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Superfund Chemical Data Matrix

Appendix B Tables

SUPERFUND CHEMICAL DATA MATRIX

APPENDIX B TABLES

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TABLE OF CONTENTS

SECTION Page

1. INTRODUCTION 1
   1.1 DEFINITIONS 1

2. SUPERFUND CHEMICAL DATA MATRIX DATA SOURCES 1
   2.1 HAZARDOUS SUBSTANCE IDENTITIES 2
   2.2 DATA COMPILATION METHODOLOGY 3
      2.2.1 Toxicity Information 3
         2.2.1.1 LD_{50}—Oral, Dermal 3
         2.2.1.2 LC_{50}—Inhalation 4
         2.2.1.3 Reference Dose (RfD)—Oral, Inhalation 4
      2.2.2 Carcinogenicity Information 5
         2.2.2.1 Cancer Potency Factor and Weight-of-Evidence—Oral, Inhalation 5
         2.2.2.2 ED_{10} and Weight-of-Evidence—Oral, Inhalation 6
      2.2.3 Mobility Information 6
         2.2.3.1 Vapor Pressure 6
         2.2.3.2 Henry's Law Constant 7
         2.2.3.3 Water Solubility—Non-metallic Compounds 8
         2.2.3.4 Water Solubility—Metals and Metalloids 8
         2.2.3.5 Distribution Coefficient (K_d) 9
      2.2.4 Persistence Information 9
         2.2.4.1 Hydrolysis, Biodegradation, and Photolysis Half-Lives 9
         2.2.4.2 Radioactive Half-Life 9
      2.2.5 Bioaccumulation Potential Information 10
         2.2.5.1 Bioconcentration Factor—Freshwater, Salt Water 10
         2.2.5.2 Partition Coefficient (Log K_{ow}) 11
      2.2.6 Ecotoxicity Parameters 11
         2.2.6.1 Acute and Chronic Freshwater Criteria 11
         2.2.6.2 Acute and Chronic Salt Water Criteria 11
         2.2.6.3 LC_{50}—Freshwater, Salt Water 11
      2.2.7 Benchmarks 12
         2.2.7.1 National Ambient Air Quality Standards (NAAQS) 12
         2.2.7.2 National Emissions Standards for Hazardous Air Pollutants (NESHAPS) 12
         2.2.7.3 Maximum Contaminant Levels (MCLs) 12
         2.2.7.4 Maximum Contaminant Level Goals (MCLGs) 12
         2.2.7.5 FDA Action Level 13
         2.2.7.6 Uranium Mill Tailings Radiation Control Act (UMTRCA) Standards 13
         2.2.7.7 Ecological-Based Benchmarks 13
   2.3 CALCULATIONS IN SUPERFUND CHEMICAL DATA MATRIX 13
      2.3.1 Volatilization Half-Life 13
         2.3.1.1 Volatilization Half-Life for Rivers, Oceans, Coastal Tidal Waters, and the Great Lakes 14
         2.3.1.2 Volatilization Half-Life for Lakes 15
      2.3.2 Distribution Coefficient (K_d) 15
      2.3.3 Benchmarks 15

2.3.3.1 Screening Concentrations for the Ground Water Pathway and the Surface Water Pathway Drinking Water Threat 16
2.3.3.2 Screening Concentrations for the Surface Water Pathway Human Food Chain Threat 18
2.3.3.3 Screening Concentrations for the Soil Exposure Pathway 19
2.3.3.4 Screening Concentrations for the Air Pathway 21

3. CHEMICAL DATA, FACTOR VALUES, AND BENCHMARKS FOR HAZARDOUS SUBSTANCES 22

LIST OF REFERENCES 23

APPENDIX B-1 TABLES FOR NON-RADIOACTIVE HAZARDOUS SUBSTANCES B-1

APPENDIX B-2 TABLES FOR RADIONUCLIDES B-73

APPENDIX C SYNONYMS C-1

1. INTRODUCTION

The Superfund Chemical Data Matrix (SCDM) Appendix B Tables are a source for factor values and benchmark values applied when evaluating potential National Priority List (NPL) sites using the Hazard Ranking System (HRS). The HRS assigns factor values for toxicity, gas migration potential, gas and ground water mobility, surface water persistence, and bioaccumulation potential based on the physical, chemical, and radiological properties of hazardous substances (defined for HRS purposes as CERCLA hazardous substances plus CERCLA pollutants and contaminants) present at a site for a particular migration pathway. The HRS also assigns extra weight to targets with exposure levels to hazardous substances that are at or above benchmarks. These benchmarks include both screening concentrations and concentrations specified in regulatory limits for the hazardous substances present at a site for a particular migration pathway.

SCDM contains HRS factor values and benchmark values for hazardous substances that are frequently found at sites evaluated using the HRS, as well as the physical, chemical, and radiological data used to calculate those values. The raw data in SCDM are either taken directly from sources or are calculated from a source. The HRS rules are then applied to the raw data to arrive at a factor value or benchmark.

Section 2 of this document explains how data are selected and calculated for inclusion in SCDM. Section 3 describes how SCDM data, HRS factor values, and benchmarks are presented. The factor values and benchmarks are listed, substance by substance, in Appendix A (not included). Appendix B-1 contains an HRS factor value and benchmark tables (organized by pathway) for nonradioactive hazardous substances, Appendix B-2 contains similar tables for radionuclides, and Appendix C contains a cross reference index of substance name synonyms.

1.1 DEFINITIONS

In addition to the definitions found in Section 1.1 of the Hazard Ranking System (55 *Federal Register* 51585 - 51587, 14 December 1990), the following definitions are used in this document:

- Cancer Risk Screening Concentrations: Substance-specific intake concentrations that are based on estimates of a daily exposure level of a substance. They are used in the HRS as benchmarks in evaluating target populations actually exposed to carcinogenic substances (see also the definition of "Screening Concentrations" in Section 1.1 of the HRS).

- Reference Dose Screening Intake Benchmarks: Substance-specific intake concentrations that are based on estimates of a daily exposure level of a substance. They are used in the HRS as benchmarks in evaluating target population actually exposed to noncarcinogenic substances (see also the definitions of "Reference Dose" and "Screening Concentrations" in Section 1.1 of the HRS).

2. SUPERFUND CHEMICAL DATA MATRIX DATA SOURCES

This Section describes how the data available in research studies and regulatory guidance documents are chosen for inclusion in SCDM. Section 2.1 describes how to resolve ambiguities in determining which particular values are included for particular hazardous substances. Section 2.2 specifies the references used as sources for SCDM data. The choices described below are based on the type and quality of data in the references listed in Section 2.2; they are not intended to apply to all data in general. As different compilations of data become available, different criteria may be considered. Finally, SCDM requires some

types of data for which extensive compilations are unavailable. Section 2.3 describes how these values were calculated from other types of data that were available.

2.1 HAZARDOUS SUBSTANCE IDENTITIES

Compiling SCDM requires determining which data reasonably apply to a hazardous substance. Data in the references cited in Section 2.2 are sometimes available for classes and mixtures of hazardous substances but not for the individual substances in that class or mixture. This Section describes how ambiguities in assigning particular values to members of classes or mixtures of hazardous substances in SCDM have been resolved.

SCDM contains generic values for the following classes of compounds (for chromium, these generic values are used only when specific oxidation state is not adequately known):

- Chromium (III and VI oxidation states)
- Arsenic (III and V oxidation states)
- PCBs (various congeners and Aroclors)
- Endosulfans (I and II)

If any member of these classes can be documented as present at a hazardous substance site, it is assumed that the most toxic, most persistent, or most bioaccumulating member of the class is present (unless the oxidation state of chromium is adequately known). Therefore, from among the data given in the specified references for members of these classes, SCDM contains those data resulting in the greatest HRS factor values (*e.g.*, lowest LD_{50}, longest half-life, greatest bioconcentration factor). In the case of endosulfans I and II (which can be distinguished analytically), no data for either isomer by itself are available in the designated sources; all available data were thus obtained using the mixture of endosulfan isomers.

For the following classes of compounds, SCDM contains values for individual substances:

- Dichlorobenzenes
- Dichloroethylenes
- Dinitrotoluenes
- Hexachlorocyclohexanes
- Nitrophenols
- Xylenes

If no data can be found in the specified references for a specific substance in the class but data are available for the generic class, SCDM assigns the generic value to that substance. These classes are all relatively small sets of isomers, which are likely to occur as mixtures in many cases. Furthermore, these classes are well defined in the sense that the generic class, *e.g.*, xylenes, almost always refers to a mixture of all members of the class (*o*-, *m*-, and *p*-xylene in the example). The expected similarity in chemical behavior for members of each class, as well as the likelihood that they will occur as mixtures, makes use of data from mixtures reasonable.

In contrast, if data are not available in the specified references for a substance in the following classes, generic properties are <u>not</u> ascribed in SCDM to the specific substances:

- chlorinated naphthalenes
- chlorobenzenes

The reason for the different treatment of these two classes compared to the classes previously cited is that they are larger than the other classes. In addition, they are less well defined in the sense that the generic class, *e.g.*, chlorinated naphthalenes, does not always refer to a similar mixture (chlorinated naphthalenes may be predominantly mono- and dichloronaphthalenes in some cases and tetra- and

pentachloronaphthalenes in other cases). As a result, it is likely that some members of these classes will occur without the members of the class that give rise to the particular value; for example, it seems unreasonable to assign a value for chlorinated naphthalenes to 2-chloronaphthalene if tri- or tetrachloronaphthalene isomers dominate the measurement of that value, whereas tri- and tetrachloronaphthalenes are not necessarily present when 2-chloronaphthalene is found.

SCDM also defines another class of compounds containing the following polychlorinated dibenzodioxins and polychlorinated dibenzofurans:

- 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin
- 1,2,3,7,8-Pentachlorinated dibenzo-*p*-dioxin
- 1,2,3,4,7,8-Hexachlorinated dibenzo-*p*-dioxin
- 1,2,3,7,8,9-Hexachlorinated dibenzo-*p*-dioxin
- 1,2,3,6,7,8-Hexachlorinated dibenzo-*p*-dioxin
- 1,2,3,4,6,7,8-Heptachlorinated dibenzo-*p*-dioxin
- 2,3,7,8-Tetrachlorodibenzofuran
- 1,2,3,7,8-Pentachlorinated dibenzofuran
- 2,3,4,7,8-Pentachlorinated dibenzofuran
- 1,2,3,4,7,8-Hexachlorinated dibenzofuran
- 1,2,3,7,8,9-Hexachlorinated dibenzofuran
- 1,2,3,6,7,8-Hexachlorinated dibenzofuran
- 2,3,4,6,7,8-Hexachlorinated dibenzofuran
- 1,2,3,4,6,7,8-Heptachlorinated dibenzofuran
- 1,2,3,4,6,7,9-Heptachlorinated dibenzofuran

SCDM contains for individual members of this class. SCDM estimates the cancer slope factor for all members of this class except 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). The cancer slope for TCDD is multiplied by the *toxicity equivalence factor* (TEF) for each substance to give the estimated slope factor for that substance. TEF values are obtained from Table 3 of USEPA (1989a), on page 12. All members of this class are assigned the weight-of-evidence for TCDD.

For all data except toxicity, if nothing can be found in the specified references for an individual chemical and data are available for the generic class or for TCDD, SCDM assigns the generic or TCDD value to the substance (*not multiplied by the TEF*). This is a relatively small class of congeners, which is often likely to occur in mixtures. Furthermore, the expected similarity in chemical behavior for a set of tetra- through heptachlorinated polynuclear heteraromatic substances (all of which have one or more elements of molecular symmetry present), as well as their likelihood to occur in mixtures, makes use of data from mixtures or TCDD reasonable.

2.2 DATA COMPILATION METHODOLOGY

2.2.1 Toxicity Information

2.2.1.1 LD_{50}—Oral, Dermal

SCDM uses data from the following references for oral and dermal LD_{50}:

- C-E Environmental, Inc., 1990, *The Identification of Health Effects Data for Chemicals Contained in the Clean Air Act Amendments: Final Report to Dr. John Vanderburg*, U. S. Environmental Protection Agency, Research Triangle Park, NC.

- American Conference of Governmental Industrial Hygienists (ACGIH), 1986, *Documentation of the Threshold Limit Value and Biological Exposure Indices, 5th ed.*, ACGIH, Cincinnati, OH.

- National Institute for Occupational Safety and Health (NIOSH), 1993, *Registry of Toxic Effects of Chemical Substances (RTECS)*, NIOSH Publication #83-107, NIOSH, Cincinnati, OH.

SCDM prefers C-E Environmental data over the other two sources, and prefers ACGIH over NIOSH data.

SCDM contains the lowest value for any mammalian species by the specified route of exposure (*i.e.*, oral or dermal) in controlled dose studies in laboratory animals. Human lethality data (*i.e.*, from suicide and worker poisonings) are not used due to the associated inaccuracy of the dosage estimates. Data from former East Block countries (*e.g.*, USSR) are not used due to the typically poor data quality. Only data for exposure durations less than 24 hours are used. If an LD_{50} value is not given, SCDM uses an LD_{LO} value under three conditions: (1) if it is for the same exposure route, (2) has an exposure less than 24 hours, and (3) is reasonable relative to the other values (*e.g.*, relative to chronic values) given for that substance and exposure route.

2.2.1.2 LC_{50}—Inhalation

SCDM uses data from the following references for inhalation LC_{50}:

- American Conference of Governmental Industrial Hygienists (ACGIH), 1986, *Documentation of the Threshold Limit Value and Biological Exposure Indices, 5th ed.*, ACGIH, Cincinnati, OH.

- National Institute for Occupational Safety and Health (NIOSH), 1993, *Registry of Toxic Effects of Chemical Substances (RTECS)*, NIOSH Publication #83-107, NIOSH, Cincinnati, OH.

SCDM prefers ACGIH data over NIOSH data.

SCDM contains the lowest value for any mammalian species by inhalation in controlled dose studies in laboratory animals. Human lethality data (*i.e.*, from suicide and worker poisonings) are not used due to the associated inaccuracy of the dosage estimations. Data from former East Block countries (*e.g.*, USSR) are not used due to the typically poor data quality. Only data for exposure durations less than 24 hours are used. If an LC_{50} value is not given, SCDM uses an LC_{LO} value under three conditions: (1) if it is for the same exposure route, (2) has an exposure less than 24 hours, and (3) is reasonable relative to the other values (*e.g.*, relative to chronic values) given for that substance and exposure route.

2.2.1.3 Reference Dose (RfD)—Oral, Inhalation

SCDM uses data from the following references for oral and inhalation RfD:

- U. S. Environmental Protection Agency, 1993, Integrated Risk Information System (IRIS) database (updated monthly).

- U. S. Environmental Protection Agency, 1993, *Health Effects Assessment Summary Tables (HEAST), FY 1993 Annual Update*, Office of Solid Waste and Emergency Response (OHEA ECAO-821).

SCDM prefers IRIS data over HEAST data. Inhalation data in IRIS are given as RfCs—the reference concentrations equivalent to dose—rather than RfDs. Reference concentrations are converted to doses by the following equation:

$$RfD_{inhal} = \frac{RfC \times IR \times AR}{BW \times 100} \qquad [1]$$

where:

RfC= Reference Concentration in Air (mg/m^3)
IR = Inhalation Rate (m^3/day)
BW = Body Weight (kg)
AR = Absorption Rate (in percent)

Using an inhalation rate of 20 m^3/day and an average adult body weight of 70 kg in equation [1] provides the following expression:

$$RfD_{inhal} = \frac{RfC \times AR}{350} \qquad [2]$$

Equation [2] is used to convert reference concentrations to reference doses for use in SCDM. If USEPA does not provide an absorption rate, it is assumed to be 100 percent; this is consistent with the conversion described in HEAST.

2.2.2 Carcinogenicity Information

2.2.2.1 Cancer Potency Factor and Weight-of-Evidence—Oral, Inhalation

SCDM uses data from the following references for oral and inhalation cancer potency factors and the associated weights-of-evidence:

- U. S. Environmental Protection Agency, 1993, Integrated Risk Information System (IRIS) database (updated monthly).

- U. S. Environmental Protection Agency, 1993, *Health Effects Assessment Summary Tables (HEAST), FY 1993 Annual Update*, Office of Solid Waste and Emergency Response (OHEA-ECAO-CINN-821).

SCDM prefers IRIS values for nonradioactive hazardous substances over HEAST values. For radioactive hazardous substances, SCDM contains values from HEAST. The data in IRIS for inhalation are given as unit cancer risks, which are related to cancer potency factors by the following equation (used for nonradionuclides only):

$$UCR = \frac{IR \times AR \times CPF_{inhal}}{BW \times CF \times 100} \qquad [3]$$

where:

UCR= Unit Cancer Risk ($m^3/\mu g$)
IR = Inhalation Rate (m^3/day)
CPF = Cancer Potency Factor (kg-day/mg)

BW = Body Weight (kg)
AR = Absorption Rate (in percent)
CF = Conversion Factor (1,000 μg/mg)

Using an inhalation rate of 20 m^3/day and an average adult body weight of 70 kg, solving equation [3] for CPF provides the following expression:

$$CPF_{inhal}\ (\text{kg-day/mg}) = \frac{UCR \times 350{,}000}{AR} \qquad [4]$$

Equation [4] is used to convert unit cancer risk values to cancer potency factors for use in SCDM. If IRIS does not provide an absorption rate, it is assumed to be 100 percent; this is consistent with the conversion described in HEAST.

SCDM uses the weight-of-evidence from the same reference that provides the corresponding slope factor. Typically, IRIS reports a single weight-of-evidence; this value is recorded separately as both the oral weight-of-evidence and inhalation weight-of-evidence. In HEAST, there are usually two values listed, one for oral and one for inhalation. Usually these values are identical; SCDM records each value separately.

2.2.2.2 ED_{10} and Weight-of-Evidence—Oral, Inhalation

SCDM uses data from the following reference for oral and inhalation ED_{10}:

- U. S. Environmental Protection Agency, 1988, *Methodology for Evaluating Potential Carcinogenicity in Support of Reportable Quantity Adjustments Pursuant to CERCLA Section 102*, Office of Health and Environmental Assessment (EPA/600/8-89/053).

In USEPA (1988), a single potency factor ($1/ED_{10}$) is reported. The reciprocal of this value is recorded separately as both the oral ED_{10} and inhalation ED_{10}. Typically, these values are identical; SCDM records each value separately. SCDM uses the weight-of-evidence from the same reference that provides the corresponding ED_{10} value. The potency factor for chromium is taken from the Reportable Quantity Adjustments document (EPA/600/8-91/093).

2.2.3 Mobility Information

2.2.3.1 Vapor Pressure

SCDM uses data from the following references for vapor pressure:

- U. S. Environmental Protection Agency, 1989b, *Risk Assessment Guidance for Superfund [RAGS] Appendices, Superfund Public Health Evaluation Manual*, Exhibit A-1: Physical, Chemical and Fate Data, Office of Emergency and Remedial Response (ECAO-CIN-745).

- Syracuse Research Corporation (SRC), 1993, CHEMFATE database.

- GSC Corporation, 1990, CHEMEST database, developed for USEPA Office of Pesticides and Toxic Substances.

SCDM prefers RAGS data over CHEMFATE and CHEMEST. Within CHEMFATE, the recommended value is preferred. If a recommended value is not available, SCDM uses a value measured at 25°C. If values are not available for measurements at 25°C, values determined within the range of 20-30°C are used. If there is more than one value measured at the same temperature and none is recommended, SCDM uses the highest value. If no conditions (*e.g.*, temperature) were specified in CHEMFATE for all vapor pressure measurements for a substance, SCDM uses the highest value. For organic substances, if CHEMFATE contains only a reference citation without a value, CHEMEST is used to estimate values. For non-metallic substances, if no vapor pressure is available a normal boiling point was obtained from Weast (1981). The following substances had no vapor pressure values available and normal boiling points less than 25°C:

- chlorine cyanide
- cyanogen
- fluorine
- hydrogen sulfide
- nitrogen dioxide
- phosphine
- radon-222

These substances were assigned a default vapor pressure of 760 torr (*i.e.*, they are assumed for HRS purposes to be gases at 25°C).

If no vapor pressure is available for a substance and the normal boiling point is greater than or equal to 25°C, SCDM assumes for HRS purposes that the substance is a particulate, rather than a gaseous substance, although no default vapor pressure value is assigned in SCDM. This assumption is made because for non-gaseous substances (under standard conditions), the absence of vapor pressure value is very often because the value is extremely low and can not be measured.

2.2.3.2 Henry's Law Constant

SCDM uses data from the following references for Henry's Law constant:

- U. S. Environmental Protection Agency, 1989b, *Risk Assessment Guidance for Superfund [RAGS] Appendices, Superfund Public Health Evaluation Manual*, Exhibit A-1: Physical, Chemical and Fate Data, Office of Emergency and Remedial Response (ECAO-CIN-745).

- Syracuse Research Corporation, 1993, CHEMFATE database.

- GSC Corporation, 1990, CHEMEST database, developed for USEPA, Office of Pesticides and Toxic Substances.

SCDM prefers RAGS data over CHEMFATE and CHEMEST. Within CHEMFATE, a recommended value is preferred. If a recommended value is not available, SCDM uses a value measured at 25°C. If values are not available for measurements at 25°C, values determined within the range of 20-30°C are used. If there is more than one value measured at the same temperature and none is recommended, SCDM uses the highest value. If no conditions (*e.g.*, temperature) were specified in CHEMFATE for all Henry's law constant measurements for a substance, SCDM uses the highest value. For organic substances, if CHEMFATE contains only a reference citation without a value, CHEMEST is used to estimate values. CHEMEST is also used to calculate a numerical value for organic substances if the other references report a value as miscible or infinitely soluble.

2.2.3.3 Water Solubility—Non-metallic Compounds

SCDM uses data from the following references for water solubility for non-metallic compounds:

- U. S. Environmental Protection Agency, 1989b, *Risk Assessment Guidance for Superfund [RAGS] Appendices, Superfund Public Health Evaluation Manual*, Exhibit A-1: Physical, Chemical and Fate Data, Office of Emergency and Remedial Response (ECAO-CIN-745).

- Syracuse Research Corporation, 1990, CHEMFATE database.

- GSC Corporation, 1990, CHEMEST database, developed for USEPA, Office of Pesticides and Toxic Substances.

SCDM prefers RAGS data over CHEMFATE and CHEMEST. Within CHEMFATE, the a recommended value is preferred. If a recommended value is not available, SCDM uses a value measured at 25°C. If values are not available for measurements at 25°C, values determined within the range of 20-30°C are used. If there is more than one value measured at the same temperature and none is recommended, SCDM uses the highest value. If no conditions were specified in CHEMFATE for any measurement for a substance, SCDM uses the highest value. For organic substances, if CHEMFATE contains only a reference citation without a value, CHEMEST is used to estimate values. CHEMEST is also used to calculate a numerical value for organic substances if the other references report a value as miscible or infinitely soluble.

2.2.3.4 Water Solubility—Metals and Metalloids

SCDM uses data from the following references for water solubility of metals and metalloid compounds:

- Weast, R.C., 1981, *Handbook of Chemistry and Physics, 62nd ed.*, Cleveland, OH: CRC Press, pp. B-73 - B-166.

- Dean, J. A., Ed., 1985, *Lange's Handbook of Chemistry, 13th ed.*, New York: McGraw-Hill, pp. 5-7 - 5-12.

SCDM contains geometric mean water solubility values which are defined in the HRS as the geometric mean of the highest and the lowest water solubility values available for any compound containing the metal or metalloid. Highest and lowest compound solubility values were taken directly from Weast (1981), except for the following low solubility compounds:

- Copper (II) sulfide
- Lead (II) sulfide
- Mercury (II) sulfide
- Nickel (II) sulfide
- Silver (I) sulfide
- Thallium (III) hydroxide
- Thorium (IV) hydroxide
- Uranyl hydroxide
- Zinc (II) sulfide

Solubility values for these compounds were calculated using the standard expression for the solubility product (K_{sp}) for each compound and the K_{sp} value taken from Dean (1985).

2.2.3.5 Distribution Coefficient (K_d)

SCDM uses data from the following reference for distribution coefficient:

- CH_2M Hill, 1990, *Revised K_d and Water Solubility Values to Support Ground Water Mobility Scoring*, memorandum no. WDC61607.A0.01 from P. Chapman to A Ortiz, USEPA, et al.

For organic hazardous substances, SCDM contains the geometric mean K_d value presented in the reference (geometric mean of the K_d high [$0.77 \bullet K_{oc}$] and K_d low [$0.03 \bullet K_{oc}$]). For some organic substances for which CH_2M Hill (1990) provides no K_d value and which have a partition coefficient value chosen as described in Section 2.2.5.2, a K_d value is calculated as specified in Section 2.3.2. For any hazardous substance that is a metal or metalloid, the HRS requires assigning the distribution coefficient for the metal or metalloid. For an inorganic hazardous substance, CH_2M Hill (1990) reports a single K_d value taken from Baes *et al.* (1984).

2.2.4 Persistence Information

2.2.4.1 Hydrolysis, Biodegradation, and Photolysis Half-Lives

SCDM uses data from the following references for hydrolysis, biodegradation, and photolysis half-lives:

- Syracuse Research Corporation (SRC), 1989, *Chemical Fate Rate Constants for SARA Section 313 Chemicals and Superfund Public Health Evaluation Manual (SPHEM) Chemicals*, prepared under contract no. 68-02-4254 for USEPA Office of Toxic Substances and USEPA Environmental Criteria and Assessment Office.

- Syracuse Research Corporation, 1993, CHEMFATE database.

- National Institute for Occupational Safety and Health (NIOSH), 1983, *Registry of Toxic Effects of Chemical Substances (RTECS)*, NIOSH Publication #83-107, NIOSH, Cincinnati, OH.

SCDM contains values from the SRC (1989) in preference to CHEMFATE, which is used in preference to data from NIOSH (1983). SCDM contains values measured at 25°C; if no values for measurements at 25°C are available, values determined within the range of 20-30°C are used. In SRC (1989) high and low values are given for hydrolysis, biodegradation and photolysis. The high value is used for these three parameters. SCDM also includes values from NIOSH (1983) where no conditions are specified or where "scientific judgment" is given as the only rationale for inclusion. Measurements performed in non-aqueous solvents from any reference and data qualified by CHEMFATE as "insufficient" are omitted.

2.2.4.2 Radioactive Half-Life

SCDM uses data from the following reference for radioactive half-life:

- International Commission on Radiological Protection (ICRP), *Radionuclide Transformations: Energy and Intensity of Emissions*, Publication No. 38.

2.2.5 Bioaccumulation Potential Information

2.2.5.1 Bioconcentration Factor—Freshwater, Salt Water

SCDM uses data from the following references for freshwater and salt water bioconcentration factors (BCF):

- Versar, Inc., 1989a, *Issue Paper: Bioaccumulation Potential Based on Ambient Water Quality Criteria Documents*, prepared for USEPA under contract no. 68-W8-0098.

- U. S. Environmental Protection Agency, 1992, Aquatic Information Retrieval (AQUIRE) Database, Environmental Research Laboratory, Duluth, MN.

SCDM contains the highest measured value from the Versar (1989a) document in preference to an estimated value from the same document. If no value is reported in Versar (1989a), the highest value from AQUIRE is used. All values where no environment is given but which list NaCl as a control are considered as fresh water values.

SCDM uses the highest value from the following aquatic organisms to establish Human Food Chain threat BCF values (this list includes only aquatic human food chain organisms in the cited references and is not meant to be a complete list of aquatic human food chain organisms):

- american or virginia oyster
- asiatic clam
- atlantic salmon
- atlantic silverside
- black mussel
- black bullhead
- black crappie
- blue crab
- bluegill
- brook trout
- brown trout
- channel catfish
- clam
- common bay mussel
- common mirror colored carp
- common shrimp
- crayfish
- dungeness or edible crab
- giant gourami
- gulf toadfish
- kiyi
- lake trout (siscowet)
- lake whitefish
- mangrove snapper
- manila littleneck clam
- mussel
- northern pike
- northern anchovy
- pilchard sardine
- pinfish
- pink salmon
- rainbow trout
- red swamp crayfish
- rock bass
- sauger
- shore crab
- spot
- striped bass
- striped mullet
- swan mussel
- tong sole
- topmouth gudgeon (golden shiner)
- white mullet
- white sand mussel
- winter flounder

Non-human food chain aquatic organisms are not used for the food chain BCF. The highest value from <u>any</u> aquatic organism mentioned in each reference is used to establish Environmental threat BCF values, using the same order of preference.

2.2.5.2 Partition Coefficient (Log K_{ow})

SCDM uses data from the following references for Log K_{ow} (also referred to as Log P) values:

- Versar, Inc., 1989b, *Impact of Variability in Log P Values on HRS Bioaccumulation Potential Scores Based on Peer-Reviewed Literature*, prepared for USEPA under contract no. 68-W8-0098.
- Syracuse Research Corporation, 1993, CHEMFATE database.
- GSC Corporation, 1990, CHEMEST database, developed for USEPA, Office of Pesticides and Toxic Substances.

SCDM prefers Versar values over CHEMFATE values. Within CHEMFATE, the recommended value is preferred. An estimated value is used if it is recommended and is greater than the measured value; otherwise, the measured value is used. If a recommended value is not available, SCDM uses the highest measured value. If there is more than one value measured at the same temperature and none is recommended, SCDM uses the highest value. If no conditions (*e.g.*, temperature) were specified in CHEMFATE for all Log K_{ow} measurements for a substance, SCDM uses the highest value. For organic substances, if Versar and CHEMFATE do not contain a value, CHEMEST is used to estimate values.

2.2.6 Ecotoxicity Parameters

2.2.6.1 Acute and Chronic Freshwater Criteria

SCDM uses data from the following reference for acute and chronic freshwater criteria:

- U. S. Environmental Protection Agency, 1986b, *Quality Criteria for Water—1986*, Office of Water (EPA 440/5-86-001).

SCDM uses only values that are specifically stated as criteria. At this time, no Ambient Aquatic Life Advisory Concentrations (AALACs) have been specified.

2.2.6.2 Acute and Chronic Salt Water Criteria

SCDM uses data from the following reference for acute and chronic salt water criteria:

- U. S. Environmental Protection Agency, 1986b, *Quality Criteria for Water—1986*, Office of Water (EPA 440/5-86-001).

SCDM uses only values that are specifically stated as criteria. At this time, no AALACs have been specified.

2.2.6.3 LC_{50}—Freshwater, Salt Water

SCDM uses data from the following reference for freshwater and salt water LC_{50} values:

- U. S. Environmental Protection Agency, 1993, Aquatic Information Retrieval (AQUIRE) database, Environmental Research Laboratory, Duluth, MN.

SCDM uses the lowest, acute LC_{50} value found for any aquatic organism in the specified environment with an acute exposure duration of greater than one day and less than or equal to four days. All LC_{50} values where no environment is given but which use NaCl as a control are considered as fresh water LC_{50} values. When no durations and environments are given, LC_{50} values are omitted from SCDM.

2.2.7 Benchmarks

The HRS assigns extra weight to targets with exposure levels to hazardous substances that are at or above benchmarks values. This section describes the sources for certain regulatory limits that the HRS uses as health-based or ecological-based benchmarks.

2.2.7.1 National Ambient Air Quality Standards (NAAQS)

SCDM uses data from the following reference for NAAQS:

- 40 CFR Part 50, 1978, National Ambient Air Quality Standards.

2.2.7.2 National Emissions Standards for Hazardous Air Pollutants (NESHAPS)

SCDM uses the following reference for NESHAPS:

- 40 CFR Part 61, 1985, National Emissions Standards for Hazardous Air Pollutants.

SCDM uses only values that are reported in ambient concentration units ($\mu g/m^3$).

2.2.7.3 Maximum Contaminant Levels (MCLs)

SCDM uses the following reference for MCLs:

- 40 CFR Part 141, 1993, National Primary Drinking Water Standards.

SCDM uses only MCLs that are reported in units of concentration (mg/L or µg/L). SCDM does not contain the MCLs for total trihalomethanes (0.10 mg/L of bromoform, bromodichloromethane, chloroform, plus dibromochloromethane), radium isotopes (5 pC_i/L of ^{226}Ra plus ^{228}Ra), gross alpha-particle activity (15 pC_i/L including ^{226}Ra but excluding uranium and radon), and beta-particle plus photon radioactivity (4 mrem/year). The action levels for lead and copper (56 FR 26560) are included.

2.2.7.4 Maximum Contaminant Level Goals (MCLGs)

SCDM uses the following reference for MCLGs:

- 40 CFR Part 141, 1993, National Primary Drinking Water Standards.

SCDM uses only non-zero MCLGs that are reported in units of concentration (mg/L or µg/L). For substances where multiple values are listed due to lack of consensus on appropriate carcinogen class, SCDM contains the lowest number. For substances where MCLs and MCLGs are reported but different, SCDM selects the MCLG as the lower of the two values (55 FR 51593).

2.2.7.5 FDA Action Level

SCDM uses the following reference for Food and Drug Administration Action Levels:

- U. S. Food and Drug Administration, 1987, *Action Levels for Poisonous or Deleterious Substances in Human and Animal Feed*, Center for Food Safety and Applied Nutrition.

SCDM contains FDA Action Levels for fish and shellfish only.

2.2.7.6 Uranium Mill Tailings Radiation Control Act (UMTRCA) Standards

SCDM uses the following reference for UMTRCA standards:

- 40 *CFR* 192 (1990), Uranium Mill Tailings Radiation Control Act Standards.

2.2.7.7 Ecological-Based Benchmarks

The Ambient Water Quality Criteria and the Ambient Aquatic Life Advisory Concentrations discussed in section 2.2.6 are also used to assign the ecological-based benchmarks.

2.3 CALCULATIONS IN SUPERFUND CHEMICAL DATA MATRIX

2.3.1 Volatilization Half-Life

SCDM estimates volatilization half-life in surface water for organic substances using CHEMEST method 1 (Thomas, 1982). In this method, the volatilization half-life ($\tau_{1/2}$) can be expressed as follows, where Z equals the mean water body depth in centimeters (cm) and K_L equals the overall liquid-phase mass transfer coefficient:

$$\tau_{1/2} = \frac{Z \cdot \ln 2}{K_L hr} \qquad [5]$$

The following expression gives the overall liquid-phase mass transfer coefficient, where H equals Henry's constant in atm•m^3/mol, R equals the universal gas constant (8.2 x 10^{-5} atm•m^3/mol•K), T equals the temperature in K, k_g equals the gas-phase exchange coefficient, and k_l equals the liquid-phase exchange coefficient:

$$K_L = \frac{(H/RT)k_g k_l}{(H/RT)k_g + k_l} \text{ cm/hr} \qquad [6]$$

The gas-phase exchange coefficient expression is dependent on the molecular weight (MW) of the compound. If MW is less than 65 g/mol, the following equation is used:

$$K_g = 3{,}000 \cdot (18/MW)^{1/2} \text{ cm/hr} \qquad [7]$$

If MW is greater than or equal to 65 g/mol, the following equation is used, where V_{wind} equals the wind velocity in m/sec and V_{curr} equals the current velocity in m/sec:

$$K_g = 1137.5 \cdot (V_{wind} + V_{curr}) \cdot (18/MW)^{1/2} \quad cm/hr \qquad [8]$$

The liquid-phase exchange coefficient expression is also dependent on the molecular weight of the compound. If MW is less than 65 g/mol, the following equation is used:

$$K_l = 20 \cdot (44/MW)^{1/2} \quad cm/hr \qquad [9]$$

If MW is greater than or equal to 65 g/mol, the expression also depends on the wind and current velocities; the following equation is used when V_{wind} is less than or equal to 1.9 m/sec and MW is greater than or equal to 65 g/mol:

$$K_l = 23.51 \cdot (V_{curr}^{0.969}/Z^{0.673}) \cdot (32/MW)^{1/2} \quad cm/hr \qquad [10]$$

The following equation is used when V_{wind} is greater than 1.9 m/sec and less than or equal to 5 m/sec, and MW is greater than or equal to 65 g/mol:

$$K_l = 23.51 \cdot (V_{curr}^{0.969}/Z^{0.673}) \cdot (32/MW)^{1/2}\, e^{0.526(V_{wind}-1.9)} \quad cm/hr \qquad [11]$$

No liquid-phase exchange coefficient equation is provided in Thomas (1982) for wind velocities greater than 5 m/sec.

Combining equations [5], [6], [7], and [9] into a single equation for estimating volatilization half-life ($\tau_{1/2}$) for compounds with MW less than 65 g/mol gives the following equation:

$$\tau_{1/2} = Z \cdot \ln 2 \cdot [\{(1/20) \cdot (MW/44)^{1/2}\} + \{(RT/H \cdot 3000) \cdot (MW/18)^{1/2}\}] \quad hr \qquad [12]$$

The following equation, combining equations [5], [6], [8], and [10], can be used to estimate the volatilization half-life ($\tau_{1/2}$) for compounds with MW greater than or equal to 65 g/mol if the wind velocity is less than or equal to 1.9 m/sec:

$$\tau_{1/2} = Z \cdot \ln 2 \cdot [\{(Z^{0.673}/23.51 \cdot V_{curr}^{0.969}) \cdot (MW/32)^{1/2}\} + \{(RT/H \cdot 1137.5) \cdot [V_{wind} + V_{curr}]) \cdot (MW/18)^{1/2}\}] \quad hr \qquad [13]$$

The following equation, combining equations [5], [6], [8], and [11], can be used to estimate the volatilization half-life ($\tau_{1/2}$) for compounds with MW greater than or equal to 65 g/mol if the wind velocity is greater than 1.9 m/sec and less than or equal to 5 m/sec:

$$\tau_{1/2} = Z \cdot \ln 2 \cdot [\{(Z^{0.673}/23.51 \cdot V_{curr}^{0.969}) \cdot (MW/32)^{1/2}\} e^{0.526(1.9-V_{wind})} + \{(RT/H \cdot 1137.5) \cdot [V_{wind} + V_{curr}]) \cdot (MW/18)^{1/2}\}] \quad hr \qquad [14]$$

2.3.1.1 Volatilization Half-Life for Rivers, Oceans, Coastal Tidal Waters, and the Great Lakes

In order to calculate the volatilization half-life for rivers, oceans, coastal tidal waters, and the Great Lakes, the mean water body depth is taken as 100 cm, the temperature as 298 K, the wind velocity as 5 m/sec, and the current velocity as 1 m/sec. Using these values, equations [12] and [14] reduce to the following:

- MW less than 65 g/mol

$$\tau_{1/2} = 2.89 \cdot [0.05 \cdot (MW/44)^{1/2}\} + \{(8.1 \times 10^{-6}/H) \cdot (MW/18)^{1/2}\}] \text{ days} \quad [15]$$

- MW greater than or equal to 65 g/mol

$$\tau_{1/2} = 2.89 \cdot [0.185 \cdot (MW/32)^{1/2}\} + \{(3.6 \times 10^{-6}/H) \cdot (MW/18)^{1/2}\}] \text{ days} \quad [16]$$

where H is Henry's Law constant in atm•m^3/mol (chosen as described in Section 2.2.3.2) and MW is the molecular weight of the hazardous substance in g/mol.

2.3.1.2 Volatilization Half-Life for Lakes

In order to calculate the volatilization half-life for lakes, the mean water body depth is taken as 100 cm, the temperature as 298 K, the wind velocity as 0.5 m/sec, and the current velocity as 0.05 m/sec. Using these values, equations [12] and [13] reduce to the following:

- MW less than 65 g/mol

$$\tau_{1/2} = 2.89 \cdot [0.05 \cdot (MW/44)^{1/2}\} + \{(8.1 \times 10^{-6}/H) \cdot (MW/18)^{1/2}\}] \text{ days} \quad [17]$$

- MW greater than or equal to 65 g/mol

$$\tau_{1/2} = 2.89 \cdot [17.2 \cdot (MW/32)^{1/2}\} + \{(3.9 \times 10^{-6}/H) \cdot (MW/18)^{1/2}\}] \text{ days} \quad [18]$$

where H is Henry's Law constant in atm•m^3/mol (chosen as described in Section 2.2.3.2) and MW is the molecular weight of the hazardous substance in g/mol.

If H is less than 10^{-7} atm•m^3/mol, the substance is less volatile than water and its concentration will increase as the water evaporates. The substance should be considered essentially nonvolatile (Thomas, 1982, p. 15-15); no volatilization half-life is estimated.

2.3.2 Distribution Coefficient (K_d)

For hazardous substances that are organic, the HRS assigns a mobility value based on the geometric mean of the upper and lower K_d range values where $K_d = K_{oc} \times f_s$, using f_s values of 0.03 and 0.77 to establish the upper and lower K_d values. The reference specified for K_d (CH_2M Hill, 1990) specifies that if no K_{oc} values are available, K_{oc} is taken as $0.63 \times K_{ow}$. Combining these relationships gives the following equation:

$$K_d = 0.09575 \times 10^{\text{Log } K_{ow}} \quad [19]$$

For any hazardous substance that is organic for which no K_d value is available in CH_2M Hill (1990) but with a Log K_{ow} value chosen as described in Section 2.2.5.2, SCDM calculates K_d using the equation [19].

2.3.3 Benchmarks

The HRS assigns extra weight to targets with exposure levels to hazardous substances that are at or above benchmarks values. In addition to the regulatory limits discussed in Section 2.2.7, the HRS uses

a number of benchmarks called screening concentrations. Screening concentrations correspond to a 10^{-6} individual cancer risk or an exposure level corresponding to an RfD under specified exposure assumptions. These assumptions, discussed below, are conservative, as well as broadly and easily applicable to sites nationwide. The Agency recognizes that modeling of human activity patterns would provide a more realistic determination of exposure or risk. While such information may be determined on a site-specific basis with considerable effort, it is difficult to develop assumptions on the activity patterns of target populations that could be applied to sites on a nationwide basis in order to develop exposure scenarios for the HRS. For this reason, the HRS exposure assumptions reflect values used for the assessment of risk throughout different programs within the Agency. EPA recognizes that a critical evaluation of the references cited below, along with other information, could lead to differing exposure assumptions. Moreover, this evaluation would indicate that the Agency is still refining the assumptions used in this area of risk assessment.

EPA also considered the limited number of samples available at the NPL listing stage when it selected these assumptions. As outlined in the Field Test of the proposed revised HRS, the Agency generally expects to have less than 100 samples for all pathways to support the HRS analysis. This limited sampling may miss areas of maximum contamination, or "hot spots," and thus the sample results may not represent the maximum level of contamination. Although the use of conservative exposure assumptions does not fully compensate for the limited data available for analysis, the use of less conservative assumptions would likely lead to a greater incidence of false negatives, *i.e.*, the Agency may not identify sites that should be investigated further under the remedial program.

For all the screening concentration benchmark calculations, it is assumed that an individual may be exposed for a period of 70 years. Recent assessments have recommended the adoption of an assumed exposure period of 30 years (USEPA, 1989c). Given the limitations discussed above, as well as the desire to maintain a simple procedure that is based on accepted methods, HRS screening concentrations assume 70 year lifetime exposures.

2.3.3.1 Screening Concentrations for the Ground Water Pathway and the Surface Water Pathway Drinking Water Threat

The following equation (USEPA, 1989c, p. 6-35) is used to calculate intake of a hazardous substance from ingestion of ground water or surface water used as drinking water:

$$\text{Intake (mg/kg/day)} = \frac{CW \times IR \times EF \times ED}{BW \times AT} \qquad [20]$$

where:

CW = Contaminant Concentration in Water (mg/L)
IR = Ingestion Rate (L/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (days)

Under the assumptions used for HRS purposes, the adult ingestion rate is 2 L/day, the exposure frequency for residents is daily (365 days/year), and the average adult body weight is 70 kg. The assumption of 2 L/day has been commonly employed by the Agency in most past assessments (c.f., USEPA, 1983). It is assumed that affected individuals will consume the water at this rate every day of the year. Refinements

in risk assessments sometimes assume that an individual will be away for vacations or that some water will be consumed at the workplace.

Cancer Risk Screening Concentration. The cancer risk screening concentration is obtained from the cancer potency factor, which is defined as follows:

$$\text{Probability of Cancer Response} = \text{Lifetime Average Intake} \cdot \text{Cancer Potency Factor} \quad [21]$$

A lifetime average intake requires setting the averaging time in equation [20] to 25,550 days (70 years). Combining equations [20] and [21] provides the concentration (SC_i) in water that corresponds to a 10^{-6} individual lifetime excess cancer risk for drinking water ingestion as follows:

$$SC_i = \frac{10^{-6} \text{ x BW x AT}}{\text{Oral Cancer Potency Factor x IR x EF x ED}}$$

Using the assumptions listed above with an averaging time of 25,550 days (for lifetime average intake) reduces equation [22] to the following:

$$SC_i \text{ (mg/L)} = \frac{35.0 \text{ x } 10^{-6}}{\text{Oral Cancer Potency Factor(kg-day/mg)}} \quad [23]$$

This equation is used to calculate SC_i for non-radioactive hazardous substances. Cancer potency factors for radionuclides are provided in pC_i^{-1}; body weight and averaging time do not apply. Thus, the following equation for radionuclides corresponds to equation [22] for non-radionuclides:

$$SC_i = \frac{10^{-6}}{\text{Oral Cancer Potency Factor x IR x EF x ED}} \quad [24]$$

Using the same exposure assumptions reduces equation [24] to the following equation for the concentration (SC_i) in water that corresponds to a 10^{-6} individual lifetime excess cancer risk for radionuclides for drinking water ingestion:

$$SC_i \text{ (pC}_i\text{/L)} = \frac{1.957 \times 10^{-11}}{\text{Oral Cancer Potency Factor (pC}_i^{-1}\text{)}} \quad [25]$$

Reference Dose Screening Intake Benchmark. A reference dose is an estimate of a daily exposure level of a substance to a human population below which adverse noncancer health effects are not anticipated. Setting the intake from ingestion of ground water or surface water used as drinking water equal to the oral reference dose (RfD_{oral}) and solving equation [20] for concentration gives the following equation:

$$CR_j = \frac{RfD_{oral} \times BW \times AT}{IR \times EF \times ED} \quad [26]$$

For non-carcinogenic effects, the averaging time is taken as equal to the period of exposure. Using the assumptions listed above reduces equation [26] to the following:

$$CR_j \text{ (mg/L)} = RfD_{oral} \text{ (mg/kg/day)} \times 35.0 \qquad [27]$$

2.3.3.2 Screening Concentrations for the Surface Water Pathway Human Food Chain Threat

The following equation (USEPA, 1989c, p. 6-45) is used to calculate intake from fish and shellfish ingestion:

$$\text{Intake (mg/kg/day)} = \frac{CF \times IR \times FI \times EF \times ED}{BW \times AT} \qquad [28]$$

where:

CF = Contaminant Concentration in Fish (mg/kg)
IR = Ingestion Rate (kg/day)
FI = Fraction Ingested from Contaminated Source (unitless)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (days)

The value for ingestion rate is 0.054 kg/day (USDA, 1982), the fraction ingested is taken as 1.0 (corresponding to fishing exclusively in contaminated waters), the value for exposure frequency is 365 days/year, and the average adult body weight is 70 kg.

Cancer Risk Screening Concentration. Combining equations [21] and [28] provides the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for fish and shellfish ingestion as follows:

$$SC_i = \frac{10^{-6} \times BW \times AT}{\text{Oral Cancer Potency Factor} \times IR \times FI \times EF \times ED} \qquad [29]$$

Using the assumptions listed above with an averaging time of 25,550 days for carcinogenic effects reduces this equation to the following:

$$SC_i \text{ (mg/kg)} = \frac{0.00130}{\text{Oral Cancer Potency Factor(kg-day/mg)}} \qquad [30]$$

Equation [30] is used to calculate SC_i for non-radioactive hazardous substances.

Using the above assumptions in equation [24] for the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for radionuclide ingestion provides the following expression for ingestion of radionuclides in fish and shellfish:

$$SC_i\ (pC_i/kg) = \frac{7.25 \times 10^{-10}}{\text{Oral Cancer Potency Factor } (pC_i^{-1})} \qquad [31]$$

Reference Dose Screening Intake Benchmark. Setting the intake from fish and shellfish ingestion equal to the oral reference dose (RfD_{oral}) and solving equation [28] for concentration gives the following equation:

$$CR_j = \frac{RfD_{oral} \times BW \times AT}{IR \times FI \times EF \times ED} \qquad [32]$$

For non-carcinogenic effects, the averaging time is taken as equal to the period of exposure. Using the assumptions listed above reduces equation [32] to the following:

$$CR_j\ (mg/kg) = RfD_{oral}\ (mg/kg/day) \times 1300 \qquad [33]$$

2.3.3.3 Screening Concentrations for the Soil Exposure Pathway

The following equation (USEPA, 1989c, p. 6-40) is used to calculate intake from soil ingestion:

$$\text{Intake (mg/kg/day)} = \frac{CW \times IR \times CF \times FI \times EF \times ED}{BW \times AT} \qquad [34]$$

where:

CS = Contaminant Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
CF = 10^{-6} kg/mg
FI = Fraction Ingested from Contaminated Source (unitless)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (days)

The value for ingestion rate is 200 mg/day for ages 6 years and younger and 100 mg/day for ages 7 years and older; this gives an average ingestion rate of soil over a lifetime of 120 mg/day. The fraction ingested is taken as 1.0 (corresponding to residing on contaminated soil), the exposure frequency is 365 days/year, and the body weight is 70 kg.

Cancer Risk Screening Concentration. Combining equations [21] and [34] provides the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for soil ingestion as follows:

$$SC_i = \frac{10^{-6} \times BW \times AT}{\text{Oral Cancer Potency Factor} \times IR \times CF \times FI \times EF \times ED} \qquad [35]$$

Using the assumptions listed above with an averaging time of 25,550 days for carcinogenic effects reduces this equation to the following:

$$SC_i \text{ (mg/L)} = \frac{0.583}{\text{Oral Cancer Potency Factor(kg-day/mg)}} \quad [36]$$

This equation is used to calculate SC_i for non-radioactive hazardous substances. Using the above assumptions in equation [24] for the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for radionuclide ingestion provides the following expression for ingestion of radionuclides in soil:

$$SC_i \text{ (pC}_i\text{/L)} = \frac{3.26 \times 10^{-7}}{\text{Oral Cancer Potency Factor (pC}_i^{-1}\text{)}} \quad [37]$$

Screening Concentration for External Radiation Exposures. The following equation (USEPA, 1991b, p. C-4) provides the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for external radiation exposures from gamma-emitting radionuclides:

$$SC_i = \frac{10^{-6}}{\text{External Exposure Cancer Potency Factor} \times \text{ED}} \quad [38]$$

where

SD =Effective surface density of soil (kg/m^2)
ED = Exposure Duration (years)

Using an effective surface density of soil of 143 kg/m^2 and an exposure duration of 70 years in equation [37] provides the following expression:

$$SC_i \text{ (pC}_i\text{/kg)} = \frac{1.0 \times 10^{-10}}{\text{Cancer Potency Factor (m}^2\text{/pC}_i \bullet \text{yr)}} \quad [39]$$

Reference Dose Screening Intake Benchmark. Setting the intake from soil ingestion equal to the oral reference dose (RfD_{oral}) and solving equation [34] for concentration gives the following equation:

$$CR_j = \frac{RfD_{oral} \times BW \times AT}{IR \times CF \times FI \times EF \times ED} \quad [40]$$

For non-carcinogenic effects, the averaging time is taken as equal to the period of exposure. Using the assumptions listed above reduces equation [40] to the following:

$$CR_j \text{ (mg/kg)} = RfD_{oral} \text{ (mg/kg/day)} \times 583{,}000 \quad [41]$$

2.3.3.4 Screening Concentrations for the Air Pathway

The following equation (USEPA, 1989c, p. 6-44) is used to calculate intake from inhalation of airborne hazardous substances:

$$\text{Intake (mg/kg/day)} = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT} \qquad [42]$$

where:

CA = Contaminant Concentration in Air (mg/m^3)
IR = Inhalation Rate (m^3/hour)
ET = Exposure Time (hours/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (days)

The value for inhalation rate is 0.833 m^3/hr (20 m^3/day), the exposure time is 24 hours/day, the exposure frequency is 365 days/year, and the average adult body weight is 70 kg. Available references (c.f., USEPA, 1989c) recognize that other values may be applied to obtain an estimate of daily inhalation rates, but are not used in SCDM.

Cancer Risk Screening Concentration. Combining equations [21] and [42] provides the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for inhalation as follows:

$$SC_i = \frac{10^{-6} \times BW \times AT}{\text{Inhalation Cancer Potency Factor} \times IR \times ET \times EF \times ED} \qquad [43]$$

Using the assumptions listed above with an averaging time of 25,550 days for carcinogenic effects reduces this equation to the following:

$$SC_i\ (mg/m^3) = \frac{3.50 \times 10^{-6}}{\text{Inhalation Cancer Potency Factor(kg-day/mg)}} \qquad [44]$$

This equation is used to calculate SC_i for non-radioactive hazardous substances. Using the above assumptions in equation [24] for the concentration (SC_i) that corresponds to a 10^{-6} individual lifetime excess cancer risk for radionuclide ingestion provides the following expression for inhalation of radionuclides:

$$SC_i\ (pC_i/m^3) = \frac{1.957 \times 10^{-12}}{\text{Oral Cancer Potency Factor } (pC_i^{-1})} \qquad [45]$$

Reference Dose Screening Intake Benchmark. Setting the inhalation intake equal to the inhalation reference dose (RfD_{inhal}) and solving equation [42] for concentration gives the following equation:

$$CR_j = \frac{RfD_{inhal} \times BW \times AT}{IR \times ET \times EF \times ED} \qquad [46]$$

For non-carcinogenic effects, the averaging time is taken as equal to the period of exposure. Using the assumptions listed above reduces equation [46] to the following:

$$CR_j \text{ (mg/m}^3\text{)} = RfD_{inhal} \text{ (mg/kg/day)} \times 3.50 \qquad [47]$$

3. CHEMICAL DATA, FACTOR VALUES, AND BENCHMARKS FOR HAZARDOUS SUBSTANCES

Appendix B-1 contains tables for non-radioactive hazardous substances. The first table in Appendix B-1 lists all of the factor values by pathway. The second table presents the benchmarks for the air and ground water pathways, the third table presents benchmarks for the surface water pathway, and the fourth table presents benchmarks for the soil exposure pathway. Appendix B-2 contains tables for radionuclides; the first table lists all of the factor values by pathway and the second table presents benchmarks for all pathways. Appendix C contains a cross reference index of hazardous substance names, synonyms and CAS numbers.

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Appendix B-1

Tables for Non-Radioactive Hazardous Substances

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Acenaphthene	000083-32-9	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	10000	100*	11	0.2000	Yes	Yes
Acenaphthylene	000208-96-8	...	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	11	0.0200	Yes	Yes
Acetaldehyde	000075-07-0	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	10	10	17	1.0000	Yes	No
Acetone	000067-64-1	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007*	0.0700	0.5	0.5	0.5	0.5	100	1	17	1.0000	Yes	No
Acetonitrile	000075-05-8	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.0700	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes	No
Acetophenone	000098-86-2	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000*	1.0000	5.0	5.0	5.0	5.0	1	1	11	1.0000	Yes	No
Acetyl-2-thiourea, 1-	000591-08-2	10	1.0E+00	...	...	...	1.0000*	1.0000*	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Acrolein	000107-02-8	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0700*	0.0700	500.0	500.0	500.0	500.0	10000	1000	17	1.0000	Yes	No
Acrylamide	000079-06-1	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000*	1.0000*	5.0	5.0	5.0	5.0	10	10	6	0.2000	Yes	Yes
Acrylic acid	000079-10-7	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	11	1.0000	Yes	No
Acrylonitrile	000107-13-1	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	50.0	50.0	50.0	50.0	100	10	17	1.0000	Yes	No
Adipic acid	000124-04-9	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	10	10	6	0.0200	Yes	Yes
Aldicarb	000116-06-3	1000*	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	10000	10000	6	0.0200	Yes	Yes
Aldrin	000309-00-2	10000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50.0	50.0	50000.0	50000.0	10000	10000	11	0.0200	Yes	Yes
Allyl alcohol	000107-18-6	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	0.5	0.5	0.5	0.5	1000	1000	11	1.0000	Yes	No
Aluminum	007429-90-5	...	1.0E+00	...	...	...	1.0000	1.0000	50.0	50.0	50.0*	50.0*	...*	...*	NA	NA	No	Yes
Aluminum phosphide	020859-73-8	10000	1.0E+00	...	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Ammonia	007664-41-7	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0700	0.5	0.5	0.5	0.5	10	10	17	1.0000	Yes	No
Ammonium picrate	000131-74-8	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes

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* Indicates difference between previous version of chemical data (MAR93) and current version of chemical data.

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Ammonium sulfamate	007773-06-0	10	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1	1	NA	NA	No	Yes
Aniline	000062-53-3	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000*	5.0	5.0	500.0	500.0	10000	10	11	1.0000	Yes	No
Anthracene	000120-12-7	10	1.0E+00	1.0E-04	2.0E-03	2.0E-07	0.4000	0.4000	5000.0	5000.0	5000.0	5000.0	10000	100*	6	0.0020	Yes	Yes
Antimony	007440-36-0	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Arsenic	007440-38-2	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	500.0	50.0	500.0	10	100	NA	NA	No	Yes
Asbestos	001332-21-4	10000	1.0E+00	1.0E-04	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Atrazine	001912-24-9	100	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.0007	0.0700	50.0	50.0	50.0	50.0	1000	10000	6	0.0020	Yes	Yes
Azinphos- ethyl	002642-71-9	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	500.0	500.0	500.0	500.0	10000	10000	NA	NA	No	Yes
Azinphos- methyl	000086-50-0	1000	1.0E+00	1.0E-02*	2.0E-01*	2.0E-03*	0.4000	0.0700	50.0*	50.0*	50.0*	50.0*	10000	10000	NA	NA	No	Yes
Aziridine	000151-56-4	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	11	1.0000	Yes	No
Barium	007440-39-3	10000*	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	1	1	NA	NA	No	Yes
Barium cyanide	000542-62-1	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Benz(a)anthracene	000056-55-3	1000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0002	Yes	Yes
Benzene	000071-43-2	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	5000.0	5000.0	500.0	50000.0	100*	100*	17	1.0000	Yes	No
Benzene carbonyl chloride	000098-88-4	1	1.0E+00	... *	...	...	0.4000	1.0000	0.5	0.5	0.5	0.5	10	1	11	1.0000	Yes	No
Benzidine	000092-87-5	10000	1.0E+00	1.0E-04	1.0E+00	1.0E-04	0.4000	0.0700	50.0	50.0	50.0	50.0	...	...	0	0.0002	Yes	Yes
Benzo(a)pyrene	000050-32-8	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	500.0	50000.0	500.0	10000	1000	6	0.0002	Yes	Yes
Benzo(g,h,i)perylene	000191-24-2	...	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	NA	NA	No	Yes
Benzo(j,k)fluorene	000206-44-0	100	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000	1000	6*	0.0002	Yes	Yes

* Indicates difference between previous version of chemical data (MAR93) and current version of chemical data.

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Benzo(k)fluoranthene	000207-08-9	...	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	6	0.0002	Yes	Yes
Benzofluoranthene, 3,4-	000205-99-2	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	6	0.0020	Yes	Yes
Benzoic acid	000065-85-0	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000*	0.0700*	5.0	5.0	5.0	5.0	1	1	11	0.2000	Yes	Yes
Benzonitrile	000100-47-0	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	10	10	11	1.0000*	Yes	No *
Benzothiazole, 1,2,-	000095-16-9	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	50.0	50.0	50.0	50.0	10	10	11	0.2000	Yes	Yes
Benzyl chloride	000100-44-7	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.0700	0.0700	50.0	50.0	50.0	50.0	100	100	11	1.0000	Yes	No
Beryllium	007440-41-7	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	...	...	NA	NA	No	Yes
Biphenyl, 1,1-	000092-52-4	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.4000	500.0	500.0	500.0	500.0	1000	100	11	0.2000	Yes	Yes
Bis (2-ethylhexyl) phthalate	000117-81-7	100	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0*	50000.0*	50000.0	50000.0	1000	1*	6	0.0020	Yes	Yes
Bis(2-chloroethoxy)methane	000111-91-1	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	6	0.0200	Yes	Yes
Bis(2-chloroethyl)ether	000111-44-4	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	1	1	11	1.0000	Yes	No
Bis(chloromethyl)ether	000542-88-1	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0007	5.0*	5.0*	5.0*	5.0*	...	...	17	1.0000	Yes	No
Boron	007440-42-8	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Bromodichloromethane	000075-27-4	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	...	...	17	1.0000	Yes	No
Bromomethane	000074-83-9	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.4000*	5.0	5.0	5.0	5.0	10000	10	17	1.0000	Yes	No
Bromoxynil	001689-84-5	100	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.0700	50.0	50.0	50.0	50.0	10	10	0	0.0002	Yes	Yes
Butadiene, 1,3-	000106-99-0	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Butanol	000071-36-3	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	5.0	5.0	5.0	1	1	11	1.0000	Yes	No
Butylbenzyl phthalate	000085-68-7	10	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	500.0	500.0	500.0	500.0	100	1000	6	0.0020	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	100	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.0700	50.0	50.0	50.0	50.0	100	100	0	0.0020	Yes	Yes
Cadmium	007440-43-9	10000	1.0E+00	1.0E+00	2.0E-01	2.0E-01	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	1000	1000	NA	NA	No	Yes
Captan	000133-06-2	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.0007	0.0700	50.0	50.0	50.0	50.0	10000	100*	6	0.0200	Yes	Yes
Carbaryl	000063-25-2	10	1.0E+00	1.0E+00	2.0E-01	2.0E-01	0.4000*	0.0700*	50.0	50.0	50.0	50.0	10000	10000	0	0.0020	Yes	Yes
Carbofuran	001563-66-2	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	10000	1000	11	1.0000	Yes	No
Carbon disulfide	000075-15-0	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Carbon Tetrachloride	000056-23-5	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	1*	17	1.0000	Yes	No
Carbophenothion	000786-19-6	100	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000	10000	NA	NA	No	Yes
Cesium	007440-46-2	...	1.0E+00	...	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Chloral	000075-87-6	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	...	...	11	1.0000	Yes	No
Chlordane	000057-74-9	10000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes
Chlorine cyanide	000506-77-4	10	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10000	10000	17	1.0000	Yes	No
Chloro-3-methylphenol, 4-	000059-50-7	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	100	100	11	0.2000	Yes	Yes
Chloroaniline, p-	000106-47-8	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0700*	0.0700*	5.0	5.0	5.0	5.0	10000	10	11	0.2000	Yes	Yes
Chlorobenzene	000108-90-7	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.0007	0.0700	50.0	50.0	50.0	50.0	1000	100*	17	1.0000	Yes	No
Chloroform	000067-66-3	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	10	17	1.0000	Yes	No
Chloromethane	000074-87-3	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes	No
Chloromethyl methyl ether	000107-30-2	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0007	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Chloromethyloxirane, 2-	000106-89-8	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	10	10	17	1.0000	Yes	No

* Indicates difference between previous version of chemical data (MAR93) and current version of chemical data.

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Chloronaphthalene, 2-	000091-58-7	10	1.0E+00	1.0E-02*	2.0E-01	2.0E-03	0.4000*	1.0000	500.0	500.0	500.0	500.0	...	...	11	0.2000	Yes	Yes
Chlorophenol, 2-	000095-57-8	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	500.0	500.0	500.0	500.0	100	100	11*	1.0000	Yes	No
Chlorpyrifos	002921-88-2	1000	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	500.0	5000.0	5000.0	5000.0	10000	10000	NA	NA	No	Yes
Chromium	007440-47-3	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	500.0	5.0	500.0	10000	10000	NA	NA	No	Yes
Chromium(III)	016065-83-1	1	1.0E+00	1.0E-02	1.0E+00*	1.0E-02	1.0000*	1.0000*	500.0*	500.0*	500.0*	500.0*	10	10	NA	NA	No	Yes
Chromium(VI)	018540-29-9	10000*	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0*	500.0*	5.0*	500.0*	100*	100*	NA	NA	No	Yes
Chrysene	000218-01-9	...	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	500.0	500.0	5000.0	500.0	1000	1000	6	0.0002	Yes	Yes
Cobalt	007440-48-4	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	5000.0	5000.0	...	...	NA	NA	No	Yes
Copper	007440-50-8	...	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	100	1000	NA	NA	No	Yes
Copper cyanide	000544-92-3	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	NA	NA	No	Yes
Coumaphos	000056-72-4	100	1.0E+00	1.0E-04	2.0E-01	2.0E-05	0.4000	0.4000	500.0	500.0	500.0	500.0	10000	1000	NA	NA	No	Yes
Creosote	008001-58-9	10	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Cresol, m-	000108-39-4	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	5.0	5.0	5.0	100	100	11	1.0000	Yes	No
Cresol, p-	000106-44-5	100*	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.0007	0.0700*	5.0	5.0	5.0	5.0	100	100	11	1.0000	Yes	No
Cumene	000098-82-8	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	100	1	17	1.0000	Yes	No
Cyanazine	021725-46-2	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	50.0	50.0	50000.0	50000.0	100*	100*	0	0.0020	Yes	Yes
Cyanide	000057-12-5	100	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1000	1000	NA	NA	No	Yes
Cyanogen	000460-19-5	100	1.0E+00	...	1.0E+00	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Cyanogen bromide	000506-68-3	10	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1000	1000	NA	NA	No	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Cyclohexane	000110-82-7	1	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	100	100	17	1.0000	Yes	No
Cyclohexanone	000108-94-1	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	1	1	11	1.0000	Yes	No
Cyclotrimethylenetrinitriamine	000121-82-4	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	100	100	NA	NA	No	Yes
DDD	000072-54-8	100	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes
DDE	000072-55-9	100	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes
DDT	000050-29-3	1000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes
DEF	000078-48-8	10000	1.0E+00	...	...	...	1.0000*	0.4000*	5000.0	5000.0	5000.0	5000.0	1000	10000	NA	NA	No	Yes
Di-n-butyl phthalate	000084-74-2	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	1000	10000	6	0.0200	Yes	Yes
Di-n-octyl phthalate	000117-84-0	100	1.0E+00	1.0E-04	2.0E-03*	2.0E-07	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	6	0.0020	Yes	Yes
Diazinon	000333-41-5	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.0700	500.0	500.0	500.0	500.0	10000	1000	17	1.0000	Yes	No
Dibenz(a,h)anthracene	000053-70-3	...*	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	NA	NA	No	Yes
Dibenzofuran	000132-64-9	...	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	500.0	500.0	500.0	500.0	100*	100*	11	0.0200	Yes	Yes
Dibromo-3-chloropropane, 1,2-	000096-12-8	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	...	...	11	1.0000	Yes	No
Dibromochloromethane	000124-48-1	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	...	...	11	1.0000	Yes	No
Dibromoethane, 1,2-	000106-93-4	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Dicamba	001918-00-9	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	100	100	6	0.0200	Yes	Yes
Dichlorobenzene, 1,2-	000095-50-1	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Dichlorobenzene, 1,3-	000541-73-1	...	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Dichlorobenzene, 1,4-	000106-46-7	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100*	17	1.0000	Yes	No

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Dichlorobenzidine, 3,3-	000091-94-1	100	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	0.0700	500.0	500.0	500.0	500.0	...	...	0	0.0002	Yes	Yes
Dichlorodifluoromethane	000075-71-8	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	...	...	17	1.0000	Yes	No
Dichloroethane, 1,1-	000075-34-3	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Dichloroethane, 1,2-	000107-06-2	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes	No
Dichloroethene, 1,1-	000075-35-4	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	10	1	17	1.0000	Yes	No
Dichloroethylene, cis-1,2-	000156-59-2	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Dichloroethylene, trans-1,2-	000156-60-5	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	1	1	17	1.0000	Yes	No
Dichlorophenol, 2,4-	000120-83-2	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	0.4000	500.0	500.0	500.0	500.0	100	100	11	0.2000	Yes	Yes
Dichlorophenoxyacetic acid, 2,4-	000094-75-7	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	100	100	0	0.0020	Yes	Yes
Dichloropropane, 1,2-	000078-87-5	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	10	1	17	1.0000	Yes	No
Dichloropropene, 1,3-	000542-75-6	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	5.0	5.0	5.0	5.0	1000	100*	17	1.0000	Yes	No
Dichlorvos	000062-73-7	1000*	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10000	10000	17	0.2000	Yes	Yes
Dicofol	000115-32-2	10	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	1000	NA	NA	No	Yes
Dieldrin	000060-57-1	10000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	5000.0	50000.0	5000.0	10000	10000	6	0.0020	Yes	Yes
Diethyl phthalate	000084-66-2	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	500.0	500.0	500.0	500.0	10000	10000	11	0.2000	Yes	Yes
Diethylene glycol	000111-46-6	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	1	1	11	0.2000	Yes	Yes
Diisopropylmethyl-phosphonate	001445-75-6	10	1.0E+00	...	...	...	0.4000	0.0700	5.0	5.0	5.0	5.0	1	1	NA	NA	No	Yes
Dimethoate	000060-51-5	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	1000	0	0.0020	Yes	Yes
Dimethoxybenzidine, 3,3-	000119-90-4	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5.0	5.0	5.0	5.0	...	...	0	0.0020	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Dimethyl phenol, 2,4-	000105-67-9	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	500.0	500.0	500.0	500.0	100	100	11	0.2000	Yes	Yes
Dimethyl phthalate	000131-11-3	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	0.4000	50.0	50.0	50.0	50.0	10	10	11	0.2000	Yes	Yes
Dimethyl sulfate	000077-78-1	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	100	10	11	1.0000	Yes	No
Dinitrobenzene, 1,3-	000099-65-0	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	5.0	5.0	5.0	100	100	6	0.0200	Yes	Yes
Dinitrophenol, 2,4-	000051-28-5	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	10000	10*	11	0.2000	Yes	Yes
Dinitrotoluene, 2,4-	000121-14-2	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000*	0.4000	50.0	50.0	50.0	50.0	100	100	6	0.0200	Yes	Yes
Dinitrotoluene, 2,6-	000606-20-2	1000*	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	50.0	50.0	50.0	50.0	10	10	6	0.0200	Yes	Yes
Dinoseb	000088-85-7	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	50.0	50.0	10000	100	6	0.0200	Yes	Yes
Dioxane, 1,4-	000123-91-1	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Dioxathion	000078-34-2	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	50.0	50.0	50.0	50.0	10000	10000	NA	NA	No	Yes
Diphenylhydrazine, 1,2-	000122-66-7	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	50.0	50.0	50.0	50.0	100	100	6	0.0200	Yes	Yes
Diquat	000085-00-7	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1000	1000	NA	NA	No	Yes
Disulfoton	000298-04-4	10000	1.0E+00	1.0E+00	2.0E-01	2.0E-01	1.0000	1.0000	500.0	500.0	500.0	500.0	10000	10000	6	0.0200	Yes	Yes
Diuron	000330-54-1	1000	1.0E+00	1.0E-02*	2.0E-01	2.0E-03	0.4000	0.0700	50.0*	50.0*	500.0	500.0	1000	100	NA	NA	No	Yes
Endosulfan (I or II)	000115-29-7	100*	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	0.4000	5000.0	5000.0	5000.0	5000.0	10000	10000	11	0.0020	Yes	Yes
Endosulfan sulfate	001031-07-8	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	...	...	17	1.0000	Yes	No
Endothall	000145-73-3	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	500.0	500.0	10000	10000	6	0.0200	Yes	Yes
Endrin	000072-20-8	10000	1.0E+00	1.0E+00	2.0E-03	2.0E-03	1.0000	1.0000	5000.0	5000.0	50000.0	5000.0	10000	10000	6	0.0020	Yes	Yes
Endrin aldehyde	007421-93-4	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10000*	10000*	NA	NA	No	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Ethion	000563-12-2	1000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000	10000	NA	NA	No	Yes
Ethyl acetate	000141-78-6	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes	No
Ethyl benzene	000100-41-4	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	100	10	17	1.0000	Yes	No
Ethyl chloride	000075-00-3	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Ethyl ether	000060-29-7	10	1.0E+00	1.0E+00	2.0E-01	2.0E-01	0.4000	1.0000	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes	No
Ethyldipropylthiocarbamate, s-	000759-94-4	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	500.0	500.0	500.0	500.0	10	10	11	1.0000	Yes	No
Ethylene glycol	000107-21-1	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	0.5	0.5	0.5	0.5	1*	1	6	0.2000	Yes	Yes
Ethylene glycol monoethyl ether	000110-80-5	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Fenethion	000055-38-9	100	1.0E+00	1.0E-04*	2.0E-01*	2.0E-05*	0.4000	0.4000*	500.0*	500.0*	50.0	50.0	10000	10000	NA	NA	No	Yes
Ferrous sulfate	007720-78-7	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	1000	1000	NA	NA	No	Yes
Fluorene	000086-73-7	100	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	1000	1000	11	0.2000	Yes	Yes
Fluorine	007782-41-4	10	1.0E+00	1.0E-02	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Formaldehyde	000050-00-0	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	100	10	11	1.0000	Yes	No
Formic acid	000064-18-6	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	11	1.0000	Yes	No
Furan	000110-00-9	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	10	17	1.0000	Yes	No
Furfural	000098-01-1	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	10	10	11	1.0000	Yes	No
Glycidylaldehyde	000765-34-4	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	11	1.0000	Yes	No
Heptachlor	000076-44-8	1000	1.0E+00	1.0E-02	2.0E-03	2.0E-05	0.4000*	0.4000*	5000.0	5000.0	50000.0	50000.0	10000	10000	11	0.0200	Yes	Yes
Heptachlor epoxide	001024-57-3	10000	1.0E+00	1.0E+00	2.0E-03	2.0E-03	1.0000	1.0000	5.0	5.0	50000.0	50000.0	10000	10000	11	0.0200	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Heptachlorinated dibenzo-p-dioxin, 1,2,3,4,6,	035822-46-9	1000	1.0E+00	...	...	...	0.4000	0.0700	50000.0*	50000.0*	50000.0*	50000.0*	...	...	NA	NA	No	Yes
Heptachlorinated dibenzofuran, 1,2,3,4,6,7,8-	067562-39-4	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Heptachlorinated dibenzofuran, 1,2,3,4,6,7,9-	055673-89-7	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexabromobenzene	000087-82-1	1000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	6	0.0002	Yes	Yes
Hexachlorinated dibenzo-p-dioxin, 1,2,3,4,7,8	039227-28-6	10	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorinated dibenzo-p-dioxin, 1,2,3,6,7,8	057653-85-7	1000	1.0E+00	...	...	...	0.4000	0.0700	5000.0*	5000.0*	5000.0*	5000.0*	10000*	10000*	NA	NA	No	Yes
Hexachlorinated dibenzo-p-dioxin, 1,2,3,7,8,9	019408-74-3	10000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorinated dibenzofuran, 1,2,3,4,7,8-	070648-26-9	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorinated dibenzofuran, 1,2,3,6,7,8-	057117-44-9	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorinated dibenzofuran, 1,2,3,7,8,9-	072918-21-9	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorinated dibenzofuran, 2,3,4,6,7,8-	060851-34-5	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Hexachlorobenzene	000118-74-1	1000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	5000.0	50000.0	50000.0	50000.0	10	10	11	0.0200	Yes	Yes
Hexachlorobutadiene	000087-68-3	10000*	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	50.0	50.0	5000.0	5000.0	10000	100	17	0.2000	Yes	Yes
Hexachlorocyclohexane, alpha-	000319-84-6	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	100	1000	11	0.0200	Yes	Yes
Hexachlorocyclohexane, beta-	000319-85-7	100	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	1.0000	500.0	500.0	500.0	5000.0	...	...	6	0.0020	Yes	Yes
Hexachlorocyclohexane, delta-	000319-86-8	1	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0*	500.0*	500.0*	500.0	...	...	6	0.0200	Yes	Yes
Hexachlorocyclopentadiene	000077-47-4	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5000.0	5000.0	50.0	50.0	10000	10000	17	0.2000	Yes	Yes
Hexachloroethane	000067-72-1	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	1000	100*	17	1.0000	Yes	No
Hexachlorophene	000070-30-4	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000	10000	NA	NA	No	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Hexane	000110-54-3	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	100	100	17	1.0000	Yes	No
Hydrazine	000302-01-2	10000	1.0E+00	... *	1.0E+00	... *	1.0000	0.4000	0.5	0.5	0.5	0.5	1000	100	17	1.0000	Yes	No
Hydrochloric acid	007647-01-0	1000	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1	1	17*	1.0000*	Yes*	No *
Hydrogen cyanide	000074-90-8	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	1000	1000	17	1.0000	Yes	No
Hydrogen sulfide	007783-06-4	10000*	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	1000*	1000*	17	1.0000	Yes	No
Indeno(1,2,3-CD)pyrene	000193-39-5	...	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	NA	NA	No	Yes
Ioxynil	001689-83-4	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.0700	500.0	500.0	500.0	500.0	1000	1000	NA	NA	No	Yes
Iron	015438-31-0	...	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	10	10	NA	NA	No	Yes
Isobutanol	000078-83-1	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	10	1	17	1.0000	Yes	No
Isophorone	000078-59-1	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	1	1	11	1.0000	Yes	No
Kepone	000143-50-0	10000	1.0E+00	1.0E-04	2.0E-01	2.0E-05	0.4000	0.4000	50000.0	50000.0*	50000.0	50000.0	10000	10000	0	0.0020	Yes	Yes
Lead	007439-92-1	10000	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	1.0000	50.0	5000.0	5000.0	5000.0	1000	1000	NA	NA	No	Yes
Lindane	000058-89-9	10000	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	500.0	500.0	500.0	500.0	10000	10000	11	0.0200	Yes	Yes
Magnesium	007439-95-4	...	1.0E+00	1.0E+00	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Malathion	000121-75-5	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	10000	10000	0	0.0020	Yes	Yes
Maleic anhydride	000108-31-6	10	1.0E+00	...	...	...	0.0007	0.0007	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Maleic hydrazide	000123-33-1	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	0.5	0.5	0.5	0.5	10	10	17	1.0000*	Yes	No *
Manganese	007439-96-5	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	50000.0	50000.0	...	...	NA	NA	No	Yes
Mercury	007439-97-6	10000	1.0E+00	1.0E+00	2.0E-05	2.0E-05	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	11	0.2000	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Methacrylonitrile	000126-98-7	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Methanol	000067-56-1	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Methomyl	016752-77-5	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	0.5	0.5	0.5*	0.5*	10000	10000	17	1.0000	Yes	No
Methoxychlor	000072-43-5	100	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	5000.0	50000.0	5000.0	10000	10000	6	0.0020	Yes	Yes
Methyl chlorocarbonate	000079-22-1	100	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Methyl ethyl ketone	000078-93-3	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes	No
Methyl isobutyl ketone	000108-10-1	100*	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes	No
Methyl methacrylate	000080-62-6	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000*	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes	No
Methyl Napthalene, 2-	000091-57-6	...	1.0E+00	1.0E-02*	2.0E-01	2.0E-03	0.4000	0.4000*	5000.0	5000.0	5000.0	5000.0	1000	1000	11*	0.2000*	Yes*	Yes
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	1000	1.0E+00	1.0E-04	2.0E-01	2.0E-05	0.4000	0.0700	500.0	500.0	500.0	500.0	...	...	0	0.0002	Yes	Yes
Methylene chloride	000075-09-2	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	1	10	17	1.0000	Yes	No
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	10000	1.0E+00	... *	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	6*	0.0020	Yes	Yes
Metribuzin	021087-64-9	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Mirex	002385-85-5	10000	1.0E+00	...	...	...	0.4000	0.0700	5000.0	50000.0	50000.0	50000.0	10000	10000	NA	NA	No	Yes
Naphthalene	000091-20-3	1*	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.4000	500.0	5.0	500.0	5000.0	1000	1000	11	0.2000	Yes	Yes
Nickel	007440-02-0	100*	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	1.0000	0.5	500.0	500.0	500.0	10	1000	NA	NA	No	Yes
Nitric acid	007697-37-2	100	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17*	1.0000*	Yes*	No *
Nitric oxide	010102-43-9	10	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Nitroaniline, p-	000100-01-6	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	1	1	0	0.0020	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Nitrobenzene	000098-95-3	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	5.0	5.0	5.0	100	10*	11	1.0000	Yes	No
Nitrogen dioxide	010102-44-0	1	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Nitroglycerine	000055-63-0	10	1.0E+00	...	1.0E+00	...	1.0000*	1.0000*	50.0	50.0	50.0	50.0	100	100	6	0.0200	Yes	Yes
Nitrophenol, 4-	000100-02-7	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	5.0	5.0	500.0	500.0	100	10	6	0.0200	Yes	Yes
Nitroso-di-n-butylamine, N-	000924-16-3	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000*	1.0000	5.0	5.0	5.0	5.0	...	...	11	0.2000	Yes	Yes
Nitroso-di-n-methylurethane, N-	000615-53-2	100	1.0E+00	1.0E+00	1.0E+00*	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	11	1.0000	Yes	No
Nitrosodiethanolamine, N-	001116-54-7	1000	1.0E+00	1.0E+00	1.0E+00*	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	6*	0.0200	Yes	Yes
Nitrosodiethylamine, N-	000055-18-5	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Nitrosodimethylamine, N-	000062-75-9	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	1	1	11	1.0000	Yes	No
Nitrosodiphenylamine, N-	000086-30-6	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	100	100	6	0.0200	Yes	Yes
Nitrosopyrrolidine, N-	000930-55-2	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	6	0.2000	Yes	Yes
Nitrotoluene, 4-	000099-99-0	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	10	10	11	0.2000	Yes	Yes
Parathion, ethyl-	000056-38-2	100	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	10000	10000	6	0.0020	Yes	Yes
Parathion, methyl-	000298-00-0	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	0.4000	50.0*	50.0*	50.0*	50.0*	10000	10000	6	0.0200	Yes	Yes
PCBs	001336-36-3	10000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	11	0.0200*	Yes	Yes*
Pentachlorinated dibenzo-p-dioxin, 1,2,3,7,8-	040321-76-4	1000*	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Pentachlorinated dibenzofuran, 1,2,3,7,8-	109719-77-9	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Pentachlorinated dibenzofuran, 2,3,4,7,8-	057117-41-6	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Pentachlorobenzene	000608-93-5	1000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	100	1000*	11	0.2000	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Pentachloroethane	000076-01-7	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	1*	17	1.0000	Yes	No
Pentachloronitrobenzene	000082-68-8	1000	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	11	0.0200	Yes	Yes
Pentachlorophenol	000087-86-5	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	500.0	500.0	5000.0	500.0	100	100	6	0.0200	Yes	Yes
Phenanthrene	000085-01-8	...	1.0E+00	1.0E-04	2.0E-01	2.0E-05	0.4000	0.4000	50.0	50.0	5000.0	50.0	1000	1000	11	0.0200	Yes	Yes
Phenol	000108-95-2	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	5.0	5.0	5.0	5.0	10000	100	11	1.0000	Yes	No
Phenyl sulfide	000139-66-2	10	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	11	0.0200	Yes	Yes
Phenylmercuric acetate	000062-38-4	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	10000	1000	6	0.0020	Yes	Yes
Phorate	000298-02-2	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	0.4000	500.0	500.0	50.0	50.0	10000	10000	11	0.0200	Yes	Yes
Phosgene	000075-44-5	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Phosphamidon	013171-21-6	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10000	10000	NA	NA	No	Yes
Phosphine	007803-51-2	10000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	17	1.0000	Yes	No
Phosphoric acid	007664-38-2	1	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10000	10000	NA	NA	No	Yes
Phosphorodithioc acid,phenyl-o-ethyl-o-(4-nit	002104-64-5	10000	1.0E+00	...	...	...	0.4000	0.0700	500.0	500.0	5000.0	500.0	10000	10000	NA	NA	No	Yes
Phosphorous (elemental)	007723-14-0	1000	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10000	10000	NA	NA	No	Yes
Phthalic anhydride	000085-44-9	100*	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	6	0.0200	Yes	Yes
Plutonium	007440-07-5	...	1.0E+00	...	...	...	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	...	...	NA	NA	No	Yes
Polychlorinated triphenyl	012642-23-8	1	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10*	10*	NA	NA	No	Yes
Potassium silver cyanide	000506-61-6	10	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Pronamide	023950-58-5	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	...	...	11	0.2000	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Pyrene	000129-00-0	100	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	50.0	50.0	50.0	50.0	...	...	6	0.0020	Yes	Yes
Pyridine	000110-86-1	1000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	100	10	11	1.0000	Yes	No
Quinoline	000091-22-5	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	50.0	50.0	1000	1000	11	0.2000	Yes	Yes
Radium	007440-14-4	...	1.0E+00	1.0E-02	...	...	1.0000*	1.0000*	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Radon	010043-92-2	...	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Resorcinol	000108-46-3	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	1000	10	6	0.0200	Yes	Yes
Ronnel	000299-84-3	10	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	5000.0	5000.0	5.0*	5.0*	10000	10000	NA	NA	No	Yes
Selenium	007782-49-2	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5000.0	50.0	5000.0	50.0	100	100	NA	NA	No	Yes
Selenourea	000630-10-4	100	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Silver	007440-22-4	100	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	50.0	50.0	50.0	50.0	10000	10000	NA	NA	No	Yes
Silver Cyanide	000506-64-9	10	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	NA	NA	No	Yes
Sodium	007440-23-5	...	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Strontium	007440-24-6	1	1.0E+00	...	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Strychnine	000057-24-9	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	1000	1000	NA	NA	No	Yes
Styrene	000100-42-5	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100*	17	1.0000	Yes	No
Sulfuric acid	007664-93-9	1000	1.0E+00	1.0E+00	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	10	10	11*	0.0200*	Yes*	Yes
TB, 2,4,5-	000093-80-1	...	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	500.0	500.0	500.0	500.0	...	...	0	0.0020	Yes	Yes
TCDD	001746-01-6	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000*	10000*	6	0.0002	Yes	Yes
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	10000	1.0E+00	1.0E-04	2.0E-03	2.0E-07	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	100	1000*	17	0.2000	Yes	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Tetrachloroethane, 1,1,1,2-	000630-20-6	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	10	10	17	1.0000	Yes	No
Tetrachloroethane, 1,1,2,2-	000079-34-5	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	5.0	5.0	5.0	5.0	100	10*	11	1.0000	Yes	No
Tetrachloroethene	000127-18-4	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	10*	17	1.0000	Yes	No
Tetrachlorophenol, 2,3,4,6-	000058-90-2	100	1.0E+00	1.0E-04	1.0E+00	1.0E-04	1.0000	1.0000	500.0	500.0	5000.0	5000.0	1000	100	11	0.2000	Yes	Yes
Tetraethyl lead	000078-00-2	10000	1.0E+00	...	2.0E-03	...	0.0700	0.0700	500.0	500.0	500.0	500.0	100	10000	17	1.0000	Yes	No
Tetraethyldithiopyrophosphate	003689-24-5	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Tetrahydrofuran	000109-99-9	1	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	1.0000	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes	No
Thallium	007440-28-0	1000	1.0E+00	1.0E-04	1.0E+00	1.0E-04	1.0000	1.0000	500.0	50.0	500.0	50.0	...	...	NA	NA	No	Yes
Thiourea	000062-56-6	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000*	1.0000*	0.5	0.5	0.5	0.5	100	100	6	0.0200	Yes	Yes
Thiram	000137-26-8	100	1.0E+00	...	2.0E-01	...	1.0000*	0.4000*	5000.0	5000.0	5000.0	5000.0	10000	10000	NA	NA	No	Yes
Thorium	007440-29-1	...	1.0E+00	1.0E-04	... *	... *	1.0000*	1.0000*	0.5*	0.5*	0.5*	0.5*	...	...	NA	NA	No	Yes
Toluene	000108-88-3	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Toluene diisocyanate	000584-84-9	1000	1.0E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	1	1	11	0.2000	Yes	Yes
Toxaphene	008001-35-2	1000	1.0E+00	1.0E-02	2.0E-03	2.0E-05	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes
TP, 2,4,5-	000093-72-1	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	500.0	500.0	500.0	500.0	1000*	1000*	0	0.0020	Yes	Yes
Tribromomethane	000075-25-2	100	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	1.0000	50.0	50.0	50.0	50.0	10	10	11	1.0000	Yes	No
Trichloro-1,2,2-Trifluoroethane, 1,1,2-	000076-13-1	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	...	...	17	1.0000	Yes	No
Trichlorobenzene, 1,2,4-	000120-82-1	1000*	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	1.0000	500.0	500.0	500.0	500.0	1000	1000	17	1.0000	Yes	No

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid: Karst	Ground Water Mobility: Liquid: Non-Karst	Ground Water Mobility: Non-Liquid: Karst	Ground Water Mobility: Non-Liquid: Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain: Fresh	Bioaccumulation: Food Chain: Salt	Bioaccumulation: Environmental: Fresh	Bioaccumulation: Environmental: Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Trichloroethane, 1,1,1-	000071-55-6	1*	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	5.0	5.0	5.0	5.0	10	10	17	1.0000	Yes	No
Trichloroethane, 1,1,2-	000079-00-5	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	10	10*	17	1.0000	Yes	No
Trichloroethylene	000079-01-6	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	10	17	1.0000	Yes	No
Trichlorofluoromethane	000075-69-4	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	...	...	17	1.0000	Yes	No
Trichlorophenol, 2,3,5-	000933-78-8	...	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	...	...	6	0.0200	Yes	Yes
Trichlorophenol, 2,3,6-	000933-75-5	...	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	...	...	6	0.0200	Yes	Yes
Trichlorophenol, 2,4,5-	000095-95-4	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	0.4000	500.0	500.0	5000.0	5000.0	1000	100*	11	0.2000	Yes	Yes
Trichlorophenol, 2,4,6-	000088-06-2	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0000	0.4000	500.0	500.0	50000.0	50000.0	1000	100	11	0.2000	Yes	Yes
Trichlorophenol, 3,4,5-	000609-19-8	...	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	500.0	500.0	500.0	1000	1000	11	0.0200	Yes	Yes
Trichlorophenoxyacetic acid, 2,4,5-	000093-76-5	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	0.0700	50.0	50.0	500.0	500.0	10000*	10000*	0	0.0020	Yes	Yes
Trichloropropane, 1,2,3-	000096-18-4	100	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	5.0	5.0	5.0	5.0	10	10	11	1.0000	Yes	No
Triethanolamine	000102-71-6	1	1.0E+00	1.0E+00	1.0E+00*	1.0E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	1	1	0	0.0020	Yes	Yes
Trifluralin	001582-09-8	100	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	5000.0	5000.0	50000.0	50000.0	10000	1000	11	0.0200	Yes	Yes
Trinitrobenzene, 1,3,5-	000099-35-4	10000	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	100	100	6	0.0200	Yes	Yes
Trinitrotoluene	000118-96-7	1000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	1.0000	1.0000	5.0	5.0	5.0	5.0	100	100	6	0.0200	Yes	Yes
Tris (2,3-dibromopropyl) phosphate	000126-72-7	1000	1.0E+00	1.0E-04	2.0E-01	2.0E-05	1.0000	1.0000	5000.0	5000.0	5.0	5.0	...	...	11	0.0200	Yes	Yes
Uranium	007440-61-1	...	1.0E+00	1.0E-02	... *	... *	1.0000*	1.0000*	0.5*	0.5*	0.5*	0.5*	...	...	NA	NA	No	Yes
Vanadium	007440-62-2	100	1.0E+00	1.0E-02	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	...	...	NA	NA	No	Yes
Vanadium pentoxide	001314-62-1	100	1.0E+00	...	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	100	100	NA	NA	No	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(333 Substances)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Vinyl acetate	000108-05-4	10	1.0E+00	1.0E+00	1.0E+00	1.0E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	10	10*	17	1.0000	Yes	No
Vinyl chloride	000075-01-4	10000	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.0007	0.0700	5.0	5.0	5.0	5.0	...	...	17	1.0000	Yes	No
Warfarin	000081-81-2	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	0.4000	0.0700	50.0	50.0	50.0	50.0	10	10	NA	NA	No	Yes
Xylene, m-	000108-38-3	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	500.0	500.0	500.0	500.0	100	10	17	1.0000	Yes	No
Xylene, o-	000095-47-6	1	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Xylene, p-	000106-42-3	10	1.0E+00	1.0E-02	1.0E+00	1.0E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	1	17	1.0000	Yes	No
Zinc	007440-66-6	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	500.0	50000.0	500.0	50000.0	10	100	NA	NA	No	Yes
Zinc cyanide	000557-21-1	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	NA	NA	No	Yes
Zinc phosphide	001314-84-7	10000	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	...	...	NA	NA	No	Yes
Zinc sulfate	007733-02-0	10	1.0E+00	1.0E-02	2.0E-01	2.0E-03	1.0000	1.0000	5.0	50.0	50.0	50000.0	10000	10000*	NA	NA	No	Yes

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HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Acenaphthene	000083-32-9	...	...	...	...	2.1E+00	...
Acenaphthylene	000208-96-8	...	...	...	...	...	...
Acetaldehyde	000075-07-0	...	9.0E-03	4.5E-04	...	...	...
Acetone	000067-64-1	...	...	...	...	3.5E+00	...
Acetonitrile	000075-05-8	...	4.9E-02*	...	...	2.1E-01	...
Acetophenone	000098-86-2	...	...	...	...	3.5E+00	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...	...	...	...	...
Acrolein	000107-02-8	...	2.0E-05	...	...	7.0E-01	...
Acrylamide	000079-06-1	...	...	7.7E-07	...	7.0E-03	7.8E-06
Acrylic acid	000079-10-7	...	3.0E-04	...	...	2.8E+00	...
Acrylonitrile	000107-13-1	...	2.0E-03	1.5E-05	...	...	6.5E-05
Adipic acid	000124-04-9	...	...	...	...	...	...
Aldicarb	000116-06-3	...	...	...	... *	3.5E-02*	...
Aldrin	000309-00-2	...	...	2.0E-07	...	1.1E-03	2.1E-06
Allyl alcohol	000107-18-6	...	...	...	...	1.8E-01	...
Aluminum	007429-90-5	...	...	...	...	...	...
Aluminum phosphide	020859-73-8	...	...	...	...	1.4E-02	...
Ammonia	007664-41-7	...	1.0E-01	...	...	1.2E+03	...
Ammonium picrate	000131-74-8	...	...	...	...	...	...
Ammonium sulfamate	007773-06-0	...	...	...	...	7.0E+00	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Aniline	000062-53-3	...	1.0E-03	...	...	...	6.3E-03
Anthracene	000120-12-7	...	...	...	...	1.1E+01	...
Antimony	007440-36-0	...	...	...	6.0E-03*	1.4E-02	...
Arsenic	007440-38-2	...	...	2.3E-07	5.0E-02	1.1E-02	2.0E-05
Asbestos	001332-21-4	...	...	4.3E-06 fibers/mL	...	...	...
Atrazine	001912-24-9	...	...	...	3.0E-03	1.2E+00*	1.6E-04
Azinphos- ethyl	002642-71-9	...	...	...	...	...	...
Azinphos- methyl	000086-50-0	...	...	...	...	...	...
Aziridine	000151-56-4	...	...	...	...	...	...
Barium	007440-39-3	...	4.9E-04*	...	2.0E+00	2.5E+00	...
Barium cyanide	000542-62-1	...	...	...	...	3.5E+00	...
Benz(a)anthracene	000056-55-3	...	...	...	... *	...	...
Benzene	000071-43-2	...	...	1.2E-04	5.0E-03	...	1.2E-03
Benzene carbonyl chloride	000098-88-4	...	...	...	...	...	...
Benzidine	000092-87-5	...	...	1.5E-08	...	1.1E-01	1.5E-07
Benzo(a)pyrene	000050-32-8	...	...	... *	2.0E-04	...	4.8E-06
Benzo(g,h,i)perylene	000191-24-2	...	...	...	...	...	...
Benzo(j,k)fluorene	000206-44-0	...	...	...	...	1.4E+00	...
Benzo(k)fluoranthene	000207-08-9	...	...	...	... *	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Benzoic acid	000065-85-0	...	...	...	...	1.4E+02	...
Benzonitrile	000100-47-0	...	...	...	...	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...	...	...	...	...
Benzyl chloride	000100-44-7	...	...	...	...	...	2.1E-04
Beryllium	007440-41-7	1.0E-02	...	4.2E-07	4.0E-03*	1.8E-01	8.1E-06
Biphenyl, 1,1-	000092-52-4	...	...	...	...	1.8E+00	...
Bis (2-ethylhexyl) phthalate	000117-81-7	...	...	...	...	7.0E-01	2.5E-03
Bis(2-chloroethoxy)methane	000111-91-1	...	...	...	...	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	...	3.0E-06	...	...	3.2E-05
Bis(chloromethyl)ether	000542-88-1	...	...	1.6E-08	...	...	1.6E-07
Boron	007440-42-8	...	2.0E-02	...	...	3.2E+00	...
Bromodichloromethane	000075-27-4	...	...	...	...	7.0E-01	5.6E-04*
Bromomethane	000074-83-9	...	5.0E-03	...	...	4.9E-02	...
Bromoxynil	001689-84-5	...	...	...	...	7.0E-01	...
Butadiene, 1,3-	000106-99-0	...	...	3.6E-06	...	...	...
Butanol	000071-36-3	...	...	...	...	3.5E+00	...
Butylbenzyl phthalate	000085-68-7	...	...	...	... *	7.0E+00	...
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	...	...	...	...	2.8E-01	...
Cadmium	007440-43-9	...	...	5.6E-07	5.0E-03	1.8E-02	...
Captan	000133-06-2	...	...	...	...	4.6E+00	1.0E-02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Carbaryl	000063-25-2	...	...	...	...	3.5E+00	...
Carbofuran	001563-66-2	...	...	...	4.0E-02	1.8E-01	...
Carbon disulfide	000075-15-0	...	1.0E-02	...	...	3.5E+00	...
Carbon Tetrachloride	000056-23-5	...	...	6.7E-05	5.0E-03	2.5E-02	2.7E-04
Carbophenothion	000786-19-6	...	...	...	...	...	...
Cesium	007440-46-2	...	...	...	...	...	...
Chloral	000075-87-6	...	...	...	...	7.0E-02	...
Chlordane	000057-74-9	...	...	2.7E-06	2.0E-03	2.1E-03	2.7E-05
Chlorine cyanide	000506-77-4	...	...	...	...	1.8E+00	...
Chloro-3-methylphenol, 4-	000059-50-7	...	...	...	...	7.0E+01	...
Chloroaniline, p-	000106-47-8	...	...	...	...	1.4E-01	...
Chlorobenzene	000108-90-7	...	2.0E-02*	...	...	7.0E-01	...
Chloroform	000067-66-3	...	...	4.3E-05	...	3.5E-01	5.7E-03
Chloromethane	000074-87-3	...	...	5.6E-04	...	...	2.7E-03
Chloromethyl methyl ether	000107-30-2	...	...	...	...	...	...
Chloromethyloxirane, 2-	000106-89-8	...	1.0E-03	8.3E-04	...	7.0E-02*	3.5E-03
Chloronaphthalene, 2-	000091-58-7	...	...	...	...	2.8E+00	...
Chlorophenol, 2-	000095-57-8	...	...	...	...	1.8E-01	...
Chlorpyrifos	002921-88-2	...	...	...	...	1.1E-01	...
Chromium	007440-47-3	...	...	...	1.0E-01	1.8E-01	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Chromium(III)	016065-83-1	...	...	...	...	3.5E+01	...
Chromium(VI)	018540-29-9	...	...	* 8.3E-08*	...	1.8E-01*	...
Chrysene	000218-01-9	...	...	...	... *	...	...
Cobalt	007440-48-4	...	...	...	...	...	...
Copper	007440-50-8	...	...	...	1.3E+00*	...	...
Copper cyanide	000544-92-3	...	...	...	...	1.8E-01	...
Coumaphos	000056-72-4	...	...	...	...	...	...
Creosote	008001-58-9	...	...	...	...	...	...
Cresol, m-	000108-39-4	...	...	...	...	1.8E+00	...
Cresol, p-	000106-44-5	...	...	...	...	1.8E-01*	...
Cumene	000098-82-8	...	9.0E-03	...	...	1.4E+00	...
Cyanazine	021725-46-2	...	...	...	...	7.0E-02	4.2E-05*
Cyanide	000057-12-5	...	...	...	2.0E-01	7.0E-01	...
Cyanogen	000460-19-5	...	...	...	...	1.4E+00	...
Cyanogen bromide	000506-68-3	...	...	...	...	3.2E+00	...
Cyclohexane	000110-82-7	...	...	...	...	...	...
Cyclohexanone	000108-94-1	...	...	...	...	1.8E+02	...
Cyclotrimethylenetrinitriamine	000121-82-4	...	...	...	...	1.1E-01	3.2E-04
DDD	000072-54-8	...	...	...	...	...	1.5E-04
DDE	000072-55-9	...	...	...	...	...	1.0E-04

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
DDT	000050-29-3	...	...	1.0E-05	...	1.8E-02	1.0E-04
DEF	000078-48-8	...	...	...	...	1.1E-02*	...
Di-n-butyl phthalate	000084-74-2	...	...	...	...	3.5E+00	...
Di-n-octyl phthalate	000117-84-0	...	...	...	...	7.0E-01	...
Diazinon	000333-41-5	...	...	...	...	3.2E-02	...
Dibenz(a,h)anthracene	000053-70-3	...	...	...	... *	...	...
Dibenzofuran	000132-64-9	...	...	...	...	...	...
Dibromo-3-chloropropane, 1,2-	000096-12-8	...	2.0E-04	5.1E+00*	...	...	2.5E-05
Dibromochloromethane	000124-48-1	...	...	...	...	7.0E-01	4.2E-04
Dibromoethane, 1,2-	000106-93-4	...	2.0E-04*	4.5E-06	5.0E-05	...	4.1E-07
Dicamba	001918-00-9	...	...	...	...	1.1E+00	...
Dichlorobenzene, 1,2-	000095-50-1	...	2.0E-01*	...	6.0E-01	3.2E+00	...
Dichlorobenzene, 1,3-	000541-73-1	...	...	...	6.0E-01*	...	...
Dichlorobenzene, 1,4-	000106-46-7	...	8.1E-01*	...	7.5E-02	...	1.5E-03
Dichlorobenzidine, 3,3-	000091-94-1	...	...	...	...	...	7.8E-05
Dichlorodifluoromethane	000075-71-8	...	2.0E-01*	...	...	7.0E+00	...
Dichloroethane, 1,1-	000075-34-3	...	4.9E-01*	...	...	3.5E+00*	...
Dichloroethane, 1,2-	000107-06-2	...	...	3.8E-05	5.0E-03	...	3.8E-04
Dichloroethene, 1,1-	000075-35-4	...	...	2.0E-05	7.0E-03	3.2E-01	5.8E-05
Dichloroethylene, cis-1,2-	000156-59-2	...	...	...	7.0E-02	3.5E-01	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Dichloroethylene, trans-1,2-	000156-60-5	...	...	...	1.0E-01	7.0E-01	...
Dichlorophenol, 2,4-	000120-83-2	...	...	...	...	1.1E-01	...
Dichlorophenoxyacetic acid, 2,4-	000094-75-7	...	...	...	7.0E-02	3.5E-01	...
Dichloropropane, 1,2-	000078-87-5	...	4.0E-03	...	5.0E-03	...	5.1E-04
Dichloropropene, 1,3-	000542-75-6	...	2.0E-02	2.7E-05	...	1.1E-02	1.9E-04
Dichlorvos	000062-73-7	...	...	...	...	1.8E-02*	1.2E-04
Dicofol	000115-32-2	...	...	...	...	...	...
Dieldrin	000060-57-1	...	...	2.2E-07	...	1.8E-03	2.2E-06
Diethyl phthalate	000084-66-2	...	...	...	...	2.8E+01	...
Diethylene glycol	000111-46-6	...	...	...	...	...	...
Diisopropylmethyl-phosphonate	001445-75-6	...	...	...	...	2.8E+00	...
Dimethoate	000060-51-5	...	...	...	...	7.0E-03	...
Dimethoxybenzidine, 3,3-	000119-90-4	...	...	...	...	...	2.5E-03
Dimethyl phenol, 2,4-	000105-67-9	...	...	...	...	7.0E-01	...
Dimethyl phthalate	000131-11-3	...	...	...	...	3.5E+02	...
Dimethyl sulfate	000077-78-1	...	...	...	...	...	...
Dinitrobenzene, 1,3-	000099-65-0	...	...	...	...	3.5E-03	...
Dinitrophenol, 2,4-	000051-28-5	...	...	...	...	7.0E-02	...
Dinitrotoluene, 2,4-	000121-14-2	...	...	...	...	7.0E-02	...
Dinitrotoluene, 2,6-	000606-20-2	...	...	...	...	3.5E-02*	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		AIR PATHWAY			GROUND WATER PATHWAY		
Substance Name	CAS Number	NAAQS/NESHAPS (µg/m3)	Reference Dose Screen Conc (mg/m3)	Cancer Risk Screen Conc (mg/m3)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)
Dinoseb	000088-85-7	...	...	...	7.0E-03	3.5E-02	...
Dioxane, 1,4-	000123-91-1	...	...	...	...	...	3.2E-03
Dioxathion	000078-34-2	...	...	...	...	...	...
Diphenylhydrazine, 1,2-	000122-66-7	...	...	4.5E-06	...	...	4.4E-05
Diquat	000085-00-7	...	...	...	2.0E-02	7.7E-02	...
Disulfoton	000298-04-4	...	...	...	...	1.4E-03	...
Diuron	000330-54-1	...	...	...	...	7.0E-02	...
Endosulfan (I or II)	000115-29-7	...	...	...	...	2.1E-01*	...
Endosulfan sulfate	001031-07-8	...	...	...	...	...	...
Endothall	000145-73-3	...	...	...	1.0E-01	7.0E-01	...
Endrin	000072-20-8	...	...	...	2.0E-03	1.1E-02	...
Endrin aldehyde	007421-93-4	...	... *	...	...	... *	...
Ethion	000563-12-2	...	...	...	...	1.8E-02	...
Ethyl acetate	000141-78-6	...	...	...	...	3.2E+01	...
Ethyl benzene	000100-41-4	...	1.0E+00	...	7.0E-01	3.5E+00	...
Ethyl chloride	000075-00-3	...	1.0E+01	...	...	...	...
Ethyl ether	000060-29-7	...	...	...	...	7.0E+00	...
Ethyldipropylthiocarbamate, s-	000759-94-4	...	...	...	...	8.8E-01	...
Ethylene glycol	000107-21-1	...	...	...	...	7.0E+01	...
Ethylene glycol monoethyl ether	000110-80-5	...	2.0E-01	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Fenethion	000055-38-9	...	...	...	...	...	...
Ferrous sulfate	007720-78-7	...	...	...	...	...	...
Fluorene	000086-73-7	...	...	...	...	1.4E+00	...
Fluorine	007782-41-4	...	...	...	...	2.1E+00	...
Formaldehyde	000050-00-0	...	...	7.7E-05	...	7.0E+00	...
Formic acid	000064-18-6	...	...	...	...	7.0E+01	...
Furan	000110-00-9	...	...	...	...	3.5E-02	...
Furfural	000098-01-1	...	4.9E-02*	...	...	1.1E-01	...
Glycidylaldehyde	000765-34-4	...	5.0E-04*	...	...	1.4E-02	...
Heptachlor	000076-44-8	...	...	7.7E-07	4.0E-04*	1.8E-02	7.8E-06
Heptachlor epoxide	001024-57-3	...	...	3.8E-07	2.0E-04	4.6E-04	3.8E-06
Heptachlorinated dibenzo-p-dioxin, 1,2,3	035822-46-9	...	...	2.3E-08	...	...	2.3E-07
Heptachlorinated dibenzofuran, 1,2,3,4,6	067562-39-4	...	...	2.3E-08	...	...	2.3E-07
Heptachlorinated dibenzofuran, 1,2,3,4,6	055673-89-7	...	...	2.3E-08	...	...	2.3E-07
Hexabromobenzene	000087-82-1	...	...	...	...	7.0E-02	...
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	039227-28-6	...	...	6.0E-11	...	...	5.8E-10
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	057653-85-7	...	...	6.0E-11	...	...	5.8E-10
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	019408-74-3	...	...	7.7E-10	...	...	5.7E-09
Hexachlorinated dibenzofuran, 1,2,3,4,7,	070648-26-9	...	...	2.3E-09	...	...	2.3E-08
Hexachlorinated dibenzofuran, 1,2,3,6,7,	057117-44-9	...	...	2.3E-09	...	...	2.3E-08

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		AIR PATHWAY			GROUND WATER PATHWAY		
Substance Name	CAS Number	NAAQS/NESHAPS (µg/m3)	Reference Dose Screen Conc (mg/m3)	Cancer Risk Screen Conc (mg/m3)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)
Hexachlorinated dibenzofuran, 1,2,3,7,8,	072918-21-9	...	...	2.3E-09	...	...	2.3E-08
Hexachlorinated dibenzofuran, 2,3,4,6,7,	060851-34-5	...	...	2.3E-09	...	...	2.3E-08
Hexachlorobenzene	000118-74-1	...	...	2.2E-06	1.0E-03	2.8E-02	2.2E-05
Hexachlorobutadiene	000087-68-3	...	...	4.5E-05	...	7.0E-03*	4.5E-04
Hexachlorocyclohexane, alpha-	000319-84-6	...	...	5.6E-07	...	...	5.6E-06
Hexachlorocyclohexane, beta-	000319-85-7	...	...	1.9E-06	...	...	1.9E-05
Hexachlorocyclohexane, delta-	000319-86-8	...	...	...	...	...	...
Hexachlorocyclopentadiene	000077-47-4	...	7.0E-05	...	5.0E-02	2.5E-01	...
Hexachloroethane	000067-72-1	...	...	2.5E-04	...	3.5E-02	2.5E-03
Hexachlorophene	000070-30-4	...	...	...	...	1.1E-02	...
Hexane	000110-54-3	...	2.0E-01	...	...	2.1E+00	...
Hydrazine	000302-01-2	...	...	2.0E-07	...	...	1.2E-05
Hydrochloric acid	007647-01-0	...	7.0E-03	...	...	...	...
Hydrogen cyanide	000074-90-8	...	...	...	...	7.0E-01	...
Hydrogen sulfide	007783-06-4	...	9.0E-04*	...	...	1.1E-01*	...
Indeno(1,2,3-CD)pyrene	000193-39-5	...	...	...	... *	...	...
Ioxynil	001689-83-4	...	...	...	...	...	...
Iron	015438-31-0	...	...	...	...	...	...
Isobutanol	000078-83-1	...	...	...	...	1.1E+01	...
Isophorone	000078-59-1	...	...	...	...	7.0E+00	3.7E-02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

SCDM Version: JUN94

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Kepone	000143-50-0	...	...	...	...	...	...
Lead	007439-92-1	1.5E+00	...	...	1.5E-02*	...	...
Lindane	000058-89-9	...	...	...	2.0E-04	1.1E-02	2.7E-05
Magnesium	007439-95-4	...	...	...	...	...	...
Malathion	000121-75-5	...	...	...	...	7.0E-01	...
Maleic anhydride	000108-31-6	...	...	...	...	3.5E+00	...
Maleic hydrazide	000123-33-1	...	...	...	...	1.8E+01	...
Manganese	007439-96-5	...	4.0E-04	...	... *	1.8E-01*	...
Mercury	007439-97-6	...	3.0E-04	...	2.0E-03	1.1E-02	...
Methacrylonitrile	000126-98-7	...	7.0E-04*	...	...	3.5E-03	...
Methanol	000067-56-1	...	...	...	...	1.8E+01	...
Methomyl	016752-77-5	...	...	...	...	8.8E-01	...
Methoxychlor	000072-43-5	...	...	...	4.0E-02	1.8E-01	...
Methyl chlorocarbonate	000079-22-1	...	...	...	...	...	...
Methyl ethyl ketone	000078-93-3	...	1.0E+00	...	...	2.1E+01*	...
Methyl isobutyl ketone	000108-10-1	...	8.1E-02*	...	...	1.8E+00	...
Methyl methacrylate	000080-62-6	...	...	...	...	2.8E+00	...
Methyl Napthalene, 2-	000091-57-6	...	...	...	...	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	...	...	2.7E-05	...	2.5E-02	2.7E-04
Methylene chloride	000075-09-2	...	3.0E+00	2.1E-03	5.0E-03*	2.1E+00	4.7E-03

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	...	2.0E-05	...	...	...	...
Metribuzin	021087-64-9	...	...	...	...	8.8E-01	...
Mirex	002385-85-5	...	...	...	...	7.0E-03	1.9E-05
Naphthalene	000091-20-3	...	...	...	...	... *	...
Nickel	007440-02-0	...	...	...	1.0E-01	7.0E-01	...
Nitric acid	007697-37-2	...	...	...	...	...	...
Nitric oxide	010102-43-9	...	...	...	...	3.5E+00	...
Nitroaniline, p-	000100-01-6	...	...	...	...	...	...
Nitrobenzene	000098-95-3	...	2.0E-03*	...	...	1.8E-02	...
Nitrogen dioxide	010102-44-0	1.0E+02	...	...	...	3.5E+01	...
Nitroglycerine	000055-63-0	...	...	...	...	...	...
Nitrophenol, 4-	000100-02-7	...	...	...	...	...	...
Nitroso-di-n-butylamine, N-	000924-16-3	...	...	6.3E-07	...	...	6.5E-06
Nitroso-di-n-methylurethane, N-	000615-53-2	...	...	...	...	...	...
Nitrosodiethanolamine, N-	001116-54-7	...	...	...	...	...	1.3E-05
Nitrosodiethylamine, N-	000055-18-5	...	...	2.3E-08	...	...	2.3E-07
Nitrosodimethylamine, N-	000062-75-9	...	...	7.1E-08	...	...	6.9E-07
Nitrosodiphenylamine, N-	000086-30-6	...	...	...	...	...	7.1E-03
Nitrosopyrrolidine, N-	000930-55-2	...	...	1.6E-06	...	...	1.7E-05
Nitrotoluene, 4-	000099-99-0	...	...	...	...	3.5E-01	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Parathion, ethyl-	000056-38-2	...	...	...	...	2.1E-01	...
Parathion, methyl-	000298-00-0	...	...	...	...	8.8E-03	...
PCBs	001336-36-3	...	...	...	5.0E-04	...	4.5E-06
Pentachlorinated dibenzo-p-dioxin, 1,2,3	040321-76-4	...	...	5.0E-11	...	...	4.7E-10
Pentachlorinated dibenzofuran, 1,2,3,7,8	109719-77-9	...	...	2.3E-10	...	...	2.3E-09
Pentachlorinated dibenzofuran, 2,3,4,7,8	057117-41-6	...	...	2.3E-10	...	...	2.3E-09
Pentachlorobenzene	000608-93-5	...	...	...	...	2.8E-02	...
Pentachloroethane	000076-01-7	...	...	...	...	...	...
Pentachloronitrobenzene	000082-68-8	...	...	...	...	1.1E-01	1.3E-04
Pentachlorophenol	000087-86-5	...	...	...	1.0E-03	1.1E+00	2.9E-04
Phenanthrene	000085-01-8	...	...	...	...	...	...
Phenol	000108-95-2	...	...	...	...	2.1E+01	...
Phenyl sulfide	000139-66-2	...	...	...	...	...	...
Phenylmercuric acetate	000062-38-4	...	...	...	...	2.8E-03	...
Phorate	000298-02-2	...	...	...	...	7.0E-03	...
Phosgene	000075-44-5	...	...	...	...	...	...
Phosphamidon	013171-21-6	...	...	...	...	...	...
Phosphine	007803-51-2	...	3.0E-05	...	...	1.1E-02	...
Phosphoric acid	007664-38-2	...	...	...	...	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	...	...	...	...	3.5E-04	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		AIR PATHWAY			GROUND WATER PATHWAY		
Substance Name	CAS Number	NAAQS/NESHAPS (µg/m3)	Reference Dose Screen Conc (mg/m3)	Cancer Risk Screen Conc (mg/m3)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)
Phosphorous (elemental)	007723-14-0	...	...	...	...	...	...
Phthalic anhydride	000085-44-9	...	1.2E-01*	...	...	7.0E+01	...
Plutonium	007440-07-5	...	...	...	...	...	...
Polychlorinated triphenyl	012642-23-8	...	...	...	...	...	...
Potassium silver cyanide	000506-61-6	...	...	...	...	7.0E+00	...
Pronamide	023950-58-5	...	...	...	...	2.6E+00	...
Pyrene	000129-00-0	...	...	...	...	1.1E+00	...
Pyridine	000110-86-1	...	...	...	...	3.5E-02	...
Quinoline	000091-22-5	...	...	...	...	...	2.9E-06
Radium	007440-14-4	...	...	...	...	...	...
Radon	010043-92-2	...	...	...	...	...	...
Resorcinol	000108-46-3	...	...	...	...	...	...
Ronnel	000299-84-3	...	...	...	...	1.8E+00	...
Selenium	007782-49-2	...	...	...	5.0E-02	1.8E-01	...
Selenourea	000630-10-4	...	...	...	...	1.8E-01	...
Silver	007440-22-4	...	...	...	...	1.8E-01	...
Silver Cyanide	000506-64-9	...	...	...	...	3.5E+00	...
Sodium	007440-23-5	...	...	...	...	...	...
Strontium	007440-24-6	...	...	...	...	2.1E+01	...
Strychnine	000057-24-9	...	...	...	...	1.1E-02	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Styrene	000100-42-5	...	1.0E+00	...	1.0E-01	7.0E+00	...
Sulfuric acid	007664-93-9	...	...	...	...	...	...
TB, 2,4,5-	000093-80-1	...	...	...	...	...	...
TCDD	001746-01-6	...	...	2.0E-11	3.0E-08*	...	2.3E-10
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	...	...	...	...	1.1E-02	...
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	...	2.3E-10	...	...	2.3E-09
Tetrachloroethane, 1,1,1,2-	000630-20-6	...	...	1.3E-04	...	1.1E+00	1.3E-03
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	...	1.8E-05	...	...	1.8E-04
Tetrachloroethene	000127-18-4	...	...	1.8E-03	5.0E-03	3.5E-01	6.7E-04
Tetrachlorophenol, 2,3,4,6-	000058-90-2	...	...	...	...	1.1E+00	...
Tetraethyl lead	000078-00-2	...	...	...	...	3.5E-06	...
Tetraethyldithiopyrophosphate	003689-24-5	...	...	...	...	1.8E-02	...
Tetrahydrofuran	000109-99-9	...	...	...	...	...	...
Thallium	007440-28-0	...	...	...	5.0E-04	...	...
Thiourea	000062-56-6	...	...	...	...	...	...
Thiram	000137-26-8	...	...	...	...	1.8E-01	...
Thorium	007440-29-1	...	...	...	...	...	...
Toluene	000108-88-3	...	4.0E-01	...	1.0E+00	7.0E+00	...
Toluene diisocyanate	000584-84-9	...	...	...	...	...	...
Toxaphene	008001-35-2	...	...	3.2E-06	3.0E-03	...	3.2E-05

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		AIR PATHWAY			GROUND WATER PATHWAY		
Substance Name	CAS Number	NAAQS/NESHAPS (µg/m3)	Reference Dose Screen Conc (mg/m3)	Cancer Risk Screen Conc (mg/m3)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)
TP, 2,4,5-	000093-72-1	...	...	...	5.0E-02	2.8E-01	...
Tribromomethane	000075-25-2	...	...	9.1E-04	...	7.0E-01	4.4E-03
Trichloro-1,2,2-Trifluoroethane, 1,1,2-	000076-13-1	...	3.0E+01*	...	...	1.1E+03	...
Trichlorobenzene, 1,2,4-	000120-82-1	...	9.1E-03*	...	7.0E-02	3.5E-01	...
Trichloroethane, 1,1,1-	000071-55-6	...	...	...	2.0E-01	... *	...
Trichloroethane, 1,1,2-	000079-00-5	...	...	6.3E-05	3.0E-03	1.4E-01	6.1E-04
Trichloroethylene	000079-01-6	...	...	5.8E-04	5.0E-03	...	3.2E-03
Trichlorofluoromethane	000075-69-4	...	7.0E-01*	...	...	1.1E+01	...
Trichlorophenol, 2,3,5-	000933-78-8	...	...	...	...	...	...
Trichlorophenol, 2,3,6-	000933-75-5	...	...	...	...	...	...
Trichlorophenol, 2,4,5-	000095-95-4	...	...	...	...	3.5E+00	...
Trichlorophenol, 2,4,6-	000088-06-2	...	...	3.2E-04	...	...	3.2E-03
Trichlorophenol, 3,4,5-	000609-19-8	...	...	...	...	...	...
Trichlorophenoxyacetic acid, 2,4,5-	000093-76-5	...	...	...	...	3.5E-01	...
Trichloropropane, 1,2,3-	000096-18-4	...	...	...	...	2.1E-01	...
Triethanolamine	000102-71-6	...	...	...	...	...	...
Trifluralin	001582-09-8	...	...	...	...	2.6E-01	4.5E-03
Trinitrobenzene, 1,3,5-	000099-35-4	...	...	...	...	1.8E-03	...
Trinitrotoluene	000118-96-7	...	...	...	...	1.8E-02	1.2E-03
Tris (2,3-dibromopropyl) phosphate	000126-72-7	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Uranium	007440-61-1	...	...	...	...	...	...
Vanadium	007440-62-2	...	...	...	...	2.5E-01	...
Vanadium pentoxide	001314-62-1	...	...	...	...	3.2E-01	...
Vinyl acetate	000108-05-4	...	2.0E-01	...	...	3.5E+01	...
Vinyl chloride	000075-01-4	...	...	1.2E-05	2.0E-03	...	1.8E-05
Warfarin	000081-81-2	...	...	...	...	1.1E-02	...
Xylene, m-	000108-38-3	...	...	...	1.0E+01*	7.0E+01	...
Xylene, o-	000095-47-6	...	...	...	1.0E+01*	7.0E+01	...
Xylene, p-	000106-42-3	...	...	...	1.0E+01*	...	...
Zinc	007440-66-6	...	...	...	...	1.1E+01	...
Zinc cyanide	000557-21-1	...	...	...	...	1.8E+00	...
Zinc phosphide	001314-84-7	...	...	...	...	1.1E-02	...
Zinc sulfate	007733-02-0	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Acenaphthene	000083-32-9	...	2.1E+00	...	...	7.8E+01	...	...	...
Acenaphthylene	000208-96-8	...	...	...	...	...	...	...	...
Acetaldehyde	000075-07-0	...	...	...	...	...	...	...	...
Acetone	000067-64-1	...	3.5E+00	...	...	1.3E+02	...	...	...
Acetonitrile	000075-05-8	...	2.1E-01	...	...	7.8E+00	...	...	...
Acetophenone	000098-86-2	...	3.5E+00	...	...	1.3E+02	...	...	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...	...	...	...	...	...	...
Acrolein	000107-02-8	...	7.0E-01	...	...	2.6E+01	...	...	...
Acrylamide	000079-06-1	...	7.0E-03	7.8E-06	...	2.6E-01	2.9E-04	...	...
Acrylic acid	000079-10-7	...	2.8E+00	...	...	1.0E+02	...	...	...
Acrylonitrile	000107-13-1	...	...	6.5E-05	...	...	2.4E-03	...	...
Adipic acid	000124-04-9	...	...	...	...	...	...	...	...
Aldicarb	000116-06-3	... *	3.5E-02*	...	...	1.3E+00*	...	...	...
Aldrin	000309-00-2	...	1.1E-03	2.1E-06	3.0E-01	3.9E-02	7.6E-05	3.0E+00	1.3E+00
Allyl alcohol	000107-18-6	...	1.8E-01	...	...	6.5E+00	...	...	...
Aluminum	007429-90-5	...	...	...	...	...	...	...	...
Aluminum phosphide	020859-73-8	...	1.4E-02	...	...	5.2E-01	...	...	...
Ammonia	007664-41-7	...	1.2E+03	...	...	4.4E+04	...	...	...
Ammonium picrate	000131-74-8	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Ammonium sulfamate	007773-06-0	...	7.0E+00	...	...	2.6E+02	...	...	...
Aniline	000062-53-3	...	...	6.3E-03	...	...	2.3E-01	...	...
Anthracene	000120-12-7	...	1.1E+01	...	...	3.9E+02	...	...	...
Antimony	007440-36-0	6.0E-03*	1.4E-02	...	...	5.2E-01	...	...	...
Arsenic	007440-38-2	5.0E-02	1.1E-02	2.0E-05	...	3.9E-01	7.4E-04	1.9E+02	3.6E+01
Asbestos	001332-21-4	...	...	...	...	...	...	...	...
Atrazine	001912-24-9	3.0E-03	1.2E+00*	1.6E-04	...	4.6E+01*	5.9E-03	...	...
Azinphos- ethyl	002642-71-9	...	...	...	...	...	...	...	...
Azinphos- methyl	000086-50-0	...	...	...	...	...	...	...	...
Aziridine	000151-56-4	...	...	...	...	...	...	...	...
Barium	007440-39-3	2.0E+00	2.5E+00	...	...	9.1E+01	...	...	...
Barium cyanide	000542-62-1	...	3.5E+00	...	...	1.3E+02	...	...	...
Benz(a)anthracene	000056-55-3	... *	...	...	...	...	...	...	...
Benzene	000071-43-2	5.0E-03	...	1.2E-03	...	...	4.5E-02	...	...
Benzene carbonyl chloride	000098-88-4	...	...	...	...	...	...	...	...
Benzidine	000092-87-5	...	1.1E-01	1.5E-07	...	3.9E+00	5.7E-06	...	...
Benzo(a)pyrene	000050-32-8	2.0E-04	...	4.8E-06	...	...	1.8E-04	...	...
Benzo(g,h,i)perylene	000191-24-2	...	...	...	...	...	...	...	...
Benzo(j,k)fluorene	000206-44-0	...	1.4E+00	...	...	5.2E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Benzo(k)fluoranthene	000207-08-9	... *	...	...	...	...	...	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...	...	...	...	...	...	...
Benzoic acid	000065-85-0	...	1.4E+02	...	...	5.2E+03	...	...	...
Benzonitrile	000100-47-0	...	...	...	...	...	...	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...	...	...	...	...	...	...
Benzyl chloride	000100-44-7	...	...	2.1E-04	...	...	7.6E-03	...	...
Beryllium	007440-41-7	4.0E-03*	1.8E-01	8.1E-06	...	6.5E+00	3.0E-04	...	...
Biphenyl, 1,1-	000092-52-4	...	1.8E+00	...	...	6.5E+01	...	...	...
Bis (2-ethylhexyl) phthalate	000117-81-7	...	7.0E-01	2.5E-03	...	2.6E+01	9.3E-02	...	...
Bis(2-chloroethoxy)methane	000111-91-1	...	...	...	...	...	...	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	...	3.2E-05	...	...	1.2E-03	...	...
Bis(chloromethyl)ether	000542-88-1	...	...	1.6E-07	...	...	5.9E-06	...	...
Boron	007440-42-8	...	3.2E+00	...	...	1.2E+02	...	...	...
Bromodichloromethane	000075-27-4	...	7.0E-01	5.6E-04*	...	2.6E+01	2.1E-02*	...	...
Bromomethane	000074-83-9	...	4.9E-02	...	...	1.8E+00	...	...	...
Bromoxynil	001689-84-5	...	7.0E-01	...	...	2.6E+01	...	...	...
Butadiene, 1,3-	000106-99-0	...	...	...	...	...	...	...	...
Butanol	000071-36-3	...	3.5E+00	...	...	1.3E+02	...	...	...
Butylbenzyl phthalate	000085-68-7	... *	7.0E+00	...	...	2.6E+02	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	...	2.8E-01	...	...	1.0E+01	...	...	...
Cadmium	007440-43-9	5.0E-03	1.8E-02	...	...	1.3E+00	...	1.1E+00	9.3E+00
Captan	000133-06-2	...	4.6E+00	1.0E-02	...	1.7E+02	3.7E-01	...	...
Carbaryl	000063-25-2	...	3.5E+00	...	...	1.3E+02	...	...	...
Carbofuran	001563-66-2	4.0E-02	1.8E-01	...	...	6.5E+00	...	...	...
Carbon disulfide	000075-15-0	...	3.5E+00	...	...	1.3E+02	...	...	...
Carbon Tetrachloride	000056-23-5	5.0E-03	2.5E-02	2.7E-04	...	9.1E-01	1.0E-02	...	...
Carbophenothion	000786-19-6	...	...	...	...	...	...	...	...
Cesium	007440-46-2	...	...	...	...	...	...	...	...
Chloral	000075-87-6	...	7.0E-02	...	...	2.6E+00	...	...	...
Chlordane	000057-74-9	2.0E-03	2.1E-03	2.7E-05	3.0E-01	7.8E-02	1.0E-03	4.3E-03	4.0E-03
Chlorine cyanide	000506-77-4	...	1.8E+00	...	...	6.5E+01	...	4.0E-03	4.0E-03
Chloro-3-methylphenol, 4-	000059-50-7	...	7.0E+01	...	...	2.6E+03	...	...	...
Chloroaniline, p-	000106-47-8	...	1.4E-01	...	...	5.2E+00	...	...	...
Chlorobenzene	000108-90-7	...	7.0E-01	...	...	2.6E+01	...	...	...
Chloroform	000067-66-3	...	3.5E-01	5.7E-03	...	1.3E+01	2.1E-01	...	...
Chloromethane	000074-87-3	...	...	2.7E-03	...	...	1.0E-01	...	...
Chloromethyl methyl ether	000107-30-2	...	...	...	...	...	...	...	...
Chloromethyloxirane, 2-	000106-89-8	...	7.0E-02*	3.5E-03	...	2.6E+00*	1.3E-01	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Chloronaphthalene, 2-	000091-58-7	...	2.8E+00	...	...	1.0E+02	...	...	...
Chlorophenol, 2-	000095-57-8	...	1.8E-01	...	...	6.5E+00	...	...	...
Chlorpyrifos	002921-88-2	...	1.1E-01	...	...	3.9E+00	...	4.1E-02	5.6E-03
Chromium	007440-47-3	1.0E-01	1.8E-01	...	...	6.5E+00	...	...	...
Chromium(III)	016065-83-1	...	3.5E+01	...	...	1.3E+03	...	2.1E+02	2.1E+02
Chromium(VI)	018540-29-9	...	1.8E-01*	...	...	6.5E+00*	...	1.1E+01*	5.0E+01*
Chrysene	000218-01-9	... *	...	...	...	...	...	...	...
Cobalt	007440-48-4	...	...	...	...	...	...	...	...
Copper	007440-50-8	1.3E+00*	...	...	...	...	...	1.2E+01	2.9E+00
Copper cyanide	000544-92-3	...	1.8E-01	...	...	6.5E+00	...	...	...
Coumaphos	000056-72-4	...	...	...	...	...	...	...	...
Creosote	008001-58-9	...	...	...	...	...	...	...	...
Cresol, m-	000108-39-4	...	1.8E+00	...	...	6.5E+01	...	...	...
Cresol, p-	000106-44-5	...	1.8E-01*	...	...	6.5E+00*	...	...	...
Cumene	000098-82-8	...	1.4E+00	...	...	5.2E+01	...	...	...
Cyanazine	021725-46-2	...	7.0E-02	4.2E-05*	...	2.6E+00	1.5E-03*	...	...
Cyanide	000057-12-5	2.0E-01	7.0E-01	...	...	2.6E+01	...	5.2E+00	1.0E+00
Cyanogen	000460-19-5	...	1.4E+00	...	...	5.2E+01	...	...	...
Cyanogen bromide	000506-68-3	...	3.2E+00	...	...	1.2E+02	...	...	...

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Cyclohexane	000110-82-7	...	...	...	...	...	...	...	...
Cyclohexanone	000108-94-1	...	1.8E+02	...	...	6.5E+03	...	...	...
Cyclotrimethylenetrinitriamine	000121-82-4	...	1.1E-01	3.2E-04	...	3.9E+00	1.2E-02	...	...
DDD	000072-54-8	...	...	1.5E-04	5.0E+00	...	5.4E-03	...	...
DDE	000072-55-9	...	...	1.0E-04	5.0E+00	...	3.8E-03	...	...
DDT	000050-29-3	...	1.8E-02	1.0E-04	5.0E+00	6.5E-01	3.8E-03	1.0E-03	1.0E-03
DEF	000078-48-8	...	1.1E-02*	...	...	3.9E-01*	...	...	...
Di-n-butyl phthalate	000084-74-2	...	3.5E+00	...	...	1.3E+02	...	...	...
Di-n-octyl phthalate	000117-84-0	...	7.0E-01	...	...	2.6E+01	...	...	...
Diazinon	000333-41-5	...	3.2E-02	...	...	1.2E+00	...	...	...
Dibenz(a,h)anthracene	000053-70-3	... *	...	...	...	...	...	...	...
Dibenzofuran	000132-64-9	...	...	...	...	...	...	...	...
Dibromo-3-chloropropane, 1,2-	000096-12-8	...	...	2.5E-05	...	...	9.3E-04	...	...
Dibromochloromethane	000124-48-1	...	7.0E-01	4.2E-04	...	2.6E+01	1.5E-02	...	...
Dibromoethane, 1,2-	000106-93-4	5.0E-05	...	4.1E-07	...	...	1.5E-05	...	...
Dicamba	001918-00-9	...	1.1E+00	...	...	3.9E+01	...	...	...
Dichlorobenzene, 1,2-	000095-50-1	6.0E-01	3.2E+00	...	...	1.2E+02	...	...	...
Dichlorobenzene, 1,3-	000541-73-1	6.0E-01*	...	...	...	...	...	...	...
Dichlorobenzene, 1,4-	000106-46-7	7.5E-02	...	1.5E-03	...	...	5.4E-02	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Dichlorobenzidine, 3,3-	000091-94-1	...	...	7.8E-05	...	...	2.9E-03	...	...
Dichlorodifluoromethane	000075-71-8	...	7.0E+00	...	...	2.6E+02	...	...	...
Dichloroethane, 1,1-	000075-34-3	...	3.5E+00*	...	...	1.3E+02*	...	...	...
Dichloroethane, 1,2-	000107-06-2	5.0E-03	...	3.8E-04	...	...	1.4E-02	...	...
Dichloroethene, 1,1-	000075-35-4	7.0E-03	3.2E-01	5.8E-05	...	1.2E+01	2.2E-03	...	...
Dichloroethylene, cis-1,2-	000156-59-2	7.0E-02	3.5E-01	...	...	1.3E+01	...	...	...
Dichloroethylene, trans-1,2-	000156-60-5	1.0E-01	7.0E-01	...	...	2.6E+01	...	...	...
Dichlorophenol, 2,4-	000120-83-2	...	1.1E-01	...	...	3.9E+00	...	...	...
Dichlorophenoxyacetic acid, 2,4-	000094-75-7	7.0E-02	3.5E-01	...	...	1.3E+01	...	...	...
Dichloropropane, 1,2-	000078-87-5	5.0E-03	...	5.1E-04	...	...	1.9E-02	...	...
Dichloropropene, 1,3-	000542-75-6	...	1.1E-02	1.9E-04	...	3.9E-01	7.2E-03	...	...
Dichlorvos	000062-73-7	...	1.8E-02*	1.2E-04	...	6.5E-01*	4.5E-03	...	...
Dicofol	000115-32-2	...	...	...	...	...	...	...	...
Dieldrin	000060-57-1	...	1.8E-03	2.2E-06	3.0E-01	6.5E-02	8.1E-05	1.9E-03	1.9E-03
Diethyl phthalate	000084-66-2	...	2.8E+01	...	...	1.0E+03	...	1.9E-03	1.9E-03
Diethylene glycol	000111-46-6	...	...	...	...	...	...	...	...
Diisopropylmethyl-phosphonate	001445-75-6	...	2.8E+00	...	...	1.0E+02	...	...	...
Dimethoate	000060-51-5	...	7.0E-03	...	...	2.6E-01	...	...	...
Dimethoxybenzidine, 3,3-	000119-90-4	...	...	2.5E-03	...	...	9.3E-02	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Dimethyl phenol, 2,4-	000105-67-9	...	7.0E-01	...	...	2.6E+01	...	...	...
Dimethyl phthalate	000131-11-3	...	3.5E+02	...	...	1.3E+04	...	...	...
Dimethyl sulfate	000077-78-1	...	...	...	...	...	...	...	...
Dinitrobenzene, 1,3-	000099-65-0	...	3.5E-03	...	...	1.3E-01	...	...	...
Dinitrophenol, 2,4-	000051-28-5	...	7.0E-02	...	...	2.6E+00	...	...	...
Dinitrotoluene, 2,4-	000121-14-2	...	7.0E-02	...	...	2.6E+00	...	...	...
Dinitrotoluene, 2,6-	000606-20-2	...	3.5E-02*	...	...	1.3E+00*	...	...	...
Dinoseb	000088-85-7	7.0E-03	3.5E-02	...	...	1.3E+00	...	...	...
Dioxane, 1,4-	000123-91-1	...	...	3.2E-03	...	...	1.2E-01	...	...
Dioxathion	000078-34-2	...	...	...	...	...	...	...	...
Diphenylhydrazine, 1,2-	000122-66-7	...	...	4.4E-05	...	...	1.6E-03	...	...
Diquat	000085-00-7	2.0E-02	7.7E-02	...	...	2.9E+00	...	...	...
Disulfoton	000298-04-4	...	1.4E-03	...	...	5.2E-02	...	...	...
Diuron	000330-54-1	...	7.0E-02	...	...	2.6E+00	...	...	...
Endosulfan (I or II)	000115-29-7	...	2.1E-01*	...	...	7.8E+00*	...	5.6E-02	8.7E-03
Endosulfan sulfate	001031-07-8	...	...	...	...	...	...	...	...
Endothall	000145-73-3	1.0E-01	7.0E-01	...	...	2.6E+01	...	...	...
Endrin	000072-20-8	2.0E-03	1.1E-02	...	3.0E-01	3.9E-01	...	2.3E-03	2.3E-03
Endrin aldehyde	007421-93-4	...	... *	...	...	... *	...	2.3E-03*	2.3E-03*

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Ethion	000563-12-2	...	1.8E-02	...	...	6.5E-01	...	...	...
Ethyl acetate	000141-78-6	...	3.2E+01	...	...	1.2E+03	...	...	...
Ethyl benzene	000100-41-4	7.0E-01	3.5E+00	...	...	1.3E+02	...	...	...
Ethyl chloride	000075-00-3	...	...	...	...	...	...	...	...
Ethyl ether	000060-29-7	...	7.0E+00	...	...	2.6E+02	...	...	...
Ethyldipropylthiocarbamate, s-	000759-94-4	...	8.8E-01	...	...	3.3E+01	...	...	...
Ethylene glycol	000107-21-1	...	7.0E+01	...	...	2.6E+03	...	...	...
Ethylene glycol monoethyl ether	000110-80-5	...	...	...	...	...	...	...	...
Fenethion	000055-38-9	...	...	...	...	...	...	...	...
Ferrous sulfate	007720-78-7	...	...	...	...	...	...	...	...
Fluorene	000086-73-7	...	1.4E+00	...	...	5.2E+01	...	...	...
Fluorine	007782-41-4	...	2.1E+00	...	...	7.8E+01	...	...	...
Formaldehyde	000050-00-0	...	7.0E+00	...	...	2.6E+02	...	...	...
Formic acid	000064-18-6	...	7.0E+01	...	...	2.6E+03	...	...	...
Furan	000110-00-9	...	3.5E-02	...	...	1.3E+00	...	...	...
Furfural	000098-01-1	...	1.1E-01	...	...	3.9E+00	...	...	...
Glycidylaldehyde	000765-34-4	...	1.4E-02	...	...	5.2E-01	...	...	...
Heptachlor	000076-44-8	4.0E-04*	1.8E-02	7.8E-06	3.0E-01	6.5E-01	2.9E-04	3.8E-03	3.6E-03
Heptachlor epoxide	001024-57-3	2.0E-04	4.6E-04	3.8E-06	3.0E-01	1.7E-02	1.4E-04	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Heptachlorinated dibenzo-p-dioxin, 1,2,3	035822-46-9	...	...	2.3E-07	...	...	8.7E-06	...	...
Heptachlorinated dibenzofuran, 1,2,3,4,	067562-39-4	...	...	2.3E-07	...	...	8.7E-06	...	...
Heptachlorinated dibenzofuran, 1,2,3,4,	055673-89-7	...	...	2.3E-07	...	...	8.7E-06	...	...
Hexabromobenzene	000087-82-1	...	7.0E-02	...	...	2.6E+00	...	...	...
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	039227-28-6	...	...	5.8E-10	...	...	2.2E-08	...	...
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	057653-85-7	...	...	5.8E-10	...	...	2.2E-08	...	...
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	019408-74-3	...	...	5.7E-09	...	...	2.1E-07	...	...
Hexachlorinated dibenzofuran, 1,2,3,4,7,	070648-26-9	...	...	2.3E-08	...	...	8.7E-07	...	...
Hexachlorinated dibenzofuran, 1,2,3,6,7,	057117-44-9	...	...	2.3E-08	...	...	8.7E-07	...	...
Hexachlorinated dibenzofuran, 1,2,3,7,8,	072918-21-9	...	...	2.3E-08	...	...	8.7E-07	...	...
Hexachlorinated dibenzofuran, 2,3,4,6,7,	060851-34-5	...	...	2.3E-08	...	...	8.7E-07	...	...
Hexachlorobenzene	000118-74-1	1.0E-03	2.8E-02	2.2E-05	...	1.0E+00	8.1E-04	...	...
Hexachlorobutadiene	000087-68-3	...	7.0E-03*	4.5E-04	...	2.6E-01*	1.7E-02	...	...
Hexachlorocyclohexane, alpha-	000319-84-6	...	...	5.6E-06	...	...	2.1E-04	...	...
Hexachlorocyclohexane, beta-	000319-85-7	...	...	1.9E-05	...	...	7.2E-04	...	...
Hexachlorocyclohexane, delta-	000319-86-8	...	...	...	...	...	...	...	...
Hexachlorocyclopentadiene	000077-47-4	5.0E-02	2.5E-01	...	...	9.1E+00	...	...	...
Hexachloroethane	000067-72-1	...	3.5E-02	2.5E-03	...	1.3E+00	9.3E-02	...	...
Hexachlorophene	000070-30-4	...	1.1E-02	...	...	3.9E-01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Hexane	000110-54-3	...	2.1E+00	...	...	7.8E+01	...	...	...
Hydrazine	000302-01-2	...	...	1.2E-05	...	...	4.3E-04	...	...
Hydrochloric acid	007647-01-0	...	...	...	...	...	...	...	...
Hydrogen cyanide	000074-90-8	...	7.0E-01	...	...	2.6E+01	...	...	...
Hydrogen sulfide	007783-06-4	...	1.1E-01*	...	...	3.9E+00*	...	2.0E+00*	2.0E+00*
Indeno(1,2,3-CD)pyrene	000193-39-5	... *	...	...	...	...	...	...	...
Ioxynil	001689-83-4	...	...	...	...	...	...	...	...
Iron	015438-31-0	...	...	...	...	...	...	1.0E+03	1.0E+03
Isobutanol	000078-83-1	...	1.1E+01	...	...	3.9E+02	...	...	...
Isophorone	000078-59-1	...	7.0E+00	3.7E-02	...	2.6E+02	1.4E+00	...	...
Kepone	000143-50-0	...	...	...	3.0E-01	...	...	...	...
Lead	007439-92-1	1.5E-02*	...	...	...	...	...	3.2E+00	5.6E+00
Lindane	000058-89-9	2.0E-04	1.1E-02	2.7E-05	...	3.9E-01	1.0E-03	8.0E-02	8.0E-02
Magnesium	007439-95-4	...	...	...	...	...	...	...	...
Malathion	000121-75-5	...	7.0E-01	...	...	2.6E+01	...	1.0E-01	1.0E-01
Maleic anhydride	000108-31-6	...	3.5E+00	...	...	1.3E+02	...	...	...
Maleic hydrazide	000123-33-1	...	1.8E+01	...	...	6.5E+02	...	...	...
Manganese	007439-96-5	... *	1.8E-01*	...	...	6.5E+00*	...	...	...
Mercury	007439-97-6	2.0E-03	1.1E-02	...	1.0E+00	3.9E-01	...	1.2E-02	2.5E-02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Methacrylonitrile	000126-98-7	...	3.5E-03	...	...	1.3E-01	...	...	...
Methanol	000067-56-1	...	1.8E+01	...	...	6.5E+02	...	...	...
Methomyl	016752-77-5	...	8.8E-01	...	...	3.3E+01	...	...	...
Methoxychlor	000072-43-5	4.0E-02	1.8E-01	...	...	6.5E+00	...	3.0E-02	3.0E-02
Methyl chlorocarbonate	000079-22-1	...	...	...	...	...	...	...	...
Methyl ethyl ketone	000078-93-3	...	2.1E+01*	...	...	7.8E+02*	...	...	...
Methyl isobutyl ketone	000108-10-1	...	1.8E+00	...	...	6.5E+01	...	...	...
Methyl methacrylate	000080-62-6	...	2.8E+00	...	...	1.0E+02	...	...	...
Methyl Napthalene, 2-	000091-57-6	...	...	...	...	...	...	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	...	2.5E-02	2.7E-04	...	9.1E-01	1.0E-02	...	...
Methylene chloride	000075-09-2	5.0E-03*	2.1E+00	4.7E-03	...	7.8E+01	1.7E-01	...	...
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	...	...	...	...	...	...	...	...
Metribuzin	021087-64-9	...	8.8E-01	...	...	3.3E+01	...	...	...
Mirex	002385-85-5	...	7.0E-03	1.9E-05	1.0E-01	2.6E-01	7.2E-04	1.0E-03	1.0E-03
Naphthalene	000091-20-3	...	... *	...	...	... *	...	...	...
Nickel	007440-02-0	1.0E-01	7.0E-01	...	...	2.6E+01	...	1.6E+02	8.3E+00
Nitric acid	007697-37-2	...	...	...	...	...	...	...	...
Nitric oxide	010102-43-9	...	3.5E+00	...	...	1.3E+02	...	...	...
Nitroaniline, p-	000100-01-6	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Nitrobenzene	000098-95-3	...	1.8E-02	...	...	6.5E-01	...	...	...
Nitrogen dioxide	010102-44-0	...	3.5E+01	...	...	1.3E+03	...	...	...
Nitroglycerine	000055-63-0	...	...	...	...	...	...	...	...
Nitrophenol, 4-	000100-02-7	...	...	...	...	...	...	...	...
Nitroso-di-n-butylamine, N-	000924-16-3	...	...	6.5E-06	...	...	2.4E-04	...	...
Nitroso-di-n-methylurethane, N-	000615-53-2	...	...	...	...	...	...	...	...
Nitrosodiethanolamine, N-	001116-54-7	...	...	1.3E-05	...	...	4.6E-04	...	...
Nitrosodiethylamine, N-	000055-18-5	...	...	2.3E-07	...	...	8.7E-06	...	...
Nitrosodimethylamine, N-	000062-75-9	...	...	6.9E-07	...	...	2.5E-05	...	...
Nitrosodiphenylamine, N-	000086-30-6	...	...	7.1E-03	...	...	2.7E-01	...	...
Nitrosopyrrolidine, N-	000930-55-2	...	...	1.7E-05	...	...	6.2E-04	...	...
Nitrotoluene, 4-	000099-99-0	...	3.5E-01	...	...	1.3E+01	...	...	...
Parathion, ethyl-	000056-38-2	...	2.1E-01	...	...	7.8E+00	...	...	...
Parathion, methyl-	000298-00-0	...	8.8E-03	...	...	3.3E-01	...	...	...
PCBs	001336-36-3	5.0E-04	...	4.5E-06	...	...	1.7E-04	1.4E-02	3.0E-02
Pentachlorinated dibenzo-p-dioxin, 1,2,3	040321-76-4	...	...	4.7E-10	...	...	1.7E-08	...	...
Pentachlorinated dibenzofuran, 1,2,3,7,8	109719-77-9	...	...	2.3E-09	...	...	8.7E-08	...	...
Pentachlorinated dibenzofuran, 2,3,4,7,8	057117-41-6	...	...	2.3E-09	...	...	8.7E-08	...	...
Pentachlorobenzene	000608-93-5	...	2.8E-02	...	...	1.0E+00	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Pentachloroethane	000076-01-7	...	...	...	...	...	...	...	...
Pentachloronitrobenzene	000082-68-8	...	1.1E-01	1.3E-04	...	3.9E+00	5.0E-03	...	...
Pentachlorophenol	000087-86-5	1.0E-03	1.1E+00	2.9E-04	...	3.9E+01	1.1E-02	1.3E+01	1.3E+01
Phenanthrene	000085-01-8	...	...	...	...	...	...	...	...
Phenol	000108-95-2	...	2.1E+01	...	...	7.8E+02	...	...	...
Phenyl sulfide	000139-66-2	...	...	...	...	...	...	...	...
Phenylmercuric acetate	000062-38-4	...	2.8E-03	...	...	1.0E-01	...	...	...
Phorate	000298-02-2	...	7.0E-03	...	...	2.6E-01	...	...	...
Phosgene	000075-44-5	...	...	...	...	...	...	...	...
Phosphamidon	013171-21-6	...	...	...	...	...	...	...	...
Phosphine	007803-51-2	...	1.1E-02	...	...	3.9E-01	...	...	...
Phosphoric acid	007664-38-2	...	...	...	...	...	...	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	...	3.5E-04	...	...	1.3E-02	...	...	...
Phosphorous (elemental)	007723-14-0	...	...	...	...	...	...	1.0E-01	1.0E-01
Phthalic anhydride	000085-44-9	...	7.0E+01	...	...	2.6E+03	...	...	...
Plutonium	007440-07-5	...	...	...	...	...	...	...	...
Polychlorinated triphenyl	012642-23-8	...	...	...	...	...	...	...	...
Potassium silver cyanide	000506-61-6	...	7.0E+00	...	...	2.6E+02	...	...	...
Pronamide	023950-58-5	...	2.6E+00	...	...	9.8E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Pyrene	000129-00-0	...	1.1E+00	...	...	3.9E+01	...	...	...
Pyridine	000110-86-1	...	3.5E-02	...	...	1.3E+00	...	...	...
Quinoline	000091-22-5	...	...	2.9E-06	...	...	1.1E-04	...	...
Radium	007440-14-4	...	...	...	...	...	...	...	...
Radon	010043-92-2	...	...	...	...	...	...	...	...
Resorcinol	000108-46-3	...	...	...	...	...	...	...	...
Ronnel	000299-84-3	...	1.8E+00	...	...	6.5E+01	...	...	...
Selenium	007782-49-2	5.0E-02	1.8E-01	...	...	6.5E+00	...	3.6E+01	5.4E+01
Selenourea	000630-10-4	...	1.8E-01	...	...	6.5E+00	...	...	...
Silver	007440-22-4	...	1.8E-01	...	...	6.5E+00	...	1.2E-01	1.2E-01
Silver Cyanide	000506-64-9	...	3.5E+00	...	...	1.3E+02	...	...	...
Sodium	007440-23-5	...	...	...	...	...	...	...	...
Strontium	007440-24-6	...	2.1E+01	...	...	7.8E+02	...	...	...
Strychnine	000057-24-9	...	1.1E-02	...	...	3.9E-01	...	...	...
Styrene	000100-42-5	1.0E-01	7.0E+00	...	...	2.6E+02	...	...	...
Sulfuric acid	007664-93-9	...	...	...	...	...	...	...	...
TB, 2,4,5-	000093-80-1	...	...	...	...	...	...	...	...
TCDD	001746-01-6	3.0E-08*	...	2.3E-10	...	...	8.7E-09	...	...
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	...	1.1E-02	...	...	3.9E-01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	...	2.3E-09	...	...	8.7E-08	...	...
Tetrachloroethane, 1,1,1,2-	000630-20-6	...	1.1E+00	1.3E-03	...	3.9E+01	5.0E-02	...	...
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	...	1.8E-04	...	...	6.5E-03	...	...
Tetrachloroethene	000127-18-4	5.0E-03	3.5E-01	6.7E-04	...	1.3E+01	2.5E-02	...	...
Tetrachlorophenol, 2,3,4,6-	000058-90-2	...	1.1E+00	...	...	3.9E+01	...	...	...
Tetraethyl lead	000078-00-2	...	3.5E-06	...	...	1.3E-04	...	...	...
Tetraethyldithiopyrophosphate	003689-24-5	...	1.8E-02	...	...	6.5E-01	...	...	...
Tetrahydrofuran	000109-99-9	...	...	...	...	...	...	...	...
Thallium	007440-28-0	5.0E-04	...	...	...	...	...	...	...
Thiourea	000062-56-6	...	...	...	...	...	...	...	...
Thiram	000137-26-8	...	1.8E-01	...	...	6.5E+00	...	...	...
Thorium	007440-29-1	...	...	...	...	...	...	...	...
Toluene	000108-88-3	1.0E+00	7.0E+00	...	...	2.6E+02	...	...	...
Toluene diisocyanate	000584-84-9	...	...	...	...	...	...	...	...
Toxaphene	008001-35-2	3.0E-03	...	3.2E-05	5.0E+00	...	1.2E-03	1.3E-02	2.0E-04
TP, 2,4,5-	000093-72-1	5.0E-02	2.8E-01	...	...	1.0E+01	...	...	...
Tribromomethane	000075-25-2	...	7.0E-01	4.4E-03	...	2.6E+01	1.6E-01	...	...
Trichloro-1,2,2-Trifluoroethane, 1,1,2-	000076-13-1	...	1.1E+03	...	...	3.9E+04	...	...	...
Trichlorobenzene, 1,2,4-	000120-82-1	7.0E-02	3.5E-01	...	...	1.3E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Trichloroethane, 1,1,1-	000071-55-6	2.0E-01	... *	...	...	... *	...	...	...
Trichloroethane, 1,1,2-	000079-00-5	3.0E-03	1.4E-01	6.1E-04	...	5.2E+00	2.3E-02	...	...
Trichloroethylene	000079-01-6	5.0E-03	...	3.2E-03	...	...	1.2E-01	...	...
Trichlorofluoromethane	000075-69-4	...	1.1E+01	...	...	3.9E+02	...	...	...
Trichlorophenol, 2,3,5-	000933-78-8	...	...	...	...	...	...	...	...
Trichlorophenol, 2,3,6-	000933-75-5	...	...	...	...	...	...	...	...
Trichlorophenol, 2,4,5-	000095-95-4	...	3.5E+00	...	...	1.3E+02	...	...	...
Trichlorophenol, 2,4,6-	000088-06-2	...	...	3.2E-03	...	...	1.2E-01	...	...
Trichlorophenol, 3,4,5-	000609-19-8	...	...	...	...	...	...	...	...
Trichlorophenoxyacetic acid, 2,4,5-	000093-76-5	...	3.5E-01	...	...	1.3E+01	...	...	...
Trichloropropane, 1,2,3-	000096-18-4	...	2.1E-01	...	...	7.8E+00	...	...	...
Triethanolamine	000102-71-6	...	...	...	...	...	...	...	...
Trifluralin	001582-09-8	...	2.6E-01	4.5E-03	...	9.8E+00	1.7E-01	...	...
Trinitrobenzene, 1,3,5-	000099-35-4	...	1.8E-03	...	...	6.5E-02	...	...	...
Trinitrotoluene	000118-96-7	...	1.8E-02	1.2E-03	...	6.5E-01	4.3E-02	...	...
Tris (2,3-dibromopropyl) phosphate	000126-72-7	...	...	...	...	...	...	...	...
Uranium	007440-61-1	...	...	...	...	...	...	...	...
Vanadium	007440-62-2	...	2.5E-01	...	...	9.1E+00	...	...	...
Vanadium pentoxide	001314-62-1	...	3.2E-01	...	...	1.2E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Vinyl acetate	000108-05-4	...	3.5E+01	...	...	1.3E+03	...	...	...
Vinyl chloride	000075-01-4	2.0E-03	...	1.8E-05	...	...	6.8E-04	...	...
Warfarin	000081-81-2	...	1.1E-02	...	...	3.9E-01	...	...	...
Xylene, m-	000108-38-3	1.0E+01*	7.0E+01	...	...	2.6E+03	...	...	...
Xylene, o-	000095-47-6	1.0E+01*	7.0E+01	...	...	2.6E+03	...	...	...
Xylene, p-	000106-42-3	1.0E+01*	...	...	...	...	...	...	...
Zinc	007440-66-6	...	1.1E+01	...	...	3.9E+02	...	1.1E+02	8.6E+01
Zinc cyanide	000557-21-1	...	1.8E+00	...	...	6.5E+01	...	...	...
Zinc phosphide	001314-84-7	...	1.1E-02	...	...	3.9E-01	...	...	...
Zinc sulfate	007733-02-0	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Acenaphthene	000083-32-9	3.5E+04	...
Acenaphthylene	000208-96-8	...	...
Acetaldehyde	000075-07-0	...	...
Acetone	000067-64-1	5.8E+04	...
Acetonitrile	000075-05-8	3.5E+03	...
Acetophenone	000098-86-2	5.8E+04	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...
Acrolein	000107-02-8	1.2E+04	...
Acrylamide	000079-06-1	1.2E+02	1.3E-01
Acrylic acid	000079-10-7	4.7E+04	...
Acrylonitrile	000107-13-1	...	1.1E+00
Adipic acid	000124-04-9	...	...
Aldicarb	000116-06-3	5.8E+02*	...
Aldrin	000309-00-2	1.7E+01	3.4E-02
Allyl alcohol	000107-18-6	2.9E+03	...
Aluminum	007429-90-5	...	...
Aluminum phosphide	020859-73-8	2.3E+02	...
Ammonia	007664-41-7	2.0E+07	...
Ammonium picrate	000131-74-8	...	...
Ammonium sulfamate	007773-06-0	1.2E+05	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Aniline	000062-53-3	...	1.0E+02
Anthracene	000120-12-7	1.7E+05	...
Antimony	007440-36-0	2.3E+02	...
Arsenic	007440-38-2	1.7E+02	3.3E-01
Asbestos	001332-21-4	...	...
Atrazine	001912-24-9	2.0E+04*	2.6E+00
Azinphos- ethyl	002642-71-9	...	...
Azinphos- methyl	000086-50-0	...	...
Aziridine	000151-56-4	...	...
Barium	007440-39-3	4.1E+04	...
Barium cyanide	000542-62-1	5.8E+04	...
Benz(a)anthracene	000056-55-3	...	...
Benzene	000071-43-2	...	2.0E+01
Benzene carbonyl chloride	000098-88-4	...	...
Benzidine	000092-87-5	1.7E+03	2.5E-03
Benzo(a)pyrene	000050-32-8	...	8.0E-02
Benzo(g,h,i)perylene	000191-24-2	...	...
Benzo(j,k)fluorene	000206-44-0	2.3E+04	...
Benzo(k)fluoranthene	000207-08-9	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Benzoic acid	000065-85-0	2.3E+06	...
Benzonitrile	000100-47-0	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...
Benzyl chloride	000100-44-7	...	3.4E+00
Beryllium	007440-41-7	2.9E+03	1.4E-01
Biphenyl, 1,1-	000092-52-4	2.9E+04	...
Bis (2-ethylhexyl) phthalate	000117-81-7	1.2E+04	4.2E+01
Bis(2-chloroethoxy)methane	000111-91-1	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	5.3E-01
Bis(chloromethyl)ether	000542-88-1	...	2.7E-03
Boron	007440-42-8	5.2E+04	...
Bromodichloromethane	000075-27-4	1.2E+04	9.4E+00*
Bromomethane	000074-83-9	8.2E+02	...
Bromoxynil	001689-84-5	1.2E+04	...
Butadiene, 1,3-	000106-99-0	...	...
Butanol	000071-36-3	5.8E+04	...
Butylbenzyl phthalate	000085-68-7	1.2E+05	...
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	4.7E+03	...
Cadmium	007440-43-9	2.9E+02	...
Captan	000133-06-2	7.6E+04	1.7E+02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Carbaryl	000063-25-2	5.8E+04	...
Carbofuran	001563-66-2	2.9E+03	...
Carbon disulfide	000075-15-0	5.8E+04	...
Carbon Tetrachloride	000056-23-5	4.1E+02	4.5E+00
Carbophenothion	000786-19-6	...	...
Cesium	007440-46-2	...	...
Chloral	000075-87-6	1.2E+03	...
Chlordane	000057-74-9	3.5E+01	4.5E-01
Chlorine cyanide	000506-77-4	2.9E+04	...
Chloro-3-methylphenol, 4-	000059-50-7	1.2E+06	...
Chloroaniline, p-	000106-47-8	2.3E+03	...
Chlorobenzene	000108-90-7	1.2E+04	...
Chloroform	000067-66-3	5.8E+03	9.6E+01
Chloromethane	000074-87-3	...	4.5E+01
Chloromethyl methyl ether	000107-30-2	...	...
Chloromethyloxirane, 2-	000106-89-8	1.2E+03*	5.9E+01
Chloronaphthalene, 2-	000091-58-7	4.7E+04	...
Chlorophenol, 2-	000095-57-8	2.9E+03	...
Chlorpyrifos	002921-88-2	1.7E+03	...
Chromium	007440-47-3	2.9E+03	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Chromium(III)	016065-83-1	5.8E+05	...
Chromium(VI)	018540-29-9	2.9E+03*	...
Chrysene	000218-01-9	...	...
Cobalt	007440-48-4	...	...
Copper	007440-50-8	...	...
Copper cyanide	000544-92-3	2.9E+03	...
Coumaphos	000056-72-4	...	...
Creosote	008001-58-9	...	...
Cresol, m-	000108-39-4	2.9E+04	...
Cresol, p-	000106-44-5	2.9E+03*	...
Cumene	000098-82-8	2.3E+04	...
Cyanazine	021725-46-2	1.2E+03	6.9E-01*
Cyanide	000057-12-5	1.2E+04	...
Cyanogen	000460-19-5	2.3E+04	...
Cyanogen bromide	000506-68-3	5.2E+04	...
Cyclohexane	000110-82-7	...	...
Cyclohexanone	000108-94-1	2.9E+06	...
Cyclotrimethylenetrinitriamine	000121-82-4	1.7E+03	5.3E+00
DDD	000072-54-8	...	2.4E+00
DDE	000072-55-9	...	1.7E+00

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
DDT	000050-29-3	2.9E+02	1.7E+00
DEF	000078-48-8	1.7E+02*	...
Di-n-butyl phthalate	000084-74-2	5.8E+04	...
Di-n-octyl phthalate	000117-84-0	1.2E+04	...
Diazinon	000333-41-5	5.2E+02	...
Dibenz(a,h)anthracene	000053-70-3	...	...
Dibenzofuran	000132-64-9	...	...
Dibromo-3-chloropropane, 1,2-	000096-12-8	...	4.2E-01
Dibromochloromethane	000124-48-1	1.2E+04	6.9E+00
Dibromoethane, 1,2-	000106-93-4	...	6.9E-03
Dicamba	001918-00-9	1.7E+04	...
Dichlorobenzene, 1,2-	000095-50-1	5.2E+04	...
Dichlorobenzene, 1,3-	000541-73-1	...	...
Dichlorobenzene, 1,4-	000106-46-7	...	2.4E+01
Dichlorobenzidine, 3,3-	000091-94-1	...	1.3E+00
Dichlorodifluoromethane	000075-71-8	1.2E+05	...
Dichloroethane, 1,1-	000075-34-3	5.8E+04*	...
Dichloroethane, 1,2-	000107-06-2	...	6.4E+00
Dichloroethene, 1,1-	000075-35-4	5.2E+03	9.7E-01
Dichloroethylene, cis-1,2-	000156-59-2	5.8E+03	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Dichloroethylene, trans-1,2-	000156-60-5	1.2E+04	...
Dichlorophenol, 2,4-	000120-83-2	1.7E+03	...
Dichlorophenoxyacetic acid, 2,4-	000094-75-7	5.8E+03	...
Dichloropropane, 1,2-	000078-87-5	...	8.6E+00
Dichloropropene, 1,3-	000542-75-6	1.7E+02	3.2E+00
Dichlorvos	000062-73-7	2.9E+02*	2.0E+00
Dicofol	000115-32-2	...	...
Dieldrin	000060-57-1	2.9E+01	3.6E-02
Diethyl phthalate	000084-66-2	4.7E+05	...
Diethylene glycol	000111-46-6	...	...
Diisopropylmethyl-phosphonate	001445-75-6	4.7E+04	...
Dimethoate	000060-51-5	1.2E+02	...
Dimethoxybenzidine, 3,3-	000119-90-4	...	4.2E+01
Dimethyl phenol, 2,4-	000105-67-9	1.2E+04	...
Dimethyl phthalate	000131-11-3	5.8E+06	...
Dimethyl sulfate	000077-78-1	...	...
Dinitrobenzene, 1,3-	000099-65-0	5.8E+01	...
Dinitrophenol, 2,4-	000051-28-5	1.2E+03	...
Dinitrotoluene, 2,4-	000121-14-2	1.2E+03	...
Dinitrotoluene, 2,6-	000606-20-2	5.8E+02*	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Dinoseb	000088-85-7	5.8E+02	...
Dioxane, 1,4-	000123-91-1	...	5.3E+01
Dioxathion	000078-34-2	...	...
Diphenylhydrazine, 1,2-	000122-66-7	...	7.3E-01
Diquat	000085-00-7	1.3E+03	...
Disulfoton	000298-04-4	2.3E+01	...
Diuron	000330-54-1	1.2E+03	...
Endosulfan (I or II)	000115-29-7	3.5E+03*	...
Endosulfan sulfate	001031-07-8	...	...
Endothall	000145-73-3	1.2E+04	...
Endrin	000072-20-8	1.7E+02	...
Endrin aldehyde	007421-93-4	... *	...
Ethion	000563-12-2	2.9E+02	...
Ethyl acetate	000141-78-6	5.2E+05	...
Ethyl benzene	000100-41-4	5.8E+04	...
Ethyl chloride	000075-00-3	...	...
Ethyl ether	000060-29-7	1.2E+05	...
Ethyldipropylthiocarbamate, s-	000759-94-4	1.5E+04	...
Ethylene glycol	000107-21-1	1.2E+06	...
Ethylene glycol monoethyl ether	000110-80-5	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Fenethion	000055-38-9	...	...
Ferrous sulfate	007720-78-7	...	...
Fluorene	000086-73-7	2.3E+04	...
Fluorine	007782-41-4	3.5E+04	...
Formaldehyde	000050-00-0	1.2E+05	...
Formic acid	000064-18-6	1.2E+06	...
Furan	000110-00-9	5.8E+02	...
Furfural	000098-01-1	1.7E+03	...
Glycidylaldehyde	000765-34-4	2.3E+02	...
Heptachlor	000076-44-8	2.9E+02	1.3E-01
Heptachlor epoxide	001024-57-3	7.6E+00	6.4E-02
Heptachlorinated dibenzo-p-dioxin, 1,2,3	035822-46-9	...	3.9E-03
Heptachlorinated dibenzofuran, 1,2,3,4,	067562-39-4	...	3.9E-03
Heptachlorinated dibenzofuran, 1,2,3,4,	055673-89-7	...	3.9E-03
Hexabromobenzene	000087-82-1	1.2E+03	...
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	039227-28-6	...	9.7E-06
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	057653-85-7	...	9.7E-06
Hexachlorinated dibenzo-p-dioxin, 1,2,3,	019408-74-3	...	9.4E-05
Hexachlorinated dibenzofuran, 1,2,3,4,7,	070648-26-9	...	3.9E-04
Hexachlorinated dibenzofuran, 1,2,3,6,7,	057117-44-9	...	3.9E-04

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Hexachlorinated dibenzofuran, 1,2,3,7,8,	072918-21-9	...	3.9E-04
Hexachlorinated dibenzofuran, 2,3,4,6,7,	060851-34-5	...	3.9E-04
Hexachlorobenzene	000118-74-1	4.7E+02	3.6E-01
Hexachlorobutadiene	000087-68-3	1.2E+02*	7.5E+00
Hexachlorocyclohexane, alpha-	000319-84-6	...	9.3E-02
Hexachlorocyclohexane, beta-	000319-85-7	...	3.2E-01
Hexachlorocyclohexane, delta-	000319-86-8	...	...
Hexachlorocyclopentadiene	000077-47-4	4.1E+03	...
Hexachloroethane	000067-72-1	5.8E+02	4.2E+01
Hexachlorophene	000070-30-4	1.7E+02	...
Hexane	000110-54-3	3.5E+04	...
Hydrazine	000302-01-2	...	1.9E-01
Hydrochloric acid	007647-01-0	...	...
Hydrogen cyanide	000074-90-8	1.2E+04	...
Hydrogen sulfide	007783-06-4	1.7E+03*	...
Indeno(1,2,3-CD)pyrene	000193-39-5	...	...
Ioxynil	001689-83-4	...	...
Iron	015438-31-0	...	...
Isobutanol	000078-83-1	1.7E+05	...
Isophorone	000078-59-1	1.2E+05	6.1E+02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Kepone	000143-50-0	...	...
Lead	007439-92-1	...	...
Lindane	000058-89-9	1.7E+02	4.5E-01
Magnesium	007439-95-4	...	...
Malathion	000121-75-5	1.2E+04	...
Maleic anhydride	000108-31-6	5.8E+04	...
Maleic hydrazide	000123-33-1	2.9E+05	...
Manganese	007439-96-5	2.9E+03*	...
Mercury	007439-97-6	1.7E+02	...
Methacrylonitrile	000126-98-7	5.8E+01	...
Methanol	000067-56-1	2.9E+05	...
Methomyl	016752-77-5	1.5E+04	...
Methoxychlor	000072-43-5	2.9E+03	...
Methyl chlorocarbonate	000079-22-1	...	...
Methyl ethyl ketone	000078-93-3	3.5E+05*	...
Methyl isobutyl ketone	000108-10-1	2.9E+04	...
Methyl methacrylate	000080-62-6	4.7E+04	...
Methyl Napthalene, 2-	000091-57-6	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	4.1E+02	4.5E+00
Methylene chloride	000075-09-2	3.5E+04	7.8E+01

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	...	...
Metribuzin	021087-64-9	1.5E+04	...
Mirex	002385-85-5	1.2E+02	3.2E-01
Naphthalene	000091-20-3	... *	...
Nickel	007440-02-0	1.2E+04	...
Nitric acid	007697-37-2	...	...
Nitric oxide	010102-43-9	5.8E+04	...
Nitroaniline, p-	000100-01-6	...	...
Nitrobenzene	000098-95-3	2.9E+02	...
Nitrogen dioxide	010102-44-0	5.8E+05	...
Nitroglycerine	000055-63-0	...	...
Nitrophenol, 4-	000100-02-7	...	...
Nitroso-di-n-butylamine, N-	000924-16-3	...	1.1E-01
Nitroso-di-n-methylurethane, N-	000615-53-2	...	...
Nitrosodiethanolamine, N-	001116-54-7	...	2.1E-01
Nitrosodiethylamine, N-	000055-18-5	...	3.9E-03
Nitrosodimethylamine, N-	000062-75-9	...	1.1E-02
Nitrosodiphenylamine, N-	000086-30-6	...	1.2E+02
Nitrosopyrrolidine, N-	000930-55-2	...	2.8E-01
Nitrotoluene, 4-	000099-99-0	5.8E+03	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Parathion, ethyl-	000056-38-2	3.5E+03	...
Parathion, methyl-	000298-00-0	1.5E+02	...
PCBs	001336-36-3	...	7.6E-02
Pentachlorinated dibenzo-p-dioxin, 1,2,3	040321-76-4	...	7.8E-06
Pentachlorinated dibenzofuran, 1,2,3,7,8	109719-77-9	...	3.9E-05
Pentachlorinated dibenzofuran, 2,3,4,7,8	057117-41-6	...	3.9E-05
Pentachlorobenzene	000608-93-5	4.7E+02	...
Pentachloroethane	000076-01-7	...	...
Pentachloronitrobenzene	000082-68-8	1.7E+03	2.2E+00
Pentachlorophenol	000087-86-5	1.7E+04	4.9E+00
Phenanthrene	000085-01-8	...	...
Phenol	000108-95-2	3.5E+05	...
Phenyl sulfide	000139-66-2	...	...
Phenylmercuric acetate	000062-38-4	4.7E+01	...
Phorate	000298-02-2	1.2E+02	...
Phosgene	000075-44-5	...	...
Phosphamidon	013171-21-6	...	...
Phosphine	007803-51-2	1.7E+02	...
Phosphoric acid	007664-38-2	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	5.8E+00	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Phosphorous (elemental)	007723-14-0	...	...
Phthalic anhydride	000085-44-9	1.2E+06	...
Plutonium	007440-07-5	...	...
Polychlorinated triphenyl	012642-23-8	...	...
Potassium silver cyanide	000506-61-6	1.2E+05	...
Pronamide	023950-58-5	4.4E+04	...
Pyrene	000129-00-0	1.7E+04	...
Pyridine	000110-86-1	5.8E+02	...
Quinoline	000091-22-5	...	4.9E-02
Radium	007440-14-4	...	...
Radon	010043-92-2	...	...
Resorcinol	000108-46-3	...	...
Ronnel	000299-84-3	2.9E+04	...
Selenium	007782-49-2	2.9E+03	...
Selenourea	000630-10-4	2.9E+03	...
Silver	007440-22-4	2.9E+03	...
Silver Cyanide	000506-64-9	5.8E+04	...
Sodium	007440-23-5	...	...
Strontium	007440-24-6	3.5E+05	...
Strychnine	000057-24-9	1.7E+02	...

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Styrene	000100-42-5	1.2E+05	...
Sulfuric acid	007664-93-9	...	...
TB, 2,4,5-	000093-80-1	...	...
TCDD	001746-01-6	...	3.9E-06
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	1.7E+02	...
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	3.9E-05
Tetrachloroethane, 1,1,1,2-	000630-20-6	1.7E+04	2.2E+01
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	2.9E+00
Tetrachloroethene	000127-18-4	5.8E+03	1.1E+01
Tetrachlorophenol, 2,3,4,6-	000058-90-2	1.7E+04	...
Tetraethyl lead	000078-00-2	5.8E-02	...
Tetraethyldithiopyrophosphate	003689-24-5	2.9E+02	...
Tetrahydrofuran	000109-99-9	...	...
Thallium	007440-28-0	...	...
Thiourea	000062-56-6	...	...
Thiram	000137-26-8	2.9E+03	...
Thorium	007440-29-1	...	...
Toluene	000108-88-3	1.2E+05	...
Toluene diisocyanate	000584-84-9	...	...
Toxaphene	008001-35-2	...	5.3E-01

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
TP, 2,4,5-	000093-72-1	4.7E+03	...
Tribromomethane	000075-25-2	1.2E+04	7.4E+01
Trichloro-1,2,2-Trifluoroethane, 1,1,2-	000076-13-1	1.7E+07	...
Trichlorobenzene, 1,2,4-	000120-82-1	5.8E+03	...
Trichloroethane, 1,1,1-	000071-55-6	... *	...
Trichloroethane, 1,1,2-	000079-00-5	2.3E+03	1.0E+01
Trichloroethylene	000079-01-6	...	5.3E+01
Trichlorofluoromethane	000075-69-4	1.7E+05	...
Trichlorophenol, 2,3,5-	000933-78-8	...	...
Trichlorophenol, 2,3,6-	000933-75-5	...	...
Trichlorophenol, 2,4,5-	000095-95-4	5.8E+04	...
Trichlorophenol, 2,4,6-	000088-06-2	...	5.3E+01
Trichlorophenol, 3,4,5-	000609-19-8	...	...
Trichlorophenoxyacetic acid, 2,4,5-	000093-76-5	5.8E+03	...
Trichloropropane, 1,2,3-	000096-18-4	3.5E+03	...
Triethanolamine	000102-71-6	...	...
Trifluralin	001582-09-8	4.4E+03	7.6E+01
Trinitrobenzene, 1,3,5-	000099-35-4	2.9E+01	...
Trinitrotoluene	000118-96-7	2.9E+02	1.9E+01
Tris (2,3-dibromopropyl) phosphate	000126-72-7	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Uranium	007440-61-1	...	...
Vanadium	007440-62-2	4.1E+03	...
Vanadium pentoxide	001314-62-1	5.2E+03	...
Vinyl acetate	000108-05-4	5.8E+05	...
Vinyl chloride	000075-01-4	...	3.1E-01
Warfarin	000081-81-2	1.7E+02	...
Xylene, m-	000108-38-3	1.2E+06	...
Xylene, o-	000095-47-6	1.2E+06	...
Xylene, p-	000106-42-3	...	...
Zinc	007440-66-6	1.7E+05	...
Zinc cyanide	000557-21-1	2.9E+04	...
Zinc phosphide	001314-84-7	1.7E+02	...
Zinc sulfate	007733-02-0	...	...

Appendix B-2

Tables for Radionuclides

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(22 Radionuclides)

Substance Name	CAS Number	Toxicity	Ground Water Mobility: Liquid Karst	Ground Water Mobility: Liquid Non-Karst	Ground Water Mobility: Non-Liquid Karst	Ground Water Mobility: Non-Liquid Non-Karst	Persistence: River	Persistence: Lake	Bioaccumulation: Food Chain Fresh	Bioaccumulation: Food Chain Salt	Bioaccumulation: Environmental Fresh	Bioaccumulation: Environmental Salt	Ecotoxicity: Fresh	Ecotoxicity: Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Plutonium 236 (radionuclide)	015411-92-4	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 238 (radionuclide)	013981-16-3	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 239 (radionuclide)	015117-48-3	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 240 (radionuclide)	014119-33-6	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 241 (radionuclide)	014119-32-5	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 242 (radionuclide)	013982-10-0	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Plutonium 243 (radionuclide)	015706-37-3	100	1.0E+00	...	2.0E-05	2.0E-05	0.0700	0.0700	50.0*	50.0*	50000.0	50000.0	100	100	0	0.0000	No	Yes
Plutonium 244 (radionuclide)	014119-34-7	10000	1.0E+00	...	2.0E-05	2.0E-05	1.0000	1.0000	50.0*	50.0*	50000.0	50000.0	10000	10000	0	0.0000	No	Yes
Radium 226 (radionuclide)	013982-63-3	10000	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Radon 222 (radionuclide)	014859-67-7	100	1.0E+00	1.0E+00	2.0E-05	2.0E-05	1.0000	0.4000	0.5	0.5	0.5	0.5	100	100	0	0.0000	No	Yes
Thorium 227 (radionuclide)	015623-47-9	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	0.4000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Thorium 228 (radionuclide)	014274-82-9	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Thorium 229 (radionuclide)	015594-54-4	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Thorium 230 (radionuclide)	014269-63-7	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Thorium 231 (radionuclide)	014932-40-2	100	1.0E+00	1.0E-04	2.0E-05	2.0E-09	0.4000	0.0700	0.5	0.5	0.5	0.5	100	100	0	0.0000	No	Yes
Thorium 232 (radionuclide)	007440-29-1	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000*	1.0000*	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Thorium 234 (radionuclide)	015065-10-8	10000	1.0E+00	1.0E-04	2.0E-05	2.0E-09	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Tritium	010028-17-8	100	1.0E+00	1.0E+00	2.0E-05	2.0E-05	1.0000	1.0000	0.5	0.5	0.5	0.5	100	100	0	0.0000	No	Yes
Uranium 233 (radionuclide)	013968-55-3	10000	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Uranium 234 (radionuclide)	013966-29-5	10000	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes

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* Indicates difference between previous version of chemical data (MAR93) and current version of chemical data.

HAZARD RANKING SYSTEM
Hazardous Substance Factor Values
(22 Radionuclides)

			Ground Water Mobility						Bioaccumulation									
			Liquid		Non-Liquid		Persistence		Food Chain		Environmental		Ecotoxicity					
Substance Name	CAS Number	Toxicity	Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Air Gas Migration	Air Gas Mobility	Gas	Part
Uranium 235 (radionuclide)	015117-96-1	10000	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes
Uranium 238 (radionuclide)	007440-61-1	10000	1.0E+00	1.0E-02	2.0E-05	2.0E-07	1.0000*	1.0000*	0.5	0.5	0.5	0.5	10000	10000	0	0.0000	No	Yes

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(22 Radionuclides)

Substance Name	CAS Number	AIR PATHWAY Cancer Risk Screen Conc (pCi/m3)	GROUND WATER PATHWAY MCL (pCi/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (pCi/L)	SURFACE WATER PATHWAY Drinking Water MCL (pCi/L)	SURFACE WATER PATHWAY Drinking Water Cancer Risk Screen Conc (pCi/L)	SURFACE WATER PATHWAY Food Chain Cancer Risk Screen Conc (pCi/kg)	SOIL EXPOSURE UMTRCA (pCi/kg)	SOIL EXPOSURE Cancer Risk Screen Conc Ingestion (pCi/kg)	SOIL EXPOSURE Cancer Risk Screen Conc External Exposure (pCi/kg)
Plutonium 236 (radionuclide)	015411-92-4	8.2E-05	...	3.9E-01	...	3.9E-01	1.5E+01	...	7.4E+03	...
Plutonium 238 (radionuclide)	013981-16-3	5.0E-05	...	8.9E-02	...	8.9E-02	3.3E+00	...	1.7E+03	...
Plutonium 239 (radionuclide)	015117-48-3	5.2E-05	...	8.5E-02	...	8.5E-02	3.2E+00	...	1.6E+03	...
Plutonium 240 (radionuclide)	014119-33-6	5.2E-05	...	8.5E-02	...	8.5E-02	3.2E+00	...	1.6E+03	...
Plutonium 241 (radionuclide)	014119-32-5	8.5E-03	...	5.4E+00	...	5.4E+00	2.0E+02	...	1.0E+05	...
Plutonium 242 (radionuclide)	013982-10-0	5.4E-05	...	8.9E-02	...	8.9E-02	3.3E+00	...	1.7E+03	...
Plutonium 243 (radionuclide)	015706-37-3	2.0E+01	...	1.8E+02	...	1.8E+02	6.6E+03	...	3.4E+06	...
Plutonium 244 (radionuclide)	014119-34-7	5.4E-05	...	8.9E-02	...	8.9E-02	3.3E+00	...	1.7E+03	...
Radium 226 (radionuclide)	013982-63-3	6.5E-04	...	1.6E-01	...	1.6E-01	6.0E+00	...	3.1E+03	...
Radon 222 (radionuclide)	014859-67-7	2.7E+00	...	1.4E+01	...	1.4E+01	5.2E+02	...	2.6E+05	...
Thorium 227 (radionuclide)	015623-47-9	4.0E-04	...	4.3E+00	...	4.3E+00	1.6E+02	...	8.2E+04	...
Thorium 228 (radionuclide)	014274-82-9	2.5E-05	...	1.8E+00	...	1.8E+00	6.6E+01	...	3.4E+04	...
Thorium 229 (radionuclide)	015594-54-4	2.7E-05	...	9.3E-01	...	9.3E-01	3.5E+01	...	1.8E+04	...
Thorium 230 (radionuclide)	014269-63-7	6.7E-05	...	1.5E+00	...	1.5E+00	5.6E+01	...	2.8E+04	...
Thorium 231 (radionuclide)	014932-40-2	4.0E+00	...	4.9E+01	...	4.9E+01	1.8E+03	...	9.2E+05	...
Thorium 232 (radionuclide)	007440-29-1	7.0E-05	...	1.6E+00	...	1.6E+00	6.0E+01	...	3.1E+04	...
Thorium 234 (radionuclide)	015065-10-8	6.1E-02	...	4.9E+00	...	4.9E+00	1.8E+02	...	9.2E+04	...
Tritium	010028-17-8	2.5E+01	...	3.6E+02	...	3.6E+02	1.3E+04	...	6.8E+06	...
Uranium 233 (radionuclide)	013968-55-3	7.2E-05	...	1.2E+00	...	1.2E+00	4.5E+01	...	2.3E+04	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(22 Radionuclides)

Substance Name	CAS Number	AIR PATHWAY	GROUND WATER PATHWAY		SURFACE WATER PATHWAY			SOIL EXPOSURE		
					Drinking Water		Food Chain		Cancer Risk Screen Conc	
		Cancer Risk Screen Conc (pCi/m3)	MCL (pCi/L)	Cancer Risk Screen Conc (pCi/L)	MCL (pCi/L)	Cancer Risk Screen Conc (pCi/L)	Cancer Risk Screen Conc (pCi/kg)	UMTRCA (pCi/kg)	Ingestion (pCi/kg)	External Exposure (pCi/kg)
Uranium 234 (radionuclide)	013966-29-5	7.5E-05	...	1.2E+00	...	1.2E+00	4.5E+01	...	2.3E+04	...
Uranium 235 (radionuclide)	015117-96-1	7.8E-05	...	1.2E+00	...	1.2E+00	4.5E+01	...	2.3E+04	...
Uranium 238 (radionuclide)	007440-61-1	8.2E-05	...	1.5E-01	...	1.5E-01	5.6E+00	...	2.8E+03	...

Appendix C

Synonyms

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000092-87-5	(1,1'-biphenyl)-4,4'-diamine	Benzidine
000072-43-5	(2,2,2-trichloroethylidiene)bis(4-methoxy-benzene), 1,1'-	Methoxychlor
000330-54-1	(3,4-Dichlorophenyl)-1,1-dimethylurea, 3-	Diuron
001116-54-7	(nitrosoimino) bis-ethanol, 2,2'-	Nitrosodiethanolamine, N-
000111-44-4	1,1'-oxybis(2-chloroethane)	Bis(2-chloroethyl)ether
000085-68-7	1,2-benzenedicarboxylic acid, butyl phenylmethyl ester	Butylbenzyl phthalate
000156-60-5	1,2-dichloroethylene	Dichloroethylene, trans-1,2-
000105-67-9	1-Hydroxy-2,4-dimethylbenzene	Dimethyl phenol, 2,4-
001746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	TCDD
001563-66-2	2,3-dihydro-2,2-dimethyl-7-benzofuranol methylcarbamate	Carbofuran
000093-76-5	2,4,5-T	Trichlorophenoxyacetic acid, 2,4,5-
000094-75-7	2,4- D, acid	Dichlorophenoxyacetic acid, 2,4-
000094-82-6	2,4-DB	Butyric acid, 4-(2,4-dichlorophenoxy)
000606-20-2	2-Methyl-1,3-dinitrobenzene	Dinitrotoluene, 2,6-
000067-64-1	2-Propanone	Acetone
001689-84-5	3,4-dibromo-4-hydroxy-benzonitrile	Bromoxynil
000083-32-9	A	Acenaphthene
000083-32-9	Acenaphthylene, 1,2-dihydro	Acenaphthene
000141-78-6	Acetic acid, ethyl ester	Ethyl acetate
000108-05-4	Acetic acid, vinyl ester	Vinyl acetate
000062-38-4	acetoxyphenylmercury	Phenylmercuric acetate
000098-86-2	Acetylbenzene	Acetophenone
000079-34-5	Acetylene tetrachloride	Tetrachloroethane, 1,1,2,2-
000591-08-2	Acetylthiocarbamide, n-	Acetyl-2-thiourea, 1-
000060-57-1	Aldrin epoxide	Dieldrin
000319-84-6	alpha-BHC	Hexachlorocyclohexane, alpha-
012642-23-8	Aroclor 5442	Polychlorinated triphenyl
000110-86-1	Azobenzene	Pyridine
000542-62-1	Barium dicyanide	Barium cyanide
000050-32-8	Benz(a)pyrene	Benzo(a)pyrene
000056-55-3	Benzanthrene	Benz(a)anthracene
000584-84-9	Benzene, 2,4-diisocyano-1-methyl-	Toluene diisocyanate
000062-53-3	Benzeneamine	Aniline

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000100-01-6	Benzeneamine, 4-nitro-	Nitroaniline, p-
000117-81-7	Benzenedicarboxylic acid, bis (2-ethylhexyl) ester, 1,2-	Bis (2-ethylhexyl) phthalate
000084-74-2	Benzenedicarboxylic acid, dibutyl ester, 1,2-	Di-n-butyl phthalate
000084-66-2	Benzenedicarboxylic acid, didecyl ester, 1,2-	Diethyl phthalate
000131-11-3	Benzenedicarboxylic acid, dimethyl ester, 1,2-	Dimethyl phthalate
000117-84-0	Benzenedicarboxylic acid, dioctyl ester, 1,2-	Di-n-octyl phthalate
000085-44-9	Benzenedicarboxylic anhydride, 1,2-	Phthalic anhydride
000108-46-3	Benzenediol, 1,3-	Resorcinol
000205-99-2	Benzo(b)fluoranthene	Benzofluoranthene, 3,4-
000129-00-0	Benzo(def)phenanthrene	Pyrene
000065-85-0	Benzoate	Benzoic acid
000218-01-9	Benzophenanthrene, 1,2-	Chrysene
000091-22-5	Benzopyridine	Quinoline
000098-88-4	Benzoyl chloride	Benzene carbonyl chloride
000319-85-7	beta-BHC	Hexachlorocyclohexane, beta-
000319-86-8	BHC-delta	Hexachlorocyclohexane, delta-
000092-52-4	Biphenyl	Biphenyl, 1,1-
000137-26-8	Bis(dimethylthiocarbamyl)disulfide	Thiram
000506-68-3	Bromocyanide	Cyanogen bromide
000075-25-2	Bromoform	Tribromomethane
000106-99-0	Butadiene	Butadiene, 1,3-
000093-80-1	Butanoic acid, 4-(2,4,5-trichlorophenoxy)-	TB, 2,4,5-
000078-93-3	Butanone	Methyl ethyl ketone
000071-36-3	Butyl alcohol	Butanol
000924-16-3	Butyl-n-nitroso-1-butanamine, n-	Nitroso-di-n-butylamine, N-
000630-10-4	Carbamidodselenoic acid	Selenourea
000759-94-4	Carbamothioic acid, dipropyl-, s-ethyl ester	Ethyldipropylthiocarbamate, s-
000786-19-6	Carbofenthion	Carbophenothion
000075-44-5	Carbonic dichloride	Phosgene
000079-22-1	Carbonochloridic acid, methyl ester	Methyl chlorocarbonate
000143-50-0	Chlordecone	Kepone
008001-35-2	Chlorinated camphene	Toxaphene
000106-47-8	Chloro-benzeneamine, 4-	Chloroaniline, p-

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000059-50-7	Chloro-m-cresol, p-	Chloro-3-methylphenol, 4-
000076-44-8	Chlorochlordene, 3-	Heptachlor
000075-00-3	Chloroethane	Ethyl chloride
000075-01-4	Chloroethene	Vinyl chloride
000107-30-2	Chloromethoxy-methane	Chloromethyl methyl ether
000100-44-7	Chloromethyl benzene	Benzyl chloride
000091-58-7	Chloronaphthalene, beta-	Chloronaphthalene, 2-
000106-46-7	Chlorophenyl chloride, p-	Dichlorobenzene, 1,4-
000106-89-8	Chloropropylene oxide, 3-	Chloromethyloxirane, 2-
007440-47-3	Chrome	Chromium
000156-59-2	cis-dichloroethylene	Dichloroethylene, cis-1,2-
000071-43-2	Coal naptha	Benzene
000081-81-2	Coumafen	Warfarin
000056-72-4	Coumafos	Coumaphos
000544-92-3	Cuprous cyanide	Copper cyanide
000506-77-4	Cyanogen chloride	Chlorine cyanide
002385-85-5	Dechlorane	Mirex
000302-01-2	Diamine	Hydrazine
000119-90-4	Diamino-3,3-dimethoxybiphenyl, 4,4-	Dimethoxybenzidine, 3,3-
000053-70-3	Dibenz(a)anthracene, 1,2:5,6-	Dibenz(a,h)anthracene
000207-08-9	Dibenzo(bjk)fluorene	Benzo(k)fluoranthene
023950-58-5	Dichloro-N-(1,1-dimethylpropynyl)benzamide, 3,5-	Pronamide
000095-50-1	Dichlorobenzene, o-	Dichlorobenzene, 1,2-
000091-94-1	Dichlorobenzidine, o,o-	Dichlorobenzidine, 3,3-
000075-27-4	Dichlorobromomethane	Bromodichloromethane
000072-54-8	Dichlorodiphenyl dichloroethane	DDD
000072-55-9	Dichlorodiphenyldichloroethylene, p,p-	DDE
000050-29-3	Dichlorodiphenyltrichloroethane, 4,4-	DDT
000075-35-4	Dichloroethylene, 1,1-	Dichloroethene, 1,1-
000115-32-2	Dichlorokelthane	Dicofol
000075-09-2	Dichloromethane	Methylene chloride
000120-83-2	Dichlorophenol, 4,6-	Dichlorophenol, 2,4-
000542-75-6	Dichloropropylene, 1,3-	Dichloropropene, 1,3-

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000056-38-2	Diethyl 4-nitrophenyl phosphorothionate	Parathion, ethyl-
000060-29-7	Diethyl ether	Ethyl ether
000123-33-1	Dihydro-3,6-pyridazinedione, 1,2-	Maleic hydrazide
000108-38-3	Dimethyl benzene, 1,3-	Xylene, m-
000062-73-7	Dimethyl dichlorovinyl phosphate	Dichlorvos
000299-84-3	Dimethyl o-(2,4,5-trichlorophenyl)thiophosphate, o,o-	Ronnel
000298-00-0	Dimethyl p-nitrophenyl thiophosphate	Parathion, methyl-
000060-51-5	Dimethyl S-(N-methylcarbamoylmethyl) dithiophosphate, o,o-	Dimethoate
000106-42-3	Dimethylbenzene, 1,4-	Xylene, p-
000088-85-7	Dinitro-6-(1-methylpropyl) phenol, 2,4-	Dinoseb
000099-65-0	Dinitrobenzene, 1,2-	Dinitrobenzene, 1,3-
000132-64-9	Diphenylene Oxide	Dibenzofuran
000085-00-7	Diquat dibromide	Diquat
000075-15-0	Dithiocarbonic anhydride	Carbon disulfide
003689-24-5	Dithiofos	Tetraethyldithiopyrophosphate
002921-88-2	Dursban	Chlorpyrifos
002104-64-5	EPN	Phosphorodithioc acid,phenyl-o-ethyl-o-(4-nitrophenyl)ester
000109-99-9	Epoxybutane, 1,4-	Tetrahydrofuran
001024-57-3	Epoxyheptachlor	Heptachlor epoxide
000107-21-1	Ethanediol, 1,2-	Ethylene glycol
016752-77-5	Ethanimidothioic acid, n-	Methomyl
000110-80-5	Ethoxy-ethanol, 2-	Ethylene glycol monoethyl ether
000075-07-0	Ethyl aldehyde	Acetaldehyde
002642-71-9	Ethyl guthion	Azinphos- ethyl
000055-18-5	Ethyl-n-nitroso-ethanamine, n-	Nitrosodiethylamine, N-
000107-06-2	Ethylene chloride	Dichloroethane, 1,2-
000106-93-4	Ethylene dibromide (EDB)	Dibromoethane, 1,2-
000151-56-4	Ethylenimine	Aziridine
000075-34-3	Ethylidene chloride	Dichloroethane, 1,1-
000206-44-0	Fluoranthene	Benzo(j,k)fluorene
007782-41-4	Fluorine-19	Fluorine
000075-69-4	Freon 11	Trichlorofluoromethane
000076-13-1	Freon 113	Trichloro-1,2,2-Trifluoroethane, 1,1,2-

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000075-71-8	Freon 12	Dichlorodifluoromethane
000098-01-1	Furancarboxaldehyde, 2-	Furfural
000108-31-6	Furandione, 2,5-	Maleic anhydride
000058-89-9	Hexachlorocyclohexane- gamma	Lindane
000110-82-7	Hexahydrobenzene	Cyclohexane
000124-04-9	Hexanedioic acid	Adipic acid
000122-66-7	Hydrazodibenzene	Diphenylhydrazine, 1,2-
000057-12-5	Hydrocyanic acid	Cyanide
000074-90-8	Hydrocyanic acid	Hydrogen cyanide
007697-37-2	Hydrogen nitrate	Nitric acid
007803-51-2	Hydrogen phosphide	Phosphine
007783-06-4	Hydrosulfuric acid	Hydrogen sulfide
000051-28-5	Hydroxy-2,4-dinitrobenzene, 1-	Dinitrophenol, 2,4-
001689-83-4	Hydroxy-3,5-diiodo-benzonitrile, 4-	Ioxynil
000095-57-8	Hydroxychlorobenzene, 2-	Chlorophenol, 2-
000100-02-7	Hydroxynitrobenzene, 4-	Nitrophenol, 4-
000078-83-1	Isobutyl alcohol	Isobutanol
000064-18-6	Methanoic acid	Formic acid
001918-00-9	Methoxy-3,6-dichlorobenzoic acid, 2-	Dicamba
000067-56-1	Methyl alcohol	Methanol
000108-88-3	Methyl benzene	Toluene
000074-87-3	Methyl chloride	Chloromethane
000071-55-6	Methyl chloroform	Trichloroethane, 1,1,1-
000075-05-8	Methyl cyanide	Acetonitrile
000086-50-0	Methyl guthion	Azinphos- methyl
000108-39-4	Methyl phenol, 3-	Cresol, m-
000106-44-5	Methyl phenol, 4-	Cresol, p-
000118-96-7	Methyl-1,3,5-trinitrobenzene, 2-	Trinitrotoluene
000121-14-2	Methyl-2,4-dinitrobenzene, 1-	Dinitrotoluene, 2,4-
000108-10-1	Methyl-2-pentanone, 4-	Methyl isobutyl ketone
000126-98-7	Methyl-2-propanenitrile, 2-	Methacrylonitrile
000080-62-6	Methyl-2-propenoic acid, methyl ester, 2-	Methyl methacrylate
000062-75-9	Methyl-n-nitroso-methanomine, n-	Nitrosodimethylamine, N-

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000074-83-9	Methylbromide	Bromomethane
000063-25-2	Methylcarbamate-1-naphthalenol	Carbaryl
000101-14-4	Methylene bis (2-chloro-benzeneamine), 4,4'-	Methylene bis (2-chloroaniline), 4,4-
000070-30-4	Methylene bis (3,4,6-trichlorophenol), 2,2-	Hexachlorophene
000050-00-0	Methylene oxide	Formaldehyde
000086-73-7	Methylenebiphenyl, 2,2-	Fluorene
000098-82-8	Methylethylbenzene, 1-	Cumene
000099-99-0	Methylnitrobenzene, p-	Nitrotoluene, 4-
000615-53-2	Methylnitroso-carbamic acid, ethyl ester	Nitroso-di-n-methylurethane, N-
000095-47-6	Methyltoulene, o-	Xylene, o-
007647-01-0	Muriatic acid	Hydrochloric acid
008001-58-9	Naphthalene oil	Creosote
000091-57-6	Napthylamine	Methyl Napthalene, 2-
000096-12-8	Nemazon	Dibromo-3-chloropropane, 1,2-
000102-71-6	Nitrilotriethanol, 2,2,2-	Triethanolamine
000098-95-3	Nitrobenzol	Nitrobenzene
010102-43-9	Nitrogen oxide	Nitric oxide
010102-44-0	Nitrogen oxide	Nitrogen dioxide
000086-30-6	Nitrosophenylbenzeneamine, n-	Nitrosodiphenylamine, N-
000930-55-2	Nitrosopyrrolidine, 1-	Nitrosopyrrolidine, N-
000057-74-9	Octachloro-4,7-methanotetrahydroindane	Chlordane
000110-00-9	Oxacyclopentadiene	Furan
000460-19-5	Oxalonitrile	Cyanogen
000765-34-4	Oxiranecarboxaldehyde	Glycidylaldehyde
000542-88-1	Oxybis(chloromethane)	Bis(chloromethyl)ether
000111-46-6	Oxybis-ethanol, 2,2-	Diethylene glycol
000120-12-7	Paranaphthalene	Anthracene
012642-23-8	PCT	Polychlorinated triphenyl
000076-01-7	Pentalin	Pentachloroethane
000118-74-1	Perchlorobenzene	Hexachlorobenzene
000087-68-3	Perchlorobutadiene	Hexachlorobutadiene
000077-47-4	Perchlorocyclopentadiene	Hexachlorocyclopentadiene
000067-72-1	Perchloroethane	Hexachloroethane

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000085-01-8	Phenanthren	Phenanthrene
000131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt	Ammonium picrate
000108-95-2	Phenyl alcohol	Phenol
000108-90-7	Phenyl chloride	Chlorobenzene
000100-47-0	Phenyl cyanide	Benzonitrile
000541-73-1	Phenylene dichloride, m-	Dichlorobenzene, 1,3-
000100-41-4	Phenylethane	Ethyl benzene
000055-38-9	Phosphorothioic acid, o,o-dimethyl	Fenethion
007723-14-0	Phosphorous, white	Phosphorous (elemental)
020859-73-8	Phostoxin	Aluminum phosphide
000145-73-3	Phthalic acid, hexahydro-3,6-endo-oxy-	Endothall
000108-94-1	Pimelic ketone	Cyclohexanone
001336-36-3	Polychlorinated biphenyls	PCBs
000506-61-6	Potassium dicyanoargentate	Potassium silver cyanide
000055-63-0	Propanetriol, trinitrate, 1,2,3-	Nitroglycerine
000107-02-8	Propenal	Acrolein
000079-06-1	Propenamide	Acrylamide
000079-10-7	Propenoic acid	Acrylic acid
000107-18-6	Propenol, 2-	Allyl alcohol
000078-87-5	Propylene chloride	Dichloropropane, 1,2-
000093-72-1	Silvex	TP, 2,4,5-
007773-06-0	Sulfamic acid, monoammonium salt	Ammonium sulfamate
007720-78-7	Sulfuric acid iron salt (1:1)	Ferrous sulfate
000077-78-1	Sulfuric acid, dimethyl ester	Dimethyl sulfate
007733-02-0	Sulfuric acid, zinc salt	Zinc sulfate
000091-20-3	Tar camphor	Naphthalene
000095-95-4	TCP	Trichlorophenol, 2,4,5-
000095-94-3	Tetrachlorobenzene, s-	Tetrachlorobenzene, 1,2,4,5-
001746-01-6	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	TCDD
000127-18-4	Tetrachloroethylene	Tetrachloroethene
000056-23-5	Tetrachloromethane	Carbon Tetrachloride
000563-12-2	Tetraethyl S,S'-methylenebisphosphorithioate, o,o,o',o'-	Ethion
000123-91-1	Tetrahydro-1,4-dioxin	Dioxane, 1,4-

Synonyms List
(by Synonym Name)

CAS Number	Synonym Name	SCDM Name
000062-56-6	Thio-carbamide	Thiourea
001031-07-8	Thiodan sulfate	Endosulfan sulfate
000078-48-8	Tributyl phosphorotrithioate, s,s,s-	DEF
000067-66-3	Trichlormethane	Chloroform
000075-87-6	Trichloroacetaldehyde	Chloral
000079-01-6	Trichloroethene	Trichloroethylene
000078-59-1	Trimethyl-2-cyclohexen-1-one, 3,5,5-	Isophorone
001314-62-1	Vanadium oxide	Vanadium pentoxide
000107-13-1	Vinyl cyanide	Acrylonitrile
000079-00-5	Vinyl trichloride	Trichloroethane, 1,1,2-
000100-42-5	Vinylbenzene	Styrene

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000083-32-9	Acenaphthene	*-Acenaphthylene, 1,2-dihydro
		A
000208-96-8	Acenaphthylene	
000075-07-0	Acetaldehyde	*-Ethyl aldehyde
000067-64-1	Acetone	*-2-Propanone
000075-05-8	Acetonitrile	*-Methyl cyanide
000098-86-2	Acetophenone	*-Acetylbenzene
000591-08-2	Acetyl-2-thiourea, 1-	*-Acetylthiocarbamide, n-
000107-02-8	Acrolein	*-Propenal
000079-06-1	Acrylamide	*-Propenamide
000079-10-7	Acrylic acid	*-Propenoic acid
000107-13-1	Acrylonitrile	*-Vinyl cyanide
000124-04-9	Adipic acid	*-Hexanedioic acid
000116-06-3	Aldicarb	
000309-00-2	Aldrin	
000107-18-6	Allyl alcohol	*-Propenol, 2-
007429-90-5	Aluminum	
020859-73-8	Aluminum phosphide	*-Phostoxin
007664-41-7	Ammonia	
000131-74-8	Ammonium picrate	*-Phenol, 2,4,6-trinitro-, ammonium salt
007773-06-0	Ammonium sulfamate	*-Sulfamic acid, monoammonium salt
000062-53-3	Aniline	*-Benzeneamine
000120-12-7	Anthracene	*-Paranaphthalene
007440-36-0	Antimony	
007440-38-2	Arsenic	
001332-21-4	Asbestos	
001912-24-9	Atrazine	
002642-71-9	Azinphos- ethyl	*-Ethyl guthion
000086-50-0	Azinphos- methyl	*-Methyl guthion
000151-56-4	Aziridine	*-Ethylenimine
007440-39-3	Barium	
000542-62-1	Barium cyanide	*-Barium dicyanide
000056-55-3	Benz(a)anthracene	*-Benzanthrene

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000071-43-2	Benzene	*-Coal naptha
000098-88-4	Benzene carbonyl chloride	*-Benzoyl chloride
000092-87-5	Benzidine	*-(1,1'-biphenyl)-4,4'-diamine
000050-32-8	Benzo(a)pyrene	*-Benz(a)pyrene
000191-24-2	Benzo(g,h,i)perylene	
000206-44-0	Benzo(j,k)fluorene	*-Fluoranthene
000207-08-9	Benzo(k)fluoranthene	*-Dibenzo(bjk)fluorene
000205-99-2	Benzofluoranthene, 3,4-	*-Benzo(b)fluoranthene
000065-85-0	Benzoic acid	*-Benzoate
000100-47-0	Benzonitrile	*-Phenyl cyanide
000095-16-9	Benzothiazole, 1,2,-	
000100-44-7	Benzyl chloride	*-Chloromethyl benzene
007440-41-7	Beryllium	
000092-52-4	Biphenyl, 1,1-	*-Biphenyl
000117-81-7	Bis (2-ethylhexyl) phthalate	*-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester, 1,2-
000111-91-1	Bis(2-chloroethoxy)methane	
000111-44-4	Bis(2-chloroethyl)ether	*-1,1'-oxybis(2-chloroethane)
000542-88-1	Bis(chloromethyl)ether	*-Oxybis(chloromethane)
007440-42-8	Boron	
000075-27-4	Bromodichloromethane	*-Dichlorobromomethane
000074-83-9	Bromomethane	*-Methylbromide
001689-84-5	Bromoxynil	*-3,4-dibromo-4-hydroxy-benzonitrile
000106-99-0	Butadiene, 1,3-	*-Butadiene
000071-36-3	Butanol	*-Butyl alcohol
000085-68-7	Butylbenzyl phthalate	*-1,2-benzenedicarboxylic acid, butyl phenylmethyl ester
000094-82-6	Butyric acid, 4-(2,4-dichlorophenoxy)	*-2,4-DB
007440-43-9	Cadmium	
000133-06-2	Captan	
000063-25-2	Carbaryl	*-Methylcarbamate-1-naphthalenol
001563-66-2	Carbofuran	*-2,3-dihydro-2,2-dimethyl-7-benzofuranol methylcarbamate
000075-15-0	Carbon disulfide	*-Dithiocarbonic anhydride
000056-23-5	Carbon Tetrachloride	*-Tetrachloromethane
000786-19-6	Carbophenothion	*-Carbofenthion

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
007440-46-2	Cesium	
000075-87-6	Chloral	*-Trichloroacetaldehyde
000057-74-9	Chlordane	*-Octachloro-4,7-methanotetrahydroindane
000506-77-4	Chlorine cyanide	*-Cyanogen chloride
000059-50-7	Chloro-3-methylphenol, 4-	*-Chloro-m-cresol, p-
000106-47-8	Chloroaniline, p-	*-Chloro-benzeneamine, 4-
000108-90-7	Chlorobenzene	*-Phenyl chloride
000067-66-3	Chloroform	*-Trichlormethane
000074-87-3	Chloromethane	*-Methyl chloride
000107-30-2	Chloromethyl methyl ether	*-Chloromethoxy-methane
000106-89-8	Chloromethyloxirane, 2-	*-Chloropropylene oxide, 3-
000091-58-7	Chloronaphthalene, 2-	*-Chloronaphthalene, beta-
000095-57-8	Chlorophenol, 2-	*-Hydroxychlorobenzene, 2-
002921-88-2	Chlorpyrifos	*-Dursban
007440-47-3	Chromium	*-Chrome
016065-83-1	Chromium(III)	
018540-29-9	Chromium(VI)	
000218-01-9	Chrysene	*-Benzophenanthrene, 1,2-
007440-48-4	Cobalt	
007440-50-8	Copper	
000544-92-3	Copper cyanide	*-Cuprous cyanide
000056-72-4	Coumaphos	*-Coumafos
008001-58-9	Creosote	*-Naphthalene oil
000108-39-4	Cresol, m-	*-Methyl phenol, 3-
000106-44-5	Cresol, p-	*-Methyl phenol, 4-
000098-82-8	Cumene	*-Methylethylbenzene, 1-
021725-46-2	Cyanazine	
000057-12-5	Cyanide	*-Hydrocyanic acid
000460-19-5	Cyanogen	*-Oxalonitrile
000506-68-3	Cyanogen bromide	*-Bromocyanide
000110-82-7	Cyclohexane	*-Hexahydrobenzene
000108-94-1	Cyclohexanone	*-Pimelic ketone
000121-82-4	Cyclotrimethylenetrinitriamine	

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000072-54-8	DDD	*-Dichlorodiphenyl dichloroethane
000072-55-9	DDE	*-Dichlorodiphenyldichloroethylene, p,p-
000050-29-3	DDT	*-Dichlorodiphenyltrichloroethane, 4,4-
000078-48-8	DEF	*-Tributyl phosphorotrithioate, s,s,s-
000084-74-2	Di-n-butyl phthalate	*-Benzenedicarboxylic acid, dibutyl ester, 1,2-
000117-84-0	Di-n-octyl phthalate	*-Benzenedicarboxylic acid, dioctyl ester, 1,2-
000333-41-5	Diazinon	
000053-70-3	Dibenz(a,h)anthracene	*-Dibenz(a)anthracene, 1,2:5,6-
000132-64-9	Dibenzofuran	Diphenylene Oxide
000096-12-8	Dibromo-3-chloropropane, 1,2-	*-Nemazon
000124-48-1	Dibromochloromethane	
000106-93-4	Dibromoethane, 1,2-	*-Ethylene dibromide (EDB)
001918-00-9	Dicamba	*-Methoxy-3,6-dichlorobenzoic acid, 2-
000095-50-1	Dichlorobenzene, 1,2-	*-Dichlorobenzene, o-
000541-73-1	Dichlorobenzene, 1,3-	*-Phenylene dichloride, m-
000106-46-7	Dichlorobenzene, 1,4-	*-Chlorophenyl chloride, p-
000091-94-1	Dichlorobenzidine, 3,3-	*-Dichlorobenzidine, o,o-
000075-71-8	Dichlorodifluoromethane	*-Freon 12
000075-34-3	Dichloroethane, 1,1-	*-Ethylidene chloride
000107-06-2	Dichloroethane, 1,2-	*-Ethylene chloride
000075-35-4	Dichloroethene, 1,1-	*-Dichloroethylene, 1,1-
000156-59-2	Dichloroethylene, cis-1,2-	*-cis-dichloroethylene
000156-60-5	Dichloroethylene, trans-1,2-	*-1,2-dichloroethylene
000120-83-2	Dichlorophenol, 2,4-	*-Dichlorophenol, 4,6-
000094-75-7	Dichlorophenoxyacetic acid, 2,4-	*-2,4- D, acid
000078-87-5	Dichloropropane, 1,2-	*-Propylene chloride
000542-75-6	Dichloropropene, 1,3-	*-Dichloropropylene, 1,3-
000062-73-7	Dichlorvos	*-Dimethyl dichlorovinyl phosphate
000115-32-2	Dicofol	*-Dichlorokelthane
000060-57-1	Dieldrin	*-Aldrin epoxide
000084-66-2	Diethyl phthalate	*-Benzenedicarboxylic acid, didecyl ester, 1,2-
000111-46-6	Diethylene glycol	*-Oxybis-ethanol, 2,2-
001445-75-6	Diisopropylmethyl-phosphonate	

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000060-51-5	Dimethoate	*-Dimethyl S-(N-methylcarbamoylmethyl) dithiophosphate, o,o-
000119-90-4	Dimethoxybenzidine, 3,3-	*-Diamino-3,3-dimethoxybiphenyl, 4,4-
000105-67-9	Dimethyl phenol, 2,4-	*-1-Hydroxy-2,4-dimethylbenzene
000131-11-3	Dimethyl phthalate	*-Benzenedicarboxylic acid, dimethyl ester, 1,2-
000077-78-1	Dimethyl sulfate	*-Sulfuric acid, dimethyl ester
000099-65-0	Dinitrobenzene, 1,3-	*-Dinitrobenzene, 1,2-
000051-28-5	Dinitrophenol, 2,4-	*-Hydroxy-2,4-dinitrobenzene, 1-
000121-14-2	Dinitrotoluene, 2,4-	*-Methyl-2,4-dinitrobenzene, 1-
000606-20-2	Dinitrotoluene, 2,6-	*-2-Methyl-1,3-dinitrobenzene
000088-85-7	Dinoseb	*-Dinitro-6-(1-methylpropyl) phenol, 2,4-
000123-91-1	Dioxane, 1,4-	*-Tetrahydro-1,4-dioxin
000078-34-2	Dioxathion	
000122-66-7	Diphenylhydrazine, 1,2-	*-Hydrazodibenzene
000085-00-7	Diquat	*-Diquat dibromide
000298-04-4	Disulfoton	
000330-54-1	Diuron	*-(3,4-Dichlorophenyl)-1,1-dimethylurea, 3-
000115-29-7	Endosulfan (I or II)	
001031-07-8	Endosulfan sulfate	*-Thiodan sulfate
000145-73-3	Endothall	*-Phthalic acid, hexahydro-3,6-endo-oxy-
000072-20-8	Endrin	
007421-93-4	Endrin aldehyde	
000563-12-2	Ethion	*-Tetraethyl S,S'-methylenebisphosphorithioate, o,o,o',o'-
000141-78-6	Ethyl acetate	*-Acetic acid, ethyl ester
000100-41-4	Ethyl benzene	*-Phenylethane
000075-00-3	Ethyl chloride	*-Chloroethane
000060-29-7	Ethyl ether	*-Diethyl ether
000759-94-4	Ethyldipropylthiocarbamate, s-	*-Carbamothioic acid, dipropyl-, s-ethyl ester
000107-21-1	Ethylene glycol	*-Ethanediol, 1,2-
000110-80-5	Ethylene glycol monoethyl ether	*-Ethoxy-ethanol, 2-
000055-38-9	Fenethion	*-Phosphorothioic acid, o,o-dimethyl
007720-78-7	Ferrous sulfate	*-Sulfuric acid iron salt (1:1)
000086-73-7	Fluorene	*-Methylenebiphenyl, 2,2-
007782-41-4	Fluorine	*-Fluorine-19

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000050-00-0	Formaldehyde	*-Methylene oxide
000064-18-6	Formic acid	*-Methanoic acid
000110-00-9	Furan	*-Oxacyclopentadiene
000098-01-1	Furfural	*-Furancarboxaldehyde, 2-
000765-34-4	Glycidylaldehyde	*-Oxiranecarboxaldehyde
000076-44-8	Heptachlor	*-Chlorochlordene, 3-
001024-57-3	Heptachlor epoxide	*-Epoxyheptachlor
035822-46-9	Heptachlorinated dibenzo-p-dioxin, 1,2,3,4,6,7,8-	
067562-39-4	Heptachlorinated dibenzofuran, 1,2,3,4,6,7,8-	
055673-89-7	Heptachlorinated dibenzofuran, 1,2,3,4,6,7,9-	
000087-82-1	Hexabromobenzene	
039227-28-6	Hexachlorinated dibenzo-p-dioxin, 1,2,3,4,7,8-	
057653-85-7	Hexachlorinated dibenzo-p-dioxin, 1,2,3,6,7,8-	
019408-74-3	Hexachlorinated dibenzo-p-dioxin, 1,2,3,7,8,9-	
070648-26-9	Hexachlorinated dibenzofuran, 1,2,3,4,7,8-	
057117-44-9	Hexachlorinated dibenzofuran, 1,2,3,6,7,8-	
072918-21-9	Hexachlorinated dibenzofuran, 1,2,3,7,8,9-	
060851-34-5	Hexachlorinated dibenzofuran, 2,3,4,6,7,8-	
000118-74-1	Hexachlorobenzene	*-Perchlorobenzene
000087-68-3	Hexachlorobutadiene	*-Perchlorobutadiene
000319-84-6	Hexachlorocyclohexane, alpha-	*-alpha-BHC
000319-85-7	Hexachlorocyclohexane, beta-	*-beta-BHC
000319-86-8	Hexachlorocyclohexane, delta-	*-BHC-delta
000077-47-4	Hexachlorocyclopentadiene	*-Perchlorocyclopentadiene
000067-72-1	Hexachloroethane	*-Perchloroethane
000070-30-4	Hexachlorophene	*-Methylene bis (3,4,6-trichlorophenol), 2,2-
000110-54-3	Hexane	
000302-01-2	Hydrazine	*-Diamine
007647-01-0	Hydrochloric acid	*-Muriatic acid
000074-90-8	Hydrogen cyanide	*-Hydrocyanic acid
007783-06-4	Hydrogen sulfide	*-Hydrosulfuric acid
000193-39-5	Indeno(1,2,3-CD)pyrene	
001689-83-4	Ioxynil	*-Hydroxy-3,5-diiodo-benzonitrile, 4-

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
015438-31-0	Iron	
000078-83-1	Isobutanol	*-Isobutyl alcohol
000078-59-1	Isophorone	*-Trimethyl-2-cyclohexen-1-one, 3,5,5-
000143-50-0	Kepone	*-Chlordecone
007439-92-1	Lead	
000058-89-9	Lindane	*-Hexachlorocyclohexane- gamma
007439-95-4	Magnesium	
000121-75-5	Malathion	
000108-31-6	Maleic anhydride	*-Furandione, 2,5-
000123-33-1	Maleic hydrazide	*-Dihydro-3,6-pyridazinedione, 1,2-
007439-96-5	Manganese	
007439-97-6	Mercury	
000126-98-7	Methacrylonitrile	*-Methyl-2-propanenitrile, 2-
000067-56-1	Methanol	*-Methyl alcohol
016752-77-5	Methomyl	*-Ethanimidothioic acid, n-
000072-43-5	Methoxychlor	*-(2,2,2-trichloroethylidiene)bis(4-methoxy-benzene), 1,1'-
000079-22-1	Methyl chlorocarbonate	*-Carbonochloridic acid, methyl ester
000078-93-3	Methyl ethyl ketone	*-Butanone
000108-10-1	Methyl isobutyl ketone	*-Methyl-2-pentanone, 4-
000080-62-6	Methyl methacrylate	*-Methyl-2-propenoic acid, methyl ester, 2-
000091-57-6	Methyl Napthalene, 2-	Napthylamine
000101-14-4	Methylene bis (2-chloroaniline), 4,4-	*-Methylene bis (2-chloro-benzeneamine), 4,4'-
000075-09-2	Methylene chloride	*-Dichloromethane
000101-68-8	Methylenediphenyl diisocyanate, 4,4-	
021087-64-9	Metribuzin	
002385-85-5	Mirex	*-Dechlorane
000091-20-3	Naphthalene	*-Tar camphor
007440-02-0	Nickel	
007697-37-2	Nitric acid	*-Hydrogen nitrate
010102-43-9	Nitric oxide	*-Nitrogen oxide
000100-01-6	Nitroaniline, p-	*-Benzeneamine, 4-nitro-
000098-95-3	Nitrobenzene	*-Nitrobenzol
010102-44-0	Nitrogen dioxide	*-Nitrogen oxide

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000055-63-0	Nitroglycerine	*-Propanetriol, trinitrate, 1,2,3-
000100-02-7	Nitrophenol, 4-	*-Hydroxynitrobenzene, 4-
000924-16-3	Nitroso-di-n-butylamine, N-	*-Butyl-n-nitroso-1-butanamine, n-
000615-53-2	Nitroso-di-n-methylurethane, N-	*-Methylnitroso-carbamic acid, ethyl ester
001116-54-7	Nitrosodiethanolamine, N-	*-(nitrosoimino) bis-ethanol, 2,2'-
000055-18-5	Nitrosodiethylamine, N-	*-Ethyl-n-nitroso-ethanamine, n-
000062-75-9	Nitrosodimethylamine, N-	*-Methyl-n-nitroso-methanomine, n-
000086-30-6	Nitrosodiphenylamine, N-	*-Nitrosophenylbenzeneamine, n-
000930-55-2	Nitrosopyrrolidine, N-	*-Nitrosopyrrolidine, 1-
000099-99-0	Nitrotoluene, 4-	*-Methylnitrobenzene, p-
000056-38-2	Parathion, ethyl-	*-Diethyl 4-nitrophenyl phosphorothionate
000298-00-0	Parathion, methyl-	*-Dimethyl p-nitrophenyl thiophosphate
001336-36-3	PCBs	*-Polychlorinated biphenyls
040321-76-4	Pentachlorinated dibenzo-p-dioxin, 1,2,3,7,8-	
109719-77-9	Pentachlorinated dibenzofuran, 1,2,3,7,8-	
057117-41-6	Pentachlorinated dibenzofuran, 2,3,4,7,8-	
000608-93-5	Pentachlorobenzene	
000076-01-7	Pentachloroethane	*-Pentalin
000082-68-8	Pentachloronitrobenzene	
000087-86-5	Pentachlorophenol	
000085-01-8	Phenanthrene	*-Phenanthren
000108-95-2	Phenol	*-Phenyl alcohol
000139-66-2	Phenyl sulfide	
000062-38-4	Phenylmercuric acetate	*-acetoxyphenylmercury
000298-02-2	Phorate	
000075-44-5	Phosgene	*-Carbonic dichloride
013171-21-6	Phosphamidon	
007803-51-2	Phosphine	*-Hydrogen phosphide
007664-38-2	Phosphoric acid	
002104-64-5	Phosphorodithioc acid,phenyl-o-ethyl-o-(4-nitrophenyl)ester	*-EPN
007723-14-0	Phosphorous (elemental)	*-Phosphorous, white
000085-44-9	Phthalic anhydride	*-Benzenedicarboxylic anhydride, 1,2-
007440-07-5	Plutonium	

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
015411-92-4	Plutonium 236 (radionuclide)	
013981-16-3	Plutonium 238 (radionuclide)	
015117-48-3	Plutonium 239 (radionuclide)	
014119-33-6	Plutonium 240 (radionuclide)	
014119-32-5	Plutonium 241 (radionuclide)	
013982-10-0	Plutonium 242 (radionuclide)	
015706-37-3	Plutonium 243 (radionuclide)	
014119-34-7	Plutonium 244 (radionuclide)	
012642-23-8	Polychlorinated triphenyl	PCT
		Aroclor 5442
000506-61-6	Potassium silver cyanide	*-Potassium dicyanoargentate
023950-58-5	Pronamide	*-Dichloro-N-(1,1-dimethylpropynyl)benzamide, 3,5-
000129-00-0	Pyrene	*-Benzo(def)phenanthrene
000110-86-1	Pyridine	*-Azobenzene
000091-22-5	Quinoline	*-Benzopyridine
007440-14-4	Radium	
013982-63-3	Radium 226 (radionuclide)	
010043-92-2	Radon	
014859-67-7	Radon 222 (radionuclide)	
000108-46-3	Resorcinol	*-Benzenediol, 1,3-
000299-84-3	Ronnel	*-Dimethyl o-(2,4,5-trichlorophenyl)thiophosphate, o,o-
007782-49-2	Selenium	
000630-10-4	Selenourea	*-Carbamidodselenoic acid
007440-22-4	Silver	
000506-64-9	Silver Cyanide	
007440-23-5	Sodium	
007440-24-6	Strontium	
000057-24-9	Strychnine	
000100-42-5	Styrene	*-Vinylbenzene
007664-93-9	Sulfuric acid	
000093-80-1	TB, 2,4,5-	*-Butanoic acid, 4-(2,4,5-trichlorophenoxy)-
001746-01-6	TCDD	*-Tetrachlorodibenzo-p-dioxin, 2,3,7,8-
		2,3,7,8-Tetrachlorodibenzo-p-dioxin

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000095-94-3	Tetrachlorobenzene, 1,2,4,5-	*-Tetrachlorobenzene, s-
125322-32-9	Tetrachlorodibenzofuran, 2,3,7,8-	
000630-20-6	Tetrachloroethane, 1,1,1,2-	
000079-34-5	Tetrachloroethane, 1,1,2,2-	*-Acetylene tetrachloride
000127-18-4	Tetrachloroethene	*-Tetrachloroethylene
000058-90-2	Tetrachlorophenol, 2,3,4,6-	
000078-00-2	Tetraethyl lead	
003689-24-5	Tetraethyldithiopyrophosphate	*-Dithiofos
000109-99-9	Tetrahydrofuran	*-Epoxybutane, 1,4-
007440-28-0	Thallium	
000062-56-6	Thiourea	*-Thio-carbamide
000137-26-8	Thiram	*-Bis(dimethylthiocarbamyl)disulfide
007440-29-1	Thorium	
015623-47-9	Thorium 227 (radionuclide)	
014274-82-9	Thorium 228 (radionuclide)	
015594-54-4	Thorium 229 (radionuclide)	
014269-63-7	Thorium 230 (radionuclide)	
014932-40-2	Thorium 231 (radionuclide)	
007440-29a1	Thorium 232 (radionuclide)	
015065-10-8	Thorium 234 (radionuclide)	
000108-88-3	Toluene	*-Methyl benzene
000584-84-9	Toluene diisocyanate	*-Benzene, 2,4-diisocyano-1-methyl-
008001-35-2	Toxaphene	*-Chlorinated camphene
000093-72-1	TP, 2,4,5-	*-Silvex
000075-25-2	Tribromomethane	*-Bromoform
000076-13-1	Trichloro-1,2,2-Trifluoroethane, 1,1,2-	*-Freon 113
000120-82-1	Trichlorobenzene, 1,2,4-	
000071-55-6	Trichloroethane, 1,1,1-	*-Methyl chloroform
000079-00-5	Trichloroethane, 1,1,2-	*-Vinyl trichloride
000079-01-6	Trichloroethylene	*-Trichloroethene
000075-69-4	Trichlorofluoromethane	*-Freon 11
000933-78-8	Trichlorophenol, 2,3,5-	
000933-75-5	Trichlorophenol, 2,3,6-	

Synonyms List
by SCDM Chemical Name

CAS Number	SCDM Name	Synonym Name
000095-95-4	Trichlorophenol, 2,4,5-	*-TCP
000088-06-2	Trichlorophenol, 2,4,6-	
000609-19-8	Trichlorophenol, 3,4,5-	
000093-76-5	Trichlorophenoxyacetic acid, 2,4,5-	*-2,4,5-T
000096-18-4	Trichloropropane, 1,2,3-	
000102-71-6	Triethanolamine	*-Nitrilotriethanol, 2,2,2-
001582-09-8	Trifluralin	
000099-35-4	Trinitrobenzene, 1,3,5-	
000118-96-7	Trinitrotoluene	*-Methyl-1,3,5-trinitrobenzene, 2-
000126-72-7	Tris (2,3-dibromopropyl) phosphate	
010028-17-8	Tritium	
007440-61-1	Uranium	
013968-55-3	Uranium 233 (radionuclide)	
013966-29-5	Uranium 234 (radionuclide)	
015117-96-1	Uranium 235 (radionuclide)	
007440-61a1	Uranium 238 (radionuclide)	
007440-62-2	Vanadium	
001314-62-1	Vanadium pentoxide	*-Vanadium oxide
000108-05-4	Vinyl acetate	*-Acetic acid, vinyl ester
000075-01-4	Vinyl chloride	*-Chloroethene
000081-81-2	Warfarin	*-Coumafen
000108-38-3	Xylene, m-	*-Dimethyl benzene, 1,3-
000095-47-6	Xylene, o-	*-Methyltoulene, o-
000106-42-3	Xylene, p-	*-Dimethylbenzene, 1,4-
007440-66-6	Zinc	
000557-21-1	Zinc cyanide	
001314-84-7	Zinc phosphide	
007733-02-0	Zinc sulfate	*-Sulfuric acid, zinc salt