithm IIb used the same rankings as employed in that immediately preceding, but uses weighting factors (coefficients) in an attempt to balance the impact of the individual terms on the final index. The form is as follows:

$$\begin{aligned} \text{HI} = & W_1 (\text{Health Effects}) + W_2 (\text{Welfare Effects}) \\ & + W_3 (\text{Aggravating Effects}) - W_4 (\text{Mitigating Effects}) \end{aligned}$$

It is apparent that one must be very careful in assigning weighting factors so as not to overrate certain criteria, and therefore create artificial values that are so large from one factor that the input from other important criteria becomes insignificant in comparison.

Algorithm III is an extension of the second. It is comprised of essentially the same rating factors; however, the mathematical approach is different. Rather than being strictly additive, it incorporates multiplicative arrangements to arrive at a final rating. This third algorithm takes the following form:

$$\begin{aligned}
 & (\text{Health Effects}) \times (\text{Aggravating Health Factors}) \\
 & + (\text{Welfare Effects}) \times (\text{Aggravating/Mitigating} \\
 & \quad \text{Transformation Properties})
 \end{aligned}$$

The fourth algorithm was similar to the second in form, but differed in that it considered solubility and volatility (environmental mobility) rather than other mitigating factors, and included media-specific toxicity evaluations (e.g., inhalation, oral, and dermal toxicities). The form of algorithm IV is as follows:

$$\begin{aligned}
 \text{HI} = & (\text{Health Effects}) + (\text{Welfare Effects}) + \\
 & (\text{Environmental Mobility}) + (\text{Aggravating Characteristics})
 \end{aligned}$$

Details of the ranking schemes and numerical assignments for each individual criterion and component of these indices will not be presented in this report. To test and compare the indices, 27 hazardous substances, selected to represent a wide range of dangerous properties, were evaluated via each index, and then the relative rankings within each index were determined. For each algorithm, the substance with the highest HI value was taken to be the most hazardous and therefore was assigned a relative rank of 1. The substance with the next highest HI value was assigned a relative rank of 2, and so on. If two or more substances shared the same HI value, then each received an identical ranking. In such cases the next relative rank assigned was equal to the last relative rank assigned, plus the number of identical rankings. The following from Algorithm I should serve as an example:

<u>Hazardous Substance</u>	<u>HI Value</u>	<u>Relative Ranking</u>
N-Nitrosodimethylamine	12	1
Carbon Disulfide	11	2
Chloroform	11	2
Phosphorus (White)	11	2
Acrolein	10	5

The final relative rankings for the 27 substances by all algorithms is given in Table 3-1.

The rankings presented in Table 3-1 highlight the problems with hazard indices, and reemphasize the complications pointed out earlier. It is immediately evident that there is no consistency in the way the indices rate different compounds.

In conclusion, it does not appear that standardized hazard indices can readily be adapted to the assignment of RQs. Until such time as data gaps are eliminated and a "standardized" index—as well as "standardized" ways to rate the various individual factors—are developed (perhaps by interagency study and the adoption of suitable conventions), the use of such indices is not recommended.

TABLE 3-1. RELATIVE RANKINGS OF HAZARDOUS SUBSTANCES

Hazardous Substance	I	IIa	IIb	III	IV
Acetyl bromide	24	4	20	6	21
Acetylene	24	20	27	16	18
Acrolein	5	3	3	3	3
Acrylonitrile	10	6	12	6	1
Ammonium dichromate	16	18	17	19	9
Benzene	16	13	16	13	13
Benzidine	6	23	9	23	13
Benzo(a)pyrene	16	26	21	26	25
Bis(2-ethylhexyl)phthalate	16	27	23	27	18
Carbon disulfide	2	2	4	5	2
Carbon tetrachloride	6	8	6	6	4
Chloroform	2	4	4	2	6
DDT	10	19	7	16	12
Heptachlor epoxide	6	24	18	25	24
Methyl chloride	22	9	22	10	17
Nitric acid	10	13	9	11	9
N-Nitrosodimethylamine	1	11	2	21	13
PCBs	21	20	19	23	21
Phenol	20	13	13	16	13
Phosgene	10	11	7	13	21
Phosphorus (white)	2	1	1	1	9
Potassium permanganate	22	25	26	21	18
Sodium amide	24	13	24	3	27
Sodium dichromate	6	17	9	13	8
2,4,6-TNT	27	20	25	20	25
Vinyl chloride	10	6	14	6	4
Vinylidene chloride	10	10	15	11	7

## SECTION 4

### ADMINISTRATIVE CONSIDERATIONS

#### ADMINISTRATIVE FACTORS

The legislative history of CERCLA makes it very clear that in setting RQs, "administrative feasibility and practicality should be primary factors," and that "a single quantity is to be determined for each hazardous substance." The Senate Report 96-848, issued by the Committee on Environment and Public Works to accompany S.1480, states:

The provision intentionally omits from the requirement to determine "reporting" quantities any reference to harm or hazard. A single quantity is to be determined for each hazardous substance, and this single quantity requires notification upon release into any environmental medium. It would be virtually impossible to determine a single quantity applicable to all media while at the same time linking such quantity to any subjective concept of harm.

It is essential that such quantities be relatively simple for those subject to notification requirements to understand and comply with. Since releases in such quantities trigger notification requirements, but do not, in and of themselves, give rise to other liabilities under this Act, the President's broad discretion to select quantities will not unfairly burden those persons subject to the Act.

In determining reportable quantities under this paragraph, the President may consider any factors deemed relevant to administering the reporting requirements or the President's other responsibilities under this Act. Administrative feasibility and practicality should be primary factors. In addition, the President may revise such regulations from time to time if under-reporting or over-reporting is occurring under existing regulations. (p. 29)

Section 102 requires the Administrator to promulgate regulations establishing RQs for hazardous substances. Congressional intent was clearly to vest the Administrator of the EPA with broad authority and considerable discretion to adjust the RQs from either those assigned under CWA Section 311, or the 1-lb quantity statutorily assigned to all other Section 101(14) hazardous substances.

The term "administrative feasibility and practicality" may be interpreted in a very broad sense to include any practical factors deemed relevant to administering the Act.

Although the RQ adjustment process proposed herein rests on scientific and technical criteria based on some considerations of practicality and administrative feasibility, in the future the EPA may choose to modify the RQs based on still other administrative factors. None of the factors discussed below has actually been used to modify the RQs proposed following the procedure of Section 2. Implementation of such modification of the RQs will be done, as appropriate, on a case-by-case basis, taking into account those factors that are deemed relevant by the Administrator at the time the RQs are modified. Despite the fact that there are currently no specific methods for applying some of these factors, it is possible that as experience with the notification requirement of CERCLA Section 103 is acquired, the Agency may develop mechanism(s) for employing administrative feasibility and practicality factors discussed below. The factors may include, but are not limited to, any or all of the following:

1. Release history
2. Release potential
  - A. Spill frequency
  - B. Price
  - C. Production volume or available quantity
  - D. Container size

Any one or more of these factors may have an overriding effect on the RQ to be assigned to a particular hazardous substance for CERCLA. General approaches to

applying each of these factors are suggested below.

### Release History

Although the NRC, EPA, and Coast Guard districts have received hazardous substance spill notifications for several years, the data on release history are limited and are not consistently catalogued or filed. The CWA Section 311 substances released into navigable waters and transportation-related releases provide a substantial history of release patterns, but not all the CERCLA substances have been subject to reporting requirements pursuant to CWA Section 311. Analysis of release history would evaluate past releases to determine how often a response was necessary, and, if so, what type of response was required.

As the Agency gains experience in handling reports of releases of CERCLA hazardous substances, it may find that some substances are frequency released in situations that require an emergency response. Such release history might be used to adjust RQs. For example, if the EPA has, in the past, responded to 100-lb releases of hazardous substances, a 100-lb RQ may be appropriate.

Several factors either describe the tendency of hazardous substances to enter the environment or are related to that tendency and therefore may be employed to modify the RQs arrived at using the strategy outlined in Section 2. A possible way of using those factors is to raise the RQ proposed herein for those substances with a much lower than average release potential. In deciding whether release potential is much smaller or much larger than average, those substances are to be compared which fall in the same RQ tier based upon the same primary criterion. For example, RQs of substances that have 100-lb RQs because of their aquatic toxicity and which have much lower than average release potential may be administratively raised.

Several factors may be used to predict the likelihood that hazardous substances will be released into the environment. These include: (1) price, (2) production volume or available quantity, (3) distribution mode, (4)

transportation mode, and (5) packaging and containerization. The Agency might raise the proposed RQs for substances that are more likely to be released.

1. Price. Expensive substances may be handled in a fashion that will minimize the likelihood that the substances would be released or discarded as wastes (from which a later release could occur). When a release of one of these substances does occur, the releaser may have an economic incentive to clean up the release to recover the substance. Substances more expensive than average might therefore be given higher RQs.
2. Production volume or available quantity. Substances produced in higher volume may be released more often than substances produced in low volume, and may therefore require lower RQs than the low-volume substances.
3. Distribution mode. Some hazardous substances are produced exclusively as intermediates for use in the same plant location which produces the intermediates. Other hazardous substances may be produced at locations that are fairly close to the plants at which they are consumed and converted into other substances. Where only a few plants produce the hazardous substance or where the consuming plants are either at the same site or nearby, the RQ suggested on the basis of the primary and secondary criteria may be relaxed because of the relatively small risk of release from the limited distribution of the hazardous substance.
4. Transportation mode. The mode of transportation, e.g., rail, truck, or barge, may have an influence on the likelihood of a release. If some hazardous substances are generally shipped by a transportation mode that exposes them to a particularly high risk of release, the RQ may be reduced; on the other hand, hazardous substances that are primarily shipped by safer modes of transportation might have their RQs increased.

5. Packaging and containerization. The method of packaging of the hazardous substance could be used to modify the RQ. Substances that are usually packaged in a fashion that substantially reduces the risk of release (such as very high-priced substances) may be assigned RQs on the basis of the smallest package size. Substances that are usually shipped in large containers may be usually released in quantities that are related to the container size. For example, a release from a tank truck is more likely to involve a large quantity of a substance than is a release from a case of 1-lb bottles. The RQs might therefore be set on the basis of container size for some substances.

The above administrative factors may be used in the future to revise the technically adjusted RQs presented in this report. An administrative factor considered earlier for possible application to RQ revision, which has been rejected, is ease of cleanup. EPA is not including this criterion because ease of cleanup does not guarantee that the releaser will actually take cleanup action, nor do unique cleanup requirements necessarily mean that the releaser will not take proper response measures.

## SECTION 5

### AQUATIC TOXICITY

This section of the report is aimed at providing supplementary information to those who desire a broader understanding of the concept of aquatic toxicity. Readers are reminded, however, that RQs derived on this basis are not intended to be measures of harm. The RQ is intended to serve as a trigger for notification and not as a response action level. RQs only alert OSCs that they should evaluate a release situation to determine if a response is warranted.

#### INTRODUCTION

During the past 25 years, aquatic bioassay has become an important tool for determining the effects of environmental conditions and toxicants on species living in lakes, rivers, estuaries, and oceans. An aquatic bioassay is any test whose objective is to determine the effects of one or more substances, wastes, or environmental factors (e.g., pH, dissolved oxygen, light), alone or in combination, on aquatic organisms (Ref. 5-1). Such tests, while conducted in the laboratory, can be made to simulate in-situ conditions so that the observed effects can be generalized to the field environment.

Aquatic bioassay, which tests the effects of toxicants on organisms, provides important information that is useful for protecting the aquatic environment, which chemical examination alone cannot. The results from aquatic bioassay tests of a toxicological agent are used to determine both acute and chronic effects. For example, such tests can be used to determine the acute and chronic sensitivity of a single species to a number of toxicants, the relative acute and chronic sensitivities of a number of species to a single toxicant, and the maximum allowable toxicant concentration which causes no long-term negative effects, and the maximum allowable toxicant concentration for very

short exposures (e.g., slugs or periodic discharges).

Further, by carefully choosing the species and the bioassay test procedure, estimates of the effects of a toxicant on an ecosystem can be made based on bioassay results using a single species (Ref. 5-2). For example, by choosing a test species of critical importance in an ecosystem food chain (e.g., an alga or a sensitive fish species), one can conclude from the bioassay data that a concentration of the toxicant which causes significant death of the critical species within a specified time period will have a severe negative impact on the ecosystem.

In recent years, the procedures for conducting aquatic bioassay tests have become standardized. Many of the procedures are promulgated in Ref. 5-1. Widespread use of standard procedures will promote a large data base of comparable data, and a basis for reproducing critical data. Much of what follows is based on the standard methods and procedures found in the scientific literature. The following sections discuss the nomenclature, methodology, and significance of aquatic bioassay utilizing toxic substances, including wastes.

#### NOMENCLATURE

Aquatic bioassay is concerned with determining the effects of a toxicant or combination of toxicants of specified concentration for a specified period of time on a species of organism. The key words are "effects," "concentration," and "time."

The effects of a toxicant on an organism can be manifested in a number of ways including but not limited to:

1. Death
2. Paralysis
3. Deformity

4. Resistance to disease
5. Developmental abnormality
6. Lowered reproductive capacity
7. Impairment of other bodily functions
8. Loss of other competitive abilities

When death is the criterion of toxicity, the bioassay is conducted to determine the lethality of varying concentrations of the toxicant (the LC or lethal concentration). When a criterion other than death is of interest, such as 2 through 8 above, the bioassay can be used to determine the influence of toxicant concentration on these (EC or effective concentration). Only in extremely rare cases is lethal dose (LD) or effective dose (ED) used in aquatic bioassay, since poisoning of aquatic organisms usually occurs through diffusion of the toxicant into the tissues from the aqueous medium, rather than by ingestion.

A numerical suffix and prefix always accompany the LC or EC designation. The suffix is the percentage of organisms experiencing death (for LC) or some other effect (for EC) at the designated concentration. The prefix is the duration of the bioassay. For example, 96-hour  $LC_{50} = 100$  ppm means that 50% of the test organisms exposed to the toxicant at 100 ppm would be expected to die within 96 hours (a 96-hour bioassay is usually used to measure acute toxicity).

Recent standard aquatic bioassay procedures (Ref. 5-1) specify the use of LC and EC when reporting results. However, much of the literature on aquatic toxicity contains median tolerance limits, or  $TL_m$ . When lethality is the criterion of toxicity, the  $TL_m = LC_{50}$ . When a nonlethal criterion is used, then  $TL_m = EC_{50}$ . However, it should be understood that the tolerance limit specifies the percentage of organisms able to tolerate exposure to the toxicant over the duration of the test. Thus, for example,  $TL_{10} = LC_{90}$  (for

death) and  $TL_{90} = EC_{10}$  (for nonlethal effects).

There are several other important parameters that can be gleaned from aquatic bioassay. The first of these is incipient lethal level, also called the incipient  $LC_{50}$ . This is the toxicant concentration at which 50% of the test organisms can be expected to die on long exposure (Ref. 5-3). Incipient  $EC_{50}$  values are also reported. Such bioassay tests require long-term testing, on the order of months to years, depending on the life cycle of the test organisms. A 96-hour  $LC_{50}$  and an incipient  $LC_{50}$  can be two vastly different numbers with vastly different meanings.

The most important values from an environmental viewpoint that are obtainable from long-term aquatic bioassay are the safe concentration (SC) and the maximum allowable toxicant concentration (MATC). The SC is the maximum concentration of a toxicant that has no observable harmful effects after long-term exposure over one or more generations. The MATC is the concentration of toxic substance that may be present in the receiving water without causing significant harm to its productivity and all of its various uses. Both the SC and MATC are used as standard water quality criteria.

## METHODOLOGY

Aquatic bioassay testing exposes individuals of a species of organism to various concentrations of a toxicant for a predetermined period of time or until a specific effect is observed. The effect each concentration has on the individuals is determined, and through statistical means the LC, EC, SC, or MATC values are derived, depending on the type of bioassay performed.

Aquatic bioassay procedures are often categorized by duration, which includes short-term, intermediate-term, and long-term tests. Short-term aquatic bioassay tests are of two types: rangefinding and definitive. Rangefinding short-term bioassay is used to screen a toxicant for proper concentrations to be used for longer term testing. Definitive short-term bioassay can be used

to determine acute LC and EC values, the relative toxicity of a number of toxicants on a single species, or the relative sensitivity of several species to a single toxicant.

Intermediate-term aquatic bioassay is used to determine incipient  $LC_{50}$  and incipient  $EC_{50}$  values, the sensitivity to toxicants of selected life stages of long-lived species, or to indicate the toxicant concentrations to be used in a long-term bioassay.

Long-term aquatic bioassay is frequently performed when SC or MATC values are desired. Additionally, incipient EC values can be obtained for effects that require long periods to be manifested, for example, effects on:

1. Growth
2. Reproduction
3. Maturation
4. Bioaccumulation
5. Behavior

Short and intermediate bioassay can be performed using static, renewed, or flowthrough conditions. Long-term bioassay is usually performed as a flowthrough test. A static bioassay test uses the same aqueous test solution throughout. Static testing is not useful when it would be difficult to maintain the toxicant concentration over the duration of the test (e.g., when a volatile toxicant is used). In such cases, the aqueous test solution can be periodically renewed (e.g., every 24 hours), which will help to maintain a constant concentration.

Flowthrough bioassay is the most desirable type, since a constant toxicant concentration is assured and field conditions can be simulated. However, the experimental apparatus is immensely more complicated and costly than that used for static bioassay. The apparatus includes water reservoirs, pumps, drains,

diluters, etc. Some species, for example those of the phytoplankton (the free-floating plants) are difficult to bioassay under flowthrough conditions because they are easily swept away.

### Test Species

Aquatic bioassays can be performed using species representing all aquatic phyla due to refinements in culture techniques that have taken place in recent decades. When it is known that a particular chemical will be discharged into a receiving water (for example when a chemical processing plant is sited next to a river), bioassays should be performed on the most sensitive local species.

However, during aquatic toxicity screening of chemicals when the ecosystem into which the chemical may ultimately be discharged is unknown, the tendency is to perform bioassays on standard species, particularly species of fish. The rainbow trout (salmo gairdneri Richardson) is a good representative species of a cool, fresh-water fish which is now used worldwide in aquatic bioassay. The fathead minnow (Pimephales promelas Rafinesque) is used extensively in the United States, particularly for sublethal bioassay involving reproduction. Similarly, the bluegill (Lepomis macrochirus Rafinesque) is widely used in the United States. The common goldfish (Carassius auratus [L.]) may become a standard fish, primarily because of its availability (Ref. 5-4). Evidence suggests that using the results from bioassays with standard fish to predict the effects on other species of fish is defensible since the variability in results between fish species is often less than the variability observed when the same species is tested in different waters (Ref. 5-4). However, there is also great variability among aquatic species to the same pollutant.

## SIGNIFICANCE

Aquatic bioassay methods have been refined over the years so that current procedures yield data that provide good estimates of the impacts that chemicals have on the aquatic environment, based on the bioassay results from one or several sensitive, critical organisms. Thus, aquatic toxicity derived from aquatic bioassay provides a basis for assessing the impacts of chemical insults to the aquatic environment.

Recognizing this, the EPA used acute aquatic toxicity (96-hour  $LC_{50}$ ) as one of the criteria in designating the substances in the Clean Water Act, for determining the reportable quantity of each, and for calculating the rates of penalty when a designated substance was released into the environment in an amount equal to or greater than its RQ (Ref. 5-5).

Five ranges of acute toxicity define the degree of toxic hazard in the Clean Water Act. These are:

<u>Category</u>	<u>Toxicity Range</u>	
	<u>96-Hr</u>	<u><math>LC_{50}</math> mg/Liter</u>
X	Less than 0.1	
A	0.1-1	
B	1-10	
C	10-100	
D	100-500	

EPA used the 500 mg/l 96-hour  $LC_{50}$  as the criterion for environmental damage, based on historical spill data and the consensus of a panel of experts. These data showed that fish kills had consistently occurred when substances with 96-hour  $LC_{50}$  values greater than 100 mg/l were spilled. However, spills of substances with 96-hour  $LC_{50}$  values greater than 500 mg/l consistently showed no evidence of environmental damage in the form of fish kills (Ref. 5-5).

Thus, using acute aquatic toxicity as one factor in determining Superfund reportable quantities for the aquatic medium has precedence in regulations pursuant to the Clean Water Act. Additionally, using a 96-hour  $LC_{50}$  of 500

mg/l criterion for environmental damage has precedence under the Clean Water Act.

It must be emphasized, however, that LC, EC, SC, or MATC values are species-specific and cannot, without some error, be generalized to members even of the same class (e.g., bluegill data to other fish), and cannot, without great error, be generalized to other classes of organisms. Thus, it is untenable to use aquatic toxicity data to predict hazards to terrestrial organisms, including humans. To illustrate, Table 5-1 shows the difference in toxicity to rats (mammal), mallards (bird), and bluegill (fish) of three pesticides: Parathion, Methyl parathion, and Guthion.

TABLE 5-1. TOXICITIES OF COMMON  
INSECTICIDES (FROM REF. 5-2)

<u>Pesticide</u>	<u>Male Rat LD<sub>50</sub></u> <u>(mg/kg)(oral)</u>	<u>Mallard LD<sub>50</sub></u> <u>(mg/kg)(oral)</u>	<u>Bluegill 96-hr</u> <u>TL<sub>m</sub> (ug/L)</u>
Parathion	13	2.13	95
Methyl parathion	14	10	1900
Guthion	13	136	5.2

There is little difference in the toxicity of the three pesticides to rats. Mallards find Methyl parathion approximately 5 times less toxic than Parathion, and Guthion approximately 13 times less toxic than Methyl parathion. Bluegill are nearly opposite in their sensitivity to the pesticides. Guthion is the most toxic, Methyl parathion the least toxic, and Parathion of intermediate toxicity. The data presented in Table 5-1 show that generalizing the toxicity of these three pesticides to rats and mallards based on toxicity to bluegills would be completely erroneous. Using the toxicity data from the rats or mallards to predict toxicity to the other two species would be equally fallacious.

The reasons for such inconsistent relative toxicities of the three pesticides to the three different species which represent three different classes of animals are differences in rates and processes of metabolic activation or detoxification and general differences of metabolic pathways of these species.

Aquatic toxicity data has been used as one criterion for selecting Superfund reportable quantities. It is useful for predicting aquatic environmental impacts when chemicals are spilled into these systems, and has precedence in the Clean Water Act. Using the 500 mg/l 96-hour  $LC_{50}$  as the criterion for environmental damage is supported by historical spill data. Since there are other potential hazards that the Agency desires to address, aquatic toxicity is only one component in the SCP strategy that includes mammalian toxicity, chronic toxicity, carcinogenicity, ignitability, and reactivity.

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## SECTION 6

### MAMMALIAN TOXICITY

This section of the report is aimed at providing supplementary information to those who desire a broader understanding of the concept of mammalian toxicity. Readers are reminded, however, that RQs derived on this basis are not intended to be measures of harm. The RQ is intended to serve as a trigger for notification and not as a response action level. RQs only alert OSCs that they should evaluate a release situation to determine if a response is warranted.

#### INTRODUCTION

Bioassay testing using nonhuman mammals is used extensively for assessing the toxicity of chemicals. The primary goal of such tests is to estimate the toxicity of chemicals to man. The accuracy of predicting human sensitivity to a chemical based on the sensitivity of, say, a rat, varies with a number of factors relating to the chemical itself, the test conditions, and differences between the test organism and man. Efforts should be made to conduct such tests using consistent test conditions and procedures that facilitate extrapolation to man.

Mammals - those animals that nourish their young with milk supplied by mammary glands and that have skin which is more or less covered by hair - represent a single class of vertebrate animals. Mammals share basic characteristics of appearance, anatomy, and perhaps most important, physiology.

It has been demonstrated from accidental human exposure to toxic chemicals that using nonhuman mammal bioassay results to predict human toxicity is reasonably accurate for many chemicals, and since there are very little data concerning toxicity testing on humans, it is the best method available for

assessing potential chemical hazards to humans. With some chemicals 10- to 12-fold differences in susceptibility to toxicants between mice and humans has been observed (Ref. 6-1).

The following sections discuss the nomenclature used in toxicity testing using mammals, the methods employed for these tests, and the significance of mammalian toxicity data for establishing Superfund multimedia reportable quantities.

## NOMENCLATURE

Mammalian toxicity testing, like aquatic toxicity testing, is concerned with both lethal and sub-lethal (toxic) exposure effects. The toxicant is administered to the test animal by various routes of administration, including vapor form as an inhalant (at a given concentration), by applying the toxicant topically to an external surface of the test animal (at a given dosage), or by placing the toxicant into the body of the test animal (at a given dosage).

Thus when death is the criterion of toxicity, mammalian toxicity data is expressed as lethal concentration (LC) if the toxicant is an inhalant, or lethal dose (LD) if the toxicant is placed on or in the body. When a toxic effect other than death is the criterion of toxicity, a toxic concentration (TC) designation is used for toxicants administered as an inhalant, and toxic dose (TD) for those administered on or in the body.

The LC, LD, TC, and TD designations are followed by a numerical suffix. For example (from Ref. 6-2):

LC<sub>50</sub>-Lethal Concentration Fifty - a calculated concentration of a substance in air, exposure to which for a specified length of time is expected to cause the death of 50% of an entire defined experimental mammal population.

LD<sub>50</sub>-Lethal Dose Fifty - a calculated dose of a substance which is expected to cause the death of 50% of an entire defined experimental mammal population. It is determined from the exposure to the substance

by any route other than inhalation.

TC<sub>50</sub>-Toxic Concentration Fifty - a calculated concentration of a substance in air, exposure to which for a specified length of time is expected to produce toxic effects in 50% of an entire defined experimental mammal population.

TD<sub>50</sub>-Toxic Dose Fifty - a calculated dose of a substance which is expected to cause toxic effects in 50% of an entire defined experimental mammal population. It is determined from exposure to the substance by any route other than inhalation.

It should be noted that percentages other than 50% (e.g., LC<sub>10</sub>) are reported in the literature.

Review articles or compendiums of toxicity data (e.g., Ref. 6-2) often report LC<sub>Lo</sub>, LD<sub>Lo</sub>, TC<sub>Lo</sub>, or TD<sub>Lo</sub> values. These are the lowest reported values from the literature (either concentrations or doses) which cause either death or other toxic effects.

For LD or TD, the dosage units are usually given in quantity of toxicant per unit body weight (e.g., mg/kg). When dermal administration of the substance is used, results may be expressed as quantity of toxicant per unit area of skin (e.g., mg/cm<sup>2</sup>). For LC or TC, concentrations are generally listed as parts per million (ppm) in air on a volume/volume basis when the toxicant is a gas, or as weight of toxicant per volume of air (e.g., mg/m<sup>3</sup>) when the toxicant is an airborne liquid or solid.

Other important data are reported along with the toxicity data values, including the duration of the exposure, if the exposure was continuous or discontinuous, and the frequency of the exposure. For example, an experiment might require that mice be fed twice daily over a 6-week period with food dosed with the toxicant every other week. Complete reporting of experimental conditions is required so that tests may be accurately reproduced and data accurately compared.

## METHODOLOGY

The following discussion of the method employed in mammalian toxicity testing is divided into sections on general considerations, routes of toxicant administration, toxic effects which are commonly observed, and the test species which are often used for such testing.

### General Considerations

Mammalian toxicity testing is performed to determine the effects, both lethal and sub-lethal, of chemicals. Testing must be performed using strict procedures and protocol, including accurate dosing equipment, cleanliness, and minimal external stresses to the test animals. For example, rats which are housed singly develop high blood pressure (Ref. 6-3) which affects the metabolism of chemicals. Overcrowded conditions also can create stress.

Of utmost importance in mammalian toxicity testing is the existence of a control group of animals which is treated in exactly the same manner as the test group. The sole experimental variable between the two groups is the administration or non-administration of the toxicant.

### Toxicant Administration

Toxicants are administered either topically, via inhalation, or orally in many mammalian toxicity tests; however, other methods of internal administration are used (e.g., intravenously, intramuscularly, and intraperitoneally).

Topical administration is either to the eyes (ocular) or to the skin (dermal), which may be intact or abraded. These tests are used to determine both sub-lethal toxic effects (e.g., skin or eye irritation, systematic effects) and lethal toxic effects, either acute or chronic.

Administration of toxicants by inhalation is achieved by placing the animals in a test chamber whose atmosphere is dosed with the toxicant, via mask, or by cannulation (intubation of the respiratory tract). Lethal, sub-lethal, acute and chronic effects can be determined using this method of toxicant administration.

Oral administration of toxicants is achieved by dosing either the food or water, via capsule or tablet, or by intubation into the stomach. Lethal, sub-lethal, acute, and chronic effects can be determined using this method of toxicant administration.

The method chosen for administration of the toxicant will, in part, depend on the mode of entry of the toxicant most likely to be encountered in the environment. For example, polychlorinated biphenyls (PCBs) pose risk when absorbed through the skin and when ingested. Both modes of exposure are possible with PCBs since they are found in transformer oils and drinking water. Therefore, skin application and oral ingestion methods of administration are used in toxicity testing of PCBs.

### Toxic Effects

Sub-lethal or toxic effects of exposure to chemicals can be manifested in a number of ways and in a number of organs. Toxicants can irritate the skin or eyes (indicated by redness or bleeding). Exposure can produce tumors in or on the body which can be benign or malignant. The functioning of organs can decrease or increase. Exposure can result in aberrations in the offspring of those exposed (teratogenicity). Changes in behavior may be brought about after exposure to toxicants.

### Test Species

A wide variety of mammals are used in toxicity testing. Two of the most common species are mice and rats. These species are popular because individuals of known genetic background are easily obtained and they are relatively inexpensive. Cost is an important consideration since extensive testing can require thousands of animals.

Other mammalian species used in toxicity testing include:

Cat	Guinea Pig
Cattle	Hamster
Horse	Monkey
Dog	Pig
Goat	Rabbit
Sheep	Squirrel

### SIGNIFICANCE

Reportable quantities are assigned based on toxicity to nonhuman animals. This is necessitated by the fact that little in the way of reliable data exists on human toxicity from most chemicals. There are toxic effects which are not easily observed in animals, but clearly manifested in humans. For example, exposure to many chemicals can cause changes in behavior. It is difficult, if not impossible, to observe subtle behavior changes in animals, and therefore such toxic effects could be missed. Additionally, there is relatively little chronic toxicity data available in which the test species is exposed to small amounts of the toxicant over long periods of time, although such conditions are occasionally simulated. Such long-term studies are exceedingly costly to perform. In this report, less than a third of the substances have concrete evidence for chronic toxicity, and not all of such evidence will be adequate for RQ assignment.

Despite the limitations in the use of nonhuman mammalian toxicity data for predicting subtle effects in humans, the use of the gross effect (namely, death) and the resultant comparison of chemical toxic effects on the basis of lethal doses ( $LD_{50}$ s) has much to recommend it. Such values will generally fall in the same range for a wide variety of mammalian species, and may thus be extrapolated to humans with a high degree of certainty. Furthermore,  $LD_{50}$  values are replicable with the use of standard test protocols and standard strains of the various species. Finally, where accurate comparisons are important, test population sizes may be increased to improve the validity of the data from a statistical point of view.

The RQ strategy allows one to base decisions on factors other than mammalian toxicity, and to select RQ levels based on other factors, such as aquatic toxicity, carcinogenicity, ignitability, and reactivity, and to make further adjustments on the basis of biodegradation, hydrolysis, or photolysis. These factors may be used to assign RQs in the absence of mammalian toxicity data, or to assign RQs lower than that indicated by mammalian toxicity whenever appropriate.

#### REFERENCES

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## SECTION 7

### DATA MANAGEMENT SYSTEM

#### THE NIH/EPA CHEMICAL INFORMATION SYSTEM (CIS)

Fein-Marquart Associates, Inc., Baltimore, MD, conducts a program to design, develop, implement, install, and maintain the CIS for the EPA, the National Institutes of Health, and the National Bureau of Standards. The CIS is a collection of computerized data storage and retrieval modules for chemical information. Each of these modules is essentially a "stand-alone" system dealing with a particular aspect of chemistry. However, they are all prepared according to a standard set of CIS guidelines so that they can share the same utility software and communicate among each other. In this way it is relatively easy to conduct composite searches dealing with these various aspects of chemistry, and similarly to display, in association with retrieved compounds, information stored in the data bases associated with the various modules.

The modules (components) of the CIS are listed below, and the structure of the CIS is depicted in Figure 7-1.

SANSS	Structure and Nomenclature Search System
MSSS	Mass Spectral Search System
CRYST	X-Ray Crystallographic Search System
CNMR	Carbon 13 NMR Search System
MLAB	Mathematical Modeling Laboratory
CLAB	Cluster Analysis Laboratory
RTECS	Registry of Toxic Effects of Chemical Substances
NUCSEQ	Nucleotide Sequences Search System
OHM/TADS	Oil and Hazardous Materials/Technical Assistance Data System

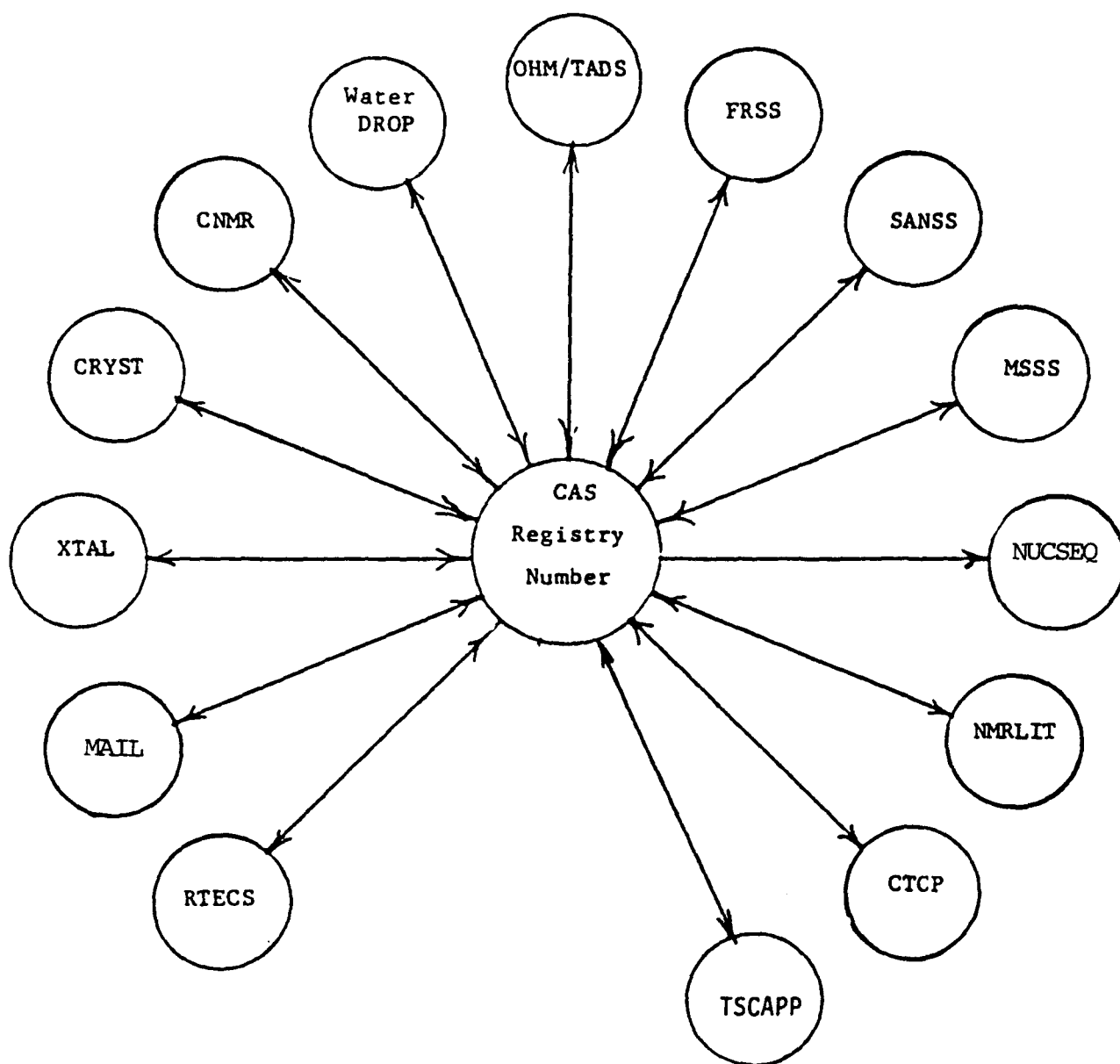


Figure 7-1. Structure of the CIS.

FRSS	Federal Register Search System
XTAL	Single Crystal Reduction and Search System
WDROP	Water Distribution Register of Organic Pollutants
NMRLIT	NMR Literature Search System
CTCP	Clinical Toxicity of Commercial Products Search System
TSCAPP	Toxic Substance Control Act Plant & Production Data
MAIL	MAIL System

The modules of the CIS communicate among themselves by stored lists of Registry Numbers, for the most part supplied by Chemical Abstracts Service. In the case of some modules, for example CTCP, WaterDROP, and Federal Register Search System, the retrievals are, more exactly, represented internally by "Citations," where each citation contains a specific reference to a compound (represented by its Registry Number). A given list of citations is automatically converted to a list of the pure Registry Numbers of all the compounds referenced in that list when it was generated. In some modules, where more than one "entry" for a Registry Number is possible, a subidentifier is appended to the Registry Number. As an example, there are cases when more than one crystalline form for a compound exists, and therefore, more than one entry for a compound might be found in a list of one or more Registry Numbers being generated and stored. For instance, within the Structure and Nomenclature Search System (SANSS) one might ask for all compounds containing a particular structural fragment, or with a name or synonym containing broad criteria. The answer to each such query is a stored file containing a list of the Registry Numbers for those compounds satisfying the criteria specified.

For essentially all the compounds in the CIS the following information is available:

- \* CAS Registry Number

- \* Structure

- \* The chemical name and molecular formula in accordance with the introductory sections of the Toxic Substances Control Act, Chemical Substances Inventory, Volume 1, May 1979
- \* CAS Index Name(s)
- \* A list of sources of further information
- \* Other names and synonyms by which the substances are commonly known in commerce and manufacturing

In addition, as described in the following sections, much additional information, e.g., mass spectrum, toxicity data, regulation, is also available for many of the compounds.

The following sections will discuss briefly the features of each of the CIS components that are most useful to the Reportable Quantities program. For an overview of CIS and descriptions of other components, as well as insight into other applications of the system, the reader should consult recent descriptive publications (G.W.A. Milne, C.L. Fisk, S.R. Heller, and R. Potenzzone, Jr., Science, 215, 371-375, 22 January 1982).

#### Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS)

OHM/TADS is a collection of interactive computer programs that allow searching of the EPA's Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS). This data system provides necessary technical support for the assessment of potential or actual dangers encountered as a result of the discharge of oil or hazardous substances. OHM/TADS contains data for any material which has been designated an oil or hazardous material by the EPA. Currently, there is information in the system for about 1100 substances. While the primary function of this data base is to provide emergency information to spill response team personnel, it can also be regarded as a

general source of diverse information on hazardous substances. OHM/TADS data has been gathered from the open literature.

OHM/TADS searches are based on the 126 subjects into which all information in the data base has been categorized. These subjects are generally referred to as "fields." For example, the MAT field contains the material name, and the DRK field contains the recommended drinking water limits. Every material in the data base has information in the MAT field, but information may not be available on every subject for the material of interest. Perhaps the necessary measurement has not been made; for example, the boiling point (BLP field) may not be known. One can list all of the information available for a particular chemical or restrict the listing to only the fields of interest.

OHM/TADS allows a search for materials with certain values of specified properties (for example, the specific gravity or vapor pressure) or ranges of those properties. OHM/TADS also provides recommended methods for disposing of spilled materials (the DIS field), and for notifying proper authorities (DSN field).

#### Structure and Nomenclature Search System (SANSS)

The SANSS module data base is designed to contain an entry for each compound included in the data bases associated with the other individual CIS components. Each such entry includes, as available: CAS Registry Number; systematic name (8th CI and/or 9th CI); synonyms and trade names; molecular formula; connection table, and references to other sources of information. Currently there are approximately 200,000 substances in the data base. One can query this system for compounds having a wide variety of characteristics. For example, one can search for all compounds having a specific structural fragment contained within it. To accomplish this, the user describes the two-dimensional structural fragment by means of simple typed commands. The system can also be searched on the basis of name (either complete or partial); ring system; specific functional groups; molecular formula (complete,

partial, or ranged); molecular weight, and atom count.

#### Acute Toxicity Data from the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS)

The search and retrieval system for the NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) is based on the NIOSH publication of the same name. Each quarter, a completely updated magnetic tape copy of the RTECS publication is processed, and the data base for the interactive search and retrieval system is replaced. Currently there is information in the system for almost 50,000 compounds.

The direct search allows the user to display, for a given list of compounds, the CAS Registry Number, the RTECS Registry Number, and the details of each published toxicity measurement for each compound, including literature references.

Alternatively, the user may ask for all entries relating to specific end effects (e.g., eye irritation) on specific classes of animals (e.g., rabbits) for specific means of application, having dosage within a given range. The result of such a query is a list of Registry Numbers that can then be used to display RTECS data or to obtain information from other modules of the CIS.

#### Clinical Toxicology of Commercial Products (CTCP)

CTCP is an on-line interactive data base based on the book of the same title by Drs. Gosselin, Hodge, Smith, and Gleason. In it is contained information about approximately 20,000 commercial products, consisting of their manufacturer, uses, and composition. For the chemicals comprising a product, the CAS Registry Number, concentration, and indication of toxicity (if applicable) are given. As any consumer knows, the composition of a product is subject to change from time to time, even if the trade name under which it is marketed remains the same. However, it is often critical to know the

composition of earlier versions of a specific product—for example, in the case where a child may have ingested the contents of an old bottle. Thus, prior formulations are retained whenever possible.

The data base may be searched against essentially all of its fields. For example, one might inquire about all compounds containing phosphoric acid that are used as fertilizers.

#### Toxic Substances Control Act Plant & Production Data (TSCAPP)

The TSCAPP data base is the production and plant site information associated with the TSCA Chemical Substance Inventory: Initial Inventory. This information was originally contained in two tape files in the CICIS—Chemical Production Information Tape, which is documented in NTIS Computer Products Data Sheet, Accession No. PB80-155153, EPA Report No. EPA/DE-80/005.

The TSCAPP data base contains two separate sets of entries: one of production information concerning the production of a single substance in a plant; another set of entries containing information about plants. These two sets of entries are accessed by different commands, but can be combined in various ways for display. For example, searches performed by CAS Registry Number will allow assessment of the total annual production of a given compound, and the manufacturing sites can be identified.

## SECTION 8

### DATA TABLES FOR CHEMICALS

Detailed data tables showing the basis for the proposed RQs for the chemicals following the SCP strategy as described in Section 2 are presented in Table 8-1. This list of chemicals are those hazardous substances designated under the CWA Sections 311(b)(4) and 307(a) and the hazardous air pollutants designated under CAA Section 112. (Substances designated under RCRA Section 3001 appear later in Section 9.) The tables include the data on aquatic toxicity, mammalian toxicity, chronic toxicity, ignitability, and reactivity upon which the choice of the proposed RQ is based. As discussed elsewhere in this report, many substances remain to be assessed for chronic toxicity or carcinogenicity by the ECAO or CAG, respectively, and these substances are appropriately flagged "CHRON TBA" or "CARC TBA" in the column titled "Chronic Toxicity/Carcinogen-Note 4." In those cases where the chronic toxicity assessments are not yet available, RQs have been suggested based on data using other factors. However, no RQ is proposed in Table 2-1 (or the NPRM) for those substances that must still be assessed. No RQs have yet been assessed based on carcinogenicity.

All notes listed in the table are located at the end of this section, and all abbreviations used are discussed there in some length. For those not concerned with the complete development of the data in Table 8-1, the most common abbreviations are as follows:

(X), (A), (B), (C), (D) - RQ Categories, 1, 10, 100, 1000, and 5000 lbs, respectively

CARC TBA - To be assessed for carcinogenicity

CHRON TBA - To be assessed for chronic toxicity

CARC\* - Known carcinogen, but RQ already as low as possible (1 lb) on some other basis

CHRON\* - Known chronic toxicant, but RQ already as low as possible (1 lb) on some other basis

F - Flash point

B - Boiling Point

R - Reactivity

311 - The RQ was established under the regulations from CWA Section 311

AQTX - Aquatic toxicity

CTX - Chronic toxicity

BHP - Biodegradation, hydrolysis, and photolysis

ICR - Ignitability, corrosivity, and reactivity

CS - The RQ was assigned on the basis of chemical similarity to another substance, in the absence of data for the primary criteria

Max - Maximum possible RQ assignment

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Acenaphthene (83-32-9)		X		10-1 (B)		CARC TBA	Solid		100	AQTX	Notes 9 10 11
Acenaphthylene (208-96-8)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
Acetaldehyde (75-07-0)	X			100-10 (C)	Rat-ori:1930 (D)		F -38 (B) B 70 May polymerize	1000	1000	BHP	Note 90
Acetic acid (64-19-7)	X			100-10 (C)	Rat-ori:3310 (D) Rat-ihl/LC10:16000/4H (D)		F 103 (D) B 245	1000	5000	BHP	Note 90
Acetic anhydride (108-24-7)	X			100-10 (C)	Rat-ori:1780 (D)		F 120 (D) B 284	1000	5000	BHP	Note 90
Acetone cyanohydrin (75-86-5)	X			1-0.1 (A)	Rat-ori:17 (C)		F 165 (Max) B 248	10	10	311	
Acetyl bromide (506-96-7)	X			500-100 (D)			R:NH <sub>3</sub> (D)	5000	5000	311,R	Note 13
Acetyl chloride (75-36-5)	X			100-10 (C)			R:NH <sub>3</sub> (D) F 40 (C) B 124	5000	5000	BHP	Notes 14 15 90
Acrolein (107-02-8)	X	X		<0.1 (X)	Rat-ori:46 (C)	CHRON *	F -15 (C) B 125	1	1	311	
Acrylonitrile (107-13-1)	X	X		10-1 (B)	Rat-ori:82 (C)	CARC TBA CHRON TBA	F 32 (C) B 171	100	100	311	Notes 16 17
Adipic acid (124-04-9)	X			500-100 (D)	Rat-ori:3600 LD10 (D) Mus-ori:1900 (D)		F 385 (Max) B 509	5000	5000	311,T(ori)	
Aldrin (309-00-2)	X	X		<0.1 (X)	Rat-ori:39 (C)	CARC *	Solid	1	1	311	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Allyl alcohol (107-18-6)	X			10-1 (B)	Rat-orl:64 (C)	CT=34.8 (B)	F 70 (C) B 206	100	100	311,CTX	
Allyl chloride (107-05-1)	X			100-10 (C)	Rat-orl:64 LD <sub>50</sub> (C) Rat-ihl:290 ppm/8H LC <sub>50</sub> (C) Rbt-skn:2200 LD <sub>50</sub> (D)		F -25 (C) B 113	1000	5000	BHP,I	Note 90
Aluminum sulfate (10043-01-3)	X			500-100 (D)			Solid	5000	5000	311	
Ammonia (7664-41-7)	X			1-0.1 (A)	Rat-orl:350 (D)	CHRON TBA	F GAS B -28	100	10	AQTX	Note 10
Ammonium acetate (631-61-8)	X			500-100 (D)	[Rat-orl:3530] (D)		Solid	5000	5000	311	Note 18
Ammonium benzoate (1863-63-4)	X			500-100 (D)	[Rat-orl:4100] (D)		Solid	5000	5000	311	Note 18
Ammonium bicarbonate (1066-33-7)	X			500-100 (D)			Solid	5000	5000	311	
Ammonium bichromate (7789-09-5)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Ammonium bifluoride (1341-49-7)	X			500-100 (D)		CHRON TBA	R:HF (C)	5000	100	CS	Note 19
Ammonium bisulfite (10192-30-0)	X			500-100 (D)			Solid	5000	5000	311	
Ammonium carbamate (1111-78-0)	X			500-100 (D)			Solid	5000	5000	311	
Ammonium carbonate (506-87-6)	X			500-100 (D)	[Rat-orl:5000] (D)		Solid	5000	5000	311	Note 18
Ammonium chloride (12125-02-9)	X			500-100 (D)	Rat-orl:1650 (D)		Solid	5000	5000	311,T(orl)	
Ammonium chromate (7788-98-9)	X			100-10 (C)		CARC TBA	Solid	1000	1000	311	Note 11
Ammonium citrate, dibasic (3012-65-5)	X			500-100 (D)	[Rat-orl:11,700] (D)		Solid	5000	5000	311	Note 18
Ammonium fluoroborate (13826-83-0)	X			500-100 (D)			Solid	5000	5000	311	
Ammonium fluoride (12125-01-8)	X			500-100 (D)	[Rat-orl:180] (D)	CT=18.6 (C)	R:HF (C)	5000	100	CS	Notes 18 20
Ammonium hydroxide (1336-21-6)	X			100-10 (C)	Rat-orl:350 (D)		R:Cl <sub>2</sub> (D)	1000	1000	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Ammonium oxalate (6009-70-7)	X			500-100 (D)	[Rat-orl:375] (D)		Solid	5000	5000	311	Note 18
Ammonium silicofluoride (16919-19-0)	X			100-10 (C)	[Rat-orl:125] (D)		Solid	1000	1000	311	Note 18
Ammonium sulfamate (7773-06-0)	X			500-100 (D)	Rat-orl:1600 (D)		Solid	5000	5000	311	
Ammonium sulfide (12135-76-1)	X			500-100 (D)	[Mus-orl:2] (B)		F 72 (C) B 104 R:H <sub>2</sub> S	5000	100	T(orl)	Note 18
Ammonium sulfite (10196-04-0)	X			500-100 (D)	[Rbt-orl:2828] (D)		Solid	5000	5000	311	Note 18
Ammonium tartrate (14307-43-8)	X			500-100 (D)	[Rat-orl:1290] (D)		Solid	5000	5000	311	Note 18
Ammonium thiocyanate (1762-95-4)	X			500-100 (D)	Hmn-orl:430 TDlo (D) Mus-orl:330 LDlo (D)		Solid	5000	5000	311	
Ammonium thiosulfate (7783-18-8)	X			500-100 (D)			Solid	5000	5000	311	
Amyl acetate (628-63-7)	X			100-10 (C)	Rat-orl:6500 (D)		F 60 (C) B 300	1000	5000	BHP	Note 90
Aniline (62-53-3)	X			100-10 (C)	Rat-orl:440 (D) Rat-ihl LClo:250/4H (C)		F 158 B 364	1000	5000	BHP	Note 90
Anthracene (120-12-7)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
ANTIMONY AND COMPOUNDS		X									
Antimony (7440-36-0)		X				CHRON TBA	Solid		5000	Max	Notes 10 21
Antimony pentachloride (7647-18-9)	X			100-10 (C)	Rat-orl:1115 (D)		R:NH <sub>3</sub> (D)	1000	1000	311	Note 22
Antimony potassium tartrate (28300-74-5)	X			100-10 (C)	Rat-orl:115 (D)	CT=38.0 (B)	Solid	1000	100	CTX	
Antimony tribromide (7789-61-9)	X			100-10 (C)			Solid	1000	1000	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Antimony trichloride (10025-91-9)	X			100-10 (C)	Rat-ori:525 (D)		R:NH <sub>3</sub> (D)	1000	1000	311	Note 23
Antimony trifluoride (7783-56-4)	X			100-10 (C)			Solid	1000	1000	311	
Antimony trioxide (1309-64-4)	X			500-100 (D)		CT=18.4 (C)	Solid	5000	1000	CTX	
ARSENIC AND COMPOUNDS		X									
Arsenic (7440-38-2)		X	X			CARC TBA CHRON TBA	Solid		5000	Max	Notes 10 11 17 24
Arsenic disulfide (1303-32-8)	X			500-100 (D)		CARC TBA CHRON TBA	Solid	5000	5000	311	Notes 11 17
Arsenic pentoxide (1303-28-2)	X			10-1 (B)	Rat-ori:8 (B)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(ori)	Notes 11 17
Arsenic trichloride (7784-34-1)	X			10-1 (B)	Mus-ih11CLO:338/10M (C)	CARC TBA CHRON TBA	R:NH <sub>3</sub> (D)	5000	100	AQTX	Notes 11 25
Arsenic trioxide (1327-53-3)	X			10-1 (B)	Man-ori:1 (B) Rat-ori:20 (C)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(ori)	Note 17
Arsenic trisulfide (1303-33-9)	X			500-100 (D)		CARC TBA CHRON TBA	Solid	5000	5000	311	Notes 11 17
Asbestos (1332-21-4)		X	X			CARC TBA CHRON TBA	Solid		5000	Max	Notes 11 12
Barium cyanide (542-62-1)	X			<1 (A)			Solid	10	10	311	
Benz[a]anthracene (56-55-3)		X			Mus-skn:18 TD10 (C)	CARC TBA CHRON TBA	Solid		1000	T(skn)	
Benzene (71-43-2)	X	X	X	10-1 (B)	Rat-ori:3800 (D)	CARC TBA CHRON TBA	F 12 (C) B 176	1000	100	AQTX	Note 10
Benzidine (92-87-5)		X		10-1 (B)	Rat-ori:309 (D)	CARC TBA CHRON TBA	Solid		100	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Benzo[b]fluoranthene (205-99-2)		X				CARC TBA CHRON TBA			5000	Max	Notes 9 11 12
Benzo[k]fluoranthene (207-08-9)		X				CARC TBA			5000	Max	Notes 9 11 12
Benzo[ghi]perylene (191-24-2)		X				CARC TBA			5000	Max	Notes 9 11 12
Benzo[a]pyrene (50-32-8)		X				CARC TBA CHRON TBA	Solid		5000	Max	
Benzoic acid (65-85-0)	X			500-100 (D)	Rat-ori:2530 (D)		Solid F 250 (Max) B 480	5000	5000	311	
Benzonitrile (100-47-0)	X			100-10 (C)	Rat-ori:720 LD <sub>50</sub> (D) Rat-ihl:950 ppm/8H LC <sub>50</sub> (D) Rat-skn:1200 (D) Mus-ori:1400 (D)		F 167 B 376	1000	5000	BHP	Note 90
Benzoyl chloride (98-88-4)	X			100-10 (C)			F 162 (Max) B 387	1000	1000	311	Note 26
Benzyl chloride (100-44-7)	X			10-1 (B)	Rat-ori:1231 (D)	CARC TBA	F 153 (Max) B 354 Requires Stabilizer (B)	100	100	311,R	Notes 11 27
BERYLLIUM AND COMPOUNDS		X									
Beryllium (7440-41-7)		X	X		Hmn-ihl:300 mg/m <sup>3</sup> TC <sub>10</sub> (C)	CARC TBA CHRON TBA	Solid		1000	T(ihl)	Note 10
Beryllium chloride (7787-47-5)	X			100-10 (C)	Rat-ori:86 (C)	CARC TBA CHRON TBA	R:NH <sub>3</sub> (D)	5000	1000	AQTX, T(ori)	Notes 11 28

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Beryllium fluoride (7787-49-7)	X			500-100 (D)	Rat-orl:98 (C)	CARC TBA CHRON TBA	Solid	5000	1000	T(orl)	Note 11
Beryllium nitrate (13597-99-4)	X			500-100 (D)		CARC TBA CHRON TBA	Solid	5000	5000	311	Note 11
Bis (2-chloroethoxy) methane (111-91-1)		X			Rat-orl:65 (C)		F 230 (Max)		1000	T(orl)	
Bis (2-chloroethyl) ether (111-44-4)		X		1000-100 (D)	Rat-orl:75 (C)	CARC TBA	F 131 (D) B 353		1000	T(orl)	
Bis (2-chloroisopropyl) ether (108-60-1)		X			Rat-orl:240 (D)	CT=12 (C)	F 185 (Max)		1000	CTX	
Bis (2-ethylhexyl) phthalate (117-81-7)		X			Rat-orl:31 gm/kg (D)		F 420		5000	Max	Notes 17 29 30
Bromoform (75-25-2)		X		46-56 (C)	Mus-orl:1400 (D)	CT=25.8 (B)			100	CTX	
4-Bromophenyl phenyl ether (101-55-3)		X		1-0.1 (A)					10	AQTX	
Butyl acetate (123-86-4)	X			100-10 (C)	Rat-orl:14 gm/kg (D)		F 72 (C) B 260	5000	5000	BHP	Note 90
Butyl benzyl phthalate (85-68-7)		X		>1000 (D)			F 390 (Max) B 698		5000	Max	Note 29
n-Butyl phthalate (84-74-2)	X	X		10-1 (B)	Mus-orl:12000 (D)	CT=12.8 (C)	F 315 (Max) B 635	100	100	311	Note 30
Butylamine (109-73-9)	X			100-10 (C)	Rat-orl:500 (D)		F 10 (C) B 172	1000	5000	BHP	Note 90
Butyric acid (107-92-6)	X			1000-100 (D)	Rat-orl:2940 (D)		F 161 (Max) B 327	5000	5000	311	
CADMIUM AND COMPOUNDS		X									
Cadmium (7440-43-9)		X			Rat-orl:225 (D)	CARC TBA CHRON TBA	Solid		5000	T(orl)	Notes 10 11 17 31

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Cadmium acetate (543-90-8)	X			10-1 (B)		CARC TBA CHRON TBA	Solid	100	100	311	Notes 11 17
Cadmium bromide (7789-42-6)	X			10-1 (B)		CARC TBA CHRON TBA	Solid	100	100	311	Notes 11 17
Cadmium chloride (10108-64-2)	X			100-<1	Rat-ori: 88 (C)	CARC TBA CHRON TBA	Solid	100	100	311	Notes 11 17
Calcium arsenate (7778-44-1)	X			100-10 (C)	Rat-ori:20 (C)	CARC TBA CHRON TBA	Solid	1000	1000	311,T(ori)	Notes 11 17
Calcium arsenite (52740-16-6)	X			40 ppm (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Calcium carbide (75-20-7)	X			500-100 (D)			Solid, Inflames (A)	5000	10	I/R	Note 32
Calcium chromate (13765-19-0)	X			28 ppm (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Calcium cyanide (592-01-8)	X			1-0.1 (A)	Rat-ori:39 (C)		R:CN-	10	10	311	
Calcium dodecylbenzene sulfonate (26264-06-2)	X			100-10 (C)			Solid	1000	1000	311	
Calcium hypochlorite (7778-54-3)	X			10-1 (B)			Solid Strong oxidizer (A)	100	10	R	Note 33
Captan (133-06-2)	X			1-0.1 (A)	Rat-ori:10 gm/kg (D)	CHRON TBA	Solid	10	10	311	
Carbaryl (63-25-2)	X			10-1 (B)	Rat-ori:250 (D)		Solid	100	100	311	
Carbofuran (1563-66-2)	X			1-0.1 (A)	Hmn-ori:11 mg/kg (C) Hmn-skn:10 gm/kg Rat-ori:5300 ug/kg (B)		Solid	10	10	311	
Carbon disulfide (75-15-0)	X			1000-100 (D)	Hmn:ori LDlo:14 (C)	CHRON TBA	F -22 (C) B 115	5000	1000	T(ori),I	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Carbon tetrachloride (56-23-5)	X	X		100-10 (C)	Rat-ori:2800 (D)	CARC TBA CHRON TBA		5000	1000	AQTX	
Chlordane (57-74-9)	X	X		<0.1 (X)	Rat-skn:700 (D) Rbt-ori:100 (C)	CARC *	Solid	1	1	311	Note 17
CHLORINATED BENZENES		X									
Chlorobenzene (108-90-7)	X	X		10-1 (B)	Rat-ori:2910 (D)	CT=11.6 (C)	F 84 (C) B 270	100	100	311	
Hexachlorobenzene (118-74-1)		X			Rat-ori:10,000 (D)	CARC TBA CHRON TBA	Solid		5000	Max	Note 17
1,2,4-Trichlorobenzene (120-82-1)		X		10-1 (B)	Rat-ori:756 (D)	CT=12.6 (C)	F 222 (Max) B 415		100	AQTX	Note 17
CHLORINATED ETHANES		X									
Chloroethane (75-00-3)		X		>1000 (D)	Gpg-ihl:4000 ppm/45M LClo (D)	CHRON TBA	F -58 (B) B 54		100	I	
1,1-Dichloroethane (75-34-3)		X		160-320 (D)	Rat-ori:725 (D)	CHRON TBA	F 22 (C) B 135-138		1000	I	
1,2-Dichloroethane (107-06-2)	X	X		1000-100 (D)	Rat-ori:670 (D) Rat-ihl LClo:1000 ppm/4H (D) Mus-ori:600 LDlo (D)	CARC TBA CHRON TBA	F 56 (C) B 183	5000	1000	I	
Hexachloroethane (67-72-1)		X		10-1 (B)	Rat-ori:6000 (D)	CARC TBA CHRON TBA	Solid		100	AQTX	
1,1,2,2-Tetrachloroethane (79-34-5)		X		10-1 (B)	Rat-ihl LClo:1000/4H (D) Dog-ori LDlo:300 (D)	CARC TBA CHRON TBA			100	AQTX	Notes 10 17
1,1,1-Trichloroethane (71-55-6)		X		100-10 (C)	Rat-ori:10,300 (D) Rat-ihl LClo:1000 (D)	CT=2.0 (D)			1000	AQTX	
1,1,2-Trichloroethane (79-00-5)		X		100-10 (C)	Rat-ori:1140 (D) Rat-ihl LClo:500/8H (D)	CARC TBA CHRON TBA			1000	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
CHLORINATED NAPHTHALENES		X									
2-Chloronaphthalene (91-58-7)		X			Rat-ori:2078 (D) Mus-ori:886 (D)		Solid		5000	Max	
CHLORINATED PHENOLS		X									
2-Chlorophenol (95-57-8)		X		10-1 (B)	Rat-ori:670 (D) Mus-ori:670 (D)	CHRON TBA	F 147 (Max)		100	AQTX	
p-Chloro-m-cresol (59-50-7)		X			Rat-ori:500 mg/kg LD10 (D)		Solid		5000	T(ori)	Note 34
2,4-Dichlorophenol (120-83-2)		X		10-1 (B)	Rat-ori:580 (D) Mus-ori:1600 (D)	CHRON TBA	F 237 (Max) B 410		100	AQTX	
Pentachlorophenol (87-86-5)	X	X		<0.1 (X)	Rat-ori:50 (C) Rat-ihl:11.7 (B) Rat-skn:105 (D)	CHRON *	Solid	10	1	AQTX	Notes 10 17
2,4,6-Trichlorophenol (88-06-2)		X		1-0.1 (A)	Rat-ori:820 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Note 11
Chlorine (7782-50-5)	X			<1 (A)	Rat-ihl:293 ppm/1H LC50 (C) Mus-ihl:137 ppm/1H LC50 (C)			10	10	311	
CHLOROALKYL ETHERS		X									
Bis(2-chloroethoxy)methane (111-91-1)		X			Rat-ori:65 (C)		F 230 (Max)		1000	T(ori)	
Bis(2-chloroethyl)ether (111-44-4)		X		1000-100 (D)	Rat-ori:75 (C)	CARC TBA	F 131 (D) B 353		1000	T(ori)	
Bis(2-chloroisopropyl)ether (108-60-1)		X			Rat-ori:240 (D)	CT=12 (C)	F 185 (Max)		1000	CTX	
2-Chloroethylvinyl ether (110-75-8)		X		1000-100 (D)	Rat-ori:250 (D) Rat-ihl:250 ppm/4H LC10 (C)		F 80 (C) B 228		1000	T(ori), I	
Chlorobenzene (108-90-7)	X	X		10-1 (B)	Rat-ori:2910 (D)	CT=11.6 (C)	F 84 (C) B 270	100	100	311	
Chlorodibromomethane (124-48-1)		X			Mus-ori:800 (D)	CT=25.8 (B)			100	CTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
p-Chloro-m-cresol (59-50-7)		X			Rat-ori:500 mg/kg LD10 (D)		Solid		5000	T(ori)	Note 34
Chlorpethane (75-00-3)		X		>1000 (D)	Gpg-ihl:4000 ppm/45M LC10 (D)	CHRON TBA	F -58(B) B 54		100	I	
2-Chloroethylvinyl ether (110-75-8)		X		1000-100 (D)	Rat-ori:250 (D) Rat-ihl:250 ppm/4H LC10 (C)		F 80(C) B 228		1000	T(ori), I	
Chloroform (67-66-3)	X	X		100-10 (C)	Rat-ori:800 (D)	CARC TBA		5000	1000	AQTX	
2-Chloronaphthalene (91-58-7)		X			Rat-ori:2078 (D) Mus-ori:886 (D)		Solid		5000	Max	
2-Chlorophenol (95-57-8)		X		10-1 (B)	Rat-ori:670 (D) Mus-ori:670 (D)		F 147(Max)		100	AQTX	
4-Chlorophenyl phenyl ether (7005-72-3)		X							5000	Max,CS	Note 35
Chlorosulfonic acid (7790-94-5)	X			100-10 (C)			R:oleum(C)	1000	1000	311,R	Note 36
Chlorpyrifos (2921-88-2)	X			<0.1 (X)	Rat-ori:97 (C) Rat-ihl:78 (C) Rat-skn:202 (D)		Solid	1	1	311	
CHROMIUM AND COMPOUNDS		X									
Chromium (7440-47-3)		X				CHRON TBA	Solid		5000	Max	Notes 17 37
Chromic acetate (1066-30-4)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Chromic acid (11115-74-5)	X			100-10 (C)		CARC TBA CHRON TBA	Solid Strong oxidizer (A)	1000	10	I/R	Notes 11 17 33
Chromic sulfate (10101-53-8)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Chromous chloride (10049-05-5)	X			100-10 (C)	Rat-ori:1870 (D)	CHRON TBA	Solid	1000	1000	311	Note 17
Chrysene (218-01-9)		X			Mus-skn:3600 ug/kg TD10 (B)	CARC TBA CHRON TBA	Solid		100	T(skn)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Cobaltous bromide (7789-43-7)	X			100 (C)			Solid	1000	1000	311	Note 17
Cobaltous formate (544-18-3)	X			100 (C)			Solid	1000	1000	311	Note 17
Cobaltous sulfamate (14017-41-5)	X			100 (C)			Solid	1000	1000	311	Note 17
COPPER AND COMPOUNDS		X									
Copper (7440-50-8)		X			Hmn-ori:120 ug/kg TD10 (A)	CT=19.0(C)	Solid		1000	CTX	Notes 10 17 38
Coumaphos (56-72-4)	X			1-0.1 (A)	Rat-ori:16 (C) Rat-skn:860 (D) Mus-ori:28 (C) Rbt-ori:80 (C)		Solid	10	10	311	
Cresol (1319-77-3)	X			10-1 (B)	Rat-ori:1454 (D) Mus-ori:861 (D) Rbt-skn:2000 (D)	CHRON TBA	F 178- 187 (Max) B 376- 395	1000	100	AQTX	Note 39
Crotonaldehyde (4170-30-3) and (123-73-9)	X			10-1 (B)	Rat-ori:300 (D)		F 55(C) B 216	100	100	311	Notes 40 41
Cupric acetate (142-71-2)	X			10-1 (B)	Rat-ori:595 (D)	CT=15(C)	Solid	100	100	311	Note 17
Cupric acetoarsenite (12002-03-8)	X			10-1 (B)	Rat-ori:22 (C)	CARC TBA CHRON TBA	Solid	100	100	311	Notes 11 17
Cupric chloride (7447-39-4)	X			1-0.1 (A)		CHRON TBA	Solid	10	10	311	Note 17
Cupric nitrate (3251-23-8)	X			10-1 (B)		CT=14.0(C)	Solid	100	100	311	Note 17
Cupric oxalate (5893-66-3)	X			10-1 (B)			Solid	100	100	311	Note 17
Cupric sulfate (7758-98-7)	X			1-0.1 (A)	Rat-ori:300 (D)	CHRON TBA	Solid	10	10	311	Note 17
Cupric sulfate ammoniated (10380-29-7)	X			10-1 (B)		CT=14.5(C)	Solid	100	100	311	Note 17
Cupric tartrate (815-82-7)	X			10-1 (B)		CHRON TBA	Solid	100	100	311	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
CYANIDES (soluble salts and complexes), N.O.S. (57-12-5)		X		[1-0.1(A)]			Solid	[10]	10	311	Notes 42 43
Cyanogen chloride (506-77-4)	X			<1 (A)	Mus-ihl:780 mg/m <sup>3</sup> /7.5M LC10 (D) Dog-ihl:800 mg/m <sup>3</sup> /7.5M LC10 (D) Rbt-ihl:3000 ppm/2M LC10 (D)		R:CN-	10	10	311	
Cyclohexane (110-82-7)	X			100-10 (C)	Rat-ori:29820 (D) Mus-ori:1297 (D)		F -4 (C) B 179	1000	1000	311,I	
2,4-D Acid (94-75-7)	X			10-1 (B)	Hmn-ori:80 (C) Rat-ori:370 (D) Rat-skn:1500 (D) Mus-ori:368 (D) Dog-ori:100 (C)	CT=16.4 (C)	Solid	100	100	311	
2,4-D Esters (94-11-1)	X			10-1 (B)	Rat-ori:700 (D) Mus-ori:541 (D) Gpg-ori:550 (D)	CT=16.4 (C)		100	100	311	
DDD (72-54-8)	X	X		<0.1 (X)	Rat-ori:113 (D) Rbt-skn:1200 (D)	CARC *	Solid	1	1	311	Note 17
DDE (72-55-9)		X		<0.1 (X) (1 datum)	Rat-ori:880 (D) Mus-ori:200 (D)	CARC *			1	AQTX	Note 17
DDT AND METABOLITES		X									
DDT (50-29-3)	X	X		<0.1 (X)	Rat-ori:113 (D) Rat-skn:1931 (D) Mus-ori:135 (D) Mky-ori:200 (D) Rbt-ori:250 (D)	CARC *	Solid	1	1	311	Note 17
Diazinon (333-41-5)	X			<0.1 (X)	Rat-ori:76 (C) Rat-skn:455 (D) Mus-ori:85 (C) Rbt-skn:400 (D)			1	10	BHP	Note 90

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Dibenz[a,h]anthracene (53-70-3) (Dibenzo[a,h]anthracene)		X				CARC TBA CHRON TBA	Solid		5000	Max	
Di-n-butyl phthalate (84-74-2)	X	X		10-1 (B)	Mus-ori:12000 (D)	CHRON TBA	F 315 (Max) B 635	100	100	311	Note 30
Dicamba (1918-00-9)	X			100-10 (C)	Rat-ori:1040 (D) Mus-ori:1190 (D) Rbt-ori:2000 (D)		Solid	1000	1000	311	
Dichlobenil (1194-65-6)	X			100-10 (C)	Rat-ori:2710 (D) Mus-ori:2056 (D) Rbt-skn:1350 (D)		Solid	1000	1000	311	
Dichlone (117-80-6)	X			<0.1 (X)	Rat-ori:1300 (D) Rbt-skn:5000 (D)		Solid	1	1	311	
Dichlorobenzene (25321-22-6)	X			10-1 (B)		CT=9 (C)	F 150 (Max) B 345	100	100	311	Note 17
DICHLOROBENZENES		X									
1,2-dichlorobenzene (95-50-1)		X		10-1 (B)	Rat-ori:500 (D)	CT=8.8 (C)	F 155 (Max) B 357		100	AQTX	
1,3-dichlorobenzene (541-73-1)		X		10-1 (B)		CT=9 (C)	F 150 (Max)		100	AQTX	
1,4-dichlorobenzene (106-46-7)		X		10-1 (B)	Rat-ori:500 (D)	CT=9.0 (C)	F 150 (Max) B 345		100	AQTX	
DICHLOROBENZIDINE		X									
3,3'-Dichlorobenzidine (91-94-1)		X			Rat-ori LDlo:4740 mg/kg (D)	CARC TBA CHRON TBA	Solid		5000	Max	Note 17
Dichlorobromomethane (75-27-4)		X			Mus-ori:450 (D)				5000	T(ori)	
1,1-Dichloroethane (75-34-3)		X		160-320 (D)	Rat-ori:725 (D)	CHRON TBA	F 22 (C) B 135-138		1000	I	
1,2-Dichloroethane (107-06-2)	X	X		1000-100 (D)	Rat-ori:670 (D) Rat-ihl LClo:1000 ppm/4H (D) Mus-ori:600 LDlo (D)	CARC TBA CHRON TBA	F 56 (C) B 183	5000	1000	I	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
DICHLOROETHYLENES		X									
1,1-Dichloroethylene (75-35-4)	X	X		1000-100 (D)	Rat-ori:200 (D) Mus-ihl LC50:98 ppm/22H (C)	CARC TBA CHRON TBA	F 0 (B) B 99	5000	100	I	Note 44
1,2-trans-Dichloroethylene (156-60-5)		X			Mus-ihl LC10:75,000/2H	CT=10.5 (C)	F 36 (C) B 119		1000	I, CTX	
2,4-Dichlorophenol (120-83-2)		X		10-1 (B)	Rat-ori:580 (D) Mus-ori:1600 (D)	CT=11.9 (C)	F 237 (Max) B 410		100	AQTX	
Dichloropropane (26638-19-7)	X			100-10 (C)	Rat-ori:1900 (D) Rat-ihl LC10:1500/4H (D)		F 60 (C) B 205	5000	1000	AQTX, I, CS	Note 45
1,2-Dichloropropane (78-87-5)		X		100-10 (C)	Rat-ori:1900 (D) Rat-ihl LC10:1500/4H (D)		F 60 (C) B 205		1000	AQTX, I	
Dichloropropane - Dichloropropene mixture (8003-19-8)	X			>100 (D)	Rat-ori:140 (D) Mus-ori:300 (D) Rbt-skn:2100 (D)			5000	100	AQTX	Note 46
Dichloropropene(s) (26952-23-8)	X			500-100 (D)				5000	100	AQTX	Note 47
1,3-Dichloropropene (542-75-6)		X		10-1 (B)	Rat-ori:250 (D)		F 95 (C) B 219		100	AQTX	
2,2-Dichloropropionic acid (75-99-0)	X			500-100 (D)	Rat-ori:970 (D)		Solid	5000	5000	311	
Dichlorvos (62-73-7)	X			1-0.1 (A)	Rat-ori:56 (C)			10	10	311	
Dieldrin (60-57-1)	X	X		<0.1 (X)	Rat-ori:46 (C)	CARC *	Solid	1	1	311	Note 17
Diethylamine (109-89-7)	X			100-10 (C)	Rat-ori:540 (D)		F -9 (C) B 134	1000	1000	311, I	
Diethyl phthalate (84-66-2)		X		(1.2-10) (B)	Rbt-ori LD10:1000 mg/kg (D)	CT=4 (D)	F 322		100	AQTX	Notes 30 48
Dimethylamine (124-40-3)	X			100-10 (C)	Rat-ori:698 (D) Mus-ori:316 (D) Rbt-ori:240 (D)	CHRON TBA	F GAS (B) B 45	1000	100	I	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
2,4-Dimethylphenol (105-67-9)		X		10-1 (B)	Rat-ori:3200 (D)		Solid		100	AQTX	Note 10
Dimethyl phthalate (131-11-3)		X			Rat-ori:6900 (D)		F 295 (Max) B 540		5000	Max	Notes 29 30
Dinitrobenzene (25154-54-5)	X			12.7 (C)		CT=28.7 (B)	Solid	1000	100	CTX	
4,6-Dinitro-o-cresol (534-52-1)		X		10-1 (B)	Rat-ori:10 (B) Rat-skn:200 (D) Mus-ori:47 (C)	CT=39.2 (B)	Solid		100	AQTX, CTX, T(ori)	
Dinitrophenol (25550-58-7)	X			1-10 (B)	Rat-ori:30 (C)	CT=30 (B)	Solid	1000	100	AQTX, CTX, CS	Note 49
2,4-Dinitrophenol (51-28-5)		X		1-10 (B)	Rat-ori:30 (C)	CT=30 (B)	Solid		100	AQTX, CTX	
Dinitrotoluene (25321-14-6)	X	X		100-10 (C)		CT=29.7 (B)	Solid	1000	100	CTX	
2,4-Dinitrotoluene (121-14-2)		X		100-10 (C)	Rat-ori:268 (D)	CT=29.7 (B)	F 404 (Max) B 572		100	CTX	
2,6-Dinitrotoluene (606-20-2)		X		100-10 (C)	Rat-ori:177 (D) Mus-ori:621 (D)	CT=29.7 (B)	Solid		100	CTX	
Di-n-octyl phthalate (117-84-0)		X					F 420		5000	Max	Notes 12 29 30
DIPHENYLHYDRAZINE		X									
1,2-Diphenylhydrazine (122-66-7)		X		1-0.1 (A)	Rat-ori:301 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Notes 10 11 17
Diquat (85-00-7)	X			100-10 (C)	Rat-ori:231 (D) Mus-ori:233 (D)		Solid	1000	1000	311	Note 17
Disulfoton (298-04-4)	X			<0.1 (X)	Rat-ori:2 (B) Rat-skn:6 (B)	CHRON *	Solid	1	1	311	
Diuron (330-54-1)	X			10-1 (B)	Rat-ori:437 (D)		Solid	100	100	311	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Dodecylbenzenesulfonic acid (27176-87-0)	X			100-10 (C)				1000	1000	311	
ENDOSULFAN AND METABOLITES		X									
Endosulfan (115-29-7)	X	X		<0.1 (X)	Rat-ori:18 (C) Rat-skn:74 (D) Mus-ori:75 (C) Cat-ori:2 (B)	CHRON *	Solid	1	1	311	
alpha - Endosulfan (959-98-8)		X							1	311	Note 50
beta - Endosulfan (33213-65-9)		X							1	311	Note 50
Endosulfan sulfate (1031-07-8)		X					Solid		1	311	Note 50
ENDRIN AND METABOLITES		X									
Endrin (72-20-8)	X	X		<0.1 (X)	Rat-ori:3 (B) Rat-skn:12 (C) Mus-ori:1.37 (B)	CHRON *	Solid	1	1	311	Note 17
Endrin aldehyde (7421-93-4)		X				CHRON *			1	311	Notes 17 51
Epichlorohydrin (106-89-8)	X			100-10 (C)	Rat-ori:90 (C) Rat-ihl LClo:250 ppm/4H (C) Rat-skn LDlo:1000 (D)	CARC TBA CHRON TBA	F 91 (C) B 239	1000	1000	AQTX, T(ori), T(ihl), I	Note 11
Ethion (563-12-2)	X			1-0.1 (A)	Rat-ori:13 (C) Rat-skn:62 (D)	CHRON TBA		10	10	311	
Ethylbenzene (100-41-4)	X	X		100-10 (C)	Rat-ori:3500 (D)	CT=4.8 (D)	F 59 (C) B 277	1000	1000	311, I	
Ethylenediamine (107-15-3)	X			100-10 (C)	Rat-ori:1200 (D)		F 93 (C) B 241	1000	5000	BHP	Note 90
Ethylene dibromide (106-93-4)	X			100-10 (C)	Rat-ori:108 (D) Rbt-ori:55 (C)	CARC TBA		1000	1000	311	Note 11

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Ethylene dichloride (107-06-2)	X	X		1000-100 (D)	Rat-ori:670 (D)	CARC TBA CHRON TBA	F 56(C) B 183	5000	1000	I	Note 52
EDTA (60-00-4)	X			500-100(D)			Solid	5000	5000	311	
Ferric ammonium citrate (1185-57-5)	X			100-10 (C)			Solid	1000	1000	311	
Ferric ammonium oxalate (2944-67-4)	X			100-10 (C)			Solid	1000	1000	311	
Ferric chloride (7705-08-0)	X			100-10 (C)	Mus-ori:1278 (D)		Solid	1000	1000	311	
Ferric fluoride (7783-50-8)	X			10-1 (B)			Solid	100	100	311	
Ferric nitrate (10421-48-4)	X			100-10 (C)			Solid	1000	1000	311	
Ferric sulfate (10028-22-5)	X			100-10 (C)			Solid	1000	1000	311	
Ferrous ammonium sulfate (10045-89-3)	X			100-10 (C)			Solid	1000	1000	311	
Ferrous chloride (7758-94-3)	X			10-1 (B)			Solid	100	100	311	
Ferrous sulfate (7720-78-7)	X			100-10 (C)	Rat-ori:319 (D) Mus-ori:979 (D)		Solid	1000	1000	311	
Fluoranthene (206-44-0)		X		10-1 (B)	Rat-ori:2000 (D) Rbt-skn:3180 (D)	CARC TBA	Solid		100	AQTX	Notes 9 10 11
Fluorene (86-73-7)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
Formaldehyde (50-00-0)	X			100-10 (C)	Rat-ori:800 (D) Rat-ihl LClo:250 ppm/4H (C) Rbt-skn:270 (D)	CHRON TBA	F GAS(B) B -3	1000	100	I	
Formic acid (64-18-6)	X			100-175 (D)	Rat-ori:1210 (D) Mus-ori:1100 (D)		F 156(Max) B 213	5000	5000	311	
Fumaric acid (110-17-8)	X			500-100(D)	Rat-ori:10,700 (D)		Solid	5000	5000	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Furfural (98-01-1)	X			100-10 (C)	Rat-ori:127 (D) Rat-ihl LC10:153 ppm/4H (C)		F 140 (D) B 322	1000	1000	311	
Guthion (86-50-0)	X			<0.1 (X)	Rat-ori:13 (C) Rat-skn:220 (D)		Solid	1	1	311	Note 17
HALOETHERS		X									
4-Bromophenyl phenyl ether (101-55-3)		X		1-0.1 (A)					10	AQTX	
4-Chlorophenyl phenyl ether (7005-72-3)		X							5000	Max	Note 35
HALOMETHANES		X									
Bromoform (75-25-2)		X		46-56 (C)	Mus-ori:1400 (D)	CT=25.8 (B)			100	CTX	
Dichlorobromomethane (75-27-4)		X			Mus-ori:450 (D)				5000	T(ori)	
Methyl bromide (74-83-9)		X		>1000 (D)	Rat-ihl:3120 ppm/15M LC10 (D) Rbt-ihl:2000 mg/m3/11H LC10 (D) Gpg-ihl:300 ppm/9H LC10 (C)				1000	T(ihl)	
Methyl chloride (74-87-3)		X		>1000 (D)	Rat-ihl:152000 mg/m <sup>3</sup> /30M LC50 (D) Mus-ihl:3146 ppm/7H LC50 (D)		F GAS (B) B -11		100	I	Note 61
Methylene chloride (75-09-2)		X		1000-100 (D)	Rat-ori:167 (D)	CT=10 (C)	F (NONFLAM) B 104		1000	CTX	
HEPTACHLOR AND METABOLITES		X									
Heptachlor (76-44-8)	X	X		<0.1 (X)	Rat-ori:40 (C) Rat-skn:119 (D)	CARC *	Solid	1	1	311	Note 17
Heptachlor epoxide (1024-57-3)		X			Rat-ori:62 (C)	CARC *	Solid		1	311	Notes 17 53
Hexachlorobenzene (118-74-1)		X			Rat-ori:10,000 (D)	CARC TBA CHRON TBA	Solid		5000	Max	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Hexachlorobutadiene (87-68-3)		X		<0.1 (X)	Rat-ori:90 (C)	CARC TBA CHRON TBA			1	AQTX	Notes 10 17
HEXACHLOROCYCLOHEXANE (Benzene Hexachloride) (all isomers) (N.A.)		X									Note 54
alpha - BHC (319-84-6)		X			Rat-ori:177 (D)	CARC *			1	311,CS	Note 54
beta - BHC (319-85-7)		X			Rat-ori:6000 (D)	CARC *			1	311,CS	Note 54
gamma - BHC (58-89-9)	X	X		<0.1 (X)	Rat-ori:76 (C) Rat-skn:500 (D)	CARC *	Solid	1	1	311	Notes 17 55
delta - BHC (319-86-8)		X			Rat-ori:1000 (D)	CARC *			1	311,CS	Note 54
Hexachlorocyclopentadiene (77-47-4)	X	X		<0.1 (X)	Rat-ori:113 (D) Rbt-skn:430 (D)	CHRON *	Solid	1	1	311	Note 17
Hexachloroethane (67-72-1)		X		10-1 (B)	Rat-ori:6000 (D)	CARC TBA CHRON TBA	Solid		100	AQTX	
Hydrochloric acid (7647-01-0) (Hydrogen chloride)	X			500-100 (D)	Hmn-ihl LClo:1300/30M (D) Rat-ihl LC50:3124/1H (D) Rbt-ori:900 (D)		R:NH <sub>3</sub> (D)	5000	5000	311, T(ori), T(ihl), R	
Hydrofluoric acid (7664-39-3) (Hydrogen fluoride)	X			500-100 (D)	Hmn-ihl LClo:50/30M (C) Rat-ihl LC50:1276/1H (D)	CT=20.5 (B)	R:oleum (C)	5000	100	CTX	
Hydrocyanic acid (74-90-8) (Hydrogen cyanide)	X			<1 (A)	Mus-ori:3.7 (B) Rat-ihl LC50:484/5M (D)		F 0(B) B 79 R:CN <sup>-</sup>	10	10	311	
Hydrosulfuric acid (7783-06-4) (Hydrogen sulfide)	X			10-1 (B)	Rat-ihl LC50:444 (D)	CHRON TBA	F GAS (B) B -76 R:H <sub>2</sub> S	100	100	311,I/R	
Indeno(1,2,3-cd)pyrene (193-39-5)		X				CARC TBA CHRON TBA	Solid		5000	Max	Notes 9 11 12

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Isophorone (78-59-1)		X		500-100 (D)	Rat-orl:2330 (D) Rat-ihl LClo:1840/4H (D) Rbt-skn:1500 (D)		F 184 (Max) B 419		5000	AQTX,T,I,	
Isoprene (78-79-5)	X			100-10 (C)		CHRON TBA	F -65 (B) B 93	1000	100	I/R	Note 56
Isopropanolamine dodecylbenzene sulfonate (42504-46-1)	X			100-10 (C)			Solid	1000	1000	311	
Kelthane (115-32-2)	X			500-100 (D)	Rat-orl:575 (D) Rat-skn:100 (D)		Solid	5000	5000	311,T(orl)	
Kepon (143-50-0)	X			<0.1 (X)	Rat-orl:95 (C) Rbt-orl:65 (C) Rbt-skn:345 (D)	CARC *	Solid	1	1	311	Note 17
LEAD AND COMPOUNDS		X									
Lead (7439-92-1)		X			Pgn-orl LDlo:160 (D)	CHRON TBA	Solid		5000	Max	Notes 10 17 57
Lead acetate (301-04-2)	X			500-100 (D)	Dog-orl LDlo:300 (D)	CARC TBA CHRON TBA	Solid	5000	5000	311	Notes 11 17
Lead arsenate (7784-40-9)	X			500-100 (D)	Rat-orl 100 (C) Rbt-orl 75 (C)	CARC TBA CHRON TBA		5000	1000	T(orl)	Notes 11 17
Lead chloride (7758-95-4)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	Note 17
Lead fluoborate (13814-96-5)	X			500-100 (D)	Rat-orl LDlo:50 (C)	CHRON TBA		5000	1000	T(orl)	Note 17
Lead fluoride (7783-46-2)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Lead iodide (10101-63-0)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	Note 17
Lead nitrate (10099-74-8)	X			500-100 (D)	Gpg-orl LDlo:500 (D)	CHRON TBA	Solid	5000	5000	311	Note 17
Lead stearate (7428-48-0)	X			500-100 (D)	Gpg-orl LDlo:6000 (D)	CHRON TBA		5000	5000	311	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Lead sulfate (15739-80-7)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	Note 17
Lead sulfide (1314-87-0)	X			>1000 (D)	Gpg-orl LD10:10 gm/kg (D)	CHRON TBA	R:H <sub>2</sub> S (B)	5000	100	I,R	
Lead thiocyanate (592-87-0)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Lindane (58-89-9)	X	X		<0.1 (X)	Rat-orl:76 (C) Rat-skn:500 (D)	CARC *	Solid	1	1	311	Note 17
Lithium chromate (14307-35-8)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Malathion (121-75-5)	X			10-<1 (A)	Rat-orl:885 (D) Rat-skn:4444 (D)		F >325	10	100	BHP	Note 90
Maleic acid (110-16-7)	X			500-100 (D)	Rat-orl:708 (D) Mus-orl:2400 (D) Rbt-skn:1560 (D)		Solid	5000	5000	311	
Maleic anhydride (108-31-6)	X			500-100 (D)	Rat-orl:481 (D) Mus-orl:465 (D) Rbt-skn:2620 (D)		F 215(Max) B 396	5000	5000	311,T(orl)	
Mercaptodimethur (2032-65-7)	X			0.64-1.4 (A)	Rat-orl:60 (C) Rat-skn:350 (D)		Solid	100	10	AQTX	Note 58
Mercuric cyanide (592-04-1)	X			<0.1 (X)	Rat-orl LD10:25 (C) Mus-orl:33 (C)	CHRON *	R:CN <sup>-</sup> (A)	1	1	311	Note 17
Mercuric nitrate (10045-94-0)	X			1-0.1 (A)		CHRON TBA	Solid	10	10	311	Notes 17 59
Mercuric sulfate (7783-35-9)	X			1-0.1 (A)	Rat-orl:57 (C) Mus-orl:40 (C)	CHRON TBA	Solid	10	10	311	Notes 17 59
Mercuric thiocyanate (592-85-8)	X			1-0.1 (A)		CHRON TBA	Solid	10	10	311	Notes 17 59
Mercurous nitrate (10415-75-5)	X			1-0.1 (A)	Rat-orl:297 (D) Mus-orl:388 (D)	CHRON TBA	Solid	10	10	311	Notes 17 59

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
MERCURY AND COMPOUNDS		X									
Mercury (7439-97-6)		X	X	<0.1 (X)	Rbt-ihl LC10:29 mg/m <sup>3</sup> /30H (B)	CHRON *			1	AQTX	Notes 10 17 60
Methoxychlor (72-43-5)	X			<0.1 (X)	Rat-ori:5000 (D)	CHRON *	Solid	1	1	311	Note 17
Methyl bromide (74-83-9)		X		>1000 (D)	Rat-ihl:3120 ppm/15M LC10 (D) Rbt-ihl:2000 mg/m <sup>3</sup> /1H LC10 (D) Gpg-ihl:300 ppm/9H LC10 (C)				1000	T(ihl)	
Methyl chloride (74-87-3)		X		>1000 (D)	Rat-ihl:152000 mg/m <sup>3</sup> /30M LC50 (D) Mus-ihl:3146 ppm/7H LC50 (D)	CHRON TBA	F GAS (B) B -11		100	I	Note 61
Methylene chloride (75-09-2)		X		1000-100 (D)	Rat-ori:167 (D)	CT=10 (C)	F (NONFLAM) B 104		1000	CTX	
Methylmercaptan (74-93-1)	X			10-1 (B)	Rat-ihl LC50:675 ppm (D)		F GAS (B) B 42.4	100	100	311, I	
Methylmethacrylate (80-62-6)	X			1000-100 (D)	Rat-ori LD10:8000 (D) Rat-ihl LC50:3750 ppm (D)	CT=16.8 (C)	F 50 (C) B 212	5000	1000	I, CTX	Note 62
Methyl parathion (298-00-0)	X			<1 (A)	Rat-ori:6 (B) Rat-ihl LC50:120 mg/m <sup>3</sup> /4H (C) Rat-skn:63 (D)	CHRON TBA		100	10	AQTX	
Mevinphos (7786-34-7)	X			<0.1 (X)	Rat-ori:3.7 (B) Rat-ihl LC50:14 ppm/1H (B) Rat-skn:4.2 (C)			1	10	BHP	Note 90
Mexacarbate (315-18-4)	X			100-10 (C)	Rat-ori:14 (C) Rat-skn:1500 (D)			1000	1000	311	
Monoethylamine (75-04-7)	X			100-10 (C)	Rat-ori LD10:400 (D) Rat-ihl LC10:3000 ppm/4H (D) Rbt-skn LD50:390 (D)	CHRON TBA	F <0 (B) B 62	1000	100	I	
Monomethylamine (74-89-5)	X			100-10 (C)			F GAS (B) B 21	1000	100	I	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Naled (300-76-5)	X			1-0.1 (A)	Rat-ori:250 (D) Rat-ihl:7.7 (B) Rat-skn:800 (D)		Solid	10	10	311	
Naphthalene (91-20-3)	X	X		10-1 (B)	Rat-ori:1780 (D)		F 174 (Max) B 424	5000	100	AQTX	Note 63
Naphthenic acid (1338-24-5)	X			10-1 (B)	Rat-ori:3000 (D)			100	100	311	
NICKEL AND COMPOUNDS		X									
Nickel (7440-02-0)		X			Gpg-ori LDlo:5 (B)	CARC TBA CHRON TBA	Solid		100	T(ori)	Notes 11 64
Nickel ammonium sulfate (15699-18-0)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Nickel chloride (7718-54-9)	X			500-100 (D)	Rat-ori:105 (D)	CHRON TBA	Solid	5000	5000	311	
Nickel hydroxide (12054-48-7)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Note 11
Nickel nitrate (14216-75-2)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Nickel sulfate (7786-81-4)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Nitric acid (7697-37-2)	X			100-10 (C)	Hmn-ori LDlo:430 (D) Rat-ihl LC50:65/4H (C)		R:NH <sub>3</sub> (D)	1000	1000	311, T(ihl)	Note 65
Nitrobenzene (98-95-3)	X	X		100-10 (C)	Rat-ori:640 (D) Rat-skn:2100 (D)		F 190 (Max) B 412	1000	1000	311	
Nitrogen dioxide (10102-44-0)	X			100-10 (C)	Rat-ihl LC50:88 ppm/4H (C) Gpg-ihl LC50:30 ppm/1H (B)		R=strong oxidizer (A)	1000	10	I/R	Note 33
Nitrophenol (25154-55-6)	X							1000	100	AQTX,CS	Note 66
2-Nitrophenol (88-75-5)		X			Rat-ori:2828 (D)		Solid		100	AQTX,CS	Note 66
4-Nitrophenol (100-02-7)		X		10-1 (B)	Rat-ori:350 (D)		Solid		100	AQTX	Note 10

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
NITROPHENOLS		X									
2,4-Dinitrophenol (51-28-5)		X		1-10 (B)	Rat-ori:30 (C)	CHRON TBA	Solid		100	AQTX	
4,6-Dinitro-o-cresol (534-52-1)		X		10-1 (B)	Rat-ori:10 (B) Rat-skn:200 (D) Mus-ori:47 (C)	CHRON TBA	Solid		100	AQTX, T(ori)	
2-Nitrophenol (88-75-5)		X			Rat-ori:2828 (D)		Solid		100	AQTX	Note 66
4-Nitrophenol (100-02-7)		X		10-1 (B)	Rat-ori:350 (D)	CHRON TBA	Solid		100	AQTX	Note 10
NITROSAMINES		X									
N-Nitrosodimethylamine (62-75-9)		X			Rat-ori:26 (C) Rat-ihl LC50:78/4H (C)	CARC TBA			1000	T(ori), T(ihl)	
N-Nitrosodiphenylamine (86-30-6)		X		10-1 (B)	Rat-ori:1650 (D)				100	AQTX	
N-Nitrosodi-n-propylamine (621-64-7)		X			Rat-ori:480 (D)	CARC TBA			5000	T(ori)	Note 11
N-Nitrosodimethylamine (62-75-9)		X			Rat-ori:26 (C) Rat-ihl LC50:78/4H (C)	CARC TBA			1000	T(ori), T(ihl)	
N-Nitrosodiphenylamine (86-30-6)		X		10-1 (B)	Rat-ori:1650 (D)				100	AQTX	
N-Nitrosodi-n-propylamine (621-64-7)		X			Rat-ori:480 (D)	CARC TBA			5000	T(ori)	Note 11
Nitrotoluene (1321-12-6)	X			100-10 (C)			F 223(Max) B 461	1000	1000	311	
Paraformaldehyde (30525-89-4)	X			100-10 (C)			Solid F 158(Max)	1000	1000	311	
Parathion (56-38-2)	X			<0.1 (X)	Rat-ori:2 (B) Rat-skn:6.8 (C)	CHRON *		1	1	311	
Pentachlorophenol (87-86-5)	X	X		<0.1 (X)	Rat-ori:50 (C) Rat-ihl:11.7 (B) Rat-skn:105 (D)	CHRON *	Solid	10	1	AQTX	Notes 10 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Phenanthrene (85-01-8)		X			Mus-ori:700 (D)		F 340 (Max) B 644		5000	Max	
Phenol (108-95-2)	X	X		100-10 (C)	Rat-ori:414 (D) Rat-skn:669 (D)	CHRON TBA	F 175 (Max) B 358	1000	1000	311	
Phosgene (75-44-5)	X			500-100 (D)	Rat-ihl LClo 50/30M (C)			5000	1000	T(ihl)	
Phosphoric acid (7664-38-2)	X			1000-100 (D)	Rat-ori:1530 (D) Rbt-skn:2740 (D)			5000	5000	311	
Phosphorus (7723-14-0)	X			<0.1 (X)	Dog-ori LDlo:50 (C)	CHRON *	Flammable Solid (A)	1	1	311	
Phosphorus oxychloride (10025-87-3)	X			100-10 (C)	Rat-ori:380 (D) Rat-ihl LC50:48/4H (C)		R:oleum (C)	5000	1000	R,AQTX	Note 67
Phosphorus pentasulfide (1314-80-3)	X			10-1 (B)	Rat-ori:389 (D)		R:H <sub>2</sub> S (B)	100	100	AQTX,R	Note 68
Phosphorus trichloride (7719-12-2)	X			100-10 (C)	Rat-ori:550 (D) Rat-ihl LC50:104/4H (C)		R=oleum (C)	5000	1000	AQTX,R	Note 69
PHthalate ESTERS		X									
Bis(2-ethylhexyl)phthalate (117-81-7)		X			Rat-ori:31 gm/kg (D)		F 420		5000	Max	Notes 17 29 30
Butyl benzyl phthalate (85-68-7)		X		>1000 (D)			F 390 (Max) B 698		5000	Max	Note 29
n-Butyl phthalate (84-74-2)	X	X		10-1 (B)	Mus-ori:12000 (D)	CHRON TBA	F 315 (Max) B 635	100	100	311	Note 30
Di-n-butyl phthalate (84-74-2)	X	X		10-1 (B)	Mus-ori:12000 (D)	CHRON TBA	F 315 (Max) B 635	100	100	311	Note 30
Diethyl phthalate (84-66-2)		X		(1.2-10) (B)	Rbt-ori LDlo:1000 mg/kg (D)	CHRON TBA	F 322		100	AQTX	Notes 30 48
Dimethyl phthalate (131-11-3)		X			Rat-ori:6900 (D)		F 295 (Max) B 540		5000	Max	Notes 29 30

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Di-n-octyl phthalate (117-84-0)		X					F 420		5000	Max	Notes 12 29 30
POLYCHLORINATED BIPHENYLS (PCBs) (1336-36-3)	X	X		<0.1 (X)		CARC *		10	1	AQTX	Notes 10 17
Aroclor 1016 (12674-11-2)		X				CARC *			1	AQTX	Note 70
Aroclor 1221 (11104-28-2)		X			Rat-ori:3980 (D)	CARC *			1	AQTX	Note 70
Aroclor 1232 (11141-16-5)		X			Rat-ori:4470 (D)	CARC *			1	AQTX	Note 70
Aroclor 1242 (53469-21-9)		X			Rat-ori:4250 (D)	CARC *			1	AQTX	Note 70
Aroclor 1248 (12672-29-6)		X			Rat-ori:11 gm/kg (D)	CARC *			1	AQTX	Note 70
Aroclor 1254 (11097-69-1)		X			Rat-ori:1295 (D)	CARC *			1	AQTX	Note 70
Aroclor 1260 (11096-82-5)		X			Rat-ori:1315 (D)	CARC *			1	AQTX	Note 70
POLYNUCLEAR AROMATIC HYDROCARBONS		X									
Acenaphthene (83-32-9)		X		10-1(B)		CARC TBA	Solid		100	AQTX	Notes 9 10 11
Acenaphthylene (208-96-8)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
Anthracene (120-12-7)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
Benz[a]anthracene (56-55-3)		X			Mus-skn:18 TD10 (C)	CARC TBA CHRON TBA	Solid		1000	T(skn)	
Benzo[b]fluoranthene (205-99-2)		X				CARC TBA CHRON TBA			5000	Max	Notes 9 11 12

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Benzo(k)fluoranthene (207-08-9)		X				CARC TBA			5000	Max	Notes 9 11 12
Benzo(ghi)perylene (191-24-2)		X				CARC TBA			5000	Max	Notes 9 11 12
Benzo[a]pyrene (50-32-8)		X				CARC TBA CHRON TBA	Solid		5000	Max	
Chrysene (218-01-9)		X			Mus-skn:3600 ug/kg TDlo (B)	CARC TBA CHRON TBA	Solid		100	T(skn)	
Dibenz[a,h]anthracene (53-70-3) (Dibenzo[a,h]anthracene)		X				CARC TBA CHRON TBA	Solid		5000	Max	
Fluoranthene (206-44-0)		X		10-1 (B)	Rat-orl:2000 (D) Rbt-skn:3180 (D)	CARC TBA	Solid		100	AQTX	Notes 9 10 11
Fluorene (86-73-7)		X				CARC TBA	Solid		5000	Max	Notes 9 11 12
Indeno(1,2,3-cd)pyrene (193-39-5)		X				CARC TBA CHRON TBA	Solid		5000	Max	Notes 9 11 12
Phenanthrene (85-01-8)		X			Mus-orl:700 (D)		F 340(Max) B 644		5000	Max	
Pyrene (129-00-0)		X							5000	Max	Note 12
Potassium arsenate (7784-41-0)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 10 11
Potassium arsenite (10124-50-2)	X			100-10 (C)	Rat-orl:14 (C) Rat-skn:150 (C)	CARC TBA CHRON TBA	Solid	1000	1000	311,T	Notes 11 17
Potassium bichromate (7778-50-9)	X			100-10 (C)	Dog-orl LDlo:2829 (D)	CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Potassium chromate (7789-00-6)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Potassium cyanide (151-50-8)	X			1-0.1 (A)	Rat-ori:10 (B) Rbt-ori:5 (B)		R:CN <sup>-</sup>	10	10	311	
Potassium hydroxide (1310-58-3)	X			100-10 (C)	Rat-ori:365 (D)		R:NH <sub>3</sub> (D)	1000	1000	311	Note 71
Potassium permanganate (7722-64-7)	X			100-1 (B)	Rat-ori:1090 (D)		Solid	100	100	311	
Propargite (2312-35-8)	X			1-0.1 (A)	Rat-ori:1480 (D) Rat-skn:250 (D)			10	10	311	
Propionic acid (79-09-4)	X			1000-100 (D)	Rat-ori:2500 (D) Rbt-skn:500 (D)		F 126 (D) B 297	5000	5000	311, I	
Propionic anhydride (123-62-6)	X			1000-100 (D)	Rat-ori:2360 (D)		F 145 (D) B 336	5000	5000	311	
Propylene oxide (75-56-9)	X			>1000 (D)	Rat-ori:930 (D) Rat-ihl LC10:4000/4H (D)		F -35 (B) B 95 R May polymerize	5000	100	I	Note 72
Pyrene (129-00-0)		X							5000	Max	Note 12
Pyrethrins (121-21-1) and (121-29-9)	X			100-10 (C)	Rat-ori:1200 (D)		Solid	1000	1000	311	Notes 17 73
Quinoline (91-22-5)	X			100-10 (C)	Rat-ori:331 (D) Rbt-skn:540 (D)		F 225 B 459	1000	5000	BHP	Note 90
Radionuclides*			X								
Resorcinol (108-46-3)	X			100-10 (C)	Rat-ori:301 (D)		Solid F 261 (Max) B 531	1000	5000	BHP	Note 90
SELENIUM AND COMPOUNDS		X									
Selenium (7782-49-2)		X			Rat-ihl LD10:33 mg/kg/8H (B)	CHRON TBA	Solid		100	† (ihl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Selenium oxide (7446-08-4)	X			SeO <sub>2</sub> =12 (168 TLm) (C)		CHRON TBA	Solid	1000	1000	311	Note 74
SILVER AND COMPOUNDS		X									
Silver (7440-22-4)		X			Mus-ori:100 (D)	CT=7.0 (C)	Solid		1000	CTX	Note 75
Silver Nitrate (7761-88-8)	X			<0.1 (X)	Mus-ori:50 (C)	CHRON *	Solid	1	1	311	
Sodium (7440-23-5)	X			100-10 (C)			Solid, Inflames (A)	1000	10	I/R	Note 76
Sodium arsenate (7631-89-2)	X			100-10 (C)	Rbt-ori LD10:12.5 (C)	CARC TBA CHRON TBA	Solid	1000	1000	311,T(ori)	Notes 11 17
Sodium arsenite (7784-46-5)	X			100-10 (C)	Rat-ori:41 (C) Rat-skn:150 (D)	CARC TBA CHRON TBA	Solid	1000	1000	311,T(ori)	Notes 11 17
Sodium bichromate (10588-01-9)	X			100-10 (C)	Rat-ori:50 (C)	CARC TBA CHRON TBA	Solid	1000	1000	311,T(ori)	Notes 11 17
Sodium bifluoride (1333-83-1)	X			500-100 (D)		CHRON TBA	R:HF (C) Solid	5000	100	CS	Note 77
Sodium bisulfite (7631-90-5)	X			500-100 (D)			Solid	5000	5000	311	
Sodium chromate (7775-11-3)	X			100-10 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311	Notes 11 17
Sodium cyanide (143-33-9)	X			1-0.1 (A)	Rat-ori:6.44 (B)		R:CN <sup>-</sup>	10	10	311	
Sodium dodecylbenzene sulfonate (25155-30-0)	X			100-10 (C)	Rat-ori:1260 (D)		Solid	1000	1000	311	
Sodium fluoride (7681-49-4)	X			500-100 (D)	Rat-ori:180 (D) Mus-ori LD10:97 (C) Dog-ori LD10:75 (C)	CT=18.0 (C)	Solid	5000	1000	CTX	
Sodium hydrosulfide (16721-80-5)	X			500-100 (D)				5000	5000	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Sodium hydroxide (1310-73-2)	X			100-10 (C)	Rbt-orl LDlo:500 (D)		R:NH <sub>3</sub> (D)	1000	1000	311	Note 78
Sodium hypochlorite (7681-52-9)	X			10-1 (B)				100	100	311	
Sodium methylate (124-41-4)	X			100-10 (C)			Solid	1000	1000	311	
Sodium nitrite (7632-00-0)	X			10-1 (B)	Rat-orl:85 (C)	CHRON TBA	Solid	100	100	311	
Sodium phosphate, dibasic (7558-79-4)	X			500-100 (D)			Solid	5000	5000	311	
Sodium phosphate, tribasic (7601-54-9)	X			500-100 (D)				5000	5000	311	
Sodium selenite (10102-18-8)	X			100-10 (C)	Rat-orl:7 (B) Mus-orl:7 (B)	CHRON TBA	Solid	1000	100	T(orl)	Note 17
Strontium chromate (7789-06-2)	X			100-10 (C)		CARC TBA	Solid	1000	1000	311	Notes 11 17
Strychnine and salts (57-24-9)	X			1-0.1 (A)	Rat-orl:16 (C)		Solid	10	10	311	Note 79
Styrene (100-42-5)	X			100-10 (C)	Rat-orl:5000 (D) Rat-ihl LClo:5000/8H (D) Mus-orl:316 (D)		F 90 (C) B 295 Requires inhibitor (C)	1000	1000	311, I/R	Note 80
Sulfuric acid (7664-93-9)	X			100-10 (C)	Rat-ihl LClo:178/7H (C) Rat-orl:2140 (D)		R:oleum (C)	1000	1000	311, T(ihl), R	
Sulfur monochloride (12771-08-3)	X			100-10 (C)			R:NH <sub>3</sub> (D)	1000	1000	311	Note 81
2,4,5-T acid (93-76-5)	X			10-1 (B)	Rat-orl:300 (D) Dog-orl:100 (D)		Solid	100	100	311	Note 30
2,4,5-T amines (2008-46-0)	X			10-1 (B)				100	100	311	Note 30
2,4,5-T esters (93-79-8)	X			10-1 (B)	Rat-orl:619 (D)			100	100	311	Note 30
2,4,5-T salts (13560-99-1)	X			10-1 (B)				100	100	311	Note 30

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
2,4,5-TP acid (93-72-1)	X			10-1 (B)	Rat-ori:650 (D)		Solid	100	100	311	Note 30
2,4,5-TP acid esters (32534-95-5)	X			10-1 (B)				100	100	311	Note 30
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (1746-01-6)		X		<0.1 (X)	Mus-ori:0.114 (A) Mus-skn LDlo:80 ug/kg (A) Dog-ori LDlo:3 (B)	CARC *			1	AQTX	Note 17
1,1,2,2-Tetrachloroethane (79-34-5)		X		10-1 (B)	Rat-ihl LClo:1000/4H (D) Dog-ori LDlo:300 (D)	CARC TBA CHRON TBA			100	AQTX	Notes 10 17
Tetrachloroethene (127-18-4) (Tetrachloroethylene)		X		100-10 (C)	Mus-ori:8100 (D) Rat-ihl LClo:4000/4H (D)	CARC TBA CHRON TBA			1000	AQTX	
Tetrachloromethane (56-23-5)	X	X		100-10 (C)	Rat-ori:2800 (D) Rat-ihl LClo:4000/4H (D) Rat-skn:5070 (D)	CARC TBA CHRON TBA		5000	1000	AQTX	Note 82
TDE (72-54-8)	X	X		<0.1 (X)	Rat-ori:113 (D)	CARC *	Solid	1	1	311	Note 17
Tetraethyl lead (78-00-2)	X			10-1(B)	Rat-ori LDlo:17 (C) Rat-ihl LClo:850 mg/m <sup>3</sup> /60M (D)	CHRON TBA	F 200(Max)	100	100	311	Note 17
Tetraethyl pyrophosphate (107-49-3)	X			10-1(B)	Rat-ori:0.5 (A) Rat-skn:2.4 (B)	CHRON TBA		100	10	T(ori)	
THALLIUM AND COMPOUNDS		X									
Thallium (7440-28-0)		X			Rat-ori:15.8 (C) Mus-ori:16-29 (C)	CHRON TBA	Solid		1000	T(ori)	Notes 10 17 30 83
Thallium(I)sulfate (7446-18-6)	X			100-10(C)	Mus-ori:29 (C)	CHRON TBA	Solid	1000	1000	311,T(ori)	Notes 17 30
Toluene (108-88-3)	X	X		100-10 (C)	Rat-ori:5000 (D) Rat-ihl LClo:4000/4H (D)	CT=7.0(C) B 231	F 40(C) B 231	1000	1000	311,I,CTX	
Toxaphene (8001-35-2)	X	X		<0.1 (X)	Rat-ori:40 (C) Rat-skn:600 (D) Dog-ori:15 (C)	CARC *	Solid	1	1	311	Note 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
1,2,4-Trichlorobenzene (120-82-1)		X		10-1 (B)	Rat-orl:756 (D)	CT=12.6 (C)	F 222 (Max) B 415		100	AQTX	Note 17
Trichlorfon (52-68-6)	X			100-10 (C)	Rat-orl:450 (D)	CHRON TBA	Solid	1000	1000	311	
1,1,1-Trichloroethane (71-55-6)		X		100-10 (C)	Rat-orl:10,300 (D) Rat-ihl LClo:1000 (D)	CT=2.0 (D)			1000	AQTX	
1,1,2-Trichloroethane (79-00-5)		X		100-10 (C)	Rat-orl:1140 (D) Rat-ihl LClo:500/8H (D)	CARC TBA CHRON TBA			1000	AQTX	
Trichloroethylene (79-01-6)	X	X		100-10 (C)	Rat-orl:4920 (D)	CARC TBA CHRON TBA	F 90 (C) B 188	1000	1000	AQTX, I	
Trichlorophenol (25167-82-2)	X			1-0.1 (A)		CARC TBA	Solid	10	10	311	
2,4,6-Trichlorophenol (88-06-2)		X		1-0.1 (A)	Rat-orl:820 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Note 11
Triethanolamine dodecylbenzene sulfonate (27323-41-7)	X			100-10 (C)			Solid	1000	1000	311	
Triethylamine (121-44-8)	X			100-10 (C)	Rat-orl:460 (D) Rat-ihl LClo:1000/4H (D) Rbt-skn:570 (D)		F 20 (C) B 193	5000	5000	BHP	Note 90
Trimethylamine (75-50-3)	X			100-10 (C)		CHRON TBA	F GAS (B) B 38	1000	100	I	
Uranyl acetate (541-09-3)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Uranyl nitrate (10102-06-4)	X			500-100 (D)		CHRON TBA	Solid	5000	5000	311	
Vanadium pentoxide (1314-62-1)	X			100-10 (C)	Rat-orl:10 (C)	CHRON TBA	Solid	1000	1000	311, T (orl)	
Vanadyl sulfate (27774-13-6)	X			100-10 (C)		CHRON TBA		1000	1000	311	
Vinyl acetate (108-05-4)	X			100-10 (C)	Rat-orl:2920 (D) Rat-ihl LClo:4000/4H (D)		F 18 (C) B 161	1000	5000	BHP	Note 90
Vinyl chloride (75-01-4)		X	X	>1000 (D)	Rat-orl:500 (D) Gpg-ihl LClo:20/30M (B)	CARC TBA CHRON TBA	F GAS (B) B 7		100	I, T (ihl)	Note 84

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Vinylidene chloride (75-35-4)	X	X		1000-100 (D)	Rat-ori:200 (D)	CARC TBA CHRON TBA	F 0(B) B 99	5000	100	I	Note 85
Xylene (1330-20-7)	X			100-10 (C)	Rat-ori:4300 (D) Rat-ihl LC50:5000/4H (D)		F 81- 90 (C) B 281- 292	1000	1000	311,I	Note 86
Xylenol (1300-71-6)	X			100-10 (C)				1000	1000	311	
ZINC AND COMPOUNDS		X									
Zinc (7440-66-6)		X				CHRON TBA	Solid F 186 (Max) B 413		5000	Max	Notes 10 17 87
Zinc acetate (557-34-6)	X			100-10 (C)	Rat-ori:2510 (D)	CHRON TBA	Solid	1000	1000	311	Note 17
Zinc ammonium chloride (52628-25-8)	X			500-100(D)		CHRON TBA	Solid	5000	5000	311	Note 17
Zinc borate (1332-07-6)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Zinc bromide (7699-45-8)	X			500-100(D)		CHRON TBA	Solid	5000	5000	311	Note 17
Zinc carbonate (3486-35-9)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Zinc chloride (7646-85-7)	X			500-100(D)	Rat-ori:350 (D)	CHRON TBA	Solid	5000	5000	311	Note 17
Zinc cyanide (557-21-1)	X			1-0.1 (A)		CHRON TBA	Solid	10	10	311	Note 17
Zinc fluoride (7783-49-5)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Zinc formate (557-41-5)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Zinc hydrosulfite (7779-86-4)	X			100-10 (C)		CHRON TBA	Solid	1000	1000	311	Note 17
Zinc nitrate (7779-88-6)	X			500-100(D)		CHRON TBA	Solid	5000	5000	311	Note 17
Zinc phenolsulfonate (127-82-2)	X			500-100(D)		CHRON TBA	Solid	5000	5000	311	Note 17
Zinc phosphide (1314-84-7)	X			100-10 (C)	Rat-ori:40 (C)	CHRON TBA	R:PH <sub>3</sub> (B)	1000	100	R	Note 88

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 8-1 COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART 1 - CHEMICALS

Substance (CAS Registry No.) (Note 1)	CWA 311 (b) (2)	CWA 307a	CAA 112	Aquatic Toxicity (Note 2)	Mammalian Toxicity (Note 3)	Chronic Toxicity Carcinogen (Note 4)	ICR (Note 5)	311 RQ Note 6	Suggested RQ (Note 7)	Basis for Suggestion (Note 8)	Comments
Zinc silicofluoride (16871-71-9)	X			500-100 (D)	Rat-oral LD <sub>50</sub> :100 (D)	CHRON TBA	Solid	5000	5000	311,T(oral)	Note 17
Zinc sulfate (7733-02-0)	X			100-10 (C)	Rat-oral LD <sub>50</sub> :2200 (D) Mus-oral:1891 (D)	CHRON TBA	Solid	1000	1000	311	Note 17
Zirconium nitrate (13746-89-9)	X			500-100 (D)	Rat-oral:2290 (D)		Solid	5000	5000	311	
Zirconium potassium fluoride (16923-95-8)	X			500-100 (D)	Mus-oral:98 (C)		Solid	5000	1000	T(oral)	
Zirconium sulfate (14644-61-2)	X			500-100 (D)	Rat-oral:3500 (D)		Solid	5000	5000	311	
Zirconium tetrachloride (10026-11-6)	X			500-100 (D)	Rat-oral:1688 (D) Mus-oral:665 (D)		R:NH <sub>3</sub> (D)	5000	5000	311, T(oral), R	Note 89

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

NOTES FOR COMPREHENSIVE HAZARDOUS SUBSTANCES LIST  
PART I - CHEMICALS

NOTE 1: The materials which appear on this comprehensive hazardous substances list (Table 8-1) are those chemicals which comprise Part I of the CERCLA 101.14 list. At the present time these include the following: 297 chemicals designated under Section 311(b)(4) of the Clean Water Act (40CFR117); 126 specific chemicals (priority pollutants) designated under Section 307(a) of the Clean Water Act; and finally 6 chemicals (all of which are duplicates already listed under Section 307) designated under Section 112 of the Clean Air Act (proposed 40CFR61). No entries have been listed under the Toxic Substances Control Act (TSCA).

NOTE 2: Aquatic Toxicity, unless specifically noted otherwise, is given as the TL<sub>M</sub> 96 (The 96-Hour Median Threshold Limit) for aquatic species. TL<sub>M</sub> 96 is that concentration of the material dissolved in water, in parts per million (ppm) or milligrams/liter (mg/l) (which is equivalent) that will kill 50% of the test organism population in 96 hours. Each TL<sub>M</sub> 96 entry is followed by a letter indicating the reportable quantity category to which it corresponds, on the following scale:

<u>TL<sub>M</sub> 96</u>	<u>RQ (Pounds)</u>
<0.1	X (1)
0.1-1	A (10)
1-10	B (100)
10-100	C (1000)
100-500	D (5000)

Note that TL<sub>M</sub> and LC<sub>50</sub> (that is, Lethal Concentration which will kill 50% of the test population) are identical, as long as the time period is the same.

Aquatic toxicity data are taken from the following sources:

- A. The reportable quantities assigned under Section 311 of the Clean Water Act, as given in 40CFR117.3 (44FR10270-10283, February 16, 1979). The detailed listing of aquatic toxicities that form the basis for these assignments is found in report No. EPA440/9-75/009, "Supplement to Document Development: Hazardous Substances Regulations, Section 311 of the Federal Water Pollution Control Act as Amended 1972," November 1975 (PB 258514).
- B. "The Registry of the Toxic Effects of Chemical Substances," RTECS, accessed as a machine-searchable data base via the EPA/NIH Chemical Information System (CIS). Latest update of this data base was January 1981. RTECS is available in hardcopy, the latest being DHHS (NIOSH)

Publication NO. 8-111, "1979 Registry of the Toxic Effects of Chemical Substances," Volumes 1 and 2, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, September 1980.

RTECS draws its aquatic toxicity data from "Water Quality Characteristics of Hazardous Materials," by Dr. Roy Hahn, Jr. and Paul Jensen, Texas A&M University, College Station, TX, 77843, 1974.

- C. Publication 2-A, "Water Quality Criteria," Second Edition, Jack Edward McKee and Harold V. Wolf (Editors). State of California, The Resources Agency of California, State Water Quality Control Board, 1963.
- D. "Handbook of Environmental Data on Organic Chemicals," Karel Verschueren, Van Nostrand Reinhold Company, New York, NY, copyright 1977 by Litton Educational Publishing, Inc.
- E. The "Oil and Hazardous Materials Technical Assistance Data Base" (OHMTADS), accessed as a machine-searchable data base via the EPA/NIH Chemical Information System (CIS).
- F. The 1980 Ambient Water Quality Criteria Documents for 64 toxic pollutants or pollutant categories, published pursuant to Section 304(a)(1) of the Clean Water Act (45FR231).
- G. "Aquatic Toxicity Testing as Fundament for a Spill Prevention Program", M. W. Curtis, C. M. Curran, and C. H. Ward, reported in the Proceedings of the 1980 National Conference on Control of Hazardous Materials Spills. (May 13-15, 1980, Louisville, Kentucky).

NOTE 3: Three types of mammalian toxicity are entered in this column, depending on the route of administration: oral, dermal (skin absorption) or inhalation. The details of the entries are as follows:

- A. Oral Toxicity: Unless otherwise identified, entries are those showing the acute oral LD<sub>50</sub> (Dose Lethal to 50% of the test animal population) in milligrams per kilogram of body weight (mg/kg). Test species are coded using the RTECS convention, as follows:

HMN = human  
RAT = rat  
MUS = mouse  
GPG = guinea pig  
DOG = dog  
RBT = rabbit

Thus the entry "Rat-orl:60" indicates an oral LD<sub>50</sub> of 60 mg/kg for rats.

B. Dermal Toxicity: These entries are indicated by the abbreviation "skn" immediately following the species code, and are again given as the acute LD<sub>50</sub> (Dose Lethal to 50% of the test animal population) in milligrams per kilogram of body weight (mg/kg). Test species are coded the same as given under Oral Toxicity, above. Thus the entry "Rat-skn:60" indicates dermal LD<sub>50</sub> of 60 mg/kg for rats.

C. Inhalation Toxicity: These entries are indicated by the abbreviation "ihl" immediately following the species code. Data are presented in terms of the LC<sub>50</sub> (Concentration in air Lethal to 50% of the test animal population) in parts per million (ppm). The exposure time is also given (H = hours, M = minutes), when available. Test species are coded the same as given under Oral Toxicity, above. Thus the entry "Rat-ihl:60/4H" indicates an inhalation LC<sub>50</sub> of 60 ppm for 4 hours for rats.

D. Low Lethal Dose (or Concentration): These are shown by the term "lo" immediately following the data entry. This means that the entry is derived from LD<sub>10</sub> or LC<sub>10</sub> data given in the literature. LD<sub>10</sub> and LC<sub>10</sub> are the lowest doses or concentrations known to have had lethal effect on the test species. Thus the entry Rat-ihl:60/4H (lo) indicates an inhalation LC<sub>10</sub> of 60 ppm for 4 hours for rats.

(Note: Human LC<sub>10</sub> and LD<sub>10</sub> data are not used, since they generally represent isolated accidental poisoning incidents. Toxicity data, unless specifically noted otherwise, have been obtained from the "Registry of the Toxic Effects of Chemical Substances." (See Note 2B, above.)

Each toxicity entry is followed by a letter indicating the reportable quantity to which it corresponds, on the following scales:

Oral LD <sub>50</sub> or lo	Dermal LD <sub>50</sub> or lo	Inhalation LC <sub>50</sub> or lo	RQ (Pounds)
<0.1	<0.04	<0.4	X (1)
0.1-1	0.04-0.4	0.4-4	A (10)
1-10	0.4-4	4-40	B (100)
10-100	4-40	40-400	C (1000)
100-500	40-200	400-2000	D (5000)

NOTE 4: Entries in this column are several and include the following:

- A. The results of evaluations of chronic toxicity effects carried out by the EPA Environmental Criteria and Assessment Office (ECAO). For chronic toxicity, the entries are given as a numerical score, followed by an equivalent RQ designation, as follows:

<u>Chronic Toxicity Score</u>	<u>RQ(pounds)</u>
81 to 100	X (1)
41 to 80	A (10)
21 to 40	B (100)
6 to 20	C (1000)
1 to 5	D (5000)

The scores are based on a combination of values assigned to minimum effective doses and severity of the toxic effects, as described in more detail elsewhere in this report.

- B. The abbreviation "CHRON TBA" is used to identify those items that remain to be assessed for chronic toxicity by the ECAO. Entries flagged with "CHRON TBA" are materials that have previously been identified by the EPA as having an appreciable chronic or subacute effect, as described in any of the following documents:

- o "Background Document. Resource Conservation and Recovery Act. Subtitle C - Identification and Listing of Hazardous Waste, Appendix A - Health and Environmental Effect Profiles. October 30, 1980. U.S. EPA, Office of Solid Waste."
- o "EPA/440/9-75/009. Supplement to Development Document: Hazardous Substances Regulations, Section 311 of the Federal Water Pollution Control Act as Amended 1972. U.S. EPA. November 1975."
- o "EPA 440/5-80-015 through -079. Ambient Water Quality Criteria Documents (64 documents). U.S. EPA, Office of Water Regulations and Standards Criteria and Standards Division. October 1980."

- C. The entry "CHRON\*" indicates that the material is known to have a chronic effect, but since its RQ has already been set at the 1 lb level on the basis of some other criterion, no further evaluation has been carried out.

- D. The abbreviation "CARC TBA" is used to identify those hazardous substances that will be assessed for carcinogenicity by the EPA Carcinogen Assessment Group (CAG), and therefore the suggested RQ of the material may be subject to further adjustment. Entries identified with a "CARC TBA" are materials that have been identified elsewhere as potential carcinogens in lists published by the following sources:

1. U.S. Department of Health and Human Services, National Toxicology Program, U.S. Public Health Services.

o First Annual Report on Carcinogens, July 1980 - lists 26 substances or classes of substances.

o Second Annual Report on Carcinogens, December 1981 - lists 88 substances or classes of substances.

2. International Agency for Research on Cancer, Summary of Monographs 1-2, September 1979 - lists 142 substances.

E. The entry "CARC\*" indicates that the material is known to be a carcinogen, but since its RQ has already been set at the 1-lb level on the basis of some other criterion, no further evaluation will be carried out.

NOTE 5: I, C, R stand for Ignitability, Corrosivity, and Reactivity.

A. Ignitability: This is judged on combinations of flash point and boiling point. These are entered in the column as F = flash point, and B = boiling point, with the value immediately following in degrees Fahrenheit. Materials that are capable of starting fires without an external source of ignition are considered to be the most hazardous, and are coded as follows:

PYR = Pyrophoric

SPONT. IGN = Capable of spontaneous ignition

STRONG OXID. = Strong oxidizer, may cause other materials to ignite, and sustain their combustion.

B. Corrosivity: No ranking scale has yet been developed for corrosivity.

C. Reactivity: Reactivity refers to either a material's reaction with water, compared with certain reference materials (see scale given below) or to its ability to undergo self-reaction, with explosion being the worst case. Certain other types of reactivity, such as the ability to liberate toxic gases, are discussed as individual cases in separate notes.

Each Ignitability or Reactivity entry is followed by a letter indicating the reportable quantity category to which it corresponds, based on the following truncated scales:

# REACTIVITY

<u>Ignitability</u>	<u>With Water (Reference Compound)</u>	<u>Self-Reaction</u>	<u>RQ (Pounds)</u>
Starts fires	Inflames	Explosive	A (10)
F <100 B <100	Extreme reaction (e.g., SO <sub>3</sub> )	May polymerize; stabilizer required	B (100)
F <100 B >100	High reaction (e.g., oleum)	May polymerize if contaminated. No stabilizer required.	C (1000)
F 100-140	Moderate reaction (e.g., NH <sub>3</sub> )	Some chance of polymerization with small heat release	D (5000)

Data for Ignitability and Reactivity ratings were taken from "Fire Protection Guide on Hazardous Materials," 7th Edition, National Fire Protection Association, Boston, Ma, 1978.

NOTE 6: Entries under this column show the value in pounds that was assigned as a reportable quantity under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979).

NOTE 7: Entries in this column are the lowest reportable quantities derived from the individual rankings shown under the Aquatic Toxicity, Mammalian Toxicity, Chronic Toxicity, and/or I/C/R columns.

NOTE 8: Entries in this column show the basis on which an RQ has been suggested, coded as follows:

- 311 - Aquatic toxicity, as assigned under Section 311 of the Clean Water Act.
- AQTX - Aquatic toxicity, other than a 311 assignment.
- T(orl) - Oral mammalian toxicity
- T(ihl) - Inhalation mammalian toxicity
- T(skn) - Skin (dermal) mammalian toxicity
- CTX - Chronic Toxicity
- I - Ignitability
- R - Reactivity
- CS - This entry indicates that the assignment of an RQ has been made on the basis of chemical similarity, in the absence of data for the primary criteria.
- Max - This entry indicates that the rating factors all exceed the upper limit of the rating scales, and that the assignment of a 5000-lb RQ has been made on the basis of this being the largest value possible to assign.

NOTE 9: It might be prudent to establish a lower RQ for this hazardous substance on the basis of it being a member of the polynuclear aromatic hydrocarbon class. Many PNA's are known or suspected carcinogens. While no definitive proof exists that all PNA's are carcinogens, experimental evidence suggests that these materials do cause formation of tumors and neoplasms. The materials benzo(k)fluoranthene and benzo(j)fluoranthene, for example, have been shown to cause cancer, however they are classified as suspect because the data were obtained from only one species. The materials benzo(ghi)perylene, fluoranthene and pyrene have been identified as promoters or co-carcinogens. ("Biorefractories in Water, Carcinogens, Mutagens, Promoters" U.S. Department of Health and Human Services, Public Health Services, National Institute of Health, First Report, February 1980.) Carcinogenicity is currently under consideration for use as a primary ranking factor.

NOTE 10: The aquatic toxicity data listed for this material were taken from the 1980 Ambient Water Quality Criteria Documents.

NOTE 11: Evidence of the carcinogenicity of this material is currently being assessed. The suggested RQ, therefore, may be subject to further adjustment.

NOTE 12: No data have been found that permit the ranking of this material. A working assignment of a 5000-lb RQ has been made on the basis of this being the maximum value possible to assign. It may well be that the absence of data indicates that the material is not a hazard except as a carcinogen, and that a much lower RQ will be assigned after the carcinogen assessments are complete.

NOTE 13: Acetyl bromide reacts violently with water, forming toxic and corrosive fumes of hydrogen bromide.

NOTE 14: Acetyl chloride reacts vigorously with water, evolving hydrogen chloride fumes.

NOTE 15: The Registry of the Toxic Effects of Chemical Substances (RTECS) gives an aquatic toxicity for acetyl chloride of 10-100 ppm, which would place it in reportable quantity category C, rather than the reportable quantity category D assigned under Section 311 of the Clean Water Act. No attempt has been made to resolve this apparent discrepancy since the suggested RQ for the material derives from other ranking factors.

NOTE 16: Polymerization may occur spontaneously in absence of oxygen or on exposure to visible light or excessive heat, violently in the presence of alkali. Pure acrylonitrile is subject to self-polymerization with rapid pressure development. The commercial product requires an inhibitor.

NOTE 17: Evidence found in OMTADS and/or "Water-Related Environmental Fate of 129 Priority Pollutants" (EPA-440/4-79-029a) indicates that this material,

or a constituent of this material, is bioaccumulated to toxic levels in the tissue of aquatic and marine organisms, and has the potential to concentrate in the food chain.

NOTE 18: In the absence of specific data for the material listed, oral toxicity data for the sodium salt is given in brackets.

NOTE 19: Ammonium bifluoride dissolves in water to form hydrofluoric acid. It has been assigned a suggested RQ of 100 lbs consistent with the suggested RQ of 100 lbs assigned to hydrofluoric acid, based on its chronic toxicity assessment.

NOTE 20: Ammonium fluoride will dissolve in water to form hydrofluoric acid. It has been assigned a suggested RQ of 100 lbs based on its chronic toxicity assessment.

NOTE 21: A maximum RQ level of 5000 lbs has been assessed as a working value for antimony metal until such time as its carcinogenicity and/or chronic toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 22: Antimony pentachloride reacts vigorously with water to form hydrogen chloride gas.

NOTE 23: Antimony trichloride reacts vigorously with water to form a strong solution of hydrochloric acid.

NOTE 24: A maximum RQ level of 5000 lbs has been assessed as a working value for arsenic metal until such time as its carcinogenicity and/or chronic toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 25: Arsenic trichloride reacts vigorously with water to generate hydrogen chloride.

NOTE 26: Benzoyl chloride will react energetically with water or steam with production of heat, toxic and corrosive fumes.

- NOTE 27: Benzyl chloride, if unstabilized, readily undergoes a condensation reaction with liberation of heat and hydrogen chloride in the presence of copper, aluminum, iron, zinc, magnesium, tin, and various other metals that act as catalysts. If the reaction takes place in a container, there is the possibility of violent rupture of the container.
- NOTE 28: Beryllium chloride reacts vigorously with water with evolution of heat. Forms beryllium oxide and hydrochloric acid solution.
- NOTE 29: The different RQ levels assigned to the several phthalate esters may arise from the fact that aquatic toxicity data is available for some of them (e.g., dibutyl phthalate, RQ=100 lbs, Basis:311(AQTX)) but is unavailable for others (e.g., dioctyl phthalate, RQ=5000 lbs, Basis:Max) It might be appropriate to set all phthalate esters at an RQ level of B (100 lbs) on the basis of very close chemical similarity.
- NOTE 30: Experimental evidence suggests that this material is either a positive or potential teratogenic agent. A chronic toxicity assessment is pending.
- NOTE 31: A maximum RQ level of 5000 lbs has been assessed as a working value for cadmium metal until such time as its carcinogenicity and/or chronic toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.
- NOTE 32: Calcium carbide produces acetylene gas on contact with water and will generate sufficient heat on contact to ignite the acetylene. Based on this fact, an RQ of 10 lbs is suggested.
- NOTE 33: The suggested RQ level of Category A (10 lbs) is based on the fact that this material is a strong oxidizer and can readily cause fires.
- NOTE 34: Although no data could be found on the aquatic toxicity of this material, it might be prudent to assign an RQ level of B (100 lbs) on the basis of the aquatic toxicity of other related chlorinated phenols.
- NOTE 35: No data have been found that permit the ranking of this material. However, an RQ level of category D (5000 lbs) is suggested, based on the oral toxicities of the related bis(chlorophenyl) ether (orl-gpg:1000 mg/kg) and diphenyl ether (orl-rat:3370 mg/kg).
- NOTE 36: Chlorosulfonic acid is dangerously reactive in the presence of moisture or water. It is a strong oxidizing agent and may cause ignition by contact with combustible materials. Through its reaction with moisture

in air or water it is broken down into hydrochloric and sulfuric acids. An RQ level of 1000 lbs is suggested.

NOTE 37: A maximum RQ level of 5000 lbs has been assessed as a working value for chromium metal until such time as its carcinogenicity and/or chronic toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 38: An RQ category of C(1000 lbs) is recommended for copper metal on the basis of its chronic toxicity. This RQ is not meant to apply to massive forms of the metal (ingots, rods, etc.). It is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles are considered to be excluded from the chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 39: The range of flash points (F) and boiling points (B) shown in the ICR column derives from the three different Cresol isomers, ortho-, meta-, and para-.

NOTE 40: In addition to its flammability, this material may polymerize at elevated temperatures. If the polymerization takes place in a container, there is possibility of violent rupture of the container. It is readily converted by oxygen to hazardous peroxides and acids.

NOTE 41: Crotonaldehyde has been identified under two different CAS Registry numbers, 4170-30-3 and 123-73-9, the latter referring to the trans-isomer. The mammalian toxicity data listed are for the trans- isomer.

NOTE 42: All cyanides assigned reportable quantities under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979) were placed at RQ level A (10 lbs) on the basis of the aquatic toxicity of the cyanide ion. The same practice is continued here, with aquatic toxicity values and 311 ratings placed in brackets to indicate that they were not actually part of the aforementioned regulation, but derive their suggested RQ from it nonetheless.

NOTE 43: The CAS Registry number listed for the generic class of Cyanides refers to the cyanide ion only.

NOTE 44: This material requires an inhibitor to prevent polymerization.

NOTE 45: The data listed are for 1,2-Dichloropropane.

NOTE 46: Although flash point data are not specifically listed for the dichloropropane - dichloropropene mixture, it is reasonable to assume that this mixture will have a similar ignitability rating as the individual components.

NOTE 47: The suggested RQ for all isomers is based on the aquatic toxicity rating of 1,3-Dichloropropene.

NOTE 48: The RQ level, Category B (100 lbs), suggested for this material is based on aquatic toxicity data found in OHMTADS. 1.2 ppm of the material is indicated as lethal to goldfish in 30 minutes, and a much lower survival is noted for brine shrimp at the 10 ppm level.

NOTE 49: The data listed are for 2,4-Dinitrophenol (51-28-5). An RQ of 1000 lbs was established for dinitrophenols under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979). However, there were no specific isomers identified in making that assignment. An RQ of 100 lbs is suggested for 2,4-Dinitrophenol on the basis of an aquatic toxicity lower than that used to make the assignments under Section 311.

NOTE 50: The suggested RQ is based on the RQ established for Endosulfan itself under Section 311 of the Clean Water Act.

NOTE 51: The suggested RQ is based on the RQ established for Endrin itself under Section 311 of the Clean Water Act.

NOTE 52: This material is the same as 1,2-Dichloroethane.

NOTE 53: An RQ of 1 lb is suggested for this material based on the 1 lb RQ assigned to Heptachlor under Section 311 of the Clean Water Act.

NOTE 54: An RQ of 1 lb was established for the gamma isomer of hexachlorocyclohexane, commonly known as Lindane, under Section 311 of the Clean Water Act. An RQ of 1 lb is suggested for all isomers of Hexachlorocyclohexane, based on similar chemical structures, since detailed data are not available in all cases.

NOTE 55: This material is the same as Lindane (58-89-9).

NOTE 56: In addition to its high flammability, isoprene requires an inhibitor to prevent self-polymerization. At elevated temperatures, such as in fire conditions, polymerization may take place. If the polymerization takes place in a container there is a possibility of violent rupture of the container.

NOTE 57: A maximum RQ level of 5000 lbs has been assessed as a working value for lead metal until such time as its carcinogenicity and/or chronic

toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 58: The LC50 - 96 hour aquatic toxicity range listed in OHMTADS for this material is 0.64-1.4 ppm for rainbow trout. Using this data, an RQ level of Category A (10 lbs) would apply, rather than the 100 lb RQ assigned under Section 311 of the Clean Water Act.

NOTE 59: According to the OHMTADS file, mercury compounds have been shown to be teratogenic. Chronic toxicity assessments are pending.

NOTE 60: Long-term exposure to mercury vapor is known to induce a degenerative disease (mercurialism, the "Hatter's Disease") in humans.

NOTE 61: Inhalation of high concentrations of methylchloride causes serious central nervous system damage, lingering illness, and sometimes death. Persons may unknowingly be exposed to considerable concentrations because it has no detectable odor.

NOTE 62: Polymerization of this material may occur upon exposure to heat, oxidizing agents and ultraviolet light.

NOTE 63: There is a wide range of aquatic toxicities reported for naphthalene in OHMTADS, ranging down to 1 ppm for certain species and conditions. Similarly, RTECS reports an aquatic toxicity for naphthalene of 1-10 ppm. On this basis, a lower RQ has been suggested than that established under Section 311 of the Clean Water Act.

NOTE 64: An RQ level of 100 lbs is suggested at the present time for nickel metal, until its chronic toxicity and carcinogenicity have been fully assessed. The 100 lb RQ is based on mammalian toxicity. This RQ is not meant to apply to massive forms of the metal (ingots, rods, etc.). It is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles are considered to be excluded from the chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 65: The inhalation toxicity data listed is for red fuming nitric acid.

NOTE 66: An RQ of 1000 lbs was established for nitrophenol under Section 311 of the Clean Water Act, using a single aquatic toxicity data point of 46.3

ppm. However, there were no specific isomers identified in making that assignment. A lower RQ of 100 lbs is suggested for all isomers of nitrophenol on the basis of similar chemical structure to 4-Nitrophenol, which has an aquatic toxicity lower than that used to make the assignment for nitrophenol under Section 311.

NOTE 67: Phosphorus oxychloride reacts violently with water and moisture to yield hydrogen chloride.

NOTE 68: Phosphorus sulfide reacts with water to liberate hydrogen sulfide, as indicated by the symbols  $H_2S$  in the I/C/R columns of the table. The RQ suggested for  $H_2S$  is also 100 lbs.

NOTE 69: Phosphorous trichloride will react violently when brought into contact with water and may produce flashes of fire. Hydrochloric and phosphorous acids are generated as products of the reaction with water.

NOTE 70: An RQ level of Category X (1 lb) is suggested for each of the individual Aroclor compounds, based on the aquatic toxicity listed for the broad class of PCB's.

NOTE 71: This material is not combustible but the solid form in contact with moisture or water may generate sufficient heat to ignite combustible materials. Contact with some metals can generate flammable hydrogen gas.

NOTE 72: This material may polymerize with evolution of heat when in contact with highly active catalytic surfaces such as anhydrous chlorides of iron, tin, and aluminum, peroxides of iron and aluminum, and alkali metal hydroxides. If the polymerization takes place in a container there is possibility of violent rupture of the container.

NOTE 73: Pyrethrins were designated under Section 311 of the Clean Water Act with no specific reference to either Pyrethrin I (CAS No. 121-21-1) or Pyrethrin II (CAS No. 121-29-9). Both CAS Registry numbers are given here.

NOTE 74: Since  $SeO_2$  immediately hydrates to  $H_2SeO_3$  in water, their toxicities are, for all practical purposes, equivalent.

NOTE 75: A maximum RQ level of 1000 lbs is suggested at the present time for silver metal, based on its chronic toxicity ranking. This RQ is not meant to apply to massive forms of the metal (ingots, rods, etc.). It is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles are considered to be excluded from the chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

- NOTE 76: Sodium is extremely dangerous in contact with moisture or water, releasing hydrogen with sufficient heat to cause ignition or explosion. It ignites spontaneously in air or oxygen. It burns violently accompanied by explosions which cause spattering of the material.
- NOTE 77: Sodium bifluoride reacts with water liberating heat and forming hydrofluoric acid. It has been assigned a suggested RQ of 100 lbs consistent with the suggested RQ of 100 lbs assigned to hydrofluoric acid, based on its reactivity with water.
- NOTE 78: This material is not combustible but the solid form in contact with moisture or water may generate sufficient heat to ignite combustible materials. Contact with some metals can generate hydrogen gas.
- NOTE 79: The aquatic toxicity data and the suggested RQ (10 lbs) apply to both strychnine and its salts. Strychnine is a common name for this material.
- NOTE 80: Polymerization may occur if heated above 150°F. Can cause rupture of container. Metal salts, peroxides, and strong acids may also cause polymerization.
- NOTE 81: Sulfur monochloride reacts violently with water to produce heat and hydrogen chloride fumes. The resulting solution is strongly acidic.
- NOTE 82: The common name for this material is carbon tetrachloride.
- NOTE 83: An RQ level of 1000 lbs is suggested at the present time for thallium metal, based on its mammalian toxicity ranking until assessment of its chronic toxicity has been completed. This RQ is not meant to apply to massive forms of the metal (ingots, rods, etc.). It is unlikely that the Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles are considered to be excluded from the chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.
- NOTE 84: Vinyl chloride polymerizes in presence of air, sunlight, or heat unless stabilized by inhibitors.
- NOTE 85: This material is also known as 1,1-Dichloroethylene.
- NOTE 86: The range of flash points (F) and boiling points (B) shown in the ICR column derives from the three different Xylene isomers, ortho-, meta-, and para-.
- NOTE 87: A maximum RQ level of 5000 lbs has been assessed as a working value for zinc metal until such time as its carcinogenicity and/or chronic toxicity has been assessed. An RQ of 5000 lbs is appropriate for massive forms of the metal (ingots, rods, etc.). However, it is unlikely that the

Agency will require notification for releases of such massive forms, and "massive" will be taken to mean that the diameter of the metal particles is equal to or greater than 100 micrometers (0.004 inches). Such particles will be excluded from chronic and carcinogenic assessments because they are large enough not to be respirable. They are also large enough not to react rapidly with air or water.

NOTE 88: A metal phosphide will react with water to liberate phosphine as indicated by the symbols  $\text{PH}_3$  in the ICR column of the table. The suggested reportable quantity of this material is thus suggested at a value of 100 lbs.

NOTE 89: This material will react vigorously with water, liberating heat, to form hydrogen chloride, and will fume in moist air. An RQ level of Category D (5000 lbs) is suggested on this basis.

NOTE 90: The suggested RQ takes into consideration one or more of the natural dissipation processes of biodegradation, hydrolysis or photolysis. More specifically, the lowest RQ suggested by any of the primary ranking factors has been adjusted upward one level.

## SECTION 9

### DATA TABLES FOR HAZARDOUS WASTES

Detailed data tables showing the basis for the proposed RQs for the hazardous wastes following the SCP strategy as described in Section 2 are presented in Tables 9-1 and 9-2. These lists are the hazardous substances designated under RCRA Section 3001. The substances are commonly called the "P," "U," "F," and "K" wastes, referring to the initial letter used to identify them by hazardous waste number in 40 CFR Part 261. Data are given in Table 9-1 for the P- and U-wastes and Table 9-2 for the F- and K- waste streams. The tables include the data on ignitability, reactivity, aquatic toxicity, mammalian toxicity, and chronic toxicity, upon which the choice of the proposed RQ is based. As discussed elsewhere in this report, many substances remain to be assessed for chronic toxicity or carcinogenicity by the ECAO or CAG, respectively, and these substances are appropriately flagged "CHRON TBA" or "CARC TBA" in the column titled "Chronic Toxicity/Carcinogen-Note 5." In those cases where the chronic toxicity assessments are not yet available, RQs have been suggested based on data using other factors. No RQs have yet been assessed based on carcinogenicity.

All notes listed in the table are located at the end of this section, and all abbreviations used are discussed there in some length. For those not concerned with the complete development of the data in Table 9-1, the most common abbreviations are as follows:

(X), (A), (B), (C), (D) - RQ Categories 1, 10, 100, 1000, and 5000 lbs, respectively

CARC TBA - To be assessed for carcinogenicity

CHRON TBA - To be assessed for chronic toxicity

CARC\* - Known carcinogen, but RQ already as low as possible (1 lb) on some other basis

CHRON\* - Known chronic toxicant, but RQ already as low as possible (1 lb) on some other basis

F - Flash point

B - Boiling point

R - Reactivity

311 - The RQ was established under the regulations from CWA Section 311

AQTX - Aquatic toxicity

CTX - Chronic toxicity

BHP - Biodegradation, hydrolysis, and photolysis

ICR - Ignitability, corrosivity, and reactivity

CS - The RQ was assigned on the basis of chemical similarity to another substance, in the absence of data for the primary criteria.

Max - Maximum possible RQ assignment

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Chronic Toxicity Note 3	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basic Suggested for ion Note 9	Comments
1 (42)	P023	Acetaldehyde, chloro- (107-20-0)	T			Rat 23 (C)				1000	T (orl)	
2 (7)	P002	Acetamide, N-(aminothioxomethyl)- (591-08-2)	T			Rat 50 (C)		Solid		1000	T (orl)	
3 (80)	P057	Acetamide, 2-fluoro- (640-19-7)	T			Rat 5.75 (B)		Solid		100	T (orl)	
4 (81)	P058	Acetic acid, fluoro-, sodium salt (62-74-8)	T			Rat 0.22 (A)		Solid		10	T (orl)	
5 (103)	P066	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester (16752-77-5)	T			Rat 17 (C) rat ihl 77 (C)		Solid		1000	T (orl) T (ihl)	
6 (192)	P001	3-(alpha-Acetylbenzyl)-4-hydroxycoumarin and salts (81-81-2)	T			Rat 3 (B)		Solid		100	T (orl)	
7 (2)	P002	1-Acetyl-2-thiourea (591-08-2)	T			Rat 50 (C)		Solid		1000	T (orl)	
8 (157)	P003	Acrolein (107-02-8)	T	<0.1 (X)		Rat 46 (C) rat ihl 8/4H lo (B)	CHRON *	F-15, B125 (C)	1	1	311	
9 (150)	P070	Aldicarb (116-06-3)	T			Rat 1.0 (A) mus 0.3 (A)		Solid		10	T (orl)	
10 (87)	P004	Aldrin (309-00-2)	T	<0.1 (X)		Rat 39 (C)	CARC *	Solid	1	1	311	Note 10
11 (158)	P005	Allyl alcohol (107-18-6)	T	1-10 (B)		Rat 64 (C) rat ihl 165/4H (C)	CT=34.8 (B)	F70 (C) B206	100	100	311, CTX	
12 (-)	P006	Aluminum phosphide (20859-73-8)	T	1-10 (B)		HMN 20 (D)		PH <sub>3</sub> ^ (B)		100	R, AQT X	Note 11
13 (96)	P007	5-(Aminomethyl)-3-isoxazolol (2763-96-4)	T			Rat 45 (C)		Solid		1000	T (orl)	
14 (161)	P008	4-Aminopyridine (504-24-5)	T			Rat 20 (C)		Solid		1000	T (orl)	
15 (133)	P009	Ammonium picrate (131-74-8)	R					R=exp (A)		10	R	
16 (189)	P119	Ammonium vanadate (7803-55-6)	T			Rat 18 (C)		Solid		1000	T (orl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Concentration Note 8	Basic Information Note 9	Comments
17 (-)	P010	Arsenic acid (7778-39-4) or (1327-52-2)	T		Rat 48 (C)	CARC TBA CHRON TBA	Solid		1000	T(orl)	Notes 12 13
18 (21)	P012	Arsenic(III) oxide (1327-53-3)	T	10-1 (B)	Rat 20 (C) Man 1 (B)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(orl)	Note 10
19 (20)	P011	Arsenic(V) oxide (1303-28-2)	T	10-1 (B)	Rat 8 (B)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(orl)	Notes 10 13
20 (19)	P011	Arsenic pentoxide (1303-28-2)	T	10-1 (B)	Rat 8 (B)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(orl)	Notes 10 13
21 (18)	P012	Arsenic trioxide (1327-53-3)	T	10-1 (B)	Rat 20 (C) Man 1 (B)	CARC TBA CHRON TBA	Solid	5000	100	AQTX, T(orl)	Note 10
22 (52)	P038	Arsine, diethyl- (692-42-2)	T			CARC TBA CHRON TBA	Pyro (A)		10	R	Notes 14 15
23 (77)	P054	Aziridine (151-56-4)	T		Rat 15 (C) rat ihl 25/8H lo (B)	CARC TBA	Needs stabilizer (B)		100	R, T(ihl)	Note 13
24 (-)	P013	Barium cyanide (542-62-1)	T	0.1-1 (A)			Solid	10	10	311	
25 (43)	P024	Benzenamine, 4-chloro- (106-47-8)	T	10-100 (C)	Rat 420 (D)				1000	AQTX	
26 (116)	P077	Benzenamine, 4-nitro- (100-01-6)	T	106.1 (D)	Rat 750 (D)				5000	AQTX	
27 (30)	P028	Benzene, chloromethyl- (100-44-7)	T	1-10 (B)	Rat 1231 rat ihl 150/2H (C)	CARC TBA	F153 B354 requires stabilizer (B)	100	100	R, 311	Notes 13 16
28 (73)	P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]- (51-43-4)	T		Rat 30 (C) Rat skin 62 (D)		Solid		1000	T(orl)	
29 (182)	P014	Benzenethiol (108-98-5)	T		Rat 46 (C) rat ihl 33/4H (B)				100	T(ihl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basics for Suggestion Note 9	Comments
30 (27)	P028	Benzyl chloride (100-44-7)	T	1-10 (B)	Rat 1231 rat ihl 150/2H (C)	CARC TBA	F153 requires stabilizer (B)	100	100	R, 311	Notes 13 16
31 (-)	P015	Beryllium dust (7440-41-7)	T	10-100 (C)	HMN ihl: 300mg/m3 TCLO (C)	CARC TBA CHRON TBA	Solid		1000	T (ihl)	Note 17
32 (99)	P016	Bis(chloromethyl) ether (542-88-1)	T		Rat 210 (D) rat ihl 7/7H (B)	CARC TBA CHRON TBA			100	T (ihl)	Note 13
33 (155)	P017	Bromoacetone (598-31-2)	T	10-100 (C)	Rat 70 (C) mus ihl 600 lo				1000	AQTX	
34 (-)	P018	Brucine (357-57-3)	T	1-10 (B)	Rat 1 (A)		Solid		10	T (orl)	
35 (-)	P021	Calcium cyanide (592-01-8)	T	0.1-1 (A)	Rat 39 (C)		Solid	10	10	311	
36 (187)	P123	Camphene, octachloro- (8001-35-2)	T	<0.1 (X)	Rat 40 (C)	CARC *	Solid	1	1	311	Note 10
37 (164)	P103	Carbamimidoseleonic acid (630-10-4)	T		Rat 50 (C)	CHRON TBA	Solid		1000	T (orl)	
38 (39)	P022	Carbon bisulfide (75-15-0)	T	100-500 (D)	HMN 14 lo (C)	CHRON TBA	F-22, B115 (C)	5000	1000	I	
39 (38)	P022	Carbon disulfide (75-15-0)	T	100-500 (D)	HMN 14 lo (C)	CHRON TBA	F-22, B115 (C)	5000	1000	I	
40 (138)	P095	Carbonyl chloride (75-44-5)	T	100-500 (D)	Rat 50/30M lo (C)			5000	1000	T (ihl)	
41 (49)	P033	Chlorine cyanide (506-77-4)	T	0.1-1 (A)	Dog ihl 20/6H lo (B)		R:CN-	10	10	311	
42 (1)	P023	Chloroacetaldehyde (107-20-0)	T		Rat 23 (C)				1000	T (orl)	
43 (25)	P024	p-Chloroaniline (106-47-8)	T	10-100 (C)	Rat 420 (D)				1000	AQTX	
44 (184)	P026	1-(o-Chlorophenyl)thiourea (5344-82-1)	T		Rat 4.6 (B)		Solid		100	T (orl)	
45 (152)	P027	3-Chloropropionitrile (542-76-7)	T		Rat 50 (C)		F168		1000	T (orl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basics for Revision Note 9	Comments
46 (-)	P029	Copper cyanides (544-92-3)	T	[0.1-1(A)]			Solid	[10]	10	311	Note 18
47 (-)	P030	Cyanides (soluble cyanide salts), not elsewhere specified (N.A.) (57-12-5)	T	[0.1-1(A)]			Solid	[10]	10	311	Notes 18 19
48 (-)	P031	Cyanogen (460-19-5)	T		Rat ihl 350/1H(C)		F gas, B-6 (B)		100	I	
49 (41)	P033	Cyanogen chloride (506-77-4)	T	0.1-1(A)	Dog ihl 20/6H 1o(B)		R:CN <sup>-</sup>	10	10	311	
50 (134)	P036	Dichlorophenylarsine (696-28-6)	T		Rat skin 16(C) rht skin 0.5(B) gpg skin 4 (B)	CARC TBA CHRON TBA			100	T(skn)	Note 14
51 (85)	P037	Dieldrin (60-57-1)	T	<0.1(X)	Rat 46(C)	CARC *	Solid	1	1	311	Note 10
52 (22)	P038	Diethylarsine (692-42-2)	T			CARC TBA CHRON TBA	Pyro. (A)		10	R	Notes 14 15
53 (67)	P039	O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate (298-04-4)	T	<0.1(X)	Rat 2 (B)	CHRON *	Solid	1	1	311	
54 (140)	P041	Diethyl-p-nitrophenyl phosphate (311-45-5)	T		Rat 1.8 (B)				100	T(orl)	
55 (145)	P040	O,O-Diethyl O-pyrazinyl phosphorothioate (297-97-2)	T		Rat 3.5(B)				100	T(orl)	
56 (142)	P043	Diisopropyl fluorophosphate (55-91-4)	T		Rat 6(B) rat skn 72(D)				100	T(orl)	
57 (141)	P044	Dimethoate (60-51-5)	T	<1 (A)	HMN 30(C) rat 152(D)		Solid		10	AQTX	
58 (180)	P045	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime (39196-18-4)	T		Rat 8.5 (B)		Solid		100	T(orl)	
59 (108)	P071	O,O-Dimethyl O-p-nitrophenyl phosphorothioate (298-00-0)	T	<1 (A)	Rat 6(B) rat ihl 120/4H(C)	CHRON TBA		100	10	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

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**Note:** All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 RQ Note 7	Suggested RQ Note 8	Basic Information Note 9	Comments
77 (23)	P054	Ethylenimine (151-56-4)	T		Rat 15(C) rat ihl 25/8H lo(B)	CARC TBA	Needs stabilizer(B)		100	R,T(ihl)	Note 13
78 (146)	P097	Famphur (52-85-7)	T		Rat 35(C)		Solid		1000	T(orl)	
79 (-)	P056	Fluorine (7782-41-4)	T		Rat ihl 185/1H(C)		R=strong oxidizer (A)		10	R	
80 (3)	P057	Fluoroacetamide (640-19-7)	T		Rat 5.75(B)		Solid		100	T(orl)	
81 (4)	P058	Fluoroacetic acid, sodium salt (62-74-8)	T		Rat 0.22(A)		Solid		10	T(orl)	
82 (98)	P065	Fulminic acid, mercury(II)salt (628-86-4)	R,T			CHRON TBA	R=exp(A)		10	R	
83 (102)	P059	Heptachlor (76-44-8)	T	<0.1 (X)	Rat 40 (C)	CARC *	Solid	1	1	311	Note 10
84 (72)	P051	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene (72-20-8)	T	<0.1 (X)	Rat 3 (B)	CHRON *	Solid	1	1	311	Note 10
85 (51)	P037	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene (60-57-1)	T	<0.1 (X)	Rat 46(C)	CARC *	Solid	1	1	311	Note 10
86 (88)	P060	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene (465-73-6)	T	<0.1 (X)	Rat 7(B) rat skin 23(C)		Solid		1	AQTX	
87 (10)	P004	1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene (309-00-2)	T	<0.1 (X)	Rat 39(C)	CARC *	Solid	1	1	311	Note 10
88 (86)	P060	Hexachlorohexahydro-endo,endo-dimethanonaphthalene (465-73-6)	T	<0.1 (X)	Rat 7(B) rat skin 23(C)		Solid		1	AQTX	
89 (175)	P062	Hexaethyl tetraphosphate (757-58-4)	T	1-10 (B)	Rat 7(B) rat skin 15 lo(C)				100	AQTX T(orl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	Reactivity R Q 7	Stability Note 8	Biodegradability Note 9	Comments
90 (183)	P116	Hydrazinecarbothioamide (79-19-6)	T	20.8 (C)	Rat 9 (B)		Solid		100	T(ori)	
91 (105)	P068	Hydrazine, methyl- (60-34-4)	T		Rat 33 (C) rat ihl 74/4H (C)		R=spont. ign. (A)		10	R	
92 (93)	P063	Hydrocyanic acid (74-90-8)	T	0.1-1 (A)	Mus 3.7 (B) mus ihl 323/5M		F0, B79 (B)	10	10	311	
93 (92)	P063	Hydrogen cyanide (74-90-8)	T	0.1-1 (A)	Mus 3.7 (B) mus ihl 323/5M		F0, B79 (B)	10	10	311	
94 (139)	P096	Hydrogen phosphide (7803-51-2)	T		Rat ihl 11/4H (B)		F gas (B) B-126		100	I, T(ihl)	
95 (106)	P064	Isocyanic acid, methyl ester (624-83-9)	T		Rat 71 (C) rat ihl 5/4H (B)		F19, B102 (C)		100	T(ihl)	
96 (13)	P007	3(2H)-Isoxazolone, 5-(aminomethyl)- (2763-96-4)	T		Rat 45 (C)		Solid		1000	T(ori)	
97 (135)	P092	Mercury, (acetato-O)phenyl- (62-38-4)	T		Rat 30 (C)	CHRON TBA	Solid		1000	T(ori)	
98 (82)	P065	Mercury fulminate (628-86-4)	R, T			CHRON TBA	R=exp (A)		10	R	
99 (32)	P016	Methane, oxybis(chloro- (542-88-1)	T		Rat 210 (D) rat ihl 7/7H (B)	CARC TBA CHRON TBA			100	T(ihl)	Note 13
100 (174)	P112	Methane, tetranitro- (509-14-8)	R		Rat 130 (D) rat ihl 13/4H (B)		R=exp (A)		10	R	
101 (188)	P118	Methanesulfonyl chloride, trichloro (594-42-3)			Rat 83 (C) Rat ihl 10 (B)				100	T(ihl)	Note 22
102 (83)	P059	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a, 4,7,7a-tetrahydro- (76-44-8)	T	<0.1 (X)	Rat 40 (C)	CARC *	Solid	1	1	311	Note 10
103 (5)	P066	Methomyl (16752-77-5)	T		Rat 17 (C) rat ihl 77 (C)		Solid		1000	T(ori) T(ihl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Code a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested R Q 8	Basic for Suggestion Note 9	Comments
104 (159)	P067	2-Methylaziridine (75-55-8)	T		Rat 19(C)	CARC TBA			1000	T(ori)	Note 13
105 (91)	P068	Methyl hydrazine (60-34-4)	T		Rat 33(C) rat ihl 74/4H(C)		R=spont. ign. (A)		10	R	
106 (95)	P064	Methyl isocyanate (624-83-9)	T		Rat 71(C) rat ihl 5/4H(B)		F19, B102(C)		100	T(ihl)	
107 (153)	P069	2-Methylactonitrile (75-86-5)	T	1-0.1 (A)	Rat 17(C) rat ihl 63/4H 1o(C)		F 165 B 248	10	10	311	
108 (59)	P071	Methyl parathion (298-00-0)	T	<1 (A)	Rat 6 (B) Rat ihl 120/4H(C)	CHRON TBA		100	10	AQTX	
109 (185)	P072	alpha-Naphthylthiourea (86-88-4)	T	1-10 (B)	Rat 6(B)		Solid		100	AQTX T(ori)	
110 (113)	P073	Nickel carbonyl (13463-39-3)	T	10-100(C)	Rat ihl 35/30M 1o(B)	CARC TBA CHRON TBA	F-4, B110(C)		100	T(ihl)	Note 13
111 (112)	P074	Nickel cyanide (557-19-7)	T	[0.1-1(A)]		CHRON TBA	Solid	[10]	10	AQTX, 311	Note 18
112 (111)	P074	Nickel(II) cyanide (557-19-7)	T	[0.1-1(A)]		CHRON TBA	Solid	[10]	10	AQTX, 311	Note 18
113 (110)	P073	Nickel tetracarbonyl (13463-39-3)	T	10-100(C)	Rat ihl 35/30M 1o(B)	CARC TBA CHRON TBA	F-4, B110(C)		100	T(ihl)	Note 13
114 (162)	P075	Nicotine and salts (54-11-5)	T	1-10(B)	Rat 53(C)		Solid		100	AQTX	Note 23
115 (118)	P076	Nitric oxide (10102-43-9)	T		Rat ihl 88/4H(C)		R=strong oxidizer (A)		10	R	Note 24
116 (26)	P077	p-Nitroaniline (100-01-6)	T	106.1(D)	Rat 750 (D)				5000	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Special Note R Q 8	Basic Information for 311 R Q 9	Comments
117 (119)	P078	Nitrogen dioxide (10102-44-0)	T	100-10(C)	Rat ihl 88/4H(C)		R=strong oxidizer (A)	1000	10	R	Note 25
118 (115)	P076	Nitrogen(II) oxide (10102-43-9)	T		Rat ihl 88/4H(C)		R=strong oxidizer (A)		10	R	Note 24
119 (117)	P078	Nitrogen(IV) oxide (10102-44-0)	T	100-10(C)	Rat ihl 88/4H(C)		R=strong oxidizer (A)	1000	10	R	Note 25
120 (154)	P081	Nitroglycerine (55-63-0)	T				R=exp(A)		10	R	
121 (60)	P082	N-Nitrosodimethylamine (62-75-9)	T		Rat 26(C)	CARC TBA			1000	T(orl)	
122 (75)	P084	N-Nitrosomethylvinylamine (4549-40-0)	T		Rat 24 (C)	CARC TBA			1000	T(orl)	Note 13
123 (70)	P050	5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro, cyclic sulfite (115-29-7)	T	<0.1(X)	Rat 18 (C)	CHRON *	Solid	1	1	311	
124 (66)	P085	Octamethylpyrophosphoramidate (152-16-9)	T		Rat 5(B)				100	T(orl)	
125 (126)	P087	Osmium oxide (20816-12-0)	T		Rat 14(C) rat ihl 40/4H lo(C)		Solid		1000	T(orl) T(ihl)	
126 (125)	P087	Osmium tetroxide (20816-12-0)	T		Rat 14(C) rat ihl 40/4H lo(C)		Solid		1000	T(orl) T(ihl)	
127 (71)	P088	7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid (145-73-3)	T		Rat 50(C)		Solid		1000	T(orl)	
128 (144)	P089	Parathion (56-38-2)	T	<0.1 (X)	Rat 2(B) rat ihl 10/2H lo(B)	CHRON *		1	1	311	
129 (63)	P034	Phenol, 2-cyclohexyl-4,6-dinitro- (131-89-5)	T	1-10(B)	Rat 65(C)		Solid		100	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Classification Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 1 1 R Q 7	8 S u g g e s t e d N o t e 8 R Q	9 B a s i s f o r S u g g e s t i o n N o t e 9	Comments
130 (64)	P048	Phenol, 2,4-dinitro- (51-28-5)	T	1-10 (B)	Rat 30 (C)	CT=30 (B)	Solid		100	AQTX, CTX	Note 21
131 (62)	P047	Phenol 2,4-dinitro-6-methyl-, and salts (534-52-1)	T	1-10 (B)	Rat 10 (B)	CT=39.6 (B)	Solid		100	AQTX, CTX T (orl)	Note 20
132 (65)	P020	Phenol, 2,4-dinitro-6-(1-methylpropyl)- (88-85-7)	T	12-100 (C)	Rat 25 (C) rat skin 80 (D)		Solid		1000	AQTX T (orl)	
133 (15)	P009	Phenol, 2,4,6-trinitro-, ammonium salt (131-74-8)	R				R=exp (A)		10	R	
134 (50)	P036	Phenyl dichloroarsine (696-28-6)	T		Rat skin 16 (C) rbt skin 0.5 (B) gpg skin 4 (B)	CARC TBA CHRON TBA			100	T (skn)	Note 14
135 (97)	P092	Phenylmercuric acetate (62-38-4)	T		Rat 30 (C)	CHRON TBA	Solid		1000	T (orl)	
136 (186)	P093	N-Phenylthiourea (103-85-5)	T		Rat 3 (B)		Solid		100	T (orl)	
137 (143)	P094	Phorate (298-02-2)	T		Rat 1.1 (B) rat ihl 11/2H 10 (B)	CHRON TBA	Solid		100	T (orl) T (ihl)	
138 (40)	P095	Phosgene (75-44-5)	T	100-500 (D)	Rat 50/30M 10 (C)			5000	1000	T (ihl)	
139 (94)	P096	Phosphine (7803-51-2)	T		Rat ihl 11/4H (B)		F gas B-126 (B)		100	I, T (ihl)	
140 (54)	P041	Phosphoric acid, diethyl p-nitrophenyl ester (311-45-5)	T		Rat 1.8 (B)				100	T (orl)	
141 (57)	P044	Phosphrodithioic acid, O,O-dimethyl S-[2(methylamino) -2-oxoethyl] ester (60-51-5)	T	<1 (A)	HMN 30 (C) rat 152 (D)		Solid		10	AQTX	
142 (56)	P043	Phosphorofluoridic acid, bis(1-methylethyl) ester (55-91-4)	T		Rat 6 (B) rat skin 72 (D)				100	T (orl)	
143 (137)	P094	Phosphorodithioic acid, O,O-diethyl S-(ethylthio) methyl ester (298-02-2)	T		Rat 1.1 (B) rat ihl 11/2H 10 (B)	CHRON TBA	Solid		100	T (orl) T (ihl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 R Q	7 N o t e	S u g g e s t e d R Q	8 N o t e	B a s i s f o r	S u g g e s t i o n N o t e	9	Comments
144 (128)	P089	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester (56-38-2)	T	<0.1(X)	Rat 2(B) rat ihl 10/2H lo(B)	CHRON *		1		1		311			
145 (55)	P040	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester (297-97-2)	T		Rat 3.5 (B)					100		T(orl)			
146 (78)	P097	Phosphorothioic acid, O,O-dimethyl O-[p-(dimethylamino)-sulfonyl] phenyl ester (52-85-7)	T		Rat 35(C)		Solid			1000		T(orl)			
147 (172)	P110	Plumbane, tetraethyl- (78-00-2)	T	1-10(B)	Rat 17(C) rat ihl 860/1H(D)	CHRON TBA	F200	100		100		311		Note 10	
148 (-)	P098	Potassium cyanide (151-50-8)	T	0.1-1(A)	Rat 10(B)		Solid	10		10		311			
149 (-)	P099	Potassium silver cyanide (506-61-6)	T	<0.1(X)	Rat 21(C)		Solid	[10]		1		AQTX		Note 25	
150 (9)	P070	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime (116-06-3)	T		Rat 1.0(A) mus 0.3(A)		Solid			10		T(orl)			
151 (76)	P101	Propanenitrile (107-12-0)	T		Rat 39(C) rat ihl 500/4H lo(D)		F36 (C) B207	[10]		10		311			
152 (45)	P027	Propanenitrile, 3-chloro- (542-76-7)	T		Rat 50(C)		F168			1000		T(orl)			
153 (107)	P069	Propanenitrile, 2-hydroxy-2-methyl- (75-86-5)	T	1-0.1 (A)	Rat 17(C) rat ihl 63/4H lo(C)		F 165 B 248	10		10		311			
154 (120)	P081	1,2,3-Propanetriol, trinitrate- (55-63-0)	T				R=exp (A)			10		R			
155 (33)	P017	2-Propanone, 1-bromo- (598-31-2)	T	10-100 (C)	Mus ihl 600 lo rat 70 (C)					1000		AQTX			
156 (160)	P102	Propargyl alcohol (107-19-7)	T		Rat 70 (C) rat ihl 2000/2H (D)		F97 (C) B239			1000		I,T(orl)			

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Not e R Q 8	Suggested for S u g g e s t i o n N o t e 9	Comments
157 (8)	P003	2-Propenal (107-02-8)	T	<0.1(X)	Rat 46(C) rat 8/4H 10(B)	CHRON *	F-15,B125(C)	1	1	311	
158 (11)	P005	2-Propen-1-ol (107-18-6)	T	1-10(B)	Rat 64(C) rat ihl 165/4H (C)	CT=34.8(B)	F70(C) B206	100	100	311,CTX	
159 (104)	P067	1,2-Propylenimine (75-55-8)	T		Rat 19(C)	CARC TBA			1000	T(orl)	Note 13
160(156)	P102	2-Propyn-1-ol (107-19-7)	T		Rat 70(C) rat ihl 2000/2H (D)		F97(C) B239		1000	I,T(orl)	
161 (14)	P008	4-Pyridinamine (504-24-5)	T		Rat 20(C)		Solid		1000	T(orl)	
162 (114)	P075	Pyridine, (S)-3-(1-methyl-2-pyrrolidiny)-, and salts (54-11-5)	T	1-10(B)	Rat 53(C)		Solid		100	AQTX	Note 23
163 (173)	P111	Pyrophosphoric acid, tetraethyl ester (107-49-3)	T	1-10(B)	Rat 0.5(A) rat skin 2.4(B)	CHRON TBA		100	10	T(orl)	
164 (37)	P103	Selenourea (630-10-4)	T		Rat 50(C)	CHRON TBA	Solid		1000	T(orl)	
165 (-)	P104	Silver cyanide (506-64-9)	T	<0.1(X)	Rat 123(D)	CHRON *	Solid	[10]	1	AQTX	Note 26
166 (-)	P105	Sodium azide (26628-22-8)	T		Rat 42(C)		Solid		1000	T(orl)	
167 (-)	P106	Sodium cyanide (143-33-9)	T	0.1-1(A)	Rat 6.44(B)		Solid	10	10	311	
168 (-)	P107	Strontium sulfide (1314-96-1)	T				H <sub>2</sub> S(B)		100	R	Note 27
169 (-)	P108	Strychnidin-10-one, and salts (57-24-9)	T	0.1-1(A)	Rat 16(C) Na salt rat 5(B)		Solid	10	10	311	Note 28
170 (179)	P115	Sulfuric acid, thallium(I) salt (7446-18-6)	T	10-100(C)	Mus 29(C)	CHRON TBA	Solid	1000	1000	311, T(orl)	Notes 10 29

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Classification Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested R Q 8	Suggested Basics for R Q 9	Comments
171 (69)	P109	Tetraethyldithiopyrophosphate (3689-24-5)	T		Rat 5(B) rbt skin 20(C)				100	T(or1)	
172 (147)	P110	Tetraethyl lead (78-00-2)	T	1-10 (B)	Rat 17 (C) rat ihl 860/1H (D)	CHRON TBA	F200	100	100	311	Note 10
173 (163)	P111	Tetraethylpyrophosphate (107-49-3)	T	1-10 (B)	Rat 0.5 (A) Rat skin 2.4 (B)	CHRON TBA		100	10	T(or1)	
174 (100)	P112	Tetranitromethane (509-14-8)	R		Rat 130 (D) rat ihl 13/4H (B)		R=exp (A)		10	R	
175 (89)	P062	Tetraphosphoric acid, hexaethyl ester (757-58-4)	T	1-10 (B)	Rat 7 (B) rat skin 15 lo (C)				100	AQTX, T(or1)	
176 (177)	P113	Thallic oxide (1314-32-5)	T		Rat 22 (C)	CHRON TBA	Solid		1000	T(or1)	Note 29
177 (176)	P113	Thallium(III) oxide (1314-32-5)	T		Rat 22 (C)	CHRON TBA	Solid		1000	T(or1)	Note 29
178 (-)	P114	Thallium(I) selenide (12039-52-0)	T		Rat 50 (C)	CHRON TBA	Solid		1000	T(or1)	Notes 29 30
179 (170)	P115	Thallium(I) sulfate (7446-18-6)	T	10-100 (C)	mus 29 (C)	CHRON TBA	Solid	1000	1000	311, T(or1)	Notes 10 29
180 (58)	P045	Thiofanox (39196-18-4)	T		Rat 8.5 (B)		Solid		100	T(or1)	
181 (68)	P049	Thioimidodicarbonic diamide (541-53-7)	T		Rat 5 (B)		Solid		100	T(or1)	
182 (29)	P014	Thiophenol (108-98-5)	T		Rat 46 (C) rat ihl 33/4H (B)				100	T(1hl)	
183 (90)	P116	Thiosemicarbazide (79-19-6)	T	20.8 (C)	Rat 9 (B)		Solid		100	T(or1)	
184 (44)	P026	Thiourea, (2-chlorophenyl)- (5344-82-1)	T		Rat 4.6 (B)		Solid		100	T(or1)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - A. ACUTE HAZARDOUS WASTES (P LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basics for Suggestion Note 9	Comments
185 (109)	P072	Thiourea, 1-naphthalenyl- (86-88-4)	T	1-10 (B)	Rat 6 (B)		Solid		100	AQTX, T(orl)	
186 (136)	P093	Thiourea, phenyl- (103-85-5)	T		Rat 3 (B)		Solid		100	T(orl)	
187 (36)	P123	Toxaphene (8001-35-2)	T	<0.1 (X)	Rat 40 (C)	CARC*	Solid	1	1	311	Note 10
188 (101)	P118	Trichloromethanesulfonyl chloride (594-42-3)			Rat 83 (C) Rat 1hl 1o(B)				100	T(1hl)	Note 22
189 (16)	P119	Vanadic acid, ammonium salt (7803-55-6)	T		Rat 18 (C)		Solid		1000	T(orl)	
190 (191)	P120	Vanadium pentoxide (1314-62-1)	T	100-10 (C)	Rat 10 (C) rat 1hl 70/2H 1o(C)	CHRON TBA	Solid	1000	1000	311, T(orl)	
191 (190)	P120	Vanadium(V) oxide (1314-62-1)	T	100-10 (C)	Rat 10 (C) rat 1hl 70/2H 1o (C)	CHRON TBA	Solid	1000	1000	311, T(orl)	
192 (6)	P001	Warfarin (81-81-2)	T		Rat 3 (B)		Solid		100	T(orl)	
193 (-)	P121	Zinc cyanide (557-21-1)	T	0.1-1 (A)		CHRON TBA	Solid	10	10	311	Note 10
194 (-)	P122	Zinc phosphide (1314-84-7)	R,T	10-100 (C)	Rat 40 (C)	CHRON TBA	PH <sub>3</sub> ^ (B)	1000	100	R	Note 11

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l Q 7	5 0 0 0 8	5 0 0 0 9	Comments
1 (195)	U001	Acetaldehyde (75-07-0)	I	10-100 (C)	Rat 1930, rat ihl. 4000/4H 10		F-38, B70 (B) May polymerize	1000	1000	311, BHP	Note 65
2 (110)	U034	Acetaldehyde, trichloro- (75-87-6)	T		Rbt 480 (D)	CARC TBA			5000	T(ori)	Notes 31 64
3 (354)	U187	Acetamide, N-(4-ethoxyphenyl)- (62-44-2)	T		Rat 1650	CARC TBA	Solid		5000	Max	Note 13
4 (11)	U005	Acetamide, N-9H-fluoren-2-yl- (53-96-3)	T		Mus 1020	CARC TBA	Solid		5000	Max	Note 13
5 (220)	U112	Acetic acid, ethyl ester (141-78-6)	I	1000-100 (D)	Rat 11,000		F24, B171 (C)		5000	BHP	Note 65
6 (270)	U144	Acetic acid, lead salt (301-04-2)	T	500-100 (D)	Dog 300 (D)	CARC TBA CHRON TBA	Solid	5000	5000	311	Notes 10 13
7 (424)	U214	Acetic acid, thallium(I) salt (563-68-8)	T		Mus 35 (C)	CHRON TBA	Solid		1000	T(ori)	Notes 10 29
8 (383)	U002	Acetone (67-64-1)	I	>1000			F-4, B133 (C)		5000	BHP	Note 65
9 (203)	U003	Acetonitrile (75-05-8)	I, T	1000	Rat 3800	CT=19.2 (C)	F42, B179 (C)		1000	I, CTX	
10 (218)	U004	Acetophenone (98-86-2)	T		Rat 900		F170, B396		5000	Max	
11 (4)	U005	2-Acetylaminofluorene (53-96-3)	T		Mus 1020	CARC TBA	Solid		5000	Max	Note 13
12 (219)	U006	Acetyl chloride (75-36-5)	C, R, T	100-10 (C)			R: NH <sub>3</sub> (D) F40, B124 (C)	5000	5000	311, BHP	Notes 32 33 65
13 (384)	U007	Acrylamide (79-06-1)	T		Rat 170 (D), rbt skin 1000 10		Solid		5000	T(ori)	
14 (389)	U008	Acrylic acid (79-10-7)	I		Rat 340 (D)		F1.2, B287 (D)		5000	T(ori), I	
15 (387)	U009	Acrylonitrile (107-13-1)	T	1-10 (B)	Rat 82 (C), rat ihl 500/4H (D)	CARC TBA CHRON TBA	F32, B171 (C)	100	100	311	Note 34

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	C L i s t e r i n g a 2 Note	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l R Q 7 Note	S u c c e s s f u l l R Q 8 Note	B a s i s f o r S u c c e s s i o n 9 Note	Comments
16 (277)	U150	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L- (148-82-3)	T			CARC TBA	Solid		5000	Max	Note 13
17 (436)	U011	Amitrole (61-82-5)	T		Rat 1100	CARC TBA	Solid		5000	Max	Note 13
18 (29)	U012	Aniline (62-53-3)	I,T	10-100 (C)	Rat 440 (D), rat ihl 250/4H (C)		F158,B364	1000	5000	BHP, T(orl)	Note 65
19 (30)	U014	Auramine (492-80-8)	T			CARC TBA	Solid		5000	Max	Note 13
20 (409)	U015	Azaserine (115-02-6)	T		Rat 170 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
21 (319)	U010	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- (50-07-7)	T		Rat 14 (C)	CARC TBA	Solid		1000	T(orl)	Note 13
22 (305)	U157	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl- (56-49-5)	T			CARC TBA	Solid		5000	Max	Note 13
23 (24)	U016	Benz[c]acridine (225-51-4)	T			CARC TBA	Solid		5000	Max	Note 13
24 (23)	U016	3,4-Benzacridine (225-51-4)	T			CARC TBA	Solid		5000	Max	Note 13
25 (49)	U017	Benzal chloride (98-87-3)	T		Rat 3249				5000	Max	
26 (27)	U018	Benz[a]anthracene (56-55-3)	T		Mus-skn:18 (C) TDlo	CARC TBA CHRON TBA	Solid		1000	T(skn)	
27 (26)	U018	1,2-Benzanthracene (56-55-3)	T		Mus-skn:18 (C) TDlo	CARC TBA CHRON TBA	Solid		1000	T(skn)	
28 (179)	U094	1,2-Benzanthracene, 7,12-dimethyl- (57-97-6)	T		Rat 327 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
29 (18)	U012	Benzenamine (62-53-3)	I,T	10-100 (C)	Rat 440 (D), rat ihl 250/4H (C)		F158, B364	1000	5000	BHP, T(orl)	Note 65
30 (59)	U054	Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl- (492-80-8)	T			CARC TBA	Solid		5000	Max	Note 51

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Cr List in a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 R Q 7	S uggested R Q 8	B asis for S uggestion 9	Comments
31 (122)	U049	Benzenamine. 4-chloro-2-methyl-, hydrochloride (3165-93-3)	T			CARC TBA	Solid		5000	Max	Note 13
32 (178)	U093	Benzenamine, N,N-dimethyl-4-phenylazo- (60-11-7)	T		Rat 200 (D)	CARC TBA	Solid		5000	T(or)1	Note 13
33 (306)	U158	Benzenamine, 4,4'-methylenebis(2-chloro- (101-14-4)	T			CARC TBA	Solid		5000	Max	Note 13
34 (435)	U222	Benzenamine, 2-methyl-, hydrochloride (636-21-5)	T		Rat 2951	CARC TBA	Solid		5000	Max	Note 13
35 (343)	U181	Benzenamine, 2-methyl-5-nitro- (99-55-8)	T		Rat 574	CARC TBA	F315		5000	Max	Note 13
36 (-)	U019	Benzene (71-43-2)	I,T	10-1 (B)	Rat 3800, rat ihl 10,000/7H	CARC TBA CHRON TBA	F12,B176 (C)	1000	100	AQTX	Note 17
37 (223)	U038	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester (510-15-6)	T		Rat 700	CARC TBA	Solid		5000	Max	Note 13
38 (89)	U030	Benzene, 1-bromo-4-phenoxy- (101-55-3)	T	1-0.1 (A)					10	AQTX	
39 (114)	U037	Benzene, chloro- (108-90-7)	T	1-10 (B)	Rat 2910	CT=11.6 (C)	F84, B270 (C)	100	100	311	
40 (370)	U190	1,2-Benzenedicarboxylic acid anhydride (85-44-9)	T		Rat 4020		F305		5000	Max	
41 (86)	U028	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester (117-81-7)	T		Rat 31,000		F420		5000	Max	Notes 10 29 35
42 (149)	U069	1,2-Benzenedicarboxylic acid, dibutyl ester (84-74-2)	T	1-10 (B)	Mus 12,000	CT=12.8 (C)	F315	100	100	311	Note 29
43 (172)	U088	1,2-Benzenedicarboxylic acid, diethyl ester (84-66-2)	T	1.2 (B)	Rbt 1000 (1o)	CT=4 (D)	F322		100	AQTX	Notes 29 36
44 (186)	U102	1,2-Benzenedicarboxylic acid, dimethyl ester (131-11-3)	T		Rat 6900		F295		5000	Max	Notes 29 35
45 (190)	U107	1,2-Benzenedicarboxylic acid, di-n-octyl ester (117-84-0)	T				F420		5000	Max	Notes 29 35 37

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Critical Listing Note a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l R Q	7 Note R Q	8 Note R Q	Suggested Basis for Suggestion Note 9	Comments
46 (151)	U070	Benzene, 1,2-dichloro- (95-50-1)	T	1-10 (B)	Rat 500 (D)	CT=8.8 (C)	F151			100	AQTX	
47 (152)	U071	Benzene, 1,3-dichloro- (541-73-1)	T	1-10 (B)		CT=9 (C)	F150			100	AQTX	
48 (153)	U072	Benzene, 1,4-dichloro- (106-46-7)	T	1-10 (B)	Rat 500 (D)	CT=9.0 (C)	F150			100	AQTX	
49 (25)	U017	Benzene, (dichloromethyl)- (98-87-3)	T		Rat 3249					5000	Max	
50 (434)	U223	Benzene, 2,4-diisocyanatomethyl- (584-84-9)	T,R	1-10 (B)	Rat 5800, mus ihl 10/4H (B)		R:NH <sub>3</sub> (D), F270			100	AQTX, T(ihl)	Note 38
51 (403)	U201	1,3-Benzenediol (108-46-3)	T	10-100 (C)	Rat 301 (D)		F261	1000	5000		BHP	Note 65
52 (246)	U127	Benzene, hexachloro- (118-74-1)	T		Rat 10,000	CARC TBA CHRON TBA	Solid			5000	Max	Note 10
53 (132)	U056	Benzene, hexahydro- (110-82-7)	I	10-100 (C)	Rat 29,820		F-4,B179 (C)	1000	1000		I,311	
54 (355)	U188	Benzene, hydroxy- (108-95-2)	T	10-100 (C)	Rat 414 (D)	CHRON TBA	F175	1000	1000		311	
55 (432)	U220	Benzene, methyl- (108-88-3)	T	10-100 (C)	Rat 5000	CT=7.0 (C)	F40, B231 (C)	1000	1000		I,311, CTX	
56 (188)	U105	Benzene, 1-methyl-2,4-dinitro- (121-14-2)	T	10-100 (C)	Rat 268 (D)	CT=29.7 (B)	F404,B576			100	CTX	
57 (189)	U106	Benzene, 1-methyl-2,6-dinitro- (606-20-2)	T	10-100 (C)	Rat 177 (D)	CT=29.7 (B)	Solid			100	CTX	
58 (405)	U203	Benzene, 1,2-methylenedioxy-4-allyl- (94-59-7)	T		Rat 1950	CARC TBA	F212			5000	Max	Note 13
59 (267)	U141	Benzene, 1,2-methylenedioxy-4-propenyl- (120-58-1)	T		Rat 1340	CARC TBA				5000	Max	Note 13
60 (175)	U090	Benzene, 1,2-methylenedioxy-4-propyl- (94-58-6)	T		Rat 2260	CARC TBA				5000	Max	Note 13
61 (129)	U055	Benzene, (1-methylethyl)- (98-82-8)	I		Rat 1400		F96,B306 (C)			5000	BHP	Note 65
62 (331)	U169	Benzene, nitro- (98-95-3)	I,T	10-100 (C)	Rat 640		F190,B412 (D)	1000	1000		311	
63 (349)	U183	Benzene, pentachloro- (608-93-5)	T			CHRON TBA	Solid			5000	Max	Note 39

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Critical Note List 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 R Q 7	5 R Q 8	Suggested Note for Basis of Decision 9	Comments
64 (351)	U185	Benzene, pentachloronitro- (82-68-8)	T		Rat 1650	CARC TBA CHRON TBA	Solid		5000	Max	Note 13
65 (66)	U020	Benzenesulfonic acid chloride (98-09-9)	C,R		Rat 1960, rat ihl 32/1H(B)		R:NH <sub>3</sub> (D)		100	T(ihl)	
66 (65)	U020	Benzenesulfonyl chloride (98-09-9)	C,R		Rat 1960, rat ihl 32/1H(B)		R:NH <sub>3</sub> (D)		100	T(ihl)	
67 (418)	U207	Benzene, 1,2,4,5-tetrachloro- (95-94-3)	T		Rat 1500	CT=2.0 (D)	F311		5000	Max	
68 (76)	U023	Benzene, (trichloromethyl)- (98-07-7)	C,R,T		Rat ihl 125/4H(C)		F260		1000	T(ihl)	
69 (445)	U234	Benzene, 1,3,5-trinitro- (99-35-4)	R,T		Rat 505	CHRON TBA	R=exp(A)		10	R	
70 (79)	U021	Benzidine (92-87-5)	T	10-1 (B)	Rat 309(D)	CARC TBA CHRON TBA	Solid		100	AQTX	
71 (404)	U202	1,2-Benzisothiazolin-3-one, 1,1-dioxide, and salts (81-07-2)	T			CARC TBA	Solid		5000	Max	Note 13
72 (234)	U120	Benzo[j,k]fluorene (206-44-0)	T	10-1 (B)	Rat 2000	CARC TBA	Solid		100	AQTX	Notes 13 17 40
73 (74)	U022	Benzo[a]pyrene (50-32-8)	T			CARC TBA CHRON TBA	Solid		5000	Max	
74 (73)	U022	3,4-Benzopyrene (50-32-8)	T			CARC TBA CHRON TBA	Solid		5000	Max	
75 (131)	U197	p-Benzoquinone (106-51-4)	T	0.1-1 (A)	Rat 130 (D)	CHRON TBA	F100-200 (D)		10	AQTX	
76 (68)	U023	Benzotrichloride (98-07-7)	C,R,T		Rat ihl 125/4H(C)		F 260		1000	T(ihl)	
77 (124)	U050	1,2-Benzphenanthrene (218-01-9)	T		Mus-skn 3600 ug/kg TD10(B)	CARC TBA CHRON TBA	Solid		100	T(skn)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste Code	Substance (CAS Registry No.)	Classification Code	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	Reactivity Code	Reactivity Code	Reactivity Code	Reactivity Code	Comments
78 (168)	U085	2,2'-Bioxirane (1464-53-5)	I,T		Rat 78 (C) Rat ihl 90/4H (C)	CARC TBA			1000	T(orl)		Note 13
79 (70)	U021	(1,1'-Biphenyl)-4,4'diamine (92-87-5)	T	10-1 (B)	Rat 309 (D)	CARC TBA CHRON TBA	Solid		100	AQTX		
80 (154)	U073	(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro- (91-94-1)	T		Rat 4740	CARC TBA CHRON TBA	Solid		5000	Max		Note 10
81 (176)	U091	(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethoxy- (119-90-4)	T		Rat 1920	CARC TBA	Solid		5000	Max		Note 13
82 (180)	U095	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl- (119-93-7)	T		Rat 404 (D)	CARC TBA	Solid		5000	T(orl)		Note 13
83 (202)	U024	Bis(2-chloroethoxy) methane (111-91-1)	T		Rat 65 (C) Rat ihl 65/4H 1o (C)		F230		1000	T(orl) T(ihl)		
84 (378)	U027	Bis(2-chloroisopropyl) ether (108-60-1)	T		Rat 240 (D) Rat ihl 700/5H (D)	CT=12 (C)	F185		1000	CTX		
85 (431)	U244	Bis(dimethylthiocarbamoyl) disulfide (137-26-8)	T	0.79 (A)	Rat 560		Solid		10	AQTX		
86 (41)	U028	Bis(2-ethylhexyl) phthalate (117-81-7)	T		Rat 31,000		F420		5000	Max		Notes 10 29 35
87 (130)	U246	Bromine cyanide (506-68-3)	T	10-100 (C)	Mus ihl 510/10H 1o (D)				1000	AQTX		
88 (291)	U225	Bromoform (75-25-2)	T	46-56 (C)	Mus 1400 (D)	CT=25.8 (B)			100	CTX		
89 (38)	U030	4-Bromophenyl phenyl ether (101-55-3)	T	1-0.1 (A)					10	AQTX		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 RQ	Special Note RQ 7	Special Note RQ 8	Basis for Suggestion Note 9	Comments
90 (247)	U128	1,3-Butadiene, 1,1,2,3,4,4-hexachloro- (87-68-3)	T	<0.1 (X)	Rat 90 (C)	CARC TBA CHRON TBA				1	AQTX	Notes 10 17
91 (334)	U172	1-Butanamine, N-butyl-N-nitroso- (924-16-3)	T		Rat 1200	CARC TBA				5000	Max	Note 13
92 (111)	U035	Butanoic acid, 4-[bis(2-chloroethyl) amino]benzene- (305-03-3)	T			CARC TBA	Solid			5000	Max	Note 13
93 (98)	U031	1-Butanol (71-36-3)	I		Rat 790		F84,B283(C)			5000	BHP	Note 65
94 (311)	U159	2-Butanone (78-93-3)	I,T	>1000	Rat 3400	CT=8.8 (C)	F16,B176 (C)			1000	I,CTX	
95 (312)	U160	2-Butanone peroxide (1338-23-4)	R,T		Rat 484 (D) rat ihl 200/4H (C)		R=exp(A)			10	R	
96 (128)	U053	2-Butenal (4170-30-3) and (123-73-9)	T	1-10 (B)	Rat 300 (D)		F55,B216 (C)	100	100	311		Notes 41 42
97 (155)	U074	2-Butene, 1,4-dichloro- (764-41-0)	I,T	<0.1 (X)	Rat 89 (C) rat ihl 200/4H (C)		F80,B262 (C)			1	AQTX	
98 (93)	U031	n-Butyl alcohol (71-36-3)	I		Rat 790		F84,B283 (C)			5000	BHP	Note 65
99 (262)	U136	Cacodylic acid (75-60-5)	T		Rat 700	CARC TBA	Solid			5000	Max	Note 14
100 (123)	U032	Calcium chromate (13765-19-0)	T	10-100 (C)		CARC TBA CHRON TBA	Solid	1000	1000	311		Notes 10 13
101 (222)	U238	Carbamic acid, ethyl ester (51-79-6)	T		Mus 2500	CARC TBA	Solid			5000	Max	Note 13
102 (340)	U178	Carbamic acid, methylnitroso-, ethyl ester (615-53-2)	T		Rat 180 (D)	CARC TBA	Solid			5000	T(orl)	Note 13
103 (338)	U176	Carbamide, N-ethyl-N-nitroso- (759-73-9)	T		Rat 300 (D)	CARC TBA	Solid			5000	T(orl)	Note 13
104 (339)	U177	Carbamide, N-methyl-N-nitroso (684-93-5)	T		Rat 110 (D)	CARC TBA	Solid			5000	T(orl)	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	C L I s t e r i n g a 2 Note	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l R Q 7 Note	S u g g e s t e d R Q 8 Note	B a s i s f o r S u g g e s t i o n 9 Note	Comments
105 (430)	U219	Carbamide, thio- (62-56-6)	T		Rat 125 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
106 (182)	U097	Carbamoyl chloride, dimethyl- (79-44-7)	T		Rat 1000	CARC TBA			5000	Max	Note 13
107 (425)	U215	Carbonic acid, dithallium (I) salt (6533-73-9)	T		Mus 21 (C)	CHRON TBA	Solid		1000	T(orl)	Notes 10 29
108 (303)	U156	Carbonochloridic acid, methyl ester (79-22-1)	I,T		Rat 110 (D) rat ihl 88/1H (C)				1000	T(ihl)	
109 (-)	U033	Carbon oxyfluoride (353-50-4)	R,T		Rat ihl 360/1 (C)				1000	T(ihl)	
110 (2)	U034	Chloral (75-87-6)	T		Rbt 480 (D)	CARC TBA			5000	T(orl)	Notes 31 64
111 (92)	U035	Chlorambucil (305-03-3)	T			CARC TBA	Solid		5000	Max	Note 13
112 (295)	U036	Chlordane, technical (57-74-9)	T	<0.1 (X)	Rbt 100 (C)	CARC *	Solid	1	1	311	Note 10
113 (330)	U026	Chlornaphazine (494-03-1)	T			CARC TBA	Solid		5000	Max	Note 13
114 (39)	U037	Chlorobenzene (108-90-7)	T	10-1 (B)	Rat 2910	CT=11.6 (C)	F84,B270 (C)	100	100	311	
115 (357)	U039	4-Chloro-m-cresol (59-50-7)	T		Rat 500 (D)		Solid		5000	T(orl)	Note 43
116 (347)	U041	1-Chloro-2,3-epoxypropane (106-89-8)	T	10-100 (C)	Rat 90 (C) rat ihl 250/4H (C)	CARC TBA CHRON TBA	F91,B239 (C)	1000	1000	I,311	Notes 13 44
117 (213)	U042	2-Chloroethyl vinyl ether (110-75-8)	T	1000-100 (D)	Rat 250 (D)		F80,B228 (C)		1000	I	
118 (292)	U044	Chloroform (67-66-3)	T	100-10 (C)	Rat 800 rat ihl 8000/4H	CARC TBA		5000	1000	AQTX	
119 (283)	U046	Chloromethyl methyl ether (107-30-2)	T	100-1000 (D)	Rat 817 rat ihl 55/7H (C)	CARC TBA CHRON TBA			1000	T(ihl)	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l R Q	7 Note	8 Suggested R Q	8 Note	9 Suggested Basis for Suggestion	9 Note	Comments
120 (322)	U047	beta-Chloronaphthalene (91-58-7)	T		Rat 2078		Solid			5000		Max		
121 (356)	U048	o-Chlorophenol (95-57-8)	T	8-20 (B)	Rat 670		F147			100		AQTX		
122 (31)	U049	4-Chloro-o-toluidine, hydrochloride (3165-93-3)	T			CARC TBA	Solid			5000		Max		Note 13
123 (100)	U032	Chromic acid, calcium salt (13765-19-0)	T	10-100 (C)		CARC TBA CHRON TBA	Solid	1000	1000			311		Notes 10 13
124 (77)	U050	Chrysene (218-01-9)	T		Mus-skn 3600 ug/kg TD10 (B)	CARC TBA CHRON TBA	Solid			100		T(skn)		
125 (-)	U051	Creosote (8001-58-9)	T	1-10 (B)	Rat 725	CARC TBA CHRON TBA	F165			100		AQTX		Notes 13 45
126 (127)	U052	Cresols (1319-77-3)	T	10-1 (B)	Rat 1454 (D) Mus 861 (D) Rbt 2000 (D)	CHRON TBA	F178-187	1000	100			AQTX		Note 46
127 (126)	U052	Cresylic acid (1319-77-3)	T	10-1 (B)	Rat 1454 (D) Mus 861 (D) Rbt 2000 (D)	CHRON TBA	F178-187	1000	100			AQTX		Note 46
128 (96)	U053	Crotonaldehyde (4170-30-3) and (123-73-9)	T	1-10 (B)	Rat 300 (D)		F55,B216 (C)	100	100			311, I		Notes 41 42
129 (61)	U055	Cumene (98-82-8)	T		Rat 1400		F96,B306 (C)			5000		BHP		Note 65
130 (87)	U246	Cyanogen bromide (506-68-3)	T	10-100 (C)	Mus ih1 510/10H 10 (D)					1000		AQTX		
131 (75)	U197	1,4-Cyclohexadienedione (106-51-4)	T	0.1-1 (A)	Rat 130 (D)	CHRON TBA	F100-200 (D)			10		AQTX		
132 (53)	U056	Cyclohexane (110-82-7)	I	10-100 (C)	Rat 29,820		F-4,B179 (C)	1000	1000			I,311		
133 (-)	U057	Cyclohexanone (108-94-1)	I		Rat 1620		F111,B313 (D)			5000		I		
134 (249)	U130	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro- (77-47-4)	T	<0.1 (X)	Rat 113 (D)	CHRON *	Solid	1	1			311		Note 10

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 1 1 R Q 7	Not e 8	S u g g e s t e d R Q 8	B a s i s f o r N o t e 9	Comments
135 (345)	U058	Cyclophosphamide (50-18-0)	T		Rat 94 (C)	CARC TBA	Solid		1000	T(ori)	Note 13	
136 (165)	U240	2,4-D, salts and esters (94-75-7)	T	1-10 (B)	HMN 80 (C)	CT=16.4 (C)	Solid	100	100	311	Note 47	
137 (320)	U059	Daunomycin (20830-81-3)	T			CARC TBA	Solid		5000	Max	Note 13	
138 (158)	U060	DDD (72-54-8)	T	<0.1 (X)	Rat 113 (D)	CARC *	Solid	1	1	311	Note 10	
139 (159)	U061	DDT (50-29-3)	T	<0.1 (X)	Rat 113 (D)	CARC *	Solid	1	1	311	Note 10	
140 (268)	U142	Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta [c,d]-pentalen-2-one (143-50-0)	T	<0.1 (X)	Rat 95 (C)	CARC *	Solid	1	1	311	Note 10	
141 (150)	U062	Diallate (2303-16-4)	T		Rat 395 (D)	CARC TBA	Solid		5000	T(ori)	Note 13	
142 (253)	U133	Diamine (302-01-2)	R,T		Mus ihl 252/4H (C)	CARC TBA	Spont ign (A)		10	I		
143 (433)	U221	2,4-Diaminotoluene (95-80-7)	T		Rat 260 (D)	CARC TBA	Solid		5000	T(ori)	Note 13	
144 (145)	U063	Dibenz[a,h]anthracene (53-70-3)	T			CARC TBA CHRON TBA	Solid		5000	Max		
145 (144)	U063	1,2:5,6-Dibenzanthracene (53-70-3)	T			CARC TBA CHRON TBA	Solid		5000	Max		
146 (147)	U064	1,2:7,8-Dibenzopyrene (189-55-9)	T			CARC TBA	Solid		5000	Max	Note 13	
147 (146)	U064	Dibenz[a,i]pyrene (189-55-9)	T			CARC TBA	Solid		5000	Max	Note 13	
148 (375)	U066	1,2-Dibromo-3-chloropropane (96-12-8)	T		Rat 170 (D) rat ihl 103/8H (C)	CARC TBA			1000	T(ihl)	Note 13	
149 (42)	U069	Dibutyl Phthalate (84-74-2)	T	1-10 (B)	Mus 12,000	CT=12.8 (C)	F315	100	100	311	Note 29	
150 (141)	U062	S-(2,3-Dichloroallyl) diisopropylthiocarbamate (2303-16-4)	T		Rat 395 (D)	CARC TBA	Solid		5000	T(ori)	Note 13	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

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**Note:** All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Criteria Listing g a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l R Q	7 N o t e	S u g g e s t e d R Q	8 N o t e	B a s i s f o r S u g g e s t i o n	9 N o t e	Comments
165 (136)	U240	2,4-Dichlorophenoxyacetic acid, salts and esters (94-75-7)	T	1-10 (B)	HMN 80 (C)	CT=16.4 (C)	Solid	100	100	311				Note 47
166 (395)	U083	1,2-Dichloropropane (78-87-5)	T	100-10 (C)	Rat 1900		F60,B205 (C)		1000	I,AQTX				
167 (385)	U084	1,3-Dichloropropene (542-75-6)	T	10-1 (B)	Rat 250 (D)		F95,B219 (C)		100	AQTX				
168 (78)	U085	1,2:3,4-Diepoxybutane (1464-53-5)	I,T		Rat 78 (C) Rat ihl 90/4H (C)	CARC TBA			1000	T(orl)				Note 13
169 (191)	U108	1,4-Diethylene dioxide (123-91-1)	T	100-1000 (D)	Rat 4200	CARC TBA	F54,B214 (C)		1000	I				Note 13
170 (254)	U086	N,N'-Diethylhydrazine (1615-80-1)	T			CARC TBA			5000	Max				Note 13
171 (368)	U087	O,O-Diethyl S-Methyl Dithiophosphate (3288-58-2)	T		Mus 156 (D)				5000	T(orl)				
172 (43)	U088	Diethyl Phthalate (84-66-2)	T	1.2 (B)	Rbt 1000 (lo)	CT=4 (D)	F322		100	AQTX				Notes 29 36
173 (411)	U089	Diethylstilbestrol (56-53-1)	T		Mus 2500	CARC TBA	Solid		5000	Max				Note 13
174 (275)	U148	1,2-Dihydro-3,6-pyridazinedione (123-33-1)	T		Rat 3800		Solid		5000	Max				
175 (60)	U090	Dihydrosafrole (94-58-6)	T		Rat 2260	CARC TBA			5000	Max				Note 13
176 (81)	U091	3,3'-Dimethoxybenzidine (119-90-4)	T		Rat 1920	CARC TBA	Solid		5000	Max				Note 13
177 (280)	U092	Dimethylamine (124-40-3)	I	10-100 (C)	Rat 698	CHRON TBA	F20,B45 (B)	1000	100	I				
178 (32)	U093	Dimethylaminoazobenzene (60-11-7)	T		Rat 200 (D)	CARC TBA	Solid		5000	T(orl)				Note 13
179 (28)	U094	7,12-Dimethylbenz[a]anthracene (57-97-6)	T		Rat 327 (D)	CARC TBA	Solid		5000	T(orl)				Note 13
180 (82)	U095	3,3'-Dimethylbenzidine (119-93-7)	T		Rat 404 (D)	CARC TBA	Solid		5000	T(orl)				Note 13
181 (261)	U096	alpha,alpha-Dimethylbenzylhydroperoxide (80-15-9)	R		Rat 382 (D), rat ihl 220/4H (C)		R=exp (A)		10	R				

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	Reactivity Note 7	Suggested Reactivity Note 8	Basic Suggested Reactivity Note 9	Comments
182 (106)	U097	Dimethylcarbamoyl chloride (79-44-7)	T		Rat 1000	CARC TBA			5000	Max	Note 13
183 (255)	U098	1,1-Dimethylhydrazine (57-14-7)	T		Rat ihl 252/4H (C)	CARC TBA	Spont.ign. (A)		10	I	
184 (256)	U099	1,2-Dimethylhydrazine (540-73-8)	T		Rat 100 (C) rat ihl 280/4H (C)	CARC TBA			1000	T(orl)	Note 13
185 (360)	U101	2,4-Dimethylphenol (105-67-9)	T	10-1 (B)	Rat 3200		Solid		100	AQTX	Note 17
186 (44)	U102	Dimethyl phthalate (131-11-3)	T		Rat 6900		F295		5000	Max	Notes 29 35
187 (414)	U103	Dimethyl sulfate (77-78-1)	T	10-100 (C)	Rat 440 (D) rat ihl 32/4H lo (B)	CARC TBA	F182		100	T(ihl)	Note 13
188 (56)	U105	2,4-Dinitrotoluene (121-14-2)	T	10-100 (C)	Rat 268 (D)	CT=29.7 (B)	F404,B576		100	CTX	
189 (57)	U106	2,6-Dinitrotoluene (606-20-2)	T	10-100 (C)	Rat 177 (D)	CT=29.7 (B)	Solid		100	CTX	
190 (45)	U107	Di-n-octyl phthalate (117-84-0)	T				F420		5000	Max	Notes 29 35 37
191 (169)	U108	1,4-Dioxane (123-91-1)	T	100-1000 (D)	Rat 4200	CARC TBA	F54,B214 (C)		1000	I	Note 13
192 (257)	U109	1,2-Diphenylhydrazine (122-66-7)	T	1-0.1 (A)	Rat 301 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Notes 10 13 17 50
193 (374)	U110	Dipropylamine (142-84-7)	I		Rat 930		F63,B229 (C)		5000	BHP	Note 65
194 (337)	U111	Di-n-propylnitrosamine (621-64-7)	T		Rat 480 (D)	CARC TBA			5000	T(orl)	Note 13
195 (1)	U001	Ethanal (75-07-0)	I	10-100 (C)	Rat 1930 rat ihl 4000/4 lo		F-38,B70 (B) May polymerize	1000	1000	BHP	Note 65

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Critical Note Listed in a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basis for Suggestion for Note 9	Comments
196 (336)	U174	Ethanamine, N-ethyl-N-nitroso- (55-18-5)	T		Rat 280 (D)	CARC TBA			5000	T(ori)	Note 13
197 (225)	U067	Ethane, 1,2-dibromo- (106-93-4)	T	10-100 (C)	Rat 108 (D) rat ihl 400/2H (C)	CARC TBA		1000	1000	311	Note 13
198 (230)	U076	Ethane, 1,1-dichloro- (75-34-3)	T	160-320 (D)	Rat 725	CT=9.8 (C)	F22,B135 (C)		1000	I,CTX	
199 (226)	U077	Ethane, 1,2-dichloro- (107-06-2)	T	100-500 (D)	Rat 670	CARC TBA CHRON TBA	F56,B183 (C)	5000	1000	I	
200 (224)	U114	1,2-Ethanedithiylbiscarbamodithioic acid, salts and esters (111-54-6)	T		Rat 395 (D)		Solid		5000	T(ori)	Note 51
201 (250)	U131	Ethane, 1,1,1,2,2,2-hexachloro- (67-72-1)	T	10-1 (B)	Rat 6000	CARC TBA CHRON TBA	Solid		100	AQTX	
202 (83)	U024	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro (111-91-1)]	T		Rat 65 (C) rat ihl 65/4H 10 (C)		F230		1000	T(ori), T(ihl)	
203 (9)	U003	Ethanenitrile (75-05-8)	I,T	1000	Rat 3800	CT=19.2 (C)	F42,B179 (C)		1000	I,CTX	
204 (229)	U117	Ethane, 1,1'-oxybis- (60-29-7)	I		Rat 1700		F-49,B95 (B)		100	I	
205 (162)	U025	Ethane, 1,1'-oxybis[2-chloro- (111-44-4)]	T	1000-100 (D)	Rat 75 (C) rat ihl 1000/45M	CARC TBA	F131 (D)		1000	T(ori)	Note 48
206 (350)	U184	Ethane, pentachloro- (76-01-7)	T	<1 (A)	Dog 500 (D)	CHRON TBA			10	AQTX	
207 (419)	U208	Ethane, 1,1,1,2-tetrachloro- (630-20-6)	T			CARC TBA CHRON TBA			5000	Max	Notes 13 37
208 (420)	U209	Ethane, 1,1,2,2-tetrachloro- (79-34-5)	T	10-1 (B)	Dog 300 (D) rat ihl 1000/4H	CARC TBA CHRON TBA			100	AQTX	Notes 10 17

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Criteria List Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 1 R Q 7	S u g g e s t e d N o t e 8	B a s i s S u g g e s t e d f o r N o t e 9	Comments
209 (428)	U218	Ethanethioamide (62-55-5)	T		Rat 200 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
210 (438)	U227	Ethane, 1,1,2-trichloro- (79-00-5)	T	10-100 (C)	Rat 1140	CARC TBA CHRON TBA			1000	AQTX	
211 (298)	U247	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl) (72-43-5)	T	<0.1 (X)	Rat 5000	CHRON *	Solid	1	1	311	Note 10
212 (451)	U043	Ethene, chloro- (75-01-4)	T	>1000	Rat 500 (D) Gpg ihl 20/30M (B)	CARC TBA CHRON TBA	F gas, B 7 (B)		100	I, T(ihl)	Note 52
213 (117)	U042	Ethene, 2-chloroethoxy- (110-75-8)	T	1000-100 (D)	Rat 250 (D)		F80, B228 (C)		1000	I	
214 (160)	U078	Ethene, 1,1-dichloro- (75-35-4)	T	1000-100 (D)	Rat 200 (D) rat ihl 10,000/24H	CARC TBA CHRON TBA	F0, B99 (B)	5000	100	I	
215 (161)	U079	Ethene, trans-1,2-dichloro- (156-60-5)	T		Mus ihl 75,000/2H	CT=10.5 (C)	F36, B119 (C)		1000	I, CTX	
216 (421)	U210	Ethene, 1,1,2,2-tetrachloro- (127-18-4)	T	10-100 (C)	Mus 8100	CARC TBA CHRON TBA			1000	AQTX	
217 (335)	U173	Ethanol, 2,2'-(nitrosoimino)bis- (1116-54-7)	T		Rat 7500	CARC TBA			5000	Max	Note 13
218 (10)	U004	Ethanone, 1-phenyl- (98-86-2)	T		Rat 900		F170, B396 (D)		5000	Max	
219 (12)	U006	Ethanoyl chloride (75-36-5)	C, R, T	100-10 (C)			R: NH <sub>3</sub> (D) F40, B124 (C)	5000	5000	BHP, 311	Notes 32 33 65
220 (5)	U112	Ethyl acetate (141-78-6)	I	1000-100 (D)	Rat 11,000		F24, B171 (C)		5000	BHP	Note 65
221 (390)	U113	Ethyl acrylate (140-88-5)	I	1000-100 (D)	Rat 1020		F50, B211 (C)		5000	BHP	Note 65
222 (101)	U238	Ethyl carbamate (Urethane) (51-79-6)	T		Mus 2500	CARC TBA	Solid		5000	Max	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Crit. Toxicity List a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l R Q	7 N o t e	S u g g e s t e d R Q	8 N o t e	B a s i s f o r	S u g g e s t i o n	9 N o t e	Comments
223 (37)	U038	Ethyl 4,4'-dichlorobenzilate (510-15-6)	T		Rat 700	CARC TBA	Solid			5000		Max			Note 13
224 (200)	U114	Ethylenebis(dithiocarbamic acid), salts and esters (111-54-6)	T		Rat 395 (D)		Solid			5000		T(ori)			Note 51
225 (197)	U067	Ethylene dibromide (106-93-4)	T	10-100 (C)	Rat 108 (D) rat ihl 400/2H (C)	CARC TBA		1000	1000			311			Note 13
226 (199)	U077	Ethylene dichloride (107-06-2)	T	100-500 (D)	Rat 670	CARC TBA CHRON TBA	F56,B183 (C)	5000	1000			I			
227 (346)	U115	Ethylene oxide (75-21-8)	I,T	10-100 (C)	Rat 72 (C)		F<0,B51 (B)			100		I			
228 (263)	U116	Ethylenethiourea (96-45-7)	T		Rat 1832	CARC TBA	Solid			5000		Max			Note 13
229 (204)	U117	Ethyl ether (60-29-7)	I		Rat 1700		F-49,B95 (B)			100		I			
230 (198)	U076	Ethylidene dichloride (75-34-3)	T	160-320 (D)	Rat 725	CT=9.6 (C)	F22,B135 (C)			1000		I,CTX			
231 (391)	U118	Ethyl methacrylate (97-63-2)	T		Rat 14,800		F68,B239 (C)			1000		I			
232 (288)	U119	Ethyl methanesulfonate (62-50-0)	T			CARC TBA				5000		Max			Note 13
233 (265)	U139	Ferric dextran (9004-66-4)	T			CARC TBA	Solid			5000		Max			Note 13
234 (72)	U120	Fluoranthene (206-44-0)	T	10-1 (B)	Rat 2000	CARC TBA	Solid			100		AQTX			Notes 13 17 40
235 (310)	U122	Formaldehyde (50-00-0)	T	10-100 (C)	Rat 800 rat ihl 250/4H 1o (C)	CHRON TBA	F gas,B-3 (B)	1000	100			I			
236 (294)	U123	Formic acid (64-18-6)	T,C	100-175 (D)	Rat 1210		F156	5000	5000			311			
237 (242)	U124	Furan (110-00-9)	I				F<32,B88 (B)			100		I			

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basic Suggested for Note 9	Comments
238 (241)	U125	2-Furancarboxaldehyde (98-01-1)	I	10-100 (C)	Rat 127 (D)		F140,B322 (D)	1000	1000	311	
239 (274)	U147	2,5-Furandione (108-31-6)	T	150-240 (D)	Rat 481 (D)		F215	5000	5000	311, T(orl)	
240 (423)	U213	Furan, tetrahydro- (109-99-9)	I		Rat 3000		F6,B151 (C)		1000	I	
241 (238)	U125	Furfural (98-01-1)	I	10-100 (C)	Rat 127 (D)		F140,B322 (D)	1000	1000	311	
242 (237)	U124	Furfuran (110-00-9)	I				F<32,B88 (B)		100	I	
243 (412)	U206	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)- (18883-66-4)	T		Mus 264 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
244 (381)	U126	Glycidylaldehyde (765-34-4)	T		Rat 50 (C)	CARC TBA			1000	T(orl)	Note 13
245 (316)	U163	Guanidine, N-nitroso-N-methyl-N'-nitro- (70-25-7)	T		Rat 90 (C)	CARC TBA	Solid		1000	T(orl)	Note 13
246 (52)	U127	Hexachlorobenzene (118-74-1)	T		Rat 10,000	CARC TBA CHRON TBA	Solid		5000	Max	Note 10
247 (90)	U128	Hexachlorobutadiene (87-68-3)	T	<0.1 (X)	Rat 90 (C)	CARC TBA CHRON TBA			1	AQTX	Notes 10 17
248 (273)	U129	Hexachlorocyclohexane (gamma isomer) (58-89-9)	T	<0.1 (X)	Rat 76 (C)	CARC *	Solid	1	1	311	Note 10
249 (134)	U130	Hexachlorocyclopentadiene (77-47-4)	T	<0.1 (X)	Rat 113 (D)	CHRON *	Solid	1	1	311	Note 10
250 (201)	U131	Hexachloroethane (67-72-1)	T	10-1 (B)	Rat 6000	CARC TBA CHRON TBA	Solid		100	AQTX	
251 (307)	U132	Hexachlorophene (70-30-4)	T		Rat 60 (C)	CHRON TBA	Solid		1000	T(orl)	
252 (386)	U243	Hexachloropropene (1888-71-7)	T		Rat ihl 425/30M (C)				1000	T(ihl)	Note 53
253 (142)	U133	Hydrazine (302-01-2)	R,T		Mus ihl 252/4H (C)	CARC TBA	Spont.ign. (A)		10	I	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q	Special Handling R Q	Basic Information R Q	Comments
254 (170)	U086	Hydrazine, 1,2-diethyl- (1615-80-1)	T			CARC TBA			5000	Max	Note 13
255 (183)	U098	Hydrazine, 1,1-dimethyl- (57-14-7)	T		Rat ihl 252/4H (C)	CARC TBA	Spont.ign. (A)		10	I	
256 (184)	U099	Hydrazine, 1,2-dimethyl- (540-73-8)	T		Rat 100 (C) rat ihl 280/4H (C)	CARC TBA			1000	T(orl)	Note 13
257 (192)	U109	Hydrazine, 1,2-diphenyl- (122-66-7)	T	1-0.1 (A)	Rat 301 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Notes 10 13 17 50
258 (259)	U134	Hydrofluoric acid (7664-39-3)	C,T	100-500 (D)	Rat ihl 1276/1H	CT=20.5 (B)	R:oleum (C)	5000	100	CTX	
259 (258)	U134	Hydrogen fluoride (7664-39-3)	C,T	100-500 (D)	Rat ihl 1276/1H	CT=20.5 (B)	R:oleum (C)	5000	100	CTX	
260 (413)	U135	Hydrogen sulfide (7783-06-4)	T	1-10 (B)	Rat ihl 444 (D)	CHRON TBA	F=gas, B-76 (B)	100	100	I, 311	
261 (181)	U096	Hydroperoxide, 1-methyl-1-phenylethyl- (80-15-9)	R		Rat 382 (D), rat ihl 220/4H (C)		R=exp (A)		10	R	
262 (99)	U136	Hydroxydimethylarsine oxide (75-60-5)	T		Rat 700	CARC TBA	Solid		5000	Max	Note 14
263 (228)	U116	2-Imidazolidinethione (96-45-7)	T		Rat 1832	CARC TBA	Solid		5000	Max	Note 13
264 (366)	U137	Indeno[1,2,3-cd]pyrene (193-39-5)	T			CARC TBA CHRON TBA	Solid		5000	Max	Notes 13 37
265 (233)	U139	Iron dextran (9004-66-4)	T			CARC TBA	Solid		5000	Max	Note 13
266 (382)	U140	Isobutyl alcohol (78-83-1)	I,T	100-1000 (D)	Rat 2460		F82, B225 (C)		5000	BHP	Note 65
267 (59)	U141	Isosafrole (120-58-1)	T		Rat 1340	CARC TBA			5000	Max	Note 13
268 (140)	U142	Repone (143-50-0)	T	<0.1 (X)	Rat 95 (C)	CARC *	Solid	1	1	311	Note 10

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Interference Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basis for Suggestion Note 9	Comments
269 (-)	U143	Lasiocarpine (303-34-4)	T		Rat 150 (D)	CARC TBA	Solid		5000	T(or)1	Note 13
270 (6)	U144	Lead acetate (301-04-2)	T	500-100 (D)	Dog 300 (D)	CARC TBA CHRON TBA	Solid	5000	5000	311	Notes 10 13
271 (367)	U145	Lead phosphate (7446-27-7)	T			CARC TBA CHRON TBA	Solid		5000	Max	Note 13
272 (-)	U146	Lead subacetate (1335-32-6)				CARC TBA CHRON TBA			5000	Max	Note 13
273 (248)	U129	Lindane (58-89-9)	T	<0.1 (X)	Rat 76 (C)	CARC *	Solid	1	1	311	Note 10
274 (239)	U147	Maleic anhydride (108-31-6)	T	150-240 (D)	Rat 481 (D)		F215	5000	5000	311, T(or)1	
275 (174)	U148	Maleic hydrazide (123-33-1)	T		Rat 3800		Solid		5000	Max	
276 (376)	U149	Malononitrile (109-77-3)	T		Rat 61 (C) mus 19 (C)				1000	T(or)1	
277 (16)	U150	Melphalan (148-82-3)	T			CARC TBA	Solid		5000	Max	Note 13
278 (-)	U151	Mercury (7439-97-6)	T	<0.1 (X)	Rbt ihl 29/30H lo (B)			1		AQTX	Notes 10 17 54
279 (388)	U152	Methacrylonitrile (126-98-7)	I,T		Rat 250 (D) rat ihl 328/4H lo (C)				1000	T(ihl)	
280 (177)	U092	Methanamine, N-methyl- (124-40-3)	T	10-100 (C)	Rat 698	CHRON TBA	F20,B45 (B)	1000	100	I	
281 (300)	U029	Methane, bromo- (74-83-9)	T	>1000	Gpg ihl 300/9H (C)				1000	T(ihl)	
282 (302)	U045	Methane, chloro- (74-87-3)	I,T	>1000	Mus ihl 3146/7H	CHRON TBA	F gas,B-11 (B)		100	I	Note 55

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Basic Suggested for Note 9	Comments
283 (119)	U046	Methane, chloromethoxy- (107-30-2)	T	100-1000 (D)	Rat 817 rat ihl 55/7H (C)	CARC TBA CHRON TBA			1000	T(ihl)	Note 13
284 (308)	U068	Methane, dibromo- (74-95-3)	T						1000	CS	Note 56
285 (309)	U080	Methane, dichloro- (75-09-2)	T	100-1000 (D)	Rat 167 (D)	CT=10 (C)	F (NONFLAM) B 104		1000	CTX	
286 (156)	U075	Methane, dichlorodifluoro- (75-71-8)	T	>1000	Rat ihl 800,000/30M				5000	Max	
287 (313)	U138	Methane, iodo- (74-88-4)	T		Rat 150 (D)	CARC TBA			5000	T(orl)	Note 13
288 (232)	U119	Methanesulfonic acid, ethyl ester (62-50-0)	T			CARC TBA			5000	Max	Note 13
289 (-)	U211	Methane, tetrachloro- (56-23-5)	T	100-10 (C)	Rat 2800 (D) rat ihl 4000/4H	CARC TBA CHRON TBA		5000	1000	AQTX	Note 57
290 (429)	U153	Methanethiol (74-93-1)	T	1-10 (B)	Rat ihl 675		F (gas) (B) B42.4	100	100	311,I	
291 (88)	U225	Methane, tribromo (75-25-2)	T	46-56 (C)	Mus 1400	CT=25.8 (B)			100	CTX	
292 (118)	U044	Methane, trichloro- (67-66-3)	T	10-100 (C)	Rat 800 rat ihl 8000/4H	CARC TBA		5000	1000	AQTX	
293 (441)	U121	Methane, trichlorfluoro- (75-69-4)	T		Rat ihl 100,000				5000	Max	
294 (236)	U123	Methanoic acid (64-18-6)	T,C	100-175 (D)	Rat 1210		F156	5000	5000	311	
295 (112)	U036	4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro- (57-74-9)	T	<0.1 (X)	Rbt 100 (C)	CARC *	Solid	1	1	311	Note 10
296 (299)	U154	Methanol (67-56-1)	I	>1000	Rat 13,000		F52,B147 (C)		5000	BHP	Note 65

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 1 1 R Q	7 Note	S u g g e s t e d R Q	8 Note	B a s i s f o r S u g g e s t i o n	9 Note	Comments
297 (397)	U155	Methapyrilene (91-80-5)	T		Rat 150 (D)		Solid			5000		T(orl)		
298 (211)	U247	Methoxychlor (72-43-5)	T	<0.1 (X)	Rat 5000	CHRON *	Solid	1	1			311		Note 10
299 (296)	U154	Methyl alcohol (67-56-1)	I	>1000	Rat 13,000		F52,B147 (C)			5000		BHP		Note 65
300 (281)	U029	Methyl bromide (74-83-9)	T	>1000	Gpg ihl 300/9H (C)					1000		T(ihl)		
301 (353)	U186	1-Methylbutadiene (504-60-9)	I	10-100 (C)			F-20,B-45 (B)			100		I		
302 (282)	U045	Methyl chloride (74-87-3)	I,T	>1000	Mus ihl 3146/7H	CHRON TBA	F gas, B-11 (B)			100		I		Note 55
303 (108)	U156	Methyl chlorocarbonate (79-22-1)	I,T		Rat 110 (D) rat ihl 88/1H (C)					1000		T(ihl)		
304 (437)	U226	Methyl chloroform (71-55-6)	T	10-100 (C)	Rat 10,300 rat ihl 24,000/1H	CT=2.0 (D)				1000		AQTX		
305 (22)	U157	3-Methylcholanthrene (56-49-5)	T			CARC TBA	Solid			5000		Max		Note 13
306 (33)	U158	4,4'-Methylenebis(2-chloroaniline) (101-14-4)	T			CARC TBA	Solid			5000		Max		Note 13
307 (251)	U132	2,2'-Methylenebis(3,4,6-trichlorophenol) (70-30-4)	T		Rat 60 (C)	CHRON TBA	Solid			1000		T(orl)		
308 (284)	U068	Methylene bromide (74-95-3)	T							1000		CS		Note 56
309 (285)	U080	Methylene chloride (75-09-2)	T	100-1000 (D)	Rat 167 (D)	CT=10 (C)	F (NONFLAM) B 104			1000		CTX		
310 (235)	U122	Methylene oxide (50-00-0)	T	10-100 (C)	Rat 800 rat ihl 250/4H 10 (C)	CHRON TBA	F gas, B-3 (B)	1000	100			I		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria 1 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 1 1 R Q	7 Note R Q	8 Note R Q	9 Note R Q	10 Note R Q	11 Note R Q	12 Note R Q	Comments
311 (94)	U159	Methyl ethyl ketone (78-93-3)	I,T	>1000	Rat 3400	CT=8.8 (C)	F16,B176 (C)			1000	I,CTX				
312 (95)	U160	Methyl ethyl ketone peroxide (1338-23-4)	R,T		Rat 484 (D) rat ihl 200/4H (C)		R=exp (A)			10	R				
313 (287)	U138	Methyl iodide (74-88-4)	T		Rat 150 (D)	CARC TBA				5000	T(orl)	Note 13			
314 (317)	U161	Methyl isobutyl ketone (108-10-1)	I		Rat 2080		F64, B244 (C)			5000	BHP	Note 65			
315 (392)	U162	Methyl methacrylate (80-62-6)	I,T	1000-100 (D)	Rat 8000 lo rat ihl 3750	CT=16.0 (C)	F50,B212 (C)	5000	1000		I,CTX	Note 58			
316 (245)	U163	N-Methyl-N'-nitro-N-nitrosoguanidine (70-25-7)	T		Rat 90 (C)	CARC TBA	Solid			1000	T(orl)	Note 13			
317 (314)	U161	4-Methyl-2-pentanone (108-10-1)	I		Rat 2080		F64,B244 (C)			5000	BHP	Note 65			
318 (400)	U164	Methylthiouracil (56-04-2)	T		Rbt 2500	CARC TBA	Solid			5000	Max	Note 13			
319 (21)	U010	Mitomycin C (50-07-7)	T		Rat 14 (C)	CARC TBA	Solid			1000	T(orl)	Note 13			
320 (137)	U059	5,12-Naphthacenedione, (8s-cis)-8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranoxyl]oxyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy- (20830-81-3)	T			CARC TBA	Solid			5000	Max	Note 13			
321 (-)	U165	Naphthalene (91-20-3)	T	10-1 (B)	Rat 1780		F 174 B 424	5000	100		AQTX	Note 59			
322 (120)	U047	Naphthalene, 2-chloro- (91-58-7)	T		Rat 2078		Solid			5000	Max				
323 (325)	U166	1,4-Naphthalenedione (130-15-4)	T		Rat 190 (D)		Solid			5000	T(orl)				
324 (448)	U236	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)	T			CARC TBA	Solid			5000	Max	Note 13			

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Criteria List a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Substance Reactivity Note R Q 8	Basic Information for S a f e t y Note 9	Comments
325 (323)	U166	1,4-Naphthoquinone (130-15-4)	T		Rat 190 (D)		Solid		5000	T(orl)	
326 (328)	U167	1-Naphthylamine (134-32-7)	T	1-10 (B)	Rat 779	CARC TBA	Solid		100	AQTX	Note 13
327 (329)	U168	2-Naphthylamine (91-59-8)	T	1-10 (B)	Rat 727	CARC TBA	Solid		100	AQTX	Note 13
328 (326)	U167	alpha-Naphthylamine (134-32-7)	T	1-10 (B)	Rat 779	CARC TBA	Solid		100	AQTX	Note 13
329 (327)	U168	beta-Naphthylamine (91-59-8)	T	1-10 (B)	Rat 727	CARC TBA	Solid		100	AQTX	Note 13
330 (113)	U026	2-Naphthylamine, N,N-bis(2-chloroethyl)- (494-03-1)	T			CARC TBA	Solid		5000	Max	Note 13
331 (62)	U169	Nitrobenzene (98-95-3)	I,T	10-100 (C)	Rat 640		F190,B412	1000	1000	311	
332 (361)	U170	p-Nitrophenol (100-02-7)	T	10-1 (B)	Rat 350 (D)		Solid		100	AQTX	Note 17
333 (377)	U171	2-Nitropropane (79-46-9)	I		Rat 500 (D), rat ihl 400/6H (C)		F75,B248 (C)		1000	T(ihl),I	
334 (91)	U172	N-Nitrosodi-n-butylamine (924-16-3)	T		Rat 1200	CARC TBA			5000	Max	Note 13
335 (217)	U173	N-Nitrosodiethanolamine (1116-54-7)	T		Rat 7500	CARC TBA			5000	Max	Note 13
336 (196)	U174	N-Nitrosodiethylamine (55-18-5)	T		Rat 280 (D)	CARC TBA			5000	T(orl)	Note 13
337 (194)	U111	N-Nitrosodi-n-propylamine (621-64-7)	T		Rat 480 (D)	CARC TBA			5000	T(orl)	Note 13
338 (103)	U176	N-Nitroso-N-ethylurea (759-73-9)	T		Rat 300 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
339 (104)	U177	N-Nitroso-N-methylurea (684-93-5)	T		Rat 110 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
340 (102)	U178	N-Nitroso-N-methylurethane (615-53-2)	T		Rat 180 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
341 (398)	U179	N-Nitrosopiperidine (100-75-4)	T		Rat 200 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
342 (401)	U180	N-Nitrosopyrrolidine (930-55-2)	T		Rat 900	CARC TBA	Solid		5000	Max	Note 13
343 (35)	U181	5-Nitro-o-toluidine (99-55-8)	T		Rat 574	CARC TBA	F315		5000	Max	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 RQ Note 7	Suggested RQ Note 8	Basic Hazard Classification Note 9	Comments
344 (379)	U193	1,2-Oxathiolane, 2,2-dioxide (1120-71-4)	T		Mus skin 1000	CARC TBA	Solid		5000	Max	Note 13
345 (135)	U058	2H-1,3,2-Oxazaphosphorine, 2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide (50-18-0)	T		Rat 94 (C)	CARC TBA	Solid		1000	T(or)I	Note 13
346 (227)	U115	Oxirane (75-21-8)	I, T	10-100 (C)	Rat 72 (C)		F<0, B51 (B)		100	I	
347 (116)	U041	Oxirane, 2-(chloromethyl)- (106-89-8)	T	10-100 (C)	Rat 90 (C) rat ihl 250/4H (C)	CARC TBA CHRON TBA	F91, B239 (C)	1000	1000	311, I	Notes 13 44
348 (446)	U182	Paraldehyde (123-63-7)	T		Rat 1530		F96, B265 (C)		1000	I	
349 (63)	U183	Pentachlorobenzene (608-93-5)	T			CHRON TBA	Solid		5000	Max	Note 39
350 (206)	U184	Pentachloroethane (76-01-7)	T	<1 (A)	Dog 500 (D)	CHRON TBA			10	AQTX	
351 (64)	U185	Pentachloronitrobenzene (82-68-8)	T		Rat 1650	CARC TBA CHRON TBA	Solid		5000	Max	Note 13
352 (362)	U242	Pentachlorophenol (87-86-5)	T	<0.1 (X)	Rat 50 (C)	CHRON *	Solid	10	1	AQTX	Notes 10 17
353 (301)	U186	1,3-Pentadiene (504-60-9)	I	10-100 (C)			F-20, B-45 (B)		100	I	
354 (3)	U187	Phenacetin (62-44-2)	T		Rat 1650	CARC TBA	Solid		5000	Max	Note 13
355 (54)	U188	Phenol (108-95-2)	T	10-100 (C)	Rat 414 (D)	CHRON TBA	F175	1000	1000	311	
356 (121)	U048	Phenol, 2-chloro- (95-57-8)	T	8-20 (B)	Rat 670		F147		100	AQTX	
357 (115)	U039	Phenol, 4-chloro-3-methyl- (59-50-7)	T		Rat 500 (D)		Solid		5000	T(or)I	Note 43
358 (163)	U081	Phenol, 2,4-dichloro- (120-83-2)	T	5-10 (B)	Rat 580	CT=11.9 (C)	F237		100	AQTX	
359 (164)	U082	Phenol, 2,6-dichloro- (87-65-0)	T	5 (B)	Rat 2940		F>200		100	AQTX	Note 49

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Critical List Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested Note R Q 8	Suggested Basis for Note 9	Comments
360 (185)	U101	Phenol, 2,4-dimethyl- (105-67-9)	T	10-1 (B)	Rat 3200		Solid		100	AQTX	Note 17
361 (332)	U170	Phenol, 4-nitro- (100-02-7)	T	10-1 (B)	Rat 350 (D)		Solid		100	AQTX	Note 17
362 (352)	U242	Phenol, pentachloro- (87-86-5)	T	<0.1 (X)	Rat 50 (C)	CHRON *	Solid	10	1	AQTX	Notes 10 17
363 (422)	U212	Phenol, 2,3,4,6-tetrachloro- (58-90-2)	T	1-0.1 (A)	Rat 140 (D) rbt skin 250	CT=32 (B)	Solid		10	AQTX	
364 (442)	U230	Phenol, 2,4,5-trichloro- (95-95-4)	T	0.1-1 (A)	Rat 820	CHRON TBA	Solid		10	AQTX	
365 (443)	U231	Phenol, 2,4,6-trichloro (88-06-2)	T	0.1-1 (A)	Rat 820 (D)	CARC TBA CHRON TBA	Solid		10	AQTX	Note 13
366 (264)	U137	1,10-(1,2-Phenylene)pyrene (193-39-5)	T			CARC TBA CHRON TBA	Solid		5000	Max	Notes 13 37
367 (271)	U145	Phosphoric acid, lead salt (7446-27-7)	T			CARC TBA CHRON TBA	Solid		5000	Max	Note 13
368 (171)	U087	Phosphorodithioic acid, 0,0-diethyl S-methyl ester (3288-58-2)	T		Mus 156 (D)				5000	T(or)1	
369 (415)	U189	Phosphorus sulfide (1314-80-3)	R	1-10 (B)	Rat 389 (D)		H <sub>2</sub> S (B)	100	100	311,R	Note 60
370 (40)	U190	Phthalic anhydride (85-44-9)	T		Rat 4020		F305		5000	Max	
371 (399)	U191	2-Picoline (109-06-8)	T		Rat 790 rat ihl 4000/4H 10		F102 (D)		5000	I	
372 (157)	U192	Pronamide (23950-58-5)	T		Rat 5620		Solid		5000	Max	
373 (394)	U194	1-Propanamine (107-10-8)	I,T	10-100 (C)	Rat 570 10		F-35,B120 (C)		5000	BHP,I	Note 65
374 (193)	U110	1-Propanamine, N-propyl- (142-84-7)	I		Rat 930		F63,B229 (C)		5000	BHP	Note 65

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Substance R Q 8	Basic for 311 R Q 9	Comments
375 (148)	U066	Propane, 1,2-dibromo-3-chloro- (96-12-8)	T		Rat 170 (D) rat ihl 103/8H (C)	CARC TBA			1000	T(ihl)	Note 13
376 (276)	U149	Propanedinitrile (109-77-3)	T		Rat 61 (C) mus 19 (C)				1000	T(orl)	
377 (333)	U171	Propane, 2-nitro- (79-46-9)	I		Rat 500 (D), rat ihl 400/6H (C)		F75, B248 (C)		1000	T(ihl), I	
378 (84)	U027	Propane, 2,2'-oxybis[2-chloro- (108-60-1)	T		Rat 240 (D) Rat ihl 700/5H (D)	CT=12 (C)	F185		1000	CTX	
379 (344)	U193	1,3-Propane sultone (1120-71-4)	T		Mus skin 1000	CARC TBA	Solid		5000	Max	Note 13
380 (447)	U235	1-Propanol, 2,3-dibromo-, phosphate (3:1) (126-72-7)	T		Rat 1010	CARC TBA			5000	Max	Note 13
381 (244)	U126	1-Propanal, 2,3-epoxy- (765-34-4)	T		Rat 50 (C)	CARC TBA			1000	T(orl)	Note 13
382 (266)	U140	1-Propanol, 2-methyl- (78-83-1)	I, T	100-1000 (D)	Rat 2460		F82, B225 (C)		5000	BHP	Note 65
383 (8)	U002	2-Propanone (67-64-1)	I	>1000			F-4, B133 (C)		5000	BHP	Note 65
384 (13)	U007	2-Propenamide (79-06-1)	T		Rat 170 (D) rbt skin 1000 lo		Solid		5000	T(orl)	
385 (167)	U084	Propene, 1,3-dichloro- (542-75-6)	T	10-1 (B)	Rat 250 (D)		F95, B219 (C)		100	AQTX	
386 (252)	U243	1-Propene, 1,1,2,3,3,3-hexachloro- (1888-71-7)	T		Rat ihl 425/30M (C)				1000	T(ihl)	Note 53
387 (15)	U009	2-Propenenitrile (107-13-1)	T	1-10 (B)	Rat 82 (C) rat ihl 500/4H (D)	CARC TBA CHRON TBA	F32, B171 (C)	100	100	311	Note 34

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria Note 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 RQ 7	Substance Note 8	Basic Information Note 9	Comments
388 (279)	U152	2-Propenenitrile, 2-methyl- (126-98-7)	T		Rat 250 (D) rat ihl 328/4H 1o (C)				1000	T (ihl)	
389 (14)	U008	2-Propenoic acid (79-10-7)	I		Rat 340 (D)		F122, B287 (D)		5000	T (orl), I	
390 (221)	U113	2-Propenoic acid, ethyl ester (140-88-5)	T	1000-100 (D)	Rat 1020		F50, B211 (C)		5000	BHP	Note 65
391 (231)	U118	2-Propenoic acid, 2-methyl-, ethyl ester (97-63-2)	T		Rat 14,800		F68, B239 (C)		1000	I	
392 (315)	U162	2-Propenoic acid, 2-methyl-, methyl ester (80-62-6)	I, T	1000-100 (D)	Rat 8000 1o rat ihl 3750	CT=16.8 (C)	F50, B212 (C)	5000	1000	I, CTX	Note 58
393 (410)	U233	Propionic acid, 2-(2,4,5-trichlorophenoxy)- (93-72-1)	T	1-10 (B)	Rat 650		Solid	100	100	311	Note 29
394 (373)	U194	n-Propylamine (107-10-8)	I, T	10-100 (C)	Rat 570 1o		F-35 B120 (C)		5000	BHP	Note 65
395 (166)	U083	Propylene dichloride (78-87-5)	T	100-10 (C)	Rat 1900		F60, B205 (C)		1000	AQTX, I	
396 (-)	U196	Pyridine (110-86-1)	T	100-1000 (D)	Rat 891	CHRON TBA	F68, B239 (C)		1000	I	
397 (297)	U155	Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]- (91-80-5)	T		Rat 150 (D)		Solid		5000	T (orl)	
398 (341)	U179	Pyridine, hexahydro-N-nitroso- (100-75-4)	T		Rat 200 (D)	CARC TBA	Solid		5000	T (orl)	Note 13
399 (371)	U191	Pyridine, 2-methyl- (109-06-8)	T		Rat 790 rat ihl 4000/4H 1o	CHRON TBA	F102 (D)		5000	I	
400 (318)	U164	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo- (56-04-2)	T		Rbt 2500	CARC TBA	Solid		5000	Max	Note 13
401 (342)	U180	Pyrrrole, tetrahydro-N-nitroso- (930-55-2)	T		Rat 900	CARC TBA.	Solid		5000	Max	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Critical Listing Note a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 l l R Q	7 Note	Suggested R Q	8 Note	Basis for Suggestion Note	9	Comments
402 (453)	U200	Reserpine (50-55-5)	T		Rat 390 (D)		Solid			5000		T(orl)		
403 (51)	U201	Resorcinol (108-46-3)	T	10-100 (C)	Rat 301 (D)		F261	1000		5000		BHP	Note 65	
404 (71)	U202	Saccharin and salts (81-07-2)	T			CARC TBA	Solid			5000		Max	Note 13	
405 (58)	U203	Safrole (94-59-7)	T		Rat 1950	CARC TBA	F212			5000		Max	Note 13	
406 (407)	U204	Selenious acid (7783-00-8)	T	[10-100 (C)]	Rat 25 lo (C)	CHRON TBA				1000		311 T(orl)	Note 61	
407 (406)	U204	Selenium dioxide (7446-08-4)	T	10-100 (C)	[Rat 25 lo (C)]	CHRON TBA		1000		1000		311 T(orl)	Note 61	
408 (416)	U205	Selenium disulfide (7488-56-4)	R,T		Rat 138 (D)	CHRON TBA	R:H <sub>2</sub> S (B)			100		R	Note 62	
409 (20)	U015	L-Serine, diazoacetate (ester) (115-02-6)	T		Rat 170 (D)	CARC TBA	Solid			5000		T(orl)	Note 13	
410 (393)	U233	Silvex (93-72-1)	T	1-10 (B)	Rat 650		Solid	100		100		311	Note 29	
411 (173)	U089	4,4'-Stilbenediol, alpha, alpha'-diethyl- (56-53-1)	T		Mus 2500	CARC TBA	Solid			5000		Max	Note 13	
412 (243)	U206	Streptozotocin (18883-66-4)	T		Mus 264 (D)	CARC TBA	Solid			5000		T(orl)	Note 13	
413 (260)	U135	Sulfur hydride (7783-06-4)	T	1-10 (B)	Rat 1hl 444 (D)	CHRON TBA	F=gas, B-76 (B)	100		100		311, I		
414 (187)	U103	Sulfuric acid, dimethyl ester (77-78-1)	T	10-100 (C)	Rat 400 (D) rat 1hl 32/4H lo (B)	CARC TBA	F182			100		T(1hl)	Note 13	
415 (369)	U189	Sulfur phosphide (1314-80-3)	R	1-10 (B)	Rat 389 (D)		R:H <sub>2</sub> S (B)	100		100		R	Note 60	
416 (408)	U205	Sulfur selenide (7488-56-4)	R,T		Rat 138 (D)	CHRON TBA	R:H <sub>2</sub> S (B)			100		R	Note 62	
417 (444)	U232	2,4,5-T (93-76-5)	T	1-10 (B)	Rat 300 (D)		Solid	100		100		311	Note 29	
418 (67)	U207	1,2,4,5-Tetrachlorobenzene (95-94-3)	T		Rat 1500	CT=2.0 (D)	F311			5000		Max		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	3 R Q	7 Note	8 Suggested R Q	9 Note	Basics for Suggestion Note	Comments
419 (207)	U208	1,1,1,2-Tetrachloroethane (630-20-6)	T			CARC TBA CHRON TBA				5000	Max	Notes 13 37	
420 (208)	U209	1,1,2,2-Tetrachloroethane (79-34-5)	T	10-1 (B)	Dog 300 (D) rat ihl 1000/4H	CARC TBA CHRON TBA				100	AQTX	Notes 10 17	
421 (216)	U210	Tetrachloroethylene (127-18-4)	T	10-100 (C)	Mus 8100	CARC TBA CHRON TBA				1000	AQTX		
422 (363)	U212	2,3,4,6-Tetrachlorophenol (58-90-2)	T	1-0.1 (A)	Rat 140 (D) rbt skin 250	CT=32 (B)	Solid			10	AQTX		
423 (240)	U213	Tetrahydrofuran (109-99-9)	I		Rat 3000		F6,B151 (C)			1000	I		
424 (7)	U214	Thallium(I) acetate (563-68-8)	T		Mus 35 (C)	CHRON TBA	Solid			1000	T(orl)	Notes 10 29	
425 (107)	U215	Thallium(I) carbonate (6533-73-9)	T		Mus 21 (C)	CHRON TBA	Solid			1000	T(orl)	Notes 10 29	
426 (-)	U216	Thallium(I) chloride (7791-12-0)	T		Rat 24 (C)	CHRON TBA	Solid			1000	T(orl)	Notes 10 29	
427 (-)	U217	Thallium(I) nitrate (10102-45-1)	T		Mus 33 (C)	CHRON TBA	Solid			1000	T(orl)	Notes 10 29	
428 (209)	U218	Thioacetamide (62-55-5)	T		Rat 200 (D)	CARC TBA	Solid			5000	T(orl)	Note 13	
429 (290)	U153	Thiomethanol (74-93-1)	T	1-10 (B)	Rat ihl 675		F(gas)B B 42.4	100	100	I			
430 (105)	U219	Thiourea (62-56-6)	T		Rat 125 (D)	CARC TBA	Solid			5000	T(orl)	Note 13	
431 (85)	U244	Thiram (137-26-8)	T	0.79 (A)	Rat 560		Solid			10	AQTX		
432 (55)	U220	Toluene (108-88-3)	T	10-100 (C)	Rat 5000	CT=7.0 (C)	F40,B231 (C)	1000	1000	311,I, CTX			

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested R Q 8	Basic for S ion Note 9	Comments
433 (143)	U221	Toluene-2,4-diamine (95-80-7)	T		Rat 260 (D)	CARC TBA	Solid		5000	T(orl)	Note 13
434 (50)	U223	Toluene diisocyanate (584-84-9)	T,R	1-10 (B)	Rat 5800 Mus ihl 10/4H (B)		R:NH <sub>3</sub> (D) F270		100	AQTX T(ihl)	
435 (34)	U222	o-Toluidine hydrochloride (636-21-5)	T		Rat 2951	CARC TBA	Solid		5000	Max	Note 13
436 (17)	U011	1H-1,2,4-Triazol-3-amine (61-82-5)	T		Rat 1100	CARC TBA	Solid		5000	Max	Note 13
437 (304)	U226	1,1,1-Trichloroethane (71-55-6)	T	10-100 (C)	Rat 10,300 rat ihl 24,000/lH	CT=2.0 (D)			1000	AQTX	
438 (210)	U227	1,1,2-Trichloroethane (79-00-5)	T	10-100 (C)	Rat 1140	CARC TBA CHRON TBA			1000	AQTX	
439 (440)	U228	Trichloroethene (79-01-6)	T	10-100 (C)	Rat 4920	CARC TBA CHRON TBA	F90,B188 (C)	1000	1000	AQTX,I	
440 (439)	U228	Trichloroethylene (79-01-6)	T	10-100 (C)	Rat 4920	CARC TBA CHRON TBA	F90,B188 (C)	1000	1000	AQTX,I	
441 (293)	U121	Trichloromonofluoromethane (75-69-4)	T		Rat ihl 100,000				5000	Max	
442 (364)	U230	2,4,5-Trichlorophenol (95-95-4)	T	0.1-1 (A)	Rat 820	CHRON TBA	Solid		10	AQTX	
443 (365)	U231	2,4,6-Trichlorophenol (88-06-2)	T	0.1-1 (A)	Rat 820	CARC TBA CHRON TBA	Solid		10	AQTX	Note 13
444 (417)	U232	2,4,5-Trichlorophenoxyacetic acid (93-76-5)	T	1-10 (B)	Rat 300 (D)		Solid	100	100	311	Note 29
445 (69)	U234	sym-Trinitrobenzene (99-35-4)	R,T		Rat 505	CHRON TBA	R=exp (A)		10	R	
446 (348)	U182	1,3,5-Trioxane, 2,4,6-trimethyl- (123-63-7)	T		Rat 1530		F96,B265 (C)		1000	I	
447 (380)	U235	Tris(2,3-dibromopropyl) phosphate (126-72-7)	T		Rat 1010	CARC TBA			5000	Max	Note 13

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-1. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - B. TOXIC WASTES (U LIST)

No. (Alt.) (Note 1)	Hazardous Waste No.	Substance (CAS Registry No.)	Listing Criteria a 2	Aquatic Toxicity (Note 3)	Mammalian Toxicity (Note 4)	Chronic Toxicity Carcinogen (Note 5)	I/C/R (Note 6)	311 R Q 7	Suggested R Q 8	Basic for Suggestion Note 9	Comments
448 (324)	U236	Trypan blue (72-57-1)	T			CARC TBA	Solid		5000	Max	Note 13
449 (450)	U237	Uracil, 5-[bis(2-chloroethyl)amino]- (66-75-1)	T		Rat 7.5(B)	CARC TBA	Solid		100	T(orl)	Note 13
450 (449)	U237	Uracil mustard (66-75-1)	T		Rat 7.5(B)	CARC TBA	Solid		100	T(orl)	Note 13
451 (212)	U043	Vinyl chloride (75-01-4)	T	>1000	Rat 500(D) Gpg ihl 20/30M(B)	CARC TBA CHRON TBA	F gas, B7(B)		100	I	Note 52
452 (-)	U239	Xylene (1330-20-7)	I	10-100(C)	Rat 4300 rat ihl 5000/4H		F81-90(C) B282-292	1000	1000	311,I	Note 63
453 (402)	U200	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester (50-55-5)	T		Rat 390(D)		Solid		5000	T(orl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

NOTES FOR TABLE 9-1, COMPREHENSIVE HAZARDOUS SUBSTANCES LIST

PART II - HAZARDOUS WASTES

A - Acute Hazardous Wastes

B - Toxic Wastes

NOTE 1: The abbreviation No.(ALT.) stands for NUMBER (ALTERNATE). Each line item is numbered consecutively, with an alternate number immediately following in parentheses. With a few exceptions, each compound on the Acute Hazardous Wastes List, A (P List) and Toxic Wastes List, B (U List) is listed a second time by an alternate name. The entries in this column serve as a cross-index of those alternates. Thus, the entry 8 (383) for U002, Acetone, refers the reader to the synonym U002, 2-Propanone where, conversely, the entry 383 (8) refers back to U002, Acetone. The P list and U list are numbered separately.

NOTE 2: The listing criteria are I, C, R, and T, standing for Ignitability, Corrosivity, Reactivity, and Extraction Procedure Toxicity, respectively. These represent the reasons why a material was listed as a hazardous waste in the first place, and have been explained in detail in the RCRA (Resource Conservation and Recovery Act) regulations, 40261.10 through 40261.24 (45FR33121-33122, May 19, 1980).

NOTE 3: Aquatic Toxicity, unless specifically noted otherwise, is given as the TL<sub>96</sub> (The 96-Hour Median Threshold Limit) for aquatic species. TL<sub>96</sub> is that concentration of the material dissolved in water, in parts per million (ppm) or milligrams/liter (mg/l) (which is equivalent) that will kill 50% of the test organism population in 96 hours. Each TL<sub>96</sub> entry is followed by a letter indicating the reportable quantity to which it corresponds, on the following scale:

<u>TL<sub>96</sub></u>	<u>RQ (Pounds)</u>
Less than 0.1	X (1)
0.1-1	A (10)
1-10	B (100)
10-100	C (1000)
100-500	D (5000)

Note that TL<sub>96</sub> and LC<sub>50</sub> (that is, Lethal Concentration which will kill 50% of the test population) are identical, as long as the time period is the same.

Aquatic toxicity data are taken from the following sources:

- A. The reportable quantities assigned under Section 311 of the Clean Water Act, as given in 40CFR117.3 (44FR10279-10283, February 16, 1979). The detailed listing of aquatic toxicities that form the basis

for these assignments is found in Report No. EPA #440/9-75/009, "Supplement to Development Document: Hazardous Substances Regulations, Section 311 of the Federal Water Pollution Control Act as Amended 1972", November 1975 (PB 258514).

- B. "The Registry of the Toxic Effects of Chemical Substances", RTECS, accessed as a machine-searchable data base via the EPA/NIH Chemical Information System (CIS). Latest update of this data base was January 1981. RTECS is available in hardcopy, the latest being DHHS (NIOSH) Publication No. 8-111, "1979 Registry of the Toxic Effects of Chemical Substances", Volumes 1 and 2, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, September 1980.

RTECS draws its aquatic toxicity data from "Water Quality Characteristics of Hazardous Materials", by Dr. Roy Hahn, Jr. and Paul Jensen, Texas A&M University, College Station, TX, 77843, 1974.

- C. Publication 2-A, "Water Quality Criteria", Second Edition, Jack Edward McKee and Harold V. Wolf (Editors). State of California, The Resources Agency of California, State Water Quality Control Board, 1963.
- D. "Handbook of Environmental Data on Organic Chemicals", Karel Verschueren, Van Nostrand Reinhold Company, New York, NY, copyright 1977 by Litton Educational Publishing, Inc.
- E. The "Oil and Hazardous Materials Technical Assistance Data Base" (OHMTADS), accessed as a machine-searchable data base via the EPA/NIH Chemical Information System (CIS).
- F. The 1980 Ambient Water Quality Criteria Documents for 64 toxic pollutants or pollutant categories, published pursuant to Section 304(a)(1) of the Clean Water Act (45FR231).
- G. "Aquatic Toxicity Testing as Fundament for a Spill Prevention Program", M. W. Curtis, C. M. Curran, and C.H. Ward, reported in the Proceedings of the 1980 National Conference on Control of Hazardous Materials Spills. (May 13-15, 1980, Louisville, Kentucky).

NOTE 4: Three types of mammalian toxicity are entered in this column, depending on the route of administration: oral, dermal (skin absorption) or inhalation. The details of the entries are as follows:

- A. Oral Toxicity: Unless otherwise identified, entries are those showing the acute oral LD<sub>50</sub> (Dose Lethal to 50% of the test animal population) in milligrams per kilogram of body weight (mg/kg). Test species are coded as follows:

HMN = human  
 RAT = rat  
 MUS = mouse  
 GPG = guinea pig  
 DOG = dog  
 RBT = rabbit

Thus the entry "RAT 60" indicates an oral LD<sub>50</sub> of 60 mg/kg for rats.

- B. Dermal Toxicity: These entries are indicated by the code "skin" immediately following the species code, and are again given as the acute LD<sub>50</sub> (Dose Lethal to 50% of the test animal population) in milligrams per kilogram of body weight (mg/kg). Test species are coded the same as given under ORAL TOXICITY, above. Thus the entry "RAT skin 60" indicates dermal LD<sub>50</sub> of 60 mg/kg for rats.
- C. Inhalation Toxicity: These entries are indicated by the abbreviation "ihl" immediately following the species code. Data are presented in terms of the LC<sub>50</sub> (Concentration in air lethal to 50% of the test animal population) in parts per million (ppm). The exposure time is also given (H = hours, M = minutes), when available. Test species are coded the same as given under Oral Toxicity, above. Thus the entry "RAT ihl 60/4H" indicates an inhalation LC<sub>50</sub> of 60 ppm for 4 hours for rats.
- D. Low Lethal Dose (or Concentration): These are shown by the term "lo" immediately following the data entry. This means that the entry is derived from LD<sub>10</sub> or LC<sub>10</sub> data given in the literature. LD<sub>10</sub> and LC<sub>10</sub> are the lowest doses or concentrations known to have had lethal effect on the test species. Thus the entry RAT ihl 60/4H (lo) indicates an inhalation LC<sub>10</sub> of 60 ppm for 4 hours for rats. (Note: Human LC<sub>10</sub> and LD<sub>10</sub> data are not used, since they generally represent isolated accidental poisoning incidents.) Toxicity data, unless specifically noted otherwise, have been obtained from the "Registry of the Toxic Effects of Chemical Substances". (See NOTE 3B above.)

Each toxicity entry is followed by a letter indicating the reportable quantity category to which it corresponds, on the following scales:

Oral LD <sub>50</sub> or lo	Dermal LD <sub>50</sub> or lo	Inhalation LC <sub>50</sub> or lo	RQ (Pounds)
<0.1	<0.04	<0.4	X (1)
0.1-1	0.04-0.4	0.4-4	A (10)
1-10	0.4 -4	4-40	B (100)
10-100	4-40	40-400	C (1000)
100-500	40-200	400-2000	D (5000)

NOTE 5: Entries in this column are several and include the following:

- A. The results of evaluations of chronic toxicity effects carried out by the EPA Environmental Criteria and Assessment Office (ECAO). For chronic toxicity, the entries are given as a numerical score, followed by an equivalent RQ designation, as follows:

<u>Chronic Toxicity Score</u>	<u>RQ(pounds)</u>
81 to 100	X (1)
41 to 80	A (10)
21 to 40	B (100)
6 to 20	C (1000)
1 to 5	D (5000)

The scores are based on a combination of values assigned to minimum effective doses and severity of the toxic effects, as described in more detail elsewhere in this report.

- B. The abbreviation "CHRON TBA" is used to identify those items that are still to be assessed for chronic toxicity by the ECAO. Entries flagged with "CHRON TBA" are materials that have previously been identified by the EPA as having an appreciable chronic or subacute effect, as described in any of the following documents:

- o "Background Document. Resource Conservation and Recovery Act. Subtitle C - Identification and Listing of Hazardous Waste, Appendix A - Health and Environmental Effect Profiles. October 30, 1980. U.S. EPA, Office of Solid Waste."
- o "EPA/440/9-75/009. Supplement to Development Document: Hazardous Substances Regulations, Section 311 of the Federal Water Pollution Control Act as Amended 1972. U.S. EPA. November 1975."
- o "EPA 440/5-80-015 through -079. Ambient Water Quality Criteria Documents (64 documents). U.S. EPA, Office of Water Regulations and Standards Criteria and Standards Division. October 1980."

- C. The entry "CHRON\*" indicates that the material is known to have a chronic effect, but since its RQ has already been set at the 1- or 10-lb level on the basis of some other criterion, no further evaluation has been carried out.

- D. The abbreviation "CARC TBA" is used to identify those hazardous substances that will be assessed for carcinogenicity by the EPA Carcinogen Assessment Group (CAG), and therefore the suggested RQ of the material may be subject to further adjustment. Entries identified with a "CARC TBA" are materials that have been identified elsewhere as known human or animal carcinogens, from lists published by the following sources:

1. U.S. Department of Health and Human Services, National Toxicology Program, U.S. Public Health Services.

o First Annual Report on Carcinogens, July 1980 - lists 26 substances or classes of substances.

o Second Annual Report on Carcinogens, December 1981 - lists 88 substances or classes of substances.

2. International Agency for Research on Cancer, Summary of Monographs 1-2, September 1979 - lists 142 substances.

E. The entry "CARC\*" indicates that the material is known to be a carcinogen, but since its RQ has already been set at the 1-lb level on the basis of some other criterion, no further evaluation will be carried out.

NOTE 6: I, C, R stand for Ignitability, Corrosivity, and Reactivity.

A. Ignitability: This is judged on combinations of flash point and boiling point. These are entered in the column as F = flash point, and B = boiling point, with the value immediately following in degrees Fahrenheit. Materials that are capable of starting fires without an external source of ignition are considered to be the most hazardous, and are coded as follows:

PYR = Pyrophoric

SPONT. IGN. = Capable of spontaneous ignition

STRONG OXID. = Strong oxidizer, may cause other materials to ignite, and sustain their combustion.

The entry "Solid" indicates that the material is solid at room temperature, and not readily ignitable.

B. Corrosivity: No ranking scale has yet been developed for corrosivity.

C. Reactivity: Reactivity refers to either a material's reaction with water, compared with certain reference materials (see scale given below) or to its ability to undergo self-reaction, with explosion being the worst case. Certain other types of reactivity, such as the ability to liberate toxic gases, are discussed as individual cases in separate notes.

Each Ignitability or Reactivity entry is followed by a letter indicating the reportable quantity category to which it corresponds, based on the following scales:

<u>Ignitability</u>	<u>REACTIVITY</u>		<u>RQ (Pounds)</u>
	<u>With Water</u> (Reference Compound)	<u>Self-Reaction</u>	
Starts fires	Inflames	Explosive	A (10)
F < 100 B < 100	Extreme reaction (e.g., SO <sub>3</sub> )	May polymerize; requires stabilizer	B (100)
F < 100 B < 100	High reaction (e.g., oleum)	May polymerize if contaminated. No stabilizer required.	C (1000)
F 100-140	Moderate reaction (e.g., NH <sub>3</sub> )	Some chance of poly- merization with small heat release.	D (5000)

Data for Ignitability and Reactivity ratings were taken from "Fire Protection Guide on Hazardous Materials", 7th Edition, National Fire Protection Association, Boston, MA, 1978.

NOTE 7: Entries under this column show the value in pounds that was assigned as a reportable quantity under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979).

NOTE 8: Entries in this column are the lowest reportable quantities derived from the individual rankings shown under the Aquatic Toxicity, Mammalian Toxicity, Chronic Toxicity, and/or I/C/R columns.

NOTE 9: Entries in this column show the basis on which an RQ has been suggested, coded as follows:

- 311 - Aquatic toxicity, as assigned under Section 311 of the Clean Water Act.
- AQTX - Aquatic toxicity, other than a 311 assignment
- T(oral) - Oral mammalian toxicity
- T(ihl) - Inhalation mammalian toxicity
- T(skn) - Skin (dermal) mammalian toxicity
- CTX - Chronic Toxicity

- I        - Ignitability
- R        - Reactivity
- CS       - This entry indicates that the assignment of an RQ has been made on the basis of chemical similarity, in the absence of data for the primary criteria.
- Max      - This entry indicates that the rating factors all exceed the upper limit of the rating scales, and that the assignment of a 5000-lb RQ has been made on the basis of this being the largest value possible to assign.

Note 10: Evidence found in OHMTADS and/or "Water-Related Environmental Fate of 129 Priority Pollutants" (EPA-440/4-79-029a) indicates that this material, or a constituent of this material, is bioaccumulated to toxic levels in the tissue of aquatic and marine organisms, and has the potential to concentrate in the food chain.

NOTE 11: A metal phosphide will react with water to liberate phosphine, as indicated by the symbol  $\text{PH}_3$  in the I/C/R column of the table. The suggested reportable quantity of this material is thus set equal to that suggested for phosphine (P096), at a value of 100 lbs.

NOTE 12: There are two arsenic acids, one identified by the Chemical Abstracts Service Registry Number (CAS No.) 7778-39-4, and having synonyms as arsenic acid ( $\text{H}_3\text{AsO}_4$ ), arsenic acid solution, arsenic acid liquid, and orthoarsenic acid. The other, with CAS No. 1327-52-2, has the synonyms arsenic acid liquid and arsenic anhydride. Data on the latter may be found in OHMTADS, while the toxicity of the former may be found in RTECS.

NOTE 13: Evidence of the carcinogenicity of this material is currently being assessed. The suggested RQ, therefore, may be subject to further adjustment.

NOTE 14: Degradation of this substance could lead to the formation of trivalent inorganic arsenic compounds, which have been identified as carcinogens in the "First Annual Report on Carcinogens".

NOTE 15: No specific data was found for diethylarsine. However, the alkyl arsines, as a class, are pyrophoric, and diethyl arsine has been placed at a suggested RQ level of A (10 lbs) on this basis. (See also Note 14.)

NOTE 16: Benzyl chloride, if unstabilized, readily undergoes a condensation reaction with liberation of heat and hydrogen chloride in the presence of copper, aluminum, iron, zinc, magnesium, tin, and various other metals that act as catalysts. If the reaction takes place in a container, there is the possibility of violent rupture of

the container.

NOTE 17: The aquatic toxicity data listed for this material were taken from the 1980 Ambient Water Quality Criteria Documents.

NOTE 18: All cyanides assigned reportable quantities under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979) were placed at RQ level A (10 lbs) on the basis of the aquatic toxicity of the cyanide ion. The same practice is continued here.

NOTE 19: The CAS Registry number listed for the generic class of Cyanides refers to the cyanide ion.

NOTE 20: Data are presented only for the cresol itself; however, the suggested RQ also applies to the salts.

NOTE 21: AN RQ of 1000 lbs was established for dinitrophenols under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979). However, there were no specific isomers identified in making that assignment. An RQ of 100 lbs is suggested for 2,4-dinitrophenol on the basis of an aquatic toxicity lower than that used to make the assignments under Section 311.

NOTE 22: The entry "Trichloromethylmercaptan" (p118) in 40 CFR 261.33 has been taken to mean perchloromethylmercaptan, otherwise known as trichloromethanesulfenyl chloride.

NOTE 23: Data are presented only for nicotine itself; however, the suggested RQ also applies to the salts.

NOTE 24: Nitrogen (II) oxide (nitric oxide) is rapidly converted to nitrogen (IV) oxide (nitrogen dioxide) upon exposure to air. The inhalation toxicity shown (in brackets) is that of IV oxide.

NOTE 25: The suggested RQ level of Category A (10 lbs) is based on the fact that this material is a strong oxidizer and can readily cause fires.

NOTE 26: The aquatic toxicity of this material is listed as less than 0.1 on the basis of its silver content; silver is extremely toxic to aquatic organisms.

NOTE 27: An RQ level of B (100 lbs) is suggested on the basis of Reactivity, inasmuch as the mishandling of the material might result in the release of hydrogen sulfide, which has been placed at the 100 lb RQ level.

NOTE 28: The aquatic toxicity data and the suggested RQ (10 lbs) apply to both strychnine and its salts. Strychnine is a common name for this material.

- NOTE 29: There is evidence that this or closely related compounds have teratogenic effects. Chronic toxicity assessments are pending.
- NOTE 30: This compound was identified as the selenite in the published RCRA regulations (40CFR261.33, 45FR78542). "The Registry of the Toxic Effects of Chemical Substances" also uses the name Thallium selenite, but gives the formula  $TlSe$ , which is that of Thallium Selenide. The Structure and Nomenclature Search System (a component of the EPA/NIH Chemical Information System (CIS) gives the name Thallium Selenide, and the CAS No. shown here. It appears that selenide is the correct term.
- NOTE 31: Chloral rapidly hydrates upon ingestion to form chloral hydrate. The toxicity value shown is that of the hydrate.
- NOTE 32: The Registry of the Toxic Effects of Chemical Substances (RTECS) gives an aquatic toxicity for acetyl chloride of 10-100 ppm, which would place it in reportable quantity category C, rather than the reportable quantity category D assigned under Section 311 of the Clean Water Act. No attempt has been made to resolve this apparent discrepancy, since the suggested RQ for the material derives from other ranking factors.
- NOTE 33 Acetyl chloride reacts vigorously with water, evolving hydrogen chloride fumes.
- NOTE 34: Polymerization may occur spontaneously in the absence of oxygen or on exposure to visible light or excessive heat, violently in the presence of alkali. Pure acrylonitrile is subject to self-polymerization with rapid pressure development. The commercial product requires an inhibitor.
- NOTE 35: The different RQ levels assigned to the several phthalate esters may arise from the fact that aquatic toxicity data is available for some of them (e.g., dibutyl phthalate, RQ=100 lbs, Basis:311(AQTX)) but is unavailable for others (e.g., dioctyl phthalate, RQ=5000 lbs, Basis:Max). It might be appropriate to set all phthalate esters at an RQ level of B (100 lbs) on the basis of very close chemical similarity.
- NOTE 36: The RQ level, category B (100 lbs) suggested for this material is based on aquatic toxicity data found in OHMTADS. 1.2 ppm of the material is indicated as lethal to goldfish in 30 minutes, and a much lower survival is noted for brine shrimp at the 10 ppm level.
- NOTE 37: An assignment of a 5000 lb RQ has been made on the basis of this being the maximum value possible to assign.
- NOTE 38: It is highly likely that the intent in the RCRA regulations was

to list Benzene,2,4-diisocyanatomethyl (CAS No. 584-84-9), which is the same as Toluene diisocyanate (or Toluene,2,4-diisocyanate) and which is also the more common item of commerce (U223). The compound Benzene,1,3-diisocyanatomethyl has a CAS Registry No. of 26471-62-5 and is chemically the same as Xylene diisocyanate.

NOTE 39 A working RQ value of 5000 lbs has been assigned to this material, pending its assessment for chronic toxicity affects. It would also be possible, in the absence of any other data, to assign this material an RQ based on its very close chemical similarity to hexachlorobenzene and 1,2,4,5-tetrachlorobenzene.

NOTE 40: It might be prudent to establish a lower RQ for this hazardous substance on the basis of it being a member of the polynuclear aromatic hydrocarbon class. Many PNAs are known or suspected carcinogens. While no definitive proof exists that all PNAs are carcinogens, experimental evidence suggests that these materials do cause formation of tumors and neoplasms. The materials benzo(k)fluoranthene and benzo(j)fluoranthene, for example, have been shown to cause cancer; however they are classified as suspect because the data were obtained from only one species. The materials benzo(ghi)perylene, fluoranthene and pyrene have been identified as promoters or co-carcinogens. ("Biorefractories in Water, Carcinogens, Mutagens, Promoters", U.S. Department of Health and Human Services, Public Health Services, National Institute of Health, First Report, February 1980.)

NOTE 41: In addition to its flammability, this material may polymerize at elevated temperatures. If the polymerization takes place in a container, there is possibility of violent rupture of the container. It is readily converted by oxygen to hazardous peroxides and acids.

NOTE 42: Crotonaldehyde has been identified under two different CAS Registry numbers, 4170-30-3 and 123-73-9, the latter referring to the trans- isomer. The mammalian toxicity data listed are for the trans-isomer.

NOTE 43: The RQ for this material is set at 5000 lbs, based on oral toxicity. Most other chlorinated phenols have much lower RQ values (e.g., 2-chlorophenol and 2,4-dichlorophenol, working RQs set at 100 lbs, pending chronic toxicity assessment) based in all cases on aquatic toxicity data. It is possible that the comparatively high RQ assigned in this case arises simply from the unavailability of aquatic toxicity data. An RQ could be established for this substance on the basis of its very close chemical similarity to the other chlorophenols.

NOTE 44: Common name for this material is Epichlorohydrin.

NOTE 45: Coal tar cresote is identified by the Chemical Abstracts Service

Registry Number (CAS No.) 8001-58-9, and data presented is for this material. No data were found that would allow rating of beechwood creosote, CAS No. 8021-39-4.

- NOTE 46: The range of flash points (F) and boiling points (B) shown in the ICR column derives from the three different Cresol isomers, ortho-, meta-, and para-.
- NOTE 47: Data are presented only for the free acid; however, the suggested RQ also applies to salts and esters.
- NOTE 48: This material is the same as Bis(2-chloroethyl)ether.
- NOTE 49: Data on the aquatic toxicity for 2,6-Dichlorophenol may be found in OHMTADS under the entry for 2,4-Dichlorophenol.
- NOTE 50: Common name for this material is Hydrazobenzene.
- NOTE 51: The oral toxicity value shown is for the sodium salt; however, the suggested RQ applies to the free acid and esters as well.
- NOTE 52: This material polymerizes in the presence of air, sunlight, or heat unless stabilized by inhibitors.
- NOTE 53: Inhalation toxicities are most commonly measured over a 4-hour period. In this case, the inhalation toxicity of 425 ppm was determined in only 30 minutes. A 4-hour exposure would undoubtedly bring that figure down to well under 400 ppm, corresponding to an RQ category of C (1000 lbs), and this RQ has accordingly been suggested.
- NOTE 54: Long-term exposure to mercury vapor is known to induce a degenerative disease (mercurialism, the "Hatters's Disease") in humans.
- NOTE 55: Inhalation of high concentrations of methyl chloride causes serious central nervous system damage, lingering illness, and sometimes death. Persons may unknowingly be exposed to considerable concentrations because it has no detectable odor.
- NOTE 56: This compound has been assigned an RQ value based on its very close similarity to methyl bromide and bromoform, which have suggested RQ levels of C (1000 lbs), and B (100 lbs). The 1000 lb level was selected.
- NOTE 57: Common name for this material is carbon tetrachloride.
- NOTE 58: Polymerization of this material may occur upon exposure to heat, oxidizing agents and ultraviolet light.
- NOTE 59: There is a wide range of aquatic toxicities reported for

naphthalene in OHMTADS, ranging down to 1 ppm for certain species and conditions. Similarly, RTECS reports an aquatic toxicity for naphthalene of 1-10 ppm. On this basis, a lower RQ has been suggested than that established under Section 311 of the Clean Water Act.

NOTE 60: Phosphorus sulfide reacts with water to liberate hydrogen sulfide, as indicated by the symbol  $H_2S$  in the I/C/R columns of the table. The RQ suggested for  $H_2S$  is also 100 lbs.

NOTE 61: The RCRA regulation (40CFR261.33, 45FR78544) lists selenious acid and selenium dioxide under the same number (U204). However, these are two separate and distinct materials, and the Chemical Abstracts Services Registry Number (CAS RN.) has been provided for each. However, the distinction is of little consequence, since  $SeO_2$  immediately hydrates to  $H_2SeO_3$  in water, so that their toxicities are, for all practical purposes, equivalent. Brackets around entries for these two compounds indicate where such equivalent data has been assigned from one material to the other.

NOTE 62: Mishandling of this material could lead to the liberation of  $H_2S$ , and accordingly the suggested RQ is set at a level of B (100 lbs).

NOTE 63: The range of flash points (F) and boiling points (B) shown in the I/C/R column derives from the three different Xylene isomers, ortho-, meta-, and para-.

NOTE 64: Trichloroacetaldehyde, chloral (hydrate) decomposes in alkaline water to yield chloroform, an identified carcinogen. While evidence directly implicating chloral as a carcinogen is scanty, and it is not listed as such by either IARC or DHHS in any of their publications, it might be prudent to adjust its RQ on the basis of carcinogenicity because it could be a precursor to a known carcinogen under many conditions of release.

NOTE 65: The suggested RQ takes into consideration one or more of the natural dissipation processes of biodegradation, hydrolysis, or photolysis. More specifically, the lowest RQ suggested by any of the primary ranking factors has been adjusted upward one level.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Generic	F001	The following spent halogenated solvents used in degreasing and sludges from the recovery of these solvents in degreasing operations:				###		
		(a) Tetrachlorethylene (127-18-4)	T	U210		###		
		(b) Trichloroethylene (79-01-6)	T	U228	1000	###		
		(c) Methylene chloride (75-09-2)	T	U080		1000	CTX	
		(d) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(e) Carbon tetrachloride (56-23-5)	T	U211	5000	###		
	F002	(f) Chlorinated fluorocarbons (N.A.)	T	U075 U121		5000	Max	See also Note 7
		The following spent halogenated solvents and the still bottoms from the recovery of these solvents:				###		
		(a) Tetrachloroethylene (127-18-4)	T	U210		###		
		(b) Methylene Chloride (75-09-2)	T	U080		1000	CTX	
		(c) Trichloroethylene (79-01-6)	T	U228	1000	###		
		(d) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(e) Chlorobenzene (108-90-7)	T	U037	100	100	311	
		(f) 1,1,2-Trichloro-1,2,2-trifluoroethane (76-13-1)	T			5000	Max	Note 7
		(g) o-Dichlorobenzene (106-46-7)	T	U072		100	AQTX	
		(h) Trichlorofluoromethane (75-69-4)	T	U121		5000	Max	
	F003	The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				100		
		(a) Xylene (1330-20-7)	I	U239	1000	1000	311,I	
		(b) Acetone (67-64-1)	I	U002		5000	BHP	Note 8
		(c) Ethyl acetate (141-78-6)	I	U112		5000	BHP	Note 8
		(d) Ethylbenzene (100-41-4)	I		1000	1000	311,I	Note 9
		(e) Ethyl ether (60-29-7)	I	U117		100	I	

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TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	F003 (Cont.)	(f) Methyl isobutyl ketone (108-10-1) (g) n-Butyl alcohol (71-36-3) (h) Cyclohexanone (108-94-1) (i) Methanol (67-56-1)	I I I I	U161 U031 U057 U154		5000 5000 5000 5000	BHP BHP I BHP	Note 8 Note 8  Note 8
	F004	The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:  (a) Cresols/Cresylic acid (1319-77-3) (b) Nitrobenzene (98-95-3)	T T	U052 U169	1000 1000	# # #		
	F005	The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:  (a) Toluene (108-88-3) (b) Methyl ethyl ketone (78-93-3) (c) Carbon disulfide (75-15-0) (d) Isobutanol (78-83-1) (e) Pyridine (110-86-1)	I, T I, T I, T I, T I, T	U220 U159 P022 U140 U196	1000  5000	1000 1000 # 5000 #	311,I,CTX I, CTX  BHP	    Note 8
	F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum  (a) Cadmium compounds (N.A.)				###  ###	Components	

**Note: All comments are located at the end of this table and all abbreviations used are discussed there.**

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	F006 (Cont.)	(b) Hexavalent chromium compounds (N.A.) (c) Nickel compounds (N.A.) (d) Cyanides (complexed) (N.A.)	T T T	P030	(10)	## ### 10	311	Note 10
	F019	Wastewater treatment sludges from the chemical conversion coating of aluminum  (a) Hexavalent chromium compounds (N.A.) (b) Cyanides (complexed) (N.A.)	  T T	  P030	  (10)	##  ## 10	Components  311	  Note 10
	F007	Spent cyanide plating bath solutions from electroplating operations (except for precious metals electroplating spent cyanide plating bath solutions)  (a) Cyanide (Salts) (N.A.)	  T	  P030	  (10)	10  10	Component  311	  Note 10
	F008	Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges)  (a) Cyanide (Salts) (N.A.)	  T	  P030	  (10)	10  10	Component  311	  Note 10
	F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions)  (a) Cyanide (Salts) (N.A.)	  T	  P030	  (10)	10  10	Component  311	  Note 10

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TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Wood Preservation	F010	Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges)				10	Component	
		(a) Cyanide (Salts) (N.A.)	T	P030	(10)	10	311	Note 10
	F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning)				10	Component	
		(a) Cyanide (Salts) (N.A.)	T	P030	(10)	10	311	Note 10
	F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater treatment sludges)				10	Component	
		(a) Cyanides (Complexed) (N.A.)	T	P030	(10)	10	311	Note 10
	K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol	T			1	Components	
		(a) Pentachlorophenol (87-86-5)	T	U242	10	1	AQTX	
		(b) Phenol (108-95-2)	T	U188	1000	##		
		(c) 2-Chlorophenol (95-57-8)	T	P048		100	AQTX	
		(d) p-Chloro-m-cresol (59-50-7)	T	U039		5000	T(orl)	
		(e) 2,4-Dinitrophenol (51-28-5)	T	P048	(1000)	100	AQTX, CTX	
		(f) Trichlorophenols (1) 2,4,5 isomer (95-95-4)	T	U230	10	##		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Inorganic Pigments	K001 (Cont.)	(2) 2,4,6 isomer (88-06-2)	T	U231	5000	###	AQTX	
		(g) Tetrachlorophenol (s)	T	U212		10		
		(1) 2,3,4,6 isomer (58-90-2)		U051		###		
		(h) Creosote (8001-58-9)	T	U050		###		
		(i) Chrysene (218-01-9)	T	U165		100		
		(j) Naphthalene (91-20-3)	T			###		
		(k) Benzo(b)fluoranthene (205-99-2)	T			###		
		(l) Fluoranthene (206-44-0)	T	U120		#		
		(m) Benzo(a)pyrene (50-32-8)	T	U022		###		
		(n) Indeno(1,2,3-cd)pyrene (193-39-5)	T	U137		###		
		(o) Benz(a)anthracene (56-55-3)	T	U018		###		
		(p) Dibenzo(a,h)anthracene (53-70-3)	T	U063		###		
		(q) Acenaphthylene (208-96-8)	T			#		
		(r) 2,4-Dimethylphenol (105-67-9)	T	U101		100	AQTX	
	K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K003	Wastewater treatment sludge from the production of molybdate orange pigments	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K004	Wastewater treatment sludge from the production of zinc yellow pigments	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Organic Chemicals	K005	Wastewater treatment sludge from the production of chrome green pigments	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated)	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
	K007	Wastewater treatment sludge from the production of iron blue pigments	T			##	Component	
		(a) Cyanide (complexed) (N.A.)	T	P030	(10)	10	311	Note 10
		(b) Hexavalent chromium compounds (N.A.)	T			##		
	K008	Oven residue from the production of chrome oxide green pigments	T			##	Component	
		(a) Hexavalent Chromium Compounds (N.A.)	T			##		
	K009	Distillation bottoms from the production of acetaldehyde from ethylene	T			###	Component	
		(a) Chloroform (67-66-3)	T	U044	5000	#		
		(b) Formaldehyde (50-00-0)	T	U122	1000	##		
		(c) Methylene chloride (75-09-2)	T	U080		1000	CTX	
		(d) Methyl chloride (74-87-3)	T	U045		##		
		(e) Paraldehyde (123-63-7)	T	U182		1000	I	
		(f) Formic acid (64-18-6)	T	U123	5000	5000	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K010	Distillation side cuts from the production of acetaldehyde from ethylene	T			###	Component	
		(a) Chloroform (67-66-3)	T	U044	5000	#		
		(b) Formaldehyde (50-00-0)	T	U122	1000	##		
		(c) Methylene chloride (75-09-2)	T	U080		1000	CTX	
		(d) Methyl chloride (74-87-3)	T	U045		##		
		(e) Paraldehyde (123-63-7)	T	U182		1000	I	
		(f) Formic acid (64-18-6)	T	U123	5000	5000	311	
		(g) Chloroacetaldehyde (107-20-0)	T	P023		1000	T(orl)	
	K011	Bottom stream from the wastewater stripper in the production of acrylonitrile	R,T			###	Components	
		(a) Acrylonitrile (107-13-1)	R,T	U009	100	###		
		(b) Acetonitrile (75-05-8)	R,T	U003		1000	I,CTX	
		(c) Hydrocyanic acid (74-90-8)	R,T	P063	10	10	311	
	K013	Bottom stream from the acetonitrile column in the production of acrylonitrile	R,T			###	Component	
		(a) Acrylonitrile (107-13-1)	R,T	U009	100	###		
		(b) Acetonitrile (75-05-8)	R,T	U003		1000	I,CTX	
		(c) Hydrocyanic acid (74-90-8)	R,T	P063	10	10	311	
	K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile	T			##	Component	
		(a) Acetonitrile (75-05-8)	T	U003		1000	I,CTX	
		(b) Acrylamide (79-06-1)	T	U007		5000	T(orl)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K015	Still bottoms from the distillation of benzyl chloride	T			#	Component	
		(a) Benzyl chloride (100-44-7)	T	P028	100	#		
		(b) Chlorobenzene (108-90-7)	T	U037	100	100	311	
		(c) Toluene (108-88-3)	T	U220	1000	1000	311, I, CTX	
		(d) Benzotrachloride (98-07-7)	T	U023		1000	T(1hl)	
	K016	Heavy ends or distillation residues from the production of carbon tetrachloride	T			###	Component	
		(a) Hexachlorobenzene (118-74-1)	T	U127		###		
		(b) Hexachlorobutadiene (87-68-3)	T	U128		###		
		(c) Carbon tetrachloride (56-23-5)	T	U211	5000	###		
		(d) Hexachloroethane (67-72-1)	T	U131		###		
		(e) Perchloroethylene (127-18-4)	T	U210		1000	AQTX	
	K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin	T			###	Components	
		(a) Epichlorohydrin (106-89-8)	T	U041	1000	###		
		(b) bis (Chloromethyl ether) (542-88-1)	T	P016		###		
		(c) bis (2-Chloroethyl ether) (111-44-4)	T	U025		#		
		(d) Trichloropropane						
		(1) 1,2,3 isomer (96-18-4)	T			5000	T(ori)	Note 11
		(e) Dichloropropanol						
		(1) n-,2,3 isomer (616-23-9)	T			1000	T(ori)	Note 12

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K018	Heavy ends from the fractionation column in ethyl chloride production	T			###	Component	
		(a) 1,2-Dichloroethane (107-06-2)	T	U077	5000	###		
		(b) Trichloroethylene (79-01-6)	T	U228	1000	###		
		(c) Hexachlorobutadiene (87-68-3)	T	U128		###		
		(d) Hexachlorobenzene (118-74-1)	T	U127		###		
	K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production	T			###	Component	
		(a) Ethylene dichloride (107-06-2)	T	U077	5000	###		
		(b) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(c) 1,1,2-Trichloroethane (79-00-5)	T	U227		###		
		(d) 1,1,1,2-Tetrachloroethane (630-20-6)	T	U208		###		
		(e) 1,1,2,2-Tetrachloroethane (79-34-5)	T	U209		###		
		(f) Trichloroethylene (79-01-6)	T	U228	1000	###		
		(g) Tetrachloroethylene (127-18-4)	T	U210		###		
		(h) Carbon Tetrachloride (56-23-5)	T	U211	5000	###		
		(i) Chloroform (67-66-3)	T	U044	5000	#		
		(j) Vinyl chloride (75-01-4)	T	U043		###		
		(k) Vinylidene chloride (75-35-4)	T	U078	5000	###		
	K020	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production	T			###	Component	
		(a) Components of this waste are identical with those of K019, immediately preceding						SEE K019

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K021	Aqueous spent antimony catalyst waste from fluoromethanes production	T			###	Components	
		(a) Antimony Trichloride (10025-91-9)	T		1000	1000	311	Note 13
		(b) Carbon Tetrachloride (56-23-5)	T	U211	5000	###		
		(c) Chloroform (67-66-3)	T	U044	5000	#		
	K022	Distillation bottom tars from the production of phenol/acetone from cumene	T			###	Components	
		(a) Phenol (108-95-2)	T	U188	1000	##		
		(b) Tars (polycyclic aromatic) (N.A.)	T			#		
	K023	Distillation light ends from the production of phthalic anhydride from naphthalene	T			5000	Components	
		(a) Phthalic anhydride (85-44-9)	T	U190		5000	Max	
		(b) Maleic anhydride (108-31-6)	T	U147	5000	5000	311,T(or1)	
	K024	Distillation bottoms from the production of phthalic anhydride from naphthalene	T			5000	Components	
		(a) Phthalic anhydride (85-44-9)	T	U190		5000	Max	
		(b) 1,4-Naphthoquinone (130-15-4)	T	U166		5000	T(or1)	
	K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene	T			5000	Components	
		(a) Phthalic anhydride (85-44-9)	T	U190		5000	Max	
		(b) Maleic anhydride (108-31-6)	T	U147	5000	5000	311,T(or1)	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene	T			5000	Component	
		(a) Phthalic anhydride (85-44-9)	T	U190		5000	Max	
	K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene	T			100	Component	
		(a) meta-Dinitrobenzene (99-65-0)	T			100	CTX	
		(b) 2,4-Dinitrotoluene (121-14-2)	T	U105		100	CTX	
	K026	Stripping still tails from the production of methyl ethyl pyridines	T			##	Components	
		(a) Paraldehyde (123-63-7)	T	U182		1000	I	
		(b) Pyridine(s) (110-86-1)	T	U196		##		
		(c) 2-Picoline (109-06-8)	T	U191		5000	I	
	K027	Centrifuge and distillation residues from toluene diisocyanate production	T			#	Component	
		(a) Toluene diisocyanate (584-84-9)	T	U223		100	AQTX,T(ihl)	
		(b) Toluene-2,4-diamine (95-80-7)	T	U221		#		
	K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane	T			###	Component	
		(a) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(b) Vinyl chloride (75-01-4)	T	U043		###		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane	T			***	Components	
		(a) 1,2-Dichloroethane (107-06-2)	T	U077	5000	***		
		(b) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(c) Vinyl chloride (75-01-4)	T	U043		***		
		(d) Vinylidene chloride (75-35-4)	T	U078	5000	***		
		(e) Chloroform (67-66-3)	T	U044	5000	#		
	K095	Distillation bottoms from the production of 1,1,1-trichloroethane	T			***	Component	
		(a) 1,1,2-Trichloroethane (79-00-5)	T	U227		***		
		(b) 1,1,1,2-Tetrachloroethane (630-20-6)	T	U208		***		
		(c) 1,1,2,2-Tetrachloroethane (79-34-5)	T	U209		***	AQTX	
	K096	Heavy ends from the heavy ends column from the production of a,a,a-trichloroethane 1,1,1	T			***	Components	
		(a) 1,2-Dichloroethane (107-06-2)	T	U077	5000	***		
		(b) 1,1,1-Trichloroethane (71-55-6)	T	U226		1000	AQTX	
		(c) 1,1,2-Trichloroethane (79-00-5)	T	U227		***		
	K030	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene	T			***	Components	
		(a) Hexachlorobenzene (118-74-1)	T	U127		***		
		(b) Hexachlorobutadiene (87-68-3)	T	U128		***		
		(c) Hexachloroethane (67-72-1)	T	U131		***		
		(d) 1,1,1,2-Tetrachloroethane (630-20-6)	T	U208		***		
		(e) 1,1,2,2-Tetrachloroethane (79-34-5)	T	U209		***		
		(f) Ethylene dichloride (107-06-2)	T	U077	5000	***		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K083	Distillation bottoms from aniline extraction	T			##	Component	
		(a) Aniline (62-53-3)	T	U012	1000	5000	BHP	Note 8
		(b) Diphenylamine (122-39-4)	T			5000	T(orl)	Note 14
		(c) Nitrobenzene (98-95-3)	T	U169	1000	##		
		(d) Phenylenediamine (para-isomer) (106-50-3)	T			100	AQTX	Note 15
	K103	Process residues from aniline extraction from the production of aniline	T			##	Component	
		(a) Aniline (62-53-3)	T	U012	1000	5000	BHP	Note 8
		(b) Nitrobenzene (98-95-3)	T	U169	1000	##		
		(c) Phenylenediamine (para-isomer) (106-50-3)	T			100	AQTX	Note 15
	K104	Combined wastewater streams generated from nitrobenzene/aniline chlorobenzenes	T			###	Components	
		(a) Benzene (71-43-2)	T	U019	1000	###		
		(b) Aniline (62-53-3)	T	U012	1000	5000	BHP	Note 8
		(c) Diphenylamine (122-39-4)	T			5000	T(orl)	Note 14
		(d) Nitrobenzene (98-95-3)	T	U169	1000	##		
		(e) Phenylenediamine (para-isomer) (106-50-3)	T			100	AQTX	Note 15
	K085	Distillation or fractionation column bottoms from the productin of chlorobenzenes	T			###	Components	
		(a) Benzene (71-43-2)	T	U019	1000	###		
		(b) Dichlorobenzenes						
		(1) 1,2-isomer (95-50-1)	T	U070		100	AQTX	
		(2) 1,3-isomer (541-73-1)	T	U071		100	AQTX	
		(3) 1,4-isomer (106-46-7)	T	U072		100	AQTX	
		(c) Trichlorobenzenes						
		(1) 1,2,4-isomer (120-82-1)	T			100	AQTX	
		(d) Tetrachlorobenzene						

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K085 (Cont.)	(1) 1,2,4,5-isomer (95-94-3) (e) Pentachlorobenzene (608-93-5) (f) Hexachlorobenzene (118-74-1) (g) Benzyl chloride (100-44-7)	T T T T	U207 U183 U127 P028	100	5000 ## ### #	Max	
	K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes  (a) Benzene (71-43-2) (b) Monochlorobenzene (108-90-7) (c) Dichlorobenzene (s) (1) 1,2-isomer (95-50-1) (2) 1,3-isomer (541-73-1) (3) 1,4-isomer (106-46-7) (d) 2,4,6-Trichlorophenol (88-06-02)	T  T T T T T T	  U019 U037  U070 U071 U072 U231	1000 100	### 100 100 100 ###	Component  311 AQTX AQTX AQTX	
	K071	Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used  (a) Mercury (7439-97-6)	T  T	  U151		1  1	Component  AQTX	
	K073	Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production  (a) Chloroform (67-66-3) (b) Carbon tetrachloride (56-23-5) (c) Hexachloroethane (67-72-1) (d) Trichloroethane (1) 1,1,1-isomer (71-55-6) (2) 1,1,2-isomer (79-00-5) (e) Tetrachloroethylene (127-18-4) (f) Dichloroethylene (1) trans 1,2-isomer (156-60-5)	T  T T T T T T T	  U044 U211 U131  U226 U227 U210  U079	5000 5000	# ### ###  1000 ### ###  1000	Component  AQTX  I,CTX	See Table 9-1

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Pesticides	K073 (Cont.)	(g) 1,1,2,2-Tetrachloroethane (79-34-5)	T	U209		###		
	K106	Wastewater treatment sludge from the mercury cell process in chlorine production	T			1	Component	
		(a) Mercury (7439-97-6)	T	U151		1	AQTX	See Table 9-1
	K031	By-product salts generated in the production of MSMA and cacodylic acid	T			###	Component	
		(a) Arsenic compounds (N.A.)	T			###		
	K032	Wastewater treatment sludge from the production of chlordane	T			1	Component	
		(a) Hexachlorocyclopentadiene (77-47-4)	T	U130	1	1	311	
	K033	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane	T			1	Component	
		(a) Hexachlorocyclopentadiene (77-47-4)	T	U130	1	1	311	
	K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane	T			1	Component	
		(a) Hexachlorocyclopentadiene (77-47-4)	T	U130	1	1	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane	T			1	Component	
		(a) Chlordane (57-74-9)	T	U036	1	1	311	
		(b) Heptachlor (76-44-8)	T	P059	1	1	311	
	K035	Wastewater treatment sludges generated in the production of creosote	T			###	Components	
		(a) Creosote (8001-58-9)	T	U051		###		
		(b) Chrysene (218-01-9)	T	U050		###		
		(c) Naphthalene (91-20-3)	T	U165	5000	100	AQTX	
		(d) Benzo(b)fluoranthene (205-99-2)	T			###		
		(e) Fluoranthene (206-44-0)	T	U120		#		
		(f) Benzo(a)pyrene (50-32-8)	T	U022		###		
		(g) Indeno(1,2,3-cd)pyrene (193-39-5)	T	U137		###		
		(h) Benz(a)anthracene (56-55-3)	T	U018		###		
		(i) Dibenz(a,h)anthracene (53-70-3)	T	U063		###		
		(j) Acenaphthalene (208-96-8)	T			#		
	K036	Still bottoms from toluene reclamation distillation in the production of disulfoton	T			1	Compound	
		(a) Toluene (108-88-3)	T	U220	1000	1000	311,I,CTX	
		(b) Phosphorodithioic esters (N.A.)	T			1		Note 16
		(c) Phosphorothioic esters (N.A.)	T			1		Note 16
	K037	Wastewater treatment sludges from the production of disulfoton	T			1	Component	
		Components of this waste are identical with those of K036, immediately preceding	T					SEE K036

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K038	Wastewater from the washing and stripping of phorate production	T			##	Component	
		(a) Phorate (298-02-2)	T	P094		##		
		(b) Formaldehyde (50-00-0)	T	U122	1000	##		Note 17
		(c) Phosphorodithioic esters (N.A.)	T			##		Note 17
		(d) Phosphorothioic esters (N.A.)	T			##		
	K039	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate	T			##	Component	Note 17
		(a) Phosphorodithioic esters (N.A.)	T			##		Note 17
		(b) Phosphorothioic esters (N.A.)	T			##		Note 17
	K040	Wastewater treatment sludge from the production of phorate	T			##	Component	
		Components of this waste are identical with those of K038, above.	T					SEE K038
	K041	Wastewater treatment sludge from the production of toxaphene	T			1	Component	
		(a) Toxaphene (8001-35-2)	T	P123	1	1	311	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
	K098	Untreated process wastewater from the production of toxaphene	T			1	Component	
		(a) Toxaphene (8001-35-2)	T	P123	1	1	311	
	K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T	T			###	Component	
		(a) Hexachlorobenzene (118-74-1)	T	U127		###		
		(b) Orthodichlorobenzene (95-50-1)	T	U070		100	AQTX	
	K043	2,6-Dichlorophenol waste from the production of 2,4-D	T			###	Component	
		(a) 2,4-Dichlorophenol (120-83-2)	T	U081		100	AQTX	
		(b) 2,6-Dichlorophenol (87-65-0)	T	U082		100	AQTX	
		(c) 2,4,6-Trichlorophenol (88-06-2)	T	U231		###		
	K099	Untreated wastewater from the production of 2,4-D	T			###	Component	
		(a) 2,4-Dichlorophenol (120-83-2)	T	U081		100	AQTX	
		(b) 2,4,6-Trichlorophenol (88-06-2)	T	U231		###		
Explosives	K044	Wastewater treatment sludges from the manufacturing and processing of explosives	R			10	R=EXP	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Petroleum Refining	K045	Spent carbon from the treatment of wastewater containing explosives	R			10	R=EXP	
	K046	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds	T			##	Component	
		(a) Lead (compounds) (N.A.)	T			##		Note 18
	K047	Pink/red water from TNT operations	R			10	R=EXP	
	K048	Dissolved air flotation (DAF) float from the petroleum refining industry	T			##	Component	
		(a) Hexavalent Chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K049	Slop oil emulsion solids from the petroleum refining industry	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Iron and Steel	K051	API separator sludge from the petroleum refining industry	T			##	Component	
		(a) Hexavalent Chromium compounds (N.A.)	T			##		
		(b) Lead compounds (N.A.)	T			##		
	K052	Tank bottoms (leaded) from the petroleum refining industry	T			##	Component	
		(a) Lead compounds = Tetraethyl lead (78-00-2)	T	P110	100	##		Note 19
	K061	Emission control dust/sludge from the primary production of steel in electric furnaces	T			###	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead (compounds) (N.A.)	T			##		
		(c) Cadmium (compounds) (N.A.)	T			###		
	K062	Spent pickle liquor from steel finishing operations	T			##	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead (compounds) (N.A.)	T			##		
	K069	Emission control dust/sludge from secondary lead smelting	T			###	Component	
		(a) Hexavalent chromium compounds (N.A.)	T			##		
		(b) Lead (compounds) (N.A.)	T			##		
		(c) Cadmium (compounds) (N.A.)	T			###		

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Veterinary Pharmaceuticals	K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting  (Components of this waste are identical with those of K069, immediately preceding)	T			***	Component	SEE K069
	K084	Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds  (a) Arsenic (compounds) (N.A.)	T  T			***  ***	Component	
	K101	Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds  (a) Arsenic (compounds) (N.A.)	T  T			***  ***	Component	
	K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds  (a) Arsenic (compounds) (N.A.)	T  T			***  ***	Component	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

TABLE 9-2. COMPREHENSIVE HAZARDOUS SUBSTANCE LIST, PART II - HAZARDOUS WASTES - C. NON-SPECIFIC AND SPECIFIC WASTE STREAMS (F AND K LISTS)

Industry	Hazardous Waste No.	Substance (CAS Registry No.) (Note 1)	Listing Criteria (Note 2)	Specific Chemical Waste Number (Note 3)	311 RQ (Note 4)	Suggested RQ (Note 5)	Basis for Suggestion (Note 6)	Comments
Ink Formulation	K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead	T			##	Component	
		(a) Lead (compounds) (N.A.)	T			##		
		(b) Hexavalent chromium compounds (N.A.)	T			##		
Coking	K060	Ammonia still lime sludge from coking operations	T			###	Components	
		(a) Cyanides (N.A.)	T	P030	(10)	10	311	Note 10
		(b) Phenolic compounds (N.A.) [Phenol (108-95-2)]	T	U188	1000	##		
		(c) Naphthalene (91-20-3)	T	U165	5000	100		
		(d) Arsenic compounds (N.A.)	T			###		
	K087	Decanter tank tar sludge from coking operations	T			##	Component	
		(a) Phenol (108-95-2)	T	U188	1000	##		
		(b) Naphthalene (91-20-3)	T	U165	5000	100	AQTX	

Note: All comments are located at the end of this table and all abbreviations used are discussed there.

## NOTES FOR TABLE 9-2

### COMPREHENSIVE HAZARDOUS SUBSTANCE LIST PART II - HAZARDOUS WASTES NON-SPECIFIC AND SPECIFIC WASTE STREAMS

- NOTE 1: Each waste on these lists (the F and K lists) is followed by the chemical name and parenthetically the CAS No. (Chemical Abstract Services Registry Number) of its constituents. Where the constituents are indefinite or generic in nature, and no CAS No. applies, the abbreviation N.A. (Not Applicable) follows the entry. Constituents listed are either those defined as part of the waste itself, or those given in the RCRA (Resource Conservation and Recovery Act) regulation, 40CFR261, Appendix 7, 45FR4619-4620, January 16, 1981. The nomenclature is that used in these two sources, and additional notes are provided to indicate where it differs from that used elsewhere in this report.
- NOTE 2: The listing criteria are I, C, R, and T, standing for Ignitability, Corrosivity, Reactivity, and Extraction Procedure Toxicity, respectively. This represents the reasons why a waste stream was listed as a hazardous waste in the first place. They are explained in detail in the RCRA (Resource Conservation and Recovery Act) regulations, 40CFR261.10 through 261.24 (45FR33121-33122, May 19, 1980).
- NOTE 3: With few exceptions, the constituents of the F and K list waste streams have been previously evaluated and a suggested RQ (reportable quantity) determined. Entries in this column refer to the Specific Chemical Waste on the U or P list in Table 9-1 where that evaluation was made. Individual notes describe the evaluation of those few materials not on the U and P lists. Sources of data for such evaluations are the same as those given in Notes 2-5, Table 9-1.
- NOTE 4: Entries in this column show the value in pounds that was assigned as a reportable quantity under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979).
- NOTE 5: Entries under this column are either (a) the lowest reportable quantities derived for the constituents of the F and K list waste streams as previously evaluated (see Table 9-1 where that evaluation was made) or (b) the entries are flagged as follows to indicate why RQs have not at this time been assigned, pending further assessment of the materials by the Agency.

# - to be assessed for carcinogenicity by CAG

## - to be assessed for chronic toxicity by ECAO

### - to be assessed for both carcinogenicity and chronic toxicity.

F list wastes F001 - F005 may consist of any one of their constituents alone, and therefore a numerical suggested RQ in pounds is shown for each constituent of each waste, and the lowest of these RQ's is shown opposite the description of the nature of the waste itself. For the remaining F list wastes and each K list waste, which consist of a mixture of their constituents, a numerical suggested RQ in pounds is shown opposite both the constituents and the description of the waste itself (unless any of the constituents are still being assessed for carcinogenicity or chronic toxicity). This latter suggested RQ is the same as the lowest RQ suggested for any constituent.

NOTE 6: Entries in this column show the basis on which an RQ has been suggested, coded as follows:

311 - aquatic toxicity, as assigned under Section 311 of the Clean Water Act

AQTX - aquatic toxicity, other than a 311 assignment

T(oral) - oral mammalian toxicity

T(ihl) - inhalation mammalian toxicity

T(skn) - skin (dermal) mammalian toxicity

I - ignitability

R - reactivity

CT - chronic toxicity

For K list waste descriptions, the entry of the term "component" indicates that the basis of the assignment is that constituent of the waste having the lowest suggested RQ. See Note 5, above.

NOTE 7: A maximum RQ (5000 lbs) is suggested for 1,1,2-Trichloro-1,2,2-trifluoroethane on the basis of the following data:

LD50 RAT = 43,000 mg/kg (oral)

LC50 RAT = 87,000 ppm/6 hours (inhalation)

NOTE 8: The suggested RQ takes into consideration one or more of the natural dissipation processes of biodegradation, hydrolysis, or photolysis. More specifically, the lowest RQ suggested by any of the primary ranking factors has been adjusted upward one level.

NOTE 9: An RQ level of C (1000 lbs) is suggested for ethylbenzene on the basis of the following data:

Flash point = 59°F

Boiling point = 277°F

NOTE 10: All cyanides assigned reportable quantities under Section 311 of the Clean Water Act (40CFR117.3, 44FR10279-10283, February 16, 1979) were placed at RQ level A (10 lbs) on the basis of the aquatic toxicity of the cyanide ion. The same practice is continued here.

NOTE 11: An RQ level of D (5000 lbs) is suggested for 1,2,3-Trichloropropane on the basis of the following data:

LD50 RAT = 320 mg/kg (oral)

LC50 = 1000 ppm/4 hours (inhalation)

NOTE 12: An RQ level of C (1000 lbs) is suggested for 2,3-Dichloro-n-propanol on the basis of the following data:

LD50 RAT = 90 mg/kg (oral)

LC10 RAT = 500 ppm/4 hours (ihl)

NOTE 13: This is an aqueous waste, and it has been assumed that the antimony compound in solution is the trichloride.

NOTE 14: An RQ level of D (5000 lbs) is suggested for Diphenylamine on the basis of the following data:

LD50 GPG = 300 mg/kg (oral)

NOTE 15: An RQ level of B (100 lbs) is suggested for paraphenylenediamine on the basis of the following data:

TLm(48) GOLDFISH = 5.7 ppm

LD50 RAT = 80 mg/kg (oral)

NOTE 16: These esters are assumed to be composed of disulfoton and/or its analogues, and accordingly an RQ level of X (1 lb) is suggested, based on the RQ assignment of 1 lb given to disulfoton under Section 311 of The Clean Water Act.

NOTE 17: These esters are assumed to be composed of phorate and/or its analogues, and accordingly an RQ level will be suggested, based on the RQ assignment of phorate itself, pending assessment of its chronic toxicity.

NOTE 18: Lead azide (explosive) is assumed to be one of these lead compounds.

NOTE 19: It is assumed that lead compounds in this waste derive from tetraethyl lead; that is, they are the residues from leaded gasoline, and that their toxicities and that of tetraethyl lead will be essentially the same.

## Appendix A

### U.S. EPA CARCINOGEN ASSESSMENT GROUP PRELIMINARY CARCINOGEN RANKING

#### METHODOLOGY APPLIED TO SOME CERCLA 101(14) POTENTIAL CARCINOGENS

##### A. THE APPROACH

###### 1. Literature Searches

Biological data relevant to assessing carcinogenic hazard to humans is searched both manually and by computer using appropriate key words and data bases. Current bioassay status is checked. Key articles are acquired for evaluation.

###### 2. Critical Review and Evaluation of Key Articles

Careful reviews and evaluation of key articles are performed by experienced scientists. In the evaluation of carcinogenic data (whether positive or negative), particular emphasis will be placed on ascertaining: (1) species and strain tested; (2) age at start of test (including in utero); (3) control groups; (4) number and survival of animals; (5) duration of testing; (6) number of dose levels and dose selections; (7) route of administration; (8) gross necropsy and histopathologic evaluation; (9) tumour incidence; (10) site and type of tumours; (11) incidence of lesions other than tumours; (12) tumours and other lesions in controls; and (13) method of evaluation of experimental data. All of these factors are important determinants in establishing carcinogenic activity for a chemical, and thus will be focused in

the extraction and summarization of data.

### 3. Summarizing the Weight-of-Evidence for Carcinogenicity

#### Using the IARC Criteria

After the data has been evaluated, they will be summarized as follows:

- a. Weight-of-evidence statement using the IARC criteria
  - (1) Animal data
  - (2) Human data
- b. Dose-response data that can be used for potency estimates
  - (1) Animal data
  - (2) Human data

### 4. Potency Factor Estimates

After the decision has been made that a compound has the potential for causing cancer in humans, attempts will be made to estimate a potency factor  $F$  defined as  $1/ED_{10}$ .  $ED_{10}$  is the estimated dose associated with a lifetime cancer risk of 10%. The potency factor  $F$  will be used together with the qualitative weight-of-evidence for carcinogenicity in the ranking of the carcinogenic hazard potential of the chemicals.

The potency factor  $F$  is used in place of the potency factor  $q_1^*$  (the upper confidence limit for the linear coefficient in the multistage model). The CAG normally uses in the estimation of risk because the objective here is to rank chemicals for their potential to cause carcinogenic harm and not to estimate risk associated with a particular level of exposure. Furthermore, it is advantageous to use the potency factor  $F$  because it can be estimated without the use of many assumptions required for calculating and/or using  $q_1^*$ . This is possible because the dose associated with a lifetime cancer risk of 10% is

usually within or close to the experimentally observable range.

Other advantages of the potency factor F are:

- A. It is relatively insensitive to the choice of the dose-response extrapolation model.
- B. The point estimation of  $ED_{10}$ , which has some optimal statistical properties, can be used to calculate F. Therefore, it is not necessary to use the upper-bound estimate which is more stable for estimating risk at very low doses.

The data used for the risk estimate is one or both of two types:

1. Lifetime animal studies
2. Human studies where excess cancer risk has been associated with exposure to the agent

For animal data, the potency factor F will be calculated for a chemical using the multistage dose-response model.

Under the multistage theory, the probability of cancer by age t with a constant exposure d is given by

$$P(t,d) = 1 - \exp [-Q(d) \times A(t)]$$

where  $Q(d) = q_0 + q_1 d + \dots + q_k d^k$  and  $A(t)$  is some function of t. The possible forms of  $A(t)$  have been extensively investigated and evaluated both on human and animal data (e.g., Whittemore 1977). If only the cancer risk at a specific time (age) t is of interest, the form of  $A(t)$  need not be specified. The risk associated with a dose d for a given t within the experimental range could be estimated by the procedure of Daffer et al. (1980). In the cases where only dichotomous data are available, the

formula without the term  $A(t)$  (i.e.,  $A(t) = 1$ ) would be used. If the mortality rates among treatment groups are comparable, use of the formula with or without  $A(t)$  would make no practical difference. The details of the risk estimation procedure on the basis of animal data can be found in the Notice of Water Quality Criteria Availability (U.S. EPA 1980).

The procedure for estimating risk on the basis of human data depends mainly on the availability of data and the assumptions one is willing to make. The data reported in an epidemiological study may range from a simple relative risk estimate associated with a rough estimation of average exposure to the full report on each individual in the cohort with respect to the time when exposure began and terminated, age and cause of death, detailed work history, smoking habit, etc.

Under the framework of the multistage theory, one could estimate the cancer risk based on data obtained under various exposure patterns:

- a. constant exposure concentration
- b. exposure starting at age  $t_0$  and ending at  $t$
- c. Single exposure at  $t_0$

An excellent discussion of these procedures can be found in Day and Brown (1980), Whittemore (1977, 1978), Whittemore and Keller (1978). When making risk estimate from human data, one almost always has to make the assumption that the exposure pattern is one of the three cases indicated above. Attempts will always be made to use the model that has the least assumptions.

## 5. Potency Factor Grouping

The potency factor estimates are indicators of relative potential to cause carcinogenic harm. Although the numerical values themselves are not of major importance for consideration in this assessment, they are useful tools to separate the high, medium, and low hazard chemicals.

When the relative potency factors are estimated by the procedure outlined in (4) above, they will be grouped into four groups. Those chemicals with the highest potency factors will be put in group 1, those chemicals with the next highest potency factors will be put in group 2, the low potency factor chemicals will be put in group 3, and the lowest potency factor chemicals will be put in group 4.

One method of grouping is analysis for clustering in addition to potency factor numerical value cutoffs. This requires analysis of all chemicals to be completed before grouping can be done.

#### 6. Hazard Ranking

Chemicals are ranked as high, medium, or low hazard by combining the qualitative weight-of-evidence for carcinogenicity and potency factor grouping according to the following hazard ranking scheme.

<u>Hazard</u>	<u>Carcinogenicity Classification</u>		<u>Potency Factor Group</u>
High*	Sufficient**	and	1
Medium	Sufficient	and	2,3
	Limited	and	1,2
Low	Sufficient	and	4
	Limited	and	3,4

\* In some cases we might judge that factors such as genotoxicity, environmental persistence, and structure activity may warrant a limited, potency 1 agent to be ranked as a high hazard.

\*\* Sufficient here means sufficient evidence with respect to human data and/or animal data.

## B. SPECIAL ISSUES

### 1. Use of Chemical and Environmental Fate and Transformation in Assessing Metals and Their Salts

The chemical and environmental speciation; oxidation state; solubility; chemical and environmental fate and half-life; disproportionation reactions are important determinants of the toxicity of inorganic compounds. Furthermore, it is anticipated that toxicological data on metals and their salts are limited. When toxicity data on a particular metal salt is lacking and an evaluation of these important determinants indicates its convertibility to the toxic/nontoxic species under the exposure conditions considered, then a toxicity evaluation, based on the above-mentioned factor, should be performed.

## 2. Multimedia Exposure

The media into which the toxicant is released will affect the form and toxicity of the toxicant. Since the carcinogenic hazard assessment here deals with multimedia exposure, if data are available for more than one route of exposure, the one most sensitive to carcinogenic response will be used in the estimation of potency. For example, respiratory exposures to nickel and nickel compounds induce carcinogenic responses but oral exposure does not. Thus, inhalation data will be used in estimating the carcinogenic potency of nickel compounds.

## 3. Asbestos

The carcinogenic hazard of asbestos is associated with concentrations of airborne fibers of certain size and not with mass. While larger asbestos fibers may not be carcinogenic, they can subdivide into smaller carcinogenic fibrils. Although the amount of asbestos in mass relates directly to its carcinogenic potential, information such as asbestos type and potential for fiber release per unit mass is needed before a hazard evaluation on a weight basis can be made. Since this information is difficult to ascertain and cannot be objectively predicted, asbestos carcinogenic hazard cannot be ranked with other chemical agents where potency factor estimates are calculated on a weight/volume concentration basis.

## C. SAMPLE RANKING

Table A-1 ranks 21 chemicals using the approach discussed in Part A. It is important to note that while we do not expect changes in their ranking when the assessment of all chemicals is completed, it is conceivable that those chemicals on the borderline between potency factor groupings could change position.

TABLE A-1. SAMPLE CARCINOGENIC HAZARD RANKING

Agent	Carcinogenicity Classification	Potency Grouping	Hazard Ranking
<u>Substance</u> <u>(CAS Registry No.)</u>			
Acrylonitrile (107-13-1)	Sufficient	3	Medium
Arsenic trioxide (1327-53-3)	Sufficient	1	High
Benzene (71-43-2)	Sufficient	4	Low
Benzidine (92-87-5)	Sufficient	1	High
Benzo(a)pyrene (50-32-8)	Sufficient	1	High
Beryllium and compounds (7440-41-7)	Sufficient	2	Medium
Bis (2-chloroethyl) ether (111-44-4)	Limited	3	Low
Carbon tetrachloride (56-23-5)	Sufficient	4	Low
Chloroform (67-66-3)	Sufficient	3	Medium
3,3'-Dichlorobenzidine (91-94-1)	Sufficient	3	Medium
1,2-Dichloroethane (107-06-2)	Sufficient	4	Low
1,1-Dichloroethylene (75-35-4)	Limited	3	Low
Dimethylnitrosamine (62-75-9)	Sufficient	1	High
Hexachlorobenzene (118-74-1)	Sufficient	2	Medium
Hexachlorobutadiene (87-68-3)	Limited	4	Low
Hexachloroethane (67-72-1)	Limited	4	Low

(continued)

TABLE A-1 (Continued)

Agent	Carcinogenicity Classification	Potency Grouping	Hazard Ranking
<u>Substance</u> <u>(CAS Registry No.)</u>			
1,1,2,2-Tetrachloroethane (79-34-5)	Limited	3	Low
Tetrachloroethene (127-18-4)	Limited	4	Low
1,1,2-Trichloroethane (79-00-5)	Limited	4	Low
Trichloroethylene (79-01-6)	Limited	4	Low
Vinyl chloride (75-01-4)*	Sufficient	4	Low

\* Although the evidence for carcinogenicity and mutagenicity of vinyl chloride is well-established and accepted, it was categorized as a low hazard because it produces weak responses on a per-gram basis. It is a gas transported in large pressurized vessels, and we would estimate that any off-factory-site releases into the environment would involve relatively large quantities.

APPENDIX B

SECONDARY CRITERIA

BIODEGRADATION, HYDROLYSIS, AND PHOTOLYSIS (BHP)

DATA FOR UPWARD RQ ADJUSTMENTS

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Biodegradable	Hydrolyzable	Physiotoxic	Data / Comments
1	Acetaldehyde	X			BOD <sub>5</sub> - 93% theoretical (activated sludge).
2	Acetic acid	X			BOD <sub>5</sub> - 76% (sewage seed).
3	Acetic anhydride	X	X		Hydrolyzes to acetic acid. Acetic acid BOD <sub>5</sub> - 76% (Sewage seed).
4	Acetone	X			BOD <sub>5</sub> - 46-55% BOD <sub>15</sub> - 78%
5	Acetone cyanohydrin				CN <sup>-</sup> is released upon standing. Hydrolyzes to HCN and acetone under alkaline conditions, to carboxylic acid under acid conditions.
6	Acetonitrile				BOD <sub>5</sub> - 0% BOD <sub>5</sub> - 17% (activated sludge). CN <sup>-</sup> released.
7	Acetyl chloride		X		Hydrolyzes to HCl, acetic acid. Acetic acid biodegrades.
8	1-Acetyl-2-thiourea				NO FATE AND EFFECTS DATA AVAILABLE
9	Acrolein				BOD <sub>10</sub> - 33%. Inhibits bacteria at high levels. Subject to photochemical attack, overtime.
10	Aldicarb				NO FATE AND EFFECTS DATA AVAILABLE
11	Allyl alcohol	X			BOD <sub>5</sub> - 9.1% (sewage seed). BOD <sub>20</sub> - 81.8% (sewage seed).

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Biodegradation	Hydrolysis	Photolysis	Data / Comments
12	Allyl chloride		X		BOD <sub>5</sub> - 14% Hydrolyzes to HCl and allyl alcohol. Some photodegradation.
13	Aluminum phosphide				Phosphine (PH <sub>3</sub> ) is a hazardous degradation product.
14	5-(Aminomethyl)-3-isoxazolol				NO FATE AND EFFECTS DATA AVAILABLE
15	4-Aminopyridine				NO FATE AND EFFECTS DATA AVAILABLE
16	Ammonia				Biochemical oxidation begins after 4-5 days. Degrades to NO <sub>3</sub> .
17	Ammonium bifluoride				Fluoride is precipitated by calcium.
18	Ammonium fluoride				Fluoride is precipitated by calcium.
19	Ammonium hydroxide				Neutralizes with dilution and oxidizes after 4-5 days.
20	Ammonium picrate				Explosive
21	Ammonium silicofluoride				Ammonia degrades after 4-5 days.
22	Ammonium sulfide				Sulfide precipitates. Ammonium degrades after 4-5 days.
23	Ammonium vanadate				Biodegradation not pertinent.
24	Amyl acetate	X			BOD <sub>5</sub> - 64% (sewage seed). BOD <sub>10</sub> - 76% (sewage seed).

Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Bio-degradation	Hydrolysis	Physiotoxicity	Data / Comments
25	Aniline	X			BOD <sub>5</sub> - 62% (sewage seed).
26	Antimony pentachloride				Decomposes to Sb <sub>2</sub> O <sub>5</sub> and HCl. Antimony bioaccumulates. Hazardous fumes and vapors generated.
27	Antimony potassium tartrate				Antimony bioaccumulates.
28	Antimony tribromide				Decomposes to Sb <sub>2</sub> O <sub>3</sub> and HBr. Antimony bioaccumulates.
29	Antimony trichloride				Antimony bioaccumulates. Hydrolyzes to HCl. Vigorous reaction. Hazardous fumes generated.
30	Antimony trifluoride				Antimony bioaccumulates. Limited hydrolysis to SbOF and HF.
31	Barium cyanide				Barium bioaccumulates.
32	Benzenesulfonyl chloride				NO FATE AND EFFECTS DATA AVAILABLE
33	Benzenethiol				NO FATE AND EFFECTS DATA AVAILABLE
34	Benzonitrile	X			BOD <sub>4</sub> - 60% (river water). BOD <sub>12</sub> - 80% (sewage seed).
35	p-Benzoquinone				NO FATE AND EFFECTS DATA AVAILABLE
36	Benzotrichloride				NO FATE AND EFFECTS DATA AVAILABLE

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Bio- degr ad- diti- on	Hy- dro- lysis	Phys- i- os	Data / Comments
37	Benzoyl chloride		X		BOD <sub>5</sub> - 71% for benzoic acid by-product. Decomposes violently in water.
38	Bis(2-chloroethoxy)methane				Slow hydrolysis estimated (data confidence low).
39	Bromoacetone				Poisonous gas.
40	Bromoform				May bioaccumulate
41	4-Bromophenyl phenyl ether				INSUFFICIENT DATA AVAILABLE
42	Brucine				Moderately persistent. Bioaccumulates
43	1-Butanol	X			BOD <sub>5</sub> - 68% (sewage seed). BOD <sub>5</sub> - 96% (activated sludge). BOD <sub>20</sub> - 92% (sewage seed).
44	2-Butanone peroxide				NO FATE AND EFFECTS DATA AVAILABLE
45	Butyl acetate	X			BOD <sub>5</sub> - 24-58% (sewage seed). BOD <sub>20</sub> - 57-83% (sewage seed).
46	Butylamine	X			BOD <sub>5</sub> - 26% (sewage seed). BOD <sub>10</sub> - 48% BOD <sub>15</sub> - 50%
47	n-Butyl phthalate				No BOD data available. Bioaccumulates

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

B-6

Line Item	Hazardous Substance	Biodegradation	Hydrolysis	Physiotoxicity	Data / Comments
48	Calcium carbide				Dangerously reactive. Acetylene gas is given off upon reaction with water.
49	Calcium cyanide				Decomposes to $\text{Ca(OH)}_2$ and HCN.
50	Calcium dodecylbenzene sulfonate				$\text{BOD}_5$ - 43% (activated sludge, based on sodium salt).
51	Calcium hypochlorite				Highly inhibitory to microbes. Non biodegradable.
52	Captan		X		Readily hydrolyzes - 2 week residual life.
53	Carbaryl				NO FATE AND EFFECTS DATA AVAILABLE
54	Carbofuran				Persistent
55	Carbon disulfide				Relatively persistent. INSUFFICIENT DATA AVAILABLE
56	Carbon oxyfluoride				NO FATE AND EFFECTS DATA AVAILABLE
57	Chlorine				Hydrolyzes to $\text{OCl}^-$ and $\text{Cl}^-$ . Poisonous gas.
58	Chloroacetaldehyde				NO FATE AND EFFECTS DATA AVAILABLE
59	p-Chloroaniline				INSUFFICIENT FATE AND EFFECTS DATA AVAILABLE
60	Chlorobenzene				$\text{BOD}_5$ - 0.03 lb/lb (1% theoretical) with sewage seed.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Bioaccumulation	Hydrolysis	Photolysis	Data / Comments
61	Chloroethane				Volatilization is primary transport process. Hydrolysis half-life is 40 days. Photolysis insignificant.
62	2-Chloroethyl vinyl ether				Volatilization is primary transport process.
63	2-Chlorophenol				INSUFFICIENT FATE AND EFFECTS DATA AVAILABLE
64	1-(o-Chlorophenyl) thiourea				NO FATE AND EFFECTS DATA AVAILABLE
65	3-Chloropropionitrile				NO FATE AND EFFECTS DATA AVAILABLE
66	Chlorosulfonic acid				Hydrolyzes to HCl and H <sub>2</sub> SO <sub>4</sub> .
67	Chlorpyrifos				Hydrolyzes in alkaline media/stable in acidic.
68	Cobaltous bromide				Cobalt can be bioconcentrated.
69	Cobaltous formate				Cobalt can be bioconcentrated.
70	Cobaltous sulfamate				Cobalt can be bioconcentrated.
71	Coumaphos				Moderately persistent. Hydrolyzes slowly under alkaline conditions.
72	Cresol	X			BOD <sub>5</sub> - 38% (acclimated activated sludge). BOD <sub>5</sub> - 65-68%
73	Crotonaldehyde				BOD <sub>5</sub> - 37% BOD <sub>5</sub> - 27% (quiescent)

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Bio- degr n	ad- diti on	Hy- dro- lysis	Phys- i- olo- gic	Data / Comments
74	Cumene	X				BOD <sub>5</sub> - 40% (sewage seed). BOD <sub>20</sub> - 70% (sewage seed).
75	Cupric acetate					Copper can be concentrated.
76	Cupric chloride					Copper can be concentrated.
77	Cupric nitrate					Copper can be concentrated.
78	Cupric oxalate					Copper can be concentrated.
79	Cupric sulfate					Copper can be concentrated.
80	Cupric sulfate ammoniated					Copper can be concentrated.
81	Cupric tartrate					Copper can be concentrated.
82	Cyanides					Cyanides are inhibitory to microbes.
83	Cyanogen					Poisonous gas/heavier than air.
84	Cyanogen bromide					CN <sup>-</sup> released
85	Cyanogen chloride					Slow hydrolysis to HCN. Poisonous gas
86	Cyclohexane					Volatile. Stable in water.

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

B-9

Line Item	Hazardous Substance	Biodegradation	Hydrolysis	Physiotoxicity	Data / Comments
87	2,4-D Acid				Degrades rapidly. Reversably concentrated by a factor of 180. Potential teratogen.
88	2,4-D Esters				Degrades rapidly, but may concentrate in an organism by a factor of 180.
89	Diazinon		X		Hydrolyzes relatively fast. Products biodegradable.
90	Dicamba				Persistent
91	Dichlobenil				Persistent
92	Dichlone				Persistent
93	Dichlorobenzene				INSUFFICIENT DATA Chlorinated by-products are persistent. Slow biodegradation at best.
94	1,2-Dichlorobenzene				INSUFFICIENT DATA Slow biodegradation at best. May bioaccumulate.
95	1,3-Dichlorobenzene				INSUFFICIENT DATA Slow biodegradation at best. May bioaccumulate.
96	1,4-Dichlorobenzene				INSUFFICIENT DATA Slow biodegradation at best. May bioaccumulate.

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a t i o n	H y d r o l y s i s	P h y s i c a l	Data / Comments
97	1,4-Dichloro-2-butene				NO FATE AND EFFECTS DATA AVAILABLE
98	1,1-Dichloroethane				Volatilization is primary pathway. Biodegradation is not important process.
99	1,2-trans-Dichloroethylene				Volatilization is primary transport process.
100	2,4-Dichlorophenol				BOD <sub>5</sub> - 100% (acclimated, activated sludge). Potential teratogen.
101	2,6-Dichlorophenol				NO DATA
102	Dichlorophenyl arsine				NO FATE AND EFFECTS DATA AVAILABLE
103	Dichloropropane				Resists degradation. May bioaccumulate.
104	1,2-Dichloropropane				Resists degradation. May bioaccumulate.
105	Dichloropropane - Dichloropropene mixture				May bioaccumulate.
106	Dichloropropene				May bioaccumulate.
107	1,3-Dichloropropene				May bioaccumulate.
108	Dichlorvos				Persistent to 62 days.
109	Diethylamine				Degrades at a moderate rate. BOD <sub>5</sub> estimated to be 10% theoretical.

B-10

Appendix B - Fate and Effects Data for Upward RQ Adjustments

B-11

Line Item	Hazardous Substance	Bio-degradation	Hydrolysis	Photolysis	Data / Comments
110	Diethylarsine				Spontaneously flammable.
111	Diethyl phthalate				NO FATE AND EFFECTS DATA AVAILABLE
112	Diethyl-p-nitrophenyl phosphate				NO FATE AND EFFECTS DATA AVAILABLE
113	o,o-Diethyl-o-pyrazinyl phosphorothioate				NO FATE AND EFFECTS DATA AVAILABLE
114	Diisopropyl fluorophosphate				NO FATE AND EFFECTS DATA AVAILABLE
115	Dimethoate				NO FATE AND EFFECTS DATA AVAILABLE
116	Dimethylamine				Degrades slowly. No BOD data available.
117	alpha, alpha-Dimethylbenzyl hydroperoxide				NO FATE AND EFFECTS DATA AVAILABLE
118	2,4-Dimethylphenol				INSUFFICIENT FATE AND EFFECTS DATA AVAILABLE
119	Dinitrobenzene				Explosive. Toxic decomposition products. Vapors readily absorbed through the skin.
120	4,6-Dinitro-o-cyclohexyl phenol				NO FATE AND EFFECTS DATA AVAILABLE
121	Dinitrophenol				BOD - 0.94-7.7%
122	2,4-Dinitrophenol				Slow photolysis (low confidence in data).
123	Dinitrotoluene				Insufficient data to determine fate with confidence.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a t i o n	H y d r o l y s i s	P h y s i o l o g i c a l	Data / Comments
124	2,4-Dinitrotoluene				Insufficient data to determine fate with confidence.
125	2,6-Dinitrotoluene				Insufficient data to determine fate with confidence.
126	Dinoseb				NO FATE AND EFFECTS DATA AVAILABLE
127	Dipropylamine	X			Degradation by Aerobacter: 200 mg/l at 30°C. Parent: 100% degradation in 26 hr. Mutant: 100% degradation in 12 hr.
128	Diquat				Persisted 7-27 days at 2.5 ppm.
129	Disulfoton				Persists 4 weeks in soil. Possible hydrolysis under alkaline conditions.
130	2,4-Dithiobiuret				NO FATE AND EFFECTS DATA AVAILABLE
131	Diuron				Relatively persistent.
132	Dodecylbenzene sulfonic acid				BOD <sub>5</sub> - 43% (activated sludge, based on sodium salt).
133	Endosulfan				Moderately persistent.
134	alpha-Endosulfan				Moderately persistent.
135	beta-Endosulfan				Moderately persistent.
136	Endosulfan sulfate				Moderately persistent.
137	Endothall				NO FATE AND EFFECTS DATA AVAILABLE

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Appendix B - Fate and Effects Data for Upward RQ Adjustments

B-13

Line Item	Hazardous Substance	B i o d e g r a d e	H y d r o l y s i s	P h y s i c a l	Data / Comments
138	Endrin				Hydrolyzes slowly - bioconcentrated by a factor of 1,000 - 10,000 times in oysters and fish.
139	Epinephrine				NO FATE AND EFFECTS DATA AVAILABLE
140	Ethion				Moderate persistence in soil. Hydrolyzes readily in water.
141	Ethyl acetate	X	X		BOD <sub>5</sub> - 36-62% (sewage seed). BOD <sub>20</sub> - 69% (sewage seed). Hydrolyzes slowly to acetic acid and ethanol, both of which biodegrade.
142	Ethyl acrylate	X	X		BOD <sub>5</sub> - 2.8% (sewage seed). BOD <sub>20</sub> - 53% Hydrolyzes slowly to acrylic acid and ethanol.
143	Ethyl benzene				BOD <sub>5</sub> - 28% (activated sewage seed). Volatilization is primary pathway.
144	Ethylenediamine	X			BOD <sub>5</sub> - 24-80%
145	Ethylene oxide				Volatile NO FATE AND EFFECTS DATA AVAILABLE
146	Ethyl ether				Most will volatilize.
147	Ethyl methacrylate				NO FATE AND EFFECTS DATA AVAILABLE
148	Famphur				NO FATE AND EFFECTS DATA AVAILABLE

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a b l e	H y d r o l y s i s	P h y s i c a l	Data / Comments
149	Ferric ammonium citrate				INSUFFICIENT DATA AVAILABLE
150	Ferric ammonium oxalate				INSUFFICIENT DATA AVAILABLE
151	Ferric chloride				Nonbiodegradable
152	Ferric fluoride				Nonbiodegradable
153	Ferric nitrate				Nonbiodegradable
154	Ferric sulfate				Nonbiodegradable
155	Ferrous ammonium sulfate				Nonbiodegradable
156	Ferrous chloride				Nonbiodegradable
157	Ferrous sulfate				Nonbiodegradable
158	Fluoracetic acid, sodium salt				NO FATE AND EFFECTS DATA AVAILABLE
159	Fluorine				Nonbiodegradable
160	Fluoroacetamide				NO FATE AND EFFECTS DATA AVAILABLE
161	Formaldehyde	X			BOD <sub>5</sub> - 47-99% (activated sludge).
162	Furan				NO FATE AND EFFECTS DATA AVAILABLE
163	Furfural				BOD <sub>5</sub> - 32% (sewage seed).

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Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d e r	a d d i t i o n a l h y d r o l y s i s	p h y s i c a l h y d r o l y s i s	Data / Comments
164	Guthion				Accumulates in liver. Hydrolyzes
165	Hexachlorocyclopentadiene		X	X	Hydrolysis half-life 14 days. Forms HCl. Photo-oxidation may occur.
166	Hexachlorohexahydro-endo, endo di-methanonaphthalene				May bioaccumulate.
167	Hexachloropropene				NO FATE AND EFFECTS DATA AVAILABLE
168	Hexaethyl tetraphosphate				Hydrolyzes readily/hazardous degradation products.
169	Hydrochloric acid				Biodegradation not pertinent.
170	Hydrocyanic acid				Poisonous gas or liquid. Highly inhibitory to microbes.
171	Hydrofluoric acid				Fluoride may be precipitated by calcium ions. Biodegradation not pertinent.
172	Hydrosulfuric acid				Biodegradation not pertinent.
173	Isobutyl alcohol	X			BOD <sub>5</sub> - 64%
174	Isoprene				Degrades in time. Unstable/easily oxidized.
175	Isopropanolamine dodecylbenzene sulfonate				BOD approximately 43% based on data for sodium salt.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Bioaccumulation	Hydrolysis	Photolysis	Data / Comments
176	Lead fluoride				Lead is a bioaccumulative metal.
177	Lead sulfide				Lead is a bioaccumulative metal.
178	Malathion		X		Hydrolyzes rapidly.
179	Malononitrile				NO FATE AND EFFECTS DATA AVAILABLE
180	Mercaptodimethur				NO FATE AND EFFECTS DATA AVAILABLE
181	Mercuric cyanide				Mercury bioaccumulates. HCN is generated.
182	Mercuric nitrate				Mercury bioaccumulates.
183	Mercuric sulfate				Mercury bioaccumulates.
184	Mercuric thiocyanate				Mercury bioaccumulates.
185	Mercurous nitrate				Mercury bioaccumulates.
186	Mercury				Mercury bioaccumulates.
187	Mercury fulminate				Mercury bioaccumulates. Explosive/must be kept wet.
188	Methacrylonitrile				NO FATE AND EFFECTS DATA AVAILABLE
189	Methanol	X			BOD <sub>5</sub> - 48-53% BOD <sub>5</sub> - 76% (sewage seed). BOD <sub>50</sub> - 98%

Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	B i o d e g r	a d a m a g e	H y d r o	P h o s p h o r u s	Data / Comments
190	Methomyl					NO FATE AND EFFECTS DATA AVAILABLE
191	Methoxychlor					Somewhat persistent.
192	1-Methylbutadiene					NO FATE AND EFFECTS DATA AVAILABLE
193	Methyl chlorocarbonate					Decomposes in water to chlorous acid.
194	Methyl bromide					Poisonous gas, clings to ground.
195	Methyl chloride					Poisonous gas, clings to ground.
196	Methylene bromide					NO FATE AND EFFECTS DATA AVAILABLE
197	Methyl ethyl ketone	X				BOD <sub>5</sub> - 76% (sewage seed).
198	Methyl hydrazine					Hazardous degradation products.
199	Methyl isobutyl ketone	X				BOD <sub>5</sub> - 4.4% BOD <sub>5</sub> - 56% (sewage seed). BOD <sub>20</sub> - 57% BOD <sub>50</sub> - 65%
200	Methyl isocyanate					Reacts with water.
201	Methylmercaptan					Decomposes slowly in water through hydrolysis. Volatilizes.
202	Methylmethacrylate	X				BOD <sub>10</sub> - 47% (sewage seed). BOD <sub>22</sub> - 66% (acclimated seed).

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Biodegradation	Hydrolysis	Physiotoxicity	Data / Comments
203	Mevinphos		X		Not persistent. Hydrolyzes rapidly.
204	Mexacarbate				Bioaccumulative
205	Monoethylamine				BOD <sub>5</sub> - 17%
206	Monomethylamine				BOD <sub>5</sub> - estimated 20%
207	Naled				Hydrolyzes rapidly to dimethylphosphoric acid, hydrobromic acid, and dichlorobromoacetic acid.
208	Naphthalene				BOD - 0 with sewage seed. BOD <sub>6</sub> - 59% (activated sludge). Products are salicylic acid, catechol, b-Ketoadipic acid, 1,2-Naphthoquinon.
209	Naphthenic acid				Considered persistent.
210	alpha-Naphthylthiourea				NO FATE AND EFFECTS DATA AVAILABLE
211	Nicotine and salts				NO FATE AND EFFECTS DATA AVAILABLE
212	Nitric acid				Biodegradation not pertinent.
213	Nitric oxide				Forms nitrous acid in water.
214	Nitrobenzene				BOD <sub>5</sub> 0 with sewage seed.
215	Nitrogen dioxide				Forms HNO <sub>3</sub> .

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Bio-degradation	Hydrolysis	Photolysis	Data / Comments
216	Nitroglycerine				Explosive
217	Nitrophenol				Persists/resists degradation.
218	2-Nitrophenol				Persists/resists degradation.
219	4-Nitrophenol				Persists/resists degradation.
220	2-Nitropropane				NO FATE AND EFFECTS DATA AVAILABLE
221	N-Nitrosodiphenylamine				NO FATE AND EFFECTS DATA AVAILABLE
222	Nitrotoluene				NO FATE AND EFFECTS DATA AVAILABLE
223	Octamethylpyrophosphoramidate				NO FATE AND EFFECTS DATA AVAILABLE
224	Osmium oxide				NO FATE AND EFFECTS DATA AVAILABLE
225	Paraformaldehyde				BOD <sub>5</sub> - 20%
226	Paraldehyde				NO FATE AND EFFECTS DATA AVAILABLE
227	Parathion				>1 year in water.
228	Pentachlorobenzene				NO FATE AND EFFECTS DATA AVAILABLE
229	Pentachloroethane				Volatilizes. NO FATE AND EFFECTS DATA AVAILABLE
230	Pentachlorophenol				Persistent/bioaccumulates.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a t i o n	H y d r o l y s i s	P h y s i c a l	Data / Comments
231	Phenol	X			BOD <sub>5</sub> - 70% (fresh water). BOD <sub>5</sub> - 90% (sewage seed).
232	N-Phenylthiourea				NO FATE AND EFFECTS DATA AVAILABLE
233	Phosgene				Poisonous gas/severe toxic effects. Degradation not pertinent.
234	Phosphine				Poisonous gas/severe toxic effects. Degradation not pertinent.
235	Phosphorus				Hydrolyzes to H <sub>3</sub> PO <sub>4</sub> upon exposure to air and water. Dangerously reactive.
236	Phosphorus oxychloride				Decomposes rapidly to HCl and H <sub>3</sub> PO <sub>4</sub> .
237	Phosphorus pentasulfide				Decomposes rapidly to H <sub>2</sub> SO <sub>4</sub> and H <sub>3</sub> PO <sub>4</sub> .
238	Phosphorus trichloride				Decomposes rapidly to HCl and H <sub>3</sub> PO <sub>4</sub> .
239	Potassium cyanide				BOD <sub>7</sub> - 6% (activated sludge). HCN is generated.
240	Potassium hydroxide				Biodegradation not pertinent.
241	Propargite				NO FATE AND EFFECTS DATA AVAILABLE
242	Propargyl alcohol				BOD - 2% theoretical

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a b l e	H y d r o l y s i s	P h o t o l y s i s	Data / Comments
243	n-Propylamine	X			Degradation by Aerobacter: 200 mg/l at 30°C. Parent: 100% degradation in 32 hr. Mutant: 100% degradation in 9 hr.
244	Propylene oxide				NO FATE AND EFFECTS DATA AVAILABLE
245	Pyrethrins				Moderately persistent.
246	Pyridine	X			BOD - 52%
247	Quinoline	X			BOD <sub>5</sub> - 50% (sewage seed). Also subject to photodegradation. BOD - 69%
248	Resorcinol	X			BOD <sub>5</sub> - 61% (sewage seed).
249	Selenious acid				Biodegradation not pertinent. Selenium may bioaccumulate.
250	Selenium disulfide				Biodegradation not pertinent.
251	Selenium oxide				Forms selenic acid which persists. May be concentrated up to 400 times.
252	Silver nitrate				Nonbiodegradable. Highly inhibitory to microbes. Silver may bioaccumulate.
253	Sodium				Dangerously reactive. Decomposes to NaOH. Biodegradation not pertinent.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Biodegradation	Hydrolysis	Physiotoxicity	Data / Comments
254	Sodium azide				Unstable explosive
255	Sodium bifluoride				Fluoride is precipitated by calcium ions.
256	Sodium cyanide				HCN is generated. Highly inhibitory to microbes.
257	Sodium dodecylbenzene sulfonate				BOD <sub>5</sub> - 43% (activated sludge).
258	Sodium hydroxide				Biodegradation not pertinent.
259	Sodium hypochlorite				Biodegradation not pertinent. Highly inhibitory to microbes.
260	Sodium methyrate				Decomposes to NaOH which neutralizes with dilution and methanol which biodegrades.
261	Sodium nitrite				Forms nitrous acid which will oxidize to nitric acid.
262	Strontium sulfide				Biodegradation not pertinent.
263	Strychnine and salts				Moderately persistent.
264	Styrene				BOD <sub>5</sub> - 65% (freshwater). Dangerously reactive; requires inhibitor.
265	Sulfur monochloride				Decomposes to HCl, H <sub>2</sub> SO <sub>4</sub> , sodium sulfite, thiosulfite
266	Sulfuric acid				Biodegradation not pertinent.

Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Bioaccumulation	Hydrolysis	Photolysis	Data / Comments
267	2,4,5,-T acid				Loss is 44% in 4 days. This increases to 79% with low intensity sunlight and 92% with high intensity. Potential teratogen.
268	2,4,5,-T amines				May be teratogenic.
269	2,4,5,-T esters				More persistent than acid. May be teratogenic.
270	2,4,5,-T salts				May be teratogenic.
271	2,4,5-TP acid				May be teratogenic.
272	2,4,5-TP acid esters				May be teratogenic.
273	Tetraethyldithiopyrophosphate				NO FATE AND EFFECTS DATA AVAILABLE
274	Tetraethyl lead				Persistent and bioaccumulative.
275	Tetraethylpyrophosphate				Half-life 7 HRS in 50/50 mixture.
276	Tetrahydrofuran				NO FATE AND EFFECTS DATA AVAILABLE
277	Tetranitromethane				NO FATE AND EFFECTS DATA AVAILABLE
278	Thallium				Bioaccumulates. May be teratogenic.
279	Thallium sulfate				Thallium bioaccumulates. May be teratogenic.

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

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Line Item	Hazardous Substance	Bio-degradation	Hydrolysis	Photolysis	Data / Comments
280	Thiofanox				NO FATE AND EFFECTS DATA AVAILABLE
281	Thionsemicarbazide				NO FATE AND EFFECTS DATA AVAILABLE
282	Thiram				NO FATE AND EFFECTS DATA AVAILABLE
283	Toluene				Biodegrades with acclimation.
284	Toluene diisocyanate				NO FATE AND EFFECTS DATA AVAILABLE
285	Trichlorfon				Hydrolyzes rapidly. Products toxic.
286	1,2,4-Trichlorobenzene				Volatilizes. Bioaccumulates.
287	1,1,1-Trichloroethane				Volatilizes
288	Trichlorophenol				BOD <sub>0.94</sub> - 4.1% with pure bacteria culture.
289	2,4,5-Trichlorophenol				>72 days for decomposition in suspended soils.
290	Trichloromethanesulfonyl chloride				NO FATE AND EFFECTS DATA AVAILABLE
291	Triethanolamine dodecylbenzene sulfonate				BOD <sub>5</sub> - 43% based on sodium salt.
292	Triethylamine	X			Degradation by Aerobacter: 200 mg/l at 30°C. Parent: 100% in 28 hr. Mutant: 100% in 11 hr.
293	Trimethylamine				BOD <sub>5</sub> - estimated 30%

Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	B i o d e g r a d a b l e	H y d r o l y s i s	P h o s p h o r u s	Data / Comments
294	sym - Trinitrobenzene				Explosive
295	Vanadium pentoxide				Nonbiodegradable
296	Vanadyl sulfate				Nonbiodegradable
297	Vinyl acetate	X			BOD <sub>5</sub> - 35% (fresh water). BOD <sub>5</sub> - 34% (sewage seed). BOD <sub>20</sub> - 32% (sewage seed). BOD <sub>5</sub> - 62% (acclimated seed). BOD <sub>20</sub> - 72% (acclimated seed).
298	Warfarin				NO FATE AND EFFECTS DATA AVAILABLE
299	Xylene				BOD <sub>5</sub> - 0
300	Xylenol				BOD <sub>5</sub> - 31%
301	Zinc acetate				Zinc accumulates in organisms.
302	Zinc borate				Zinc accumulates in organisms.
303	Zinc carbonate				Zinc accumulates in organisms.
304	Zinc cyanide				Zinc accumulates in organisms.
305	Zinc fluoride				Zinc accumulates in organisms.
306	Zinc formate				Zinc accumulates in organisms.
307	Zinc hydrosulfite				Zinc accumulates in organisms.

# Appendix B - Fate and Effects Data for Upward RQ Adjustments

Line Item	Hazardous Substance	Bioindicator	Hydrophobicity	Physiology	Data / Comments
308	Zinc phosphide				Phosphine is a hazardous degradation product. Zinc accumulates in organisms.
309	Zinc sulfate				Zinc accumulates in organisms.
310	Zirconium potassium fluoride				Highly inhibitory to microbes.