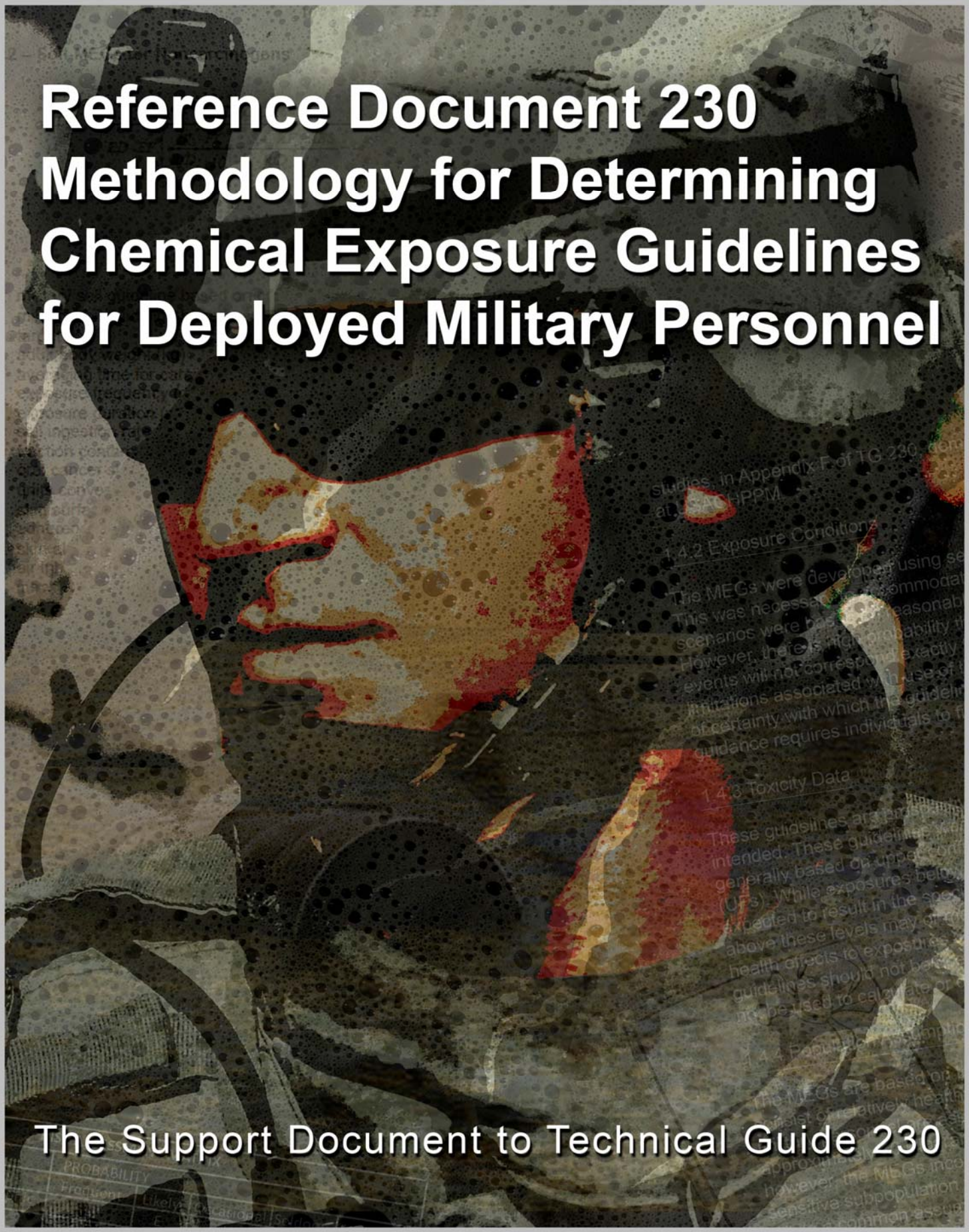
Reference Document 230 Methodology for Determining Chemical Exposure Guidelines for Deployed Military Personnel



The Support Document to Technical Guide 230

JUNE 2010 REVISION

Methodology for Developing Chemical Exposure Guidelines for Deployed Military Personnel

Reference Document 230
June 2010 Revision

This is the support document for Technical Guide 230

U.S. Army Public Health Command (Provisional)

Approved for Public Release; Distribution Unlimited

Realignment

In the fall of 2009, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) was realigned to the U.S. Army Public Health Command (Provisional) (USAPHC (Prov)).

Preface

The USAPHC (Prov) Reference Document 230 (RD 230) provides background information relevant to the June 2010 Revision of this organization's Technical Guide 230 (TG 230). Due to scientific advances and expanding operational needs, these documents will be updated as necessary. The USAPHC (Prov) Environmental Health Risk Assessment Program is the proponent of this Technical Guide. Questions, comments, and recommendations can be forwarded to—

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These documents and associated information can also be obtained electronically from the USAPHC (Prov) Technical Guides website: http://phc.amedd.army.mil/tg.htm

Acknowledgements

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Numerous peer-reviewers contributed to the improvement of these documents. Special acknowledgment for the contributions from members of the following agencies and committees for their input on this version, which helped improve the overall concepts and technical information in this technical guide: Mr. David Crawford and the U.S. Environmental Protection Agency Office of Superfund Remediation and Technology Innovation, National Research Council Subcommittee on the Toxicological Risks to Deployed Military Personnel, Oak Ridge National Laboratory Environmental Sciences Division, and the Oak Ridge Institute for Science and Education.*

Improvements were also made based on critical comments received from Service reviewers participating in the Joint Environmental Surveillance Work Group.

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1. INTRODUCTION

1.1 PURPOSE

The U.S. Army Public Health Command (Provisional) (USAPHC (Prov)) Technical Guide 230 (TG 230) provides a standard tool to assess and characterize chemical exposures during deployments in a manner that is consistent with established joint military risk management doctrine. The USAPHC (Prov) TG 230 provides a range of military exposure guidelines (MEGs) that are toxicologically based chemical concentrations for various military exposure scenarios during deployments.

The June 2010 Revision to this USAPHC (Prov) Reference Document (RD) 230 provides details associated with the methods, scientific rationale, and assumptions behind the MEGs presented in the June 2010 Revision to USAPHC (Prov) TG 230. This RD supersedes previous versions which correspond to previous versions of TG 230. This document provides the methods so that one may clearly follow the approaches, to include the exposure assumptions, algorithms and equations, and sources of data. Most users of the MEGs will not need to be familiar with the level of detail found in this RD.

Air, water, and soil MEGs are presented in USAPHC (Prov) TG 230, which also provides associated health effects information and procedural guidance to assist with operational risk management (ORM) of chemical hazards encountered in the operational environment. This includes a qualitative risk assessment ranking tool that parallels existing military doctrine. Section 1.4 and USAPHC (Prov) TG 230 provides details on the specific scope, limitations, intended audience, and application scenarios relevant to the use of the MEGs.

Appendix A contains the cited references. Appendix B contains a list of acronyms used in this document and a glossary of health effects terms. Appendices C through F present the MEGs and the supporting data.

1.2 MILITARY EXPOSURE GUIDELINES DEFINED

Military exposure guidelines are concentrations of chemicals in air, water, and soil that can assist in evaluating the military significance of field exposures to chemical hazards during deployments. The MEGs are designed to address a variety of deployment scenarios such as a single catastrophic release of large amounts of a chemical, temporary exposure conditions lasting hours to days, continuous ambient environmental conditions such as regional pollution, use of a contaminated water supply, or persistent soil contamination where there is regular contact. There are different exposure scenarios of concern for each environmental medium.

Any given MEG is a chemical concentration representing an estimate of the level above which certain types of health effects may begin to occur in individuals within the exposed population

after a continuous, single exposure of specified duration. The severity of the health effects and percentage of the exposed population demonstrating health effects will increase as concentrations increase above the MEG, but the rate is chemical-specific, and therefore cannot be represented by the MEGs themselves. The MEGs are not designed for determining casualty estimates but are instead are preventive measures guidelines.

Since existing toxicological databases and health criteria were utilized to develop the MEGs, the quality and extensiveness of toxicological information underlying these guidelines is as comparable, and as variable, as that used by Federal agencies for occupational and civilian applications.

The available set of MEGs includes values for air, water, and soil for several different exposure durations (EDs) arranged along differing occupational and environmental health (OEH) hazard severity levels from Negligible to Catastrophic. For example, for a given chemical, there are four possible air MEG values for the 1-hour ED. Each of the hypothetical MEGs in Table 1-1 represent the airborne concentration of the chemical that marks the threshold for entry into the hazard severity category found in the name of the MEG. In other words, each MEG represents a hazard severity category threshold.

Table 1-1 Example of the Potential Types of Air MEGs for a 1-hour Exposure Duration for a Hypothetical Chemical and the Standard Interpretation of the Hazard Severity Level Associated with Various Field Exposures

MEG Name	MEG Value	Exposure Estimate*	Hazard Severity Designation *
1-hour Negligible MEG	5 mg/m^3	† 5 – 29 mg/m^3	Negligible
1-hour Marginal MEG	30 mg/m^3	30 – 149 mg/m^3	Marginal
1-hour Critical MEG	150 mg/m^3	150 – 339 mg/m^3	Critical
1-hour Catastrophic MEG	340 mg/m^3	≥ 340 mg/m^3	Catastrophic

* This exposure estimate represents an average 1 hour exposure. Analytical error associated with measurements at the boundaries of the categories (e.g., 29 vs. 30 mg/m^3) must be acknowledged.
† Field exposures < 5 milligrams per cubic meter (mg/m^3) would not be considered to be a deployment hazard and would not be evaluated in a formal risk assessment.
‡ In reality, hazard severity blends together at the margins between each category, which reflects a graded series of health responses as exposure increases. For example, there is no practical measurement and toxicological distinction between 29 and 30 mg/m3 even though the selected severity categories will be different. The risk assessment method addresses exposures near the borders of the categories.

This standard approach for setting hazard severity levels within a risk assessment sets a useful framework, but it does not highlight the chemical-specific knowledge and the scientific uncertainties associated with the underlying data for any given assessment. Additional details on what data the MEGs are based on and what it means to exceed a MEG are provided in other

locations within USAPHC (Prov) TG 230 and within this reference document. The specific methodology for evaluating field exposures using the MEGs is presented in detail in USAPHC (Prov) TG 230.

For any given chemical, the MEGs that have been developed are limited to the exposure timeframes and hazard severity levels for which there were readily available health criteria published by regulatory or other agencies. The figure below presents a conceptual diagram of the available MEGs. Table 1-2 through Table 1-4 provides the definitions for the available MEGs.

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Air MEGs

Boxes represent potential MEGs.
A shaded box indicates that a MEG was developed for one or more chemicals.

	Negligible	Marginal	Critical	Catastrophic
1 year	A	B		
14 day	C			
24 hour	D	D	D	E
8 hour	F	G	G	E
1 hour	F	H	I	E
10 minutes	G	G	G	E

A – Includes general air pollutants, $PM_{2.5}$, and key toxic industrial chemicals.
B – Includes only $PM_{2.5}$.
C – Includes general air pollutants and key toxic industrial chemicals.
D – Includes chemical warfare agents, key toxic industrial chemicals, PM_{10}, and $PM_{2.5}$.
E – Includes only chemical warfare agents.
F – Includes general air pollutants, key toxic industrial chemicals, military smokes and obscurants, and chemical warfare agents.
G – Includes key toxic industrial chemicals and chemical warfare agents.
H – Includes general air pollutants, key toxic industrial chemicals, military smokes and obscurants, and chemical warfare agents.
I – Includes general air pollutants, key toxic industrial chemicals, and chemical warfare agents.

Water MEGs

	Negligible	Marginal	Critical	Catastrophic
1 year	A			
14 day	A			
7 day	A			

A – Includes the general pollutant list and the TB MED 577 chemicals (which includes chemical warfare agents).

Soil MEGs

	Negligible	Marginal	Critical	Catastrophic
1 year	A			

A – Includes the general pollutant list and the chemical warfare agents.

Figure 1-1 Conceptual Diagram of Available Military Exposure Guidelines

Table 1-2 Standard Air MEG Types and Associated Health Effect and Performance Degradation Descriptors

• **Type of MEG(s)** The descriptors apply to the deployed military population generally. Sensitive individuals may be predisposed to toxic effects and, therefore, maybe more susceptible. If available scientific evidence regarding such subpopulations exists for a particular chemical, then this information is provided with the chemical-specific MEG.
• **10-minute, 1-hour, 8-hour, or 24-hour CATASTROPHIC Air-MEG** A continuous exposure to airborne concentrations (for 10-minutes, 1 hour, 8 hours, or 24 hours) above the MEG is anticipated to result in deaths and/or many personnel with severe incapacitating effects (overall greater than 50% mission/performance capability loss). Effects are likely to require medical treatment.
• **10-minute, 1-hour, 8-hour, and 24-hour CRITICAL Air-MEG** A continuous exposure to airborne concentrations (for 10-minutes, 1 hour, 8-hours, or 24-hours) above the MEG (but below the Catastrophic MEG) could begin to result in seriously hazards effects. This MEG is a conservative population threshold estimate of potential life-threatening or lethal effects; whereby, these effects are expected initially in personnel with underlying susceptibility factors.
• **10-minute, 1-hour, 8-hour, and 24-hour MARGINAL Air-MEG** A continuous exposure to airborne concentrations (for 10-minutes, 1 hour, 8-hours, or 24-hours) above this MEG (but below the Critical MEG) could begin to produce effects that may result in some performance degradation, especially for tasks requiring extreme mental/visual acuity or physical dexterity/strength amongst a portion of individuals.
• **10-minute, 1-hour, 8-hour, and 24-hour NEGLIGIBLE Air-MEG** A continuous exposure to airborne concentrations (for 10-minutes, 1-hour, 8-hours, or 24-hours) above this MEG (but below the Marginal MEG) could begin to produce mild, non-disabling, transient, reversible effects. Such effects, if any, will typically be mild irritant types of effects and/or initially be expected in personnel with underlying susceptibility factors (e.g. asthmatics). Effects are not expected to impair performance.
• **14-day NEGLIGIBLE Air-MEG** A continuous exposure to airborne concentrations above this MEG for up to 14 days (24 hours/day) is not anticipated to result in acute performance degrading effects or specific long-term health consequences. While above this level there is an increased potential for adverse health effects in some individuals—this would still not be anticipated to result in performance degradation unless shorter-term MEGs were also exceeded. Increased concentration and/or duration could increase the potential risk of delayed/ permanent disease (e.g., kidney disease or cancer).
• **1-year NEGLIGIBLE Air-MEG *** A continuous exposure to airborne concentrations above this MEG for up to 1 year (365 days, 24 hours/day) is not anticipated to result in any adverse health effects to include acute performance degrading effects or long-term health consequences. This MEG is considered protective against the development of chronic diseases and an increased cancer risk greater than 1 in 10,000. Above this level there is an increased potential for adverse health effects in some individuals; however, this would still not be anticipated to result in performance degradation unless short-term MEGs were also exceeded. Increased concentration and/or duration could increase the potential risk of delayed/permanent disease (e.g., kidney disease or cancer).

* There is one 1-year MARGINAL Air-MEG (for PM2.5). The definition is provided in Section 4.5.

Table 1-3 Standard Water MEG Types and Associated Health Effect and Performance Degradation Descriptors

• **Type of MEG** The descriptors apply to the deployed military population generally. Sensitive individuals may be predisposed to toxic effects and, therefore, maybe more susceptible. If available scientific evidence regarding such subpopulations exists for a particular chemical, then this information is provided with the chemical-specific MEG.
• **7-day NEGLIGIBLE Water-MEGs for consumption rates of 5 and 15 liters per day** Daily consumption at or below this concentration for up to 7 days should not impair performance and is considered protective against significant non-cancer effects. As duration and/or concentration increases above this MEG, the potential is increased for performance degradation, need for medical intervention, or the potential for delayed/permanent disease (e.g., kidney disease or cancer).
• **14-day NEGLIGIBLE Water-MEG for consumption rates of 5 and 15 liters per day** Daily consumption at or below this concentration for up to 14 days should not impair performance and is considered protective against significant non-cancer effects. As duration and/or concentration increases above this MEG, the potential is increased for performance degradation, need for medical intervention, or the potential for delayed/permanent disease (e.g., kidney disease or cancer).
• **1-year NEGLIGIBLE Water-MEG for consumption rates of 5 and 15 liters per day** Daily consumption at or below this concentration for up to 1 year should not impair performance and is considered protective against development of chronic disease to include increased cancer risk greater than 1 in 10,000. As duration and/or concentration increases above this MEG, the potential is increased for delayed/permanent disease (e.g., kidney disease or cancer).

Table 1-4 Standard Soil MEG Type and Associated Health Effect and Performance Degradation Descriptors

• **Type of MEG** The descriptors apply to the deployed military population generally. Sensitive individuals may be predisposed to toxic effects and, therefore, maybe more susceptible. If available scientific evidence regarding such subpopulations exists for a particular chemical, then this information is provided with the chemical-specific MEG.
• **1-year NEGLIGIBLE Soil-MEG** Continuous, daily exposure (from ingestion, dermal absorption, and inhalation) to soil with concentrations at or below this level should not impair performance and is considered protective against development of chronic disease and an increased cancer risk greater than 1 in 10,000. As duration and/or concentration increases above this MEG, the potential is increased for delayed/permanent disease (e.g., kidney disease or cancer).

1.3 PROJECT BACKGROUND

1.3.1 Historical Overview

In 1996, USACHPPM identified a broadening scope of preventive medicine concerns relating to chemical exposures during deployments. The USACHPPM established a unique working group to provide the necessary input to this growing issue. This group included toxicologists, environmental health risk assessors, physicians, industrial hygienists, chemists, and environmental engineers. As a military support organization functioning as a technical representative to the Army's Office of The Surgeon General, USACHPPM is closely tied to the military community and field-level activities. In addition, USACHPPM utilized existing relationships with Joint Service related efforts to provide multi-service perspectives when developing USACHPPM TG 230.

By 1997, USACHPPM received funding support from the Army Office of the Surgeon General (for Nuclear, Biological, and Chemical [NBC] issues) to address the gap in Army preventive medicine guidance regarding chemical threats. Specifically, the term "chemical hazard" had begun to include not only chemical warfare agents (CWAs) but also more common toxic industrial chemicals/materials (sometimes referred to as "TICs" or "TIMs"). The concerns were also expanding to include delayed and prolonged health effects that may not be noticeable or might otherwise not have direct and immediate impacts during the deployment. These expanded concerns have been addressed under a variety of topics to include the concept of "NBC-E", where "E" represents environment, and "low-level" exposures (a particular concern in the traditional CWA arena).

During that time, the Department of Defense (DOD) continued to place more emphasis on the health of its military personnel during deployments under the concept of Force Health Protection (FHP). The Executive Office of the President, the DOD, and the scientific community were establishing policy, or emphasizing the need, to identify and consider health risks to military personnel from low-level exposures to radiation or chemicals (Presidential Review Directive (PRD) 5 (National Science and Technology Council [NSTC] 1998), DOD 1999, Institute of Medicine (IOM) 1999, National Research Council (NRC) 1999a).

The Department of Defense Instruction (DODI) Number 6055.1 (DOD 1998), specified that environmental monitoring and health risk assessments for DOD personnel in deployments outside the continental United States (OCONUS) be performed using the military ORM process. It also specified that "DOD Components shall develop, publish, and follow special military safety and occupational standards, rules, or regulations" that will be used to accommodate military-unique operations, workplaces, equipment and systems. This requirement allowed for implementation of other DODIs such as DODI 6050.5, (DOD 1990) and DODI 6490.03 (DOD 1997).

During that time, USACHPPM attempted to address these expanding responsibilities by developing standard chemical hazard assessment guidance for deployment scenarios. In May

1999, USACHPPM published TG 230A, *Short-Term Chemical Exposure Guidelines for Deployed Military Personnel*, as its first version of this guidance—at that time only addressing short-term exposure scenarios. Later in June 2000, a final review draft USACHPPM TG 230B, *Long-Term Chemical Exposure Guidelines for Deployed Military Personnel*, addressing long-term (e.g., 1-year) exposure scenarios was released. These documents were to provide the military health personnel with a standard tool from which to perform field-expedient chemical hazard assessments and assist with the Commander's ORM process in the field.

The June 2010 Revisions to TG 230 and RD 230 are the first major revisions of these documents since 2002, when USACHPPM combined the original two-part versions of USACHPPM TG 230A (for short-term guidelines) and USACHPPM TG 230B (for long-term guidelines). Previous updates and addenda from 2002 through 2004 were published primarily to address new and revised MEG values. The June 2010 Revisions not only update and add many MEGs, but they also provide updated guidance on conducting operational risk assessments. These changes also address many of the recommendations of the NRC (see Section 8).

1.3.2 Current Key Policies and Doctrine

The following policies and doctrine represent some of the key references that describe the current military position regarding identification and assessment of chemical exposures in deployed settings and which have influenced the current revisions to USAPHC (Prov) TG 230 and this RD (see these and other references on the back cover of this document).

- DOD Directive (DODD) 6200.04, Force Health Protection.
- DODD 6490.2, Comprehensive Health Surveillance.
- DODI 6490.03, Deployment Health.
- Army Regulation (AR) 11-35, Deployment Occupational and Environmental Health Risk Management.
- AR 40-5, Preventive Medicine.
- AR 70–75, Survivability of Army Personnel and Materiel.
- Field Manual (FM) 5-19, Composite Risk Management.
- FM 3-100.12, Risk Management: Multi-Service Tactics, Techniques, and Procedures for Risk Management (also referred to as Marine Corps Reference Publication 5-12.1C; Navy Tactics, Techniques, and Procedures 5-03.5; and Air Force Tactics, Techniques, and Procedures (MTTPs) (I) 3-2.34).
- FM 4-02.17, Preventive Medicine Services.
- Technical Bulletin – Medical (TB MED) 577, Sanitary Control and Surveillance of Field Water Supplies
- Joint Staff Memorandum 0028-07, Procedures for Deployment Health Surveillance.
- Joint Publication (JP) 3-11, Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments.
- JP 4-02, Health Service Support.

These documents establish policy directions and responsibilities that direct commanders to use the ORM process to manage OEH hazards within the larger FHP mission, where the goal is to minimize total health and safety risk to personnel across the broad spectrum of military operations. This includes identifying, documenting, and reporting exposures to OEH hazards (e.g., chemicals) that may result in short- or long-term health effects to deployed military personnel.

1.4 MEG DEVELOPMENT AND APPLICATION

This section describes the general approach to MEG development, the caveats and limitations of their use, and provides information on MEG updates and ongoing process improvements. The USAPHC (Prov) TG 230 provides specific risk assessment guidance using the MEGs.

1.4.1 General Approach to MEG Development

Existing exposure guidelines and peer-reviewed toxicological estimates (i.e., existing health criteria) published by other organizations provide the primary basis for MEG values. Previously published source toxicity data were evaluated and used with existing federal methodology for developing exposure guidelines. No toxicological or epidemiological studies were performed by USAPHC (Prov) to specifically provide data for development of MEGs. This approach allowed for the broadest array of chemicals to be addressed in a time-efficient and cost-efficient manner. It also ensured that the selection of guidelines was consistent with how other federal guidelines are developed (e.g., for workers and the general population), and that the selected guidelines had already gone through scientific peer-review. The use of previously peer-reviewed guidelines and estimates combined with accepted methodologies provides added quality. The target population and subpopulations that most of the existing guidelines address are different from the military population; however, the MEG development process attempts to make appropriate population-specific adjustments. This overall approach is scientifically defensible and is the most timely and cost-effective means by which to provide guidance for already on-going field assessments. This approach requires media-specific, as well as chemical-specific assumptions. These details and the specific methodologies used to develop and select the MEGs are described in this document.

1.4.2 Caveats and Limitations of Use

The MEGs are designed for use by trained preventive medicine staff within health risk assessments supporting operational risk management during military deployments. Guidance for risk assessments using MEGs is presented in TG 230.

The main limitations associated with use of the MEGs are addressed below. A more detailed assessment of the technical uncertainties associated with the MEGs is presented in Section 7.

1.4.2.1 Professional Judgment and Training Requirements

As discussed in TG 230, the presentation of numerical exposure guidelines does not preclude the requirement for sound professional judgment for their proper use in the risk assessment process. The end result of an evaluation using MEGs should be a qualitative descriptor of operational risk. Users of the guidelines are expected to have a basic understanding of the methods and limitations related to the guidelines and some familiarity with potential exposure routes and toxicological effects associated with environmental exposures.

The USAPHC (Prov) currently provides training for military health personnel to better accommodate these needs. Continued preventive medicine training sessions (6AF5 and 6AF6 courses) at the U.S. Army Medical Department Center and School have demonstrated that individuals in the preventive medicine field are able to learn the application of the TG 230 risk assessment process relatively quickly.

1.4.2.2 Exposure Conditions

The MEGs were developed using exposure assumptions broadly representative of exposure scenarios experienced by deployed military personnel (see Section 2.2). This was necessary to accommodate the breadth of military operations. The exposure scenarios were based on reasonably anticipated deployment conditions. However, there is a high probability that the true nature of exposure conditions in actual deployments will not correspond exactly to those assumed in development of the MEGs. The limitations associated with use of these exposure assumptions results in varying degrees of certainty for which the guidelines can be said to be protective or predictive. The proper use of the guidance requires individuals to find the best-fitting guideline or to recognize when a suitable guideline does not exist given a specific set of exposure conditions.

1.4.2.3 Toxicity Data

These guidelines are prospective and are developed to be protective when applied as intended. These guidelines are developed using specific assumptions and are generally based on upper confidence limits of the data and include uncertainty factors (UFs). While exposures below the MEGs (for individual chemicals) would not be expected to result in the specified health effects associated with the chemical, exposures above these levels may or may not result in health effects. The inability to directly attribute health effects to exposures above these guidelines underscores the fact that these guidelines should not be used for the retrospective attribution of health effects and cannot be used to calculate or determine specific numbers of casualties.

1.4.2.4 Population Assumptions

The MEGs are based on the general assumption that deployed military populations consist of relatively healthy and physically fit male and non-pregnant female adults. Deployed military personnel are assumed to be 18 to 55 years of age, with an average weight of approximately 70 kilograms (kg) (i.e., approximately 154 pounds). In certain instances, however, the MEGs

incorporate an additional level of safety to protect an identifiable, susceptible subpopulation that could be reasonably anticipated to be present in the deployed military population.

While a common assumption is that military personnel will have no predisposing physical or mental factors that could exacerbate exposure to environmental chemicals, scientific evidence does not entirely support such an assumption. Although there are basic health and fitness requirements that must be met at accession and maintained by military personnel, an assessment of factors that can lead to chemical-specific susceptibilities suggests that many of the predisposing factors such as physical stressors (e.g., sleep deprivation, cold, transient illness/infection), genetic traits, life-style choices (e.g., smoking or alcohol use), and chronic conditions (e.g., asthma), are present within the deployed military population (which includes Active Duty, Reserve, and National Guard personnel).

For example, recent CWA nerve agent toxicity data shows females may be twice as susceptible to effects as males (USACHPPM 2004). In addition, nerve agent exposure guidelines were estimated to address the greater susceptibility of individuals that possess abnormally low levels of blood cholinesterase and carboxylesterase activity. These low enzyme activity levels can be due to genetic variability among individuals, presence of infection or illness (particularly of the liver), anemia, drug/alcohol use, or a combination of the above. Even though these susceptible groups are thought to represent a small portion of the U.S. population, these are conditions for which military personnel are either not screened at accession, or which can develop (and be transient) during deployments.

Despite the fact that military policies dictate that pregnant women will not deploy, it is possible that a woman may not be aware of her pregnancy until after being placed on deployment status. Since fetal developmental effects are of greatest concern during the first trimester, developmental toxicity and reproductive effects endpoints were also considered and used in developing these guidelines when appropriate data were available (e.g., for lead [Pb]). However, such detailed data are not available for many chemicals.

1.4.2.5 Exposures to Multiple Hazards

The MEGs are substance-specific and most MEGs do not generally consider exposures to multiple chemicals.[1] The toxicity of a chemical may be increased or decreased by simultaneous or consecutive exposure to another chemical or multiple chemicals, particularly those that affect the same target organ or that alter the pharmacokinetics of one or more chemicals. These issues are also not typically addressed by existing federal standards and guidelines. It is recognized that the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the American Conference of Governmental Industrial Hygienists (ACGIH) do provide algorithms to address exposure to multiple chemicals (see EPA 1989, ACGIH 2010, 29 CFR 1910.1000 (d)(2)(i)). These methodologies are designed to be implemented at the site-specific level and require knowledge of the other chemical hazards

[1] Exceptions include MEGs for particulate matter, military smokes and obscurants, diesel-related compounds, some polychlorinated biphenyls, and dioxin-like compounds.

found at the site. These methods are not incorporated directly into the setting of the exposure guidelines or standards themselves. The USAPHC (Prov) is planning to develop a deployment risk assessment methodology for assessing multiple chemical exposures.

Co-exposure with environmental conditions that may increase exposure rates (e.g., extreme heat, heavy exercise) has been partially considered during MEG development. For example, deployment in a hot, arid environment will be associated with higher rates of water consumption. Therefore, water MEGs have been developed for temperate regions (5 L/d MEGs) and for arid regions (15 L/d MEGs). The air and soil MEGs were developed assuming above-average inhalation and soil ingestion rates. If site conditions are associated with a much lower or higher intake rates, then this can be incorporated into the implementation of the risk assessment process as described in TG 230.

1.4.2.6 Chemicals Not Addressed

The list of chemicals addressed by USAPHC (Prov) TG 230 is not all inclusive of every chemical to which deployed personnel may be exposed. However, all chemicals for which source information was available were included in USAPHC (Prov) TG 230. With the exception of select warfare agents, specific acutely hazardous TICs, and selected military smokes and obscurants, chemicals addressed by USAPHC (Prov) TG 230 are not considered to represent any specific priority list.

- New or Missing MEGs—The USAPHC (Prov) may add MEGs for new chemicals as additional information becomes available. As requests for new MEGs are received, interim values may be developed and posted on the USAPHC (Prov) website. If a MEG is not available for a given chemical substance, then risk assessors may choose to research the chemicals themselves (website sources are cited) or address the unavailability of a MEG through added uncertainties in their qualitative assessment.

- Nonhazardous Chemical Substances—Data received from routine laboratory analysis may include certain chemicals that can be readily identified as “non-hazards.” These are primarily identified in soil or water analysis and include essential nutrients, minerals, and related compounds. They are found commonly in nature and are considered, at least at some level, beneficial or even necessary to the proper functioning of the human body. These chemicals do not have published health criteria like other chemicals, mostly because negative health effects are expected to appear only at extremely high doses.

- Water Quality Concerns Not Related to Toxicity—Drinking water analysis also often includes properties that may not cause direct toxic effects, but which may aesthetically make the water less palatable (e.g., color, taste, or odor). This could lead to reduced ingestion that could in turn result in indirect health effects from dehydration. Because the MEGs are based on direct health effects from chemical exposures, MEGs were not developed for these properties. The U.S. Army Technical Bulletin – Medical (TB MED) 577 provides standards for physical properties that are used to determine water potability.

1.4.3 Revisions and Process Improvements

The USAPHC (Prov) continues to review and formulate improvements to both USAPHC (Prov) TG 230 and this RD to reflect lessons learned and changes to military policies and procedures, risk assessment methodologies, and toxicological information.

It is important to note that MEG values may change over time to reflect updated toxicity information. Users should use the most current MEGs presented in the latest published version of USAPHC (Prov) TG 230 and RD 230, or as posted on websites. The inside front cover of USAPHC (Prov) TG 230 and this RD provide methods for accessing the most current information. The USAPHC (Prov) may add MEGs for new chemicals as additional information becomes available. Also, USAPHC (Prov) is working to address some limitations on the existing information; for example, this version does not yet fully address aerosol particule size issues (see Section 4.6.3). Also, as requests for new MEGs are received, interim values may be developed and posted on the USAPHC (Prov) website.

The USAPHC (Prov) is merging the current MEG database into a larger chemical database to service multiple risk assessment needs for both deployment and garrison settings. This larger and more comprehensive database will allow for more efficient updating of risk reference data, such as health criteria, used to develop MEGs. These redesign efforts will increase the speed at which MEG updates are published, so that the MEGs are kept as current as possible relative to the changing toxicity information used in their development. Web-based access to the most current MEGs is forthcoming.

1.5 CHANGES FROM PREVIOUS VERSIONS

This June 2010 Revision represents the first major update of RD 230 (and TG 230) since 2002. Numerous changes were made to enhance the transparency of how MEGs are developed, accommodate user needs, and address recommendations made by the NRC. This section presents a summary of the key changes incorporated into this revision.

1.5.1 Expanded Chemical List

A prioritized list of hazards was not used to determine the chemicals for which to develop MEGs (as was done in 1999), with the exception of select warfare agents and specific acutely hazardous TICs. Instead, MEGs were developed for all chemicals for which appropriate health criteria were available. This current approach significantly increased the number of chemicals for MEG development. The intent was to provide MEGs for a wide variety of chemical hazards that may be encountered in deployment settings.

Over the past few years, USAPHC (Prov) has received numerous requests to develop MEGs for additional chemicals, and the current, augmented approach was judged as the best way to address the expanding need for various deployment scenarios. However, it is important to note that just because many MEGs are available it is not required that samples be analyzed for all

possible chemicals. When choosing chemicals of concern for exposure scenarios, chemicals selected should reflect site-specific concerns rather than the availability of a MEG. The large number of chemicals with MEGs is intended to meet the needs of different deployment scenarios, not to require additional laboratory analyses when unwarranted. Unwarranted laboratory or field analyses consume limited resources and time that are better expended characterizing specific chemicals of concern.

1.5.2 Updated Source Data and Revised Hierarchy of Sources

All the sources of data from which MEGs are developed were reviewed for updated data. This process ensures that the MEGs are based on the most current exposure values and toxicity information available (see note below). Some sources provide updated information on an annual basis where others provide updates on an as-needed basis. Each source was consulted for the most current information and data from each source was collected for all chemicals. The information collected from each source was expanded to include supplemental information for each exposure value (such as target organs, UFs, test species, and so forth) where provided. Each source was also reviewed for its applicability in developing MEGs. Guidance provided by the US Environmental Protection Agency (EPA) (EPA 2003b) and NRC (NRC 2004a) was considered while determining the most appropriate sources to use for developing MEGs. This resulted in the addition of several new sources for developing MEGs and changes to the standard hierarchies of sources used.

1.5.3 Updated Methodology for Developing Long-Term Soil MEGs

The EPA provided supplemental guidance for developing soil screening levels in 2002 (EPA 2002). This guidance provides updated equations for developing soil screening levels in occupational scenarios suitable for use in developing soil MEGs. Changes provided in the EPA guidance were incorporated into the soil MEGs so that the MEGs reflect the most current federal guidance for developing screening values. The EPA also recently provided supplemental guidance for dermal risk assessment (EPA 2004b) which was used to update the dermal component in the soil MEGs.

1.5.4 Development of MEG Database

A database was designed to contain all the chemical information used to develop the MEGs and to perform the calculations. The database allows for tracking of MEG sources and provides a central location for additional chemical information (such as synonyms and physical/chemical data). Due to the large amount of data collected, not all information is provided in RD 230.

2. EXPOSURE ASSESSMENT

The purpose of an exposure assessment in context of MEG development is twofold. The first goal is to ensure that relevant characteristics of the exposed population are considered in the development of exposure assumptions and in the evaluation of available health criteria published by other organizations for other purposes but considered to be of relevance to military scenarios. The second goal is to describe a conceptual model of environmental exposure that identifies the exposure pathways that are considered in MEG development and to document the basis behind the exposure assumptions associated with those exposure pathways.

2.1 SELECTED CHARACTERISTICS OF THE DEPLOYED POPULATION

In summary, the deployed military population is composed mostly of relatively healthy and fit male and female adults, 18 to 55 years of age, with an average weight of approximately 70 kg (i.e., approximately 154 pounds). While this description addresses the majority of personnel (e.g. estimated 90 percent or greater), demographic and other data show that there are personnel that fall outside this description. For example, particularly with increased reliance on National Guard and Reservists, older personnel are now deployed. In addition, it is know that a small percentage of females become pregnant right before or during deployment. The assumption that deployed military individuals will have no predisposing physical or mental factors that could exacerbate exposure to environmental chemicals, does not appear to be entirely supported through scientific evidence. While there are basic health and fitness requirements that must be met and maintained by military personnel, an assessment of the factors that can lead to chemical-specific susceptibilities suggests that many of the same primary susceptibility factors exist for the deployed military population (which includes active duty, reserve, and National Guard personnel). Predisposing factors such as age (> 40 years), illness (e.g., asthma), physical and emotional stressors, life-style choices (e.g., smoking or alcohol use), physiological state (e.g., fatigue, hypothermia, underlying cardiovascular disease), or unique genetic traits may alter susceptibility to some toxicants. In some cases, where adequate information is available, susceptible subgroups (e.g., asthmatics, which are included in deployments) can be considered during MEG development.

Various population characteristics were used to determine the standard hierarchy of health criteria sources and to select and/or adjust underlying toxicity values used in some MEG calculations. Available information shows that a small portion of the deployed population consists of susceptible individuals who, upon exposure to certain chemicals or classes of chemicals, are likely to first experience chemical exposure effects or will experience more severe effects. Nonetheless, in general risk analysts are typically not likely to know (a) who those individuals are, (b) what portion of the population is susceptible, and/or (c) the extent of the susceptibilities within the population. What is known are the various types of factors that increase susceptibility. This general knowledge served as the basis for developing MEGs that

address a relatively heterogeneous population amongst which there are some susceptible groups (without addressing hypersusceptible groups/persons with extreme chemicals sensitivities). The following section describes relevant population characteristics and the potential for unique susceptibilities of subgroups that are known or likely to be present.

2.1.1 Age

Demographics of the deployed active services differ from that of the general U.S. population. Most obviously, the age range of the deployed population does not include young children or the elderly. Table 2-1 provides overall statistics for deployed troops deployed from 2002–2008 (DMDC 2009), to include Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). Some summary points:

- The youngest troops are seventeen years of age (<1 percent are between 17-19 years).
- Over 74 percent are between 20 and 39 years.
- Approximately 11 percent are 40 years and older.
- Reservists (and National Guard) tend to be older that regular Active Duty.
- Approximately 10 percent are females.

The growing reliance on National Guard and especially Army Reserves for deployments to OIF and OEF has increased the percentages of the 40 and older age class amongst deployed personnel compared to historical deployment operations. For example, while only 11 percent of overall troops to OIF/OEF are over 40 years of age, over 50 percent of those deployed from Army Reserves are over 40 years. Nonetheless, data from past deployment shows less than 1.5 percent of those deployed to OIF and OEF were above 50 years of age (DMDC 2009), compared with 28 percent of the U.S. population (US Dept of Commerce 2001). Therefore, there are still significant differences between deployed personnel and the civilian population. On this same point, the oldest active service members are in the 60 to 65 year age group and this age class represents less than one percent of service personnel, and is an age class that is not represented on current deployment rosters.

It is important to recognize these differences with the civilian population, as many civilian chemical exposure standards are designed specifically to address the very young (i.e., infants and children during developmental years) or elderly populations that are not typically found among deployed personnel. However, the increasing reliance on Army Reserve and National Guard personnel greater than 40 years warrants some consideration, particularly for exposures that may have or exacerbate those with underlying cardiopulmonary disease—a category of disease that becomes increasingly likely in older populations.

2.1.2 Gender

As shown in Table 2-1, about 10 percent of deployed troops are female (in contrast, during the Persian Gulf conflict of 1990-1991 where less than 7 percent of those deployed were female). The gender distribution in military forces is markedly different from the U.S population as a whole, where the distribution between males and females is approximately 50/50 (Department

of the Army (DA) 2001; U. S. Dept of Commerce 2001). Gender differences can occur at the cellular level, and can be manifested by variation in drug reaction and metabolism. Gender differences in response to toxic exposures in the environment have been demonstrated for benzene, Pb and cigarette smoke, as well as nerve agents (Tarcher 1992). Females are considered more susceptible to the effects of exposure to benzene, and are estimated as being twice as susceptible to nerve agents (Mioduszewski et al. 2000, 2001, 2002a, 2002b; Anthony et al. 2003, 2004; Whalley et al. 2004; Benton et al. 2004, 2005). Males have been found to be more susceptible to the effects of cigarette smoke.

Table 2-1 Summary Demographics of Deployed U.S. Forces, 2002-2008[1]

Category	Male					Female					Total
	17–19	20–39	40–49	50+	Total	17–19	20–39	40–49	50+	Total	
Active Duty	4.34	58.26	4.02	0.23	66.85	0.54	6.48	0.40	0.03	7.45	74.30
Reserves	0.82	16.62	4.48	1.23	23.14	0.13	1.90	0.43	0.10	2.56	25.70
Total	5.15	74.88	8.49	1.46	89.99	0.68	8.38	0.82	0.12	10.01	100.00

All values are percentages (%).
[1] Data from the Defense Manpower Data Center from the Active Duty Master Contingency Tracking System and the Reserve Components Common Personnel Data System (DMDC 2009).

The deployed population is supposed to exclude pregnant females. Pregnant Soldiers are allowed to continue to serve in positions that do not generate potential harm to the fetus (e.g., duty is prohibited for tasks involving exposure to hazardous chemicals or military fuels, ionizing radiation, work in the motor pool involving painting/soldering, etc.) (AR 40-501). Field duty (ability to deploy from a garrison setting) is restricted for pregnant Soldiers after 20 weeks of gestation. However as soldiers do occasionally become pregnant prior to and during deployments, certain MEGs may take into account gestational/first trimester effects.

In summary, gender may make segments of the military population more or less susceptible to some chemicals. During MEG development this variation was taken into account to accommodate male or female susceptibility (whichever is more protective), where data shows a difference in response.

2.1.3 Body weight

The body weight (BW) used to estimate the MEGs was 70 kg. The EPA historically uses a 70-kg BW for conducting quantitative health risk assessments. This represents the mean BW of both adult males and females of the U.S. population. This number was updated by the EPA's Office of Research and Development (ORD) in the Exposure Factors Handbook (EPA 1997). Using data gathered by the National Center for Health Statistics, the EPA now recommends a mean adult BW of 71.8 kg.

However, existing data suggest that the overall BW of the military population is generally less than that of the general population because of their activity level. Using information from the EPA *Exposure Factors Handbook* (EPA 1997), it is estimated that the mean BW of adult males in the U.S. ranging from 18-55 years old in the U.S. is 78.2 kg. According to a study by the U.S. Army Research Institute of Environmental Medicine (USARIEM) (USARIEM 1995), the mean BW of men in the Army is estimated to equal 76.7 kg (n=32). For women, the mean BW for the general population is 64.6 kg for the same age group; for women in the Army, the mean BW is estimated to equal 61.1 kg (n=26). The EPA BW of 70 kg was considered reasonable for developing the air MEGs because use of this value is consistent with BW assumptions used to develop most of the existing toxicity values and guidelines.

2.1.4 Susceptibility factors contributing to individual response to exposures

While variability in response to chemical exposure within a deployed force is partly related age, gender, and body size (as discussed above), there are other factors that influence individual response. Health status, health-related behaviors, concurrent use of medications, and genetic susceptibility are factors that are known to influence response to various chemical exposures. Health status susceptibilities are expected to be most frequently associated with certain segments of the deployed population; for other types of factors, such as health behaviors like smoking, a continuum is likely (Lipscomb 2004, Dourson et al. 2004).

Individual and unit health status (e.g., dehydration, fatigue/lack of sleep, nutritional status, presence or absence of anemia, liver dysfunction and/or infection, presence or absence of infectious disease or injury, frequency and time course of alcohol and tobacco consumption) can govern subsequent susceptibility to chemical exposures (Morgan 1989, Haboubi and Thurnham 1986). Some of these physiological characteristics may also be transient and thus result in changes in individual susceptibility through time. Additionally, deployment and wartime factors (or "stressors") may influence individual response to chemical exposure. For example, deployed troops often experience dehydration, sleep deprivation, poor nutrition, and/or mental stress. Such factors may be independent or interdependent and can increase susceptibility to some chemical exposures.

2.1.4.1 Genetic Susceptibility

While it is implicit that genetic variability within the deployed force will be responsible for some of the variation of response to chemical exposure, this factor is not generally considered during OEH risk assessment and management practice. However, there are some cases where our scientific knowledge of gene-related susceptibilities in workplace settings informs our knowledge about establishing exposure guidelines. Notable examples include beryllium sensitivity and susceptibility to anticholinesterase toxicity.

Genetic variability is considered responsible for observed beryllium sensitivity in some members of the exposed workforce. One allele has been identified in 90 percent of those beryllium workers who exhibit chronic beryllium disease (Paustenbach et al. 2001); Paustenbach and colleagues (2001) also determined that this allele is present in 30 percent of the general

population. Therefore, while this genetic component of susceptibility is highly linked with developing chronic beryllium disease, a large portion of the population "may be" at risk if exposed. Further, it has also been determined that the prevalence of chronic beryllium disease in women beryllium workers is approximately six-fold higher than in men. In this particular example, susceptibility is not restricted to small fractions of the population.

Differences exist among individuals and subpopulations in their susceptibility to the toxicity of anticholinesterases such as organophosphate insecticides, the military-issue prophylactic compound pyridostigmine bromide, or nerve agents. These differences are due, in part, to the presence in the blood and other tissues of various types of binding enzymes (red blood cell acetylcholinesterase, plasma-cholinesterase, carboxylesterases, paraoxonase, etc.). The relative amounts, affinity and activity of these (non-nervous system) enzymes vary among individuals and subpopulations and are a consequence of genetic variability (Chanda et al. 2002); this genetic component can also show variation based on ethnic origin. For example, the low-activity variant of the paraoxonase gene is found more frequently among Orientals and African-Americans than among other ethnic groups (Allebrandt et al. 2002; Yamasaki et al. 1997; Antikainen et al. 1996). Some individuals with some of these genetic traits have enzyme activity reduced to less than 25 percent of normal values, whereas others have enzyme levels approximating 64% of normal (range 28-114 percent) (Lehmann and Liddell 1969, Bonderman and Bonderman 1971, Davies et al. 1996, Hayes 1982). Because these enzymes have been experimentally demonstrated to protect laboratory rats (see Ashani et al. 1993) and monkeys (see Raveh et al. 1997) from lethal and other acute toxic effects of nerve agent exposure, any individual who possesses abnormally low enzyme concentrations or activity may therefore, be more susceptible to nerve agent, insecticide or pyridostigmine bromide exposures. Thus, it is widely acknowledged that genetically controlled variability in the activity or concentration of these crucial enzymes is a significant factor in governing susceptibility to nerve agent exposures (NRC/Committee on Toxicology (COT) 2003).

At present, the genetic components of beryllium and nerve agent/organophosphate insecticide susceptibility are not screened at accession. Thus, susceptibility to these exposures is considered to be present within the deployed force.

2.1.4.2 Pre-Existing Cardiopulmonary Diseases

Epidemiological studies (EPA 2000b, 2004f, 2006b-c, 2008a-b) have demonstrated a positive relationship between a variety of public health problems (such as specific respiratory and cardiovascular medical outcomes) and the presence of high concentrations of air pollutants, particularly amongst specific subpopulations (e.g., elderly, young children, or those with preexisting conditions such as asthma or notable cardiovascular disease). Eye, nose, and throat irritation and other health effects, including those above, may occur sporadically, even in relatively healthy persons, especially if engaging in activities with increased aerobic activity (ground-level ozone (O_3) for example, EPA 2006e)

Air pollution exposure can aggravate asthma and bronchitis, causing increased medication use and doctor visits in individuals with these conditions. Individuals with pre-existing lung disease

may not be able to breathe as deeply or vigorously as normal. Inhalation exposure can also increase susceptibility to respiratory infections. Cardiovascular research has shown that airborne particles can aggravate some diseases, such as congestive heart failure and coronary artery disease (increased risk of blood clot formation, narrowing of vessels [vasoconstriction], and increased risk of atherosclerotic plaque rupture). Individuals with pre-existing heart disease may experience chest pain, palpitations, shortness of breath and fatigue. Inhalation exposure to fine particles has also been associated with cardiac arrhythmias and heart attacks.

The types and severity of cardiopulmonary health outcomes are largely associated with personal susceptibility. The USEPA considers persons with heart or lung disease (e.g. coronary artery disease, congestive heart failure, asthma, or chronic obstructive pulmonary disease (COPD), older adults (possibly due to undiagnosed heart or lung disease), and children to be at greater risk, especially when they are physically active. Exercise and physical activity cause people to breathe faster and more deeply—thus inhaling more pollution into their lungs.

Military personnel—especially those determined fit to deploy—are considered “healthy adults” due to age and military physical/health standards and requirements (see Section 2.1). Nonetheless, a small percentage of deployed individuals will have conditions that put them at greater risk for health effects of air pollution. For example, despite screening programs and regulations prohibiting accession of asthmatics (AR 40-501, Standards of Medical Fitness), it is estimated that due to waivers, later onset of asthma, and misdiagnosis, 2 to 5% of military personnel have asthma (Textbook of Military Medicine [TMM]-Recruit Medicine 2006). Likewise, although referral to a medical board and evaluation for fitness for duty would be indicated for individuals determined to have significant coronary artery disease, arrhythmias or hypertension, some individuals may have undiagnosed underlying conditions or may be found fit for duty after evaluation. Other conditions and risk factors that may increase air pollution impacts to deployed persons include preexisting respiratory disease, upper respiratory infections, smoking, fatigue, stress, and high aerobic activity due to increased respiratory rates during deployment. While the overall percentage of deployed personnel with these risk factors is relatively small, the impacts of an adverse health outcome, such as evacuation of someone with acute asthma unresponsive to standard treatment, or cardiac conditions requiring evaluation, can be logistically significant, and the conditions can be serious.

2.2 CONCEPTUAL MODEL OF ENVIRONMENTAL EXPOSURE

Deployed military personnel may be exposed to chemical substances in air, water, and soil. A general conceptual model of exposure is presumed, whereby deployed personnel are assumed to contact “contaminated” or impacted soil, water, and ambient air that contain chemical substances derived from multiple environmental sources or from a single source. The MEGs consider that deployed personnel would be exposed by inhaling chemical substances found in ambient air, by eye contact with ambient air, by ingestion of drinking water or field water supplies, by incidental ingestion of surface soils, by inhalation of soil dusts resuspended into the air, by inhalation of volatilized vapors emanating from soils, and by dermal skin contact with soils containing chemical hazards. While there are additional mechanisms of exposure, for

example, dermal skin contact with chemicals in field water supplies, MEGs that directly address these less common pathways are not yet developed. General exposure assumptions were used to best represent deployed military personnel exposures since military personnel may be deployed to a wide variety of locations with different exposure scenarios. Site-specific risk assessments can be used to directly assess unique exposure scenarios that are sufficiently different from the conceptual model presumed here for MEG development.

2.2.1 Ambient Air

Chemical hazards in ambient air may result from industrial emissions, accidental releases, terrorist activities and weapons systems, wind and environmental conditions, or uncovered buried wastes. The air MEGs are designed for assessing inhalation (and sometimes ocular) exposure to chemicals in ambient air. Most of the toxicity data used in deriving the air MEGs is based on inhalation exposures. However, the toxicity data used for developing the CWA air MEGs are designed for assessing inhalation and ocular exposures. Exposures to CWA vapors through the ocular routes are the most critical for assessing most nerve and mustard agent scenarios because CWA vapors are difficult to avoid, and affect the most sensitive and recognized target organs. Exposures to CWA vapors from skin absorption (percutaneous vapor exposures) are considered a substantially less hazardous exposure route than vapor eye contact or inhalation (USACHPPM 2004, NRC 2003). Therefore, the current air MEGs for CWA are protective for exposures from the percutaneous route of exposure as well. Development of air MEGs for percutaneous CWA vapor exposures may be considered for future versions of TG 230 to provide more comprehensive guidelines, but inhalation/ocular air MEGs should be used in the interim as a protective measure.

2.2.2 Drinking Water

Deployed military personnel may be exposed to chemicals in drinking water arising from industrial contamination, agriculture use (pesticides and fertilizers), intentional contamination (e.g., terrorist activities), and naturally-occurring sources. The original intent of the water MEGs was to be used to assess the risk to military personnel resulting from exposures to chemicals in field drinking water during deployments. Ingestion is the route of exposure that generally contributes most to overall intake, compared to other exposure routes.

Over the past few years, however, there has been an increasing concern that dermal and inhalation exposures resulting from non-drinking use of water sources (i.e., showering, cooking, vehicle washing, water immersion scenarios/training, etc.) may also be important. The NRC/COT reviewed a previous version of TG 230 and the water MEGs and agreed with this approach for protecting against exposure from dermal contact (NRC 2004a). The NRC performed risk calculations evaluating volatile and semi-volatile organic compounds (SVOCs) for dermal exposure from showering to determine if health risk from dermal exposure was lower than that from ingestion exposure. They found this to be true even for chemicals known to have high potential for skin penetration (NRC 2004a). Further, although the EPA has released updated guidance for conducting dermal exposure assessments (EPA 2004b), the number of

chemicals for which dermal absorption data are available is very limited. Therefore, dermal exposures were not specifically evaluated in deriving the water MEGs.

Inhalation exposure to volatile chemicals in water may occur through activities such as showering and cooking. It was not clear to the NRC whether these exposures would be as minimal as those from dermal exposure. It is anticipated that inhalation exposures would contribute less to overall exposure than ingestion exposures for most, if not all scenarios because the water MEGs were derived using higher ingestion rates relative to the general U.S. population.

Use of the water MEGs based on ingestion should, in general, be adequately protective without specifically assessing dermal and inhalation exposures. There is growing epidemiological and modeling evidence that dermal or inhalation exposure to some water contaminants (e.g. by showering) can have significant effects independent of oral exposure (Villanueva et al. 2007, Leavens et al. 2007). The current set of water MEGs does not directly assess these routes. Nonetheless, the drinking water MEGs can be adjusted to address these concerns as an interim approach. Guidance is provided in Section 5.2.2.

2.2.3 Soil

Exposure to soils during deployments may result from several routes of exposure. Personnel may incidentally ingest soil from hand-to-mouth contact, direct contact with exposed skin surfaces, or inhale dust particles or volatiles originating from soil. The soil MEGs address all three potential routes of exposure in order to provide a more comprehensive exposure guidelines, similar to the EPA methodology for developing values for construction workers (EPA 2002). Refer to Table 6-1 for a comparison of the approaches.

2.3 EXPOSURE ASSUMPTIONS RELATED TO TIME

The timing of exposure is addressed by the interplay of two factors—ED and exposure frequency (EF). These are reviewed in the following sections.

2.3.1 Exposure Duration

The ED is used to estimate the length of exposure. For the purposes of USAPHC (Prov) TG 230, EDs fall into two broad categories: “short-term” or “long-term” exposures as defined below. Table 2-2 presents the EDs used in developing MEGs for each environmental medium along with the relevant routes of exposure.

- **Short-Term Exposures Last Up to 2 Weeks (14 days or less).** Though deployments tend to span several weeks or months, there are occasions where specific operations will present unique chemical exposure hazards. Although not prolonged exposures, they may last from hours to several days. These exposures could result in significant and immediate impacts to personnel and the mission. Therefore, short-term MEGs have

been provided to address these more immediate, acute exposure events. Short-term MEGs may need to be used in context with longer deployments (e.g. 1 year) should circumstances define a unique exposure event of 14 days or less. If multiple short-term events occur consecutively, users should use long-term MEGs. Intermittent short-term exposure events may require comparison to both long-term and short-term MEGs. Exposure durations used for deriving short-term MEGs vary depending on the environmental medium and are described in Sections 4 and 5.

- **Long-Term Exposures Last from 2 Weeks up to 1 Year.** A typical long-term deployment is estimated to be 1-year in duration and this served as the ED for developing the long-term MEGs. The long-term MEGs are appropriate for assessing exposures lasting from 2 weeks to 1 year. Long-term MEGs, therefore, represent exposures to ambient environmental conditions such as pollution in the air, continual use of a contaminated water supply, or persistent soil contamination. Environmental monitoring may indicate fluctuations or variations in the actual concentrations of a chemical over time. These MEGs should be compared with what is considered the most representative and generalized exposure concentration during the 2 week to 1 year period. Deployments lasting less than 1 year but greater than 2 weeks (it is common to have 60-, 90-, or 120-day deployments) can still be assessed using the guidelines though this provides an additional level of conservatism.

Some recent deployments have been extended to 15 months (DA 2007). Active duty army units deployed to the Central Command area of responsibility will be on temporary extended deployments not to exceed 15 months due to ongoing missions. The policy will return to a 12 month duration as soon as possible (DA 2007). The long-term MEGs can be used to assess deployment exposures that are slightly longer than 1 year since they are designed to be a protective screening tool. If data shows that the average deployment length is increasing significantly and deployment policy changes, the long-term MEGs may need to be adjusted.

Table 2-2 Environmental Media, Exposure Routes, and EDs Used to Develop the MEGs

Environmental Media	ED Category	ED	Route(s) of Exposure
Ambient Air	Short-Term	10 minutes 1 hour 8 hours 24 hours 14 days	Inhalation, Ocular*
	Long-Term	1 year	
Drinking Water	Short-Term	7 days 14 days	Ingestion
	Long-Term	1 year	
Soil	Long-Term	1 year	Inhalation, Ingestion, Dermal Contact

* Consideration of the ocular (eye contact) route is limited to the CWAs only.

2.3.2 Exposure Frequency

The EF is used together with the ED to estimate the total time of exposure. Both the short- and long-term MEGs are based on the assumption that exposure is continuous, not intermittent, across the duration of exposure. Therefore, it was assumed that deployed personnel would be exposed daily throughout the course of the year (365 days) for developing the long-term MEGs. This is a protective assumption because there may be periods of time within a deployment where exposure is not continuous.

2.3.3 Averaging Time

The averaging time (AT) is the period over which the exposure is averaged and is needed to derive the long-term MEGs. The AT is presented in days and depends on the type of health effect being assessed (cancer or non-cancer). For noncarcinogen effects, the averaging time (AT_{nc}) is the period of exposure (i.e., the ED or 365 days). For cancer effects, the averaging time is a lifetime (AT_{ca}). A lifetime is considered 70 years (25,550 days). The approach for carcinogens is based on the assumption that a high dose received over a short period of time is equivalent to a corresponding low dose spread over a lifetime. The approach for determining averaging times was based on EPA guidance (EPA 1989a).

2.4 EXPOSURE ASSUMPTIONS FOR INHALATION EXPOSURES

This section describes the exposure assumptions that were used to develop the air MEGs and soil MEGs. As described previously, inhalation of vapors was not included in development of the water MEGs.

2.4.1 Inhalation Rate

The inhalation rate (IR) of deployed military personnel is expected to be higher than the general population because of potentially greater physical activity level. The EPA reports an average adult inhalation rate (IR_a) of 20 m^3/day (EPA 1989a). The EPA, *Exposure Factors Handbook* (EPA 1997), indicates somewhat lower IRs of 11.3 m^3/day and 15.2 m^3/day for females and males, respectively, for long-term exposures (EPA 1997). However, these recommendations would most likely underestimate a military person's IR due to differences in activity levels.

A U.S. Army Research Institute of Environmental Medicine (USARIEM) study provides useful information on IRs based on Soldier-specific activities (USARIEM 1995). The authors evaluated the metabolic rate of Soldiers by observing their oxygen uptake. Subjects were attired in mission-oriented protective posture (MOPP) and asked to perform tasks of various intensity while their heart rate and oxygen uptake were monitored. Two different classes of MOPP were used: MOPP-0 consisting of the battle dress uniform and MOPP-4 consisting of the battle dress oversuit with gloves, boots, and an M-17 protective mask. Since deployed military personnel are most likely to be in a battle dress uniform, only data from this experimental group (i.e., MOPP-0) were used.

To evaluate energy expenditure, Soldiers were asked to perform tasks with three different levels of intensity: light (<325 watts), moderate (325-500 watts), and high (>500 watts). In addition, each intensity level was broken down into different tasks. For example, the first task called L-1 involved maintaining a M-16 rifle, and L-2 referred to standing in a foxhole and performing guard duty. A higher numerical designation does not necessarily correspond with a higher work rate (more watts).

The USARIEM study and data presented in the EPA *Exposure Factors Handbook* (EPA 1997) regarding activity intensity and the associated IR showed reasonable similarity. Data from the USARIEM study were used to obtain a Soldier-specific IR because the degree of ventilation can be easily related to a specific activity. Table 2-3 summarizes the activity categories with the lowest and highest work rate for each intensity level. This information was compiled from male data only.

To estimate a daily IR, it was necessary to determine the probable daily activities of a deployed person. Since the type of activity is mission-dependent, it is not possible to pinpoint the exact number of hours a deployed person would spend on a task. Infantry personnel, however, would be expected to spend more hours performing higher intensity tasks than other personnel. Table 2-4 presents the number of hours spent per day on some common activities.

Table 2-3 Estimated Ventilation and Activity Category*

Task	Description	Work Rate in Watts
	LOW	
L-2	Standing in foxhole/guard duty	135
L-1	Maintain M-16 rifle	304
	MODERATE	
M-1	Load carriage, march 1.11 m/s, combat equipment with no rucksack	325
M-13	Dig defensive position	460
	HEAVY	
H-2	Load carriage, march 1.48 m/s, 20 kg load	505
H-9	Lift and carry, two 13.6 kg, 30 m, 4x/min	1162

*(USARIEM 1995)

Table 2-4 Hours Spent On Various Activities by Deployed Military Personnel

Activity	Hours Spent Per Day
Sleep	4-8
Work such as digging foxholes	8
Meals	3
Evening patrol/ambush	2-4
Other light duties	1

This information was provided and validated by military personnel deployed to the Middle East and Bosnia (Blanchard and Chang 1998, Ciesla and Chang 1998). Although only a limited number of military personnel were interviewed, their activity profile was deemed more realistic for deployed populations than assumptions used by the EPA to derive IRs for the general population. It should be noted that those who dug foxholes considered it to be a heavily strenuous activity, but USARIEM and the EPA regard it as a moderately strenuous activity. Results from the USARIEM report do suggest that digging foxholes is a more strenuous activity than other moderate activities. Activities such as night patrol and waiting-in-ambush were categorized as light as opposed to moderate (USARIEM 1995).

To estimate an IR, deployed military personnel were assumed to spend 6 hours per day sleeping, 4 hours per day for sedentary activities (e.g., eating meals), 6 hours per day for light duties (e.g., ambush) and 8 hours per day for moderate duties (e.g., digging foxholes). Even though military personnel may engage in higher intensity work or obtain less sleep, the assumption that a Soldier would be performing activities such as digging foxholes 8 hours a day for 365 days would balance out these conditions. Some of the intense to severely heavy activities, as described by the EPA, include competitive cycling and long-distance running. It is unlikely that the deployed military personnel would be engaged in tasks at such intensity levels for prolonged periods of time.
Since the USARIEM study does not include IRs for periods of sleep and rest, data from the EPA were used to fill this data gap. The recommended values are 0.4 cubic meter per hour (m^3/hour) and 0.5 m^3/hour for sleep and sedentary activities, respectively. For light activities, the arithmetic mean of all light intensity tasks from the USARIEM report was used as the representative value (1.2 m^3/hr). The arithmetic mean of moderate activities was computed to be 1.8 m^3/hr. However, this value was not used in the calculation of the chronic IR rate because, as indicated above, work such as digging foxholes requires the most energy output of this intensity level. To account for the work performed at similar intensity levels, the IR of 2.2 m^3/hr for digging defensive positions was used to represent the value for moderate activities. Only data from male subjects were used because the IR for men was greater than that for women for all tasks. This would result in more protective air MEGs. The final (weighted) IR used to develop the air MEGs was derived as shown in Equation 2-1.

Equation 2-1 Weighted Inhalation Rate

$$IR_a = \left(\frac{0.4 m^3}{hr} \cdot \frac{6 hrs}{day}\right) + \left(\frac{0.5 m^3}{hr} \cdot \frac{4 hrs}{day}\right) + \left(\frac{1.2 m^3}{hr} \cdot \frac{6 hrs}{day}\right) + \left(\frac{2.2 m^3}{hr} \cdot \frac{8 hrs}{day}\right)$$

This results in a daily IR of 29.2 m^3/day. This value was used for developing MEGs where daily IRs are included (14-day and 1-year MEGs). This value is much higher than the EPA *Exposure Factors Handbook* recommended value of 15.2 m^3/day (EPA 1997) for long-term exposures for males and is somewhat higher than the average adult EPA default value of 20 m^3/day (EPA 1989a).

2.4.2 Particulate Emission Factor

The particulate emission factor (PEF) is used for assessing exposure to nonvolatiles (SVOCs and metals) in surface soil. The PEF represents an estimate of the relationship between soil contaminant concentrations and the concentration of these contaminants in air as a consequence of particle suspension (EPA 2002). This factor is predominantly affected by wind erosion. Ideally, a site-specific PEF should be developed. However, because of considerable variability among deployment locations, EPA's default PEF for the commercial/industrial scenario was used (1.36E+09 m³/kg). (The EPA does not provide a default PEF for the construction worker scenario because development of a site-specific PEF is recommended.)

The PEF model was used by EPA to develop a default PEF used for estimating inhalation of nonvolatile contaminants in fugitive dust as a result of surface soil agitation. Calculation of the PEF requires selection of a source (contaminated area of soil) size which the EPA assumed to be 0.5 acres for deriving their default factor (EPA 2002). While a 0.5-acre source area may not be the average size of a contaminated area during deployment, only decreases in this value would result in more protective/lower soil MEGs. Furthermore, changes in the source area would only impact those chemicals that are more toxic via inhalation. It should be noted that the parameters for calculating the default PEF are based on data obtained from the continental United States (CONUS) and may not be representative of other geographical regions. The PEF used to develop the soil MEGs may be revised in the future as additional data on deployment site characteristics become available. Equation 2-2 presents our adoption of the EPA equation for the PEF that was used to derive the soil MEGs.

Equation 2-2 Derivation of the Particulate Emission Factor for the Commercial/ Industrial Scenario (EPA 2002)

$$PEF = \frac{Q}{C}_{wind} \cdot \left(\frac{3600 \text{sec}/hour}{0.036 \cdot (1-V) \cdot (U_m/U_t)^3 \cdot F(x)} \right)$$

PEF = Particulate emission factor (1.36E+09 m^3/kg)
Q/C_{wind} = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (93.77 g/m^2-s per kg/m^3)
V = Fraction of vegetation covered (0.5 or 50%) (unitless)
U_m = Mean annual wind speed (4.69 m/s)
U_t = Equivalent threshold value of wind speed at 7 meters (11.32 m/s)
F(x) = Function dependent on U_m/U_t (0.194) (unitless)

2.4.3 Volatilization Factor

The volatilization factor (VF) is used for assessing exposure to volatile organic compounds (VOCs) in subsurface soil. Some chemicals can volatilize from the soil and be inhaled as vapors while others tend to adhere to soil particles that can then be inhaled as fugitive dust

during such activities as foxhole digging. Whether or not a chemical will volatilize from the soil depends on the chemical's physicochemical characteristics. A chemical is classified as a VOC if the following criteria are met (EPA Region 9 2004):

- Henry's Law constant ≥ 10^{-5} atm-m^3/mol
- Molecular weight < 200 g/mol

The soil-to-air VF replaces the soil PEF used for semi-volatile organics and metals in the inhalation soil calculations for VOCs. The VF relates the concentration of a chemical in soil to the concentration in air resulting from volatilization (EPA 2002). Unlike the PEF, chemical-specific parameters are required to calculate the VF. The EPA provides an equation for deriving subchronic VF values for the construction scenario as presented in Equation 2-3. This equation was used to calculate chemical-specific VF values for use in the soil equations.

Equation 2-3 Derivation of the Subchronic Volatilization Factor for the Construction Scenario—Construction Worker (EPA 2002)

$$VF = \left(\frac{(3.14 \cdot DA \cdot T)^{1/2}}{2 \cdot \rho_b \cdot DA} \right) \cdot 0.0001 \frac{m^2}{cm^2} \cdot \frac{Q}{C_{sa}} \cdot \frac{1}{F_D}$$

where:

$$DA = \frac{\left[(\theta_a^{10/3} \cdot D_i \cdot H' + \theta_w^{10/3} \cdot D_w) / n^2 \right]}{\rho_b \cdot K_d + \theta_w + \theta_a \cdot H'}$$

VF = Soil-to-air volatilization factor (m^3/kg) (chemical-specific)*
DA = Apparent diffusivity (cm^2/s) (chemical-specific)
T = Total time over which deployment occurs (31,536,000 seconds) or 1 year*
ρ_b = Dry soil bulk density (1.5 g/cm^3)
Q/C_{sa} = Inverse of the ratio of the 1-hour geometric mean air concentration to the volatilization flux at the center of a square site (14.31 g/m^2-s per kg/m^3)
F_D = Dispersion correction factor (0.185) (unitless)
θ_a = Air-filled soil porosity ($n-\theta_w$)(L_{pore}/L_{soil})
n = Total soil porosity ($1- \rho_{b/} \rho_s$)(L_{pore}/L_{soil})
θ_w = Water-filled soil porosity (0.15 L_{water}/L_{soil})
ρ_s = Soil particle density (2.65 g/cm^3)
D_i = Diffusivity in air (cm^2/s) (chemical-specific)
H' = Dimensionless Henry's law constant (unitless) (chemical-specific)
D_w = Diffusivity in water (cm^2/s) (chemical-specific)
K_d = Soil-water partition coefficient (cm^3/g) (chemical-specific)

* The parameter name or default value was changed from EPA's equation to match TG 230 terminology or deployment exposure parameters

Chemical-specific parameters required to calculate the apparent diffusivity (DA) were obtained from several sources. The EPA Region 9 develops VF values for developing their soil Preliminary Remediation Goals (PRGs) (EPA Region 9 2004). These values were not used to derive the soil MEGs because the subchronic construction scenario VF equation was determined to be more appropriate for assessing deployment exposures. The EPA Region 9 does, however, provide the individual parameters for calculating apparent diffusivity on their website. These parameters were used to calculate the VF for use to derive the soil MEGs. Other sources for chemical-specific parameters include:

- Syracuse Research Corporation's (SRC) CHEMFATE Database (SRC 2005). This database provides environmental fate and physical/chemical property information on commercially important chemicals and is supported by the EPA. The EPA uses this database as the primary source for environmental data for their Superfund Chemical Data Matrix (EPA 2004a). Recommended values are presented for different parameters and were selected for use in the soil MEGs.

- National Library of Medicine's (NLM) Hazardous Substances Data Bank (HSDB®) (NLM 2005). The HSDB provides comprehensive, peer-reviewed data for about 5,000 chemicals. The HSDB was consulted when parameters were not available from EPA Region 9 Preliminary Remediation Goal (PRG) Tables or CHEMFATE. (HSDB® is a registered trademark of the National Library of Medicine.)

- Health-Based Environmental Screening Levels (HBESL) (USACHPPM 1999). The HBESL document provides physical/chemical parameters for six CWAs that were used for developing soil screening levels. The HBESL was used as a source for obtaining chemical-specific parameters for CWAs.

Many of the VOCs in the MEG database had data available from the above sources sufficient to calculate a VF. Those without enough data were not evaluated for inhalation exposure from soil at this time.

2.5 EXPOSURE ASSUMPTIONS FOR INGESTION EXPOSURES

2.5.1 Drinking Water Ingestion Rate (IR_w)

Daily water requirements for deployed military personnel depend on environmental heat stress, activity level, exposure duration, and individual characteristics (i.e., body size and sweating rate). The water MEGs were derived for drinking water ingestion rates of 5 L/day (for temperate climates) and 15 L/day (for dry/arid climates), which are generally consistent with the TB MED 507, the CASCOM water planning report (CASCOM 2008), and the 2005 version of TB MED 577 descriptions of increased water intake based on operational conditions and individual variability. (Note: The 2010 revision of TB MED 577 does not include different potability standards for different water consumption rates. Rather, it provides a single set of short-term

standards based on the previous 2005 TB MED 577 standards for the 15 L/d consumption rate and the new long-term standards are independent of consumption rate.)

Use of a maximum daily ingestion rate of 15 L/day provides water MEGs that are protective for military personnel continuously exposed to dry/arid climates during operations. Therefore, for each of the three different exposure durations (7 day, 14 day, and 1 year), two water MEG values were derived to reflect the two ingestion rates (5 L/day and 15 L/day).

These rates are much higher than those used for assessing general population drinking water ingestion (standard assumption used by the EPA is 2 L/day for adults for 70 years), but they have been validated and established in Army doctrine and manuals (see above paragraph). Daily maximum ingestion rates are consistent with the experiences of the Israeli Defense Forces and observations by US Army Medical Services Officers at National Guard armor battalion training exercises in the Mojave Desert (Henry 1985).

It should be noted that TB MED 507, *Heat Stress Control and Heat Casualty Management*, (TB MED 507, 2003) provides an upper limit for daily water intake of 12 quarts/day (11.36 L/day). This daily upper limit is provided as a safeguard against overdrinking and development of water intoxication (hyponatremia). However, the water requirements in TB MED 507 are provided for training, and TB MED 507 describes that during operational conditions, mission needs may demand sustained high-intensity work greater than that encountered during training conditions. The TB MED 507 states—

> In extremely active soldiers (who are also very fit and highly heat acclimatized), water requirements can be greater than 12 quarts/day. World War II desert operations showed that a few very active soldiers could have daily requirements of greater than 16 quarts.

In addition, TB MED 507 fluid replacement guidelines are provided for the “average” Soldier, and it is recognized that considerable individual variability exists depending on body size and sweating rate, as well as exposure to full shade or full sun.

2.5.2 Soil Ingestion Rate

Information is not currently available to estimate incidental soil ingestion for the military population either during training at CONUS facilities or during deployments. In addition, data on soil ingestion rates (IR_s) for adults engaged in outdoor work are not currently available since most studies focus on children (EPA 2002). The EPA recommends using a default ingestion rate for construction workers of 330-mg/day which is based on the 95^{th} percentile value for adult soil intake rates reported in a soil ingestion mass-balance study (EPA 2002). This IR_s is higher than those for residential adults since EPA believes construction workers are likely to experience substantial exposures to soils during excavation and other work activities. The construction worker IR_s was adopted for assessing deployed military exposures since their activities resulting in exposure are similar, and the default value represents a high-end ingestion rate. The EPA’s default ingestion rate for construction workers is subject to change as better

data become available and any changes will be considered for use in updating the soil MEGs in future revisions.

2.5.3 Fraction Ingested

The fraction ingested is a unitless measure of the fraction of soil ingested from contaminated source. A value of 1 (or 100 percent) was used for this assessment. This is a conservative approach because it assumes all the soil ingested is contaminated, which is likely to overestimate actual exposures.

2.6 EXPOSURE ASSUMPTIONS FOR DERMAL EXPOSURES

2.6.1 Skin-Soil Adherence Factor

The adherence factor (AF) describes the amount of soil that adheres to exposed skin per square centimeter (cm^2). The skin-soil AF is primarily dependent on soil properties, the part of the body that is exposed, and the type of activity. Since little is known about the extent of soil adherence to the skin for military-specific activities, AFs developed by the EPA for other activities were reviewed as possible sources of surrogate data. The EPA's guidance for developing soil screening levels recommends a default value of 0.3 mg/cm² for construction workers (EPA 2002). This value is the same as that used for commercial/industrial outdoor worker receptors, and represents the 95th percentile value for construction workers.

This value was not used for deployed military personnel because EPA's updated dermal risk assessment guidance (EPA 2004b) provides a different recommendation. The dermal guidance recommends using a default adherence factor of 0.2 mg/cm² for commercial/industrial adult workers. This value is based on the 50th percentile weighted AF for utility workers, which was the activity determined to represent a high-end contact activity (in comparison to exposure scenarios such as grounds keepers [0.02 mg/cm²], irrigation installers [0.08 mg/cm²], construction workers [0.1 mg/cm²], gardeners [0.1 mg/cm²], and so forth). The 50th, rather than the 95th, percentile is recommended for use with a high-end soil contact activity to be consistent with use of a reasonable maximum exposure scenario. Therefore, a soil AF of 0.2 mg/cm² was used for developing the soil MEGs.

2.6.2 Dermal Absorption Fraction Values for Soil

The dermal absorption fraction (ABS) is a chemical-specific parameter used to estimate the amount of chemical that travels across the skin barrier. The ABS determines how much of the chemical bound to the soil particle actually gets absorbed across the skin. Few chemical-specific ABS values have been developed. The EPA provides recommended ABS soil values for 11 chemicals and four chemical categories in the 2004 dermal risk assessment guidance (EPA 2004b). The EPA continues to add ABS values for additional chemicals as further research becomes available. In September 2004, ABS values for 12 additional chemicals were added to their website for use in risk assessment (EPA 2004b). These recommended values

were determined using the Superfund default human exposure assumptions and are average absorption values for an exposure time per event of 24 hours.

Although EPA identified categories of chemicals to apply ABS values, the criteria for identifying chemicals included in each category were not provided. The following criteria were selected and used to assign chemicals into the four categories identified by EPA:

1. Dioxins—chemicals having toxicity values available and identified in EPA's Dioxin Reassessment (EPA 2003f) with toxic equivalence factors (TEFs).

2. Polynuclear Aromatic Hydrocarbons (PAHs)—chemicals having toxicity values available and identified as PAHs on the EPA Region 9 PRG table (EPA Region 9 2004).

3. Polychlorinated Biphenyls (PCBs)—chemicals having toxicity values available and identified on EPA's *Table of PCB Congeners and Other Species* in their PCB website (EPA 2003a).

4. Semi-Volatile Organic Compounds (SVOCs)—chemicals having toxicity values available and meeting EPA Region 3 definition of a SVOC were included in this category. Chemicals are defined by EPA Region 3 as SVOCs if their boiling point is higher than water, causing them to vaporize when exposed to temperatures above room temperature (EPA Region 3 2005b).

Default ABS values have been used in the past for assessing chemicals without ABS values available. The EPA now recommends against this practice, and only chemicals with ABS values presented in Risk Assessment Guidance for Superfund (RAGS) Part E (EPA 2004b) are assessed for dermal exposures. Default values for VOCs and inorganics are no longer available since VOC exposure from soil should be accounted for via inhalation exposure assessments. In addition, the variability of inorganics speciation and lack of data make development of a default ABS value inappropriate (EPA 2004b).

Chemical-specific ABS values have been estimated for some of the CWAs (USACHPPM 1998). These estimated ABS values are presented in Appendix H of USACHPPM 1998 and are based on an hourly soil absorption rate. A 24-hour exposure was assumed to develop the soil MEGs to account for the situation where military personnel under deployment may not shower every day, prolonging the adherence of contaminated soil to the skin. The hourly ABS values presented in USACHPPM 1998 were adjusted to a daily ABS values by multiplying the value by 24. This resulted in 24-hour exposure event based ABS values consistent with those provided by EPA.

Less than 200 chemicals had ABS values available, and a smaller number had both toxicity values and ABS values required to develop dermally-based soil MEGs. Table 2-5 presents the ABS values available from the EPA as well as those estimated for the CWA.

2.6.3 Exposed Skin Surface Area

The skin surface area (SA) describes the amount of skin exposed to soil. The average amount of SA available for contact depends on the type of clothing that is worn during deployment. While there may be instances where tops will be removed or sleeves will be rolled up during work, deployed military personnel are generally expected to be clad in uniforms at all times. This ensures that they are camouflaged and protects them from injury or insect bites. When personnel are properly attired in the field, only their hands and head would be exposed. Also, to account for the likely instance of personnel rolling up their sleeves, the surface area from the forearm was also included to account for dermal exposure from soil.

The EPA guidance was consulted to determine an appropriate SA for assessing deployment exposures (EPA 2004b). Skin exposure for EPA's adult commercial/industrial receptor is consistent with skin exposure for deployed military personnel. Both assume receptors wear a short-sleeve shirt, long pants, and shoes limiting exposure to the head, hands, and forearms. The EPA recommends an SA of 3300 cm^2 for this scenario based on the average of the 50^{th} percentile for male and female adult receptors greater than 18 years of age. This recommendation is based on SA data presented in EPA's *Exposure Factors Handbook* (EPA 1997), which contains SAs for various body parts and for different percentiles. The average of the 50^{th} percentile was used, rather than the 95^{th} percentile, to correlate with the average body weight used for developing the MEGs. This was done to prevent inconsistent parameter combinations since BW and SA are dependent variables, as indicated in current EPA guidance (EPA 2004b).

Table 2-5 Dermal Absorption Fraction Values for Soil

Chemical/Category	CASRN[1]	Dermal Absorption Fraction $(ABS)_2$	# Chemicals Included in Category	Reference
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.006	1	EPA 2004b (website)
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.009	1	EPA 2004b (website)
Arsenic	7440-38-2	0.00.93	1	EPA 2004b
Cadmium	7440-43-9	0.001	1	EPA 2004b
Chlordane	57-74-9	0.04	1	EPA 2004b
Diamino-6-nitrotoluene, 2,4-	6629-29-4	0.011	1	EPA 2004b (website)
Diamino-4-nitrotoluene, 2,6-	59229-75-3	0.005	1	EPA 2004b (website)
Dichlorophenoxy acetic acid, 2,4-	94-75-7	0.05	1	EPA 2004b
DDT	50-29-3	0.03	1	EPA 2004b
Dinitrotoluene, 2,4-	121-14-2	0.102	1	EPA 2004b (website)
Dinitrotoluene, 2,6-	606-20-2	0.099	1	EPA 2004b (website)
RDX (Cyclotrimethylenetrinitramine)	121-82-4	0.015	1	EPA 2004b (website)
Lindane	58-89-9	0.04	1	EPA 2004b
HMX (high-melting explosive)	2691-41-0	0.006	1	EPA 2004b (website)
Pentachlorophenol	87-86-5	0.25	1	EPA 2004b
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	0.00065	1	EPA 2004b (website)
Thiodiglycol	111-48-8	0.0075	1	EPA 2004b (website)
Trinitrobenzene, 1,3,5-	99-35-4	0.019	1	EPA 2004b (website)
Trinitrotoluene, 2,4,6-	118-96-7	0.032	1	EPA 2004b (website)
TCDD (2,3,4,8-Tetrachlorodibenzo-*p*-dioxin) and other dioxins	Various	0.03	17	EPA 2004b
Benzo(a)pyrene and other PAHs	Various	0.13	16	EPA 2004b
Aroclor 1254/1242 and other PCBs	Various	0.14	10	EPA 2004b
SVOCs	Various	0.1	67	EPA 2004b
GA (Tabun)	77-81-6	0.062	1	USACHPPM 1998[3]
GB (Sarin)	107-44-8	0.084	1	USACHPPM 1998[3]
GD (Soman)	96-64-0	0.19	1	USACHPPM 1998[3]
HD (Sulfur Mustard)	505-60-2	0.17	1	USACHPPM 1998[3]
VX	50782-69-9	0.065	1	USACHPPM 1998[3]

[1] CASRN - Chemical Abstract Service Registry Number.
[2] The ABS is presented as an average absorption fraction for an exposure time of 24 hours.
[3] ABS values provided by USACHPPM 1998 are estimated values based on hourly soil absorption rates. These values were multiplied by 24 to adjust for the 24 hour exposure used in developing MEGs and for consistency with the 24 hour exposure time used by the EPA in developing ABS values.

2.7 SUMMARY OF EXPOSURE ASSUMPTIONS

Table 2-6 summarizes the exposure assumptions used to develop most of the MEGs. These assumptions constitute the standard MEG-derivation exposure profile.

Table 2-6 Summary of Exposure Assumptions Used to Develop the MEGs

Exposure Parameter Abbreviation	Exposure Parameter Name	Value and Units	Reference(s)
ABS	Dermal absorption fraction	Chemical-specific (unitless)	EPA 2004b
AF	Soil-to-skin adherence factor	0.2 mg/cm²	EPA 2004b
AT_{nc}	Averaging time for non-carcinogens	365 days	EPA 1989a
AT_{ca}	Averaging time for carcinogens	25,550 days	EPA 1989a
BW	Body weight	70 kg	EPA 1997
ED	Exposure duration	Varies – up to 1 year*	DA 2007
EF	Exposure frequency	Continuous and varies depending on MEG. Up to 365 days/year	
FI	Fraction ingested from contaminated soil	1 (100 percent)	EPA 2002
IR_a	Inhalation rate for air	29.2 m³/day	USARIEM 1995, Blanchard and Chang 1998, Ciesla and Chang 1998
IR_w	Ingestion rate for water	5 L/day or 15 L/day	TB MED 507 TB MED 577 (2005) CASCOM 2008
IR_s	Ingestion rate for soil	330 mg/day	EPA 2002
PEF	Particulate emission factor	1.36E+09 m³/kg	EPA 2002
SA	Skin surface area	3300 cm^2	EPA 2004b
VF	Volatilization factor from soil	Chemical-specific (m³/kg)	EPA 2002

* DA 2007 indicates that current Active Duty Army units deployed to the CENTCOM AOR will be on temporary extended deployments not to exceed 15 months due to ongoing missions. The policy will return to a 12-month duration as soon as possible.

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3. HEALTH CRITERIA SOURCES

3.1 OVERVIEW

This section presents the sources used for obtaining health criteria to develop the MEGs. The term “health criteria” is used in this report to refer to exposure guidelines, exposure standards, and/or toxicological values used to develop the MEGs. Later chapters present the specific methodologies used for developing the MEGs for each media. Table 3-1 presents a summary of the sources used to develop the MEGs. It is important to note that this section does not provide an exhaustive list of sources publishing health criteria. A variety of agencies publish health criteria based on different types of health outcomes, receptor populations, and exposure scenarios. These sources may be used for other types of risk assessments routinely performed by the Army.

The sources used to develop the MEGs were selected based on the criteria presented in Section 3.2 and generally include values published by Federal agencies designed to be protective of populations similar to deployed military personnel. Future revisions to the MEGs may include other sources not listed in this section (such as values published by States or international organizations). Additional sources can be considered using the selection criteria in order to determine the most appropriate sources for assessing deployed military exposures.

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Table 3-1 Summary of Health Criteria Sources Used for Developing the MEGs

Source	Criteria Name(s)	Exposure Duration(s)	Route of Exposure	Population	Reference
American Conference of Governmental Industrial Hygienists (ACGIH®)	Threshold Limit Values (TLV®) • Ceiling (C) • Short-term exposure limit (STEL) • Time-weighted average (TWA)	• Acute • Chronic	• Inhalation	• Workers	ACGIH 2010
American Industrial Hygiene Association (AIHA)	Emergency Response Planning Guidelines (ERPG)	• 1-hour	• Inhalation	• Emergency responders • General public	AIHA 2009
Agency for Toxic Substances and Disease Registry (ATSDR)	Minimal Risk Levels (MRL)	• Acute • Intermediate • Chronic	• Ingestion • Inhalation	• General public	ATSDR 2009
*Centers for Disease Control and Prevention (CDC)	Airborne Exposure Limits (AELs) • Immediately Dangerous to Life or Health (IDLH) • Short-term exposure limit (STEL) • Worker Population Limit (WPL) • General Population Limit (GPL)	• Acute • Chronic	• Inhalation	• Workers • General public	CDC 2003 CDC 2004
*Department of the Army (DA)	Airborne Exposure Limits (AELs) • Immediately Dangerous to Life or Health (IDLH) • Short-term exposure limit (STEL) • Worker Population Limit (WPL) • General Population Limit (GPL)	• Acute • Chronic	• Inhalation	• Workers • General public	DA 2004a DA 2004b
U.S. Environmental Protection Agency (EPA) and the National Research Council (NRC)	Acute Exposure Guideline Levels (AEGL)	• 10-minute • 30-minute • 1-hour • 4-hour • 8-hour	• Inhalation	• General public	EPA/NRC 2010
EPA Office of Water	Drinking Water Health Advisories (HAs)	• 1-day • 10-day • Long-term • Lifetime	• Ingestion	• General public	EPA 2009b

(continued)

Table 3-1 Summary of Health Criteria Sources Used for Developing the MEGs (continued)

Source	Criteria Name(s)	Exposure Duration(s)	Route of Exposure	Population	Reference
EPA Office of Superfund Remediation and Technology Innovation – Dermal Risk Assessment Guidance	• Cancer slope factor (CSF) • Reference dose (RfD)	• Sub-chronic • Chronic	• Dermal absorption	• General public	EPA 2004b
EPA Office of Research and Development – Health Effects Assessment Summary Tables (HEAST)	• CSF • Reference concentration (RfC) • RfD • Unit risk (UR)	• Sub-chronic • Chronic	• Ingestion • Inhalation	• General public	EPA 2005b
EPA Office of Research and Development – Integrated Risk Information System (IRIS)	• CSF • RfC • RfD • UR	• Chronic	• Ingestion • Inhalation	• General public	EPA 2010
EPA Office of Air Quality Planning and Standards	National Ambient Air Quality Standards (NAAQS)	• 1-hour • 3-hour • 8-hour • 24-hour • Quarterly • Annual	• Inhalation	• General public	EPA 2009c
EPA Office of Superfund Remediation and Technology Innovation – Provisional Peer Reviewed Toxicity Values (PPRTV)	• CSF • RfC • RfD • UR	• Sub-chronic • Chronic	• Ingestion • Inhalation	• General public	EPA 2009d
*Munro et al.	• RfD • RfC	• Sub-chronic • Chronic	• Ingestion • Inhalation	• General public	Munro et al. 1999
U.S. Navy/NRC	• Continuous Exposure Guidance Level (CEGL) • Emergency Exposure Guidance Level (EEGL) • Short-term Public Emergency Guidance Level (SPEGL)	• 1-hour • 24-hour • Sub-chronic	• Inhalation	• Submariners	U.S. Navy/NRC 2009

(continued)

Table 3-1 Summary of Health Criteria Sources Used for Developing the MEGs (continued)

Source	Criteria Name(s)	Exposure Duration(s)	Route of Exposure	Population	Reference
National Research Council (NRC) – Military Smokes and Obscurants	• EEGL • PEGL/Repeated Exposure Guidance Level (REGL) • SPEGL • Permissible Public Exposure Guidance Level (PPEGL)/Repeated Public Exposure Guidance Level (RPEGL)	• 15 min • 1 hr • 6 hr • 8 hr	• Inhalation	• Military personnel • General public	NRC 1997 NRC 1999a NRC 1999b
*Opresko et al.	• RfD	• Chronic	• Ingestion	• General public	Opresko et al. 2001
*USACHPPM – Health-Based Environmental Screening Levels for Chemical Warfare Agents (HBESL)	• CSF • RfD	• Chronic	• Ingestion • Inhalation	• General public	USACHPPM 1999
*USACHPPM – Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures	• Effective Concentration (EC) • Lethal Concentration (LCt) • Population Threshold Estimate (PTE)	• 10-min • 1-hour • 8-hours • 24-hour	• Inhalation	• Military personnel	USACHPPM 2004
U.S. Army Technical Bulletin Medical 577 (2005 version) **	Tri-Service Field Water Standards (TSFWS)	• < 7day • < 1 year	• Ingestion	• Deployed military personnel	TB MED 577, 2005 **
U.S. Department of Energy (DOE)	Temporary Emergency Exposure Limits (TEEL)	• 1-hour	• Inhalation	• Emergency responders • General public	DOE 2009

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* Indicates sources exclusively for CWA and agent degradation product values.
** The 2010 TB MED 577 revision includes changes to the short and long term field water quality standards. For more information see the TB MED 577 description in Section 3.3.2.1 and the citation in Appendix A. The current MEG development process does not conflict with the 2010 TB MED 577 revision.

3.2 SOURCE SELECTION CRITERIA

Five selection criteria were used to choose sources of data and health criteria for developing the MEGs. The criteria are listed below in general order of priority. Each source listed in Table 3-1 was rated according to these criteria. For each criterion, a source was rated with a plus or minus (as defined in the sections below) in order to describe how each source ranked relative to the selection criteria.

- Similarity of Exposure Scenario.
- Consistency with EPA Guidance and NRC Recommendations.
- Peer-Review.
- Date of Publication and Reviews.
- Documentation and Transparency of Methods.

Standard hierarchies of sources were developed based in part on these criteria ratings. The hierarchies for selecting short-term MEGs are presented in Sections 4 through 6, and the hierarchies for selecting values for developing long-term MEGs are presented in Section 3.4.

3.2.1 Selection Criterion 1: Similarity of Exposure Scenario

Exposure assumptions used were compared to those for deployed military personnel. The most important factors were the ED (acute, subchronic, chronic) and route of exposure but EF (i.e., continuous versus intermittent exposure) and population characteristics (workers, sick, elderly, children, and so forth) were also considered.

- Plus Rating (+) Source has similar assumptions for at least the ED and route of exposure

- Minus Rating (–) Source ED and population assumptions differ from standard MEG-derivation exposure profile

3.2.2 Selection Criterion 2: Consistency with EPA Guidance and NRC Recommendations

The EPA revised their hierarchy of human health toxicity values recommended for use in Superfund risk assessments in December 2003 (EPA 2003b). Their hierarchy is based on the most current values, similarity of methods and procedures for developing values, peer-review, public availability, and transparency of methods. The EPA also provides suggested sources for obtaining subchronic toxicity values in their Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (EPA 2002). The NRC provided recommendations on sources to use for developing MEGs (NRC 2004a), which were considered. All three of these

referenced documents were consulted in selecting sources since these agencies are widely respected in the field of health risk assessment.

- Plus Rating (+) Source is consistent with general EPA and NRC guidance.
- Minus Rating (–) Source does not meet EPA and NRC guidance.

3.2.3 Selection Criterion 3: Peer-Review

Whether or not a source has been peer-reviewed and the extent of the peer-review is an important consideration for determining data quality. Sources having less extensive peer-review processes ranked lower because they were assumed to be less widely accepted and potentially of lower quality. In addition, some sources publish draft or proposed values (i.e., AEGLs and EPA Health Advisories) which were considered in the absence of other available values.

- Plus Rating (+) Source presents peer-reviewed, published values.
- Minus Rating (–) Source does not present peer-reviewed values and/or it does not present published values that are final.

3.2.4 Selection Criterion 4: Date of Publication and Reviews

Epidemiological and toxicological information can change over time, and the most current sources of health criteria were sought for developing the MEGs. Sources with health criteria that were published or reviewed/revised within the last 5 years were preferred. However, data from older sources (i.e., 1980s and 1990s) were used when more current information was unavailable.

- Plus Rating (+) Source presents values that are less than 5 years old and that are regularly reviewed or revised.
- Minus Rating (–) Source presents values that are more than 5 years old and that are not reviewed on a regular basis.

3.2.5 Selection Criterion 5: Documentation and Transparency of Methods

The supporting documentation accompanying sources for health criteria were evaluated to determine the transparency and consistency of methods used for developing values. Some sources provide complete documentation on source websites (i.e., EPA's IRIS database and ATSDR MRLs) while other source information is not publicly available but must be purchased or obtained by contacting the source. Sources without a clear and consistent methodology or

publicly available documentation were only used when values from other sources were not available.

- Plus Rating (+) Source documentation provides a clear presentation of methods and is easily accessible

- Minus Rating (–) Source documentation is difficult to obtain and does not provide transparency of methods

3.3 SOURCES FOR DEVELOPING SHORT-TERM MEGS

This section presents the different types of health criteria used for developing the short-term MEGs. They are presented by exposure route in alphabetical order. The selection of a hierarchy of sources and adjustments to exposure values are discussed in Sections 4 and 5, which present the methodology for developing the air and water MEGs, respectively. Short-term MEGs are not developed for soil at this time.

3.3.1 Inhalation Health Criteria Sources

3.3.1.1 (AEGLs (EPA/NRC 2010)

The AEGLs are reviewed and published by EPA and the NRC and represent exposure limits for the general public for a range of effects and emergency EDs. These values are intended to protect the general public and include consideration of sensitive sub-populations but not hypersensitive or hyper-susceptible individuals (NRC 2000). The AEGLs are derived for 10-minute, 30-minute, 1-hour, 4-hour, and 8-hour EDs. There are three generic health effect levels as defined below:

- AEGL-1—The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

- AEGL-2—The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting health effects or impaired ability to escape.

- AEGL-3—The airborne concentration of a substance above which it is predicted that the general population including susceptible individuals could experience life-threatening health effects or death.

3.3.1.2 Acute Toxicity Estimates for CWAs (USACHPPM 2004)

The USACHPPM report *Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures* (USACHPPM 2004) provides implementation guidance on the use and interpretation of the December 2001 DATSD-CBD interim-certified acute toxicity values for GA, GB, GD, Cyclosarin (GF), nerve gas VX, and HD (DATSD-CBD 2001). This USACHPPM report demonstrates how to incorporate the interim-certified military acute toxicity values into ORM terminology and how toxicity information and corresponding health impacts can be translated into the different ORM hazard severity categories found in doctrine (FM 5-19). The DATSD-CBD-designated military acute toxicity estimates are provided in the form of concentration x time values for "effective" concentrations that cause mild or severe effects (ECt mild and ECt severe), as well as LCts. The USACHPPM report (USACHPPM 2004) provides calculations and resulting concentrations for each of the severity levels (catastrophic through negligible), including derivation of estimated PTE for EDs ranging from 10 minutes to 24 hours, which were compared to AEGL 1 levels for the same durations. Section 4.2.4 provides additional information as to the application of these criteria as MEGs.

3.3.1.3 Exposure Guide Levels (EGLs) for Military Smokes and Obscurants (NRC 1997, 1999b-c)

The NRC/COT has developed EGLs for selected military smokes and obscurants [titanium dioxide, graphite, white phosphorous, brass, hexachloroethane (HC), red phosphorous, fog oil and diesel fuel]. These EGLs and the science behind their development are detailed in three NRC reports (NRC 1997, 1999b, 1999c). Volume 1 (NRC 1997) covers diesel fuel smoke, fog oil smoke, red phosphorous smoke, and HC smoke. Volume 2 (NRC 1999b) covers the remaining smokes and obscurants. Volume 3 (NRC 1999c) covers colored smokes, although NRC concluded there was not enough data to set EGLs of any duration for colored smokes. There are four levels of EGLs defined in the 3 NRC reports—

- EEGL—Emergency exposure guidance level for a rare, emergency situation resulting in an unanticipated exposure of military personnel for less than 24 hr.

- PEGL/REGL—Permissible exposure guidance level for repeated exposure of military personnel during training. Volumes 2 and 3 refer to this as a repeated exposure guidance level.

- SPEGL—Short-term public emergency guidance level for a rare, emergency situation potentially resulting in an exposure of the general public to military-training smoke.

- PPEGL/RPEGL—Permissible public exposure guidance level for possible repeated exposures of the general public residing or working near military-training facilities. Volumes 2 and 3 refer to this as a repeated public exposure guidance level.

3.3.1.4 CEGLs (U.S. Navy/NRC 2009)

The NRC/COT has developed values for deployed military personnel for continuous exposures/deployments lasting up to 90 days (e.g., as in a submarine). The CEGLs are intended to provide guidance for persistent exposures that should not cause serious or permanent effects in Navy submarine personnel. It is important to note that these values may not be protective of female reproductive and developmental endpoints since they were designed for assessing male submariners (at present, crews for the U.S. submarine fleet do not include female personnel).

3.3.1.5 ERPGs (AIHA 2009)

The ERPGs are developed by the AIHA and are intended for emergency planning and response operations. They are based on a weight-of-evidence (WOE) evaluation and are reviewed at regular intervals as new information becomes available. Definitions of the three levels of ERPG values are as follows:

- ERPG-1—The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.

- ERPG-2—The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

- ERPG-3—The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

The ERPGs are intended to protect most individuals in the general population but not particularly sensitive individuals (AIHA 2002). Hyper-sensitive individuals may develop adverse health effects at concentrations below these guidelines.

3.3.1.6 MRLs (ATSDR 2009)

The MRLs are developed by the ATSDR and are defined as an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration. The MRLs are derived in the development of toxicological profiles when ATSDR determines that reliable and sufficient data exist to identify the target organ(s) of effect or the most sensitive health effect(s) for a specific duration for a given route of exposure to the substance. The MRLs are based on non-cancer health effects only and do not consider cancer effects. The MRLs are developed for acute (1-14 days),

intermediate (14-364 days), and chronic (365 days and longer) EDs for inhalation and oral routes of exposure.

The MRLs are derived using the no-observed adverse effect level (NOAEL) concentration and applying UFs to extrapolate to the general population (including sensitive sub-populations but not hypersensitive individuals). The methodology used is consistent with that used by the EPA in the development of reference values (EPA 1989a, EPA 1997). Since these values are based on a NOAEL, adverse effects may not occur as a result of exposures to concentrations that slightly exceed the MRL. It should be noted that cancer endpoints were not considered in the development of MRLs, and, therefore, it is not certain if they are protective for this endpoint.

3.3.1.7 PACs/TEELs (DOE 2009)

The DOE Subcommittee on Consequence Assessment and Protective Actions develops PACs/TEELs for chemicals which do not have AEGLs or ERPGs available for use in emergency planning at DOE sites. The PACs/TEELs are based on the correlation between acute data [e.g., lethal concentration, 50% (LC_{50}), lowest lethal concentration (LC_{LO}), and so forth] and existing values (e.g., STELs, TLVs, and the various levels of existing ERPGs. The PACs/TEELs do not undergo the rigorous peer review processes of AEGLs and ERPGs, are subject to change, and are intended to serve as interim values until AEGLs or ERPGs are published (Craig et al. 1995, Craig and Lux 1998).

There are three levels of PACs/TEELs with definitions nearly identical to the ERPGs. PACs/TEELs are available for almost 3,000 chemicals (DOE 2009). The definitions for the PACs/TEELs are provided below—

- PAC/TEEL-1—The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.
- PAC/TEEL-2—The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action;
- PAC/TEEL-3—The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing life-threatening health effects.

3.3.1.8 TLVs (ACGIH 2010)

The ACGIH annually publishes TLVs as guidelines to assist in the control of health hazards in occupational settings. The TLVs® are developed for the typical working population that is assumed to be potentially exposed 8 hours/day, during a 40-hour work week. The ACGIH cautions against any other use for the TLVs (ACGIH 2010).

Three types of TLVs are developed by ACGIH: ceiling limits (TLV-C), short-term exposure limits (TLV-STEL), and time-weighted averages (TLV-TWA). The TLV-TWA was used to develop the MEGs and is defined below. For the purposes of this document, the term TLV is used to refer to the TLV-TWA hereafter.

- TLV-TWA—The TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect.

Epidemiological data, as well as toxicological and toxicokinetic data, are used in the derivation of TLVs. Since occupational exposures can be chronic (i.e., exceeding 7 years), cancer is considered as an endpoint. Also considered is the 2/3 (16-hour) daily break in exposure that may be important in the disposition of substances to which one is exposed in the workplace. With the 2010 publication, TLVs are available for nearly 750 chemicals.

3.3.2 Ingestion Health Criteria Sources

3.3.2.1 Military Field Drinking Water Standards (TB MED 577)

The Military Field Water Standards (MFWS) for assessing water potability are published in TB MED 577 for water hazards that may cause health effects in exposed personnel. The revised TB MED 577 (2010) includes changes to the short and long term standards previously published in 2005. The revision includes the establishment of Short-term Potability (STP) Standards for up to 30 days of exposure. The STP standards are set at levels at which some individuals might be affected, but overall unit performance and mission accomplishment should not be jeopardized. For some STP standards, the allowable levels are based on direct toxic effects. For others, they represent points where the water may become so unpalatable that personnel will choose to become dehydrated rather than drink it. Uncertainty factors to protect more sensitive members of the population were not incorporated into the standards. In some cases, concentrations just slightly higher than the standard may elicit adverse health effects. Therefore, it is important that the levels of contaminants in the water that is actually used for drinking are not higher than the standards. The approach used to develop the basis for the standards is described in the paper “Evaluation of Military Field-Water Quality” (Daniels 1990).

The 2010 30-day STP standards are are a subset of the previous 2005 standards and include standards for physical properties and microbiological, radiological, and chemical hazards. The chemical hazards addressed by the STP standards include chemical warfare agents and five other chemicals.

The 2010 revision to TB MED 577 includes a complete revision of the Long-Term Potability (LTP) standards. The new LTP standards are primarily based on U.S. Federal water standards for drinking water and bottled water. The reviewer is referred to Sections 3.4.3.5 and 5.5.2.

3.3.2.2 Drinking Water Health Advisories (EPA 2009b)

The EPA HAs are defined as estimates of acceptable drinking water levels for chemical substances based on health effects information. They are not legally enforceable standards but are intended to provide technical guidance to assist Federal, state, and local officials (EPA 2009b). Four different types of HAs have been published by EPA: (1) 1-day,(2) 10-day, (3) long-term, and (4) lifetime values. The definitions for the 1-day and 10-day HAs used to develop the short-term water MEGs are provided below.

- One-day HA—The concentration of a chemical in drinking water that is not expected to cause any adverse non-cancer effects for up to 5 consecutive days of exposure, with a margin of safety (EPA 1989b).

- Ten-day HA—The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to 14 consecutive days of exposure, with a margin of safety (EPA 1989b).

The EPA derives HAs using animal or human studies of acceptable design. Studies with an ED comparable to the HA duration are preferred for developing HAs. In general, 1-day HAs are based on data from acute human or animal studies involving up to 7 days of exposure. Ten-day HAs are generally based on subacute animal studies involving 7 to 30 days of exposure. Studies based on oral exposure (administered via drinking water, gavage, or diet) are preferred but inhalation studies are sometimes used when oral values are not available. Consideration of species sensitivity, magnitude of NOAEL/LOAEL relative to other studies, and degree of confidence in the study are also factored into study selection.

The short-term HAs were derived for a 10-kg child consuming 1 L/day since EPA considers children to be the most sensitive subpopulation. Equation 3-1 provides the general formula and exposure assumptions EPA used for calculating the HAs.

Equation 3-1 Derivation of the EPA Drinking Water Health Advisories (EPA 1989b)

$$HA = \frac{(NOAEL or\ LOAEL) \cdot BW}{UF \cdot IR_C}$$

HA = EPA drinking water health advisory (mg/L)
NOAEL = No Observed Adverse Effect Level (mg/kg-day)
LOAEL = Lowest Observed Adverse Effect Level (mg/kg-day)
BW = Body weight for child (10 kg)
UF = Uncertainty factor (chosen with EPA or NAS guidelines) (unitless)
IR_c = Drinking water ingestion rate for child (1 L/day)*

* The parameter name was changed from EPA's equation to match TG 230 terminology or deployment exposure parameters

Health advisories were available for nearly 160 chemicals in the 2009 Edition of the Drinking Water Standards and Health Advisories (EPA 2009b). Most documentation for the HAs has not been updated in many years (many are from the late 1980s). However, there are limited sources with acute oral toxicity values currently available.

3.3.2.3 MRLs (ATSDR 2009)

The MRLs are described under the inhalation values. Oral MRLs are derived similarly to the HAs but are not adjusted for BW or an ingestion rate. The NOAEL or LOAEL is simply divided by UFs and converted to units of mg/kg-day.

3.4 SOURCES FOR DEVELOPING LONG-TERM MEGS

This section presents the different sources of health criteria used for developing the long-term MEGs, as well as the general health endpoints and types of long-term health criteria. The selection of a standard hierarchy of sources is also presented. The hierarchy of sources for developing long-term MEGs is presented here as part of Section 3 (unlike the hierarchies for short-term MEGs) because a consistent approach was used rather than a separate hierarchy for each type of MEG (i.e., the same hierarchy for selecting cancer values was used for developing long-term air, water, and soil MEGs).

3.4.1 Reference Doses for Non-Cancer Effects and Acceptable Hazard Ratio

Exposure to a chemical may result in both cancer and/or non-cancer health effects depending on the particular chemical under evaluation. Non-cancer endpoints include health effects other than cancer (i.e., kidney damage, reproductive effects, and so forth). They are evaluated differently than cancer endpoints in health risk assessments because they are assumed to have a threshold dose below which adverse health effects will not occur. The potential for non-cancer effects is estimated by comparing the daily intake of a chemical to its established toxicity value as demonstrated in Equation 3-2. A ratio equal to or less than one is commonly used to indicate that there is not an increased potential for adverse health effects. This ratio is known as the “hazard quotient” in health risk assessment. A hazard quotient of one was used to develop the long-term MEGs.

Equation 3-2 Hazard Quotient Calculation (EPA 1989a)

$$HQ = \frac{Intake}{RfD}$$

HQ = Hazard quotient (unitless)
Intake = Daily chemical intake (mg/kg-day)
RfD = Reference dose (mg/kg-day)

Non-cancer toxicity values used for health risk assessment are referred to as RfD for oral and dermal exposures, and RfCs for inhalation exposures. Various reference values may be available for a chemical depending on the exposure route, critical effect, and ED. The ED is generally considered to be either chronic or subchronic. Chronic exposures are defined as exposure periods between 7 years and a lifetime and usually provide the most conservative (lowest value) RfDs. Subchronic reference values are used to evaluate exposures between 2 weeks and 7 years and provide higher reference values than chronic reference values. Since the ED used for the long-term MEGs was 1 year, subchronic reference values were the preferred non-cancer values used to develop the MEGs. The availability of subchronic reference values is limited, so chronic reference values were used to fill data gaps when necessary. The chronic RfD definition is provided below.

> A chronic RfD is defined as an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. (EPA 2010)

Reference values are typically available for inhalation and oral routes of exposure. Specific RfDs for dermal exposures are not currently available, and route-to-route extrapolations are often performed based on available oral toxicity data using guidance established by the EPA (EPA 2004b). Section 3.4.4 describes how oral toxicity data is used for assessing dermal exposures.

Additional toxicity information is provided along with the reference values to assist users. This information includes the critical effect on which the reference value is based, the confidence level in the reference value, the number of UFs applied to develop the reference value, the date and source for the reference value, and any additional notes. Because the reference value is an estimated value with inherent uncertainties, the value is reported using one significant figure.

3.4.2 Potency Measures for Cancer and Acceptable Cancer Risk

Carcinogens are presumed to have non-threshold effects. This means that increased risk of health effects is correlated with increased exposure, in terms of time and/or concentration. Since risk from exposure to cancer-causing chemicals cannot be totally eliminated, health guidelines are traditionally based on a predetermined *de minimis* or “acceptable” theoretical risk of cancer from exposure to a chemical.

The EPA often identifies an increased cancer theoretical risk of one additional person in an exposed population of 1,000,000 (or 1×10^{-6}) to one additional person in an exposed population of 10,000 (or 1×10^{-4}) as an acceptable risk range of excess cancer cases over the course of a lifetime from non-voluntary exposures to environmental chemicals (EPA 2005a). A 1×10^{-6} excess cancer risk is the more conservative end of the range and is most frequently used in decisions regarding protection of larger sectors of the general population in situations where people do not have a choice in being exposed (e.g., the U.S. Food and Drug Administration

(FDA) limits carcinogenic additives in food to levels that present no more than a 1×10^{-6} excess cancer risk). By contrast, many industrial standards for workplace environments use a 1×10^{-3} level or higher risk (e.g., a risk of 1×10^{-2}, or 1 in 100, a 1 percent chance). This higher cancer risk is "accepted" in workplace environments because it is often technologically or financially infeasible to control exposures to even lower levels and the "voluntary" nature of the exposure conditions at the workplace.

Equation 3-3 demonstrates how a cancer risk estimate is calculated based on a daily chemical intake and cancer slope factor.

Equation 3-3 Cancer Risk Estimate Calculation (EPA 1989a)

$$Risk = Intake \cdot CSF$$

Risk = Cancer risk estimate (unitless)
Intake = Daily chemical intake (mg/kg-day)
CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

For military operations, the level of acceptable risk will vary depending on the mission. Some situations may arise, particularly in adversarial/hostile environments, where high exposures to a relatively potent carcinogen are considered acceptable given the alternative hazards faced. For the purposes of assessing deployed military exposures, an acceptable excess cancer risk level is set at one additional person in an exposed population of 10,000 (or 1×10^{-4}). In addition to being within the EPA acceptable risk range and being more protective than many occupational standards, the selection of this risk level is supported by previous documentation of the DOD risk level determined to be appropriate for the military (NRC 1986). For comparison, the background cancer rate in the United States is approximately 0.4 or 40 percent (National Cancer Institute (NCI) 1999).

Before cancer potency measures are established, a determination is made as to the likelihood that the chemical is a human carcinogen. The evidence for carcinogenicity can range from no data in animals or humans to confirmed data in humans. The traditional EPA WOE classification system (EPA 1986a) assigns one of five alphabetical labels from A to E to a chemical based on the scientific evidence. The new guidance (EPA 2005a) for the WOE classification uses five categories of descriptors that are accompanied by a WOE narrative to further define the designation for the substance.

Table 3-2 presents these WOE classification systems. Both sets of WOE classification systems are relevant because the majority of toxicity information still uses the previous alphabetical designation as the EPA has not yet fully implemented the new approach. Table C-1 in Appendix C presents the EPA WOE categories for chemicals for which long-term MEGs were developed (i.e., chemicals with exposure values currently available.

Potency estimates are developed for suspected carcinogens (see Table 3-2 footnote) and are plausible upper-bound estimates of the probability of a response per unit intake of a chemical over a lifetime. Based on current regulatory policy, the EPA generally develops the cancer slope factor (CSF_o) for oral exposures and the unit risk factor (URF_i) for inhalation exposures. The CSFs and UR factors are understood to be applicable to situations approximating continuous lifetime exposure (EPA 2010).

The CSF is the slope of the dose-response curve in the low-dose region. When low-dose linearity cannot be assumed, the slope factor is the slope of the straight line from zero dose (and zero excess risk) to the dose at 1 percent excess risk. An upper bound on this slope is usually used instead of the slope itself. The units of the slope factor are usually expressed as $(mg/kg\text{-}day)^{-1}$. In risk assessment, CSFs can be developed for ingestion (CSF_o), inhalation (CSF_i), and dermal absorption (CSF_{abs}) routes of exposure.

The CSF_os are used to derive the long-term MEGs. All sources except HEAST provide oral cancer values as CSF_o. Instead, HEAST values are provided as oral unit risk factors (URF_o) that were converted into CSF_o values using Equation 3-4.

Table 3-2 The EPA Weight-of-Evidence Classifications

Previous Approach (EPA 1986a): Weight-of-Evidence (WOE) Categories

A—Human carcinogen *
Sufficient evidence in epidemiological studies to support causal association between exposure and cancer.

B—Probable human carcinogen *
Limited evidence in epidemiological studies (Group B1) and/or sufficient evidence from animal studies (Group B2).

C—Possible human carcinogen *
Limited evidence from animal studies and inadequate or no data in humans.

D—Not classifiable
Inadequate or no human and animal evidence of carcinogenicity.

E—No evidence of human carcinogenicity
No evidence of carcinogenicity in at least two adequate animal tests in different species or in adequate epidemiological or animal studies.

Revised Approach (EPA 2005a): Weight-of-Evidence Descriptors

Carcinogenic to Humans * (CA)
This descriptor is appropriate when there is convincing epidemiologic evidence demonstrating causality between human exposure and cancer, or exceptionally when there is strong epidemiological evidence, extensive animal evidence, knowledge of the mode of action, and information that the mode of action is anticipated to occur in humans and progress to tumors. The descriptor is always followed by a narrative that fully characterizes the weight of the evidence for the substance.

Likely to be Carcinogenic to Humans * (LI)
This descriptor is appropriate when the available tumor effects and other key data are adequate to demonstrate carcinogenic potential to humans, but does not reach the WOE for the descriptor “carcinogenic to humans.” The descriptor is always followed by a narrative that fully characterizes the WOE for the substance.

Suggestive Evidence of Carcinogenic Potential (SU)
This descriptor is appropriate when the evidence from human or animal data is suggestive of carcinogenicity, which raises a concern for carcinogenic effects but is judged not sufficient for a stronger conclusion. The descriptor is always followed by a narrative that fully characterizes the WOE for the substance.

Inadequate Information to Assess Carcinogenic Potential (IN)
This descriptor is used when available data are judged inadequate to perform an assessment. The descriptor is always followed by a narrative that fully characterizes the WOE for the substance.

Not Likely to be Carcinogenic to Humans (NO)
This descriptor is used when the available data are considered robust for deciding that there is no basis for human hazard concern. The descriptor is always followed by a narrative that fully characterizes the WOE for the substance.

* Though exceptions do exist, the EPA generally limits the development of dose-response assessments and consensus slope factors to these categories (made on a case-by-case basis for category C agents in the previous scheme) (EPA 1986a, 2005b).
Note: EPA does not provide abbreviated categories using the revised approach. The abbreviated category names (CA, LI, SU, IN, NO) were added for the purpose of TG/RD 230 to minimize presentation space in Appendix Tables.

Equation 3-4 Calculating a CSF_o from a UR_o

$$CSFo = \frac{URo \cdot BW \cdot CF}{IR}$$

CSF_o = Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$
UR_o = Oral unit risk factor (risk per µg/L)
BW = Body weight (70 kg)
CF = Conversion factor (1000 µg/mg)
IR = Ingestion rate (2 L/day) – EPA default assumption (EPA 1997)*

* The parameter name was changed from EPA's equation to match TG 230 terminology or deployment exposure parameters

The UR factor for inhalation exposure (UR_i) is an expression of the risk per unit concentration of a substance in air; expressed in units of (micrograms per cubic meter [$\mu g/m^3$])$^{-1}$. The UR_i values were used to develop the long-term MEGs. Some sources present inhalation cancer values as CSF_i. The CSF_i values were converted to UR_i values using the EPA default values for adult lifetime, average body weight, and IR as presented in Equation 3-5.

Equation 3-5 Calculating a UR_i from a CSF_i

$$URi = \frac{CSFi \cdot IR}{BW \cdot CF}$$

UR_i = Inhalation unit risk factor (risk per $\mu g/m^3$)
CSF_i = Inhalation cancer slope factor $(mg/kg\text{-}day)^{-1}$
IR = Inhalation rate (20 m^3/day) – EPA default assumption (EPA 1997)
BW = Body weight (70 kg)—EPA default assumption (EPA 1997)
CF = Conversion factor (1000 micrograms per milligram [µg/mg])

Specific dermal CSF_{abs} are currently not available. The EPA provides guidance for adjusting oral toxicity factors for the purposes of dermal exposure assessments (EPA 2004b), as described for non-carcinogens and presented in Section 3.4.4. However, none of the chemicals in EPA's dermal absorption database, for which adjustments to the oral toxicity values were recommended, have cancer values available (i.e., all chemicals are considered non-carcinogens).

Additional toxicity information is provided along with the CSF value for the user. This includes the WOE classification, type of cancer upon which the CSF is based, date and source for the toxicity data, and any additional notes. The CSF value is reported with two significant figures.

3.4.3 Health Criteria Sources for Inhalation and Ingestion Exposures

This section presents the sources for inhalation and ingestion health criteria used for developing the long-term MEGs. The sources (rather than value names) are presented in alphabetical order since many of the value names are the same. In addition, many sources provide values for both routes of exposure making it easier to combine into one section.

3.4.3.1 ACGIH TLVs (ACGIH 2010)

The TLVs were also used for developing some of the short-term air MEGs and are presented in Section 3.3.1.8. These values were used for developing the long-term air MEGs. The TLV-TWA is defined as the concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse health effect.

3.4.3.2 ATSDR MRLs (ATSDR 2009)

The MRLs developed by the ATSDR were introduced in Section 3.3.1.6 and are defined as estimates of the daily human exposures to hazardous substances that are likely to be without appreciable risk of adverse non-cancer health effects over a specified duration. Intermediate and chronic MRLs are used for developing the long-term MEGs.

3.4.3.3 CDC AELs (CDC 2003, CDC 2004)

The CDC is responsible for setting AELs for CWA in order to protect workers and the public near locations where CWA are stored. Updated AELs for the nerve agents GA, GB, and VX were published in the Federal Register in 2003 (CDC 2003). Interim AELs for H and HD were published in the Federal Register in 2004 (CDC 2004). Four different types of AELs were provided—

- GPL for assessing continuous exposure to the general public.
- WPL for assessing 8 hour exposures to workers.
- STEL for assessing worker exposures.
- IDLH for assessing worker exposures.

3.4.3.4 DA AELs (DA 2004a, DA 2004b)

The Army has adopted CDC's AELs for the CWA. Updated AELs were not, however, provided for GD and GF. The Army revised the AELs for GD and GF using the updated methodology for developing the AELs for consistency. This source presents the Army's updated AELs for GD and GF along with implementation guidance for adopting CDC's AELs for the other CWA.

3.4.3.5 Military Field Water Standards (TB MED 577)

The 2010 revision to TB MED 577 includes a complete revision of the Long-Term Potability (LTP) standards. The new LTP standards are primarily based on U.S. Federal water standards for drinking water and bottled water. The reviewer is referred to Section 5.5.2. During the development of the 1-year water MEGs, these Federal standards were examined in collaboration with the lead subject matter experts for the TB MED 577 revision so that the long-term (1-year) Negligible water MEGs did not conflict with the new 2010 LTP standards. Refer to Section 3.3.2.1 for additional information about TB MED 577 including the short-term potability (STP) standards.

3.4.3.6 EPA HEAST (EPA 2005b)

The EPA HEAST were last published in July 1997 (EPA 2005b) and were originally intended as a comprehensive listing consisting of provisional risk assessment information relative to oral and inhalation routes of exposure for chemicals. The HEAST contains values for subchronic and chronic exposures for both cancer and non-cancer endpoints for almost 500 chemicals. Currently, a batch-wise review of HEAST toxicity values is being conducted by the EPA. The reviewed, updated values will be entered in the PPRTV by EPA, eventually phasing out the use of HEAST. In the interim, HEAST is still used as a source for exposure values for the purposes of health risk assessment, especially subchronic values. Although HEAST was last published in 1997, EPA maintains reviewed HEAST files on their intranet. The EPA was consulted regarding the use of HEAST values for developing the MEGs and reviewed all the HEAST values in the TG 230 database, making changes as needed to reflect information in the EPA intranet (as of March 2005).

3.4.3.7 EPA IRIS (EPA 2010)

The IRIS is an electronic database prepared and maintained by the EPA. It contains information on human health effects that may result from exposure to various chemicals in the environment. The IRIS was developed in response to a growing demand for consistent information on chemical substances for use in health risk assessments, decision making, and regulatory activities. The heart of the IRIS system is its collection of computer files covering individual chemicals. These chemical files contain descriptive and quantitative information on chronic non-carcinogenic health effects (RfD_os and inhalation RfCs) and carcinogenic effects (CSF_os and oral and inhalation unit risks). The IRIS is the preferred source for toxicity information since it is an up-to-date EPA database which has undergone peer review. The IRIS data is obtained from EPA's website and values are added and updated as needed.

3.4.3.8 EPA PPRTV (EPA 2009d)

The PPRTVs consist of both chronic and subchronic toxicity information for chemicals not yet included in IRIS. The toxicity values in the PPRTV database are developed and externally reviewed according to current EPA guidance on deriving human health toxicity values for EPA's Superfund Program. However, they have not undergone the multi-program review and

consensus required for toxicity values to be placed in IRIS. The PPRTVs are also derived from reassessments of HEAST toxicity values. The PPRTVs were available on EPA's website on a trial basis until July 2004. The PPRTV data is not currently available for public access and must be obtained from the EPA Office of Superfund Remediation and Technology Innovation. The EPA was consulted regarding use of their toxicity values for developing the MEGs.

3.4.3.9 Munro et al. (Munro et al. 1999)

There are many possible agent degradation products (ADPs) from CWA breakdown. The ADPs of potential concern were identified by consulting *The Sources, Fate, and Toxicity of Chemical Warfare Agent Degradation Products (*Munro et al. 1999). Munro et al. identified ADPs of potential concern by focusing on those with known significant environmental persistence and toxicity. A total of seven ADPs were evaluated for MEG development based on identification from Table 26 of Munro et al.

Munro et al. provides reference values for those ADPs not having values published by other sources. The oral reference values provided in Munro et al. are estimated values based on data from structurally related chemicals or from quantitative structure-activity relationship estimates. These estimated values were derived in the absence of other published toxicity values and contain a higher level of uncertainty than other published reference values. None of the seven ADPs are categorized as carcinogenic and, therefore, were evaluated for non-cancer health effects only.

Munro et al. also provides inhalation reference values for agent degradation product (ADP) without other published values available. These inhalation RfCs were calculated based on route-to-route extrapolations from the estimated RfD_os previously described. Inhalation toxicity values from Munro et al. are based on route extrapolations on estimated RfDs and contain a high level of uncertainty.

3.4.3.10 Opresko et al. (Opresko et al. 2001)

Opresko et al. published the most recent estimated RfD_os for six CWAs (GA, GB, GD, VX, HD, and Lewisite) in their review of the NRC assessment of the Army's estimated RfDs (Opresko et al. 2001). The estimated reference doses (RfD_os) presented in Opresko et al. are applied on an Army-wide basis for calculating health-based environmental screening levels.

3.4.3.11 USACHPPM HBESL (USACHPPM 1999)

The *Derivation of Health-Based Environmental Screening Levels for Chemical Warfare Agents* "HBESL" (USACHPPM 1999) presents CWA soil screening levels derived using EPA methodology for residential and industrial receptors based on the three routes of exposure used to derive the soil MEGs. The HBESL document also provides an CSF_o for HD and chronic reference values for six CWAs (six inhalation RfDs and one RfD_o).

3.4.4 Health Criteria Sources for Dermal Absorption Exposures

There are no current EPA or ATSDR dermal-specific toxicity values available for use in health risk assessment. In the absence of dermal toxicity values, EPA devised a simplified paradigm for making oral-to-dermal extrapolations for systemic effects as presented in their Dermal Risk Assessment Guidance (EPA 2004b). The EPA's paradigm accounts for the fact that most RfD_os and slope factors are expressed as the amount of substance administered per unit time and body weight; whereas, exposure estimates for the dermal pathway are expressed as absorbed dose. The dose-response relationship obtained from the oral administration studies is utilized, and adjustments are made for gastrointestinal (GI) absorption efficiency to represent the toxicity factor in terms of absorbed dose. The EPA's paradigm was followed to determine toxicity values for use in assessing dermal exposure for the soil MEGs.

The EPA recommends adjusting the oral toxicity value when the GI absorption rate (ABS_{GI}) is equal to or less than 50 percent ($\leq$ 50 percent). If the ABS_{GI} is greater than 50 percent (> 50 percent) or a value is not available, EPA recommends using a default value of 100 percent is (i.e., dermal toxicity value is the same as the oral toxicity value). Using the unadjusted oral toxicity value may be less protective in some instances. However, in light of the data gaps, this is the process EPA currently recommends. For cancer effects, the dermal toxicity value is obtained by dividing the CSF_o by the ABS_{GI}. For non-cancer effects, the RfD_o is multiplied by the ABS_{GI} to obtain the dermal RfD.

There are only 11 chemicals for which EPA currently recommends adjusting the oral toxicity value for dermal assessments (EPA 2004b). All 11 chemicals had non-cancer values available (i.e., no adjustments were made to cancer values). These chemicals are presented in Table 3-3. Only one of these chemicals (cadmium) has an ABS value available and was incorporated into the soil MEG development. Dermal exposures for all other chemicals with ABS values available were assessed using unmodified oral toxicity values.

Table 3-3 Adjusted Dermal Reference Doses

Chemical Name	CASRN	ABS	ABS_{GI}	RfD_{abs} (mg/kg-day)	Exposure Value Adjusted*
Antimony, elemental	7440-36-0		15%	3.00E-05	PPRTV RfDo_sub
Barium, elemental	7440-39-3		7%	4.90E-03	IRIS RfDo_chr
Beryllium, elemental	7440-41-7		0.7%	3.50E-05	HEAST RfDo_sub
Cadmium, elemental	7440-43-9	0.001	2.5%	1.25E-05	IRIS RfDo_chr
Chromium (III)	16065-83-1		1.3%	1.95E-02	IRIS RfDo_chr
Chromium (VI)	18540-29-9		2.5%	5.00E-04	HEAST RfDo_sub
Manganese	7439-96-5		4%	5.60E-03	IRIS RfDo_chr
Mercuric chloride	7487-94-7		7%	2.10E-05	IRIS RfDo_chr
Nickel, soluble salts	Ni sol salts		4%	8.00E-04	IRIS RfDo_chr
Silver	7440-22-4		4%	2.00E-04	IRIS RfDo_chr
Vanadium pentoxide	1314-62-1		2.6%	2.34E-04	IRIS RfDo_chr

* The exposure value used to calculate the RfD_{abs} was selected according to the standard hierarchy.
sub = subchronic chr = chronic

3.4.5 Standard Hierarchies of Sources for the Long-Term MEGs

The sources of health criteria selected for developing the long-term MEGs were determined based on the selection criteria presented in Section 3.2. This section describes how these criteria were used to select the standard hierarchy of sources for obtaining cancer and non-cancer health criteria (or toxicity values), respectively. These two separate hierarchies were used to develop long-term MEGs based on both types of health endpoints. The lower of the two resulting values was generally selected as the final MEG value; however, the details on how each long-term MEG was developed is described in Sections 4 through 6. Sources of exposure values that are specific to an environmental medium (rather than a route of exposure or type of health endpoint) were not included in the hierarchy of sources (EPA Drinking Water Health Advisories, U.S. Army Tri-Service Field Water Drinking Standards, ACGIH TLVs, and the NAAQS). Descriptions of how these sources were used in developing the MEGs for each media are presented in Sections 4 though 6. Table C-1 in Appendix C presents a summary of these values and their sources used in developing the long-term MEGs.

3.4.5.1 Standard Hierarchy for Obtaining Cancer Values

The hierarchy for obtaining the cancer values (CSFs and URFs) is presented below:

1. IRIS (EPA 2010).
2. PPRTV (EPA 2009d).
3. HEAST (EPA 2005b).

Table 3-4 presents a comparison of each source to the selection criteria. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

Table 3-4 Sources of Carcinogenic Values Compared to Selection Criteria

Source (Value Type)	Selection Criteria					
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation	Total #+
1. IRIS (CSF, UR)	+	+	+	+	+	5
2. PPRTV (CSF, UR)	+	+	+	+	+	5
4. HEAST (CSF, UR)	+	+	+/–	–	–	3

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

The selection of the hierarchy for cancer values was easily determined by reviewing current EPA guidance on hierarchies for human health values (EPA 2003b). The exposure scenarios among all sources are essentially the same since all were designed for assessing long-term exposures to carcinogens for the general population. Although the NRC recommends against using HEAST values for developing the MEGs (NRC 2004a), this source was used to fill data gaps when other source values were not available since it is still listed on EPA's hierarchy.

3.4.5.2 Standard Hierarchy for Obtaining Non-Cancer Values

The hierarchy of sources for noncarcinogenic toxicity values (reference values) is presented below in order of priority:

1. PPRTV (subchronic) (EPA 2009d).
2. IRIS (subchronic)*.
3. MRL (intermediate) (ATSDR 2009).
4. HEAST (subchronic) (EPA 2005b).
5. IRIS (chronic) (EPA 2010).
6. PPRTV (chronic) (EPA 2009d).
7. MRL (chronic) (ATSDR 2009).
8. HEAST (chronic) (EPA 2005b).

* = IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Adjustments made to IRIS values are described further below.

Table 3-5 presents a comparison of each source on the hierarchy to the selection criteria. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

Table 3-5 Sources of Non-Cancer Values Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. PPRTV (subchronic RfC and RfD)	+	+	+	+	+
2. IRIS (subchronic RfC and RfD)*	+	+	+	+	+
3. MRL (oral and inhalation intermediate MRL)	+	+	+	+	+
4. HEAST (subchronic RfC and RfD)	+	+	+/–	–	–
5. IRIS (chronic RfC and RfD)	–	+	+	+	+
6. PPRTV (chronic RfC and RfD)	–	+	+	+	+
8. MRL (oral and inhalation chronic MRL)	–	+	+	+	–
9. HEAST (chronic RfC and RfD)	–	+	+/–	–	–

* = IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Adjustments made to IRIS values are described further below.

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

Non-cancer reference values (RfD_os and inhalation RfCs) are available for subchronic and chronic EDs. Subchronic values were preferred over chronic values since they are more similar to deployed military exposure scenarios. The hierarchy of sources for non-cancer values is presented in terms of sources with subchronic then chronic values. The EPA currently provides subchronic reference values in the PPRTV and HEAST databases.

The EPA's IRIS database only provides chronic values; however, the NRC recommended that these values be adjusted, when possible, for developing the MEGs (NRC 2004a). Chronic reference values from IRIS were adjusted to subchronic values only when the underlying study was based on a subchronic exposure. In addition, all the UFs used in developing the values were reviewed, and only those that were clearly based on a duration extrapolation were considered for adjustment. The EPA's IRIS Hotline was consulted to investigate those values with unclear UFs. The chronic value was not adjusted if the IRIS Hotline toxicologist could not determine the portion of the composite UF attributable to the duration extrapolation. Subchronic values were developed from IRIS values by multiplying the chronic value by the UF for the duration extrapolation. This is consistent with the logic used to develop both chronic and subchronic values based on the same subchronic study, as presented in the PPRTV and HEAST.

Adjusted IRIS chronic values were selected before subchronic values in HEAST and the MRLs because they are higher on EPA's recommended hierarchy and are more up to date. The EPA

Soil Screening Level (SSL) guidance indicates that only subchronic toxicity values should be used for assessing subchronic exposures (EPA 2002). However, chronic reference values were used when subchronic values were not available since availability of subchronic values is limited. Chronic values were obtained from IRIS, PPRTV, and HEAST similar to the hierarchy used for obtaining cancer values. The ATSDR's MRLs were used in the non-cancer hierarchy (MRLs are not available for cancer endpoints) consistent with EPA guidance. Although the intermediate MRLs are designed for assessing exposures up to 1 year in duration, they were not used before most EPA sources. The MRLs were placed ahead of HEAST since the NRC recommended not using HEAST at all due to its age and peer review status. The MRLs were placed behind other EPA sources because the MRLs are very conservative (low) values that are intended to be used as a screening tool to identify chemical hazards; not necessarily for conducting quantitative health risk assessments as other EPA sources.

3.5 SPECIAL CONSIDERATIONS FOR SELECTED SUBSTANCES

For some chemical substances, the standard hierarchies, described above and in later sections, were not used to develop MEGs. Each of the media-specific sections (Sections 4 through 6) provides details for these cases. The following sections provide chemical-specific methods that apply across two or more environmental media.

3.5.1 Health Criteria for CWAs and Degradation Products

Many of the CWAs and ADPs do not have health criteria available from the sources used for other chemicals, especially for development of the long-term MEGs. Therefore, it was necessary to consult additional sources. These additional sources are noted with an asterisk in Table 3-1. The following table provides a summary of the health criteria used to derive CWA MEGs. Additional detail is provided in the subsections below by route of exposure. Health criteria for ADPs are provided in Appendix C.

Table 3-6 Health Criteria Used for Developing Long-Term MEGs for Chemical Warfare Agents

Chemical Name	CASRN	Ingestion Value (mg/kg-day)	Inhalation Value (mg/m³)
GA (Tabun)	77-81-6	4E-05 (Opresko et al. 2001)	1E-06 (CDC 2003)
GB (Sarin)	107-44-8	2E-05 (Opresko et al. 2001)	1E-06 (CDC 2003)
GD (Soman)	96-64-0	4E-06 (Opresko et al. 2001)	1E-06 (DA 2004a, DA 2004b)
GF (Cyclosarin)	329-99-7	None Available	1E-06 (DA 2004a, DA 2004b)
HD (Sulfur mustard) *	505-60-2	7E-05 (ATSDR 2009) *CSF = 7.7E+00 (mg/kg-day)-1 (USACHPPM 1999)	2E-05 (CDC 2004) *CSF = 3E+02 (mg/kg-day)-1 (USACHPPM 1999)
Lewisite	541-25-3	1E-04 (Opresko et al. 2001)	3E-03 (USACHPPM 1999)
VX	50782-69-9	6E-07 (Opresko et al. 2001)	6E-07 (CDC 2003)

* HD is the only CWA considered carcinogenic and, therefore, has both non-cancer and cancer values (CSFs) available.

3.5.1.1 Ingestion Health Criteria

Opresko et al. published the most recent estimated RfD_os for six CWA (GA, GB, GD, VX, HD, and Lewisite) (Opresko et al. 2001). Only one other source had published an oral toxicity value for any of these CWAs. In September 2003, ATSDR published a final intermediate oral MRL for HD of 7E-05 mg/kg-day (ATSDR 2009). The MRL was used to develop the long-term MEGs for HD since this value is more current than that provided in Opresko (7E-06 mg/kg-day) and is designed for assessing subchronic exposures. All other RfD_os for the CWAs were obtained from Opresko et al.

Only one CWA is considered carcinogenic and has an CSF_o. The Derivation of Health-Based Environmental Screening Levels for Chemical Warfare Agents "HBESL" (USACHPPM 1999) provides an CSF_o for HD and was used to derive the long-term MEGs based on carcinogenic effects.

Several of the identified ADPs (diisopropyl methylphosphate [DIMP], isopropyl methyl phosphonic acid [IMPA], and methyl phosphonic acid [MPA]) have RfD_os available from EPA and ATSDR. This is not surprising since many ADPs are chemicals commonly associated with other industrial processes. Toxicity values from EPA and ATSDR were selected first when

available according to the hierarchy presented in Section 3.4.5 because they are more extensively peer-reviewed and current. Munro et al. (1999) provides reference values for those ADPs not having values published by other sources. The oral reference values provided in Munro et al. are estimated values based on data from structurally related chemicals or from quantitative structure-activity relationship estimates. These estimated values were derived in the absence of other published toxicity values and contain a higher level of uncertainty than other published reference values. For these reasons, values from Munro et al. were placed near the bottom of the hierarchy of sources. None of the seven ADPs are categorized as carcinogenic and, therefore, were evaluated for non-cancer health effects only.

3.5.1.2 Inhalation Health Criteria

The most current inhalation toxicity values for CWA are found in several sources. The CDC has published final AELs for the general population and workers for GA, GB, and VX (referred to as GPLs) and WPLs, respectively) (CDC 2003). They have also published interim values for HD (CDC 2004). The GPLs are most comparable to EPA RfCs; whereas, the WPLs are similar to the ACGIH TLVs. The GPLs were selected for developing the long-term MEGs over the WPL because the ED better reflects that of deployed personnel. The DA provides GPLs for GD and GF (DA 2004a and DA 2004b), which were used in the absence of CDC values. A CSF_i factor for HD was obtained from the HBESL report (USACHPPM 1999) to derive the long-term MEGs based on carcinogenic effects.

Munro et al. (1999) provides inhalation reference values for ADP without other published values available. These inhalation RfCs were calculated based on route-to-route extrapolations from the estimated RfD_os previously described. Inhalation toxicity values from Munro et al. were used for developing long-term MEGs only when values from sources listed in Section 3.4.5 were not available because they are based on oral exposures and contain a high level of uncertainty.

3.5.1.3 Dermal Health Criteria

Toxicity values specifically designed for assessing dermal exposure were not available for any CWAs or ADPs. Similar to other chemicals, unmodified oral toxicity values were used as surrogates for assessing dermal exposure where ABS values were available.

3.5.2 Health Criteria for Dioxin-like Compounds

The dioxin-like compounds exist in the environment as mixtures (i.e., a single compound is not found in isolation) and include polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and some coplanar polychlorinated biphenyls (PCBs). Dioxin-like compounds are defined as those substances identified as one of the 29 most toxic halogenated aromatic hydrocarbon congeners that induce a common battery of dioxin-like toxic responses through similar biological modes of action (NAS 2006). Their toxicity is based on their ability to bind to the Aryl hydrocarbon (Ah) receptor and evoke a response. These chemicals include PCDDs and PCDFs that retain chlorine substitutions at positions 2, 3, 7, and 8 on the benzene rings. This group also includes the PCBs with four or more chlorines in the lateral positions (3,

3', 4, 4', 5, or 5'), with established dioxin-like environmental and biological behaviors. Table 3-7 lists these compounds, which are the PCDD, PCDF, and PCB congeners addressed by the EPA Dioxin Reassessment (EPA 2003f, NAS 2006) and the World Health Organization (WHO) (Van den Berg 2006).

Table 3-7 Dioxin-like Compounds and Toxicity Equivalency Factors (TEFs)

Halogenated Aromatic Hydrocarbon Congener	CASRN	IUPAC* No.	TEF
PCDD congeners			
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1746-01-6	—	1
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	40321-76-4	—	1
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	39227-28-6	—	0.1
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	57653-85-7	—	0.1
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	19408-74-3	—	0.1
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	35822-46-9	—	0.01
1,2,3,4,6,7,8,9-Octachlorodibenzo-*p*-dioxin	3268-87-9	—	0.0003
PCDF congeners			
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	—	0.1
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	—	0.03
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	—	0.3
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	—	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	—	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	—	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	—	0.1
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	—	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	—	0.01
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	—	0.0003
PCB congeners			
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	77	0.0001
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	81	0.0003
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	105	0.00003
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	114	0.00003
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	118	0.00003
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	123	0.00003
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	126	0.1
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	156	0.00003
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	157	0.00003
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	167	0.00003
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	169	0.03
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	189	0.00003

* IUPAC = International Union of Pure and Applied Chemistry

While it is believed that the 29 recognized compounds have a similar mechanism of toxicity, not all are equally toxic. The EPA has been working for some time to update their formal recommendations for toxicity criteria for the dioxin-like compounds (EPA 2003f). The NRC recently completed a critical review (NAS 2006) of the 2003 EPA dioxin reassessment (EPA

2003f) and recommended how the agency could substantially improve the scientific robustness and clarity of their reassessment. Consensus-based toxicity criteria for each congener remain unavailable. Nonetheless, there is general consensus among most agencies (including the NRC) to use the toxicity equivalence (TEQ)/TEF approach to assess the carcinogenic risks associated with exposure to dioxin-like compounds. Under this approach, each congener's toxic equivalency is relative to the most toxic and best-studied dioxin-like congener—2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The 2,3,7,8-TCDD congener is assigned a TEF of 1, and the remaining compounds are assigned values equal to or less than 1 based on their relative toxicity. This is the recommended approach in the current draft EPA reassessment (EPA 2003b) and is supported by the NRC (NAS 2006).

The TEQ/TEF approach was adopted for generating cancer-based MEGs for dioxin-like compounds; whereby, MEGs were only derived for the 2,3,7,8-TCDD TEQ rather than for each congener.

The EPA has not recommended the quantitative estimation of risk using toxicity criteria for non-cancer health effects (EPA 2005e, 2003f, 2000a); however, other agencies have recommended such non-cancer criteria (see for example the ATSDR MRL for 2,3,7,8-TCDD) and the need to develop consensus-based non-cancer criteria was emphasized in the recent NRC review (NAS 2006). Due to the lack of consensus for the evaluation of non-cancer effects, USAPHC (Prov) has only derived a non-cancer dioxin-like MEG for 2,3,7,8-TCDD. The cancer-based MEGs for the 2,3,7,8-TCDD TEQ is generally presumed to be protective of the non-cancer health endoints.

3.5.2.1 Chronic Risk Assessment

Chronis exposures to dioxin-like compounds should be assessed using the TEF/TEQ approach. Such risk assessments should proceed according to the following steps:

1. The environmental concentration (in air, water, or soil) for each congener is multiplied by the congener-specific TEF. Table 3-7 provides the most current, consensus-based toxicity equivalency factors (TEFs) for each congener (Van den Berg 2006).

2. These TEQ concentrations are then summed across all detected dioxin-like compounds in the medium into a single criterion that represents the 2,3,7,8-TCDD TEQ concentration for that medium.

3. This single 2,3,7,8-TCDD TEQ concentration is then compared to the 2,3,7,8-TCDD TEQ MEG.

This risk assessment approach represents a change from the previous TG 230 approach. While the previous approach made use of the TEF methodology, it developed separate MEG values for each congener (the PCB congeners were not included, however). This approach can lead to potential underestimates the risk when the total exposure across all dioxin-like compounds is not considered together.

- Ingestion Health Criteria for Dioxin-like Compounds—Until consensus-based toxicity values are developed for the most toxic congener, or for all congeners (see above), USAPHC (Prov) uses the 1997 oral cancer slope factor of 1.5×10^{5} per mg/kg-d for 2,3,7,8-TCDD from HEAST (EPA 2005b). No other criteria are used for the other dioxin-like congeners. For non-cancer health effects, the ATSDR oral intermediate MRL for 2,3,7,8-TCDD of 2×10^{-8} mg/kg-d was used.

- Inhalation Health Criteria for Dioxin-like Compounds—Until consensus-based toxicity values are developed, USAPHC (Prov) uses the 1997 inhalation cancer slope factor of 1.5×10^{5} per mg/kg-d for 2,3,7,8-TCDD from HEAST (EPA 2005b). No other criteria are used for the other dioxin-like congeners.

- Dermal Health Criteria for Dioxin-like Compounds—Toxicity values specifically designed for assessing dermal exposure for dioxin-like compounds are not available. Similar to other chemicals (Section 3.4.4), unmodified oral toxicity values were used as surrogates for assessing dermal exposure where ABS values were available.

3.5.2.2 Acute Risk Assessments

Acute exposures to dioxin-like compounds should not be assessed using the TEF/TEQ approach, because that approach was developed for assessing cancer risk over a lifetime of exposure. Acute risk assessments should proceed according to the following steps.

1. The environmental concentrations (in air, water, or soil) for each congener should be summed without regard to the TEFs.

2. This total concentration should then be compared to the short-term MEGs available for 2,3,7,8-TCDD.

3.5.3 Health Criteria for Polychlorinated Biphenyls (PCBs)

There have been 209 different congeners of PCBs identified, some of which can exhibit dioxin-like effects. Additionally, PCB product mixtures can be encountered in the environment. These mixtures (or Aroclors) have defined toxicities and have their own MEGs when data are available. Health risks of exposure to dioxin-like PCBs are assessed using the method described in Section 3.5.2 The derivation of MEG values addressing non-dioxin-like toxicity for weathered PCBs (i.e., not in pure Aroclor form) and PCB congeners is discussed below.

3.5.3.1 Ingestion and Inhalation Health Criteria for PCBs for Non-Dioxin-like Effects

Currently, the EPA IRIS database provides multiple CSFs depending on the PCB mixture being assessed. The database also provides guidance on selecting the most appropriate CSF for the evaluation of PCB mixtures. For the purpose of developing MEGs, the more conservative

(protective) slope factor of 2 $(mg/kg\text{-}day)^{-1}$ for oral and inhalation exposures was used. For PCB mixtures generally, the oral RfD for Aroclor 1254 was used to assess the non-cancer effects. No inhalation toxicity values for non-cancer effects are available for PCBs.

3.5.3.2 Dermal Health Criteria for PCBs for Non-Dioxin-like Effects

Toxicity values specifically designed for assessing dermal exposure for PCBs are not available. Similar to other chemicals (Section 3.4.4), unmodified oral toxicity values were used as surrogates for assessing dermal exposure where ABS values were available.

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4. AIR MILITARY EXPOSURE GUIDELINES

4.1 INTRODUCTION

The MEGs for air were developed to assess deployment exposures to chemicals in ambient air. Air MEGs were derived for various EDs, both short-term (14 days or less) and long-term (1 year), to address different lengths of deployment exposures. These exposures could result in significant and immediate impacts to personnel and the mission. Short-term air MEGs are intended to address the more immediate, acute exposure scenarios but can also be used in the context of longer deployments (e.g., 1 year) should circumstances define a unique exposure setting of less than 14 days. If multiple, short-term exposures occur consecutively, the long-term air MEGs would be the appropriate index. Intermittent short-term exposures may require comparison to both long-term and short-term air MEGs.

All the air MEGs were derived to reflect continuous exposures to ambient air, regardless of the ED. For example, the 8-hour air MEG is based on a single, continuous 8-hour exposure (not intermittent or repeated), and the 1-year air MEG is based on a continuous 24 hour/day, 365 day/year exposure for an entire year. These assumptions are considered protective as operational exposures in a deployment situation are unlikely to be continuously sustained.

Most air MEGs were developed using a standard source and calculation hierarchy for each ED; however, there are some notable exceptions as briefly highlighted below. Table 4-1 provides a summary of the types of air MEGs developed and the standard hierarchy of sources.

Some unique EDs were necessary for high volatility acutely TICs and CWAs. Sections 4.2.4 and 4.2.5 provide MEG development details. Exposures of primary concern to such chemicals are of limited length. For example, CWAs are not anticipated to persist beyond 24 hours; therefore, only short-term air MEGs were developed (USACHPPM 2004). Air MEGs for CWA were developed for the following durations: 10 minutes, 1 hour, 8 hours, and 24 hours. Air MEGs for TICs were developed for the following EDs: 10 minutes, 1 hour, 8 hours, 14 days, and 1 year. Only certain TICS include 10 minute MEGs, as described in Section 4.2.5. More types of short-term air MEGs were developed for the CWA since source information was available to do so.

Additionally, chemical-specific methods were used to develop MEGs for military smokes and obscurants (see Section 4.2.6) and the criteria pollutants (see Sections 4.4 and 4.5).

Table 4-1 Hierarchy of Sources Used for Developing the Air MEGs

<table>
<tr><th>Exposure Duration Category</th><th>Exposure Duration</th><th colspan="3">Hierarchy of Sources*</th></tr>
<tr><td rowspan="9">Short-term</td><td rowspan="2">10 minutes</td><td colspan="2">CWA</td><td>TICs</td></tr>
<tr><td colspan="2">USACHPPM (2004) report “Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures.”</td><td>1. AEGLs Levels 1-3
2. ERPGs Levels 1-3
3. PACs/TEELs 1-3</td></tr>
<tr><td rowspan="2">1 hour</td><td>CWA</td><td>Smokes/Obscurants</td><td>Standard Hierarchy (TICs)</td></tr>
<tr><td>USACHPPM (2004) report “Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures.”</td><td>NRC (1997, 1999b, 1999c) report “Toxicity of Military Smokes and Obscurants Volumes 1-3”</td><td>1. AEGLs Levels 1-3
2. ERPGs Levels 1-3
3. PACs/TEELs 1-3</td></tr>
<tr><td rowspan="2">8 hours</td><td>CWA</td><td>Smokes/Obscurants</td><td>Standard Hierarchy</td></tr>
<tr><td>USACHPPM (2004) report “Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures.”</td><td>NRC (1997, 1999b, 1999c) report “Toxicity of Military Smokes and Obscurants Volumes 1-3”</td><td>1. AEGLs Level 1
2. TLVs®</td></tr>
<tr><td rowspan="2">24 hours</td><td colspan="2">CWA</td><td>Particulate matter</td></tr>
<tr><td colspan="2">USACHPPM (2004) report “Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures.”</td><td>Adapted from EPA NAAQS Air Quality Index</td></tr>
<tr><td rowspan="2">14 days</td><td colspan="3">Standard Hierarchy</td></tr>
<tr><td colspan="3">1. CEGLs
2. MRLs - acute
3. TLVs®</td></tr>
<tr><td rowspan="3">Long-term</td><td rowspan="3">1 year</td><td colspan="3">Standard Hierarchy</td></tr>
<tr><td colspan="2">Non-Cancer</td><td>Cancer</td></tr>
<tr><td colspan="2">1. PPRTV (subchronic)
2. IRIS (subchronic)**
3. MRL (intermediate)
4. HEAST (subchronic)
5. IRIS (chronic)
6. PPRTV (chronic)
7. MRL (chronic)
8. HEAST (chronic)
9. TLVs</td><td>1. IRIS
2. PPRTV
3. HEAST</td></tr>
</table>

* See Section 3 for more information on each source.
** IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS.

4.2 SHORT-TERM AIR MEGS

4.2.1 Health Effects and Acute Hazard Severity Levels

The short-term air MEGs are based on various health endpoints. These endpoints, or various levels of corresponding hazard severity, are provided for some of the short-term air MEGs to provide a more comprehensive means for assessing operational impact. The 1-hour air MEGs and all the air MEGs for CWA and key TICs reflect multiple severity ranges since data were available to conduct this type of analyses. The 8-hour and 14-day Negligible air MEGs are designed to represent a “minimal-” to “no-effect” level corresponding to a negligible hazard severity, similar to the long-term air MEGs.

These MEG values reflect health criteria that are based on data interpretation and extrapolation decisions that are designed to err towards a conservative (i.e., protective) estimation of the population threshold for the described effects. The varying levels of severity represented by the 1 hour, 8 hour, and 24 hours MEGs represent a range of effects, effect severity, and numbers/percentages impacted. They can include both an increasing number of the population to have the initial negligible effects, increasing numbers with more severe degree of the same effect, as well as additional effects and/or the number demonstrating new effects.

The selection of the threshold and approach varies by source, but the use of standard data extrapolation methods along with uncertainty or safety factors to address significant data gaps is an approach used not only for basis of long-term MEGs but also in derivation of many of the criteria used for short-term MEGs. Fewer quantitative UFs tend to be incorporated into criteria used for short-term MEGs, however, primarily because the underlying toxicity and epidemiologic evidence is more robust, and there is less uncertainty in the estimated human population threshold.

The additional endpoints for short-term air MEGs are now presented in terms consistent with the hazard severity categories from current military doctrine and policy. Table 4-2 presents the types of health effects associated with each of the acute hazard severity levels. Current deployment health policy states that “In general, short-term, one-time exposures are primarily associated with acute effects, while repeated long-term exposures are associated with chronic effects” (CJCS 2007).

Table 4-2 ORM Hazard Severity Definitions for Acute Effects (CJCS 2007)

Hazard Severity Category	Description of the Types of Health Effects Driving the Selection of the Severity Category
CATASTROPHIC	Casualties with severe incapacitating effects requiring immediate and significant medical attention and/or additional support for survival. Increasing number of fatalities are expected. Exposed personnel unable to perform critical tasks.
CRITICAL	Personnel are expected to have incapacitating health effects that require immediate medical treatment or support (e.g., are considered 'casualties'.) There may be limited numbers of fatalities. Personnel not experiencing these more serious effects are expected to have at least noticeable, but not incapacitating health effects. Exposed personnel will have limited ability to perform most critical tasks. Note: Ability to accomplish complex tasks likely to be degraded.
MARGINAL	Many exposed persons are expected to have noticeable but not incapacitating health effects. Observable effects require minimal, if any, medical attention but may reduce some individual physical capabilities and/or may enhance stress-related casualties. Exposed personnel able to perform most critical tasks. Note: Ability to accomplish complex tasks may be degraded.
NEGLIGIBLE	Few exposed personnel (if any) are expected to have noticeable health effects during mission. Exposed personnel are expected to be able to effectively perform all critical tasks during mission operations. Minimal to no degradation of abilities to conduct complex tasks are expected.

4.2.2 Selection of 1-Hour Air MEGs

The 1-hour air MEGs were developed for both CWA and TICs. However, the process for selecting each is different. This section presents the development of 1-hour air MEGs for TICs. Section 4.2.4 presents the development of air MEGs for CWA. The 1-hour air MEGs for TICs were selected to reflect three major levels of health effects corresponding with the three lowest hazard severity categories: negligible, marginal, and critical. (These categories were previously referred to as minimal, significant, and severe and were updated to correspond with the hazard severity categories in

Table 4-2). The health effects associated with each hazard severity category are defined as follows:

- 1-hour Negligible Air MEG—The airborne concentration above which continuous exposure for 1 hour could begin to produce mild, non-disabling, transient, reversible effects. Such effects, if any, will typically be mild irritant types of effects and/or initially be expected in personnel with underlying susceptibility factors (e.g. asthmatics). Effects are not expected to impair performance.

- 1-hour Marginal Air MEG—The airborne concentration above which continuous exposure for 1 hour could begin to produce effects that may result in some performance degradation, especially for tasks requiring extreme mental/visual acuity or physical dexterity/strength amongst a portion of individuals.

- 1-hour Critical Air MEG—The airborne concentration above which continuous exposure for 1 hour could begin to result in serious health effects. This MEG is a conservative population threshold estimate of potential life-threatening or lethal effects, whereby these effects are expected in military personnel with underlying susceptibility factors.

4.2.2.1 1-Hour Air MEG Hierarchy of Sources

The 1-hour air MEGs were adopted from pre-existing sources of 1-hour inhalation values. These values include AEGLs, ERPGs and TEELs, which are exposure values that identify potential human health effects based on various durations of chemical exposure as described in Section 3.3. When selecting an exposure value to be adopted for the 1-hour air MEGs, data sources were examined according to the hierarchy shown below:

1. AEGLs Levels 1-3 (EPA/NRC 2010).
2. ERPGs Levels 1-3 (AIHA 2009).
3. PACs/TEELs 1-3 (DOE 2009).

Table 4-3 presents a comparison of each source on the hierarchy to the selection criteria presented in Section 3.2. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

The AEGL values were selected first on the hierarchy because they are protective of susceptible individuals and are derived using a WOE method that commands a high degree of review. In addition, all AEGL Level 1 and 2 chemicals are evaluated to ensure that they do not pose an excess cancer risk greater than 1×10^{-4}. Since these values are extensively peer reviewed, the final, interim, and proposed AEGLs provided on the EPA website were selected first when available. Unmodified AEGL-1 values were adopted as the 1-hour Negligible air MEG, AEGL-2 as the 1-hour Marginal air MEG, and AEGL-3 as the 1-hour Critical air MEG.

Table 4-3 Sources of Exposure Values for the 1-Hour Air MEGs Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. EPA/NRC (AEGL 1-3)	+	+	+	+	+
2. AIHA (ERPG 1-3)	+	+	+	+	+
3. DOE (PAC/TEELs 1-3)	+	–	–	+	–

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

The ERPG values were next in the hierarchy and used if an AEGL value was not available. The ERPGs are intended to protect most individuals in the general population but not particularly sensitive individuals (AIHA 2002). Hyper-sensitive individuals may develop adverse health effects at concentrations below these guidelines; therefore, they are not generally considered as protective as the AEGLs. Similar to the AEGLs, unmodified ERPG-1 values were adopted as the 1-hour Negligible air MEG, ERPG -2 as the 1-hour Marginal air MEG, and ERPG-3 as the 1-hour Critical air MEG.

The PACs/TEELs do not undergo the rigorous peer review processes of AEGLs and ERPGs, are subject to change, and are intended to serve as interim values until AEGLs or ERPGs are published (Craig, et al. 1995, Craig and Lux 1998). For these reasons, the PACs/TEELs are at the bottom of the hierarchy of sources and are used only when other values are not available. Air MEGs based on the PACs/TEELs should be considered interim values since the PACs/TEELs themselves are intended to serve as interim values. Air MEGs based on PACs/TEELs carry a higher level of uncertainty. When AEGLs and ERPGs were not available, unmodified TEEL-1 values were adopted as the 1-hour Negligible air MEG, TEEL-2 as the 1-hour Marginal air MEG, and TEEL-3 as the 1-hour Critical air MEG.

4.2.2.2 Summary of 1-Hour Air MEG Derivation

The hierarchy of data sources used to obtain the 1-hour air MEGs was: (1) AEGLs, (2) ERPGs, and (3) PACs/TEELs. The values from the corresponding source were adopted unmodified as the 1-hour air MEGs for three different levels corresponding to the three lowest hazard severity categories (negligible, marginal, and critical). The 1-hour air MEGs were obtained for a total of 2,209 chemicals with the majority being based on PACs/TEELs. It is important to note that the 1-hour air MEGs based on PACs/TEELs are considered interim values since the underlying

data source was not extensively peer-reviewed and is subject to change. Table D-1 in Appendix D presents the 1-hour air MEGs and their source.

4.2.3 Selection of 8-Hour and 14-Day Air MEGs

The 8-hour and 14-day air MEGs are intended to represent continuous (8-hour or up to 14-days) exposure consistent with a brief deployment or exposures with specific source and ambient air dynamics. The variation in both exposure properties and health effects can be significant in exposures of this duration (e.g., toxicological disposition, mode of action, environmental factors, and so forth). The 8-hour and 14-day air MEGs represent exposure levels below which no significant adverse health effects are expected and above which the probability of adverse health effects are increased. The 8-hour air MEGs serve as an intermediate guideline for EDs between the negligible effects 1-hour air MEG and the 14-day air MEG. Unlike the 1-hour air MEGs (which have three levels of hazard severity), data were available to develop only a single air MEG for the lowest hazard severity (negligible) for each 8-hour and 14-day ED. The 8-hour and 14-day air MEGs are defined as follows:

- 8-hour Negligible Air MEG—The airborne concentration above which continuous exposure for 8 hours could begin to produce mild, non-disabling, transient, reversible effects, if any. Such effects should not impair performance. Increasing concentration and/or duration could result in performance degradation, especially for tasks requiring extreme mental/visual acuity or physical dexterity/strength.

- 14-day Negligible Air MEG—The airborne concentration for a continuous exposure for up to 14 days (24 hours/day) that is not anticipated to result in acute performance degrading effects or specific long-term health consequences. The potential for adverse health outcomes increases within the exposed population as the exposure increases above the MEG.

4.2.3.1 8-hour Air MEG Hierarchy of Sources

The 8-hour air MEGs were adopted from pre-existing sources of 8-hour inhalation exposure values. These sources include AEGLs and TLVs, which are exposure values that identify potential human health effects based on various durations of chemical exposure as described in Section 3. When selecting an exposure value to be adopted as an air MEG, data sources were examined according to the hierarchy shown below:

1. AEGLs Level 1 (EPA/NRC 2010).
2. TLV®s (ACGIH 2010).

Table 4-4 presents a comparison of each these two sources to the selection criteria presented in Section 3.2. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

The primary source for the 8-hour air MEGs was the 8-hour AEGL-1. The AEGLs were selected as the primary source when available since values are available for the time period of interest, and they are subject to extensive peer review. The 8-hour AEGL-1 values were adopted, unmodified as 8-hour air MEGs and were not adjusted for differences in IR. Because AEGLs are designed to protect the general population (which includes sensitive groups not typically part of the deployed population), the unmodified AEGLs were deemed sufficiently protective of a deployed population. Section 3.3.1.1 describes the AEGL concept in more detail.

Table 4-4 Sources of Exposure Values for the 8-Hour Air MEGs Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. EPA/NRC (AEGL 1)	+	+	+	+	+
2. ACGIH (TLV)	–	–	+	+	+

"Exp Scenario" = Similarity of Exposure Scenario
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations
"Peer-Review" = Peer-Review
"Pub Date" = Date of Publication and Reviews
"Documentation" = Documentation and Transparency of Methods

Direct use of TLV values were deemed suitable for 8-hour exposure and were used for 8-hour air MEGs for chemicals without AEGL values available. Adjustments were not made for the increased IR of military personnel since adjustments were not made for ED (IR adjustments would result in lower values while duration adjustments would result in increased values). The TLVs are likely overprotective of single 8-hour exposures but were used in the absence of other exposure values for 8-hour durations.

4.2.3.2 14-Day Air MEG Hierarchy of Sources

The 14-day air MEGs were adopted from pre-existing sources of inhalation exposure guidelines. These sources include CEGLs, MRLs, and TLVs, which are exposure values that identify potential human health effects based on various durations of chemical exposure. When selecting an exposure value to be adopted as an air MEG, data sources were examined according to the hierarchy shown below:

1. CEGLs (U.S. Navy/NRC 2004).
2. MRLs (ATSDR 2009).
3. TLV®s (ACGIH 2010).

Table 4-5 presents a comparison of each these three sources to the selection criteria presented in Section 3.2. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

The CEGLs were selected first on the hierarchy since they were designed for assessing the population of interest (deployed military personnel) and comparable ED (90 days). These values, when available, were adopted unmodified as the 14-day air MEGs.

Adjusted acute inhalation MRLs were used next when CEGLs were not available. The MRLs are of a comparable duration and frequency (daily exposure for up to 14 days in duration) for

Table 4-5 Sources of Exposure Values for the 14-Day Air MEGs Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. Navy/NRC (CEGL)	+	+	+	+	+
2. ATSDR (intermediate MRL)	+	+	+	+	+
3. ACGIH (TLV)	–	–	+	+	+

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

the deployed military population, so adjustments for these factors were not necessary. However, the MRLs were adjusted to account for the increased military IR. This adjustment was made by multiplying the MRL by the default general population IR (20 m³/day) divided by that for deployed military personnel (29.2 cubic meter per day [m³/day]).

Equation 4-1 Adjusted MRLs

$$MRL_{adj} = MRL\left(\frac{20}{29.2}\right) = MRL \cdot 0.68$$

Last on the hierarchy were the adjusted TLV®s. These values were used last since they are designed for a longer ED (working lifetime). Other exposure values developed for occupational scenarios are available (e.g., OSHA Permissible Exposure Limits [PELs] and National Institute of Occupational Safety and Health [NIOSH] RELs) but were not selected as sources for the

MEGs. Although these values serve regulatory purposes, TLVs® were preferred given the available documentation and review that they undergo.

The majority of TLVs were adjusted from an intermittent work-week schedule (8 hours a day for 5 days/week) with a default occupational IR (10 m^3/8 hours) to a continuous exposure (24 hours a day for 7 days/week) with an ambient default IR (29.2 m^3/24 hours) for deployed personnel. Thus, the TLV was adjusted by 5d/7d and 10 m^3/29.2 m^3 as shown in Equation 4-2.

Equation 4-2 Adjusted TLVs for Non-Irritants

$$TLV_{adj} = TLV\left(\frac{5}{7}\cdot\frac{10}{29.2}\right) \approx TLV\cdot 0.24$$

The TLVs for irritants were assumed to be concentration-dependent and, therefore, were not adjusted for ED. Chemicals were identified as irritants if irritation was listed as an exposure symptom in the TLV publication (ACGIH 2010). As a result, the TLVs for irritants were only adjusted for the increased military IR as shown in Equation 4-3.

Equation 4-3 Adjusted TLVs for Irritants

$$TLV_{adj} = TLV\left(\frac{10}{29.2}\right) \approx TLV\cdot 0.34$$

4.2.3.3 Summary of 8-hour and 14-day Air MEG Derivation

The hierarchy of data sources used to obtain the 8-hour air MEGs was: (1) unadjusted 8-hour AEGL-1 (2) unadjusted TLVs. The hierarchy of data sources used to obtain the 14-day air MEGs was: (1) unadjusted CEGLs, (2) adjusted acute inhalation MRLs, and (3) adjusted TLVs. When AEGL-1 values for 8-hour exposures were more conservative (i.e., lower) than the values chosen through the hierarchy for the 14-day air MEGs, the AEGL-1 values were given precedence. Table D-2 in Appendix D presents the 8-hour and 14-day air MEGs and the data source.

4.2.4 Selection of Short-Term Air MEGs for CWAs

> Note: Appendix D Table D-3 presents the air MEGs for the CWA along with their data sources.

Short-term air MEGs were developed for the following CWAs: (1) sulfur mustard (agent HD); (2) G-series nerve agents (agents GA, GB, GD, and GF); and (3) nerve agent VX. Long-term air

MEGs (1-year) were not developed for CWAs since exposures are not anticipated to persist for periods longer than 24 hours. As described in Section 3.3, the methods for deriving the air MEGs for CWAs were updated according to procedures described in the USACHPPM report *Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures* (USACHPPM 2004).

The reason for using the USACHPPM report (USACHPPM 2004) for deriving CWA air MEGs is that the toxicity data are specifically intended (and mandated) for assessing military personnel exposures for the time periods of interest. Unlike other air MEG sources, adjustments were not necessary since the exposure and population assumptions match. The USAPHC (Prov) intends to have other priority acute hazards similarly evaluated for military application as resources become available. In the interim, existing guidelines developed for other purposes will continue to be used and adjusted when necessary.

The CWA air MEGs were developed for EDs of 10-min, 1-hour, 8-hours, and 24-hours for each of the four hazard severity categories (negligible, marginal, critical, and catastrophic). This resulted in a total of 16 different air MEGs for each CWA. The lower bound for each toxicity range was used as the CWA air MEG for each severity level as presented in Table 4-2 and described below. It should be noted that the upper bound for each toxicity range is represented by the lower bound of the next higher severity range except for the highest severity category (catastrophic) for which the upper bound is unlimited.

A summary of the approach to MEG development is provided in the following subsections. The USACHPPM report (USACHPPM 2004) provides additional information on the development of acute toxicity estimates for the CWA and associated health effects.

4.2.4.1 Negligible Severity

The lower bound of the negligible hazard severity range theoretically extends to 0; however, the practical lower-bound is identified as the estimated level below which no health effects would be expected in any of the exposed population of concern, including susceptible sub-groups. USACHPPM designated this level for CWA as “population threshold estimates” (or PTE values) (USACHPPM 2004). This concept was consistent with criteria for negligible effects for other chemicals addressed by TG 230. The PTE values for each CWA by duration are listed in Table 4-4 on page 56 of the USACHPPM report (USACHPPM 2004). Table 4-4 (in USACHPPM 2004 report) also provides a comparison of the PTE values with the AEGL-1 values which were previously used as the “Minimal” CWA air MEGs. The PTE and AEGL-1 values are very similar (see following note) indicating that there is little difference between the susceptibilities to the CWAs within the general population when compared with the deployed military population. While initially the PTEs for the CWA (described in Tables 4-3 and 4-4, p. 55-56 of USACHPPM 2004) were going to be used as the basis for the Negligible effects Air MEGs in USAPHC (Prov) TG 230, it was decided that since this lowest bound level is used as the demarcation below which no adverse effects to even susceptible members of the military population are anticipated, it was best to use the actual AEGL-1 criteria as is used for other chemicals. This is especially true since the AEGLs have been heavily peer reviewed and judged both valid and appropriate

for civilian exposure applications. This position was also documented in a recent USACHPPM report (USACHPPM 2008).

Note: The vapor PTE values for all the nerve agents (G-agents and VX) calculated in USACHPPM 2004 are virtually indistinguishable from the AEGL–based values (they are slightly higher but within rounding—essentially same values). The HD vapor PTE was a bit lower than associated AEGLs but within a factor of three which is considered to be within the confidence range of the toxicological estimation process. Specifically, the HD PTE was determined by dividing time-specific ocular effect EC_{01} (the exposure concentration causing severe effects in 1 percent of the given population) estimates by a UF of 3 to address potentially susceptible populations within the deployed force. The EC_{01} estimates for a 'healthy male population' had been derived from the Institute for Defense Analysis (IDA) report of Grotte and Yang (2001) by application of the ten Berge et al. (1986) time-scaling concept and a protective estimate of n = 1 (a.k.a., toxic load exponent). However, since it is observed that the corresponding AEGL-1 estimates for HD—which are protective for a heterogeneous civilian population—are slightly higher than the calculated military PTEs. Specifically, the AEGL-1 already incorporates an intraspecies UF of 3 to down-adjust from initial minimal tissue effects in human subjects (experimental data for threshold conjunctival injection and minor eye discomfort with no functional decrement—which is a direct and local effect and does not vary greatly among individuals) (NRC 2003). Given that (1) ocular tissues are considered most susceptible to HD vapor exposure, (2) little response variability is exhibited among human subjects, and (3) the time-specific EC_{01} values have been estimated with a protective ten Berge exponent (n = 1), inclusion of an additional UF of 3 to down-adjust the EC_{01} is likely excessive. A comparison of EC_{01} and AEGL-1 concentrations for the same EDs (Tables 4-3 vs 4-4, p.55-56 of USACHPPM 2004) indicates little difference (e.g., 10-min EC_{01} of 0.42 mg/m^3 vs 10-min AEGL-1 of 0.40 mg/m^3; 60-min EC_{01} of 0.070 mg/m^3 vs 60-min AEGL-1 of 0.067 mg/m^3, etc.). As a consequence, the time-specific (and 24-hr equivalent) AEGL-1 concentrations for agent HD, which have been heavily peer-reviewed and judged both valid and appropriate for civilian emergency preparedness planning, are now recommended for use as HD air MEG values.

4.2.4.2 Marginal Severity

The lower bound of the marginal toxicity range is represented by values greater than the EC causing mild effects in 16 percent of the given population (ECt_{16}_mild). The EC_{16}_mild values were obtained for each duration and CWA from Table 4-5 on page 57 of the USACHPPM report (USACHPPM 2004). Values are presented in mg/m³ units consistent with other air MEGs. Table 4-5 (in USACHPPM 2004 report) also provides a comparison of the EC_{16}_mild values with the AEGL-2 values, which were previously used as the "Significant" CWA air MEGs. As with the Negligible air MEGs, the new air MEGs (EC_{16}_mild values) and AEGL-2 values are very similar indicating that there is little difference between the susceptibilities to the CWAs within the general population when compared with the deployed military population.

4.2.4.3 Critical Severity

Two different toxicity values were considered as candidates to estimate the lower bound for critical severity: the ECt01_severe (EC causing severe effects in 1 percent of the given population) or the ECt50_mild (EC causing mild effects in 50 percent of the given population). Use of the the lower of the two values was considered as the initial, preferred approach for selecting the Critical MEG. Evaluation of values indicated that for all CWA but HD, the concentration associated with the ECt50_mild (e.g., the EC50_mild) was the lower of the two values. In addition, closer examination of the estimates presented in Tables E-5 and E-6 of USACHPPM (2004) supported rationale that the ECt50_mild concentration is a much more robust toxicity estimate than the extrapolated ECt01_severe value (characterized by large uncertainties in confidence limits). Given that the well-characterized HD AEGL 3 concentration is known to be a protective estimate for critical effects (NRC 2003) and is comparably greater than the ECt50_mild based value for sulfur mustard, the ECt50_mild concentration is considered more appropriate than the lower ECt01_severe value. As a consequence, the ECt50_mild concentration is selected as the basis for the critical air MEG for each CWA.

4.2.4.4 Catastrophic Severity

Similar to the critical severity, there are two different toxicity values that may be used as the lower bound for the catastrophic severity: the LCt_{16} (lethal concentration in 16 percent of a given population) or the ECt_{50}_severe (exposure concentration causing severe health effects in 50 percent of the given population). The lower of the two values was selected as the air MEG for each CWA and duration. These values are presented in Tables E-5 and E-6 in Appendix E of the USACHPPM report (USACHPPM 2004). In all cases, the ECt_{50}_severe was lower than the LCt_{16} and was selected as the air MEG.

4.2.5 Selection of Short-Term Air MEGs for Key TICs

> Note: Appendix D Table D-6 presents the current air MEGs for the 34 key TICs of military concern.

In addition to the CWA, there is a set of key chemicals that can present particularly hazardous conditions that pose acute health risks that can have substantial impact on real-time mission accomplishment. In the past, the military has considered CWA as the key chemicals of operational concern. Recently, the traditional concept of CWA and other traditional NBC warfare agents has expanded. The current terminology for such threat agents is “Chemical, Biological, Radiological, and Nuclear” (or CBRN) includes various commercial chemicals that are widely produced, used, and available (often referred to as TICs). Of particular concern are very volatile, acutely toxic chemicals that can produce serious effects and even potential death after single short-term exposures. While not generally as potent as the CWA, even brief exposures (minutes) can produce critical effects. Therefore, additional Negligible, Marginal, and Critical short-term air MEGs (10-minute, as well as 1-hour and 8-hour) are now being provided for a list of 34 “key” TICs of particular concern. The basis (methodology) for establishing the priority list of TICs, that are considered to be of especially critical military operational concern, is

discussed in USACHPPM technical report, Industrial Chemical Prioritization and Determination of Critical Hazards of Concern, Technical Annex and Supporting Documents for International Task Force (ITF)-40 (FOUO) (USACHPPM 2003) and also summarized in a peer-reviewed publication (Hauschild and Bratt 2005). The evaluated TICs are officially endorsed as multi-national military industrial chemical priorities (USACHPPM 2003).

As high priority military CBRN hazards, these chemicals have been given special attention particular to defense capabilities needed to mitigate or control potential exposures. For several years, MEG values for CBRN hazard TICs have been proposed in certain capability documents as specification goals for detectors or protection equipment (e.g., masks). However, the 2004 version of TG 230 did not specifically explain which MEG values might be best suited for certain defense equipment specifications and, by 2008, contained some outdated and missing MEG values for these TICs. Therefore, a more specific and focused evaluation of MEGs for these high-priority TICs was requested and conducted in parallel with the larger TG 230 revision effort, resulting in the USACHPPM technical report, Health-Based Chemical Vapor Concentration Levels for Future Systems Acquisition and Development (USACHPPM 2008). The methodology for developing MEG values for the 10-min time frame and for the 1- and 8-hr Marginal and Critical severity levels in that report follows the general method (e.g. hierarchy of existing published source criteria) discussed above for the short-term MEGs, but warranted more in-depth evaluation due to the military importance of these chemicals. The USACHPPM (2008) report has been endorsed by Service medical representatives and the Office for Secretary of Defense for Health Affairs (OSD-HA 2009) as part of an initiative of the Joint Environmental Surveillance Work Group (JESWG).

During the final data review for this June 2010 Revision of TG 230, it was noted that several of the sources of exposure criteria that informed the selection of MEG values for recommended decision criteria for acquisition specifications (USACHPPM 2008) had undergone change or update by the authoring organizations since 2008. The new information was reviewed to determine the impact on derivation of the final June 2010 Revision MEGs and the potential impact on the 2008 MEG recommendations for acquisition specifications. The evaluation of the new data and rationale for setting of the June 2010 Revision MEGs for these five chemicals are presented in the numbered subparagraphs below. The general approach for reviewing this new data is discussed here.

Considerations for MEG revisions include (1) a preference for new toxicity data evaluations if confidence is substantially improved and is relevant to the military population and (2) a preference for avoiding MEG revisions if the value changes by less than a factor of three. The first consideration (data confidence) is the traditional approach to entertaining MEG revisions. As the level of confidence increases for any given MEG value, the ability of that value to support difficult or expensive risk management decisions improves. The second consideration (magnitude of change) is one approach to controlling the frequency of change of MEG values that could potentially adversely impact on-going defense equipment acquisition specifications and related program milestones. Such changes can pose a “moving target” problem for material developers and a potential imbalance between health-based science advancements relative to technological limitations and risk management considerations. Therefore, changes in

formal MEG-based recommendations for particular equipment specifications should be based on a balance of factors, whereby new health effect and toxicity information is considered only when that information would result is a substantive change in the MEG-based recommendation. The importance of the second consideration to some stakeholders in the Joint acquisition community was highlighted during the review of the report on MEG-based recommendations for acquisition specifications (USACHPPM 2008). During the Service and stakeholder review of that report, stakeholders requested that specific criteria for reevaluation of MEG values be noted to put some control on the moving target problem.

While the USACHPPM 2008 report states that the MEG values in that report will be reflected in the forthcoming updated version of TG 230, it also explains (in the executive summary) that "the specific MEG values cited herein [in the 2008 technical report] are for acquisition performance applications and the decision to modify these criteria for such applications may be conducted separately from future USACHPPM TG 230 updates. This flexibility is necessary to balance the impact of changing criteria with the potential significance of new scientific and toxicological data. To the extent that new data are available from the open literature or provided to USACHPPM from sources not yet in the open literature, MEG values identified in this report [the 2008 technical report] may be reevaluated in the future. As a general plan, revisions will be considered if the difference between the existing value and the potential new value is greater than a factor of three." This factor of three incorporates the concept of acceptable uncertainty in toxicity estimates such as that used by the USEPA definition of Reference Dose (RfD) values, which are estimates "with uncertainty spanning perhaps an order of magnitude" about the reference dose value (USEPA 1989a, p. 8-2; see also definitions on the Integrated Risk Information System website: www.epa.gov/ncea/iris/). It is further noted that the factor of three is the whole number approximating the square root of 10, which USEPA considers as the acceptable order of magnitude uncertainty span about the reference dose. A similar concept is employed by clinical toxicologists to determine when results of analytical tests indicate a biologically relevant difference from normal range (Houben et al 2010; Sacher and McPherson 2000).

The June 2010 Revision to TG 230 incorporates the dual approach to MEG revisions for chemicals of special importance to the military acquisition community, whereby potential MEG revisions involve the interplay of the considerations of both the change in confidence of the underlying data and the relative magnitude of change of the value. Both of these dimensions can substantively impact the value and quality of any given MEG value.

Five TICs were identified as having new exposure criteria information based on a review of the standard hierarchy of sources. Table 4-6 presents these TICs and their 2008 MEGs and the final June 2010 Revision MEGs.

Table 4-6 Military Exposure Guidelines for Key TICs with New Data Since 2008

Chemical / MEG Type	July 2008 Interim MEG (USACHPPM 2008)		Potential June 2010 MEG (hierarchy-based)		Final June 2010 MEG		
	Value (mg/m^3)	Basis	Value (mg/m^3)	Basis	Factor Change	Confidence Change	Value (mg/m^3)
Acrylonitrile							
1-hr Critical	160	ERPG-3	217	Interim AEGL-3	≤ 3	↔	160
1-hr Marginal	76	ERPG-2	120	Interim AEGL-2	≤ 3	↔	76
1-hr Negligible	22	ERPG-1	10	Interim AEGL-1	≤ 3	↔	22
8-hr Negligible	4.3	TLV-TWA	10	Interim AEGL-1	≤ 3	↔	4.3
Allyl Alcohol							
10-min Critical	86	4th Interim AEGL-3	630	5th Interim AEGL-3	7	↔	86
10-min Marginal	10	4th Interim AEGL-2	210	5th Interim AEGL-2	21	↔	10
10-min Negligible	5	4th Interim AEGL-1	23	5th Interim AEGL-1	5	↔	5
1-hr Critical	48	4th Interim AEGL-3	97	5th Interim AEGL-3	≤ 3	↔	48
1-hr Marginal	10	4th Interim AEGL-2	31	5th Interim AEGL-2	≤ 3	↔	10
1-hr Negligible	5	4th Interim AEGL-1	12	5th Interim AEGL-2	≤ 3	↔	5
8-hr Critical	24	4th Interim AEGL-3	11	5th Interim AEGL-3	≤ 3	↔	24
8-hr Marginal	10	4th Interim AEGL-2	3.6	5th Interim AEGL-2	≤ 3	↔	10
8-hr Negligible	5	4th Interim AEGL-1	2.4	5th Interim AEGL-1	≤ 3	↔	5
Bromomethane							
1-hr Negligible	75	TEEL/PAC-1	80	PEL-C	≤ 3	*	80
Cyanogen Chloride							
1-hr Negligible	0.75	TEEL/PAC-1	0.15	TEEL/PAC-1	≤ 3	↔	0.75
Parathion							
10-min Critical	10	TEEL/PAC-3	3.6	Interim AEGL-3	≤ 3	↑	3.6
10-min Marginal	2	TEEL/PAC-2	2.8	Interim AEGL-2	≤ 3	↑	2.8
10-min Negligible	0.3	TEEL/PAC-1	0.15	TEEL/PAC-1	≤ 3	↔	0.3
1-hr Critical	10	TEEL/PAC-3	2	Interim AEGL-3	5	↑	2
1-hr Marginal	2	TEEL/PAC-2	1.5	Interim AEGL-2	≤ 3	↑	1.5
1-hr Negligible	0.3	TEEL/PAC-1	0.15	TEEL/PAC-1	≤ 3	↔	0.3
8-hr Critical	--	Not available	0.63	Interim AEGL-3	--	↑	0.63
8-hr Marginal	--	Not available	0.48	Interim AEGL-2	--	↑	0.4

Note:
* The previous TEEL/PAC-1 was based on the PEL-C, but was erroneously coded as 75 rather than 80 mg/m^3.

4.2.5.1 Acrylonitrile

Interim AEGLs for Acrylonitrile were published in November 2009 (NAC 2009a). They were not available for consideration when the 2008 MEGs are developed (USACHPPM 2008). While the AEGLs are the preferred source of values for the short-term MEGs in most cases, all of the June 2010 MEGs remain the same as the July 2008 interim MEGs because the available new data does not significantly increase confidence and the potential new values change by less than a factor of three.

In summary, the 2008 Acrylonitrile MEGs (USACHPPM 2008) were chosen using the then-available hierarchy-based source values. The selected MEGs for the multiple short-term time durations of 10-minutes, 1-hour, and 8-hours reflected a mix of source values, which includeed 10-min Proposed AEGLs (which were available at the time), 1-hr ERPGs, and also the 8-hr TLV-TWA. While Final and Interim AEGLs are the preferred source values per the standard hierarchy, in 2008 only proposed AEGL values were available. Thus, ERPG and TLV-TWA based values were selected as the basis for all 1-hr (ERPGs) and 8-hr (TLV-TWA) Negligible MEGs, while all the 10-min MEGs and the 8-hr Marginal and Critical MEGs reflected the then Proposed AEGLs. However, in addition to using the hierarchy as the primary basis for the MEGs, the selection process of also included evaluation of the full data set and basis for all values including proposed AEGLs. The USACHPPM (2008) evaluation ensured that the various values themselves, and the degree to which they represented a threshold of effects in humans, did not appear to reflect widely divergent estimates and/or data sets. The data and estimates from the different sources appeared to all reflect relevant health endpoints and to be reasonably in line with one another. Thus the use of the hierarchy was maintained even though adherence to the hierarchy resulted in use of multiple sources for the different time durations.

The following bulleted sections review the toxicological basis of the 2008 MEGs in comparison to the potential new MEGs based on the available new data.

- 8-hr Negligible MEG:

  The June 2010 MEG remains the same as the July 2008 interim MEG because the available new health criterion does not significantly increase the confidence and the potential new value changes by less than a factor of three. The following subparagraphs review the underlying data and this decision.

  2008 MEG – The 2008 8-hour Negligible MEG (4.3 mg/m^3) was based on an 8-hour occupational TLV-TWA (2 ppm or 4.3 mg/m^3). The TLV-TWA documentation (ACGIH 2008a, p. 31) states that the TLV is based on "consistent production of tumors in rats and the suspicion of cancer in humans" given excess respiratory, lung and prostatic cancers were observed in workers (O'Berg 1980, 1984); while rats exposed to 80 ppm via inhalation for 1 year exhibited increased CNS tumors (Quast et al 1981). The TLV booklet (ACGIH 2008b) also notes that this TLV-TWA concentration protects against the critical effects of CNS impairment and lower respiratory tract irritation. Additional information is provided in the ERPG documentation (AIHA 2007), which not only summarizes studies of industrial

workers with potential TWA exposures of < 2 ppm and who exhibited no lung or liver function abnormalities attributable to Acrylonitrile exposure (Guirguis et al 1984), but also evaluated toxicity studies where inhalation exposure of rats at 90 ppm for 8 hours did not produce any respiratory or CNS toxicity (Dudley and Neal 1942). AIHA (2007) further notes that 8-hour human exposure data (Jakubowski et al 1987) suggests that 5 ppm for 8 hours is a NOEL.

Potential 2010 MEG (hierarchy-based) – The 2009 Interim 8-hr AEGL-1 (4.6 ppm or 10 mg/m^3) is based on the absence of effects in informed human subjects exposed for 8 hours to a maximum concentration of 4.6 ppm (subjects exposed to 2.3 and 4.6 ppm, or 5.0 and 10.0 mg/m^3; Jakubowksi et al 1987). A composite uncertainty factor of 1 was assigned (because the effects associated with such low-level exposure to Acrylonitrile are not likely to vary among individuals). The Interim AEGL documentation (NAC 2009a) also provides supporting information from other human and animal studies such as human exposures to the higher concentrations of 16–100 ppm (34.7–217 mg/m^3) for 20-45 minutes resulting in headache, nasal and ocular irritation and chest discomfort (Wilson et al. 1948), and rhesus monkey exposure to 65 ppm (142 mg/m3) for 4 hours producing no adverse effects (Dudley et al 1942). The NAC (2009; p. 7) also includes a personal communication as a supporting statement to the AEGL estimate as follows: "Industry reports noted that exposure to 12–15 ppm caused ocular irritation and headaches regardless of exposure duration." The Interim AEGL-1 analysis (NAC 2009a; p. 7) goes on to state that "a 3-fold reduction of the lower limit of this range (an appropriate adjustment for mild irritation effects) is equivalent to the 4.6 ppm no-effect concentration reported by Jakubowski et al. (1987). Therefore, the 4.6 ppm value is recommended for all AEGL-1 exposure durations. In light of results of studies showing only mild effects (headache, nervousness, fatigue, nausea, and insomnia) following subchronic occupational exposure to levels possibly as high as 20 ppm, further reduction of the AEGL-1 values is not warranted."

Data confidence review – The 2008 MEG (4.3 mg/m^3 or 2 ppm) appears to be at the lower range of overall concentrations examined or estimated as a threshold for human effects from a single short term exposure, and lies below the likely NOEL of 5 ppm for an 8 hour continuous exposure (AIHA 2007). While the new 8-hour Interim AEGL-1 (10 mg/m^3) indicates that the 2008 MEG might be slightly low (overprotective), a significant increase in confidence is not readily apparent. There is a lack of any specific new supporting scientific data (the AEGL-1 critical study was published in 1987), there is only a small difference between the 2008 MEG and the potential new MEG, and the new Interim AEGL has yet to be finalized. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that AEGLs will quite often undergo change before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

- 1-hr Negligible MEG:

The June 2010 MEG remains the same as the July 2008 interim MEG because the available new health criterion does not significantly increase the confidence and the potential new

value changes by less than a factor of three. The following subparagraphs review the underlying data and this decision.

2008 MEG – The 2008 1-hour Negligible MEG (22 mg/m^3) was based on the ERPG-1 established by the AIHA (2007). The AIHA (2007) documentation states that the ERPG-1 is based on several human-study parameters, including the human threshold to objectionable odor (20 ppm or 43.4 mg/m^3; E.I DuPont de Nemours & Co. 2007) and the suggested human NOEL of 5 ppm (10.9 mg/m^3) (from Jakubowski et al 1987 as described earlier) for deleterious effects. In addition, the ERPG assessment considered "symptoms observed in workers handling cleaning operations in polymerizers with estimated exposure to be about 16–100 ppm for 20–45 minutes reported that the most frequent symptoms included dull headache; fullness in the chest; irritation of all mucous membranes including eyes, nose and throat…" (AIHA 2007, with source reference to Wilson et al 1948). The ERPG analysis also includes the Dudley and Neal (1942) study, in which rats exposed to 130 ppm for 4 hours showed "slight transitory" effects, while at 90 ppm for 8 hours, "some discomfort only" was noticed (AIHA 2007)." Thus, the ERPG-1 for this compound lies below human objectionable odor thresholds as well as concentrations that generate recognized deleterious acute effects. It is noted that many investigations, including those of NAC (2009) consider sensation of objectionable odor to be a "nonlethal toxicity" parameter and an important category when characterizing human (nonlethal) toxic response.

Potential 2010 MEG (hierarchy-based) – The new 2009 Interim 1-hr AEGL-1 (4.6 ppm or 10 mg/m^3; NAC 2009a), is derived from the same analysis as the 8-hr AEGL-1 (see above discussion). The 8-hour human exposure study of Jakubowski et al (1987) is the critical study for both 8-hour and 1-hour AEGL-1 values; this same study was also considered by the AIHA (2007) in derivation of the ERPG-1.

Data confidence review – While the new 1-hour Interim AEGL-1 (10 mg/m^3) indicates that the 2008 MEG (22 mg/m^3) might be slightly high (underprotective), a significant increase in confidence is not readily apparent. There is a lack of any specific new supporting scientific data (the AEGL-1 critical study was published in 1987 and was also evaluated in the ERPG process), there is only a small difference between the 2008 MEG and the potential new MEG, and the new Interim AEGL has yet to be finalized. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that AEGLs will quite often undergo change before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

- 1-hr Marginal MEG:

The June 2010 MEG remains the same as the July 2008 interim MEG because the available new health criterion does not significantly increase the confidence and the potential new value changes by less than a factor of three. The following subparagraphs review the underlying data and this decision.

2008 MEG – The 2008 1-hour Marginal MEG (76 mg/m^3) was based on the ERPG-2 established by the AIHA (2007). The ERPG documentation (AIHA 2007) states the following basis for ERPG-2: "This limit is selected based on reversible human effects observed at estimated concentrations of 16–100 ppm for 20 to 45 minutes (Wilson et al 1948). In the animal studies, even the most sensitive species, the dog, showed only slight salivation when exposed to 30 ppm for 4 hours (Dudley and Neal 1942), whereas levels of 100-200 ppm for 1 to 2 hours produced serious signs of toxicity (DuPont Company 1942). Rats showed a marked response…these symptoms could be considered as an inability to escape (Dudley and Neal 1942)."

Potential 2010 MEG (hierarchy-based) – The new 2009 Interim 1-hr AEGL-2 (57 ppm or 120 mg/m^3; NAC 2009a) is derived from observation of "slight transient effects in rats exposed to 305 ppm for 2 hours" (Dudley and Neal 1942). The AEGL-2 documentation (NAC 2009a) states additional supporting information as follows: "Analysis of occupational exposure effects indicated that routine exposure to 10–20 ppm (up to 2x higher than the 8-hr AEGL-2" of 8.6 ppm or 19 mg/m^3) "resulted in complaints of headache, fatigue, nausea, and insomnia which were neither irreversible nor escape-impairing effects. Therefore, the critical effect upon which the AEGL-2 values are based is appropriate. The interspecies uncertainty factor was limited to 3 because PBPK modeling has shown that predicted concentrations of [Acrylonitrile] and the metabolite [2-cyanoethylene oxide] in blood and brain were similar in rats and humans exposed by inhalation. The intraspecies uncertainty factor was limited to 3 because the acute irritation effects of [Acrylonitrile] are not likely to vary greatly among individuals and because metabolism may play only a limited role in the critical effects used as the basis for AEGL-2 derivation. Time scaling for developing AEGL-2 values from the 2-hour experimental [point of departure] to AEGL-specific exposure durations was performed using $C^n \times t = k$, where n = 1.1".

Data confidence review – While the new 1-hour Interim AEGL-2 (120 mg/m^3) indicates that the 2008 MEG (76 mg/m^3) might be slightly high (underprotective), a significant increase in confidence is not readily apparent. There is a lack of any specific new supporting scientific data (the AEGL-2 critical study was published in 1942 and was evaluated by the ERPG process), there is only a small difference between the 2008 MEG and the potential new MEG, the new Interim AEGL-2 documentation indicates that the existing ERPG and Interim AEGL "are consistent", and the new Interim AEGL has yet to be finalized. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that AEGLs will quite often undergo change before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

- <u>1-hr Critical MEG</u>:

The June 2010 MEG remains the same as the July 2008 interim MEG because the available new health criterion does not significantly increase the confidence and the potential new value changes by less than a factor of three. The following subparagraphs review the underlying data and this decision.

2008 MEG – The 2008 1-hour Critical MEG (160 mg/m^3) was based on the ERPG-3 established by the AIHA (2007). Given the absence of exposure measurements for humans exposed to lethal concentrations, the ERPG documentation (AIHA 2007) states the following basis for their ERPG-3 determination: "This level is based primarily on the toxicity data obtained in studies with dogs, which showed lethality at 65 ppm for 4 hrs (Dudley and Neal 1942), serious toxic effects at 100–200 ppm for 1–2 hours (Roudabush et al 1965), and lethality at 100 ppm in a 7-hour exposure (Brieger et al 1952). Consideration was also given to the relatively steep dose-response curve observed in acute toxicity studies in animals (Dudley and Neal 1942), although response in a heterogeneous human population would be expected to exhibit more variability and a flatter slope. Based on limited metabolic data, humans apparently are closer to dogs than other species in their ability to detoxify Acrylonitrile (Wilhite et al 1981)."

Potential 2010 MEG (hierarchy-based) – The new 2009 Interim 1-hr AEGL-3 (100 ppm or 217 mg/m^3) was derived using 30-min, 1-, 2-, 4-, and 8-hour $BMCL_{05}$ estimates of the lethality threshold for rats from the experimental data of Appel et al (1981) and Dudley and Neal (1942). The AEGL documentation (NAC 2009a) states additional supporting information as follows: "With the exception of the 4-hour value, the resulting $BMCL_{05}$ values are relationally consistent across time and the 30-minute, 1-hour, and 8-hour estimates were used to derive corresponding AEGL-3 values. Because the 4-hr value was not used due to relational inconsistency, the 4-hour AEGL-3 was derived by time-scaling the 8-hour $BMCL_{05}$ of 185.9 ppm. Although the dog appeared to be the most sensitive species, the overall database for rats is more robust thereby justifying use of the rat data. Further justification for limiting the interspecies uncertainty factor to 3 comes from PBPK models demonstrating that predicted concentrations of [Acrylonitrile] and the metabolite [2-cyanoethylene oxide] in blood and brain were similar in rats and humans exposed by inhalation." "For effects resulting from a single acute exposure, an intraspecies uncertainty factor of 3 may be considered sufficient for accounting for variability in metabolism-mediated effects. Additional uncertainty factor application would result in incompatibility between AEGL-3 and AEGL-2 values."

Data confidence review – While the new 1-hour Interim AEGL-3 (217 mg/m^3) indicates that the 2008 MEG (160 mg/m^3) might be slightly low (overprotective), a significant increase in confidence is not readily apparent. There is a lack of any specific new supporting scientific data (the AEGL-3 critical studies were published in 1981 and 1942 and the 1942 study was evaluated by the ERPG process), there is only a small difference between the 2008 MEG and the potential new MEG, the new Interim AEGL-3 documentation indicates that the existing ERPG and Interim AEGL "are consistent", and the new Interim AEGL has yet to be finalized. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that AEGLs will quite often undergo change before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

4.2.5.2 Allyl Alcohol

The current Interim AEGLs for Allyl Alcohol were published in December 2008 (NAC 2008). The November 2007 version of the interim AEGLs (EPA 2007a) was used for establishing the 2008 MEGs (USACHPPM 2008). The AEGLs are the preferred source of values for the short-term MEGs in most cases; however, the AEGLs for Allyl alcohol have not yet been finalized and the current values are the fifth version of the interim AEGLs.

All of the June 2010 MEGs remain the same as the July 2008 MEGs because the available new Interim AEGLs do not significantly increase confidence and six of the nine potential new values change by less than a factor of three.

In summary, there have been several sets of Interim AEGLs for Allyl Alcohol. The 1st Interim AEGLs were released in July 2001 and the most recent are the 5th Interim AEGLs released in December 2008. The 4th Interim AEGLs (NAC 2005) were available at the time the 2008 MEGs were established and they were used for all the short term MEGs. The following bulleted sections review the toxicological basis of the 2008 MEGs based on the 4th Interim AEGLs in comparison to the potential new MEGs based on the 5th Interim AEGLs.

- Negligible MEGs:

The June 2010 MEGs remain the same as the July 2008 MEGs because the available new health criteria do not significantly increase confidence and the potential new values change by a factor of five (10-min) or by less than a factor of three (1-hr and 8-hr). The following subparagraphs review the underlying data and this decision.

2008 MEGs – The 2008 Negligible MEGs were based on the 4th Interim AEGL-1 values (NAC 2005) derived from data for slight to moderate nose irritation in human volunteer subjects (Dunlap et al 1958). It is noted that Allyl Alcohol is considered a "potent sensory irritant" (NAC 2005). A composite uncertainty factor of 3 (given that "irritation is not expected to vary greatly among individuals"; NAC 2005, p. vii) was applied for derivation of the 4th Interim AEGL-1 values. The same AEGL-1 value was applied across all exposure durations since the 2005 AEGL analysis concluded that "mild irritancy generally does not vary greatly over time, and because it is not expected that prolonged exposure will result in an enhanced effect" (NAC 2005, p. vii).

Potential 2010 MEG (hierarchy-based) – The recent 5th Interim AEGL-1 source documentation (NAC 2008; p. viii) provides the following summary information: "The AEGL-1 values are based upon nasal irritation as indicated by reversible nasal inflammation observed histologically in rats 14 days after exposure to 51 ppm for 1 hour; 22 ppm for 4 hours, or 10 ppm for 8 hours (Kirkpatrick, 2008). These values represent no effect levels for notable discomfort, as no clinical signs of nasal irritation were observed at these concentrations. A total uncertainty factor of 10 was applied. An intraspecies uncertainty factor of 3 and interspecies uncertainty factor of 3 were applied because Allyl alcohol is highly irritating and corrosive, and much of the toxicity is likely caused by a direct chemical

effect on the tissues; this type of port-of-entry effect is not expected to vary greatly among individuals or among species. For the AEGL derivation, the 1-, 4-, and 8-hour values were based upon the empirical data at the respective durations. The default value of n = 3 was used to time scale the 1-hour AEGL-1 point of departure to 10 and 30 minutes. Although the effect of mild irritation is generally not scaled across time, the empirical data indicate a time-response relationship for Allyl Alcohol-induced nasal irritation. The default value of n was used instead of the n value derived from the rat lethality data because of the uncertainty in using an n value derived from lethality to timescale the endpoint of mild irritation." NAC (2008a) further judged that the 5th Interim AEGL-1 values were determined from experimental study of nasal irritation in a sufficient number of individuals and in a well-characterized lab species (laboratory rat), rather than an experimental study of nose irritation in a small number of human subjects. In addition, NAC (2008a, p. 25) states that the previously used human data were not used for the 5th Interim AEGL-1 estimation "because of the extremely short exposure duration and uncertainties in the exposure" and further notes that "rats exposed to 600 ppm for 1 hour did not exhibit any signs of eye irritation" (Kirkpatrick 2008) Additionally, the NAC committee decided to use time-scaling (NAC 2008; p. 25) "although the effect of mild irritation is generally not scaled across time, the empirical data indicate a time-response relationship for Allyl Alcohol-induced nasal irritation."

Data confidence review – While factors of change for the 1- and 8-hour Negligible values are less than 3, indicating reasonable agreement, it is acknowledged that the factor change for the 10-min Negligible MEGs is 5. Nonetheless, a significant increase in confidence is not readily apparent for any of the new values. There have now been five versions of the Interim AEGLs released since 2001, which strongly suggests that substantial uncertainty remains regarding what the final AEGLs should be. The current 5th Interim AEGLs reflect the results of a recent rat study and a NAC decision to use this sole study to supersede the previous estimates based on human data and change their assessment of the time-dependency of irritant effects for this compound. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that this is the 5th iteration of the Interim AEGLs and additional change may occur before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

- Marginal MEGs:

The June 2010 MEGs for the 1- and 8-hour Marginal values remain the same as the July 2008 MEGs because the available new health criteria do not significantly increase confidence and the potential new values change by less than a factor of three. The June 2010 MEG for the 10-min Marginal value remains the same as the July 2008 MEG because the available new health criterion does not significantly increase confidence despite the relatively large degree of change in the value, by a factor of 21. The following subparagraphs review the underlying data and this decision.

2008 MEGs – The 2008 Marginal MEGs were based on the 4th Interim AEGL-2 values and derived from an observed NOAEL for severe eye irritation in human volunteer subjects (Dunlap et al 1958). It is noted that Allyl Alcohol is considered a "potent sensory irritant" (NAC 2005). A composite uncertainty factor of 3 (given that "irritation is not expected to vary greatly among individuals"; NAC 2005) was applied for derivation of the AEGL-2 values; the same AEGL-2 value of 10 mg/m^3 was applied across all exposure durations "because mild irritancy generally does not vary greatly over time, and because it is not expected that prolonged exposure will result in an enhanced effect" (NAC 2005, p. vii).

Potential 2010 MEG (hierarchy-based) – The recent 5th Interim AEGL-2 source documentation (NAC 2008; p. viii) provides the following summary information: "The AEGL-2 was obtained by dividing the AEGL-3 by 3. Two rats exposed to 51 ppm for 8 hours developed severe, irreversible nasal lesions (Kirkpatrick 2008). The AEGL-2 values could be based on the highest no-effect level for irreversible nasal histopathological lesions of 403 ppm for 1 hour, 102 ppm for 4 hours, and 21 ppm for 8 hours; however, these concentrations are similar to the calculated LC_{01} values used for the AEGL-3 derivations. The data for irreversible nasal lesions were insufficient for analyses by the ten Berge software or by benchmark dose because there is only one data point with a non-zero response. No other empirical data meeting the definition of an AEGL-2 endpoint were available; therefore, the AEGL-3 values were divided by 3 to provide a reasonable estimate for AEGL-2 values." Additional documentation for the 5th Interim AEGLs (NAC 2008, p. 26), states that human data were not used in the derivation for the same reasons as summarized above in the characterization of Negligible MEGs.

Data confidence review – While factors of change for the 1- and 8-hour Marginal values are less than or equal to 3 and indicate reasonable agreement, it is acknowledged that the factor change of 21 for the 10-min Marginal value is notable, with the new AEGL representing a significantly higher value. Nonetheless, a significant increase in confidence is not readily apparent for any of the new values. There have now been five versions of the Interim AEGLs released since 2001, which strongly suggests that substantial uncertainty remains regarding what the final AEGLs should be. The current 5th Interim AEGLs reflect the results of a recent rat study and a NAC decision to use this sole study to supersede the previous estimates based on human data and change their assessment of the time-dependency of irritant effects for this compound. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that this is the 5th iteration of the Interim AEGLs and additional change may occur before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

- Critical MEGs:

The June 2010 MEGs for the 1- and 8-hour Critical values remain the same as the July 2008 MEGs because the available new health criteria do not significantly increase confidence and the potential new values change by less than a factor of three. The June 2010 MEG for the 10-min Critical value remains the same as the July 2008 MEG because

the available new health criterion does not significantly increase confidence despite the relatively moderate degree of change in the value, by a factor of 7. The following subparagraphs review the underlying data and this decision.

2008 MEGs – The 2008 Critical MEGs were based on the 4th Interim AEGL-3 values, which reflected threshold lethality data for mice, rats and rabbits (Union Carbide 1951). AEGL documentation (NAC 2005) for the 4th Interim AEGL-3 values provides the following supporting information. "The concentration of 200 ppm for 1 hour produced no mortality in groups of ten mice, rats, and rabbits" (in a 1951 study) "and was chosen as the AEGL-3 point of departure (POD). Exposure at the next higher concentration in rats (1000 ppm for 1 hour) or mice (500 ppm for 1 hour) resulted in mortality (4/6 and 4/10, respectively). Although rabbits exposed to 500 ppm for 2 hours survived, the group size was limited to four animals, a small sample size upon which to base a no-effect-level for mortality. Therefore, the POD of 200 ppm for one hour was chosen to represent a level at which no mortality occurred in three species. These data suggest little difference among species in response to allyl alcohol exposure. Therefore, the interspecies uncertainty factor was set to 3. The intraspecies uncertainty factor was assigned the default value of 10. While allyl alcohol appears to be a direct acting irritant, there are uncertainties about systemic effects, particularly of the liver, at this concentration. The experimentally derived exposure value was then scaled to AEGL time frames using the concentration-time relationship given by the equation $C^n \times t = k$, where C = concentration, t = time, k is a constant, and n generally ranges from 1 to 3.5." "The value of n was not empirically derived due to the unreliability of the data." "Going with a default value results in AEGL values that are inconsistent with the available data." Therefore, an adjustment factor of 1/3 was applied. Animal data showed that a repeated exposure to rats of 20 ppm for 7 hr/day, 5 days/week for 60 exposures resulted in only reduced body weight, and "that humans survived exposure up to 25 ppm for 5 minutes with only severe irritation. These results indicated that the default duration extrapolation using an n of 1 is too conservative. Therefore, a modifying factor of 2 is applied to the 1-hour AEGL-3 to obtain the 4- and 8-hour AEGL-3 values of 10 ppm."

Potential 2010 MEG (hierarchy-based) – The recent 5th Interim AEGL-3 source documentation (NAC 2008) provides the following summary information: "The AEGL-3 values are based on the calculated LC_{01} value in rats" for exposure durations from 10 minutes to 8 hours. "The LC_{01} estimates were calculated using the ten Berge software program using the rat mortality data from" four studies. "The ten Berge program estimated an n=0.95 for time scaling. An intraspecies uncertainty factor of 3 and interspecies uncertainty factor of 3 were applied because allyl alcohol is highly irritating and corrosive, and much of the toxicity is likely caused by a direct chemical effect on the tissues; this type of port-of-entry effect is not expected to vary greatly among individuals or among species."

Data confidence review – While factors of change for the 1- and 8-hour Critical values are less than or equal to 3 and indicate reasonable agreement, it is acknowledged that the factor change of 7 for the 10-min Critical value is notable, with the new AEGL representing a significantly higher value. Nonetheless, a significant increase in confidence is not readily apparent for any of the new values. There have now been five versions of the Interim

AEGLs released since 2001, which strongly suggests that substantial uncertainty remains regarding what the final AEGLs should be. The process of finalizing AEGLs is purposely deliberative and is conducted by nationally recognized subject matter experts. Given that this is the 5th iteration of the Interim AEGLs and additional change may occur before finalization, it is prudent in this situation to wait until the deliberative NAC/NRC review process is completed before changing the MEG.

4.2.5.3 Bromomethane

The June 2010 1-hr Negligible MEG is 80 mg/m^3. While confidence is not improved in this case and the change in value is less than a factor of 3, use of the correct value ends the propagation of an error.

Available data remain insufficient for derivation of any AEGL-1 values for Bromomethane (NAC 2007) and ERPGs also do not exist. In the absence of these values, the standard hierarchy uses the current PAC/TEEL-1 value in the absent of any other information. The current PAC-1 for Bromomethane is 100 mg/m^3 (EMI SIG 2009). The previous PAC-1 value (75 mg/m^3) (EMI SIG 2007) was used for the 2008 MEG (USACHPPM 2008). In both versions of the publications, both PAC-1 values are supposedly based on the OSHA PEL-Ceiling value. However, the correct PEL-Ceiling values are 20 ppm and 80 mg/m^3 (OSHA 2010). Therefore, rather than rely on the PAC values, the new 1-hr Negligible MEG is based on the correct PEL-C values directly published by OSHA.

4.2.5.4 Cyanogen Chloride

The June 2010 1-hr Negligible MEG remains the same as the July 2008 MEG (0.75 mg/m^3) because the available new health criterion does not significantly increase confidence and the potential new value changes by less than a factor of three.

Available data remain insufficient for derivation of any AEGL values and there are no ERPG-1 values for this compound. As a consequence, Negligible MEG estimation relies on TEEL/PAC-1 values. The current PAC-1 for Cyanogen Chloride is 0.15 mg/m^3 (EMI SIG 2009). A previous PAC-1 value (0.75 mg/m^3) (EMI SIG 2007) was used for the 2008 MEG (USACHPPM 2008). The reason the value changed is because the PAC methodology changed. In 2007, the value of 0.75 mg/m^3 was based directly off of the TLV-Ceiling value of 0.3 ppm. In 2009, the value of 0.15 mg/m^3 was based on a scaling conversion from the ERPG-2 value. The PAC methodology made a change and now only considers ceiling values to be choices for PAC-2 values, whereas STEL values can be choices for PAC-1 values. However, in this particular case, since no STEL value exists for Cyanogen Chloride, the revised PAC-1 value is derived from a scaling of the ERPG-2 (DOE 2008, p.21).

The scientific basis for the value has not changed much, as the PACs are considered to be highly uncertain when not based directly on AEGLs and ERPGs. In this case, both the 2007 and 2009 approaches are extrapolations of some kind and are considered equally uncertain.

4.2.5.5 Parathion

The 2008 MEGs for Parathion were based on a very limited data set and lacked a strong peer-review and were therefore considered "Interim MEGs" subject to potential significant change pending availability of new data or analyses. Interim AEGLs (for levels 2 and 3) have since been published (NAC 2009b); however, no AEGL-1 values were published due to insufficient data.

Despite the fact that three of the new values constitute a change by less than a factor of three (one changes by a factor of five), all of the June 2010 values for the 10-min, 1-hr, and 8-hr Marginal and Critical MEGs are revised from the July 2008 MEGs because the available new data significantly increases confidence and the two 8-hr MEGs fill a previous data gap. The June 2010 values for the 10-min and 1-hr Negligible MEGs remain the same as the July 2008 MEGs because the available new data does not significantly increase confidence and the potential new values constitute a change by less than a factor of three.

The following bulleted sections review the toxicological basis of the 2008 MEGs in comparison to the potential new MEGs based on the available new data.

- Negligible MEGs

  The June 2010 MEGs for the 10-min and 1-hour Negligible values remain the same as the July 2008 MEGs because the available new health criteria do not significantly increase confidence and the potential new values change by less than a factor of three. The following subparagraphs review the underlying data and this decision.

  2008 MEGs – The 10-min and 1-hour Negligible MEGs were based on PAC-1 values (EMI SIG 2007), which in turn were based on the TLV-TWA times 3 because AEGL-1, ERPG-1, and STEL values were unavailable (DOE 2008).

  Potential 2010 MEGs (hierarchy-based) – The potential 10-min and 1-hour Negligible MEGs would be based on the same PAC-1 approach as above but would use the revised TLV-TWA.

  Data confidence review – Available data remain insufficient for derivation of AEGL-1 values (NAC 2009b) and ERPG and STEL values are unavailable. The 2008 MEG and the potential new MEG are based on the same derivation methodology with the only change being use of the revised TLV-TWA. The scientific basis for both values is relatively weak as both are extrapolations from an occupational, day-to-day exposure guideline. Confidence is not increased and the value would change by less than a factor of three.

- Marginal MEGs

  The June 2010 values for the 10-min and 1-hr Marginal MEGs have been revised from the July 2008 MEGs because the available new health criteria significantly increases confidence

despite the fact that the new values change by less than a factor of three. In 2008, data for an 8-hr Marginal MEG was unavailable, now it exists. The following subparagraphs review the underlying data and this decision.

2008 MEGs – The 2008 Marginal MEGs (for the 10-min and 1-hr durations only) were based on limited oral rat data that had been used as the basis for the then-published PAC-2. Though PAC values are the lowest preference in the hierarchy of source values for MEGs, at the time they were the only guidelines available. In the absence of 10-minute exposure guidelines from other hierarchy sources for parathion, a protective decision was made to designate the 10-minute Marginal value equal to that for the 1-hour exposure duration. At the time the 2008 MEGs were developed, there were no guidelines from which to develop 8-hour values.

Potential 2010 MEGs (hierarchy-based) – The Interim AEGL-2 values (NAC 2009b) are based on limited data, and derived as follows: "Human exposure data were unavailable and quantitative data from studies in laboratory species focused on only lethal responses. The exception was exposure-response data for tremors in rats exposed to parathion at various concentrations for 4 hours" [a 1974 NIOSH study]. "These data were considered"… "appropriate for Benchmark Dose analysis. The 4-hour $BMCL_{05}$ and 4-hour BMC_{01} values for these data were 32.3 and 28.9 mg/m3, respectively." …"the lower value (BMC_{01}) was selected as the point of departure for AEGL-2 derivation. A total uncertainty factor adjustment of 30 was applied. The interspecies uncertainty factor was limited to 3 because the mechanism of action of organophosphate anticholinesterases is well understood and their effect on cholinergic systems is consistent across species. Variability in responses is primarily a function of varying cholinesterase activity and types of cholinesterase." "The documented variability in sensitivity among different age groups and genders, and the known genetic polymorphisms in A-esterases justifies retention of the intraspecies uncertainty factor of 10. The uncertainty factor application and rationale are the same as those applied in the derivation of other organophosphate anticholinesterases." …"temporal scaling from the experimental durations to AEGL-specific durations was performed using n = 3 when extrapolating to shorter time points and n = 1 when extrapolating to longer time points using the $C^n \times t = k$ equation."

Data confidence review – The 2008 Marginal MEGs were all based on PAC-2 values that were derived from a single oral rat study. The finding of animal inhalation data with endpoints of relevance provides a clear improvement to the evaluated dataset and understanding of the effects thresholds of this chemical. While there are still uncertainties in the estimates, the publication of the Interim AEGLs based on the inhalation data demonstrates a notable improvement from the previous derived values. While the changes for the 10-min and 1-hr values are less than a factor of 3, confidence is greatly improved, and the 8-hr Marginal value fills a previous data gap.

- Critical MEGs:

The June 2010 values for the 10-min and 1-hr Critical MEGs have been revised from the July 2008 MEGs because the available new health criteria significantly increases confidence despite the fact that one of the new values changes by less than a factor of three (the other changes by a factor of 5). In 2008, data for an 8-hr Critical MEG was unavailable, now it exists. The following subparagraphs review the underlying data and this decision.

2008 MEGs – The 2008 Critical MEGs (for the 10-min and 1-hr durations only) were derived from limited oral rat data that had been used as the basis for the then-published PAC-3 (which was equal to the IDLH established by NIOSH). Although PAC values are the lowest preference in the hierarchy of source values for MEGs, at the time they were the only guidelines available. In the absence of 10-minute exposure guidelines from other hierarchy sources for parathion, a protective decision was to designate the 10-minute Critical value equal to that for the 1-hour exposure duration. At the time the 2008 MEGs were developed, there were no guidelines from which to develop 8-hour values.

Potential 2010 MEGs (hierarchy-based) – The Interim AEGL-3 values (NAC 2009b) provides derivation information as follows: "Lethality data are limited to studies in rats and 4-hour LC_{50} values of 31.5 mg/m^3, 30 mg/m^3, and 84 mg/m^3, and a 1-hour LC_{50} value of 115 mg/m^3." "The AEGL-3 values for parathion were derived using the BMC_{05} of 37.5 mg/m^3 derived from lethality data in rats exposed for 4 hours to concentrations up to 230.5 mg/m^3; the 4-hour BMC_{01}, was 41.1 mg/m^3. Uncertainty factor application and justifications, and time scaling are the same as those used in the derivation of the AEGL-2 values."

Data confidence review – The 2008 Critical MEGs were all based on PAC-3 values (EMI SIG 2007) that were derived from the NIOSH IDLH. The availability of animal inhalation data with endpoints of relevance demonstrates a clear improvement to the dataset and understanding of the effects thresholds of this chemical. While there are still uncertainties in the estimates, the publication of the Interim AEGLs based on these inhalation data demonstrates a notable improvement from the previous derived values. While the change for the 10-min value is less than a factor of 3, confidence is greatly improved. The change for the 1-hr value is greater than a factor of 3 and confidence is greatly improved. Additionally, the 8-hr Critical value fills a previous data gap.

4.2.6 Selection of Short-Term Air MEGs for Military Smokes and Obscurants

For each of the eight smokes and obscurants that the NRC investigated (see Table 4-7 and Section 3.3.1.3), the short term MEGS were set as follows:

- The 8-hour Air MEG was set equal to the PEGL/REGL value recommended by the NRC. For all smokes or obscurants, except for diesel fuel smoke, these values are listed for EDs of 8 hours for 5 days a week. For diesel fuel smoke, NRC listed two values for a PEGL/REGL with different EDs. The lower of these two values (ED of 8 hours twice a

week) was selected as the published MEG; however, if the exposure is limited to a single 8-hour exposure during a single week, the NRC report indicated that the higher value of 10 mg/m^3 can be used.

- The 1-hour negligible MEG was set equal to the SPEGL value recommended by the NRC. Use of the SPEGL value, which is designed to protect the general public, for the 1-hour negligible MEG is considered protective.

- The 1-hour marginal MEG was set equal to the EEGL value recommended by the NRC.

Table 4-7 Health Criteria Used for Developing Short-Term MEGs for Military Smokes and Obscurants

Chemical Name	Inhalation Value (mg/m³)			Source
Hexachloroethane smoke	EEGL	1 hr	3	NRC 1997 (Volume 1)
	SPEGL	1 hr	0.3	
	PEGL/REGL	8 hr	0.2	
Red phosphorous smoke	EEGL	1 hr	10	NRC 1997 (Volume 1)
	SPEGL	1 hr	1	
	PEGL/REGL	8 hr	1	
Fog oil smoke	EEGL	1 hr	90	NRC 1997 (Volume 1)
	SPEGL	1 hr	9	
	PEGL/REGL	8 hr	5	
Diesel fuel smoke	EEGL	1 hr	80	NRC 1997 (Volume 1)
	SPEGL	1 hr	8	
	PEGL	8 hr	5	
Titanium dioxide smoke	EEGL	1 hr	450	NRC 1999b (Volume 2)
	SPEGL	1 hr	45	
	PEGL/REGL	8 hr	2	
Graphite smoke	EEGL	1 hr	220	NRC 1999b (Volume 2)
	SPEGL	1 hr	22	
	PEGL/REGL	8 hr	1	
White phosphorous smoke	EEGL	1 hr	5	NRC 1999b (Volume 2)
	SPEGL	1 hr	0.5	
	PEGL/REGL	8 hr	0.09	
Brass smoke	EEGL	1 hr	0.4	NRC 1999b (Volume 2)
	SPEGL	1 hr	0.04	
	PEGL/REGL	8 hr	0.001	

Due to NRC's finding that toxicity increased with repeated exposure for at least one of the smoke compounds (diesel fuel smoke), the 8-hour air MEG cannot be used as a source for determining longer term consecutive/serial MEGS (i.e., 14-day or 1-year). There is a lack of long-term consecutive/serial exposure data for any of the smokes or obscurants. Consequently, there is no sound basis available for determining 14-day or 1-year MEGs for any of the smokes

or obscurants. In addition, NRC did not recommend any EGLs that would be appropriate for the 1-hour critical air MEG for any of the smokes or obscurants.

It is important to note that these MEGs for military smokes and obscurants should only be used for exposure to these specific smokes and not for the specific chemicals contained within the smoke (the converse is also true). There are separate MEGs that should be used for inhalation exposure to diesel fuel vapor or hexachloroethane chemical exposure. For example, the inhalation toxicity of hexachloroethane smoke is attributed to the production of zinc chloride ($ZnCl_2$), the major component of the smoke, and not the chemical HC. Diesel fuel smoke is particulate in nature as it is composed of very small droplets of liquid diesel fuel. Therefore, even though there is diesel vapor in diesel fuel smoke, the diesel fuel smoke MEG covers the combination of both the droplets and vapor and should only be used as such. See Section 4.6.2 for additional clarity on diesel-related compounds.

To determine EEGL limits, the NRC first reviewed relevant toxicological information to determine the NOAEL. If data were insufficient to determine a NOAEL, a NOAEL was extrapolated from the LOAEL by using a UF of 10. Much of the health effects data for smokes and obscurants is obtained from laboratory animal studies, and an additional UF of 10 is applied to extrapolate from animal sensitivities to human sensitivities. The SPEGL limit is set at 10 percent of the EEGL limit to protect sensitive subpopulations in the general public. The REGLs and RPEGLs are set in much the same method as EEGLs and SPEGLs; however, NRC uses chronic toxicity as the primary basis for determining limits. No studies on any of the smokes and obscurants have considered carcinogenic endpoints. Therefore, all of the MEGs are based on a non-carcinogenic endpoint.

4.3 LONG-TERM AIR MEGS

4.3.1 Definition

During MEG development, potential health effects from continuous, long-term exposures are considered differently than acute (short-term) exposures to higher concentrations. Therefore, the short-term air MEGs cannot be used to assess longer, continuous EDs. The differences resulting from ED may result from toxicodynamic (specific effects and mechanisms of action) or toxicokinetic (dynamics of absorption, distribution, and elimination) processes. In addition, processes that contribute to development of cancer are more likely to occur with chronic exposure. As previously indicated, the long-term MEGs were developed to be protective and cannot be used retrospectively to assess potential health risks, attribute the occurrence of health effects from a previous exposure, or estimate percentage of casualties.

With the exception of airborne PM, the long-term air MEGs were specifically developed to address airborne concentrations of chemicals at or below which there would be no expected significant adverse health effects for deployment durations of up to 1 year. These long-term air MEGs were developed for chemicals which are assumed to have a threshold for toxicity or are considered carcinogens. In other words, published toxicological information indicating an

exposure concentration resulting in minor or no-observable adverse health effects is required to determine a toxicity threshold for noncarcinogens. The 1-year Negligible air MEG is defined below.

> 1-year Negligible Air MEG—The airborne concentration for a continuous exposure up to 1 year (365 days, 24 hours/day) that is considered protective against all currently known adverse health effects to include acute performance degrading effects or long-term health consequences. This MEG is considered protective against the development of chronic diseases and an increased cancer risk greater than 1 in 10,000. The potential for adverse health outcomes increases within the exposed population as the exposure increases above the MEG.

For airborne PM, both a 1-year Negligible and 1-year Marginal MEGs were developed for $PM_{2.5}$ (see Section 4.5). The USAPHC (Prov) is considering the possibility of developing additional higher severity long-term MEGS (i.e., Marginal and Critical MEGs). If and when these are produced, they will be consistent with hazard severity definitions established by existing policy (e.g., CJCS 2007), which are defined in the table below.

Table 4-8 ORM Hazard Severity Definitions for Chronic Effects (CJCS 2007)

Hazard Severity Category	Description of the Types of Health Effects Driving the Selection of the Severity Category
CRITICAL	Majority to all exposed personnel are plausibly expected to develop delayed onset, irreversible effects due to the specified exposure. While this may not affect the immediate physiological capabilities of individuals, commanders must consider long term implications and appropriately communicate the potential risks. Psychological implications may adversely impact operations particularly over extended operational periods.
MARGINAL	Many exposed personnel are plausibly expected to develop delayed onset, irreversible effects. While this may not affect the immediate physiological capabilities of individuals, commanders must consider long term implications and appropriately communicate the potential risks. Operational stress related implications may adversely impact operations particularly over extended operational periods.
NEGLIGIBLE	Few exposed personnel (if any) are expected to develop delayed onset, irreversible effects.

4.3.2 Methodology for Developing 1-Year Negligible MEGs

The 1-year Negligible air MEGs were developed using inhalation health criteria from existing sources. Health criteria were adjusted to more appropriately suit the exposure conditions that military personnel might experience during a typical, long-term deployment scenario as necessary. The standard health criteria selection process used for developing the long-term MEGs was presented in Section 3.4. Descriptions of the exposure assumptions and sources of health criteria used to develop the long-term MEGs are presented in Sections 2 and 3.4.3, respectively. However, the sources on the hierarchy do not provide values for all chemicals to which deployed personnel may be exposed. Therefore, occupational TLV published by the ACGIH (ACGIH 2010) were also considered to provide 1-year air MEGs for additional chemicals.

Table 4-9 and Table 4-10 present the sources for health criteria and the calculations used to develop the 1-year air MEGs for non-carcinogens and carcinogens, respectively. The lower of the two values was selected as the 1-year air MEG. If a value was not available, the TLV®s were used as the 1-year air MEG. The TLV®s for irritants were assumed to be concentration-dependent and were not adjusted for ED as described in Section 4.2.3.2. Values for other chemicals were adjusted according to the equation presented in Section 4.2.3.2.

Only the IR required adjustment in order to adopt the non-cancer exposure values from the hierarchy of sources as 1-year air MEGs. The typical daily IR for the general population (20 m^3/day) was adjusted to the elevated military personnel rate (29.2 m^3/day) assumed for military inhalation exposure assessments (see Table 2-6). Adjustments for EF and ED were not necessary since all the sources assume continuous exposure over the ED. The only exception is for the TLVs, which are based on an intermittent exposure of 5 days per week. The TLVs were adjusted consistent with the method used for developing the 14-day air MEGs as presented in Section 4.2.3 and Section 4.2.3.2.

The methods used for deriving the air MEGs for carcinogens are consistent with the RAGS methodology (EPA 1989a). Equation 4-4 provides the calculation for the 1-year air MEGs based on carcinogenic health effects, and Table 4-10 summarizes the air MEG derivation method.

Table 4-9 Summary of Standard Sources Used and Adjustments Made for Developing 1-Year Negligble Air MEGs for Non-Cancer Health Endpoints

Source	Reference	Value Name	Calculation
1. PPRTV—EPA	EPA 2009d	RfC_sub	$\frac{RfC_{sub} \cdot 20\,m^3/day}{29.2\,m^3/day}$
2. IRIS—EPA*	EPA 2010*	RfC_sub	
3. ATSDR	ATSDR 2009	MRL_inter	$\frac{MRL_{inter} \cdot 20\,m^3/day}{29.2\,m^3/day}$
4. HEAST—EPA	EPA 2005b	RfC_sub	$\frac{RfC_{sub} \cdot 20\,m^3/day}{29.2\,m^3/day}$
5. IRIS—EPA	EPA 2010	RfC_chr	$\frac{RfC_{chr} \cdot 20\,m^3/day}{29.2\,m^3/day}$
6. PPRTV—EPA	EPA 2009d	RfC_chr	
7. ATSDR	ATSDR 2009	MRL_chr	$\frac{MRL_{chr} \cdot 20\,m^3/day}{29.2\,m^3/day}$
8. HEAST—EPA	EPA 2005b	RfC_chr	$\frac{RfC_{chr} \cdot 20\,m^3/day}{29.2\,m^3/day}$
9. ACGIH	ACGIH 2010	TLV**	Most chemicals: ~ TLV · 0.24 Irritants: ~ TLV · 0.34

* IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.5.2 describes how IRIS values were adjusted for the purposes of developing MEGs.
** The TLVs were adjusted according to Equations 4-2 and 4-3 (see Section 4.2.3.2).

Table 4-10 Summary of Standard Sources Used and Adjustments Made for Developing the 1-Year Air MEGs for Cancer Endpoints

Source	Reference	Value Name	1-Year Air MEG Calculation
1. IRIS—EPA	EPA 2010	UR_i	$\frac{0.0001 \cdot 25550\,days \cdot 20\,m^3/day}{UR_i \cdot 1000\,\mu g/mg \cdot 29.2\,m^3/day \cdot 1\,year \cdot 365\,days/year}$
2. PPRTV—EPA	EPA 2009d		
3. HEAST—EPA	EPA 2005b		

Equation 4-4 Calculation of 1-Year Air MEG Based on Carcinogenic Health Effects

$$1-yAMEG_{ca} = \frac{TCR \cdot AT_{ca} \cdot IR_R}{UR_i \cdot IR_M \cdot ED \cdot EF}$$

1-y air MEG_{ca} = 1-year air MEG based on cancer endpoint (mg/m³) (chemical-specific)
TCR = Target cancer risk (unitless) (0.0001)
AT_{ca} = Averaging time for carcinogens (25,550 days)
IR_R = Residential inhalation rate (20 m³/day)
UR_i = Inhalation unit risk factor (risk per µg/m³) (chemical-specific)
IR_M = Military inhalation rate (29.2 m³/day)
ED = Exposure duration (1 year)
EF = Exposure frequency (365 days/year)

Table D-4 in Appendix D presents the preliminary 1-year air MEGs for cancer and non-cancer endpoints along with their data source. Appendix D, Table D-5 presents the preliminary values, values based on TLVs, and the final 1-year air MEGs along with their basis.

4.4 MEGS FOR CRITERIA POLLUTANTS OTHER THAN PARTICULATE MATTER

The criteria pollutants are carbon monoxide (CO), Pb, nitrogen dioxide (NO_2), O_3, particulate matter (PM) [particulate matter (PM_{10}) and ($PM_{2.5}$)], and SO_2. The Clean Air Act (40 CFR part 50) requires the EPA to set NAAQS for [these] pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA Office of Air Quality Planning and Standards has promulgated NAAQS for six principal pollutants, which are called “criteria pollutants” (40 CFR part 50).
The NAAQS are designed to help minimize the adverse environmental conditions for the general public. The associated Air Quality Index (AQI) reporting system (EPA 2003g, EPA 2006c) is designed to identify adverse levels of these pollutants in large metropolitan areas and inform the public regarding health impacts. Specifically, AQI levels are used to forecast conditions (or provide near real-time information) so that current conditions and recommendations can be provided to the general public (e.g., O_3 alerts).

4.4.1 Pollutant Sources

The sources of these pollutants include factories, power plants, incinerators, automobiles, construction activity, fires, and windblown dusts. In the United States, the European Union, and in many other regions of the world, industry and vehicle emissions are the primary sources of

these pollutants. However, the sources and composition of PM, and notably in the US Central Command area of operation, can be different from that typically found in the United States and other industrialized nations (see Section 4.5 for more detail on PM).

4.4.2 Health Effects

Epidemiological studies (EPA 2000b, 2004f, 2006b-c, 2008a-b) have demonstrated a positive relationship between a variety of public health problems (such as, specific respiratory and cardiovascular medical outcomes) and the presence of high concentrations of criteria pollutants, particularly amongst specific subpopulations (e.g., elderly, young children, or those with pre-existing conditions, such as asthma or notable cardiovascular disease). Eye, nose, throat irritation, and other health effects, including those above, may occur sporadically, even in relatively healthy persons, especially if engaging in activities with increased aerobic activity (ground-level O_3 for example, EPA 2006e) In some population groups, potential long-term or permanent health effects have been associated with continuous exposures (e.g., months to year) to relatively high levels of some of the criteria pollutants, particularly CO and Pb (EPA 2000, 2006b).

4.4.3 MEG Development

4.4.3.1 Short-Term Air MEGs

Short-term air MEGs for criteria pollutants (other than PM) were developed using the methodology outlined in the following pollutant-specific sections. The standard MEG development hierarchies presented in Section 4.2 were used to the extent reasonable; however, there were several instances where exceptions to the standard approach were necessary.

The pollutant-specific sections also provide the available pollutant-specific AQIs showing the selected MEGs in context with the AQIs designed to protect the general US population, including sensitive sub-populations. The AQI is not directly applicable to the deployed military population; therefore, its use as a direct measure of operational risk is not recommended. However, use of the AQI information in context of an operational risk assessment may be useful in some circumstances.

A comparison of the selected MEG values against the AQI sub-indices for CO, O_3, and SO_2, shows that the selected 8-hour Negligible MEGs fall within AQI Levels of Concern between "Unhealthy" (SO_2) and "Very Unhealthy" (CO and O_3). This demonstrates two points. First, how the MEGs, designed for the military population, are not "protective" of the general population. Second, the MEGs do not necessarily provide the same "level of protection" across all chemical substances. These points are reviewed below.

- *MEGs are not "protective" of the general population*. The AQI guidelines are designed to be conservative in that they specifically consider susceptible subpopulations within the United States (e.g., elderly, children, those with pre-existing health conditions). The 8-

hour CO and O_3 MEGs are based on data and guidelines for occupational populations, not the general public.

- *MEGs may not provide the same "level of protection" for all substances*. The MEGs do not necessarily provide the same "level of protection" across all chemical substances because the original sources of the criteria and guidelines do not always provide consistent recommendations, even within agency. For example, for SO_2 there is inconsistency in the level of protection provided by the EPA NAAQS and AQI compared to the EPA AEGLs, which are also designed to protect the general population. The 8-hour Negligible SO_2 MEG is based on the EPA AEGL but falls in the EPA AQI level "Unhealthy." Such inconsistencies in the "level of protection" often reflect scientific uncertainties, different risk management judgments, lack of comparability, or a combination of factors. The resolution of these types of inconsistencies should occur over time as MEG values are refined as scientific knowledge and risk management strategies evolve.

4.4.3.2 Long-Term Air MEGs

Long-term air MEGs for criteria pollutants (other than PM) were developed using the methodology outlined in the following pollutant-specific sections. The standard MEG development hierarchies presented in Section 4.3, were used to the extent reasonable. However, in all cases either only ACGIH TLVs were available or nothing was available. The TLVs are the last choice in the standard hierarchy for deriving long-term MEGs. Following the standard hierarchy (see Section 4.3), the adjusted TLVs were considered for use as 1-year MEGs. Equations 4-2 and 4-3 were used to adjust the TLVs, depending on whether or not the pollutant was considered an irritant (i.e., NO_2, O_3, and SO_2). The adjusted TLVs were adopted for some but not all, cases.

4.4.4 Carbon Monoxide

Carbon monoxide is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and the performance of complex tasks (EPA 2000). Major sources of CO sources include vehicular exhaust or any fossil-fuel combustion source such as boilers, generators or incinerators, and open burning for land or waste management.

The following table presents the selected MEGs for CO. The 10-min MEGs, and the Critical and Marginal 1-hr and 8-hr MEGs follow the standard hierarchy and approach used for the key TICs, as CO is also one of the TICs (see Section 4.2.5). The 10-min and 1-hr Negligible MEGs were based on the TEEL-1 value because AEGL-1 values (first choice) were not available and the ERPG-1 (second choice for 1-hr values, 200 ppm) was higher than the selected 1-hr Marginal MEG. The 8-hr Negligible MEG was based on the TLV®-TWA because an AEGL-1 was not

available. The 1-year MEG was based on an adjusted TLV® (for non-irritants) because a toxicity value for chronic exposures from the standard hierarchy of source data is not available.

Table 4-11 Air MEGs for Carbon Monoxide

Selected Air-MEG			Basis
10-min Critical MEG	1900 mg/m^3	1700 ppm	AEGL-3 (10-min)
10-min Marginal MEG	480 mg/m^3	420 ppm	AEGL-2 (10-min)
10-min Negligible MEG	95 mg/m^3	83 ppm	TEEL-1
1-hour Critical MEG	380 mg/m^3	330 ppm	AEGL-3 (1-hr)
1-hour Marginal MEG	95 mg/m^3	83 ppm	AEGL-2 (1-hr)
1-hr Negligible MEG	95 mg/m^3	83 ppm	TEEL-1
8-hr Critical MEG	150 mg/m^3	130 ppm	AEGL-3 (8-hr)
8-hr Marginal MEG	31 mg/m^3	27 ppm	AEGL-2 (8-hr)
8-hr Negligible MEG	29 mg/m^3	25 ppm	TLV-TWA
14-d Negligible MEG	10 mg/m^3	9 ppm	CEGL
1-yr Negligible MEG	7 mg/m^3	6 ppm	TLV adjusted (non-irritants)

CASRN = 630-08-0

The 1-hour NAAQS for CO is 35 ppm (40 mg/m³), and the 8-hour NAAQS for CO is 9 ppm (10 mg/m³). The AQI for CO is based on an 8-hour averaging time. Table 4-12shows the 8-hr MEG in context with the AQI.

Table 4-12 Carbon Monoxide Air Quality Index (AQI) Relative to the 8-hour Air MEG*

8-hr MEGs (ppm)	8-hr AQI (ppm)	AQI Category	AQI Health Effects & Cautionary Statements
	0 – 4	Good	None
	>4 – 9	Moderate	None
	>9 – 12	Unhealthy for Sensitive Groups	Increasing likelihood of reduced exercise tolerance due to increased cardiovascular symptoms, such as chest pain, in people with heart disease. People with heart disease, such as angina, should limit heavy exertion and avoid sources of CO, such as heavy traffic.
	>12 – 15	Unhealthy	Reduced exercise tolerance due to increased cardiovascular symptoms, such as chest pain, in people with heart disease. People with heart disease, such as angina, should limit moderate exertion and avoid sources of CO, such as heavy traffic.
25 27 Negligible Marginal	>15 – 30	Very Unhealthy	Significant aggravation of cardiovascular symptoms, such as chest pain, in people with heart disease. People with heart disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic.
	>30 – 50	Hazardous	Serious aggravation of cardiovascular symptoms, such as chest pain, in people with heart disease; impairment of strenuous activities in general population. People with heart disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic; everyone else should limit heavy exertion.

* AQI data source (EPA 2006c)

4.4.5 Lead

Lead is a heavy, ductile, soft, gray solid. Air emissions of Pb typically occur as a dust or particle. Historically, the greatest source of Pb in the ambient air occurred due to the use of leaded gasoline in motor vehicles. Due to the introduction of unleaded gasoline to the consumer market in 1975 and the regulatory limits on gasoline lead content in the 1980s, almost all gasoline now sold in the United States is unleaded. However, some US industries (e.g., non-commercial and non-military aviation, stock-car racing) and some foreign countries still rely on leaded fuels. Major sources of Pb emissions in the United States include Pb smelters and battery manufacturing. Lead can accumulate in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system and other organs. Excessive exposures can result in neurological impairments such as seizures, mental retardation, and behavioral disorders. At low doses, Pb has been found to damage the nervous systems of developing fetuses and small children (EPA 1986b). Recent studies have shown that Pb may be a factor in high blood pressure and subsequent heart disease.

Table 4-13 presents the selected MEGs for Pb. The 1-hour MEGs were based on TEEL values because AEGLs and ERPGs for Pb were not available. The 8-hour Negligible MEG was based on the TLV-TWA because an AEGL-1 was not available. The 14-day Negligible MEG was

based on an adjusted TLV because CEGLs were not available. The 1-year MEG was based on an adjusted TLV (for non-irritants) because a toxicity value for chronic exposures from the standard hierarchy of source data is not available. These MEGs are based on Pb measured as a function of total particulate mass in air. Therefore, sampling and analysis of Pb levels as fractions of total suspended particulates (TSPs), such as PM_{10}, will necessarily underestimate the concentration of Pb in the air.

Table 4-13 Air MEGs for Lead

Selected Air-MEG			Basis
1-hr Critical MEG	100 mg/m^3	12 ppm	TEEL-3
1-hr Marginal MEG	0.25 mg/m^3	0.03 ppm	TEEL-2
1-hr Negligible MEG	0.15 mg/m^3	0.02 ppm	TEEL-1
8-hr Negligible MEG	0.05 mg/m^3	0.006 ppm	TLV®-TWA
14-d Negligible MEG	0.01 mg/m^3	0.001 ppm	TLV® adjusted (non-irritants)
1-yr Negligible MEG	0.01 mg/m^3	0.001 ppm	TLV® adjusted (non-irritants)

* CASRN = 7439-92-1

The NAAQS for Pb is 0.15 µg/m³ measured as TSP, and it provides protection for at-risk populations against a variety of adverse health effects, most notably effects on the developing nervous system in children (EPA 2008d). The Pb NAAQS is to be compared to rolling-3-month average concentrations. The EPA has not established an AQI for Pb (EPA 2006c) and an air MEG based on a directly comparable averaging time is not available..

4.4.6 Nitrogen Dioxide

Nitrogen dioxide is a reddish-brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide (NO). Major sources of NO include vehicular exhaust, or any fossil-fuel combustion source such as boilers, generators or incinerators, and open burning for land management or waste management. Short-term exposure (less than 3 hours) to low levels of NO_2 can lead to changes in airway responsiveness and lung function in individuals with pre-existing respiratory illness. Long-term exposure to NO_2 may lead to increased susceptibility to respiratory infection and can cause irreversible alterations in lung structure. Both NO and NO_2 react in air to form ground-level O_3 and fine particle pollution which are also associated with adverse health effects (EPA 2003c).

Table 4-14 presents the selected MEGs for NO_2. The 10-min, 1-hour, and 8-hour MEG values follow the standard hierarchy and approach used for the key TICs, as NO_2 is also one of the TICs (see Section 4.2.5). The 14-day and 1-year MEG values were based on the 8-hour AEGL-1 because following the standard hierarchy would have resulting in values greater than the 8-

hour Negligible MEG. The CEGL (1.3 mg/m^3) and an adjusted TLV for irritants (1.9 mg/m^3) were considered. Also, no toxicity value for chronic exposures from the standard hierarchy of source data was available.

Table 4-14 Air MEGs for Nitrogen Dioxide

Selected Air-MEG			Basis
10-min Critical MEG	64 mg/m^3	34 ppm	AEGL-3 (10-min)
10-min Marginal MEG	38 mg/m^3	20 ppm	AEGL-2 (10-min)
10-min Negligible MEG	0.94 mg/m^3	0.50 ppm	AEGL-1 (10-min)
1-hr Critical MEG	38 mg/m^3	20 ppm	AEGL-3 (1-hr)
1-hr Marginal MEG	23 mg/m^3	12 ppm	AEGL-2 (1-hr)
1-hr Negligible MEG	0.94 mg/m^3	0.50 ppm	AEGL-1 (1-hr)
8-hr Critical MEG	21 mg/m^3	11 ppm	AEGL-3 (8-hr)
8-hr Marginal MEG	13 mg/m^3	6.7 ppm	AEGL-2 (8-hr)
8-hr Negligible MEG	0.94 mg/m^3	0.50 ppm	AEGL-1 (8-hr)
14-d Negligible MEG	0.94 mg/m^3	0.50 ppm	AEGL-1 (8-hr)
1-yr Negligible MEG	0.94 mg/m^3	0.50 ppm	AEGL-1 (8-hr)

* CASRN = 10102-44-0

The NAAQS for NO_2 is an annual average of 0.053 ppm (100 µg/m³). A full AQI scale for NO_2 is not available because there are no short-term NAAQS (EPA 2006c).

4.4.7 Ozone

Ozone is a photochemical oxidant and the major component of smog. While O_3 in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation, O_3 at ground level can be a major health and environmental concern. Ozone is not emitted directly into the air but is formed through complex chemical reactions between VOCs and oxides of nitrogen (NOx) in the presence of heat and sunlight. The VOCs are emitted from sources such as vehicular exhaust, chemical manufacturing, dry cleaners, paint shops, solvent applications, and fossil-fuel storage and dispensing. Oxides of nitrogen are emitted in vehicular exhaust and may be found in the exhaust stream of any fossil-fuel combustion source such as boilers, generators, or incinerators and open burning for land management or waste management.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lung to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal healthy people during exercise. Signs and symptoms including chest

pain, coughing, sneezing, and pulmonary congestion generally accompany this decrease in lung function (EPA 2005c).

Table 4-15 presents the selected MEGs for O_3. The 1-hour Critical and Marginal MEG values follow the standard hierarchy. The values were based on the TEEL values because AEGLs and ERPGs were unavailable. The 1-hour Negligible MEG did not follow the hierarchy because the TEEL-1 value (0.1 ppm) was less than the 8-hour MEG based on the hierarchy using the TLV. The 1-hour Negligible MEG was altered from the hierarchy, rather than the 8-hour MEG because the PACs/TEELs are computed rotely and are considered highly uncertain; whereas, the TLV is based on a more considered professional judgment. The 8-hour MEG was based on the TLV-TWA because an AEGL-1 was not available. The 14-day and 1-year MEGs were based on the CEGL.

Table 4-15 Air MEGs for Ozone

Selected Air-MEG			Basis
1-hr Critical MEG	10 mg/m^3	5 ppm	TEEL-3
1-hr Marginal MEG	2 mg/m^3	1 ppm	TEEL-2
1-hr Negligible MEG	0.4 mg/m^3	0.2 ppm	TLV-TWA
8-hr Negligible MEG	0.4 mg/m^3	0.2 ppm	TLV-TWA
14-d Negligible MEG	0.04 mg/m^3	0.02 ppm	CEGL
1-yr Negligible MEG	0.04 mg/m^3	0.02 ppm	CEGL

CASRN = 10028-15-6

The 1-hour NAAQS for O_3 is 0.12 ppm (235 µg/m³), and the 8-hour NAAQS for O_3 is 0.075 ppm (147 µg/m³). The 8-hour NAAQS were recently revised in 2008 (EPA 2008c). The AQI for O_3 is based on both an 8-hour and 1-hour averaging time. Table 4-16 shows the 8-hr Negligible MEG value in context with the AQI based on the 8-hour averaging time, since the 8-hour NAAQS is considered more protective compared to the 1-hour standard.

Table 4-16 Ozone AQI Relative to the 8-hour Air MEG*

8-hr MEG (ppm)	8-hr AQI (ppm)	AQI Category	AQI Health Effects & Cautionary Statements
	0 – 0.059	Good	None
	0.060 – 0.075	Moderate	Unusually sensitive individuals may experience respiratory symptoms. Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
	0.076 – 0.095	Unhealthy for Sensitive Groups	Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with lung disease, such as asthma. Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy outdoor exertion.
	0.096 – 0.115	Unhealthy	Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with lung disease, such as asthma; possible respiratory effects in general population. Active children and adults, and people with lung disease, such as asthma, should avoid prolonged or heavy outdoor exertion; everyone else, especially children, should reduce prolonged or heavy outdoor exertion.
0.2	0.116 – 0.374	Very Unhealthy	Increasingly severe symptoms and impaired breathing likely in active children and adults and people with lung disease, such as asthma; increasing likelihood of respiratory effects in general population. Active children and adults, and people with lung disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should reduce outdoor exertion.
	0.405 – 0.604	Hazardous	Severe respiratory effects and impaired breathing likely in active children and adults and people with lung disease, such as asthma; increasingly severe respiratory effects likely in general population. Everyone should avoid all outdoor exertion.

* AQI data source (EPA 2006c with breakpoints revised by EPA 2008c)

4.4.8 Sulfur Dioxide

Sulfur dioxide is a colorless gas with an irritating, pungent odor. High concentrations of SO_2 affect breathing and may aggravate existing respiratory and cardiovascular disease. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children, and the elderly (EPA 1994a). Ambient SO_2 levels result largely from coal and oil combustion (based on fuel sulfur content), steel mills, refineries, pulp and paper mills, and non-ferrous smelters.

Table 4-16 presents the selected MEGs for SO_2. The 10-min, 1-hour, and 8-hour MEG values follow the approach used for the key TICs, as SO_2 is also one of the TICs (see Section 4.2.5). The selected 14-day and 1-year MEG values do not following the standard hierarchy because

the values derived by following the hierarchy result in values (2 ppm TLV, 1 ppm CEGL, and 0.7 ppm adjusted TLV for irritants) and that were higher than the 8-hr Negligible MEG based on the AEGL.

Table 4-17 Air MEGs for Sulfur Dioxide

Selected Air-MEG			Basis
10-min Critical MEG	79 mg/m^3	30 ppm	AEGL-3 (10-min)
10-min Marginal MEG	2 mg/m^3	0.75 ppm	AEGL-2 (10-min)
10-min Negligible MEG	0.52 mg/m^3	0.20 ppm	AEGL-1 (10-min)
1-hr Critical MEG	79 mg/m^3	30 ppm	AEGL-3 (1-hr)
1-hr Marginal MEG	2 mg/m^3	0.75 ppm	AEGL-2 (1-hr)
1-hr Negligible MEG	0.52 mg/m^3	0.20 ppm	AEGL-1 (1-hr)
8-hr Critical MEG	25 mg/m^3	19 ppm	AEGL-3 (8-hr)
8-hr Marginal MEG	2 mg/m^3	0.75 ppm	AEGL-2 (8-hr)
8-hr Negligible MEG	0.52 mg/m^3	0.20 ppm	AEGL-1 (8-hr)
14-d Negligible MEG	0.52 mg/m^3	0.20 ppm	AEGL-1 (8-hr)
1-yr Negligible MEG	0.52 mg/m^3	0.20 ppm	AEGL-1 (8-hr)

CASRN = 7446-09-5

The 1-year NAAQS for SO_2 is an annual arithmetic mean of 0.03 ppm (80 µg/m^3). The 24-hour NAAQS for SO_2 is 0.14 ppm (365 µg/m^3). The AQI for SO_2 is based on a 24-hour averaging time. Table 4-17 shows the 8-hour and 14-day MEGs in context with the AQI.

Table 4-18 Sulfur Dioxide AQI Relative to the 8-hr Air MEG

8-hr MEGs (ppm)	24-hr AQI (ppm)	AQI Category	AQI Health Effects & Cautionary Statements
	0 – 0.03	Good	None
	>0.03 – 0.14	Moderate	None
0.20 Negligible	>0.14 – 0.22	Unhealthy for Sensitive Groups	Increasing likelihood of respiratory symptoms, such as chest tightness and breathing discomfort, in people with asthma. People with asthma should consider limiting outdoor exertion.
	>0.22 – 0.30	Unhealthy	Increased respiratory symptoms, such as chest tightness and wheezing in people with asthma; possible aggravation of heart or lung disease. Children, asthmatics, and people with heart or lung disease should limit outdoor exertion.
	>0.30 – 0.60	Very Unhealthy	Significant increase in respiratory symptoms, such as wheezing and shortness of breath, in people with asthma; aggravation of heart or lung disease. Children, asthmatics, and people with heart or lung disease should avoid outdoor exertion; everyone else should reduce outdoor exertion.
0.75 Marginal	>0.60 – 1.0	Hazardous	Severe respiratory symptoms, such as wheezing and shortness of breath, in people with asthma; increased aggravation of heart or lung disease; possible respiratory effects in general population. Children, asthmatics, and people with heart or lung disease should remain indoors; everyone else should avoid outdoor exertion.

* AQI data source (EPA 2006c)

4.5 MEGS FOR PARTICULATE MATTER

Particulate matter air pollution is a complex mixture of extremely small particles and liquid droplets in the air. When breathed in, some of these particles can reach the deepest regions of the lungs. Exposure to particle pollution is linked to a variety of significant health problems.

Particulate matter pollution can be a major health and operational risk concern in some deployment environments. For example, the recently published DOD Enhanced Particulate Matter Surveillance Program (EPMSP) report (Defense Research Institute (DRI) 2008) confirms and extends previous findings that PM concentrations in the Middle East are as much as 10 times greater overall than those at both urban and rural southwestern US air monitoring sites. During the surveillance period for that report, all 15 sampling sites experienced PM concentrations greater than the 1-year MEGs that were current at the time of the study. For example, average concentrations sometimes reached levels more than 7 times greater than the 1-year MEG for PM less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), which

was 15 μg/m^3 at the time of the study. An accurate assessment of the health and operational risks of such high concentrations of airborne PM in the deployment environment has been challenging for several reasons, some of which are listed below:

- No military-specific exposure guidelines have been generated *de novo* due to the lack of sufficient relevant epidemiological data for healthy adult populations, especially for estimating risks of long-term health effects.

- The particle composition in deployment settings can often be significantly different than the composition found in the environments providing the basis for existing public health and occupational standards and guidelines.

- Existing public health standards are designed to protect the general population to include highly sensitive subpopulations (e.g., children, elderly, and persons with advanced cardiopulmonary disease).

- While existing US public health guidelines for monitoring daily air quality do provide information for healthy individuals, they only provide short-term (daily) health impact predictions and do not address longer-term (annual or continuous) exposure consequences for healthy adults.

- Existing occupational guidelines for particles are designed to address industrial workplace exposure settings where particles in the air tend to be measured as being associated with specific toxic chemicals found in aerosol form. Occupational guidelines for particles not otherwise specified are under reconsideration and do not yet enjoy wide consensus among industrial hygienists and are not likely to be directly relevant to the composition of PM from many environmental sources.

This section provides the following information. A general review is presented of the sources and health effects of PM pollution in the general public and what is known regarding the deployment environment. Next, available exposure standards and guidelines are described. After this, the rationale for the development of revised PM MEGs is provided. Limitations and guidelines for use are stated.

4.5.1 Particulate Matter Sources, Composition, and Particle Size

4.5.1.1 Particulate Matter Sources

Particulate matter air pollutants include solid particles and liquid droplets emitted directly into the air by sources such as power plants, motor vehicles, aircraft, non-road engines, construction activities, fires, and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of combustion exhaust gases such as SO_2) and NOx are also considered PM. Although PM matter may emanate from many sources, fossil-fuel combustion is the predominant source of particulate in areas with high population density, such

as in the United States and the European Union. However, in some important deployed settings, blowing sand can be a major contributor to the total PM concentration (DRI 2008).

The sources of PM pollution include factories, power plants, incinerators, automobiles, construction activity, fires, and windblown dusts. In the United States, the European Union, and in many other regions of the world, industrial, combustion, and vehicle emissions are the primary sources of these pollutants. However, in some deployment regions, notably the US CENTCOM area of responsibility (AOR), the sources and composition of PM can be different from that typically found in the United States and other industrialized nations. For example, while the levels of PM found in the CENTCOM AOR often far exceed levels typical in the United States, in many areas the high levels are associated with short-term dust events—exacerbated by dirt roads, agricultural activities, and motor vehicle disturbance of the desert floor—which can include coarse as well as finer particles (DRI 2008). Certain local industries (e.g., brick factories near base camps) and military operations (e.g., burn pits, vehicles) can also contribute localized sources and unique compositions of fine PM as well as other toxic air pollutants.

The DOD EPMSP report (DRI 2008) demonstrated that there are three main types of PM pollution in the CENTCOM AOR—wind-blown geological dust, smoke from base camp burn pits, and heavy metal condensates from local industries (e.g., lPb smelting and battery manufacturing facilities). Other more minor sources were also identified (e.g., electronic circuit board recycling). Additionally, current and historic use of leaded gasoline in the Middle East and in other regions also contributes to particulate Pb air pollution. The EPMSP report (DRI 2008) documented considerable differences in the ratio of PM_{10} to $PM_{2.5}$ across the study sites, reflecting the different sources of PM.

In the CENTCOM AOR, short-term dust events are one of the primary causes of extremely high peaks in 24-hour PM concentrations. The main component of the particulate mass in these samples is wind-blown geological dust (DRI 2008). These dust events result in elevated air concentrations of soil-forming elements in aerosols—including magnesium (Mg), aluminum (Al), silicon (Si), potassium (K), calcium (Ca), titanium (Ti), vanadium (V), manganese (Mn), iron (Fe), rubidium (Rb), strontium (Sr), zirconium (Zr), and barium (Ba). In general, dusts from the enhanced surveillance sites (Djibouti, Iraq, Kuwait, Qatar, United Arab Emirates, and Afghanistan) were found to be similar to dust and rocks from other desert regions. Most dusts contain mixtures of silicate minerals, carbonates, oxides, sulfates, and salts in various proportions. The extremely high PM levels driven by these large dust storms do not typically have the associated industrial-source metals, acid aerosols, and other toxic PM components associated with industry and fossil fuels in the United States and other highly urbanized areas—thus direct extrapolation of health effects from US- and European-based studies to concentrations generated during these deployment dust events can be problematic.

4.5.1.2 Particle Size and Composition

The TSP was the indicator first used to evaluate ambient levels of particulates in the United States (with a standard issued in 1971). Eventually, data demonstrated that the particles constituting the greatest health concern were only those very small particles that penetrated the

respiratory system and lodged in the lungs. Since July 1987, the EPA has regulated only PM with an aerodynamic diameter less than or equal to 10 microns (PM_{10}). The PM_{10} particles are known as the "coarse" particulate fraction, but they are small enough to reach the thoracic or lower (thoracic) regions of the respiratory tract. In 1997, EPA began regulating particles with an aerodynamic diameter 2.5 microns or smaller ($PM_{2.5}$) since additional medical research showed that particles in this size range are responsible for most of the adverse health effects due to their ability to settle out in the gas exchange regions of the lung and remain in the respiratory bronchioles.

In the CENTCOM AOR, which is relatively representative of many sandy environments across the globe which also include industrialized and urban areas, trace heavy metals (e.g., Pb, arsenic (As), cadmium (Cd), antimony (Sb), zinc (Zn)) are concentrated in the $PM_{2.5}$ size fraction, as well as fine aluminum silicate minerals (DRI 2008, p. 10). Additionally, most combustion products (elemental carbon and particulate organic compounds) occur in the fine ($PM_{2.5}$) and ultra-fine fractions (DRI 2008, p. 15). This fraction ($PM_{2.5}$ and less) contain far less geological components (e.g., Si, Al, Fe, Mg, Ca, or Mg) than the coarser fractions. Ultra fine particles (<0.5 µm) very often contain spheroidal particles of carbon, together with sulfur, sodium, and chlorine and, in a few instances Pb, bromine, and chlorine. Origin of the spheroids is uncertain, but it can be assumed from their carbon and sulfur content that many of these are from various oil, gasoline, and natural gas combustion processes, including motor vehicle tailpipe emissions (DRI 2008, p. 25).

As stated, even though the size of the PM measured by the EPA and others has changed over time, particulates measured for ambient air quality are considered "generic" particles in that the concentration of particles is measured, but no assessment of composition is made. As reviewed above, in sandy environments with high wind, particulate levels may often reflect airborne sand particles (geological sources); while in other settings, particulate levels might be more influenced by industrial emissions (combustion sources). Particles of industrial origin possess different surface and surface-chemistry characteristics than particles of geological origin such as sand and are, thus, associated with different health endpoints (NRC 2004a, NRC 2004b).

In conclusion, the size and composition of measured PM in deployment settings is directly relevant to the accurate assessment of PM health risks for deployed personnel. For this reason, the accurate health assessment of PM measurements must be accompanied by evaluations of the likely sources and composition of the measured particles.

4.5.2 Health Effects of Particulate Matter

4.5.2.1 Effects in the General Population

Epidemiological studies of human populations and laboratory studies of animals and humans have demonstrated adverse health effects associated with inhalation exposure to respirable particles. Major health effects fall into two categories: pulmonary and cardiovascular (EPA 2004c, EPA 2005d).

- Pulmonary effects may include coughing, phlegm, chest discomfort, wheezing, and shortness of breath even in healthy individuals, depending on the concentration of particulates, ED, and associated contaminants. Particulate exposure can aggravate asthma and bronchitis, causing increased medication use and doctor visits in individuals with these conditions. Individuals with pre-existing lung disease may not be able to breathe as deeply or vigorously as normal. Inhalation exposure to particles can also increase susceptibility to respiratory infections.

- Cardiovascular research has shown that particles can aggravate some diseases, such as congestive heart failure and coronary artery disease (increased risk of blood clot formation, narrowing of vessels [vasoconstriction], and increased risk of atherosclerotic plaque rupture). Individuals with pre-existing heart disease may experience chest pain, palpitations, shortness of breath and fatigue. Inhalation exposure to fine particles has also been associated with cardiac arrhythmias and heart attacks.

The mechanisms, as well as the exact types and sizes of the particles involved, are the subject of ongoing investigation by a variety of researchers supported by national regulatory authorities and other organizations. While there are indications of the potential for the development or exacerbation of illnesses such as asthma, chronic bronchitis, and cardiovascular disease, it is not entirely clear which component of PM is most strongly associated with these outcomes. However, evidence does indicate that the smaller $PM_{2.5}$ fraction generally poses a greater health risk than the larger PM_{10} fraction (USEPA 2006a; USEPA 2006b, USEPA 2007b). In addition, the nature of health effects is influenced by particulate composition, which can be quite variable (e.g., amounts and types of organic and inorganic compounds) depending on the local sources (e.g., traffic-related, industry, or soil/dust). While source apportionment within epidemiologic analyses (e.g., relative contributions of metals, sulfates, elemental carbon) indicates that some of these components appear to be associated with certain health outcomes, the current data is inadequate to clearly establish the relationships among these variables (USEPA 2006a).

The EPA acknowledges that the duration of exposure and overall personal susceptibility impact actual health outcomes. An EPA brochure “Particle Pollution and Your Health” (EPA 2003e) explains:

> ***“Short-term exposures*** *to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease short term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.*
>
> ***Long-term exposures,*** *such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such*

as reduced lung function and the development of chronic bronchitis – and even premature death."

The types and severity of health outcomes are largely associated with personal susceptibility. The EPA considers persons with heart or lung disease (e.g., coronary artery disease, congestive heart failure, asthma, COPD, older adults (possibly due to undiagnosed heart or lung disease), and children to be at greater risk, especially when they are physically active. Recent studies have indicated that diabetics may also be more susceptible (EPA 2006a, Goldberg 2006). Exercise and physical activity cause people to breathe faster and more deeply, thus, inhaling more particles into their lungs. The variable symptoms associated with short-term exposure to elevated PM concentrations in different adult groups are described below (EPA 2006c)—

- Healthy adults may experience:
  - Irritation of the eyes, nose, and throat.
  - Increased respiratory symptoms (e.g., irritation of the airways, coughing, phlegm, chest tightness and shortness of breath).

- Persons with lung (pulmonary) disease may experience:
  - Chest discomfort, wheezing, shortness of breath, unusual fatigue.
  - Aggravated asthma.
  - Development of chronic bronchitis.

- Persons with heart (cardiovascular) disease may experience:
  - Irregular heartbeat (arrhythmias).
  - Chest pain/tightness, palpitations.
  - Heart attacks.

4.5.2.2 Effects in the Deployed Military Population

Military personnel—especially those determined fit to deploy—are considered "healthy adults" due to age and military physical/health standards and requirements (see Section 2.1). Nonetheless, a small percentage of deployed individuals will have conditions that put them at greater risk for health effects of PM exposure. For example, despite screening programs and regulations prohibiting accession of asthmatics (AR 40-501, 2007), it is estimated that due to waivers, later onset of asthma, and misdiagnosis, 2 to 5 percent of military personnel have asthma (TMM-Recruit Medicine 2006). Likewise, although referral to a medical board and evaluation for fitness for duty would be indicated for individuals determined to have significant coronary artery disease, arrhythmias, or hypertension, some individuals may have undiagnosed underlying conditions or may be found fit for duty after evaluation. Other conditions and risk factors that may increase PM impacts to deployed persons include pre-existing respiratory disease, upper respiratory infections, smoking, fatigue, stress, and high aerobic activity due to increased respiratory rates during deployment. While the overall percentage of deployed personnel with these risk factors is relatively small, the impacts of an adverse health outcome,

such as evacuation of someone with acute asthma unresponsive to standard treatment or cardiac conditions requiring evaluation, can be logistically significant, and the conditions can be serious.

In addition, even those who are generally healthy may have increased susceptibility to infectious disease by decreasing clearance, impairing macrophage function, or through other effects on the immune system (EPA 2006a, 2006c). This relationship was suggested in previous evaluations of the association of PM levels versus rates of upper respiratory infections in deployed troops. Specifically, an investigation of personnel in Bosnia (Hastings 2002) indicated that higher levels of respiratory conditions, as measured by weekly respiratory Disease Non-Battle Injury (DNBI) rates, were associated with higher PM weekly maximums. A similar finding was suggested by another evaluation in Kuwait (Weese 2006). It should be noted, however, that DNBI rates represent broad categories such as “respiratory disease” that are too broad to use in the assessment of causal exposure-outcome associations.

A more recent attempt to associate PM levels and weekly respiratory DNBI rates identified that respiratory rates are highly variable and not substantially impacted by measured PM_{10} levels (Jang 2006). The analysis included PM_{10} exposure data and deployed personnel DNBI data obtained from April 2003 through November 2005 from the Shuiba Port industrial complex in Kuwait. At the time, sampling protocols for $PM_{2.5}$ had not yet been implemented. The conclusions were limited by the availability of sampling and health outcome data for all weeks, and the lack of precision of the exposure and outcome measures. The DNBI is a very broad category and increases in one subcategory of visit could be masked if overall rates are low. Additionally, DNBI is a weekly rate, and so daily PM_{10} concentrations, when available, had to be converted to either weekly averages or weekly maximums.

More recently, a study of PM levels at 15 sites in the CENTCOM AOR was conducted (Zhou 2007). Using ICD-9 coded visits for respiratory and cardiovascular outcomes in correlation with measured PM_{10} and $PM_{2.5}$ levels for the first quarter of the study, there did not appear to be an association. Health outcome data for the entire year would increase the sample size to allow specific conditions to be evaluated, and such an analysis is underway.

Finally, findings from an ongoing study of the impact of deployment to the CENTCOM AOR on post-deployment inpatient and outpatient visits for respiratory and cardiovascular conditions have been presented (DeBakey 2007). Comparing an individual’s pre- and post deployment visits, the number and nature of visits did not appear to be impacted by deployment. This was true when those who had multiple deployments were compared with those who deployed just once.

A review of the potential health implications associated with PM exposure in deployed settings in Southwest Asia has been recently published (Weese and Abraham 2009).

4.5.3 Existing Public Health and Occupational Guidelines and Standards

There are various standards and exposure guidelines for airborne PM. This section identifies and briefly describes those from the United States.

4.5.3.1 OSHA Occupational Standards and NIOSH Occupational Guidelines

In the final rule of June 1993 (OSHA 1993), OSHA reestablished an 8-hour PEL TWA limit of 15 mg/m^3 (measured as total particulate) and retained the previous 5 mg/m^3 limit for respirable particulates for all particulates not otherwise regulated (29 CFR 1910.1000 Tables Z-1 and Z-3). The OSHA concluded that these limits will protect workers against the significant safety and health risks associated with exposure to excessive concentrations of these substances, which include reduced visibility; deposits in the eyes, ears, and nasal passages; throat and eye irritation; upper-respiratory-tract problems; skin injury; and other forms of physical irritation.

The NIOSH does not provide an recommended exposure limit (REL) for “Particulates Not Otherwise Regulated (PONR).” The NIOSH defines PONR as "inert" dusts, nuisance dusts, dusts from solid substances without specific occupational exposure standards (and includes all inert or nuisance dusts, whether mineral or inorganic, not without specific occupational standards (NIOSH 2005).

4.5.3.2 ACGIH Occupational Guidelines

The ACGIH currently provides occupational exposure guidelines for “Particles (insoluble or poorly soluble) Not Otherwise Specified (PNOS)” (ACGIH 2010). However, the ACGIH does not currently recommend a TLV for PNOS because in their opinion it was not possible to meet the standard level of evidence used to assign a TLV. The TLV values for respirable and inhalable particles were withdrawn in 2003. The ACGIH states that when a sufficient body of evidence exists, then a TLV can be established (ACGIH 2010).

Until then, ACGIH informal guidelines address two particle size groups—

- Respirable PNOS (insoluble or poorly soluble) 3 mg/m^3
- Inhalable PNOS (insoluble or poorly soluble) 10 mg/m^3

The ACGIH believes that airborne concentrations in a workplace should be kept below these levels because even biologically inert, insoluble, or poorly soluble particles may have adverse effects. The ACGIH states that “exposure to excessive amounts of particulates can cause adverse health effects as a result of pulmonary clearance overload” (ACGIH 2010).
The ACGIH PNOS guidelines only apply to particles that satisfy all of the following three criteria: (1) the particle mixture does not have an applicable TLV; (2) the particle mixture is insoluble or poorly soluble in water (or, preferably, in aqueous lung fluid if data are available); and (3) the particle mixture has low toxicity (i.e., is not cytotoxic, genotoxic, or otherwise chemically reactive with lung tissue, and does not emit ionizing radiation, cause immune sensitization, or cause toxic effects other than by inflammation or the mechanism of “lung overload”). The ACGIH

recommends particle size-selective TLVs for other particle substances too; for example, crystalline silica.[2]

4.5.3.3 EPA Environmental Regulations and Guidelines

The EPA currently provides to two types of health criteria for PM—both of which separately address the different size fractions PM_{10} and $PM_{2.5}$. These criteria include both the regulatory NAAQS, required by the Clean Air Act (40 CFR part 50, 2006), and the pollutant-specific indices of the AQI reporting system. These criteria are summarized below. Their consideration in the selection of MEGs is described in more detail in Section 4.5.4.

The NAAQS are designed to help minimize the adverse environmental conditions for the general public. The current NAAQS standards reflect an iterative review of the extensive scientific literature regarding the association of ambient air concentrations with various health outcomes. The available data and analyses are primarily epidemiologic in nature; however, toxicological evidence was also included. In promulgating these standards, the EPA is required to provide the scientific justification for public review and comment, therefore, the standards reflect substantial evaluation by a variety of government, commercial, and private entities. The standards protect the public health including the health of "sensitive" populations such as asthmatics, children, and the elderly, with an adequate margin of safety (EPA 2004c, 2006a-c, 2007).

The current NAAQS for PM are listed below. The annual standard for PM_{10} was revoked in December 2006 due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution.

- PM_{10} NAAQS (24-hour) 150 $\mu g/m^3$.
- $PM_{2.5}$ NAAQS (24-hour) 35 $\mu g/m^3$.
- $PM_{2.5}$ NAAQS (Annual) 15 $\mu g/m^3$.

The associated AQI reporting system (EPA 2003g, EPA 2006c) enhances the goal of the regulatory NAAQS. The AQI program sets pollutant-specific indices for several of the criteria pollutants, including PM. The AQI is designed as a means to identify adverse air quality conditions in large metropolitan areas based on levels of criteria pollutants in order to inform the public regarding expected health impacts and provide advisory protective measures and precautions.

The AQI sub-indices are available for both forms of PM (PM_{10} and $PM_{2.5}$). They are based on a 24-hour averaging time and, thus, are designed to address primarily short-term, acute effects.

[2] There are three forms of particle size-selective TLVs: (1) Inhalable Particle Mass—for those materials that are hazardous when deposited anywhere in the respiratory tract, (2) Thoracic Particle Mass—for those materials that are hazardous when deposited anywhere within lung airways and the gas–exchange region, and (3) Respirable Particle Mass—for those materials that are hazardous when deposited in the gas-exchange region.

The AQI sub-indices are based on the NAAQS; therefore, when there is a change to a particular NAAQS then there can be corresponding changes to the AQI sub-index. Like the NAAQS, the AQI is designed to protect the general US population, including sensitive sub-populations (i.e., elderly, children, those with pre-existing health conditions). The sub-indices, derived from epidemiologic studies, provide levels of health concern associated with increasing exposure concentrations. The health effects and cautionary statements provided for each of the levels identify the populations first affected, the effects predicted, the severity of effects with increasing exposure levels, and recommendations for protecting health. The AQI sub-indices are described in more detail in the next section.

4.5.4 Selection of MEGS for Particulate Matter

Health criteria are not currently available for PM_{10} and $PM_{2.5}$ using the standard hierarchy of sources used for other chemical substances. Therefore, a specific methodology was developed for PM based, in part, on guidelines provided by the EPA NAAQS and AQI sub-indices, and recent USAPHC (Prov) experience assessing PM risks in deployment settings.

Table 4-19 and Table 4-20 present the MEGs selected for PM. The following subsections describe the evaluation of the above described public health and occupational guidelines as they pertain to the military application and the rationale for the MEG selections.

4.5.4.1 Step 1: Consideration of Occupational Standards or Guidelines

The occupational standards and guidelines from OSHA, NIOSH, and ACGIH were not considered to be appropriate for setting MEGs for environmental sources of PM for several reasons. The PNOS (ACGIH) and PNOR (OSHA and NIOSH) values are designed for use in occupational settings where industrial hygiene monitoring of other specific-chemical particulates occurs in addition to the monitoring of general dusts, insoluble or not otherwise classified. While the ACGIH TLVs were sometimes used for setting MEGs for some chemical substances, they were the least preferred source for MEGs, which are not designed for use in industrial settings. Additionally, the ACGIH PNOS guidelines are based on a data set that is not considered robust enough to support the establishment of formal TLVs. Most importantly, the applicability of the ACGIH guidelines for PNOS to environmental PM is low because the PNOS guideline is only appropriate for particulates that are insoluble (or poorly soluble) in water. The composition of fine environmental PM includes compounds that are water soluble.

4.5.4.2 Step 2: Consideration of the NAAQS

There is a difference between deployed military personnel and the populations protected by the NAAQS. In its review of a previous version of USAPHC (Prov) TG 230, the NRC (NRC 2004a) implied that the NAAQS for PM are not directly relevant to healthy young adults. The NRC report states the following (p. 105):

> The NAAQS for [PM] are set to avoid mortality, predominantly from cardiovascular and respiratory causes, although children are also at risk for

respiratory morbidity. Health young adults are not likely affected, even at high ambient levels.

- Short-Term MEGs. The 24-hour NAAQS criteria are designed to address effects from short-term exposures. While the duration addressed by the 24-hour NAAQS is consistent with the short-term MEG application, evidence from recent military studies of health impacts to deployed troops (Section 4.5.2.2), in combination with the basis of the level of protection provided by the NAAQS, supports the contention that troops are generally less susceptible to the acute effects of short-term PM pollution exposure as compared to the general public. Therefore, it was determined that direct use of the 24-hour $PM_{2.5}$ and PM_{10} NAAQS as short-term Negligible MEGs was inappropriate because it would be too conservative in the context of military deployments.

- Long-Term MEGs. The annual NAAQS are designed to address effects from repeated, long-term PM pollution exposures and, thus, fits the ED intended by the 1-year MEG. Since the EPA revoked its annual PM_{10} standard (in 2006), citing a "lack of evidence linking health problems to long-term exposure to coarse particle pollution," it was considered inappropriate to select a 1-year MEG for PM_{10}. While troops may be less susceptible to long-term health effects from $PM_{2.5}$ exposures compared to the general population the NAAQS is designed to protect, there is currently inadequate information to be confident in such a contention. Therefore, it was determined that direct use of the annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$ as the 1-year Negligible $PM_{2.5}$ MEG is appropriate at this time. While the annual $PM_{2.5}$ NAAQS standard is based on some evidence of a threshold level for long-term effects in the general population, most studies have evaluated primarily children or individuals with cardiovascular and other diseases. Thus, use of this standard as a MEG is a conservative (health-protective) decision. However, there is no technical basis for an alternative choice—that is, no analysis is available that specifically assesses the long-term health consequences of $PM_{2.5}$ exposures in generally healthy adults. Given this level of uncertainty, the 1-year Negligible $PM_{2.5}$ MEG of 15 $\mu g/m^3$ is considered a point of departure for further consideration of the potential risks of long-term health effects the military population.

Table 4-19 Short-Term (24-hour) Particulate Matter Air MEGs*

Hazard Severity	$PM_{2.5}$	PM_{10}	Description of Military Health and Operational Effects
Critical	500 µg/m^3	600 µg/m^3	Above these, most if not all personnel will experience very notable eye, nose, and throat irritation and respiratory effects. Visual acuity is impaired, as is overall aerobic capacity. Some personnel will not be able to perform assigned duties. Some lost duty days are expected. Those with a history of asthma or cardiopulmonary disease will experience more severe symptoms.** Conditions may also result in adverse, non-health related materiel/logistical impacts.
Marginal	250 µg/m^3	420 µg/m^3	Above these, a majority of personnel will experience notable eye, nose, and throat irritation and some respiratory effects. Some lost duty days are expected. Significant aerobic activity will increase risk. Those with a history of asthma or cardiopulmonary disease are expected to experience increased symptoms.**
Negligible	65 µg/m^3	250 µg/m^3	Above these, a few personnel may experience notable mild eye, nose, or throat irritation; most personnel will experience only mild effects. Pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.**

* The MEGs and descriptors are based on professional judgment reflecting a consensus opinion of USAPHC (Prov) subject matter experts.
** Diagnosis of pulmonary or cardiopulmonary diseases would prevent deployment, though some conditions may go undetected. A small percentage of deployed personnel fall into this sensitive group.

Table 4-20 Long-Term (1-year) Particulate Matter Air MEGs*

Hazard Severity	$PM_{2.5}$	PM_{10}	Description of Military Health and Operational Effects
Marginal	65 µg/m^3	Not defined	With repeated exposures above this, it is plausible that development of chronic health conditions such as reduced lung function or exacerbated chronic bronchitis, COPD, asthma, atherosclerosis, or other cardiopulmonary diseases could occur in generally healthy troops. Those with a history of asthma or cardiopulmonary disease are considered to be at particular risk. This guideline is an uncertain screening value—it is not a known health effects concentration.
Negligible	15 µg/m^3	Not defined	With repeated exposures above this, it is considered possible that a small percentage of personnel may have increased risk for developing chronic conditions such as reduced lung function or exacerbated chronic bronchitis, COPD, asthma, atherosclerosis, or other cardiopulmonary diseases. Personnel with history of asthma or cardiopulmonary disease are considered to be at particular risk. Exposures below this are not expected to result in development of chronic health conditions in generally healthy troops.

* The MEGs and descriptors are based on professional judgment reflecting a consensus opinion of USAPHC (Prov) subject matter experts. USAPHC (Prov) no longer recommends long-term MEGs for PM_{10}. The Negligible MEG is the EPA NAAQS standard reflecting a threshold level for the general population based on studies evaluating primarily children or individuals with cardiovascular and other diseases. Alternative standards for health adults do not yet exist. This MEG is considered a point of departure for further consideration and is not an action level.

4.5.4.3 Step 3: Consideration of the AQI Sub-Indices

As described for the other criteria pollutants, the AQI is not directly applicable to the deployed military population; therefore, it is not recommended to be used as a direct measure of operational risk. However, due to the lack of other directly relevant data and the risk management design of the AQI, it was decided that the AQI sub-indices could be used indirectly to set MEGs for PM until more military-relevant research is available. The AQI sub-indices are useful for two reasons. First, the range of AQI categories and recommendations is conceptually consistent with the military ORM framework. That is, categories for increased levels of risk are inherent in each system. Second, even though the US general population includes sub-groups not found in the deployed military population, the AQI sub-indices distinguish which sub-groups are first affected, to include when healthy individuals are affected.

The USAPHC (Prov) modified the AQI sub-index categories to fit the operational risk management acute hazard severity definitions and the characteristics of the deployed population. Some of the AQI categories were collapsed for MEG development. Table 4-21 shows the selected 24-hour MEGs in relation to the EPA AQI sub-indices for the general US population (a comparable long-term AQI is unavailable). This approach addresses the NRC recommendation to reconsider the use of NAAQS [and AQI by association] relative to their applicability to deployed forces (NRC 2004a).

The following paragraphs provide the specific rationale for the specific application of the AQI to select the short-term (24-hour) and long-term (1-year) MEGs:

- Short-Term MEGs. The short-term (24-hour) MEGs were selected by examination of the AQI health effects and cautionary statements. First, the 24-hour Negligible MEGs were set to the threshold of the category where healthy individuals in the general population are expected to start experiencing effects. For both $PM_{2.5}$ and PM_{10}, this is the "Unhealthy" AQI category—starting at 65 and 250 $\mu g/m^3$, respectively. Next, the 24-hour Marginal and Critical MEGs were set to the thresholds for "Hazardous" and "Extremely Hazardous" categories. These selections were made, rather than starting with the "Very Unhealthy" category, because of the differences between the populations (US general vs. deployed military) and the different risk management thresholds (public health protection vs. military operations).

- Long-Term MEGs. The USAPHC (Prov) no longer recommends any long-term MEGs for PM_{10} since the EPA revoked the annual NAAQS for PM_{10} citing a lack of evidence to linking health problems to long-term exposure to coarse particle pollution. For $PM_{2.5}$ the annual NAAQS provided the basis for the long-term Negligible MEG (15 $\mu g/m^3$), as discussed in Step 2 above. Given the occasional deployment conditions that are anticipated to exceed this Negligible MEG, there is a need for more predictive (higher risk) MEGs for $PM_{2.5}$. Therefore, the $PM_{2.5}$ AQI sub-index was evaluated to determine if additional hazard severity MEGs for long-term exposures would be determined. However, as previously indicated, the AQI are primarily developed to address effects

from short-term exposures and primarily the associated short-term health effects. While a review of available literature shows relatively strong evidence that links $PM_{2.5}$ to long-term health effects such as chronically reduced lung function or exacerbated bronchitis, COPD, asthma, atherosclerosis, and other cardiopulmonary diseases, there is no analogous source of published health criteria for PM that provides guidelines for quantitatively predicting increasing levels of risk for these long-term health effects. Scientific research is especially inadequate for directly developing such guidelines for the deployed military population, composed mostly of healthy adults. Therefore, the selected long-term MEGs for PM are based on professional judgment reflecting a consensus opinion of USAPHC (Prov) subject matter experts. Specifically, in addition to the 1-year Negligible MEG for $PM_{2.5}$ based on the annual NAAQS, a 1-year Marginal MEG for $PM_{2.5}$ was set at 65 $\mu g/m^3$, which is the AQI threshold for "Unhealthy" exposures. This Marginal MEG represents an estimated point of demarcation for a higher degree of plausible risk for long-term health effects amongst troops continuously exposed to such PM levels.

4.5.5 Limitations of the Particulate Matter MEGs

The level of protection provided by the short-term PM MEGs is uncertain due to a lack of directly relevant data and the limitations of the available data. Unfortunately, the long-term PM MEGs are considered highly uncertain, and their use should be associated with a low confidence ranking. Both sets of MEGs are likely to be revised pending continued USAPHC (Prov) experience, new data and/or scientific analyses, and future recommendations of national scientific panels.

Table 4-21 Comparison of the Short-term Air MEGs Relative to the EPA AQI for PM

MEGs (24-hr)		AQI Sub-Indices (24-hr)			AQI Health Effectsand Cautionary Statements
$PM_{2.5}$ ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	PM10 ($\mu g/m^3$)	AQI Category	
Concentrations in this range are not considered to represent an "acute hazard" within the risk assessment framework		0 – 15	0 – 50	Good	None
		>15 – 40	>50 – 150	Moderate	Respiratory symptoms possible in unusually sensitive individuals, possible aggravation of heart or lung disease in people with cardiopulmonary disease and older adults. Unusually sensitive people should consider reducing prolonged or heavy exertion.
		>40 – 65	>150 – 250	Unhealthy for Sensitive Groups	Increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in people with cardiopulmonary disease and older adults. People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion. **
65 Negligible	250 Negligible	>65 – 150	>250 – 350	Unhealthy	Increased aggravation of heart or lung disease and premature mortality in people with cardiopulmonary disease and older adults; increased respiratory effects in general population. People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion; everyone else should reduce prolonged or heavy exertion. **
		>150 – 250	>350 – 420	Very Unhealthy	Significant aggravation of heart or lung disease and premature mortality in people with cardiopulmonary disease and older adults; significant increase in respiratory effects in general population. People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion. **
250 Marginal	420 Marginal	>250 – 500	>420 – 600	Hazardous	Serious aggravation of heart or lung disease and premature mortality in people with cardiopulmonary disease and older adults; serious risk of respiratory effects in general population. Everyone should avoid all physical activity outdoors; people with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. **
500 Critical	600 Critical	> 500	> 600	Extremely Hazardous	Referred to as 'significant harm levels' by the EPA, serious respiratory effects in overall population; Everyone should avoid outdoor activity.

* AQI data source (EPA 2006c).

** The AQI report (EPA 2006c) points to specific epidemiologic evidence of the increased risk to "people with cardiopulmonary disease and older adults." No specific quantified data on the types and rates of "respiratory effects in general population" are provided. However, as described previously, the EPA describes respiratory symptoms (i.e., pulmonary effects) to include: coughing and throat irritation, increased incidence of wheezing or shortness of breath, and increased incidents of asthma, and potential increased susceptibility to respiratory infections.

4.6 MEGS FOR ADDITIONAL SPECIAL SUBSTANCES AND OTHER CONSIDERATIONS

4.6.1 Deviations from the Standard MEG Selection Hierarchy

When following the standard hierarchy for development of the MEGs, there were instances where longer-term values were higher than shorter-term values because of differences in the hierarchies to select Air MEGS of varying duration. This outcome results in MEGs that are not internally consistent across the range of durations. These chemicals requiring derivation of air MEGs outside the standard hierarchy of sources and methodology are collectively referred to as "special substances." The method and sources used for deriving air MEGs for these substances are individually documented and presented in Table D-7 in Appendix D.

In cases where the standard hierarchy of sources resulted in longer-term MEGs greater than short-term MEGs, the longer-term value was usually replaced with the more conservative shorter-term value that had the next closest duration. An exception to this approach was when the source of the value was a TEEL. For example, the 1-year Air MEG for methanol was changed from a value of 6.4E+01 mg/m^3, which is based on an adjusted TLV, to the more conservative value of 1.3E+01 mg/m^3, which is a 14 day Air MEG that has the CEGL as a source. When an Air MEG of a shorter duration was a smaller value than an Air MEG of a longer duration, and the source of the value was a TEEL, the TEEL was replaced with a longer-term value that was more scientifically defensible.

4.6.2 Diesel Fuels, Diesel Engine Emissions, and Diesel Smoke

There are Air MEGs for the following diesel-related compounds, which represent different chemical mixtures and exposures. The follow paragraphs provide clarity as to the similarities and differences between the compounds and in the sources of their MEGs:

- Diesel Fuels (CASRN 68334-30-5). In general, diesel fuel usually refers to No. 2 fuel oil (standard heating oil) and what is purchased at the pump in the United States. The Air MEGs for Diesel fuels are based in the inhalation of the vapors from the fuel. The short-term 1-hour Air MEGs for Diesel fuels are based on the PACs/TEELs; whereas, the 8-hour, 14-day and 1-year Air MEGs are based on the TLVs. The longer term Diesel Fuel MEGs (based on TLVs) are adjusted for the increased military IR of 29.2 m^3/day. Since diesel fuel is listed as an irritant, the TLVs were not adjusted for an increased ED (5 days/week to continual) because the toxicity of irritants are assumed to be dependent primarily on concentration and not exposure.

- Diesel Fuel Marine (CASRN 77650-28-3). Marine diesel is different from typical diesel fuel; whereas, it is usually a mixture of normal diesel (No. 2 fuel oil) and some heavier fuel oil (No. 6, for example). This particular CASRN is usually compared to No. 4 diesel fuel. The Air MEGs for Diesel fuel marine are based on the inhalation of the vapors from

the fuel. The short-term 1-hour Air MEGs for Diesel fuels are based on the PACs/TEELs for "diesel fuel marine (Diesel fuel No. 4)." The longer term Marine diesel MEGs (based on TLVs) are adjusted for the increased military IR of 29.2 m^3/day. Since marine diesel is listed as an irritant the TLVs were not adjusted for an increased exposure (5 days/week to continual) because the toxicity of irritants are assumed to be dependent primarily on concentration and not exposure.

- Diesel Fuel Smoke (no CASRN). Diesel fuel smoke refers to the military obscurant (i.e., used to hide vehicles, troops, or their movements). This is usually formed by injecting diesel fuel into the exhaust manifold of a vehicle causing it to be vaporized and expelled with the exhaust (but not combusted). When it reaches the atmosphere it condenses into very small droplets that generate a white smoke. Diesel smoke is still uncombusted liquid diesel fuel that is suspended in the air in very small droplets. Diesel smoke contains a significant portion of diesel fuel vapors, but additionally it contains the small droplets of liquid in suspension. The Air MEGs are based on the toxicity when these small droplets are inhaled, in combination with the other constituents in the smoke. There are three Air MEGs for Diesel smoke (1-hour Marginal, 1-hour Negligible, and 8-hour Negligible), based on a report by the NRC COT (NRC 1997).

- Diesel engine exhaust (no CASRN). Exposures to diesel engine exhaust are those associated with combusted diesel fuel that would come out of a standard engine exhaust. From past experience, this is primarily a conglomerate of PM, SOx, NOx, CO, CO_2, and probably a very small portion of uncombusted or partially combusted fuel. Only a 1-year Air MEG is available for this compound mixture, based on a chronic non-carcinogenic endpoint from EPA's IRIS database. The IRIS contains both carcinogenic and non-carcinogenic information for this compound. While IRIS does not provide a cancer-based health criterion, it states that diesel exhaust is likely to be carcinogenic to humans by inhalation from environmental exposures.

4.6.3 Understanding Aerosol Particle Size Selector Issues

There are two basic types of air MEGS. Those developed for gasses/vapors and those developed for aerosols. The primary difference being that the gasses/vapors refer to the gaseous or vaporous state of the chemical, while aerosols refer to small particles (either solid or liquid droplets) in suspension in the air. Whenever air sampling for aerosols is conducted it is important to know the aerodynamic size range of aerosols the sampler is designed to collect. TG 230 strives to be a comprehensive source of information for as many chemicals as possible the data within is drawn from many different and varied sources, and therefore different aerosol MEGs may be based on different sampling methods with different particulate size selection behavior. At this time, it is important to note that there is the possibility that the field sample may collect a different particulate size range than those used in the studies underlying the development of the MEG. And therefore, this may result in an over or underestimation of risk, depending on the actual size distribution of the aerosol in the field and the particle size-selective sampling device used.

When sampling for PM_{10} or $PM_{2.5}$ particulate matter for comparison to the respective MEGs, it is essential that the particle-size selective samplers conforming to PM_{10} and $PM_{2.5}$ criteria be used. Similarly, for other aerosols the sampling method used out in the field would ideally utilize a pre-selector that had the same particulate size selection behavior as the method used in setting the MEG, however that is not always practical or even sometimes possible. For instance, some aerosol MEGs are based on or derived from an ACGIH TLV. The ACGIH TLV booklet year used to derive the aerosol MEG should be consulted and the appropriate size-selective sampler should be used. Depending on the particular substance, the size-selective sampler should conform to size-selective criteria sampling criteria identified in the TLV booklet and will be identified as respirable (R), thoracic (T), inhalable (I), or will have no designation next to it. If there is no R, T, or I designation for the particular TLV, then it means that it is assessed as "total" particulate (TP) (using a 37-mm closed-face cassette).

5. WATER MILITARY EXPOSURE GUIDELINES

5.1 INTRODUCTION

The MEGs for water are intended to be used to assess military personnel exposures to field drinking water during deployments. The water MEGs were designed for assessing short-term and long-term deployment exposures and were selected or developed using a hierarchy of sources. The water MEGs were derived for three different exposure durations to address different lengths of deployment exposures. Two different durations of short-term water MEGs were developed: (1) exposures less than 7 days (referred to as 7 day MEGs) and (2) exposures ranging from 7 to 14 days (referred to as 14 day MEGs). The exposure durations for the short-term water MEGs changed from previous versions of TG 230 in order to be consistent with durations for the 2005 standards from TB MED 577 (see note below). The long-term water MEGs are intended to be used for assessing exposures for more than 2 weeks to 1 year (> 14 days – 1 year). The exposure frequency for all the water MEGs is assumed to be daily (i.e., personnel are drinking the water daily for the entire exposure duration).

The water MEGs are designed for risk assessment applications are not military standards. They should not be used as the sole basis to approve or disapprove field drinking water supplies. If the concentration of any chemical is higher than the TB MED 577 standards, the water should only be used for consumption after obtaining approval from the responsible Commander and the Command/Theater Surgeon. Potable water for field operations is defined in TB MED 577 as water that has been tested and certified by preventive medicine personnel to meet the TSFWS, and is, therefore, considered safe to drink insofar that it will not degrade Soldier performance of duty to the extent that mission accomplishment is jeopardized. Potable water may or may not be palatable (TB MED 577).

Note: TB MED 577 was revised in 2010 and included changes to the short and long term water quality standards. The revision includes a reduction in the number of different short term potability (STP) standards and a complete revision of the long term potability (LTP) standards. The use of the 2005 TSFWS for short-term MEG development, as described within this RD 230, does not cause conflicts with the 2010 STP standards because the revised STP standards are a subset of the 2005 standards. The revised LTP standards are primarily based on U.S. Federal water standards for drinking water and bottled water. During the development of the 1-year water MEGs, these Federal standards were examined in collaboration with the lead subject matter experts for the TB MED 577 revision so that the the long-term (1-year) Negligible water MEGs would not conflict with the 2010 TB MED 577 LTP standards.

Table 5-1 presents an overview of the hierarchy of sources used for developing the short-term and long-term water MEGs. Health criteria from these sources were usually modified to better reflect deployment exposures for military personnel. Section 5.2 provides the conceptual model

of exposure assumed for the development of the MEGs. Sections 5.3 and 5.4 present the methodology for deriving the water MEGs. Some water MEGs were not developed using the standard hierarchy, and these exceptions are described in Section 5.5.

Table 5-1 Hierarchy of Sources Used for Developing the Water MEGs

Exposure Duration Category	Exposure Duration	Hierarchy of Sources*	
Short-term	< 7 days	1. TSFWS (2005) – short-term values 2. HA – 1 day values based on acute studies 3. MRL – acute oral values 4. HA – 1 day values not based on acute studies	
	7-14 days	1. TSFWS (2005) – long-term values 2. HA – 10 day values based on acute studies 3. MRL – acute oral values 4. HA – 10 day values not based on acute studies	
Long-term	1 year	Non-Cancer	Cancer
		1. PPRTV (subchronic) 2. IRIS (subchronic)** 3. MRL (intermediate) 4. HEAST (subchronic) 5. IRIS (chronic) 6. PPRTV (chronic) 7. MRL (chronic) 8. HEAST (chronic) 9. Other sources for special chemicals	1. IRIS 2. PPRTV 3. HEAST

* See Section 3 for more information on each source.
** IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.4.5 provides describes how IRIS values were adjusted for the purposes of developing MEGs.

5.2 EXPOSURE SCENARIO CONSIDERATIONS

5.2.1 Water Used for Drinking

The water ingestion rate for deployed personnel is of critical importance in development and use of the water MEGs. As described in Section 2.5.1, deployed personnel are expected to have water ingestion rates much higher than the general population (standard EPA assumption is 2 L/day). The water MEGs are based on risk models using ingestion of water at rates of 5 and 15 L/day. The actual amount of water ingested daily by military personnel in deployed environments primarily depends on their activity level, the local climate (heat and humidity), and their access to potable water. Historical evaluations of deployed personnel ingestion rates resulted in the currently used rates of 5 and 15 L/day (TB MED 507, CASCOM 2008, and the 2005 version of TB MED 577). It is important to recognize that high ingestion rates result in proportionately higher doses to deployed personnel of any contaminants contained in the water and may mean that for some chemical contaminants, civilian drinking water standards may not

be adequately protective. Additionally, the EPA National Primary and Secondary Drinking Water Standards provide maximum contaminant levels (MCLs) for only 86 contaminants, while there are one or more water MEGS for over 600 contaminants that deployed personnel may encounter during operations throughout the world.

5.2.2 Water Used for Other Purposes (esp. hygiene and cooking)

The water MEGs were derived based on ingestion exposures and did not factor in exposures from other routes of exposure (i.e., inhalation and dermal exposures). It is recognized that bottled water is usually the primary drinking source in recent deployments, and field water is commonly used for non-drinking purposes such as showering, laundering, cooking, and other activities requiring potable water. Development of water MEGs for assessing non-drinking exposures was considered for this Revision of the USAPHC (Prov) TG/RD 230 but was not performed for the following reasons:

- An established, accepted methodology for developing water guidelines using all three routes of exposure does not currently exist.
- Federal and state agencies have not published water values for non-drinking exposures.
- Values developed for assessing drinking exposures should be protective for assessing non-drinking exposures for most chemicals.
- Few chemicals have been detected in field water at levels above the 1 year 5 L/day water MEGs indicating that a complete set of non-drinking values is not necessary.
- Significant data gaps exist for dermal toxicity and most of the time oral toxicity data is used for assessing dermal exposures. This introduces significant uncertainty and would result in values that may not be more useful than the drinking water MEGs.

The water MEGs are based on toxicological data for health effects associated with ingestion of water and exposure assumptions of 5 to 15 L/day consumption. Thus, the MEGs are conceptually similar to civilian drinking water criteria but may be even lower (i.e., more protective) due to the assumption that deployed military personnel consume significantly more than the typical US adult. The EPA and public health entities generally assume adults consume approximately 2 L/day when establishing water standards.

Until hygiene or cooking water MEGs are established, USAPHC (Prov) recommends an interim approach to identify potential chemicals of concern for hygiene and cooking activities. It is presumed that in a deployment setting, total exposure to water via non-drinking exposure routes (e.g, dermal contact, inhalation of water-based aerosols) would be less than that consumed by drinking in the typical US civilian population at a consumption rate of 2 L/d. Therefore, the interim approach is to use an adjustment to the existing MEGs to screen water sources used for non-drinking purposes. The USAPHC (Prov) recommends screening such water sources using

2.5 times the 5 L/d MEG. This adjustment will approximate the US civilian drinking water criteria set for consumption at a 2 L/d rate.

> Note: According to military doctrine, potable water, including that used for non-consumptive purposes must still meet military field drinking water standards as described in TB MED 577.

Risk assessments for water used for hygiene and cooking that include chemicals detected at levels above 2.5 times a 5 L/day MEG should be evaluated and critically reviewed on a case-by-case basis considering the specific exposure scenario. Users should contact USAPHC (Prov) for additional support assessing these situations and other potential hazards that may pose unique threat via inhalation or dermal exposure routes.

5.3 SHORT-TERM WATER MEGS

5.3.1 Definitions

The 7 day and 14 day Negligible Water MEGs were developed using a hierarchy of sources and evaluation of existing values as described below. The 7 day and 14 day MEGs are defined as follows:

- 7 day Negligible Water MEG—The drinking water concentration for a continuous daily ingestion of either 5 L/day or 15 L/day for up to 7 days that should not impair performance and is considered protective against any significant non-cancer effects. Increasing concentration and/or ED could result in performance degradation, need for medical intervention, or increase the potential for delayed/permanent disease (e.g., kidney disease).

- 14 Negligible day Water MEG—The drinking water concentration for a continuous daily ingestion of either 5 L/day or 15 L/day for 7-14 days that should not impair performance and is considered protective against any significant non-cancer effects. Increasing concentration and/or ED could result in performance degradation, need for medical intervention, or increase the potential for delayed/permanent disease (e.g., kidney disease).

5.3.2 Selection of 7 day Water MEGs

The 7 day water MEGs were developed using a hierarchy of sources and by modifying exposure assumptions to reflect those of deployed military personnel when necessary. The hierarchy of sources and military exposure adjustments for the < 7 day water MEGs are provided below—

1. Short-term TSFWS (TB MED 577, 2005).
2. 1-day HAs based on acute studies.
3. Acute oral MRLs.
4. 1-day HAs based on subchronic or chronic studies.

Table 5-2 presents a comparison of each source on the hierarchy to the selection criteria presented in Section 3.2. Selection criteria are presented in order of priority from left to right. The sources are numbered according to their order on the hierarchy.

Table E-1 in Appendix E presents the 7-Day water MEGs along with their basis.

The short-term 2005 TSFWS were selected first on the hierarchy since they represented previous field water standards for deployed personnel. The short-term 2005 TSFWS were developed for assessing personnel exposures of less than 7 days, and their use was required by TB MED 577 (TB MED 557, 2005). Therefore, these TSFWS were adopted unmodified as the short-term water MEGs when available. Short-term TSFWS were available for six chemicals (As, Cn, chloride, lindane, Mg, and sulfate) as well as six types of CWAs (HD, hydrogen cyanide (HCN), lewisite, nerve agents, BZ, and T-2 toxins) (see Section 3.3.2.1).

It is important to note that the TSFWS did not include UFs to protect members of the general population who may be unusually sensitive to the effects of chemicals unlike other sources used in the hierarchy. As a result, the TSFWS are less conservative (i.e., less protective) than the water MEGs derived from the other sources. Still, no adverse health effects should be experienced if the chemical concentration is equal to or lower than the concentration indicated by the water MEG and if the water is ingested for no more than the specified time period.

Table 5-2 Sources of Exposure Values for Developing 7-Day Water MEGs Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. TSFWS 2005 (short-term)	+	+	+	–	+
2. HA (1-day, acute)	+	+	–	–	–
3. MRL (oral, acute)	+	+	+	+	+
4. HA (1-day, subchronic/chronic)	–	+	–	–	–

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

The EPA's 1-day drinking water HAs were next on the hierarchy since they are estimates designed for assessing short-term exposure to substances in drinking water. Although the acute oral MRLs appear to rank better against the selection criteria, the HAs were selected for use first since they are published by the EPA for the purposes of assessing drinking water. Many of the HAs were originally published in the late 1980s, and the documentation on their derivation is difficult to locate. However, they are still published annually by the EPA and used by Federal, state, and local agencies for assessing drinking water quality. The definition of the 1-day HA is provided below. Details on EPA's HAs are provided in Section 3.

> One-day HA—The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to 5 consecutive days of exposure, with a margin of safety (EPA 1989b).

The HAs are ideally based on acute studies of similar ED. However, there are many instances where EPA used subchronic or even chronic studies to develop the 1-day HA in order to provide a protective value for comparison. The HAs based on studies that were not acute were ranked lower than other sources of acute oral values (the MRLs) since the exposure scenario was very different. Because of the differences in the underlying study durations, the 1-day HAs were listed twice on the hierarchy of sources (e.g., rank 2 for HAs based on acute studies; rank 4 for HAs based on non-acute studies).

The 1-day HAs were adjusted for use as water MEGs because they were derived for a 10-kg child ingesting 1 L/day. The water MEGs were developed from HAs using the same NOAEL and UFs used by the EPA, but the body weight and ingestion rate were modified to match the assumptions for military personnel. Use of the same NOAEL and UFs as the EPA is considered protective because these values were selected considering the most sensitive population (i.e., children) which are not part of the deployed population. Where they were available, the original source documents for the HAs were used rather than values in Drinking Water Standards and HAs table (EPA 2009b) because the latter values have been rounded up or down. Equation 5-1 presents how the HAs were adjusted for use as water MEGs.

Equation 5-1 Adjusted Short-Term Health Advisories

$$HA_{adj} = \frac{HA \cdot IR_{child} \cdot BW_{MP}}{IR_{w} \cdot BW_{child}} = \frac{HA \cdot 7}{5 \text{ or } 15}$$

HA_{adj} = Adjusted Health Advisory (mg/L)
HA = EPA Health Advisory (mg/L)
IR_{child} = Drinking water ingestion rate for child (1 L/day)
IR_{w} = Drinking water ingestion rate for military personnel (5 or 15 L/day)
BW_{child} = Body weight for child (10 kg)
BW_{MP} = Body weight for military personnel (70 kg)

The acute oral MRLs developed by the ATSDR were third on the hierarchy of sources. The acute MRLs are developed for assessing acute exposures ranging from 1-14 days in duration. The MRLs are derived using the NOAEL concentration and applying UFs to extrapolate to the general population (including sensitive sub-populations but not hypersensitive individuals) consistent with EPA's methodology for developing reference values. Since these values are based on a NOAEL, adverse health effects may not occur as a result of exposures to concentrations that slightly exceed the MRL. The MRLs were placed third on the hierarchy since they were not specifically developed for drinking water exposures (as were the HAs).

The acute oral MRLs had to be adjusted for use as water MEGs because they are presented as a daily dose per body weight. The MRLs were adjusted for military personnel body weight, and their increased drinking water ingestion rate as presented in Equation 5-2.

Equation 5-2 Adjusted Acute Oral MRLs

$$MRL_{oAadj} = \frac{MRLoA \cdot BW}{IR_w} = \frac{MRLoA \cdot 70}{5 or 15}$$

$MRLoA_{adj}$ = Adjusted acute oral MRL (mg/L)
MRLoA = Acute oral MRL (mg/kg-day)
BW = Body weight for military personnel (70 kg)
IR_w = Drinking water ingestion rate for military personnel (5 or 15 L/day)

The EPA's 1-day drinking water HAs, based on subchronic or chronic studies, were placed last on the hierarchy since they are likely to be overprotective of acute exposures. Because these 1-day HAs were based on long-term studies, they were seen as more conservative than the acute MRLs and were used only when other acute values were not available. These 1-day HAs were also adjusted for use as water MEGs using Equation 5-1 presented above.

5.3.3 Selection of 14-Day Water MEGs

The 14 day water MEGs were developed using a hierarchy of sources and by modifying exposure assumptions to reflect those of deployed military personnel when necessary. The hierarchy of sources and military exposure adjustments for the 7-14 day water MEGs are provided below—

1. The 2005 long-term TSFWS (TB MED, 2005).
2. The 10-day HAs based on acute studies.
3. The Acute oral MRLs.
4. The 10-day HAs based on subchronic or chronic studies.

Table 5-3 presents a comparison of each source on the hierarchy to the selection criteria presented in Section 3.2. Selection criteria are presented in order of priority from left to right.

The sources are numbered according to their order on the hierarchy. Table E-1 in Appendix E presents the 7-14 day water MEGs along with their basis.

Table 5-3. Sources of Exposure Values for Developing 7-14 Day Water MEGs Compared to Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
1. TSFWS 2005 (long-term)	+	+	+	–	+
2. HA (10-day, acute)	+	+	–	–	–
3. MRL (oral, acute)	+	+	+	+	+
4. HA (10-day, subchronic/chronic)	–	+	–	–	–

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

The 14 day water MEGs were developed in a manner similar to that for the 7 day water MEGs. The 2005 long-term TSFWS were selected first on the hierarchy since they represented field water standards for deployed personnel. The long-term TSFWS were developed for assessing exposures of more than 7 days, and their use was required military doctrine. (Note: See the annotation to the TB MED 577 reference in Appendix A.) Therefore, the 2005 TSFWS were adopted unmodified as the water MEGs when available. The 2005 long-term TSFWS were available for six chemicals and one type of CWA as described in Section 3.3.2.1. The other types of CWA do not have long-term values available because extended contamination of water is considered improbable. As described for the 7 day water MEGs, the TSFWS did not include UFs to protect members of the general population who may be unusually sensitive to the effects of chemicals unlike other sources used in the hierarchy. As a result, the TSFWS are considered less protective than the water MEGs developed from the other sources.

The EPA's 10-day drinking water HAs were next on the hierarchy since they are estimates designed for assessing short-term exposure to substances in drinking water. The definition of the 10-day HA is provided below. More information on EPA's HAs is provided above in the selection of the 7 day water MEGs and in Section 3.3.2.2.

> Ten-day HA—The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to 14 consecutive days of exposure, with a margin of safety (EPA 1989b).

Similar to the 1-day HAs, there are many instances where EPA used subchronic or chronic studies to develop the 10-day HA in order to provide a protective value for comparison. The HAs, based on studies that were not acute, were ranked lower on the hierarchy than the MRLs because the exposure scenario was very different. The 10-day HAs were adjusted for use as water MEGs the same way the 1-day HAs were adjusted, using Equation 5-1.

The acute oral MRLs were used as a source for water MEG values in preference to the 10-day HAs that were based on subchronic or chronic studies. The acute oral MRLs were adjusted for military personnel body weight and their increased drinking water ingestion rate as presented in Equation 5-2. The EPA's 10-day drinking water HAs, based on subchronic or chronic studies, were again placed last on the hierarchy since they are likely to be overprotective of acute exposures. The 10-day HAs were also adjusted for use as water MEGs using Equation 5-1 presented above.

5.4 LONG-TERM WATER MEGS

5.4.1 Definition

The long-term water MEGs were developed because health effects resulting from continuous, low-level, long-term exposures may be different than those produced by higher, acute (short-term) exposures. In addition, adverse health effects resulting from long-term exposures may occur at substantially lower concentrations than those resulting from acute exposures. The long-term water MEGs were specifically developed to address drinking water concentrations for chemicals at or below which no significant adverse health effects would be expected for the average military person during deployments of up to one year. The 1-year water MEG is defined as follows:

> 1-year Negligible Water MEG—The drinking water concentration for a continuous daily ingestion of either 5 L/day or 15 L/day for up to 1 year that should not impair performance and is considered protective against development of chronic disease and an increased cancer risk greater than 1 in 10,000. Increasing concentration and/or duration could increase the potential for delayed/permanent disease (e.g., kidney disease or cancer).

The exposure values used to establish the long-term water MEGs have different levels of UFs built in, and exposure to concentrations somewhat above the long-term water MEGs may not cause any adverse health effects. The actual concentration above which one or more of the listed health effects may occur is highly variable due to several factors including the type of chemical, the steepness (slope) of the dose-response curve, the actual quantity of contaminated water ingested, cumulative exposure through other sources such as inhaled air, exposure to other chemicals which may cause additive or synergistic effects, and unique individual susceptibilities. This section describes the underlying toxicological basis for each of the sources used in deriving the long-term water MEGs. The 1-year water MEGs were developed to be

protective and should not be used to retrospectively assess or attribute the occurrence of actual health effects from a previous exposure.

USAPHC (Prov) is considering the possibility of developing higher severity long-term water MEGS (i.e., Marginal and Critical MEGs). If and when these are produced, they will be consistent with hazard severity definitions established by existing policy (e.g., CJCS 2007), which are defined in Table 4-8.

5.4.2 Methodology for Developing 1-Year Negligible MEGs

The long-term water MEGs were developed using oral exposure values from existing sources. Health criteria from other sources were adjusted to more appropriately suit the exposure conditions that military personnel may experience during a typical, long-term deployment scenario. Descriptions of the exposure assumptions and health criteria used to develop the long-term MEGs were presented in Sections 2 and 3.

Table E-2 in Appendix E presents the 1-year water MEGs along with their basis.

A standard hierarchy of sources was used to obtain health criteria values as described in Section 3.4. Two sets of values were developed for each ingestion rate (5 L/day and 15 L/day) where data were available: one based on non-carcinogenic health endpoints and the other based on carcinogenic endpoints. This was done to compare values based on the two different types of health endpoints and determine which resulted in a lower value. The lower value was selected as the 1-year water MEG in order to protect against both types of health effects.

In general, the long-term water MEGs were calculated based on standard intake and risk calculations used by the EPA. The concentration for each type of health endpoint was calculated using Equations 5-3 and 5-4. The lower of the two values was selected as the 1-year water MEG.

Equation 5-3 Calculation of 1-Year Water MEG Based on Non-Cancer Effects

$$1yWMEG_{nc} = \frac{RfD_o \cdot THQ \cdot AT_{nc} \cdot BW}{IR_w \cdot ED \cdot EF}$$

$1\text{-}yWMEG_{nc}$	=	1-year water MEG based on non-cancer effects (mg/L) (chemical-specific)
RfD	=	Oral reference dose (mg/kg-day) (chemical-specific)
THQ	=	Target hazard quotient (unitless) (1)
AT_{nc}	=	Averaging time for non-carcinogens (365 days)
BW	=	Body weight (70 kg)
IR_w	=	Drinking water ingestion rate (5 or 15 L/day)
ED	=	Exposure duration (1 year)
EF	=	Exposure frequency (365 days/year)

Equation 5-4 Calculation of 1-Year Water MEG Based on Cancer Health Effects

$$1yWMEG_{ca} = \frac{TCR \cdot AT_{ca} \cdot BW}{CSF_o \cdot IR_w \cdot ED \cdot EF}$$

$1yWMEG_{ca}$	=	1-year water MEG based on cancer effects (mg/L) (chemical-specific)
TCR	=	Target cancer risk (unitless) (0.0001)
AT_{ca}	=	Averaging time for carcinogens (25,550 days)
BW	=	Body weight (70 kg)
CSF_o	=	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$
IR_w	=	Drinking water ingestion rate (5 or 15 L/day)
ED	=	Exposure duration (1 year)
EF	=	Exposure frequency (365 days/year)

5.5 DEVELOPMENT OF WATER MEGS FOR SPECIAL SUBSTANCES

5.5.1 Lead

A long-term water MEG was developed for Pb using a separate set of exposure values not listed in the previous hierarchy. A category of "lead compounds" was added to address common detection of total Pb in drinking water sources. Three existing drinking water values were identified for consideration and are described below. These sources were considered since exposure values were not available using the same hierarchy of sources as for other chemicals.

1. The EPA's Action Level (0.015 mg/L) (EPA 2009a).
2. The FDA's Bottled Water Standard (0.005 mg/L) (40 CFR 141 [1 Jul 2006]).
3. The WHO Drinking Water Guideline (0.01 mg/L) (WHO 1996).

Measured concentrations greater than the EPA's action level trigger implementation of treatment techniques required to reduce the level of contamination at points of consumption.

For Pb, if more than 10 percent of water samples exceed the action level of 0.015 mg/L, then domestic water systems must take additional mitigative steps (EPA 2009a). The EPA's developments of this action level took into account the fact that Pb appears in public drinking water from corrosion of public water distribution systems as well as residential plumbing. Critical effects of concern for establishing the EPA action level were delays in physical and mental development for infants and children, adult kidney damage, and/or elevated blood pressure in adults. The EPA also published a maximum contaminant level goal (MCLG) for Pb of 0 mg/L (zero) (EPA 2009a). The MCLG is defined as the level below which there is no known or expected risk to health. The MCLGs include a margin of safety and represent non-

enforceable public health goals. The EPA's action level was adopted in 1991 and was published with the 2006 Drinking Water Standards and Health Advisories (EPA 2009a).

The FDA is responsible for regulating bottled water (the EPA regulates tap water). The FDA generally adopts EPA's MCLs for drinking water but did not do so in the case of Pb. The FDA adopted a stricter standard for Pb in bottled water because Pb leaching from distribution systems was not a factor. The FDA concluded that bottlers can readily produce water with Pb levels below 0.005 mg/L, and the stricter standard was consistent with FDA's goal for reducing exposure to the extent practicable. The FDA bottled water quality standard for Pb was adopted in 1994 (FDA 1994; for commentary see Posnick and Kim 2002).

The WHO 1996 drinking water guideline is based on exposure to bottle-fed infants (5-kg infant ingesting 0.75 L/day). The WHO considered infants to be the most sensitive subgroup; ingestion guidelines based on protective infant exposures are, thus, considered to be protective for all age classes. The WHO guideline level was set at 0.01 mg/L on the basis that Pb is a cumulative poison and that there should be no accumulation of Pb body burden. The WHO guideline was developed in 1993 and reviewed in 2003 for inclusion with the guidelines published in 2004 (WHO 2004)

Short-term water MEGs are not provided for Pb because existing exposure values are based on chronic exposures with infants and children as the population of concern (thus, the chronic guidelines are protective for adult deployed personnel). Values based on these exposure scenarios are considered overly conservative for assessing short-term adult exposures. The long-term water MEG for Pb was selected by comparing the three sources with the same criteria used for the other MEGs as presented in Table 5-4. This table shows that all three sources were very similar when compared with the selection criteria. The highest value (0.015 mg/L), equivalent to the EPA domestic action level for water systems (EPA 2003d), was selected for use as the 1-year water MEG. This value is protective for adult deployed personnel because it was developed to protect the sensitive subpopulation of chronically exposed (civilian) infants and children and is protective for the relatively few cases of developing embryos and fetuses among the deployed population. Use of the EPA action-level concentration is considered sufficiently protective for military personnel even with the assumption of substantially greater water ingestion rates when compared to those used in the derivation of the general population values. The 1-year water MEG for Pb (0.015 mg/L) is considered to be a conservative value for military applications and may be adjusted in the future as more information becomes available.

Table 5-4 Sources of Exposure Values for Selecting a 1-Year Water MEG for Lead Compared to the Selection Criteria

Source (Value Type)	Selection Criteria				
	Exp Scenario	Consistent Guid	Peer-Review	Pub Date	Documentation
EPA (Action Level)	–	NA	+	–	+
FDA (Bottled Water Standard)	–	NA	+	–	+
WHO (Drinking Water Guideline)	–	NA	+	–	+

"Exp Scenario" = Similarity of Exposure Scenario.
"Consistent Guid" = Consistency with EPA Guidance and NRC Recommendations.
"Peer-Review" = Peer-Review.
"Pub Date" = Date of Publication and Reviews.
"Documentation" = Documentation and Transparency of Methods.

5.5.2 Water MEGs for Substances with Federal Water Standards

The EPA and the FDA provide Federal standards for drinking water. The EPA provides MCLs used for regulating municipal water sources (EPA 2009a). The MCL is the maximum permissible level of a contaminant in water delivered to users of a public water system and is defined below—

- MCL—The highest level of a contaminant that is allowed in drinking water. The MCLs are set as close to the MCLG as feasible using the best available analytical and treatment technologies and taking cost into consideration. MCLs are enforceable standards (EPA 2009a).

- MCLG—A non-enforceable health goal which is set at a level at which no known or anticipated adverse effect on the health of persons occurs and which allows an adequate margin of safety (EPA 2009a).

The MCLGs are commonly adopted as the MCLs. The MCLGs are derived using a method similar to that used for developing the MEGs. Besides the use of different values for exposure factors, the only significant difference is the application of a relative source contribution (RSC). The RSC is applied to account for exposure to the chemical from other sources such as food. An RSC of 20 percent is used when there are inadequate data available on occurrence. Higher percentages are applied as occurrence data indicate other exposures. The EPA applies the RSC to provide values that are protective for individuals that have composite exposures higher than that due to water consumption alone. The RSC application increases the margin of safety and results in lower MCLGs. The MEGs do not apply a RSC and, therefore, assume all exposure (100 percent) is from the given media (i.e., all exposure to evaluated chemical comes from the sampled water source). The equation used for calculating the MCLG is presented below (EPA 1992).

Equation 5-5 Maximum Contaminant Level Goal Calculation

$$MCLG = \frac{RfD \cdot BW \cdot RSC}{IR}$$

MCLG = EPA Maximum Contaminant Level Goal rounded to one significant figure (mg/L) (chemical-specific)
RfD = Chronic oral reference dose (mg/kg-day) (chemical-specific)
BW = Body weight (70 kg)
IR = Drinking water ingestion rate for the general population (2 L/day)
RSC = Relative source contribution (generally ranges from 20-80% based on chemical-specific occurrence data)

The FDA provides standards used for regulating bottled water (21 CFR 165.110, 2006). Many times the FDA and EPA values are identical because FDA commonly adopts the MCLs as bottled water standards. The FDA bottled water standards are also used in deployments by the DOD Veterinary Service Activity (DODVSA) for certifying bottled water at the source as required by Military Standard 3006C, DoD Standard Practice, Sanitation Requirements for Food Establishments (MIL-STD 3006C).

Differences between the MEGs and Federal water standards make risk communication challenging. For this reason, chemicals with Federal standards were evaluated on an individual basis to determine if Federal standards were appropriate to use for assessing deployment exposures. Even though the purpose and method used for deriving the MEGs and Federal standards are different (see Table 5-5 below for comparison), the goal in deployments is to meet garrison standards when possible (AR 11-35). Table E-3 in Appendix E presents the Federal water standards and the original water MEGs before any adjustments were made based on comparison to federal standards.

There are currently over 80 contaminants with MCLs and bottled water standards available. These contaminants include not only chemicals but also physical, biological, radiological, and aesthetic contaminants. Only chemical hazards were evaluated for MEG development, consistent with the scope of TG 230. The TB MED 577 also presents standards for other types of water hazards (i.e., biological, radiological, and physical). These references should be referred to directly for information on other types of water contaminants.

Table 5-5 Comparison of General Assumptions Used for Developing the 1-Year Water MEGs with EPA and FDA Water Standards

	USAPHC (Prov) 1-year Water MEGs	FDA Bottled Water Standards	EPA MCLs
Exposure frequency	Daily	Daily	Daily
Exposure duration	1-year	Lifetime	Lifetime
Ingestion rate	5 L/day and 15 L/day	2 L/day	2 L/day
Body weight	70 kg (154 lbs)	70 kg (154 lbs)	70 kg (154 lbs)
Population	Military personnel	General population (includes sensitive groups such as elderly and children)	
Basis for development	Health-based	Health-based as well as cost and technical feasibility	Health-based as well as cost and technical feasibility
Considers relative source contribution	No	Yes*	Yes
Reason developed	Assessing deployment exposures	Compliance/regulatory purposes for bottled water	Compliance/regulatory purposes for tap water
Frequency of review and updates	Routinely as updated toxicity information becomes available	Routinely as updated toxicity information becomes available but must undergo lengthy review process before final	

* The bottled water standards incorporate the relative source contribution (RSC) factor when FDA adopts the EPA MCLs.

References:

- FDA Bottled Water Standards: 21 CFR 165.110, 1 April 2006 edition, http://www.gpoaccess.gov/fr/index.html.
- EPA 2009a. National Primary Drinking Water Regulations. [document on the Internet]. Washington (DC): US Environmental Protection Agency, Office of Water [updated May 2009; cited July 2009]. Available from http://nsdi.epa.gov/OGWDW/consumer/pdf/mcl.pdf.

5.5.2.1 Chemicals with Federal Standards Greater than the Water MEGs

Federal standards that were greater than the water MEGs were evaluated on an individual basis to determine if Federal standards are protective for assessing deployment exposures. In this analysis, the Federal standards were adopted as the MEGs when they were determined to be protective for deployment exposures at higher ingestion rates. This determination was made by evaluating the toxicity data and methodology for developing each of the water values. The following criteria were used to determine if the water MEGs should be changed to match Federal standards:

- Affected population—
  Is the target population and/or those affected by exposure part of the deployed population? (i.e., not children, elderly, and so forth.)

- Critical endpoint—
  Is the type of health endpoint one that would have a mission impact, long-term health impact, or solely aesthetic based?

- Date of toxicity data and availability of other data—
  Does the toxicity data for which the values are based reflect most current data used by federal agencies? Or is newer data available that could be used to develop more current values?

- Exposure scenario—
  Are the ED, route of exposure, and intake rate similar to that for deployed personnel?

- Federal standard to water MEG ratio—
  How different are the values? Is the difference considered significant given the level of uncertainty in the toxicity values used?

- Individual and composite value of UFs—
  Total value can range from 1 to over 1,000 and indicates the confidence in the toxicity value.

- Methodology for deriving value—
  Strictly health-based, technical or analytical feasibility, or based on cost effectiveness of implementation

A total of 29 chemicals had Federal standards that were greater than the 1-year Negligible Water MEG for ingestion rates of 15 L/day. Each chemical was evaluated individually using the criteria listed above. The results from this evaluation, as well as the references used, are provided in Appendix E Table E-4. For all chemicals but the following six, the federal water standards were determined to be protective for assessing deployment exposures and were adopted as the MEGs without caveat.

- Fluoride – Fluorides are naturally occurring compounds. Low levels of fluorides can help prevent dental cavities. At high levels, fluorides can result in tooth and bone damage. The EPA has set a maximum amount of fluoride allowable in drinking water of 4 mg/L. For the prevention of dental decay, the Public Health Service (PHS) has, since 1962, recommended that public water supplies contain between 0.7 and 1.2 mg/L (ATSDR 2003). These values conflict with potential 1-year water MEGs of 2 mg/L (for 5 L/d consumption) and 0.6 mg/L (for 15 L/d consumption), respectively) based on the IRIS recommendation that an RfD for the critical health endpoint of skeletal fluorosis in adults might be 0.12 mg/kg-d. The primary reason these values conflict is due to the different water consumption rate assumptions, though the EPA standards are based on the main IRIS RfD for protection against dental fluorosis in children. However, the federal standards are based on the presumption of chronic lifelong exposure, whereas the MEGs need to address subchronic exposures. Studies of the subchronic exposure effects are unavailable, prohibiting the

calculation more appropriate MEGs. The health effects of concern for more longer term exposures are based on studies of fluoride exposures that are 10 or more years in duration (IOM 1997). In summary, the originally calculated MEGs are considered to be overly protective for the deployed military population. Therefore, the 1-year Negligible water MEGs were adjusted to be equal to 4 mg/L (for the 5 L/d consumption rate) and 2 mg/L (for the 15 L/d consumption rate).

- Polychlorinated biphenyls – The MCL (0.0005 mg/L) and bottled water standard (based on the MCL) are based on consideration of an out-dated cancer potency factor and were actually based on analytical capabilities (56FR3526, 30 Jan 1991). The MCL actually falls between the preliminary 5 L/d and 15 L/d 1-yr Negligible MEGs (0.00084 and 0.00028 mg/L). While the the MCL is based on technological capabilities, the MEG calculations are based on standard equations using a military-specific water ingestion rates and the IRIS noncancer Reference Dose (RfD). This RfD is based on a subchronic feeding study in monkeys identifying a NOAEL and LOAEL with an associated endpoint of reduced birth weight. The LOAEL was 4 times higher than the NOAEL and it is unclear if the health endpoint is the most relevant endpoint for setting Negligible MEGs. The 2010 revision to TB MED 577 uses the MCL as the long-term potability (LTP) standard. Therefore, the 15 L/d MEG was adjusted up from 0.00028 to 0.0005 mg/L to match the LTP standard. A reassessment of the MEG and the LTP standard is needed.

- Copper – The bottled water standard is based on the Secondary Maximum Contaminant Level from 1979, which was based on taste considerations and staining. More recent toxicity data from ATSDR (2003) shows that exposure at the FDA standard level may result in gastrointestinal effects; particularly considering the potentially higher ingestion rate of deployed personnel. No alternative oral toxicity data exist from the standard sources; however, the ATSDR study is suited for developing MEGs because it examined drinking water exposure in healthy adult humans for a subchronic duration (2 months) and the resulting criterion incorporated a low uncertainty factor (UF total = 3) and was based on NOAEL. In addition, higher effect levels were provided along with specific symptom data. However, it is unclear if the gastrointestinal effects endpoint is the most relevant for setting long-term Negligible MEGs because it is not known if they are reversible or not. In addition, the 2010 revision to TB MED 577 uses the SMCL (and bottled water standard) as the long-term potability (LTP) standard. Therefore, the 15 L/d MEG was adjusted up from 0.05 to 1 mg/L to match the LTP standard. A reassessment of the MEG and the LTP standard is needed.

- Chlorine – The Federal standard for chlorine is a Maximum Residual Disinfectant Level (MRDL) set at 4 mg/L, which is designed to balance the risk reduction achieved against microbial pathogens with the chemical toxicity risks associated with chlorine and chlorine residual byproducts formed in the water. The preliminary long-term Negligible MEGs were 1.4 and 0.47 mg/L (for 5 and 15 L/d consumption rates) and were based on an IRIS reference dose using a NOAEL from a chronic rat

drinking water study. No LOAEL was identified in the IRIS critical study. Other studies identified in the IRIS assessment identified a LOAEL over 6 times higher with a critical effect of decreased body weight due potentially to poor water palatability leading to dehydration. Therefore, it is unclear if the IRIS study is the most relevant for setting long-term Negligible MEGs. Target chlorination levels for water supplies in deployment settings range from 2 to 4 mg/L, so setting Negligible MEGs less than the MRDL poses conflicting risk management recommendations. There are some concerns about palatability of chlorinated water in when water temperatures are relatively high; however, the 2010 revision to TB MED 577 uses the MRDL of 4 mg/L as the long-term potability (LTP) standard. Both long-term Negligible MEGs were adjusted upward to match the LTP standard. A reassessment of the MEG and the LTP standard is needed; especially with regard to high temperature water and palatability concerns.

- Chloramines – The Federal standard for chloramines is a MRDL set at 4 mg/L measured as chlorine. The discussion for chlorine above is relevant here. Because the 2010 revision to TB MED 577 uses the MRDL of 4 mg/L as the long-term potability (LTP) standard. Both long-term Negligible MEGs were adjusted upward to match the LTP standard.

- Chlorine dioxide – The Federal standard for chlorine dioxide is a Maximum Residual Disinfectant Level (MRDL) set at 0.8 mg/L. The preliminary long-term Negligible MEGs were 0.42 and 0.14 mg/L (for 5 and 15 L/d consumption rates) and were based on an IRIS reference dose from a study of sodium chlorite in a two generation chronic drinking water study in rats where both a NOAEL and LOAEL were identified. The critical effect was neurodevelopmental effects and the LOAEL was double the NOAEL. While chlorine dioxide rapidly degrades to chlorite, chlorate, and chloride in drinking water, the IRIS study was based on sodium chlorite. Due to the length of this study (two generations) and the health endpoint, it is unclear if this study is the most relevant for setting long-term Negligible MEGs. Therefore, both long-term Negligible MEGs were adjusted upward to match the LTP standard.

5.5.2.2 Chemicals with Federal Standards Less than the Water MEGs

The majority of Federal standards (n = 43) were less than the 1-yr Negligible Water MEGs. This is not surprising because the Federal standards include a relative source contribution term and are developed for protecting sensitive populations over long EDs and are, thus, unlike the MEGs (i.e., different exposure assumptions). In addition, toxicity values used for developing the MEGs were based on subchronic data when available, thus, resulting in higher exposure values than those based on chronic data. The variability between the Federal standards and the MEGs was much greater than that seen when Federal standards were greater than the MEGs (i.e., the ratios of the MEGs to the Federal standards presented in Table E-3 of Appendix E were higher). An individual analysis for chemicals in this category will need to be conducted to determine if the Federal standards are overly protective for assessing deployment exposures. Using overly protective values for assessing deployment exposures is a concern because it is important not

to overestimate risk in an operational setting. Overestimating risk may result in misinformed decision making by commanders, resulting in potentially severe consequences on the mission.

5.5.2.3 Chemicals with Federal Standards without Water MEGs

Eight chemicals with Federal standards did not have preliminary water MEGs available from the traditional sources. Table E-4 in Appendix E includes the results from evaluating chemicals without preliminary MEGs and presents the actions taken and the references used. The bullets below summarize the actions taken.

- Lead – The final MEGs for Pb were developed using a special method, as described in Section 5.5.1.

- Thallium – The final MEGs for thallium were developed using the toxicity data employed in developing the MCLs. This resulted in MEGs that were slightly greater than the MCL but derived using military-specific exposure assumptions.

- Chloride, Sulfate, Asbestos, Chromium, Halocetic acids, and Trihalomethanes –The final MEGs for these substances were based directly on the Federal standards. Either the MCL or the bottled water standards were adopted because no other oral toxicity data is currently available.

Two chemicals with Federal standards (nitrate and nitrite) had preliminary MEGs, but these were ultimately removed and the Federal standards were not adopted as MEGs. Water MEGs are not published for nitrate and nitrite because military-relevant health criteria were not identified. The preliminary MEGs were based health effects in infants, as reported in the documentation for the MCLs. Older children and adults are not at risk for methemoglobinemia as infants are and nitrate is a normal component of the human diet. For these reasons, nitrate is not identified as a hazard for deployed personnel. Data indicates that even older children (1-8 years) are not impacted by elevated nitrite levels in water. Therefore, nitrite is not considered to be a potential hazard.

5.5.3 Water MEGs for Substances Not Following Hierarchy of Sources

There were instances where application of the standard hierarchy of sources resulted in longer-term values that were higher than shorter-term values. This occurred because of differences in the hierarchies used to develop water MEGS of varying duration. These substances requiring derivation of water MEGs outside the standard hierarchy of sources and methodology are collectively referred to as “special substances” (and include Pb, dioxins, and some chemicals with Federal water standards). The method and sources used for deriving water MEGs for these substances are individually documented and presented in Table E-5 in Appendix E.

The methodology for deriving water MEGs for special substance categories was described in previous (Pb, dioxins, and chemicals with Federal water standards). In cases where the standard hierarchy of sources resulted in longer-term MEGs greater than short-term MEGs, the

shorter-term values were generally deleted. This occurred in most cases because the hierarchy of sources for short-term water MEGs is limited, and usually old EPA health advisories were lower than the long-term water MEGs. In most cases, the EPA HAs were much older than the data used to derive the long-term MEG and did not have documentation available. In addition, many of the health advisory values were never finalized (released as draft values), used data intended to protect children, and used significant duration extrapolations in their application (i.e., chronic child value used as basis for 1- or 10-day HAs). Because of these drawbacks, only long-term water MEGs were developed for these substances. For cases where sources other than the EPA HAs resulted in lower short-term MEGs, the lower MEG was used to replace the long-term value in order to be protective.

5.6 VALUES FOR PHYSICAL PROPERTIES IN DRINKING WATER

Drinking water is often analyzed for physical properties that do not have a direct toxic effect but may aesthetically make the water less palatable. This could lead to reduced drinking water ingestion that could in turn result in indirect health effects from dehydration. The water MEGs are specifically developed for assessing exposure to chemicals having a direct health effect (i.e., the water MEGs are based on health effects data not aesthetic qualities) and, therefore, were not developed for physical properties. The TB MED 577 provides standards for physical properties that are used to determine water potability.

6. SOIL MILITARY EXPOSURE GUIDELINES

6.1 INTRODUCTION

The MEGs for soil are intended to be used as a tool to assess military personnel exposures to surface and subsurface soil during deployments. The soil MEGs were derived using EPA methods for environmental cleanup efforts (EPA 1989a, EPA 1996, EPA 2002, EPA 2004b). The soil MEGs and EPA SSLs were derived by back-calculating soil concentrations using exposure assumptions and accepted health-target levels (no- effect level for non-cancer endpoints and acceptable cancer risk for carcinogens). Some chemicals may have both non-cancer and carcinogenic effects. For these chemicals, soil concentrations determined from both types of health effects were compared and the lower concentration used as the final soil MEG. If a chemical is not suspected to be carcinogenic, the soil MEG was based on its non-cancer effect. The 1-year soil MEG is defined as follows—

> 1-year Negligible Soil MEG—The soil concentration for continuous, daily exposure (from ingestion, dermal absorption, and inhalation) for up to 1 year (365 days) that should not impair performance and is considered protective against development of chronic disease and an increased cancer risk greater than 1 in 10,000. Increasing concentration and/or duration could increase the potential for delayed/permanent disease (e.g., kidney disease or cancer).

The soil MEGs were designed for assessing long-term deployment exposures (up to 1 year in duration) because soil hazards are generally not considered to be an acute health threat. However, there may be some select chemicals where acute exposure may be a concern. These potential acute soil hazards may be evaluated and incorporated into future versions of TG 230 as they are identified.

The NRC recommended against developing long-term soil MEGs for all the CWAs except HD due to environmental persistence (NRC 2004a). Vapors from CWAs and the volatile G-series nerve agents pose little dermal hazard. However, soil MEGs were developed for all CWAs with exposure values available in order to be consistent with those included in the HBESL (USACHPPM 1999) even though long-term exposures are unlikely.

6.2 METHODOLOGY

6.2.1 Exposure Scenario Considerations

The EPA's guidance for developing SSLs was used to derive the soil MEGs (EPA 1996, EPA 2002). This guidance has been expanded over the years to include methods for deriving SSLs for different receptor populations and various exposure scenarios. Most recently in December 2002, EPA released supplemental guidance that includes a subchronic construction worker

scenario and provides new equations for assessing combined exposure from ingestion and dermal absorption. The EPA also released supplemental guidance for conducting dermal risk assessments in February 2004 (EPA 2004b). These two updated guidance documents were the primary sources used for determining soil MEG methods.

The EPA has developed default exposure factors for various exposure scenarios to use in developing SSLs. The exposures of many deployed military personnel are probably most similar to those of a construction worker in terms of population characteristics, activities, and ED. Military and construction activities result in more direct contact with soil (such as, from digging or crawling on the ground) leading to a higher soil exposure than the general residential population. Military and construction workers are also more likely to come in contact with subsurface soil unlike residential populations. Exposure to subsurface soils may result in inhalation of volatile substances which may pose a hazard.

The EPA's construction scenario also addresses soil-disturbing activities, such as excavation and vehicle traffic on unpaved roads, also contributing to higher exposure levels. Ultimately, military and construction workers have higher exposures to soil which results in potentially lower screening levels than those developed for the general residential population. As a result, the soil MEGs were developed using guidance provided by EPA for subchronic exposures for construction workers.

It should be noted that use of the EPA exposure scenario for construction workers is intended to provide soil MEGs that are protective for deployed military personnel having routine, direct contact with soil. Many deployed personnel (e.g., supply transport, communications, medical support, and so forth) do not experience such consistent direct soil contact and use of the soil MEGs will provide protective risk estimates for these personnel.

Table 6-1 provides a comparison of EPA's construction worker scenario to the deployed military personnel scenario used to derive the soil MEGs. Section 2 provides more information on how each exposure factor was selected for use in developing the MEGs.

6.2.2 Soil Equations

Regional and national EPA guidance (EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA 2002) and *Supplemental Guidance for Dermal Risk Assessment* (EPA 2004b)) were used for developing soil MEG methods. As described in Section 6.2.1, the updated SSL guidance includes a subchronic construction worker scenario and provides new equations for assessing combined exposure from ingestion and dermal absorption. The EPA describes that the separation of SSL equations for inhalation exposure and combined ingestion/dermal exposure allows for the development of protective screening levels for ingestion and dermal exposures occurring concurrently. In addition, it permits easy identification of the routes of exposure that are of greatest concern to assist with the selection of control measures. Separation of the inhalation from the ingestion/dermal exposures route was considered for development of the soil MEGs but was not implemented. It is likely that deployed personnel may experience concurrent exposure from all three routes of exposure so the soil

Table 6-1 Comparison of EPA's Construction Worker Scenario to the Deployed Military Personnel Exposure Scenario Used for Developing the Soil MEGs*

Population	Construction Worker	Deployed Military Personnel
Exposure Characteristics	• Exposed during construction activities only • Potentially high ingestion and inhalation exposures to surface and subsurface soil contaminants • Short-term (subchronic) exposure	• Exposed during entire deployment duration • Potentially high ingestion and inhalation exposures to surface and subsurface soil contaminants • Subchronic exposure
Pathways of Concern	• Ingestion (surface and subsurface soil) • Dermal contact (surface and subsurface soil) • Inhalation of volatiles outdoors (subsurface soil) • Inhalation of fugitive dusts due to traffic on unpaved roads (surface soil)	• Ingestion (surface and subsurface soil) • Dermal contact (surface and subsurface soil) • Inhalation of volatiles outdoors (subsurface soil) • Inhalation of fugitive dusts from surface soil
Default Exposure Factors		
AF = Skin-Soil Adherence Factor	0.3 mg/cm²	0.2 mg/cm²
AT_{ca} = averaging time for carcinogens = Lifetime	70 yr	70 yr
BW = Body Weight	70 kg	70 kg
ED = Exposure Duration	1 yr	1 yr
EF = Exposure Frequency	250 days/yr	365 days/yr
IR_a = Inhalation Rate	20 m^3/day	29.2 m^3/day
IR_S = Soil Ingestion Rate	330 mg/day	330 mg/day
SA = Skin Surface Area	3300 cm^2	3300 cm^2

* Adopted from EPA 2002, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, OSWER 9355.4-24, Exhibit 5-1.

MEG equation reflects this simultaneous exposure. In addition, having one final soil MEG instead of two (i.e., ingestion/dermal and inhalation) makes it easier to use as a screening tool. The method used to develop the soil MEG equation is consistent with that used by the EPA Regional Offices (EPA Region 6 2007), and there is discussion that EPA may adopt this method on a Federal level.

The exposure factors summarized in Table 6-1 and presented in Section 2 were combined with the toxicity criteria presented in Section 3.4 and 3.5 for use in the soil MEG equations. An intermediate soil screening value was calculated separately for each exposure route for both cancer and non-cancer endpoints. This allows users to see the contribution from each exposure route. The final soil MEG was developed by combining the three screening values and selecting the lower of the two values (cancer or non-cancer). This section presents the equations used in calculating the soil MEGs.

6.2.2.1 Screening Values for Ingestion Exposure

Military personnel may incidentally ingest chemicals in soil during deployment activities involving direct soil contact. An RfD_o or CSF_o was required to assess exposure from ingestion route. Equations 6-1 and 6-2 present the calculations for determining the ingestion screening levels for non-cancer and cancer endpoints, respectively.

Equation 6-1 Calculation for Ingestion Soil Screening Level Based on Non-Cancer Effects

$$Screening\ \ Level_{(mg/kg)} = \frac{THQ \cdot BW \cdot AT_{nc}}{CF \cdot EF \cdot ED \cdot IR \cdot \left(\frac{1}{RfDo}\right)}$$

Equation 6-2 Calculation for Ingestion Soil Screening Level Based on Cancer Effects

$$ScreeningLevel_{(mg/kg)} = \frac{TCR \cdot BW \cdot AT_{ca}}{CF \cdot EF \cdot ED \cdot IR \cdot CSF_o}$$

THQ	=	Target hazard quotient (1) (unitless)
TCR	=	Target cancer risk (0.0001) (unitless)
BW	=	Body weight (70 kg)
AT_{nc}	=	Averaging time for non-carcinogens = ED (365 days)
AT_{ca}	=	Averaging time for carcinogens (25,550 days)
CF	=	Units conversion factor (0.000001 kg/mg)
ED	=	Exposure duration (1 year)
EF	=	Exposure frequency (365 days/year)
IR_s	=	Soil ingestion rate (330 mg/day)
RfD_o	=	Oral reference dose (mg/kg-day)
CSF_o	=	Oral cancer slope factor $(mg/kg/day)^{-1}$ (chemical-specific)

6.2.2.2 Screening Values for Inhalation Exposure

Military personnel may inhale chemicals from surface and subsurface soils during deployment activities. Surface soil is defined as the top 2 centimeters (cm) of soil and subsurface soil is deeper than 2 cm (a standard EPA risk assessment assumption). Fugitive dusts from surface soil may be generated from dust storms, erosion, vehicle traffic, and other activities. Inhalation exposure to volatile substances in subsurface soils may occur during trench digging and other activities that may uncover buried waste products. Surface soil is likely to be depleted of VOCs at most sites, so VOCs are evaluated in subsurface soils only (EPA 1996).

Depending on whether a chemical is identified as a VOC, either the VF or PEF is used in the screening calculation. Chemicals identified as a VOC use the VF, while inorganics and SVOCs use the PEF in the calculation. Equations 6-3 and 6-4 present the calculations for determining the screening levels for inhalation exposure to chemicals in soil for non-cancer and cancer endpoints, respectively.

Equation 6-3 Calculation for Inhalation Soil Screening Level Based on Non-Cancer Effects

$$Screening\ \ Level_{(mg/kg)} = \frac{THQ \cdot BW \cdot AT_{nc}}{EF \cdot ED \cdot IR \cdot \left(\frac{1}{RfD_i}\right) \cdot \left(\frac{1}{PEF\ \ or\ VF}\right)}$$

Equation 6-4 Calculation for Inhalation Screening Level Based on Cancer Effects

$$Screening\ \ Level_{(mg/kg)} = \frac{TCR \cdot BW \cdot AT_{ca}}{EF \cdot ED \cdot IR \cdot CSF_i \cdot \left(\frac{1}{PEF\ \ or\ VF}\right)}$$

THQ	=	Target hazard quotient (unitless) (1)
TCR	=	Target cancer risk (unitless) (0.0001)
BW	=	Body weight (70 kg)
AT_{nc}	=	Averaging time for non-carcinogens (365 days)
AT_{ca}	=	Averaging time for carcinogens (25,550 days)
ED	=	Exposure duration (1 year)
EF	=	Exposure frequency (365 days/year)
IR	=	Military inhalation rate (29.2 m³/day)
RfD_i	=	Inhalation reference dose (mg/kg-day) (chemical-specific)
CSF_i	=	Inhalation cancer slope factor $(mg/kg\text{-}day)^{-1}$ (chemical-specific)
PEF	=	Particulate emission factor – for nonvolatiles (1.36E+09 m³/kg)
VF	=	Soil-to-air volatilization factor – for VOCs (m³/kg) (chemical-specific)

6.2.2.3 Screening Values for Dermal Exposure

Military personnel may be exposed to chemicals on exposed skin surfaces during activities involving direct soil contact (i.e., training exercises, digging, and so forth). Chemicals were evaluated for dermal exposure if a dermal or oral toxicity value and an ABS value were available. Only chemicals having both a dermal absorption RfD (or RfD_o as a surrogate value) and ABS value available were assessed for dermal exposure. Equations 6-5 and 6-6 present the calculations for determining the screening levels for dermal exposure to chemicals in soil for non-cancer and cancer endpoints, respectively.

Equation 6-5 Calculation for Dermal Soil Screening Level Based on Non-Cancer Effects

$$Screening\ \ Level_{(mg/kg)} = \frac{THQ \cdot BW \cdot AT_{nc}}{CF \cdot EF \cdot ED \cdot \left(\frac{1}{RfD_o}\right) \cdot SA \cdot AF \cdot ABS}$$

Equation 6-6 Calculation for Dermal Soil Screening Level Based on Cancer Effects

$$Screening Level_{(mg/kg)} = \frac{TCR \cdot BW \cdot AT_{ca}}{CF \cdot EF \cdot ED \cdot CSF_o \cdot SA \cdot AF \cdot ABS}$$

THQ = Target hazard quotient (1) (unitless)
TCR = Target cancer risk (0.0001) (unitless)
BW = Body weight (70 kg)
AT_{nc} = Averaging time for non-carcinogens = ED (365 days)
AT_{ca} = Averaging time for carcinogens (25,550 days)
CF = Units conversion factor (0.000001 kg/mg)
ED = Exposure duration (1 year)
EF = Exposure frequency (365 days/year)
RfD_o = Oral reference dose (mg/kg-day)
CSF_o = Oral cancer slope factor $(mg/kg/day)^{-1}$ (chemical-specific)
SA = Skin surface area (3300 cm^2/day)
AF = Adherence factor (0.2 mg/cm^2)
ABS = Dermal absorption fraction for soil (unitless) (chemical-specific)

6.2.2.4 Screening Values for Combined Exposure Routes

Screening levels incorporating all three potential routes of exposure were developed using Equations 6-7 and 6-8. Use of these calculations provided a screening level that was protective for all three routes of exposure and was used in selecting the soil MEG.

Equation 6-7 Screening Level for Combined Exposure Routes for Noncarcinogens

$$Screening\ \ Level_{nc} = \frac{1}{\left(\frac{1}{Eq.6-1}\right)+\left(\frac{1}{Eq.6-3}\right)+\left(\frac{1}{Eq.6-5}\right)}$$

Equation 6-8 Screening Level for Combined Exposure Routes for Carcinogens

$$Screening\ \ Level_{ca} = \frac{1}{\left(\frac{1}{Eq.6-2}\right)+\left(\frac{1}{Eq.6-4}\right)+\left(\frac{1}{Eq.6-6}\right)}$$

6.2.3 Selection of Final Soil MEG

The final soil MEG was selected by comparing the screening levels for the combined exposure routes presented in Equations 6-7 and 6-8. The lower of the two values was selected in order to provide a soil MEG that was protective for all three routes of exposure as well as both cancer and non-cancer endpoints. The intermediate screening values calculated for each exposure route using Equations 6-1 and 6-6 are also provided so TG 230 users have an understanding of the routes of exposure and endpoints that contribute most to overall risk. This will aid users in determining risk estimates for their specific exposure scenario and tailor control measures as needed. Table F-4 in Appendix F presents a summary of the soil screening values and MEGs.

Additional information is provided in Appendix F along with the MEGs. Several physical and chemical characteristics are typically evaluated when developing soil screening values to ensure that the estimated soil concentrations are meaningful. The soil saturation concentration (SAT) was determined for VOCs and measures the chemical concentration at which all soil pore space (both air- and water-filled) is saturated with the chemical and the adsorptive limits of the soil particles have been reached (EPA 2002). Above this level, the chemical may be a non-aqueous phase liquid if it is a liquid at ambient temperature or a pure solid if it is a solid at ambient temperature. Theoretically, it is not possible for the chemical to be present in the soil at a concentration higher than what the soil can physically hold. In previous versions of USAPHC (Prov) TG 230, the SAT was used as the MEG when it was lower than its health-based value. However, there were many instances where actual deployment concentrations were at levels greater than the SAT indicating that the SAT may not apply to all scenarios. For this reason, the SAT is provided in addition to the health-based MEG instead of in place of it. Equation 6-9 provides the derivation of the SAT for VOCs. The same assumptions used to derive the VF for the construction scenario were used in order to provide values that were comparable.

Equation 6-9 Soil Saturation Concentration Calculation (EPA 2002)

$$SAT = \frac{S}{\rho_b} \cdot \left(K_d \cdot \rho_b + \theta_w + H' \cdot \theta_a \right)$$

SAT = Soil saturation concentration (mg/kg)
S = Water solubility (mg/L) (chemical-specific)
ρ_b = Dry soil bulk density (1.5 kg/L)
K_d = Soil-water partition coefficient (L/kg) (chemical-specific)
θ_w = Water-filled soil porosity (0.15 L_{water}/L_{soil})
H' = Dimensionless Henry's law constant (unitless) (chemical-specific)
θ_a = Air-filled soil porosity (0.28 L_{pore}/L_{soil})

Similarly to the SAT comparison for VOCs, a maximum soil concentration for inorganics and SVOCs is attained when the estimated soil concentration reaches 1,000,000 mg/kg. In the event where the estimated MEG was greater than this value, a maximum value of 1E+06 was notated next to the MEG for that chemical to indicate that concentrations this high are not expected in soil.

6.3 DEVELOPMENT OF SOIL MEGS FOR SPECIAL SUBSTANCES

This section describes how soil MEGs were developed for special substances that fall outside the standard methodology.

6.3.1 Lead in Soil

Lead has an EPA WOE categorization of B2 (probable human carcinogen based on evidence in animals and inadequate or no evidence in humans) and also possesses known systemic toxicity (refer to Section 4.4 for more discussion on Pb toxicity). However, there are no recommended toxicity values to quantify Pb exposure in soil. The EPA recommends a soil Pb screening level of 400 ppm (mg/kg), which was derived using the Integrated Exposure Uptake Biokinetic Model (EPA 1994b, EPA 1994c) for residential exposures. This value is aimed at protecting the health of children who are more susceptible to Pb poisoning. Since the military population does not include children, this soil Pb screening level would not be appropriate as the Pb soil MEG.

Although EPA Region 9 recommends an SSL of 800 mg/kg for industrial exposures, this value is based on EPA default assumptions for industrial workers (e.g., soil ingestion rate of 100 mg/day) (EPA Region 9 2004). Since these assumptions are different from those used to derive the MEGs in this document (e.g., soil MEG soil ingestion rate assumption of 330 mg/day), the 1000 ppm is not applicable as a MEG. In addition, it is unclear how 1000 ppm was derived using the Adult Lead Model (ALM) (Technical Review Workgroup [TRW] 1999). The TRW for Pb suggests that an SSL of 750 ppm at industrial sites is a reasonable value (TRW 1999).

Using EPA-recommended Pb exposure models is also problematic since these models generally use child-specific data. Therefore, the open literature was consulted for other models that can be used for adult Pb exposure. During a telephone discussion with the EPA's TRW for Pb, it was suggested that the Stern Model (Stern 1996) might be more applicable for the purposes of the guidelines described in this document (Follansbee 2000). The Stern Model is based on a relationship between blood pressure elevation and low-level Pb exposure.

During the last 10 years, numerous studies have indicated a possible correlation between Pb exposure and blood pressure, particularly in adult men (Harlan 1988, Schwartz 1995). However, as the ATSDR (ATSDR 1999) points out, this relationship is still being debated in the scientific community. Other studies have shown weak or no correlation between blood pressure and blood Pb (Elwood et al. 1988; Pocock et al. 1988). Since the relationship between blood pressure and low-level Pb exposure is still a debatable issue, the Stern Model was not used.

A different model that does not depend on the blood Pb-blood pressure relationship was also evaluated to establish a soil Pb concentration. The Bowers et al. (Bowers 1994) model (herein referred to as the Bowers model) allows for the estimation of blood Pb levels in adults exposed to environmental levels of Pb. Since Bowers et al. considered blood Pb concentration from Pb exposure to various media (primarily, soil, water, and air), for the purposes of the soil MEG, the model was modified to exclude the other pathways. A comparison of the modified model with the ALM indicates that it is a component of the ALM.

A soil Pb concentration can be estimated using the Bowers model by back calculating from a target blood Pb level. Equation 6-10 shows the modified relationship between soil Pb and blood Pb concentration.

Equation 6-10 Soil MEG Calculation for Lead Using the Modified Bowers Model

$$MEG_{lead} = \frac{PbB_2 - PbB_1}{BKSF \cdot AF_{s/d} \cdot IG_s}$$

MEG_{lead} = Soil military exposure guideline for Pb (mg/kg)
PbB_1 = Background blood lead concentration in adult male (microgram per deciliter (µg/dL)
PbB_2 = Target blood lead level (µg/dL)
BKSF = Relationship between Pb soil ingestion and PbB (µg/dL)/ microgram per day (µg/day)
$AF_{s/d}$ = Soil/dust absorption (unit less)
IG_s = Soil ingestion rate (mg/day)

Table 6-2 contains the parameters that were used to derive a soil MEG for Pb. Those parameters recommended by the TRW for use in the ALM were used whenever possible.

Various standards for Pb exposure have been established to protect the health of workers. The OSHA states that if a worker's blood-lead level exceeds 40 µg/dL, the worker must be temporarily removed for medical examinations (29 CFR 1910.1025 (2006)). The OSHA also recommends that the blood Pb of female workers who intend to have children not exceed 30 µg/dL. This value is also the recommended ACGIH biological exposure index (BEI®) for Pb exposure in the workplace. (BEI® is a registered trademark of the American Conference of Governmental Industrial Hygienists.) In addition, almost all the studies reviewed by ATSDR (Table 2-1 of ATSDR 1999) show that no adverse health effects were observed in occupational populations where the blood Pb level was below 40 µg/dL. This assessment acknowledges that the EPA target blood Pb concentration for protection of the fetus is 10 µg/L (for fetal blood). The fetal blood concentration has not been incorporated into the present calculation, which necessarily focuses on deployed adults. It is appropriate and protective to incorporate the blood Pb concentration of 30 µg/dL recommended by OSHA for women of child-bearing age as the target blood-lead level in Equation 6-10. This approach represents a reasonable means of reducing potential Pb exposure to any developing fetus or embryo that may be present in the population of female deployed personnel. Additional conservatism in this estimate included as the consequence of maximal assumption for soil ingestion rate, etc.

Table 6-2 Input Parameters for the Modified Bowers Model

Parameter	Value	Rationale
PbB_2	30 µg/dL	See text for more discussion
PbB_1	2.0 µg/dL	Mid-range of 1.7 to 2.2 µg/dL for women of child-bearing age (17-45 years; based on 1988-1991 survey of US blood Pb levels) as recommended by the TRW when demographic-specific information is not available
BKSF	0.4 µg/dL per µg/day	TRW's recommended default
$AF_{s/d}$	0.12	TRW's recommended default [based on absorption factor for soluble Ob of 0.20 and a relative bioavailability of 0.6 (soil/soluble)]
IR_s	0.330 g/day	See Section 2.5.2

A soil-lead level of 2200 ppm is obtained by applying the parameters in Table 6-2 to Equation 6-10. Review of this soil MEG by the NRC observes that ingestion of soil containing 2200 ppm Pb "is not likely to result in unacceptable exposures," based on examination of populations in communities where soil Pb is present (NRC 2004a).

6.3.2 Other Special Substances

At the present time only the soil MEG for Pb was developed using a separate methodology.

7. OVERVIEW OF METHODOLOGIC UNCERTAINTIES

Risk assessment by its nature is an inexact science. Prediction, estimation, and probabilities are core tenets in the practice of risk assessment. When estimating or predicting health risks, and establishing guidelines such as MEGs, the assessor must contend with uncertainty and variability. For example, when an environmental science officer evaluates base camp monitoring data for acute chemical hazards and uses an established exposure level as the "safe" level—the 14-day Negligible MEG—there is no assurance that all people exposed at or below that level will be protected. People vary in their sensitivity to various agents; thus, one person may be susceptible to having an adverse effect at a specific exposure level and another person may have no effect at the same level. Sometimes exposure levels are based upon effects observed in animal laboratory studies because there are few or no relevant human studies. In fact, it may even be unethical to try and conduct human exposure studies for some agents. Therefore, effects observed in animal studies must be extrapolated to estimate effects in humans. Also, in order to induce and be able to see effects in animal laboratory studies, the animals may be given doses of agents at high levels that are much greater than those that people would be exposed to normally. In order for this type of study to be useful for predicting human health effects, the data must be extrapolated from high dose levels to lower levels that people might encounter. There are numerous other situations that introduce variability and uncertainty into the risk assessment process.

The following is a quote from a report by a California Risk Assessment Advisory Committee (Cal/EPA 1996), which defines and differentiates the terms variability and uncertainty, and discusses their importance to risk characterization.

> Risk assessors use the term "variability" to describe measurable quantities that cannot be characterized by a single number, such as the height of some group of people. The height of any one person, in this example, probably will not represent that of any other person, except by accident. We use statistics to help select appropriate representative quantities when it is necessary to draw mathematical conclusions in which the properties of groups or populations are important to a decision. We use the term "uncertainty" to denote ignorance of the true value of some measurable quantity or other ascertainable "state of nature," including such things as which theory best describes some natural phenomenon. We use basically the same statistics to help describe the consequences of our ignorance for decision makers. These two conceptually different notions often blend into each other in practice, and one theory of knowledge holds that for the kinds of purposes this study addresses, the two are the same. Because both real variability and ignorance primarily act to affect the risk assessors' confidence in conclusions they may draw and recommendations they may make about courses of action and because uncertainty and variability are treated by the same kind of mathematics, (it is implied) that they be considered the same. Nonetheless it is useful for risk assessors to attend to the difference between

uncertainty and variability; at least in principle, uncertainty can be reduced by obtaining more information while variability is irreducible.

Table 7-1 describes some of the specific causes of uncertainty so that users can understand the limitations associated with performing operational risk assessments using the MEGs. Identification of uncertainties also helps determine areas to improve for future revisions.

Table 7-1 Specific Uncertainties Associated with Development of the MEGs

Category	Uncertainty	Description and Effect on the Risk Estimate
Exposure Conditions	Variable field conditions	Exposure conditions in the field can vary greatly and standard exposure scenarios were used to develop the MEGs. It is hoped that the MEGs are protective (over estimate risk) of most deployment exposures, but this may not always be the case.
	Variable environmental conditions	Environmental conditions are very different throughout the world where personnel may be deployed. Assumptions about environmental conditions were made in order to develop the MEGs (especially soil MEGs) and may not fit all locations well. For example, the default PEF value used to determine soil inhalation may not apply to all deployment locations. (May over or underestimate risk)
	Use of health criteria developed for other purposes	Most all the health criteria used to develop the MEGs were developed for assessing other populations or exposure conditions. Health criteria from different sources were also derived using different methods and are of different quality (in terms of age and peer review). Actions were taken to minimize these differences (adjusting exposure assumptions, recording differences in database, etc.), but some level of uncertainty exists especially when different sources are used for developing each type of MEGs. (May over or underestimate risk)
Health Criteria	Chemicals without health criteria	MEGs were developed for all chemicals for which data were available but this may not include everything to which military personnel may be exposed. Underestimates risk)
	Use of a hierarchy for obtaining health criteria from selected sources	Additional toxicity information may be available outside the defined hierarchy of sources and was not used to develop MEGs (except for Pb, CWAs, and ADP). Other sources for data were not routinely used for individual chemicals at this time due to resource requirements and the need for consistency of methods. (May over or underestimate risk)

(continued)

Table 7-1 Specific Uncertainties Associated with Development of the MEGs (continued)

Category	Uncertainty	Description and Effect on the Risk Estimate
Health Criteria (continued)	Use of chronic values for assessing subchronic exposures	The availability of subchronic exposure data is limited and chronic data was used when subchronic values were not available. This may result in MEGs that are overly protective (i.e., too low). (May over estimate risk)
	Various UFs for toxicity data	Toxicity values have different levels of UFs applied (generally ranging from 3 to 1000) depending on the study used and quality of the data set. These factors can be applied to account for extrapolation of a LOAEL concentration to a NOAEL, ED extrapolations, use of animal data, and for human variability. These differences result in MEGs with varying levels of uncertainty. (May tend to overestimate risk)
	Lack of information on human health effects	Many exposure values are based on toxicological studies performed on animals and human health effects are uncertain. Alternately, some exposure values are based on occupational studies and effects on exposed personnel is more applicable. (May over or underestimate risk)
Population Assumptions	Use of one set of population assumptions	The MEGs are based on the general assumption that deployed military populations consist of relatively healthy and physically fit male and non-pregnant female adults. Considerations for sensitive subpopulations within the deployed population were made when data permitted to minimize this uncertainty. (May over or underestimate risk)
Multiple Exposures/ Stressors	Multiple chemical exposures	Little toxicological data is available identifying chemical interactions for assessing multiple chemical exposures. Qualitative assessments for chemicals with common target organs or endpoints are recommended to help minimize this uncertainty. (May underestimate risk)
	Exposure to other operational hazards	This impact of simultaneous exposures (such as heat/cold, psychological stress, vaccinations, etc.) to other hazards on health outcome is largely unknown and may have an impact. (May underestimate risk)
	Cumulative chemical exposures	Personnel may be exposed to chemicals over multiple deployments or from exposures outside of deployments. Data is not available for many chemicals to assess cumulative effects. The long-term MEGs are designed to be protective to minimize the potential for health effects from cumulative exposures especially for carcinogens. (May underestimate risk)

8. NATIONAL RESEARCH COUNCIL REVIEW

8.1 BACKGROUND

In 2001, the USACHPPM requested that the NRC Committee on Toxicology (NRC/COT) review the following two technical guides:

- USACHPPM TG 248, Guide for Deployed Preventive Medicine Personnel on Health Risk Management (USACHPPM 2001a).

- USACHPPM TG 230, Chemical Exposure Guidelines for Deployed Military Personnel (USACHPPM 2003b).

The purpose of the review was to obtain feedback from an external scientific committee for improving the documents in regards to their scientific validity, completeness, and conformance to current risk-assessment practices as well as military FHP policy requirements. The NRC published their review in the report titled *Review of the Army's Technical Guides on Assessing and Managing Chemical Hazards to Deployed Soldiers* (NRC 2004a). This section focuses specifically on certain NRC issues/recommendations that the USAPHC (Prov) finds to be particularly relevant.

The June 2010 Revisions to TG 230 and RD 230 are the first major revisions since the NRC/COT review. Previous updates and addenda from 2002 through 2004 were published primarily to address new and revised MEG values. The June 2010 Revisions not only update and add many MEGs, but they also provide updated guidance on conducting operational risk assessments. These changes also address many of the recommendations of the NRC. Additional evaluation of some of the more detailed recommendations of this NRC review is ongoing.

8.2 STATEMENT OF TASK

The NRC was asked to review the TG 248 and TG 230 along with many other related technical and non-technical documents. These included—

- DOD, Joint, and Army specific policies and directives.

- Past NRC reports that address some of the topics inherent to these TGs.

The USACHPPM requested that the NRC focus specifically on the following issues in their review:

- The Army's risk assessment, hazard-ranking, and risk management processes described in TG 230 and supporting documents.

- The use of pre-existing exposure guidelines developed by the NRC and other agencies and organizations and the hierarchical scheme used by the Army in selecting from those various guidelines.

- The Army's approaches to deriving MEGs for criteria pollutants, lead, soil contaminants, and other chemical contaminants.

- Technical aspects of the Army's risk management framework regarding competing health risks from different chemicals.

- The assumption that the military population includes susceptible subpopulations and the use of UFs in the derivation of MEGs.

- The adjustments of exposure guideline values to account for differences in exposure durations in the derivation of MEGs.

- The exposure assumptions and mathematical models used for the derivation of MEGs for air, water, and soil contaminants.

- Technical aspects of the Army's acceptable cancer risk level of 1 in 10,000.

- The balance of emphasis between health effects that are produced immediately or soon after exposure and possible delayed effects in the derivation of MEGs.

- The use of a single risk assessment methodology for assessing toxicological risk from exposures rather than separate risk assessment methodologies.

- The assumption that the toxicity of a mixture of chemicals that have similar modes of action will be equal to the sum of the toxicities of individual chemicals in the mixture.

- The utility of USACHPPM TG 248, USACHPPM TG 230, and USACHPPM RD 230 for decision makers who will be using MEGs in the field.

8.3 TG 248 AND USE OF THE ORM FRAMEWORK

The primary feature of USACHPPM TG 248 is the concept of using existing military operational risk management (ORM) doctrine (FM 5-19, 2006; FM 3-100.12, 2001) to assess OEH hazards and qualitatively characterize risks in a deployment setting. The ORM process allows commanders to assess OEH hazards on the same scale as other operational risks to ensure balanced decision making. The NRC endorsed this approach and commended the USACHPPM for implementing the recommendations cited in previous NRC and IOM reports. This NRC

review described the generalized framework in TG 248 as: "comprised of innovative features that are suited for practical use in the field." The exception identified by the NRC was the approach used to address confidence and uncertainty (see below). There were no significant recommendations by the NRC to modify USACHPPM TG 248. While certain elements and terms documented in TG 248 in 2001 are somewhat outdated, the conceptual military risk management framework and process to apply it to OEH hazards has been reinforced and made current by recent policy (especially CJCS 2007).

8.4 TG 230 AND MEGS FOR CHEMICALS

The same ORM logic described by USACHPPM TG 248 and commended by the NRC was used in USACHPPM TG 230. The purpose of USACHPPM TG 230 is to provide a detailed process describing how to estimate the hazard severity and hazard probability when assessing chemical exposures. This process includes two components: (1) the selection/derivation of the MEGs and (2) the translation of these quantitative MEG values into the qualitative ORM framework to meet FHP requirements. The NRC review evaluated each of these components.

8.4.1 General use of TG 230 and MEGs to Meet FHP requirements

The NRC review described the MEGs and their application as generally protective and appropriate for FHP applications. In support of this, the NRC—

- Concurred with the approach of "weighing" immediate health outcomes more heavily.
- Concurred with the approach and risk level used to address carcinogens.
- Agreed with the primary adjustments made to accommodate military exposures (such as increased drinking water consumption rates).
- Acknowledged the hierarchy of values from which the MEGs are derived.
- Explicitly recommended that "CWAs should not be evaluated differently from TICs industrial chemicals."

8.4.2 Issues Needing Further Evaluation

The USACHPPM had requested that the NRC provide recommendations on many specific issues that were either not completely or consistently addressed by the NRC. The ongoing USAPHC (Prov) evaluation is focusing on how best to address these issues which include—

- The issue of inconsistent level of protectiveness as it relates to other Federal applications, and how these approaches will be politically compared to military values (as has occurred in past Gulf War exposure issues for example).

- The issue of genetic susceptibilities in the deployed force.
- The potential impacts on the developing fetus.
- The potential impacts of multiple chemical exposures.
- Specific uncertainties attributed to certain key hazards such as airborne particulate matter.

8.4.3 Five Critical Issues

While there are many individual recommendations that the USAPHC (Prov) has addressed in this revision to TG 230, there are five critical issues/recommendations addressed in the NRC report that are of greatest significance for future revisions.

8.4.3.1 Two Sets of Exposure Guidelines

The NRC stated that the general conservative nature of the MEGs and their application can in some scenarios (e.g., war time) mislead Commanders/military decision makers by overestimating chemical risks when other hazards may be more significant. A primary recommendation of the NRC was to develop "two sets of exposure guidelines," and use these within the ORM process. The NRC recommended that the existing MEGs be used, and a separate set of "Chemical Casualty Exposure Guidelines" be developed. The NRC did not provide guidance as to when/how to choose between the two separate sets of guidelines in the context of the single military ORM framework by which all other risks are being assessed and characterized.

While the USAPHC (Prov) agrees with the development of improved military-specific exposure guidelines (addressed further below), USAPHC (Prov) believes that the NRC has missed the primary purpose of the single consistent, integrated ORM framework described in USACHPPM TG 248 and derived from existing military doctrine (a framework already commended by the NRC). A single framework for assessing chemical risks for various types of deployments (ranging from peace keeping to wartime) and continuously changing operational conditions is critical for field practicality. Current operations (e.g., OIF) have provided a clear example of how situations faced by the military today cannot be clearly identified as war or peace keeping. It is for this reason that military doctrine has long used the single ORM framework to assess any kind of hazard in any environment. Therefore, according to current Army and Joint policy and doctrinal requirements, USAPHC (Prov) will continue to use one set of MEGs for assessing all deployment scenarios in a consistent, integrated ORM framework. Instead of developing a second set of values, USAPHC (Prov) will use NRC recommendations to improve the existing MEGs, beginning with key priority chemicals.

The USACHPPM has published a report (USACHPPM 2004) where it has already modified the short-term air MEGs for CWAs to accommodate more specific data, including deployed forces demographics and potential susceptibilities. The new values for CWAs in the 2004 USACHPPM report are generally consistent with the NRC recommendations for deriving a second set of more military specific guidelines. However, the new values have replaced the previous MEGs. They are not intended to be used as separate guidelines.

Also consistent with NRC recommendations, the USACHPPM has supported an analysis that provides a prioritized listing of TICs relative to their potential risk to deployed forces (USACHPPM 2003a). This report has some similarities to the suggested priority chemicals identified by the NRC. It was used to prioritize the chemicals for which more detailed toxicity assessments were performed and improved 'best estimate' MEGs were derived in a manner similar to those for CWA. A recent USACHPPM report provides those evaluations (USACHPPM 2008).

More recently, there has been internal Army discussions as to the relationships between MEGs and military casualty estimation models, such as that proposed in a NATO Allied Medical Publication (NATO 2010) and sponsored by the Army Office of the Surgeon General. Efforts are underway to attempt to align future improvements to casualty estimation models and MEG development so that the different risk assessment applications are complimentary.

8.4.3.2 Inconsistent Derivation and Basis for MEGs

The NRC noted that because the MEGs were based on a hierarchy of existing standards and guidelines, there were inherently different levels of protection offered by these values. The NRC recommended the MEGs be reevaluated and revised to make them more relevant to FHP and more consistent with each other. A prioritized, phased approach for revising the MEGs was suggested.

The USAPHC (Prov) notes that due to the familiarity and regulatory precedent established by these other Federal standards and guidelines, there will always be an inherent comparison to such values. In fact, DA policy requires the Army, when possible, to adhere to garrison standards even in a deployed setting. When the mission prohibits this (as it often will for most operations), operational (or composite) risk management is used to minimize total risk. The USACHPPM noted these policy requirements and scenarios to the NRC where the military had been politically obligated to use Federal guidelines. However, there is concensus to reevaluate chemicals and underlying toxicity information to try to establish better deployment-specific guidelines. This will be a long-term process that must include a prioritized phased approach and a thorough peer review. The review must withstand a public, political, and congressional scrutiny such as demonstrated by past Gulf War-related assessments. To the extent that values are based on an established hierarchy, USAPHC (Prov) will, as recommended by the NRC, ensure that the most recent and appropriate values are cited along with general caveats as to assumed degree of conservativeness.

8.4.3.3 Use of UFs and Accommodating Susceptibility within Deployed Populations

The NRC concurred that it was reasonable to assume that the deployed and general populations might have similar levels of genetic susceptibility to chemical exposures. A recognized example is that of genetic susceptibility to anticholinesterase compounds, where some individuals possess abnormally low activity levels of blood cholinesterase and carboxylesterase. This genetic component of enzyme activity is also expressed, in part, on the basis of gender and ethnic origin.

While the NRC review acknowledged that genetic, gender, and other susceptibilities do exist in the deployed force, it indicated that these are relatively small percentages of the force and appears to suggest that these sub-groups should not be considered in military guideline development. The USAPHC (Prov) considers this to be a risk management decision that is contrary to FHP policy and doctrine which requires the Army to identify and document health effects to each individual (TB MED 507, 2003, FM 4-02, 2003; JP 4-02, 2006; CJCS 2007). This recommendation would have the effect of not addressing health effects in over 10 percent of the population for some cases. For example, data has shows that women are more susceptible to the effect s of organophosphates (NRC 2003). Women make up approximately 11 percent of the current deployed population for OIF (USACHPPM 2004). The USAPHC (Prov) considers this to be a significant portion of the deployed population and should be factored into MEG development.

The NRC review also suggested that the use of a UF to account for intra-species variation in response to a chemical exposure is not necessary unless specific data or evidence indicates that such variation can reasonably be anticipated in the deployed population. The USAPHC (Prov) agrees that UFs for intra-species variability should be assessed on a chemical-specific basis; however, this assessment should be performed to support the removal of the intra-species UF. In the absence of such data, the USAPHC (Prov) believes that a UF for deployed personnel is appropriate for the following reasons:

- The issue of genetic susceptibility was recognized as needing further characterization during analyses of illnesses associated with Gulf War service after the 1991 conflict (IOM 2000). The Army is committed to incorporating lessons learned and the resulting insight from the Gulf War experience to the larger issue of deployment exposure to all pertinent chemicals and not just anticholinesterase compounds. The Army is required to do so, (TB MED 507, 2003; FM 4-02, 2003; JP 4-02, 2006; CJCS 2007) identifying the points at which specific elements of genetic and physiologic susceptibility become significant.

- The NRC considers the Active Duty forces as typically spanning a more narrow age range than the general public, possessing generally good health and physical fitness, and possessing no obvious major pre-existing medical conditions that might interfere with ability to serve. While this is still generally true, the continued and expanded deployment of National Guard and Reserve units is adding significant diversity to previously assumed norms. At present, the deployed force is beginning to more closely

resemble the general population (except for the absence of children and the elderly) than in previous conflicts (USACHPPM 2004).

- The NRC's comments that asthmatics should not be expected in deployed forces is not consistent with current experience. Persons with cases of medically controlled asthma can and do deploy. In addition, there have been cases where deployment environments have been thought to be the cause for development of asthma in previously undiagnosed patients (USACHPPM 2003c, USACHPPM 2004). Additionally, a parallel NRC Subcommittee (Subcommittee on Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants) has considered submariners with controlled asthma as a subpopulation of special concern.

- The NRC also recommends that morale and psychological/stress impacts should be considered. While the NRC did not provide specific guidance as to how to address these issues, the USACHPPM had considered these when originally deriving the MEGs and as further justification for the application of UFs (or reason not to remove UFs when already factored into a value). While specific data cannot quantify the impacts, USAPHC (Prov) notes that there is sufficient evidence that such factors, in addition to fatigue, extreme temperatures, and nutritional deficiencies can increase susceptibility in certain persons. All of these factors could possibly impact personnel during deployment operations.

8.4.3.4 Providing a Confidence Level with the Risk Estimate

The NRC Subcommittee indicated that provision of a confidence level along with the risk estimate was not necessary as it was not specifically described in existing doctrine. While true, many issues described in this NRC report highlight the very reasons that provision of a confidence estimate with the risk estimate is a critical component to these guides. This facet of the approach actually accommodates some of the NRC's recommendations. For example, warning users where the MEGs may be particularly conservative based on imprecise data, or where the exposure data and estimation is particularly weak.

8.4.3.5 Additional Application Guidance

The NRC has also recommended adding more explicit guidance on the following topics:

- Sampling and exposure assessment.

- Specific controls and mitigation procedures and recommendations.

- Application of the MEGs, particularly relative to long-term, delayed health impacts and short-term effect with no operational impact.

The June 2010 Revision of TG 230 includes new guidance on exposure assessment and introduces the concept of the population exposure point concentration (PEPC) for direct

comparison to the MEGs (see TG 230). The scope of TG 230 is not considered appropriate for addressing sampling and controls and mitigation procedures in more detail. The USAPHC (Prov) does agree that they are critical components to the overall application of TG 230 and supports the development of documents that address these areas (USACHPPM 2001b, ASTM 2003).

The USAPHC (Prov) notes that in addition to application guidance described within USAPHC (Prov) TG 230, case studies are available which use the MEGs for assessing different deployment scenarios. These examples have already been successful at demonstrating how the complexities of the guidance are to be used in 'real-world' events. A variety of recent deployment applications have successfully used TG 230 (e.g., Operation New Horizons, OEF, and OIF). These applications demonstrate that the MEGs, when applied according to TG 230 interpretation guidance and confidence estimate, do not inappropriately overestimate risk, regardless of the operational environment.

The USAPHC (Prov) agrees that the guidance in TG 230 could be misused or misinterpreted by untrained personnel. Therefore, in addition to continuing initiatives to improve the certainty in the underlying MEGs, USAPHC (Prov) continues training initiatives to ensure proper interpretation and application.

8.5 SUMMARY OF ANTICIPATED REVISIONS AND TIMELINES

The USAPHC (Prov) TG 230 is a "green" document that has undergone many revisions since its first publication in 1999 to continuously reflect changes in risk assessment methodology and toxicity data. The June 2010 Revisions address several of the short-term and some of the more complex mid-to long-term recommendations of the NRC. As suggested by the NRC, the phased-revision approach will satisfy the short-term needs of current users while moving forward with the more substantial revisions which will be addressed in future revisions. This revision includes updated and modified MEGs for many chemicals and additional user clarifications. Future revisions will include additional updates to MEGs along with more detailed information regarding uncertainties and health endpoints. Section 1.4.3 provides more details related to revisions and future plans.

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APPENDIX A

REFERENCES

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APPENDIX B

LIST OF ACRONYMS, HEALTH EFFECTS DESCRIPTIONS, AND TARGET ORGANS/SYSTEMS

CONTENTS

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Table B-1. Acronym List

Acronym	Full Name
µci/L	microcurie per liter
µg/dL	microgram per decaliter
µg/kg	microgram per kilogram
µg/L	microgram per Liter
µg/m³	microgram per cubic meter
µg/mg	microgram per milligram
µm	micrometer
ABS	dermal absorption fraction for soil
ABSGI	gastrointestinal absorption rate
ACGIH	American Conference of Governmental Industrial Hygienists
ADP	agent degradation product
AEGL	Acute Exposure Guideline Level
AEL	Airborne Exposure Limit
AF	soil-to-skin adherence factor
AFs/d	soil/dust absorption
Ah	Aryl hydrocarbon
AIHA	American Industrial Hygiene Association
Al	aluminum
ALM	adult lead model
AMEDD	Army Medical Department
AMEDD	US Army Medical Department
AMEG	Air Military Exposure Guideline
AO	area of operation
AOR	area of responsibility
AQI	air quality index
As	arsenic
AT	averaging time
ATca	averaging time for carcinogens
ATnc	averaging time for non-carcinogens
ATSDR	Agency for Toxic Substances and Disease Registry
Ba	barium
BDU	battle dress uniform

Table B-1. Acronym List

Acronym	Full Name
BEI	biological exposure index
BW	body weight
C	ceiling limit
Ca	calcium
ca	cancer
CASRN	Chemical Abstract Service Registry Number
Cat	catastrophic
CBRN	Chemical, Biological, Radiological, and Nuclear
Cd	cadmium
CDC	Centers for Disease Control and Prevention
CEGL	Continuous Exposure Guidance Level
CENTCOM	Central Command
CF	conversion factor
CFR	Code of Federal Regulations
chr	chronic
cm	centimeter
cm/L	centimeter per liter
cm^2	square centimeter
cm^2/sec	square centimeter per second
cm^3	cubic centimeter
cm^3/day	cubic centimeter per day
cm^3/g	cubic centimeter per gram
cm^3/hr	cubic centimeter per hour
cm^3/kg	cubic centimeter per kilogram
CN	cyanide
CN/L	cyanide per liter
CO	carbon monoxide
CO2	carbon dioxide
COA	course of action
CONUS	continental United States
COPD	chronic obstructive pulmonary disease
COT	Committee on Toxicology

Table B-1. Acronym List

Acronym	Full Name
Crit	critical
CRM	composite risk management
CSF	cancer slope factor
CSFabs	dermal absorption cancer slope factor
CSFi	inhalation cancer slope factor
CSFo	oral cancer slope factor
CWA	chemical warfare agent
DA	apparent diffusivity
DA	Department of the Army
DA Pam	Department of the Army Pamphlet
DATSD-CBD	Deputy Assistant to the Secretary of Defense Chemical and Biological (Warfare
DIMP	diisopropyl methylphosphate
DL	detection limit
DMDC	Defense Manpower Data Center
DNBI	disease and non-battle injuries
DOD	Department of Defense
DODI	Department of Defense Instruction
DODVSA	Department of Defense Veterinary Service Activity
DOE	U.S. Department of Energy
DOEHRS	Defense Occupational Environmental Health Readiness System
EC	effective concentration
ECt01_severe	exposure concentration causing severe effects in 1 percent of the given populati
ECt50_mild	exposure concentration causing mild effects in 50 percent of the given population
ECt50_severe	exposure concentration causing severe effects in 50 percent of the given populat
ED	exposure duration
ED01	effective dose causing effects in 1 percent of the given population
ED50	effective dose causing effects in 50 percent of the given population
EEGL	Emergency Exposure Guidance Level
EF	exposure frequency
EGL	exposure guidance level
EPA	U.S. Environmental Protection Agency
EPMSP	Enhanced Particulate Matter Surveillance Program

Table B-1. Acronym List

Acronym	Full Name
ERPG	Emergency Response Planning Guideline
EV	event frequency
FDA	U.S. Food and Drug Administration
Fe	iron
FHP	Force Health Protection
FI	fraction ingested
FM	Field Manual
g/m²	grams per square meter
g/mol	grams per mole
GA	tabun
GB	sarin
GD	soman
GF	cyclosarin
GI	gastrointestinal
GPL	general population limit
HA	drinking water health advisory
HAadj	adjusted drinking water health advisory
HAH	halogenated aromatic hydrocarbon
HBESL	Health-Based Environmental Screening Levels
HC	hexachloroethane
HCN	hydrogen cyanide
HD	sulfur mustard
HEAST	Health Effects Assessment Summary Tables
HQ	hazard quotient
HQDA	Headquarters Department of the Army
hr	hour
HSDB	Hazardous Substance Databank
IARC	International Agency for Research on Cancer
IDA	Institute for Defense Analysis
IDLH	Immediately Dangerous to Life and Health
IED	improvised explosive device
IMP	isopropyl methylphosphonate

Table B-1. Acronym List

Acronym	Full Name
IMPA	isopropyl methyl phosphonic acid
inter	intermediate
IOM	Institute of Medicine
IPB	Intellegence Preparatin of the Battlefield
IR	inhalation rate
IRA	adult inhalation rate
IRa	inhalation rate
IRIS	Integrated Risk Information System
IRM	military inhalation rate
IRR	residential inhalation rate
IRs	soil ingestion rate
IRw	drinking water ingestion rate
IUPAC	International Union of Pure and Applied Chemistry
JP	joint publication
K	potassium
Kd	soil-water partition coefficient
kg	kilogram
kg/m³	kilogram per cubic meter
L	liter
L/day	liter per day
LC	lethal concentration
LC01	statistically determined lethal concentration for 1 percent of the exposed populati
LC50	statistically determined lethal concentration for 50 percent of the exposed popula
LCLO	lowest lethal concentration
LCt	lethal concentration
LCt16	lethal concentration in 16 percent of a given population
LOAEL	lowest-observed adverse effect level
LOD	limit of detection
LOQ	limit of quantification
LTP	Long Term Potability Standards
m/hr	meters per hour
m/s	meters per second

Table B-1. Acronym List

Acronym	Full Name
m^3/day	cubic meter per day
m^3/hr	cubic meter per hour
m^3/kg	cubic meter per kilogram
Marg	marginal
MAX	maximum soil concentration
MCL	maximum contaminant level
MCLG	Maximum Contaminant Level Goal
MDL	method detection limit
MEG	Military Exposure Guideline
METT-TC	Mission, Enemy, Terrain and Weather, Troops, Time, Civilian Considerations
MFWS	Military Field Water Standards
Mg	magnesium
mg/cm^2	milligram per square centimeter
mg/day	milligram per day
mg/kg	milligram per kilogram
mg/kg-day	milligram per kilogram per day
mg/L	milligram per liter
mg/m^3	milligram per cubic meter
MIL-STD	Military Standard
MOPP	mission oriented protective posture
MPA	methyl phosphonic acid
MRL	Minimal Risk Level
MSSL	medium specific screening levels
MW	molecular weight
NA	not applicable
NAAQS	National Ambient Air Quality Standards
NAPL	non-aqueous phase liquid
nc	non-cancer
NCEA	National Center for Environmental Assessment
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
Neg	negligible

Table B-1. Acronym List

Acronym	Full Name
NG	National Guard
NIOSH	National Institute of Occupational Safety and Health
NLM	National Library of Medicine
NMCPHC	Navy and Marine Corps Public Health Center
NO	nitric oxide
NO2	nitrogen dioxide
NOAEL	no-observable adverse effect level
NOx	oxides of nitrogen
NRC	National Research Council
NRC/COT	National Research Council Committee on Toxicology
NSTC	National Science and Technology Council
NSTC/PRD 5	National Science and Technology Council/Presidential Review Directive 5
NTU	nephelometric turbidity units
O3	ozone
OAQPS	EPA Office of Air Quality Planning and Standards
OCONUS	outside the continental United States
OEF	Operation Enduring Freedom
OEH	occupational and environmental health
OIF	Operation Iraqi Freedom
ORD	EPA Office of Research and Development
ORISE	Oak Ridge Institue for Science and Education
ORM	Operational Risk Management
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PbB1	background blood lead concentration in adult male
PbB2	target blood lead level
PCB	polychlorinated biphenols
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzofuran
PEF	soil particulate emmission factor

Table B-1. Acronym List

Acronym	Full Name
PEGL	permissible exposure guidance level
PEL	Permissible Exposure Limit
PEPC	population exposure point concentration
PHC	Public Health Command
PM	particulate matter
PM10	particles with an aerodynamic diameter 10 microns or smaller
PM2.5	particles with an aerodynamic diameter 2.5 microns or smaller
PMEG	preliminary 1-year AMEG
PNOR	particles not otherwise regulated
PNOS	Particles (insoluable or poorly soluable) not otherwise specified
PPEGL	permissible public exposure guidance level
ppm	parts per million
PPRTV	Provisional Peer Reviewed Toxicity Values
PRD	Presidential Review Directive
PRG	Preliminary Remediation Goal
PTE	population threshold estimate
RAGS	Risk Assessment Guidance for Superfund
Rb	rubidium
RBC	Risk-Based Concentration
RD	reference document
RDX	cyclotrimethylenetrinitramine
REGL	repeated exposure guidence level
REL	Recommended Exposure Limit
RfC	reference concentration
RfCchr	chronic reference concentration
RfCsub	subchronic reference concentration
RfD	reference dose
RfDabs	dermal absorption reference dose
RfDo	oral reference dose
RL	reporting limit
RPEGL	repeated public exposure guidance level
RSC	relative source contribution

Table B-1. Acronym List

Acronym	Full Name
S	water solubility
SA	skin surface area
SAT	soil saturation concentration
Sb	antimony
SCAPA	Subcommittee on Consequence Assessment and Protective Actions
sec/hr	seconds per hour
Si	silicon
SMEG	Soil Military Exposure Guideline
SO2	sulfur dioxide
SOH	DOD Safety and Occupational Health Program
SOx	sulfur oxides
SPEGL	Short-Term Public Emergency Guidance Level
Sr	strontium
SRC	Syracuse Research Corporation
SSL	soil screening level
STANAG	Standardization Agreement
STEL	short-term exposure limit
STP	Short Term Potability Standards
sub	subchronic
SVOC	semi-volatile organic compound
TB MED	Technical Bulletin, Medical
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
TCR	target cancer risk
TDS	total dissolved solids
TEEL	Temporary Emergency Exposure Limits
TEF	toxicity equivalence factor
TEQ	toxicity equivalence
TG	technical guide
THQ	target hazard quotient
Ti	titanium
TIC	toxic industrial chemical
TIM	toxic industrial material

Table B-1. Acronym List

Acronym	Full Name
TLV®	threshold limit value
TLVadj	adjusted threshold limit value
TLVc	threshold limit value ceiling limit
TMM	Textbook of Military Medicine
TPH	total petroleum hydrocarbon
TRW	Technical Review Workgroup
TSFWS	Tri-Service Field Water Standard
TSP	total suspended particulate
TWA	time-weighted average
UF	uncertainty factor
UR	unit risk factor
URF	unit risk factor
URFi	inhalation unit risk factor
URFo	oral unit risk factor
URi	inhalation unit risk factor
URo	oral unit risk factor
USACASCOM	US Army Combined Arms Support Command
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAMEDD	US Army Medical Department
USAPHC	U.S. Army Public Health Command
USARIEM	U.S. Army Research Institute of Environmental Medicine
USCENTCOM	US Central Command
V	vanadium
VF	soil-to-air volatilization factor
VOC	volatile organic compound
VX	nerve agent VX
WHO	World Health Organization
WMEG	Water Military Exposure Guideline
WOE	weight-of-evidence
WPL	worker population limit
yr	year
Zn	zinc

Table B-1. Acronym List

Acronym	Full Name
ZnCl2	zinc chloride
Zr	zirconium

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
abdom	abdominal	The part of the body occupying the space between the chest and the pelvis.
abnor	abnormal/abnormalities	Not conforming to type or standard.
	acidosis	Decrease of alkali in the blood, which may result in a decrease in the pH. Symptoms include very deep respirations, dehydration, drowsiness, stupor, or coma.
album	albuminuria	The finding of albumin on urine analysis, which may indicate kidney disease.
	alopecia	Loss of hair (in humans), wool or feathers (in animals).
	analgesia	Insensibility to pain without loss of consciousness.
	anemia	A condition in which the blood is deficient in red blood cells, in hemoglobin, or in total volume.
anes	anesthesia	Loss of sensation, usually produced in order to permit a painless surgical operation.
	angina	A disease marked by spasmodic attacks of intense suffocative pain; often of the chest and as a result of coronary artery spasm.
anor	anorexia	Lack or loss of the appetite for food.
anos	anosmia	Loss of the sense of smell.
	anoxia	Lack of oxygen.
	anuria	Complete urinary suppression or failure of kidney function.
anxi	anxiety	Fear, apprehension.
	aphonia	Loss of voice and of all but whispered speech.
	aplastic	Pertaining to a anatomical undevelopment or organs or cells; aplastic anemia is a condition in which the bone marrow may not be producing adequate numbers of blood elements.
	apnea	Transient cessation of respiration.
arrhy	arrhythmias	Lack of rhythm, applied especially to irregularities of heart beat.
	asbestosis	A pneumoconiosis due to asbestos particles.
asphy	asphyxia	Suffocation.
aspir	aspiration	Sucking up a fluid or solid into the respiratory tract.
	asthenia	Lack or loss of strength.
	asthma	A condition often of allergic origin that is marked by continuous or paroxysmal labored breathing accompanied by wheezing, by a sense of constriction in the chest, and often by attacks of coughing or gasping.
	ataxia	Inability to coordinate muscles in movement.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	atrophy	Decrease in size or wasting away of a body part or tissue.
	azotemia	An excess of urea and other nitrogenous waste in the blood resulting from kidney damage or failure.
	berylliosis	Poisoning resulting from exposure to fumes and dusts of beryllium compounds or alloys and occurring chiefly as an acute pneumonitis or as a granulomatosis involving esp. the lungs.
	blepharospasm	A twitching or spasmodic contraction of eyelid.
BP	blood pressure	The force or pressure exerted by the heart in pumping blood from its chambers.
	bradycardia	Abnormally slow heartbeat below a rate of 60 beats per minute.
breath	breath/breathing	Air which is inhaled and exhaled.
bron	bronchitis	Inflammation of the bronchial tubes.
	byssinosis	An occupational respiratory disease associated with inhalation of cotton, flax, or hemp dust and characterized initially by chest tightness, shortness of breath, and cough, and eventually by irreversible lung disease -- called also brown lung.
	cachexia	A state of ill health, malnutrition and wasting.
	calcification	The deposit of calcium in tissues of the body.
carc	carcinogen	Potential occupational carcinogen.
card	cardiac	Relating to the heart.
	casts	Usually renal casts, found in the urine (can denote kidney disease).
	chloracne	Acne-like disruptions over the body resulting from exposure to certain chlorinated hydrocarbons such as dioxins.
	cholestasis	Blockage of the flow of bile resulting in increases of bilirubin in the blood.
chol	cholinesterase	An enzyme that breaks down the neurotransmitter acetylcholine to stop its action.
ChE Inh	cholinesterase inhibitor	
	chorea	A nervous disease characterized by involuntary and irregular movements of the muscles of the limbs and face.
cirr	cirrhosis	An inflammatory disease of the liver associated with the replacement of liver cells by fibrous tissue.
	clonic	Referring to jerky muscle contractions or spasms.
	colic	Severe abdominal pain.
conc	concentration	The total quantity of a substance present in a given volume of a gas or liquid.
conf	confusion	A mental state marked by mingling of ideas and feelings resulting in disorientation and inability to resolve a problem.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
conj	conjunctivitis	Inflammation of the mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball.
constip	constipation	Difficult bowel evacuation, occurring at prolonged intervals.
convuls	convulsions	A violent, uncontrolled muscle spasm, or a series of them, sometimes repeated at rapid intervals.
corn	corneal	The tissue that covers the pupil and iris of the eye.
	coryza	The common cold; acute rhinitis.
cyan	cyanosis	Bluish discoloration of the skin, caused by inadequate oxygenation of the blood.
	cystitis	Inflammation of the urinary bladder; accompanied by pain and frequency of urination.
decr	decreased	
depres	depressed/depression	Dejection; melancholia.
derm	dermatitis	Inflammation of the skin.
	desquamation	Shedding of outer layer of skin.
diarr	diarrhea	Increased frequency and liquid consistency of the stools.
dist	disturbance	
	diuresis	An increased excretion of urine.
dizz	dizziness	The condition of being dizzy; a sensation of unsteadiness accompanied by a feeling of movement within the head.
drow	drowsiness	
	dysphagia	Difficulty in swallowing.
	dysphonia	Difficulty in speaking; hoarseness.
dysp	dyspnea	Breathing difficulty.
	dysuria	Impaired ability to pass urine.
	ectopic	Occuring in an abnormal position.
	eczema	An inflammatory condition of the skin characterized by redness, itching, and oozing vesicular lesions which become scaly, crusted, or hardened.
	edema	An abnormal excess accumulation of serous fluid in connective tissue or in a serous cavity.
EKG	electrocardiogram	The recording of the electrical impulses of the heart.
EEG	electroencephalogram	Tracing of brain waves produced by an encephalograph (an apparatus for detecting and recording brain waves).

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
emphy	emphysema	A condition in which the air spaces in the lungs are enlarged.
	encephalopathy	A disease of the brain.
eosin	eosinophilia	An abnormally large number of eosinophils (red staining white blood cells) in the circulating blood.
	epigastric	Refers to the upper central portion of the abdomen between the lower ribs and the umbilicus (belly button).
epilep	epileptiform	Resembling that of epilepsy.
epis	epistaxis	Nose bleed.
equi	equilibrium	Balance.
eryt	erythema	Skin redness.
euph	euphoria	An exaggerated state of well-being.
	exertional	Referring to a conditon that develops upon the act, or following the expenditure, of effort.
	expectoration	The act or an instance of expectorating (to eject matter from the throat or lungs by coughing or hawking and spitting).
	extrasystoles	A heartbeat occurring before its normal time; extrasystoles create an irregular rhythm, commonly referred to as a "skipped beat".
fail	failure	A state of inability to perform a vital function.
fasc	fasciculation	A small local contraction of muscles; visible through the skin.
ftg	fatigue	Tiredness; weariness; exhaustion.
fib	fibrosis	Replacement of the normal components of a structure by fibrous tissue.
	flush	To blush, to become red; to cleanse a wound by dowsing it with water or salt solution.
FEV	forced expiratory volume	
func	function	Any of a group of related actions contributing to a larger action.
	gastritis	Inflammation esp. of the mucous membrane of the stomach.
	gastroenteritis	Inflammation of the stomach and intestines, usually accompanied by vomiting and diarrhea.
	gingival	Referring to the gums; the tissue surrounding the teeth.
	goiter	An enlargement of the thyroid gland that is commonly visible as a swelling of the anterior part of the neck.
	granuloma	A mass or nodule of chronically inflamed tissue with granulations that can be associated with an infective process, trauma, presence of a foreign body (e.g., talc, oil, beryllium), or exposure to certain salts.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	granulomatous pneumonitis	Inflammation of the lung which may result from inhalation of organic dusts by persons sensitized to antigens in the dusts ("farmer's lung").
halu	hallucinations	Imagined or false sense perception.
head	headache	Pain in the head.
	hematoma	A mass of usually clotted blood that forms in a tissue, organ, or body space as a result of a broken blood vessel; "blood blister".
hemato	hematopoietic	The formation of blood or blood cells in the body.
hema	hematuria	Blood in the urine.
	hemoglobinuria	The presence of hemoglobin the urine.
	hemolysis	Destruction of red blood cells and escape of the hemoglobin within the bloodstream.
	hemolytic anemia	Abnormal destruction of red blood cells resulting in a decrease in the number of cells in the blood and presence of free hemoglobin, which can lead to acute renal failure.
	hemoptysis	Spitting of blood arising from hemorrhage of the larynx, trachea, bronchial tubes, or lungs.
hemorr	hemorrhage	Escape of blood from the blood vessels,
	hepatitis	Inflammation of the liver.
	hyperkeratosis	Overgrowth of the of the horny layer of the skin (stratum corneum); can also be an overgrowth of the tissue covering the pupil of the eye (cornea).
hyperpig	hyperpigmentation	Excess pigmentation in a bodily part or tissue (as the skin).
	hyperplasia	Abnormal but non-cancerous increase in the number of cells in a tissue or organ.
	hyperpnea	Abnormally rapid or deep breathing.
	hyper-reflexia	Over-activity of physiological reflexes.
	hypertension	Elevated blood pressure.
	hyperthermia	Elevated body temperature.
	hypochromic	Deficiency of color or pigmentation; deficiency of hemoglobin in the red blood cells.
	hypokalemia	A deficiency of potassium in the blood.
	hypotension	Reduced blood pressure.
	hypothermia	Decreased body temperature.
hypox	hypoxemia	Reduced oxygen in the blood.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	immunosuppression	Suppression of the immunologica response, leading to decreased resistance to disease.
inco	incoordination	Lack of coordination; inability to control muscle activity.
incr	increased	
inebri	inebriation	Drunkenness.
inflamm	inflammation	The reaction of tissues to injury; manifested by pain, heat, swelling, and redness.
ing	ingestion	To eat.
inh	inhalation	The act of breathing in.
inj	injury	Hurt, damage, or loss sustained.
insom	insomnia	Sleeplessness.
irreg	irregular/irregularities	Lacking perfect symmetry of form.
irrity	irritability	The property of protoplasm and of living organisms that permits them to react to stimuli.
irrit	irritation	A condition of inflammation, soreness, or irritability of a bodily organ or part.
jaun	jaundice	A yellow staining or darkening of the skin, whites of the eyes, and excreta due to increased bile pigments in the blood and tissues.
kera	keratitis	Inflammation of the cornea.
kerato-conj	keratoconjunctivitis	Combined inflammation of the cornea and conjunctiva.
lac	lacrimation	Discharge of tears.
	larnygitis	Inflammation of the larynx.
lar	laryngeal	Of, relating to, affecting, or used on the larynx.
lass	lassitude	Weakness, exhaustion.
	leucoplakia	A condition commonly considered precancerous in which thickened white patches of epithelium occur on the mucous membranes esp. of the mouth, vulva, and renal pelvis.
leucyt	leukocytosis	Increased blood leukocytes.
leupen	leukopenia	Reduced blood leukocytes.
liq	liquid	Flowing freely in a manner similar to that of water; neither solid nor gaseous.
local	localized	Occurs at the site of bodily contact.
	lymphocytosis	An increase in the number of lymphocytes in the blood usually associated with chronic infections or inflammations.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
mal	malaise	Vague feeling of discomfort.
malnut	malnutrition	State of being undernourished or poorly nourished.
	mania	Excitement of psychotic proportions manifested by mental and physical hyperactivity, disorganization of behavior, and elevation of mood.
methemo	methemoglobinemia	Condition in which the oxidation state of iron in hemoglobin is abnormal leading to decreased availability of oxygen to the body tissues.
	miosis	Contraction of the pupil (pin-pointed pupil).
	monocytosis	Excessive number of monocytes (a type of white blood cell) in the blood.
	mucosa	Mucous membrane; membrane lining bodily channels that communicate with air (i.e., mouth, respiratory tract, eye); glands of mucous membranes secrete mucous.
muc memb	mucous membrane	A surface membrane composed of cells which secrete various forms of mucus.
musc	muscle	Tissue composed of fibers which have the ability to elongate and shorten, thus causing bones and joints to move.
	myalgia	Pain in one or more muscles.
	mydriasis	Dilation of the pupil.
	myocardial	Of, relating to, or involving the myocardium (the middle muscular layer of the heart wall).
	myoclonic	Of, relating to, characterized by, or being myoclonus (seizures).
narco	narcosis	Stupor or deep unconsciousness; can be caused by exposure to a number of chemicals. Differs from anesthesia which refers to the loss of sensation (e.g., pain) or touch and can be local or general.
nau	nausea	The feeling that one may vomit.
nec	necrosis	Death of tissue.
neph	nephritis	Inflammation of the kidneys.
numb	numb/numbness	Diminished sensation.
	ochronosis	A metabolic condition associated with brown discoloration of the facial skin, whites of the eyes, and tissues of the muscle and cartilage.
opac	opacity	The quality of not being transparent.
	pallor	Paleness of the skin.
	palmar/plantar hyperkeratoses	An overgrowth of the horny layer of skin (stratum corneum) found on either the palm of the hand (palmar) or the sole of the foot (plantar).

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
palp	palpitations	Perceptible irregular or rapid beating or pulsation of the heart.
	palsy	Nerve paralysis or degeneration; a common manifestation is trembling of the hands.
	papule	A small solid usually conical elevation of the skin caused by inflammation, accumulated secretion, or overgrowth of tissue elements.
para	paralysis	Inability to use muscles because of disease or injury of the nerves which supply them.
	paresis	Slight or partial paralysis.
pares	paresthesia	Burning prickling, tingling, or tickling sensation.
	paroxysmal	Recurring in sudden, periodic attacks or intensification of symptoms of a disease.
perf	perforation	Pierced, ruptured; having a hole through it.
periorb	periorbital	Situated around the eye.
peri neur	peripheral neuropathy	Abnormal state of the nerves supplying the hands, arms and legs, and other areas outside of the central nervous system.
phar	pharyngeal	Relating to or located in the region of the pharynx.
photo	photophobia	Abnormal visual intolerance to light.
	pneumoconiosis	A disease of the lungs caused by the habitual inhalation of irritants (as coal dust).
pneu	pneumonitis	Inflammation of the lung.
polyneur	polyneuropathy	Disease involving a number of peripheral nerves (e.g., nerves in the hands, feet or legs).
	polyuria	Excessive secretion of urine.
	porphyria	A metabolic (often hereditary) condition oten characterized by skin photosensitivity and lesions, abdominal colic, mental disturbance, etc.
	porphyria cutanea tarda	A metabolic disorder in which reddish pigments or porphyrins are produced in the liver. The excess pigments accumulate in the skin where they are activated by visible light which causes photosensitive skin reactions characterized by skin erosions and blistering. These painful sores resolve slowly and may result in scarring, hair loss, and skin atrophy. Excess porphyrins are excreted in the urine which becomes colored dark red or brown as a result.
	precordial	Pertaining to the region over the heart and lower part of the thorax.
	prostration	Marked loss of strength; exhaustion.
prot	proteinuria	Albuminuria; the appearance of any protein in the urine.
	pruritus	Localized or generalized itching due to irritation of sensory nerve endings from organic or psychogenic causes.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	ptosis	Medical term for a drooping eyelid.
pulm	pulmonary	Pertaining to the lungs.
	pulmonary edema	Buildup of fluid in the lung.
	pulsus alternans	Alternation of strong and weak beats of the arterial pulse due to alternate strong and weak ventricular contractions.
	rales	An abnormal sound heard accompanying the normal respiratory sounds during stethoscopic examination of the chest.
RBC	red blood cell	Any of the hemoglobin-containing cells that carry oxygen to the tissues and are responsible for the red color of blood.
repro	reproductive	The act or process of reproducing.
resp	respiratory/respiration	Breathing.
restless	restlessness	Deprived of rest or sleep.
retster	retrosternal	Occurring behind the sternum.
	rhinitis	Inflammation of the mucous membrane of the nose.
rhin	rhinorrhea	Discharge of thin nasal mucus.
salv	salivation	Excess secretion of saliva from the various salivary glands.
	scotomas	Blind or dark spots in the visual field.
sens	sensitization	The action or process of making sensitive or hypersensitve.
short	shortness	
	silicosis	A chronic fibrous lung condition found among miners who have inhaled silicon dust over a period of years.
	sinusitis	Inflammation of a sinus of the skull.
con	skin and/or eye contact	
sneez	sneezing	To make a sudden violent spasmodic audible expiration of breath through the nose and mouth esp. as a reflex act following irritation of the nasal mucous membrane.
sol	solid	A substance that does not flow perceptibly under moderate stress; neither gaseous nor liquid.
soln	solution	The mixture of a solid, liquid or gas with another liquid.
	spasticity	Hypertonicity of muscles causing stiff and awkward movements.
	spermatogenesis	Development of sperm cells.
	sputum	Expectorated matter made up of saliva and often discharges from the respiratory passages.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	stannosis	Benign pneumoconiosis due to the inhalation of tin oxide; it is symptomless unless accompanied by silicosis.
	stenosis	Constriction or narrowing of a passage or orifice.
	stomatis	Inflammation of the mucous membranes of the mouth.
	strabismus	Inability of one eye to attain binocular vision with the other because of imbalance of the muscles of the eyeball ("cross-eye," "squint").
	stupor	A condition of greatly dulled or completely suspended sense or sensibility.
subs	substernal	Occurring beneath the sternum.
sweat	sweating	To excrete moisture in visible quantities through the opening of the sweat glands.
swell	swelling	To become distended or puffed up.
	syncope	A transient form of unconsciousness during which the person slumps to the ground resulting from cerebral anoxia (insufficient oxygen in the brain).
sys	system	A set of organs performing one main function.
tacar	tachycardia	Excessive rapidity in the action of the heart.
	tachypnea	Increased rate of respiration.
tend	tenderness	Pain on touching a part.
terato	teratogenic	Of, relating to, or causing malformations of an embryo or fetus.
throb	throbbing	To pulsate or pound esp. with abnormal force or rapidity.
tight	tightness	
	tinnitus	Noise (typically ringing) in the ears.
	tonic	Characterized by tonus (contraction of muscle); marked by or being prolonged muscular contraction.
twitch	twitching	A short spastic contraction of muscle fibers.
	ulcer	A break in skin or mucous membrane with loss of surface tissue.
uncon	unconsciousness	Asleep, or in a coma, or under anesthesia.
UT	urogenital tract	Denotes the organs involved in reproduction and urination.
	vacuolization	The development or formation of vacuoles (small cavity or space in the tissues of an organism containing air or fluid).
vap	vapor	A substance in the gaseous state as distinguished from the liquid or solid state.
	vascular thrombus	A blood clot within a blood vessel.

Table B-2. Health Effects Acronyms and Descriptions

Acronym	Full Name	Description
	ventricular fibrillation	Rapid contractions or twitching of the muscle fibers that replace normal contraction of the ventricular chambers of the heart.
	vertigo	Dizziness; sense of spinning.
vesic	vesiculation	Formation of a small blister-like small elevation on the skin containing serous fluid.
vis	visual	Of, relating to, or used in vision.
vomit	vomiting	To throw up the contents of the stomach.
weak	weak/weakness	
low-wgt	weight loss	
wheez	wheezing	Noisy or difficult breathing.

Table B-3. Target Organs and Systems

Target System: ALA **System Description:** Alimentary accessory organs

Target Organ	Organ Description
Gall bladder	
Liver	
Pancreas	
Salivary Glands	
Teeth	
Tongue	

Target System: ALM **System Description:** Alimentary system

Target Organ	Organ Description
Alimentary system - unspecified	
Anal canal	
Esophagus	
GI tract - unspecified	Unspecified target in the gastrointestinal tract
Large intestine	
Mouth/palate	
Pharynx	
Rectum	
Small intestine	
Stomach	

Target System: END **System Description:** Endocrine system

Target Organ	Organ Description
Adrenal glands	
Chromaffin systems/cells	
Hormones - unspecified	
Hypothalamus	
Neurosecretory systems/cells	
Other ducted glands	
Pancreas	
Parathyroid glands	
Pineal glands	
Pituitary glands	
Thyroid	
Thyroid glands	

Target System: HML **System Description:** Haemolymphoid system

Target Organ	Organ Description
Arterial system	
Blood	
Blood vessels	
Bone marrow	
Capillaries	
Circulatory system - unspecified	

Table B-3. Target Organs and Systems

CVS - unspecified	Unspecified target in the cardiovascular system
Heart	
HML - unspecified	Unspecified target in the haemolymphoid system
HMP system - unspecified	Unspecified target in the haematopoietic system
IMM system - unspecified	Unspecified target in the immune system
LYMP system - unspecified	Unspecified target in the lymphatic system
Lymph	
Lymph nodes/tissues	
Lymphatic vessels	
Lymphoid cells	
Platelets	
RBC	Red blood cells
Spleen	
Thoracic duct	
Thymus	
Venous system	
WBC	White blood cells

Target System: INT **System Description:** Integumental system

Target Organ	Organ Description
Breasts	
Eyes	
Hair	
Nails	
Skin	

Target System: MUS **System Description:** Muscular system

Target Organ	Organ Description
Muscles (non-heart)	

Target System: None **System Description:** No target system, general or no effects

Target Organ	Organ Description
None	None reported
Whole body	Non-specific general effects

Target System: NVS **System Description:** Nervous system

Target Organ	Organ Description
Brain	
CNS - unspecified	Unspecified target in the central nervous system
Nerves	
Nervous system - unspecified	
PNS - unspecified	Unspecified target in the peripherial nervous system
Special senses app.-sight, hearing	
Spinal cord	

Table B-3. Target Organs and Systems

Target System: RPR **System Description:** Reproductive system

Target Organ	Organ Description
Conceptuses/Fetuses	
Developmental - generic	
Female reproduction - unspecified	
Male reproduction - unspecified	
Male supporting structures	
Oocytes	
Ovaries	
Prostrate	
Reproductive - unspecified by gen	
Sperm	
Testes	
Urethra	
Uterus	
Vagina	

Target System: RSP **System Description:** Respiratory system

Target Organ	Organ Description
Bronchi	
Larynx	
Lungs	
Nasal-pharynx	
Nose	
Paranasal sinuses	
Respiration - unspecified	
Trachea	

Target System: SKE **System Description:** Skeletal system

Target Organ	Organ Description
Bone	
Cartilage	
Connective tissue	
Ligaments	

Target System: URI **System Description:** Urinary system

Target Organ	Organ Description
Bladder	
Kidneys	
Ureters/urethra	

APPENDIX C

HEALTH CRITERIA (OR EXPOSURE VALUES) USED FOR DEVELOPING THE LONG-TERM MEGS

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Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Acenaphthene	83-32-9		6.0E-01	IRIS_sub						
Acephate	30560-19-1	C	4.0E-03	HEAST_sub	8.7E-03	IRIS				
Acetaldehyde	75-07-0	B2					9.0E-02	IRIS_sub	2.2E-06	IRIS
Acetochlor	34256-82-1		2.0E-02	IRIS_chr						
Acetone	67-64-1	IN	2.7E+00	IRIS_sub			3.1E+01	MRL_inter		
Acetone cyanohydrin	75-86-5	IN	3.0E-02	PPRTV_sub			6.0E-02	PPRTV_sub		
Acetonitrile	75-05-8	D	6.0E-02	HEAST_sub			6.0E-02	IRIS_chr		
Acetophenone	98-86-2	D	1.0E+00	IRIS_sub						
Acifluorfen-sodium	62476-59-9		1.3E-02	IRIS_chr						
Acrolein	107-02-8	IN	4.0E-03	MRL_inter			2.0E-04	IRIS_sub		
Acrylamide	79-06-1	B2	2.0E-03	MRL_inter	5.0E-01	IRIS	6.0E-03	IRIS_chr	1.0E-04	IRIS
Acrylic acid	79-10-7		5.0E-01	HEAST_sub			3.0E-03	IRIS_sub		
Acrylonitrile	107-13-1	B1	1.0E-02	MRL_inter	5.4E-01	IRIS	5.0E-01	HEAST_sub	6.8E-05	IRIS
Adipic acid	124-04-9		2.0E+00	PPRTV_sub						
Adiponitrile	111-69-3	D					6.0E-02	PPRTV_sub		
Alachlor	15972-60-8	B2	1.0E-02	HEAST_sub	8.0E-02	HEAST				
Alar	1596-84-5		1.5E-01	IRIS_chr						
Aldicarb	116-06-3	D	1.0E-03	HEAST_sub						
Aldicarb sulfone	1646-88-4		1.0E-03	IRIS_chr						
Aldrin	309-00-2	B2	4.0E-05	PPRTV_sub	1.7E+01	IRIS			4.9E-03	IRIS
Ally	74223-64-6		2.5E-01	IRIS_chr						
Allyl alcohol	107-18-6		4.0E-03	PPRTV_sub			1.0E-03	PPRTV_sub		
Allyl chloride	107-05-1	C					1.0E-02	IRIS_sub		

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Aluminum phosphide	20859-73-8		4.0E-04	HEAST_sub						
Aluminum, elemental	7429-90-5	D					5.0E-03	PPRTV_chr		
Amdro	67485-29-4		3.0E-03	IRIS_sub						
Ametryn	834-12-8		9.0E-02	IRIS_sub						
Aminodinitrotoluenes	1321-12-6									
Aminophenol, 3-	591-27-5		3.0E-01	PPRTV_sub						
Aminophenol, 4-	123-30-8		2.0E-01	PPRTV_sub						
Aminopyridine, 4-	504-24-5	D	2.0E-04	HEAST_sub						
Amitraz	33089-61-1		2.5E-03	IRIS_chr						
Ammonia	7664-41-7	IN					1.0E-01	PPRTV_sub		
Ammonium perchlorate	7790-98-9	NO	7.0E-04	IRIS_chr						
Ammonium sulfamate	7773-06-0		2.0E+00	IRIS_sub						
Aniline	62-53-3	B2			5.7E-03	IRIS	1.0E-02	IRIS_sub		
Anthracene	120-12-7	D	1.0E+00	PPRTV_sub						
Antimony pentoxide	1314-60-9		5.0E-04	HEAST_sub						
Antimony potassium tartrate	28300-74-5		9.0E-04	HEAST_sub						
Antimony tetroxide	1332-81-6		4.0E-04	HEAST_sub						
Antimony trioxide	1309-64-4		5.0E-01	PPRTV_sub			2.0E-04	PPRTV_sub		
Antimony, elemental	7440-36-0		4.0E-04	PPRTV_sub						
Apollo	74115-24-5	C	1.3E-02	IRIS_chr						
Aramite	140-57-8	B2	1.0E-01	HEAST_sub	2.5E-02	IRIS			7.1E-06	IRIS
Aroclor 1016	12674-11-2		2.1E-04	IRIS_sub						
Aroclor 1254	11097-69-1		6.0E-05	IRIS_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Arsenic, elemental	7440-38-2	A	3.0E-04	IRIS_chr	1.5E+00	IRIS			4.3E-03	IRIS
Arsine	7784-42-1						5.0E-05	IRIS_chr		
Asbestos	1332-21-4	A							2.3E-01	IRIS
Assure	76578-14-8	D	9.0E-03	IRIS_chr						
Asulam	3337-71-1		5.0E-02	IRIS_chr						
Atrazine	1912-24-9	C	3.0E-03	MRL_inter	2.2E-01	HEAST				
Avermectin B1	65195-55-3		4.0E-04	IRIS_chr						
Azinphos methyl	86-50-0		3.0E-03	MRL_inter			1.0E-02	MRL_inter		
Azobenzene	103-33-3	B2			1.1E-01	IRIS			3.1E-05	IRIS
Barium, elemental	7440-39-3	D	7.0E-02	HEAST_sub			5.0E-03	HEAST_sub		
Baygon	114-26-1		4.0E-03	IRIS_chr						
Bayleton	43121-43-3		3.0E-02	IRIS_chr						
Baythroid	68359-37-5		2.5E-02	IRIS_chr						
Benefin	1861-40-1		3.0E-01	HEAST_sub						
Benomyl	17804-35-2		5.0E-02	IRIS_chr						
Bentazon	25057-89-0	E	3.0E-02	IRIS_chr						
Benzaldehyde	100-52-7									
Benzene	71-43-2	A	1.0E-02	PPRTV_sub	5.5E-02	IRIS	8.0E-02	PPRTV_sub	7.8E-06	IRIS
Benzenethiol	108-98-5		1.0E-04	HEAST_sub						
Benzidine	92-87-5	A	3.0E-03	HEAST_sub	2.3E+02	IRIS			6.7E-02	IRIS
Benzo(a)anthracene	56-55-3	B2								
Benzo(a)pyrene	50-32-8	B2			7.3E+00	IRIS				
Benzo(b)fluoranthene	205-99-2	B2								

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Benzo(k)fluoranthene	207-08-9	B2								
Benzoic acid	65-85-0	D	4.0E+00	PPRTV_sub			2.0E-03	PPRTV_sub		
Benzotrichloride	98-07-7	B2			1.3E+01	IRIS				
Benzyl alcohol	100-51-6									
Benzyl chloride	100-44-7	B2								
Beryllium, elemental	7440-41-7	B1	5.0E-03	HEAST_sub			2.0E-05	IRIS_sub	2.4E-03	IRIS
Bidrin	141-66-2		1.0E-04	IRIS_chr						
Bifenox	42576-02-3		1.0E+00	PPRTV_sub						
Biphenthrin	82657-04-3		1.5E-02	IRIS_chr						
Biphenyl, 1,1-	92-52-4	D	5.0E-02	HEAST_sub						
Bis(2-chloro-1-methylethyl) et	108-60-1	C	4.0E-02	IRIS_chr	7.0E-02	HEAST			1.0E-05	HEAST
Bis(2-chloroethoxy)methane	111-91-1	D	3.0E-02	PPRTV_sub						
Bis(2-chloroethyl) ether	111-44-4	B2			1.1E+00	IRIS	1.2E-01	MRL_inter	3.3E-04	IRIS
Bis(2-chloroisopropyl) ether	39638-32-9		4.0E-02	HEAST_sub						
Bis(2-ethylhexyl) phthalate	117-81-7	B2	2.0E-01	IRIS_sub	1.4E-02	IRIS				
Bis(chloromethyl) ether	542-88-1	A			2.2E+02	IRIS	1.4E-03	MRL_inter	6.2E-02	IRIS
Bisphenol A	80-05-7		5.0E-01	IRIS_sub						
Boron	7440-42-8	IN	2.0E-01	IRIS_chr			2.0E-02	HEAST_sub		
Boron trifluoride	7637-07-2						7.0E-03	HEAST_sub		
Bromate	15541-45-4	B2	4.0E-03	IRIS_chr	7.0E-01	IRIS				
Bromobenzene	108-86-1		2.0E-02	IRIS_sub			2.0E-01	IRIS_sub		
Bromodichloromethane	75-27-4	B2	8.0E-03	PPRTV_sub	6.2E-02	IRIS	2.0E-02	PPRTV_sub		
Bromoethene	593-60-2	B2					3.0E-03	HEAST_sub	3.2E-05	HEAST

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Bromoform	75-25-2	B2	3.0E-02	PPRTV_sub	7.9E-03	IRIS			1.1E-06	IRIS
Bromophos	2104-96-3		5.0E-02	HEAST_sub						
Bromoxynil	1689-84-5		2.0E-02	HEAST_sub						
Bromoxynil octanoate	1689-99-2		2.0E-02	HEAST_sub						
Busan	21564-17-0		3.0E-01	HEAST_sub						
Butadiene, 1,3-	106-99-0	CA					2.0E-03	IRIS_chr	3.0E-05	IRIS
Butanol, 1-	71-36-3	D	1.0E+00	IRIS_sub						
Butyl benzyl phthalate	85-68-7	C	2.0E+00	IRIS_sub	1.9E-03	PPRTV				
Butyl glycolyl butyl phthalate	85-70-1		1.0E+00	IRIS_chr						
Butylate	2008-41-5		5.0E-02	HEAST_sub						
Butylbenzene, n-	104-51-8	IN								
Butylbenzene, sec-	135-98-8	IN								
Butylbenzene, tert-	98-06-6	IN								
Cacodylic acid	75-60-5	D	2.0E-02	MRL_chr						
Cadmium, elemental	7440-43-9	B1	5.0E-04	IRIS_chr			1.0E-05	MRL_chr	1.8E-03	IRIS
Calcium cyanide	592-01-8		4.0E-02	HEAST_sub						
Caprolactam	105-60-2		5.0E-01	HEAST_sub						
Captafol	2425-06-1	C	2.0E-03	HEAST_sub	8.6E-03	HEAST				
Captan	133-06-2	B2	1.3E-01	HEAST_sub	3.5E-03	HEAST				
Carbaryl	63-25-2		1.0E-01	HEAST_sub						
Carbazole	86-74-8	B2			2.0E-02	HEAST				
Carbofuran	1563-66-2		5.0E-03	HEAST_sub						
Carbon disulfide	75-15-0		1.0E-01	HEAST_sub			7.0E-01	HEAST_sub		

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Carbon tetrachloride	56-23-5	B2	1.2E-02	IRIS_sub	7.0E-02	IRIS	1.9E-01	MRL_inter	6.0E-06	IRIS
Carbosulfan	55285-14-8		1.0E-02	IRIS_chr						
Carboxin	5234-68-4		1.0E-01	IRIS_chr						
Cerium	7440-45-1	D								
Chloral	75-87-6		2.0E-02	HEAST_sub						
Chloral hydrate	302-17-0	C	1.0E-01	IRIS_chr						
Chloramben	133-90-4		1.5E-02	IRIS_chr						
Chloranil	118-75-2	C			4.0E-01	HEAST				
Chlordane	57-74-9	B2	6.0E-04	MRL_inter			2.0E-04	MRL_inter	3.7E-04	HEAST
Chlordecone	143-50-0	B2	5.0E-04	MRL_inter	1.0E+01	IRIS				
Chlorfenvinphos	470-90-6		2.0E-03	MRL_inter						
Chlorimuron-ethyl	90982-32-4		2.0E-02	IRIS_chr						
Chlorine	7782-50-5		1.0E-01	IRIS_chr			5.8E-03	MRL_inter		
Chlorine dioxide	10049-04-4	D								
Chlorite (sodium chlorite)	7758-19-2	D	1.0E-01	MRL_inter						
Chloro-1,3-butadiene	126-99-8		2.0E-02	HEAST_sub			7.0E-02	HEAST_sub		
Chloro-2-methylaniline hydro	3165-93-3	B2			4.6E-01	HEAST				
Chloro-2-methylaniline, 4-	95-69-2	B2			5.8E-01	HEAST				
Chloroacetic acid	79-11-8	IN	2.0E-02	HEAST_sub						
Chloroacetophenone, 2-	532-27-4						3.0E-05	IRIS_chr		
Chloroaniline, 4-	106-47-8		5.0E-04	PPRTV_sub	2.0E-01	PPRTV				
Chlorobenzene	108-90-7	D	7.0E-02	PPRTV_sub			5.0E-01	PPRTV_sub		
Chlorobenzilate	510-15-6	B2	2.0E-02	HEAST_sub	2.7E-01	HEAST			7.8E-05	HEAST

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Chlorobenzoic acid, p-	74-11-3									
Chlorobenzotrifluoride, 4-	98-56-6		3.0E-02	PPRTV_sub			3.0E+00	PPRTV_sub		
Chlorobutane, 1-	109-69-3	D	7.0E-02	PPRTV_sub						
Chlorodifluoromethane	75-45-6						5.0E+01	IRIS_chr		
Chloroform	67-66-3	B2	1.0E-01	MRL_inter			2.4E-01	MRL_inter	2.3E-05	IRIS
Chloro-m-cresol, p-	59-50-7									
Chloronaphthalene, beta-	91-58-7		2.0E-01	PPRTV_sub						
Chloronitrobenzene, o-	88-73-3	C	2.0E-02	PPRTV_sub	3.0E-01	PPRTV	1.0E-04	PPRTV_sub		
Chloronitrobenzene, p-	100-00-5	C								
Chlorophenol, 2-	95-57-8		8.0E-03	PPRTV_sub						
Chloropropane, 2-	75-29-6						1.0E+00	HEAST_sub		
Chlorothalonil	1897-45-6	B2	1.5E-02	HEAST_sub	1.1E-02	HEAST				
Chlorotoluene, o-	95-49-8		2.0E-01	IRIS_sub						
Chlorotoluene, p-	106-43-4	IN	7.0E-01	PPRTV_sub						
Chlorpropham	101-21-3		2.0E-01	IRIS_chr						
Chlorpyrifos	2921-88-2		3.0E-03	MRL_inter						
Chlorpyrifos methyl	5598-13-0		1.0E-02	HEAST_sub						
Chlorsulfuron	64902-72-3		5.0E-02	IRIS_chr						
Chlorthiophos	60238-56-4		8.0E-04	HEAST_sub						
Chromic acid	7738-94-5									
Chromium (III)	16065-83-1	D	1.5E+00	HEAST_sub			5.0E-03	MRL_inter		
Chromium (VI)	18540-29-9	A	9.0E-03	IRIS_sub			1.0E-03	IRIS_sub	1.2E-02	IRIS
Chrysene	218-01-9	B2								

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Cobalt	7440-48-4	B1	3.0E-03	PPRTV_sub			2.0E-05	PPRTV_sub	9.0E+03	PPRTV
Coke oven emissions	8007-45-2	A							6.2E-04	IRIS
Copper cyanide	544-92-3		5.0E-02	IRIS_sub						
Copper, elemental	7440-50-8	D								
Cresol, m-	108-39-4	C	5.0E-01	IRIS_sub						
Cresol, o-	95-48-7	C	5.0E-01	IRIS_sub						
Cresol, p-	106-44-5	C	5.0E-03	HEAST_sub						
Crotonaldehyde, trans-	123-73-9	C			1.9E+00	HEAST				
Cumene	98-82-8	D	3.0E-01	IRIS_sub			4.0E+00	IRIS_sub		
Cyanazine	21725-46-2	C	2.0E-03	HEAST_sub	8.4E-01	HEAST				
Cyanide	57-12-5	D	2.0E-02	HEAST_sub						
Cyanogen	460-19-5		4.0E-02	HEAST_sub						
Cyanogen bromide	506-68-3		9.0E-02	HEAST_sub						
Cyanogen chloride	506-77-4		5.0E-02	HEAST_sub						
Cyclohexane	110-82-7	IN					6.0E+00	IRIS_chr		
Cyclohexanone	108-94-1		5.0E+00	IRIS_chr						
Cyclohexylamine	108-91-8		3.0E-01	HEAST_sub						
Cyclopentadiene	542-92-7						3.0E+00	HEAST_sub		
Cyhalothrin	68085-85-8		1.0E-02	MRL_inter						
Cypermethrin	52315-07-8		1.0E-02	IRIS_chr						
Cyromazine	66215-27-8		7.5E-03	IRIS_chr						
Dacthal	1861-32-1		1.0E-02	HEAST_sub						
Dalapon	75-99-0		3.0E-02	HEAST_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Danitol	39515-41-8		2.5E-02	IRIS_chr						
DDD	72-54-8	B2			2.4E-01	IRIS				
DDE	72-55-9	B2			3.4E-01	IRIS				
DDT	50-29-3	B2	5.0E-04	MRL_inter	3.4E-01	IRIS			9.7E-05	IRIS
Decabromodiphenyl ether	1163-19-5	C	2.1E-02	IRIS_sub	7.0E-04	IRIS				
Demeton	8065-48-3		4.0E-05	IRIS_chr						
Di(2-ethylhexyl)adipate	103-23-1	C	6.0E-01	IRIS_chr	1.2E-03	IRIS				
Diallate	2303-16-4	B2			6.1E-02	HEAST				
Diazinon	333-41-5		2.0E-03	MRL_inter			1.0E-02	MRL_inter		
Dibenz(a,h)anthracene	53-70-3	B2								
Dibenzofuran	132-64-9	D	4.0E-03	PPRTV_sub						
Dibromo-3-chloropropane, 1,	96-12-8	B2	2.0E-03	PPRTV_sub	8.0E-01	PPRTV	2.0E-03	PPRTV_sub	6.0E+03	PPRTV
Dibromobenzene, 1,4-	106-37-6		1.0E-01	IRIS_sub						
Dibromochloromethane	124-48-1	C	7.0E-02	PPRTV_sub	8.4E-02	IRIS				
Dibromoethane, 1,2-	106-93-4	LI	9.0E-03	IRIS_chr	2.0E+00	IRIS	2.0E-03	HEAST_sub	6.0E-04	IRIS
Dibromomethane	74-95-3		9.0E-03	PPRTV_sub						
Dibutyl phthalate	84-74-2	D	1.0E+00	IRIS_sub						
Dibutyl tin dichloride	683-18-1		5.0E-03	MRL_inter						
Dicamba	1918-00-9		3.0E-02	HEAST_sub						
Dichloro-2-butene, 1,4-	764-41-0	B2							4.2E-03	PPRTV
Dichloroacetic acid	79-43-6	LI	1.2E-02	IRIS_sub	5.0E-02	IRIS				
Dichlorobenzene, 1,2-	95-50-1	D	6.0E-01	MRL_inter			2.0E+00	HEAST_sub		
Dichlorobenzene, 1,3-	541-73-1	D	2.0E-02	MRL_inter						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Dichlorobenzene, 1,4-	106-46-7	C	7.0E-02	MRL_inter	2.4E-02	HEAST	2.4E+00	IRIS_sub		
Dichlorobenzidine, 3,3'-	91-94-1	B2			4.5E-01	IRIS				
Dichlorobenzophenone, 4,4'-	90-98-2									
Dichlorodifluoromethane	75-71-8		9.0E-01	HEAST_sub			2.0E+00	HEAST_sub		
Dichloroethane, 1,1-	75-34-3	C	2.0E+00	PPRTV_sub						
Dichloroethane, 1,2-	107-06-2	B2	2.0E-01	MRL_inter	9.1E-02	IRIS	2.4E+00	MRL_chr	2.6E-05	IRIS
Dichloroethylene, 1,1-	75-35-4	C	9.0E-03	HEAST_sub			7.9E-02	MRL_inter	3.4E-04	HEAST
Dichloroethylene, 1,2-	540-59-0		9.0E-03	HEAST_sub						
Dichloroethylene, cis-1,2-	156-59-2	D	1.0E-01	PPRTV_sub						
Dichloroethylene, trans-	156-60-5		2.0E-01	IRIS_sub			7.9E-01	MRL_inter		
Dichlorophenol, 2,4-	120-83-2		2.0E-02	PPRTV_sub						
Dichlorophenoxy acetic acid,	94-75-7		1.0E-02	HEAST_sub						
Dichlorophenoxybutyric acid,	94-82-6		8.0E-02	IRIS_sub						
Dichloropropane, 1,2-	78-87-5	B2	7.0E-02	MRL_inter	6.8E-02	HEAST	1.2E-02	IRIS_sub		
Dichloropropane, 1,3-	142-28-9	D	2.0E-01	PPRTV_sub						
Dichloropropanol, 2,3-	616-23-9		3.0E-03	IRIS_chr						
Dichloropropene, 1,3-	542-75-6	B2	4.0E-02	MRL_inter	1.0E-01	IRIS	3.6E-02	MRL_inter	4.0E-06	IRIS
Dichlorvos	62-73-7	B2	3.0E-03	MRL_inter	2.9E-01	IRIS	2.7E-03	MRL_inter		
Dicyclopentadiene	77-73-6	IN	8.0E-02	PPRTV_sub			2.0E-02	PPRTV_sub		
Dieldrin	60-57-1	B2	1.0E-04	MRL_inter	1.6E+01	IRIS			4.6E-03	IRIS
Diesel engine exhaust	Diesel	LI					5.0E-03	IRIS_chr		
Diethyl phthalate	84-66-2	D	8.0E+00	IRIS_sub						
Diethylene glycol monobutyl	112-34-5	D	3.0E-01	PPRTV_sub			1.0E-03	PPRTV_sub		

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Diethylene glycol monoethyl	111-90-0	D	6.0E-01	PPRTV_sub			3.0E-03	PPRTV_sub		
Diethylformamide	617-84-5	D	1.0E-03	PPRTV_sub						
Diethylstilbestrol	56-53-1	A			4.7E-03	HEAST				
Difenzoquat	43222-48-6		8.0E-02	IRIS_chr						
Diflubenzuron	35367-38-5		2.0E-02	IRIS_chr						
Difluoroethane, 1,1-	75-37-6						4.0E+01	IRIS_chr		
Diisononyl phthalate	28553-12-0									
Diisopropyl ether	108-20-3	D					4.0E+00	PPRTV_sub		
Diisopropyl methylphosphona	1445-75-6	D	8.0E-01	IRIS_sub						
Dimethipin	55290-64-7	C	2.0E-02	IRIS_chr						
Dimethoate	60-51-5		2.0E-04	HEAST_sub						
Dimethoxybenzidine, 3,3'-	119-90-4	B2			1.4E-02	HEAST				
Dimethyl methylphosphonate	756-79-6		6.0E-02	PPRTV_sub	1.7E-03	PPRTV				
Dimethyl terephthalate	120-61-6		1.0E-01	HEAST_sub						
Dimethylaniline hydrochloride	21436-96-4	C			5.8E-01	HEAST				
Dimethylaniline, 2,4-	95-68-1	C			7.5E-01	HEAST				
Dimethylaniline, N,N-	121-69-7		2.0E-02	IRIS_sub						
Dimethylbenzidine, 3,3'-	119-93-7	B2			1.1E+01	PPRTV				
Dimethylformamide	68-12-2		3.0E-01	PPRTV_sub			7.0E-02	PPRTV_sub		
Dimethylhydrazine, 1,1-	57-14-7	B2					8.0E-06	PPRTV_sub		
Dimethylhydrazine, 1,2-	540-73-8	B2	8.0E-04	MRL_inter						
Dimethylphenethylamine	122-09-8	IN								
Dimethylphenol, 2,4-	105-67-9		5.0E-02	PPRTV_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Dimethylphenol, 2,6-	576-26-1		6.0E-03	IRIS_sub						
Dimethylphenol, 3,4-	95-65-8		1.0E-02	IRIS_sub						
Dinitrobenzene, 1,2-	528-29-0	D	1.0E-03	PPRTV_sub						
Dinitrobenzene, 1,3-	99-65-0	D	1.0E-03	IRIS_sub						
Dinitrobenzene, 1,4-	100-25-4	D								
Dinitro-o-cresol, 4,6-	534-52-1	D	4.0E-03	MRL_inter						
Dinitro-o-cyclohexyl phenol, 4	131-89-5		2.0E-02	IRIS_sub						
Dinitrophenol, 2,4-	51-28-5		2.0E-02	PPRTV_sub						
Dinitrotoluene	25321-14-6	B2			6.8E-01	IRIS				
Dinitrotoluene, 2,4-	121-14-2		2.0E-03	HEAST_sub						
Dinitrotoluene, 2,6-	606-20-2		1.0E-02	PPRTV_sub						
Di-n-octyl phthalate	117-84-0	D	4.0E-01	MRL_inter						
Dinoseb	88-85-7	D	1.0E-03	HEAST_sub						
Dioxane, 1,4-	123-91-1	B2	6.0E-01	MRL_inter	1.1E-02	IRIS	3.6E+00	MRL_inter		
Diphenamid	957-51-7		3.0E-02	IRIS_chr						
Diphenyl sulfone	127-63-9	D								
Diphenyl-1,4-benzenediamin	74-31-7	D								
Diphenylamine	122-39-4		2.5E-02	HEAST_sub						
Diphenylhydrazine, 1,2-	122-66-7	B2			8.0E-01	IRIS			2.2E-04	IRIS
Diquat	85-00-7		2.2E-03	IRIS_chr						
Direct black 38	1937-37-7	A			8.6E+00	HEAST				
Direct blue 6	2602-46-2	A			8.1E+00	HEAST				
Direct brown 95	16071-86-6	A			9.3E+00	HEAST				

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Disulfoton	298-04-4		9.0E-05	MRL_inter			2.0E-04	MRL_inter		
Dithiane, 1,4-	505-29-3	D	1.0E-01	IRIS_sub						
Diuron	330-54-1		2.0E-03	IRIS_chr						
Dodine	2439-10-3		4.0E-03	IRIS_chr						
Dysprosium	7429-91-6									
EA 2192	73207-98-4		6.0E-07	Munro						
EMPA	1832-53-7		2.5E-02	Munro			3.0E-02	Munro		
Endosulfan	115-29-7		5.0E-03	MRL_inter						
Endothall	145-73-3		2.0E-02	HEAST_sub						
Endrin	72-20-8	D	2.0E-03	MRL_inter						
Epichlorohydrin	106-89-8	B2	6.0E-03	PPRTV_sub	9.9E-03	IRIS	1.0E-02	PPRTV_sub	1.2E-06	IRIS
Epoxybutane, 1,2-	106-88-7						2.0E-02	IRIS_chr		
EPTC	759-94-4		2.5E-02	HEAST_sub						
Ethephon	16672-87-0		5.0E-03	IRIS_chr						
Ethion	563-12-2		2.0E-03	MRL_inter						
Ethoxyethanol, 2-	110-80-5		5.0E-01	HEAST_sub			2.0E+00	IRIS_sub		
Ethoxyethyl acetate, 2-	111-15-9						3.0E-01	HEAST_sub		
Ethyl acetate	141-78-6		9.0E+00	IRIS_sub						
Ethyl acrylate	140-88-5	B2			4.8E-02	HEAST				
Ethyl chloride	75-00-3		1.0E-01	PPRTV_sub			4.0E+00	PPRTV_sub		
Ethyl ether	60-29-7		5.0E-01	PPRTV_sub			3.0E+00	PPRTV_sub		
Ethyl methacrylate	97-63-2		9.0E-02	HEAST_sub						
Ethyl p-nitrophenyl phenylpho	2104-64-5		1.0E-04	IRIS_sub						

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Ethylbenzene	100-41-4	D	5.0E-01	MRL_inter			3.0E+00	MRL_inter		
Ethylene cyanohydrin	109-78-4	IN	1.0E-01	PPRTV_sub						
Ethylene diamine	107-15-3	D	2.0E-01	PPRTV_sub						
Ethylene glycol	107-21-1		8.0E-01	MRL_inter						
Ethylene glycol monobutyl et	111-76-2	C	7.0E-02	MRL_inter			1.4E+01	MRL_inter		
Ethylene oxide	75-21-8	B1			1.0E+00	HEAST	1.6E-01	MRL_inter	1.0E-04	HEAST
Ethylene thiourea	96-45-7	B2	8.0E-05	HEAST_sub	1.1E-01	HEAST				
Ethylphthalyl ethyl glycolate	84-72-0		3.0E+00	IRIS_chr						
Express	101200-48-0		8.0E-03	IRIS_chr						
Fenamiphos	22224-92-6		2.5E-04	IRIS_chr						
Fluometuron	2164-17-2		1.3E-02	IRIS_chr						
Fluoranthene	206-44-0	D	4.0E-01	MRL_inter						
Fluorene	86-73-7	D	4.0E-01	IRIS_sub						
Fluoride, sodium	7681-49-4									
Fluorine	7782-41-4		6.0E-02	HEAST_sub						
Fluridone	59756-60-4		8.0E-02	HEAST_sub						
Flurprimidol	56425-91-3		2.0E-02	IRIS_chr						
Flutolanil	66332-96-5		6.0E-02	IRIS_chr						
Fluvalinate	69409-94-5		1.0E-02	IRIS_chr						
Folpet	133-07-3	B2	1.0E-01	HEAST_sub	3.5E-03	IRIS				
Fomesafen	72178-02-0	C			1.9E-01	IRIS				
Fonofos	944-22-9		2.0E-03	IRIS_chr						
Formaldehyde	50-00-0	B1	3.0E-01	MRL_inter			3.7E-02	MRL_inter	1.3E-05	IRIS

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Formic acid	64-18-6	D								
Fosetyl-aluminum	39148-24-8	C	3.0E+00	IRIS_chr						
Furan	110-00-9		1.0E-02	IRIS_sub						
Furazolidone	67-45-8	B2			3.8E+00	HEAST				
Furfural	98-01-1		3.0E-02	IRIS_sub			5.0E-01	HEAST_sub		
Furium	531-82-8	B2			5.0E+01	HEAST				
Furmecyclox	60568-05-0	B2			3.0E-02	IRIS				
Glufosinate ammonium	77182-82-2		4.0E-03	IRIS_sub						
Glycidaldehyde	765-34-4	B2	4.0E-03	IRIS_sub			1.0E-02	HEAST_sub		
Glyphosate	1071-83-6	D	1.0E-01	IRIS_chr						
Haloxyfop-methyl	69806-40-2		5.0E-05	IRIS_chr						
Harmony	79277-27-3		1.3E-02	IRIS_chr						
HCFC-142b	75-68-3						5.0E+01	IRIS_chr		
Heptachlor	76-44-8	B2	1.0E-04	MRL_inter	4.5E+00	IRIS			1.3E-03	IRIS
Heptachlor epoxide	1024-57-3	B2	1.3E-05	HEAST_sub	9.1E+00	IRIS			2.6E-03	IRIS
Hexabromobenzene	87-82-1		2.0E-02	IRIS_sub						
Hexachlorobenzene	118-74-1	B2	1.0E-04	MRL_inter	1.6E+00	IRIS			4.6E-04	IRIS
Hexachlorobutadiene	87-68-3	C	1.0E-03	PPRTV_sub	7.8E-02	IRIS			2.2E-05	IRIS
Hexachlorocyclohexane, alph	319-84-6	B2	8.0E-03	MRL_chr	6.3E+00	IRIS			1.8E-03	IRIS
Hexachlorocyclohexane, beta	319-85-7	C	6.0E-04	MRL_inter	1.8E+00	IRIS			5.3E-04	IRIS
Hexachlorocyclohexane, tech	608-73-1	B2			1.8E+00	IRIS			5.1E-04	IRIS
Hexachlorocyclopentadiene	77-47-4	E	1.8E-02	IRIS_sub			1.1E-01	MRL_inter		
Hexachloroethane	67-72-1	C	1.0E-02	IRIS_sub	1.4E-02	IRIS	5.8E+01	MRL_inter	4.0E-06	IRIS

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Hexachlorophene	70-30-4		9.0E-04	IRIS_sub						
Hexamethylene diisocyanate	822-06-0						2.1E-04	MRL_inter		
Hexane, commercial	110-54-3		3.0E-01	PPRTV_sub			2.0E+00	PPRTV_sub		
Hexazinone	51235-04-2		3.3E-02	IRIS_chr						
HFC-134A	811-97-2						8.0E+01	IRIS_chr		
HMX	2691-41-0	D	5.0E-01	IRIS_sub						
Hydrazine	302-01-2	B2			3.0E+00	IRIS	9.0E-05	PPRTV_sub	4.9E-03	IRIS
Hydrazine sulfate	10034-93-2	B2								
Hydrogen chloride	7647-01-0						2.0E-02	IRIS_chr		
Hydrogen cyanide	74-90-8		2.0E-02	IRIS_chr			9.0E-03	IRIS_sub		
Hydrogen sulfide	7783-06-4	IN	3.0E-02	HEAST_sub			2.0E-02	IRIS_sub		
Hydroquinone	123-31-9	C	4.0E-01	PPRTV_sub	6.0E-02	PPRTV				
Imazalil	35554-44-0		1.3E-02	IRIS_chr						
Imazaquin	81335-37-7		2.5E-01	IRIS_chr						
Indeno(1,2,3-cd)pyrene	193-39-5	B2								
Iodine	7553-56-2		1.0E-02	MRL_chr						
Iprodione	36734-19-7		4.0E-02	IRIS_chr						
Iron	7439-89-6		7.0E-01	PPRTV_sub						
Isobutyl alcohol	78-83-1		3.0E+00	IRIS_sub						
Isophorone	78-59-1	C	2.0E+00	IRIS_sub	9.5E-04	IRIS				
Isopropalin	33820-53-0		1.5E-01	IRIS_sub						
Isopropyl methyl phosphonic	1832-54-8	D	1.0E+00	IRIS_sub						
Isoxaben	82558-50-7	C	5.0E-02	IRIS_chr						

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
JP-4 jet fuel	50815-00-4						9.0E+00	MRL_inter		
JP-5/JP-8 jet fuel	94114-58-6									
JP-7 jet fuel	JP-7									
Kerosene	8008-20-6						1.0E-02	MRL_inter		
Lactofen	77501-63-4		2.0E-03	IRIS_chr						
Lewisite oxide	3088-37-7		3.0E-04	Munro			5.0E-01	Munro		
Lindane	58-89-9	B2	3.0E-03	IRIS_sub	1.3E+00	HEAST				
Linuron	330-55-2	C	2.0E-03	HEAST_sub						
Lithium	7439-93-2		2.0E-03	PPRTV_sub						
Lithium perchlorate	7791-03-9	NO								
Londax	83055-99-6		2.0E-01	IRIS_chr						
Lutetium	7439-94-3		5.0E-01	PPRTV_sub						
Malathion	121-75-5		2.0E-02	MRL_inter			2.0E-02	MRL_inter		
Maleic anhydride	108-31-6		1.0E-01	HEAST_sub						
Maleic hydrazide	123-33-1		5.0E-01	HEAST_sub						
Malononitrile	109-77-3	D	1.0E-03	PPRTV_sub						
Mancozeb	8018-01-7		3.0E-02	HEAST_sub						
Maneb	12427-38-2		5.0E-02	IRIS_sub						
Manganese	7439-96-5	D	1.4E-01	HEAST_sub			5.0E-05	IRIS_chr		
MCPA	94-74-6		5.0E-04	HEAST_sub						
MCPB	94-81-5		1.0E-01	HEAST_sub						
MCPP	93-65-2		1.0E-02	IRIS_sub						
Mephosfolan	950-10-7		9.0E-04	HEAST_sub						

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Mepiquat chloride	24307-26-4		3.0E-01	IRIS_sub						
Mercaptobenzothiazole, 2-	149-30-4									
Mercuric chloride	7487-94-7	C	3.0E-03	IRIS_sub						
Mercury, elemental	7439-97-6	C					3.0E-04	HEAST_sub		
Merphos	150-50-5		3.0E-04	IRIS_sub						
Merphos oxide	78-48-8		3.0E-04	IRIS_sub						
Metalaxyl	57837-19-1		6.0E-02	IRIS_chr						
Methacrylonitrile	126-98-7		1.0E-03	IRIS_sub			7.0E-03	HEAST_sub		
Methamidophos	10265-92-6		5.0E-05	IRIS_chr						
Methanol	67-56-1		5.0E+00	IRIS_sub						
Methidathion	950-37-8	C	1.0E-03	IRIS_chr						
Methomyl	16752-77-5		2.5E-02	HEAST_sub						
Methoxy-5-nitroaniline, 2-	99-59-2	B2			4.6E-02	HEAST				
Methoxychlor	72-43-5	D	5.0E-03	MRL_inter						
Methoxyethanol, 2-	109-86-4		1.0E-02	HEAST_sub			2.0E-01	IRIS_sub		
Methoxyethyl acetate, 2-	110-49-6		2.0E-02	HEAST_sub						
Methyl acetate	79-20-9		1.0E+01	HEAST_sub						
Methyl acrylate	96-33-3	D	3.0E-02	HEAST_sub						
Methyl aniline, N-	100-61-8									
Methyl bromide	74-83-9	D	5.0E-03	PPRTV_sub			1.0E-01	PPRTV_sub		
Methyl chloride	74-87-3	D			1.3E-02	HEAST	9.0E-01	IRIS_sub	1.8E-06	HEAST
Methyl ethyl ketone	78-93-3	IN	2.0E+00	HEAST_sub			1.0E+00	HEAST_sub		
Methyl hydrazine	60-34-4	B2								

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Methyl isobutyl ketone	108-10-1	IN	8.0E-01	HEAST_sub			8.0E-01	HEAST_sub		
Methyl mercaptan	74-93-1	IN								
Methyl methacrylate	80-62-6	E	8.0E-02	HEAST_sub			7.0E-01	IRIS_chr		
Methyl parathion	298-00-0		7.0E-04	MRL_inter						
Methyl tertiary butyl ether	1634-04-4		3.0E-01	MRL_inter			2.5E+00	MRL_inter		
Methyl-5-nitroaniline, 2-	99-55-8	C			3.3E-02	HEAST				
Methylaniline hydrochloride, 2	636-21-5	B2			1.8E-01	HEAST				
Methylaniline, 2-	95-53-4	B2			2.4E-01	HEAST				
Methylene chloride	75-09-2	B2	6.0E-02	HEAST_sub	7.5E-03	IRIS	1.0E+00	MRL_inter	4.7E-07	IRIS
Methylene diphenyl diisocyan	101-68-8	D					2.0E-05	HEAST_sub		
Methylene-bis(2-chroloaniline	101-14-4	LI	2.0E-03	PPRTV_sub	1.0E-01	PPRTV			3.7E-05	HEAST
Methylenebis(N,N'-dimethyl)a	101-61-1	B2			4.6E-02	IRIS				
Methylenedianiline, 4,4'-	101-77-9		8.0E-02	MRL_inter						
Methylmercury	22967-92-6	C	1.0E-04	HEAST_sub						
Methylnaphthalene, 1-	90-12-0		7.0E-02	MRL_chr	2.9E-02	PPRTV				
Methylnapthalene, 2-	91-57-6	IN	4.0E-03	PPRTV_sub						
Methylphosphonic acid	993-13-5	D					2.4E-02	Munro		
Methylstyrene, alpha-	98-83-9		7.0E-01	HEAST_sub						
Metolachlor	51218-45-2	C	1.5E-01	HEAST_sub						
Metribuzin	21087-64-9	D	2.5E-02	IRIS_chr						
Mirex	2385-85-5	B2	2.0E-04	HEAST_sub						
Molinate	2212-67-1		2.0E-03	HEAST_sub						
Molybdenum	7439-98-7		5.0E-03	HEAST_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Monochloramine	10599-90-3	D	1.0E-01	HEAST_sub						
Naled	300-76-5		2.0E-03	IRIS_chr						
Naphthalene	91-20-3	C	2.0E-01	IRIS_sub			3.0E-03	IRIS_chr		
Napropamide	15299-99-7		1.0E-01	IRIS_chr						
Nickel	7440-02-0									
Nickel refinery dust	Ni ref dust	A							2.4E-04	IRIS
Nickel subsulfide	12035-72-2	A							4.8E-04	IRIS
Nickel, soluble salts	Ni sol salts		2.0E-02	HEAST_sub						
Nitrate	14797-55-8		1.6E+00	IRIS_chr						
Nitrite	14797-65-0		1.0E-01	HEAST_sub						
Nitroaniline, 2-	88-74-4	D					4.0E-04	PPRTV_sub		
Nitroaniline, 3-	99-09-2	C								
Nitroaniline, 4-	100-01-6	C								
Nitrobenzene	98-95-3	D	6.0E-03	IRIS_sub			2.0E-02	HEAST_sub	4.0E-05	IRIS
Nitrofurantoin	67-20-9		7.0E-01	HEAST_sub						
Nitrofurazone	59-87-0	B2			1.5E+00	HEAST				
Nitroglycerin	55-63-0		1.0E-04	PPRTV_sub	1.7E-02	PPRTV				
Nitroguanidine	556-88-7	D	1.0E-01	PPRTV_sub						
Nitromethane	75-52-5	LI					6.0E-02	PPRTV_sub	9.0E+00	PPRTV
Nitrophenol, 2-	88-75-5						5.0E-04	PPRTV_sub		
Nitrophenol, 4-	100-02-7									
Nitropropane, 2-	79-46-9	B2					2.0E-02	HEAST_sub	2.7E-03	HEAST
Nitrosodiethanolamine, N-	1116-54-7	B2			2.8E+00	IRIS				

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Nitrosodiethylamine, N-	55-18-5	B2			1.5E+02	IRIS			4.3E-02	IRIS
Nitrosodimethylamine, N-	62-75-9	B2	8.0E-06	PPRTV_sub	5.1E+01	IRIS			1.4E-02	IRIS
Nitroso-di-n-butylamine, N-	924-16-3	B2			5.4E+00	IRIS			1.6E-03	IRIS
Nitrosodiphenylamine, N-	86-30-6	B2			4.9E-03	IRIS				
Nitrosodipropylamine, N-	621-64-7	B2			7.0E+00	IRIS				
Nitroso-N-ethylurea, N-	759-73-9	B2			1.4E+02	HEAST				
Nitroso-N-methylethylamine,	10595-95-6	B2			2.2E+01	IRIS				
Nitrosopyrrolidine, N-	930-55-2	B2			2.1E+00	IRIS			6.1E-04	IRIS
Nitrotoluene, m-	99-08-1	D	1.0E-03	PPRTV_sub						
Nitrotoluene, o-	88-72-2	B2	1.0E-02	PPRTV_sub	2.2E-01	PPRTV				
Nitrotoluene, p-	99-99-0	C	4.0E-03	PPRTV_sub	1.6E-02	PPRTV				
Norflurazon	27314-13-2		4.0E-02	IRIS_chr						
NuStar	85509-19-9		7.0E-04	IRIS_chr						
Octabromodiphenyl ether	32536-52-0	D	3.0E-02	IRIS_sub						
Octamethylpyrophosphorami	152-16-9		2.0E-03	HEAST_sub						
Oryzalin	19044-88-3	C	5.0E-02	IRIS_chr						
Oxadiazon	19666-30-9		5.0E-03	IRIS_chr						
Oxamyl	23135-22-0		2.5E-02	IRIS_chr						
Oxyfluorfen	42874-03-3		3.0E-03	IRIS_chr						
Paclobutrazol	76738-62-0		1.3E-01	IRIS_sub						
Paraquat dichloride	1910-42-5	C	4.5E-03	IRIS_chr						
Parathion	56-38-2	C	6.0E-03	HEAST_sub						
Pebulate	1114-71-2		5.0E-02	HEAST_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Pendimethalin	40487-42-1		4.0E-02	HEAST_sub						
Pentabromo-6-chlorocyclohe	87-84-3	C			2.3E-02	HEAST				
Pentabromodiphenyl ether	32534-81-9	D	2.0E-02	IRIS_sub						
Pentachlorobenzene	608-93-5	D	8.0E-03	IRIS_sub						
Pentachloroethane	76-01-7				9.0E-02	PPRTV				
Pentachloronitrobenzene	82-68-8	C	3.0E-03	HEAST_sub	2.6E-01	HEAST				
Pentachlorophenol	87-86-5	B2	1.0E-03	MRL_inter	1.2E-01	IRIS				
Perchlorate ion	14797-73-0	NO								
Perchloric acid	7601-90-3									
Perchloroethylene	127-18-4		1.0E-01	IRIS_sub			2.7E-01	MRL_chr		
Permethrin	52645-53-1		2.0E-01	MRL_inter						
Phenmedipham	13684-63-4		2.5E-01	IRIS_chr						
Phenol	108-95-2	D	6.0E-01	HEAST_sub						
Phenothiazine	92-84-2									
Phenylenediamine, m-	108-45-2		6.0E-02	IRIS_sub						
Phenylenediamine, o-	95-54-5	B2			4.7E-02	HEAST				
Phenylenediamine, p-	106-50-3		1.9E-01	HEAST_chr						
Phenylmercuric acetate	62-38-4		8.0E-05	HEAST_sub						
Phenylphenol, 2-	90-43-7	C			1.9E-03	HEAST				
Phorate	298-02-2		2.0E-04	HEAST_sub						
Phosgene	75-44-5						9.0E-04	IRIS_sub		
Phosmet	732-11-6		2.0E-02	IRIS_chr						
Phosphine	7803-51-2	D	3.0E-04	HEAST_sub			3.0E-03	IRIS_sub		

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Phosphoric acid	7664-38-2						1.0E-01	IRIS_sub		
Phosphorus	7723-14-0	D								
Phosphorus, white	12185-10-3		2.0E-04	MRL_inter						
Phthalic acid, p-	100-21-0									
Phthalic anhydride	85-44-9		2.0E+00	HEAST_sub			1.2E-01	HEAST_sub		
Picloram	1918-02-1		7.0E-02	IRIS_chr						
Picramic acid	96-91-3	D								
Pirimiphos-methyl	29232-93-7		1.0E-02	IRIS_chr						
Polybrominated biphenyl	36355-01-8	B2	7.0E-05	HEAST_sub	8.9E+00	HEAST				
Polychlorinated biphenyls	1336-36-3	B2			2.0E+00	IRIS			1.1E-04	IRIS
Polychlorinated terphenyls	61788-33-8									
Polymeric MDI	9016-87-9	D								
Potassium cyanide	151-50-8		5.0E-02	HEAST_sub						
Potassium perchlorate	7778-74-7	NO	7.0E-04	MRL_chr						
Potassium silver cyanide	506-61-6		2.0E-01	HEAST_sub						
Prochloraz	67747-09-5	C	9.0E-03	IRIS_chr	1.5E-01	IRIS				
Profluralin	26399-36-0		6.0E-03	HEAST_sub						
Prometon	1610-18-0		1.5E-01	IRIS_sub						
Prometryn	7287-19-6		4.0E-03	IRIS_chr						
Pronamide	23950-58-5		7.5E-02	HEAST_sub						
Propachlor	1918-16-7		1.3E-01	IRIS_sub						
Propanil	709-98-8		5.0E-03	IRIS_chr						
Propargite	2312-35-8		2.0E-02	IRIS_chr						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Propargyl alcohol	107-19-7		2.0E-02	IRIS_sub						
Propazine	139-40-2		2.0E-02	HEAST_sub						
Propham	122-42-9		2.0E-01	IRIS_sub						
Propiconazole	60207-90-1		1.3E-02	IRIS_chr						
Propylbenzene, n-	103-65-1									
Propylene glycol	57-55-6	E	2.0E+01	PPRTV_sub			2.8E-02	MRL_inter		
Propylene glycol dinitrate	6423-43-4						2.7E-04	MRL_inter		
Propylene glycol monoethyl e	1569-02-4		7.0E+00	HEAST_sub						
Propylene glycol monomethyl	107-98-2		7.0E+00	HEAST_sub			2.0E+01	IRIS_sub		
Propylene oxide	75-56-9	B2			2.4E-01	IRIS	3.0E-02	HEAST_sub	3.7E-06	IRIS
Pursuit	81335-77-5		2.5E-01	IRIS_chr						
Pydrin	51630-58-1		2.5E-02	IRIS_chr						
Pyrene	129-00-0	D	3.0E-01	PPRTV_sub						
Pyridine	110-86-1		1.0E-02	IRIS_sub						
Quinalphos	13593-03-8		5.0E-04	IRIS_chr						
Quinoline	91-22-5	B2			3.0E+00	IRIS				
RDX	121-82-4	C	3.0E-02	MRL_inter	1.1E-01	IRIS				
Refractory ceramic fibers	ref ceramic fib	B2					3.0E-02	MRL_chr		
Resmethrin	10453-86-8		3.0E-02	IRIS_chr						
Ronnel	299-84-3		5.0E-02	HEAST_sub						
Rotenone	83-79-4		4.0E-03	IRIS_chr						
Savey	78587-05-0		2.5E-02	IRIS_chr						
Selenious acid	7783-00-8	D	5.0E-03	HEAST_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Selenium	7782-49-2	D	5.0E-03	HEAST_sub						
Selenourea	630-10-4		5.0E-03	HEAST_sub						
Sethoxydim	74051-80-2		9.0E-02	IRIS_chr						
Silver	7440-22-4	D	5.0E-03	HEAST_sub						
Silver cyanide	506-64-9		1.0E-01	HEAST_sub						
Silvex	93-72-1	D	8.0E-03	HEAST_sub						
Simazine	122-34-9	C	5.0E-03	HEAST_sub	1.2E-01	HEAST				
Sodium azide	26628-22-8		4.0E-02	IRIS_sub						
Sodium cyanide	143-33-9		5.0E-02	MRL_inter						
Sodium diethydithiocarbamat	148-18-5	C	3.0E-01	IRIS_sub	2.7E-01	HEAST				
Sodium fluoroacetate	62-74-8		2.0E-04	IRIS_sub						
Sodium metavanadate	13718-26-8		1.0E-02	HEAST_sub						
Sodium perchlorate	7601-89-0	NO	7.0E-04	MRL_chr						
Strontium, stable	7440-24-6		2.0E+00	MRL_inter						
Strychnine	57-24-9		3.0E-03	IRIS_sub						
Styrene	100-42-5						8.5E-01	MRL_chr		
Sulfonylbis(4-chlorobenzene),	80-07-9	E	4.0E-03	PPRTV_sub						
Systhane	88671-89-0		2.5E-02	IRIS_chr						
TCDD, 2,3,7,8-	1746-01-6	B2	2.0E-08	MRL_inter	1.5E+05	HEAST			4.3E+01	HEAST
Tebuthiuron	34014-18-1		7.0E-02	IRIS_chr						
Temephos	3383-96-8		2.0E-01	HEAST_sub						
Terbacil	5902-51-2		1.3E-02	IRIS_chr						
Terbufos	13071-79-9		2.5E-05	HEAST_sub						

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Terbutryn	886-50-0		1.0E-03	IRIS_chr						
Tetrachlorobenzene, 1,2,4,5-	95-94-3		2.0E-03	PPRTV_sub						
Tetrachloroethane, 1,1,1,2-	630-20-6	C	9.0E-02	PPRTV_sub	2.6E-02	IRIS			7.4E-06	IRIS
Tetrachloroethane, 1,1,2,2-	79-34-5	C	1.0E-02	PPRTV_sub	2.0E-01	IRIS			5.8E-05	IRIS
Tetrachlorophenol, 2,3,4,6-	58-90-2		3.0E-01	IRIS_sub						
Tetrachlorotoluene, para, alp	5216-25-1	B2			2.0E+01	HEAST				
Tetrachlorovinphos	961-11-5	C	3.0E-02	HEAST_sub	2.4E-02	HEAST				
Tetraethyl dithiopyrophosphat	3689-24-5		5.0E-03	IRIS_sub						
Tetraethyl lead	78-00-2		1.0E-06	IRIS_sub						
Tetrahydrofuran	109-99-9									
Thallium (I) acetate	563-68-8	D	9.0E-04	HEAST_sub						
Thallium (I) carbonate	6533-73-9	D	8.0E-04	HEAST_sub						
Thallium (I) chloride	7791-12-0	D	8.0E-04	HEAST_sub						
Thallium (I) nitrate	10102-45-1	D								
Thallium (I) sulfate	7446-18-6	D	8.0E-04	HEAST_sub						
Thiobencarb	28249-77-6		1.0E-02	IRIS_chr						
Thiocyanates	463-56-9		6.0E-04	PPRTV_sub						
Thiodiglycol	111-48-8		5.0E-01	Munro						
Thiofanox	39196-18-4		3.0E-04	HEAST_sub						
Thiophanate-methyl	23564-05-8		8.0E-02	IRIS_chr						
Thiram	137-26-8		6.0E-03	HEAST_sub						
Tin, inorganic	7440-31-5		3.0E-01	MRL_inter						
Tin, tributyl	56-36-9									

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Titanium	7440-32-6									
Titanium dioxide	13463-67-7									
Titanium tetrachloride	7550-45-0						1.0E-02	MRL_inter		
Toluene	108-88-3	D	8.0E-01	PPRTV_sub			5.0E+00	PPRTV_sub		
Toluene diisocyanate mixture	26471-62-5						7.0E-05	IRIS_chr		
Toluene-2,4-diamine	95-80-7	B2			3.2E+00	HEAST				
Toluene-2,5-diamine	95-70-5		6.0E-01	HEAST_sub						
Toluene-2,6-diamine	823-40-5		6.0E-02	PPRTV_sub						
Toluidine, p-	106-49-0	C			1.9E-01	HEAST				
Toxaphene	8001-35-2	B2	1.0E-03	MRL_inter	1.1E+00	IRIS			3.2E-04	IRIS
Tralomethrin	66841-25-6		7.5E-03	IRIS_chr						
Triallate	2303-17-5		1.3E-02	HEAST_sub						
Triasulfuron	82097-50-5		1.0E-02	IRIS_chr						
Tribromobenzene, 1,2,4-	615-54-3		5.0E-02	IRIS_sub						
Tributyl phosphate	126-73-8	B2	2.0E-02	MRL_inter	9.2E-03	PPRTV				
Tributyltin oxide	56-35-9	D	3.0E-04	MRL_inter						
Trichloro-1,2,2-trifluoroethane	76-13-1		3.0E+00	HEAST_sub			3.0E+01	HEAST_sub		
Trichloroaniline hydrochloride	33663-50-2	C			2.9E-02	HEAST				
Trichloroaniline, 2,4,6-	634-93-5	C			3.4E-02	HEAST				
Trichlorobenzene, 1,2,4-	120-82-1	D	9.0E-02	PPRTV_sub	2.9E-02	PPRTV	2.0E-02	PPRTV_sub		
Trichloroethane, 1,1,1-	71-55-6	D	6.0E+00	IRIS_sub			3.8E+00	MRL_inter		
Trichloroethane, 1,1,2-	79-00-5	C	3.9E-03	PPRTV_sub	5.7E-02	IRIS			1.6E-05	IRIS
Trichloroethylene	79-01-6						5.4E-01	MRL_inter		

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Trichlorofluoromethane	75-69-4		7.0E-01	HEAST_sub			1.0E+00	PPRTV_sub		
Trichlorophenol, 2,4,5-	95-95-4		3.0E-01	PPRTV_sub						
Trichlorophenol, 2,4,6-	88-06-2	B2	1.0E-03	PPRTV_chr	1.1E-02	IRIS			3.1E-06	IRIS
Trichlorophenoxyacetic acid	93-76-5		1.0E-01	HEAST_sub						
Trichloropropane, 1,1,2-	598-77-6		5.0E-02	IRIS_sub						
Trichloropropane, 1,2,3-	96-18-4	B2	6.0E-02	MRL_inter	3.0E+01	IRIS	3.0E-03	IRIS_sub		
Trichloropropene, 1,2,3-	96-19-5	D	3.0E-02	PPRTV_sub			3.0E-03	PPRTV_sub		
Trichlorotoluene, 2,3,6-	2077-46-5		5.0E-05	HEAST_sub						
Trichlorotoluene, alpha, 2,6-	2014-83-7		5.0E-05	HEAST_sub						
Triclosan	3380-34-5		4.0E+00	HEAST_sub						
Tricresol	1319-77-3									
Tridiphane	58138-08-2		3.0E-03	IRIS_chr						
Triethylamine	121-44-8						7.0E-02	IRIS_sub		
Trifluralin	1582-09-8	C	7.5E-03	HEAST_sub	7.7E-03	IRIS				
Trimellitic anhydride	552-30-7									
Trimethyl phosphate	512-56-1	B2			3.7E-02	HEAST				
Trimethylbenzene, 1,2,4-	95-63-6						7.0E-02	PPRTV_sub		
Trimethylbenzene, 1,3,5-	108-67-8	D					1.0E-02	PPRTV_sub		
Trinitrobenzene, 1,3,5-	99-35-4		5.0E-04	HEAST_sub						
Trinitrophenylmethylnitramine	479-45-8	IN	1.0E-02	PPRTV_sub						
Trinitrotoluene, 2,4,6-	118-96-7	C	1.5E-03	IRIS_sub	3.0E-02	IRIS				
Triphenylphosphine oxide	791-28-6	D	2.0E-02	PPRTV_sub						
Tris(2-chloroethyl)phosphate	115-96-8	C	2.0E-02	PPRTV_sub	2.0E-02	PPRTV				

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Chemical Name	CASRN	WOE	Oral nc Value mg/kg-day	Source	CSFo (mg/kg-day)-1	Source	Inhalation nc Value mg/m³	Source	URi (µg/m³)-1	Source
Tris(2-ethylhexyl)phosphate	78-42-2	C	1.0E-01	PPRTV_chr	3.2E-03	PPRTV				
Uranium	7440-61-1									
Uranium, highly soluble salts	HZ1800-90-T		2.0E-03	MRL_inter			4.0E-04	MRL_inter		
Vanadium	7440-62-2		7.0E-03	HEAST_sub			1.0E-04	MRL_chr		
Vanadium pentoxide	1314-62-1		9.0E-03	HEAST_sub			1.0E-04	PPRTV_sub	8.3E-03	PPRTV
Vanadium sulfate	16785-81-2		2.0E-02	HEAST_sub						
Vanadium sulfate	36907-42-3									
Vernam	1929-77-7		1.0E-02	HEAST_sub						
Vinclozolin	50471-44-8		2.5E-02	IRIS_chr						
Vinyl acetate	108-05-4		1.0E+00	HEAST_sub			3.5E-02	MRL_inter		
Vinyl chloride	75-01-4	A	3.0E-03	IRIS_chr	7.2E-01	IRIS	7.7E-02	MRL_inter	4.4E-06	IRIS
Vinyl toluene	25013-15-4		6.0E-03	HEAST_sub			4.0E-02	HEAST_sub		
Warfarin	81-81-2		3.0E-04	HEAST_sub						
Xylene, m-	108-38-3		2.0E+00	HEAST_chr						
Xylene, o-	95-47-6		2.0E+00	HEAST_chr						
Xylenes, total	1330-20-7	IN	4.0E-01	PPRTV_sub			4.0E-01	PPRTV_sub		
Zinc cyanide	557-21-1		5.0E-02	HEAST_sub						
Zinc phosphide	1314-84-7		3.0E-03	IRIS_sub						
Zinc, metallic	7440-66-6	D	3.0E-01	HEAST_sub						
Zineb	12122-67-7		5.0E-02	HEAST_sub						

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	*CASRN*	*WOE*	*Oral nc Value mg/kg-day*	*Source*	*CSFo (mg/kg-day)-1*	*Source*	*Inhalation nc Value mg/m³*	*Source*	*URi (µg/m³)-1*	*Source*

Units:
mg/m3 = milligrams per cubic meter
mg/kg-day = milligrams per kilogram day
µg/m3 = micrograms per cubic meter

Notes:
CASRN = Chemical Abstract Service Registry Number
CSFo = oral cancer slope factor
URi = inhalation unit risk factor
mg = milligrams
kg = kilograms
µg = micrograms
m3 = cubic meters

nc = non-cancer
sub = subchronic
chr = chronic
inter = intermediate

WOE = EPA's Weight-of-Evidence Classification
CA = Carcinogenic to humans
LI = Likely to be carcinogenic to humans
SU = Suggestive evidence of carcinogenic potential
IN = Inadequate info to assess carcinogenic potential
NO = Not likely to be carcinogenic to humans
A = Human carcinogen
B1 = Probable human carcinogen (human evidence)
B2 = Probable human carcinogen (animal evidence)
C = Possible human carcinogen
D = Not classifiable as to human carcinogenicity
E = Evidence of noncarcinogenicity for humans

Sources:
HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
Munro = Munro et al 1999
PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
EPA_Reg6 = EPA Region 6 Human Health Medium-Specific Screening Values (Tox Values from NCEA)(EPA Region 6 2008)

* IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.5.2 further describes adjustments made to IRIS values

Table C-1: Health Criteria Used for Developing the Long-term MEGs

Chemical Name	*CASRN*	*WOE*	*Oral nc Value mg/kg-day*	*Source*	*CSFo (mg/kg-day)-1*	*Source*	*Inhalation nc Value mg/m³*	*Source*	*URi (µg/m³)-1*	*Source*

APPENDIX D

DEVELOPMENT OF THE AIR MILITARY EXPOSURE GUIDELINES

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Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
(2H3)Acetonitrile	2206-26-0	1.3E+03 TEEL3	6.0E+02 TEEL2	2.0E+01 TEEL1	
(C12-C18) Alkyldimethylbenzyl ammonium chloride	68391-01-5	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
1,1,1,2,2,3,4,5,5,5-Decafluoropentane	138495-42-8	1.3E+04 TEEL3	4.0E+03 TEEL2	2.0E+03 TEEL1	
1,1,1,3,3,3-Hexafluoro-2-propanol	920-66-1	6.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
1,1,1,3,3-Pentafluoropropane	460-73-1	3.0E+05 TEEL3	3.0E+05 TEEL2	5.0E+03 TEEL1	
1,1,2,2-Tetrafluoroethane	359-35-3	1.0E+05 TEEL3	5.0E+04 TEEL2	3.5E+04 TEEL1	
1,1,3,3-Tetramethoxypropane	102-52-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
1,1'-Methylenebis(isocyanato-benzene)	26447-40-5	1.2E+02 TEEL3	1.2E+02 TEEL2	7.2E+01 TEEL1	
1,2,3,5-Tetramethylbenzene	527-53-7	5.0E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
1,2,3,6-Tetrahydropyridine	694-05-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
1,2,4,5-Tetramethylbenzene	95-93-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
1,2-Bis(2-Chloroethoxy)ethane	112-26-5	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
1,2-Cyclohexanediamine	694-83-7	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
1,2-Dimethylimidizole	1739-84-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
1,3,6-Naphthalenetrisulfonic acid sodium salt	19437-42-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
1,3-Diisopropylbenzene	99-62-7	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
1,3-Propanediol	504-63-2	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
1,5-Pentanediol	111-29-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
1,6-Dibromohexane	629-03-8	1.0E+02 TEEL3	2.0E+01 TEEL2	3.5E+00 TEEL1	
1,6-Hexanediol diacrylate	13048-33-4	5.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
1,8-Diazabicyclo(5.4.0.)undec-7-ene	6674-22-2	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
1-Bromo-3-methoxybenzene	2398-37-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
1-Bromo-3-methylbutane	107-82-4	2.5E+03 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
1-Bromodecane	112-29-8	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
1-Bromododecane	143-15-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
1-Bromooctane	111-83-1	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
1-Fluoro-2-nitrobenzene	1493-27-2	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
1h-Tetrazole	288-94-8	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
1-Hydroxybenzotriazole	2592-95-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
1-Iodoheptafluoropropane	754-34-7	5.0E+01 TEEL3	2.5E+00 TEEL2	2.5E+00 TEEL1	
1-Iodopentane	628-17-1	2.5E+01 TEEL3	1.6E+00 TEEL2	1.6E+00 TEEL1	
1-Methyl-1-propanethiol	513-53-1	7.5E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
1-Naphthol	90-15-3	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
1-Nonene	124-11-8	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
1-Octanamine	111-86-4	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
1-Propanol, zirconium(4+) salt	23519-77-9	1.8E+02 TEEL3	9.0E+01 TEEL2	3.6E+01 TEEL1	
1R-(-)-10-Camphorsulfonic Acid	35963-20-3	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
2-(2-Ethyhexyloxy)ethanol	1559-35-9	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
2-(Methylamino)ethanol	109-83-1	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
2-(N-Morpholino)ethanesulfonic acid monohydrate	4432-31-9	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
2,2,2-Trichloroethanol	115-20-8	2.5E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
2,2,6,6-Tetramethyl-3,5-heptanedione	1118-71-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
2,2-Dichloro-1,1,1-trifluoroethane	306-83-2	6.3E+04 ERPG3	6.3E+03 ERPG2	7.5E+02 TEEL1	
2,2-Diethoxyethylamine	645-36-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
2,2-Dimethoxyethylamine	22483-09-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
2,2-Dimethoxypropane	77-76-9	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
2,2-Dimethyl-1,3-propanediol	126-30-7	2.0E+04 TEEL3	4.0E+03 TEEL2	6.0E+02 TEEL1	
2,2-Dimethylbutyric acid	595-37-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
2,2'-Sulfonylbis-ethanol	2580-77-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
2,4,4-Trimethyl-1-pentene	107-39-1	7.5E+03 TEEL3	1.5E+03 TEEL2	1.0E+03 TEEL1	
2,5,8,11-Tetraoxadodecane	112-49-2	7.5E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
2,6-Diaminopyridine	141-86-6	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
2,6-Diisopropylaniline	24544-04-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
2,6-Lutidine	108-48-5	3.5E+04 TEEL3	6.0E+03 TEEL2	1.0E+03 TEEL1	
2-Bromoethanol	540-51-2	6.0E+01 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
2-Bromomesitylene	576-83-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
2-Bromomethyl-1,3-dioxolane	4360-63-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
2-Chloro-1,1,1,2-Tetrafluoroethane	2837-89-0	5.6E+04 ERPG3	2.8E+04 ERPG2	5.6E+03 ERPG1	
2-Chloroethyl vinyl sulfide	81142-02-1	1.5E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
2-Dimethylaminoethyl chloride hydrochloride	4584-46-7	1.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
2-Dodecen-1-yl succinic anhydride	19780-11-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
2-Ethyl-1,3-hexanediol	94-96-2	4.0E+03 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
2-Ethyl-2-oxazoline	10431-98-8	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
2-Hydroxyethyl acrylate	818-61-1	2.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
2-Methoxypropyl-1-acetate	70657-70-4	2.7E+04 ERPG3	5.4E+03 ERPG2	2.7E+02 ERPG1	
2-Methyl-1-pentanol	105-30-6	6.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
2-Methyl-2-butene	513-35-9	6.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
2-Methyl-8-quinolinol	826-81-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
2-Methylheptane	592-27-8	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
2-Naphthol	135-19-3	5.0E+02 TEEL3	5.0E-02 TEEL2	7.5E-03 TEEL1	
2-Naphthol-8-sulfonic acid, sodium salt	832-85-9	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
2-Nitro-m-xylene	81-20-9	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
2-Octanol	123-96-6	3.5E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
2-Phenoxyethanol	122-99-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
2-Phenyl-2-oxzaoline	7127-19-7	1.5E+02 TEEL3	3.0E+01 TEEL2	1.5E+01 TEEL1	
2-Thiosalicylic acid	147-93-3	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
3-(Chloropropyl)trimethoxysilane	2530-87-2	3.0E+03 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
3-(Cyclohexylamino)-1-propanesulfonic acid	1135-40-6	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
3-(Trimethoxysilyl)-1-propanamine	13822-56-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
3,3',5,5'-Tetramethylbenzidine	54827-17-7	6.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
33 SN	20820-80-8	6.0E-02 TEEL3	1.3E-02 TEEL2	1.5E-03 TEEL1	
3-Aminopropylmethyldiethoxysilane	3179-76-8	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
3-Chloropropanol	627-30-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
3-Mercaptopropionic acid	107-96-0	4.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
3-Methylpentane	96-14-0	7.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	
3-Nitrobenzenesulfonic acid, sodium salt	127-68-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
3-Trimethoxysilyl-1-Propanethiol	4420-74-0	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
3-Trimethoxysilylpropyl methacrylate	2530-85-0	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
3-Tris((hydroxymethyl)methylamino)propane-1-sulphonic acid	29915-38-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
4-Chlorobutyryl chloride	4635-59-0	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
4-Hydroxy-3-methoxybenzaldehyde	121-33-5	5.0E+02 TEEL3	1.3E+02 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
4-Hydroxybenezenesulfonic acid	98-67-9	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
4-Hydroxybenzoic acid	99-96-7	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
4-Methoxybenzyl alcohol	105-13-5	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
4-Methyldecane	2847-72-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
4-Methylmorpholine	109-02-4	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
4-Methylnonane	17301-94-9	1.3E+03 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
4-Nitro-3-trifluoromethylphenol	88-30-2	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
4-Pyridinecarboxaldehyde	872-85-5	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
4-Tert-butylpyridine	3978-81-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
5-chloro-2-benzenesulfonic acid	0-306*	2.0E+02 TEEL3	5.0E+01 TEEL2	6.0E+00 TEEL1	
5-Chloro-methyl-isothiazolin-3-one	26172-55-4	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
5-Methyl-2-(1-methylethyl)phenol	89-83-8	4.0E+02 TEEL3	1.5E+00 TEEL2	2.5E-01 TEEL1	
6-Benzyl aminopurine	1214-39-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
6-Ethyl-2-methyl octane	62016-19-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
6-Methyl-2-Heptanone	928-68-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
6-S-Hexadecyl-2-methoxythioascorbic acid	8065-53-0	6.0E+01 TEEL3	1.5E+01 TEEL2	3.0E+00 TEEL1	
9-Octadecenoic acid	112-80-1	5.0E+02 TEEL3	4.0E-01 TEEL2	5.0E-02 TEEL1	
Acacia	9000-01-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Acenaphthene	83-32-9	2.5E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Acenaphthylene	208-96-8	5.0E+02 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Acetaldehyde	75-07-0	1.5E+03 AEGL3_1hr	4.9E+02 AEGL2_1hr	8.1E+01 AEGL1_1hr	carc CNS depres conj cough delayed pulm edema derm eye burns in animals: kidney effects in animals: repro effects in animals: terato effects irrit eyes irrit nose irrit throat skin burns
Acetamide	60-35-5	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Acetanilide	103-84-4	5.0E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Acetic acid	64-19-7	6.1E+02 ERPG3	8.6E+01 ERPG2	1.2E+01 ERPG1	black skin chronic bron conj dental erosion eye burns hyperkeratosis irrit eyes irrit nose irrit skin irrit throat lac phar edema skin burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					skin sens
Acetic acid ethenyl ester	27360-07-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Acetic acid, allyl ester	591-87-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Acetic acid, lithium salt	546-89-4	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Acetic acid, manganese(2+) salt, tetrahydrate	6156-78-1	5.0E+02 TEEL3	2.2E+01 TEEL2	1.3E+01 TEEL1	
Acetic acid, manganese(II) salt (2:1)	638-38-0	5.0E+02 TEEL3	1.6E+01 TEEL2	9.4E+00 TEEL1	
Acetic anhydride	108-24-7	4.2E+02 ERPG3	6.3E+01 ERPG2	2.1E+00 ERPG1	bron conj corn edema corn opac cough dysp lac nasal irrit phar irrit photo sens derm skin burns vesic
Acetol	116-09-6	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Acetone	67-64-1	1.4E+04 AEGL3_1hr	7.6E+03 AEGL2_1hr	4.7E+02 AEGL1_1hr	CNS depres derm dizz head irrit eyes irrit nose irrit throat
Acetone cyanohydrin	75-86-5	5.2E+01 AEGL3_1hr	2.5E+01 AEGL2_1hr	7.0E+00 AEGL1_1hr	asphy

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					conf convuls dizz head irrit eyes irrit resp sys irrit skin kidney inj lass liver inj pulm edema
Acetone thiosemicarbazide	1752-30-3	1.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Acetone-d6	666-52-4	1.5E+04 TEEL3	7.5E+03 TEEL2	5.0E+02 TEEL1	
Acetonitrile	75-05-8	1.1E+03 AEGL3_1hr	5.4E+02 AEGL2_1hr	2.2E+01 AEGL1_1hr	asphy chest pain convuls in animals: kidney damage in animals: liver damage irrit nose irrit throat lass nau stupor vomit
Acetophenone	98-86-2	3.5E+02 TEEL3	5.0E+01 TEEL2	4.9E+01 TLV_TWA_irr*	
Acetyl bromide	506-96-7	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Acetyl chloride	75-36-5	4.0E+02 TEEL3	1.5E-01 TEEL2	2.0E-02 TEEL1	
Acetyl triethyl citrate	77-89-4	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Acetylaminofluorene, 2-	53-96-3	3.5E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	carc

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					reduced function of bladder reduced function of kidneys reduced function of liver reduced function of pancreas
Acetylaminofluorenone, 2-	3096-50-2	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Acetylene	74-86-2	6.0E+03 TEEL3	2.5E+03 TEEL2	3.5E+02 TEEL1	
					asphy dizz head liquid: frostbite
Acetylene tetrabromide	79-27-6	1.0E+02 TEEL3	1.0E+02 TEEL2	7.5E+01 TEEL1	
					abdom pain anor CNS depres head irrit eyes irrit nose jaun leucyt nau
Acridine orange	494-38-2	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Acrolein	107-02-8	3.2E+00 AEGL3_1hr*	2.3E-01 AEGL2_1hr*	7.0E-02 AEGL1_1hr*	
					chronic resp disease decr pulm func delayed pulm edema irrit eyes irrit muc memb irrit skin
Acrylamide	79-06-1	6.0E+01 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
					absent deep tendon reflex ataxia carc drow hand sweat irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin lass musc weak numb limbs pares repro effects
Acrylic acid	79-10-7	5.3E+02 AEGL3_1hr	1.4E+02 AEGL2_1hr	4.4E+00 AEGL1_1hr	
					eye burns in animals: kidney inj in animals: liver inj in animals: lung inj irrit eyes irrit resp sys irrit skin skin burns skin sens
Acrylic acid 2-ethylhexyl ester	103-11-7	7.5E+01 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Acrylonitrile	107-13-1	1.6E+02 ERPG-3*	7.6E+01 ERPG-2*	2.2E+01 ERPG-1*	
					asphy carc dizz head irrit eyes irrit skin lass nau scaling derm skin vesic sneez vomit
Acrylyl chloride	814-68-6	3.5E+01 TEEL3	7.5E-01 TEEL2	4.0E-01 TEEL1	
Adamsite	578-94-9	6.4E+00 AEGL3_1hr	2.6E+00 AEGL2_1hr	1.6E-02 AEGL1_1hr	
Adipic acid	124-04-9	1.3E+02 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Adipic acid-TDI	68609-57-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Adiponitrile	111-69-3	7.5E+02 TEEL3	1.5E+01 TEEL2	1.5E+01 TEEL1	abdom pain blurred vision conf convuls dizz dysp head irrit eyes irrit resp sys irrit skin lass nau vomit
Adogen 464	63393-96-4	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Aerosol A 102	39354-45-5	5.0E+02 TEEL3	5.0E+02 TEEL2	4.0E+02 TEEL1	
Agar-agar	9002-18-0	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Agarose, type VII	9012-36-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Alamine 336	68814-95-9	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Alcohol oxidase	9073-63-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Alcohols, C6-C12	68603-15-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Aldicarb	116-06-3	2.6E-01 AEGL3_1hr	8.7E-02 AEGL2_1hr	3.0E-04 TEEL1	
Aldrin	309-00-2	2.5E+01 TEEL3	1.0E+01 TEEL2	2.5E-01 TEEL1	azotemia carc clonic convuls coma

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz head hema mal myoclonic jerks of limbs nau tonic convuls vomit
Aldrithiol	2127-03-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Aliphatic Hydrocarbon	X-068*	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Aliphatic Naphtha	64742-89-8 (2)	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Alizarin Red B	72-48-0	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Alizarine Red S	130-22-3	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Alkyl dimethylbenzyl ammonium chloride	8001-54-5	1.0E+02 TEEL3	1.0E+02 TEEL2	2.0E+01 TEEL1	
Alkylamines	0-305*	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Alkylbenzene (C10-C16)	68648-87-3	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Allene	463-49-0	6.0E+03 TEEL3	1.3E+03 TEEL2	2.0E+02 TEEL1	
Allyl alcohol	107-18-6	4.8E+01 AEGL3_1hr*	1.0E+01 AEGL2_1hr*	5.0E+00 AEGL1_1hr*	irrit eyes irrit skin irrit upper resp sys pulm edema tissue damage
Allyl bromide	106-95-6	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Allyl chloride	107-05-1	4.4E+02 AEGL3_1hr	1.7E+02 AEGL2_1hr	8.8E+00 AEGL1_1hr	in animals: kidney inj in animals: liver inj

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit nose irrit skin pulm edema
Allyl chloroformate	2937-50-0	1.0E+01 AEGL3_1hr	3.5E+00 AEGL2_1hr	5.0E-01 TEEL1	
Allyl formate	1838-59-1	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Allyl isothiocyanate	57-06-7	5.0E+01 TEEL3	1.0E+01 TEEL2	4.0E+00 TEEL1	
Allylamine	107-11-9	4.2E+01 AEGL3_1hr	7.7E+00 AEGL2_1hr	9.8E-01 AEGL1_1hr	discomfort discomfort discomfort head head head irrit irrit irrit irrit irrit irrit nau nau nau
Allylmagnesium bromide	1730-25-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Allyltrichlorosilane	107-37-9	2.4E+02 AEGL3_1hr	5.2E+01 AEGL2_1hr	4.3E+00 AEGL1_1hr	
Alpha,alpha,4-trimethyl-3-cyclohexene-1-methanol, (S)-	10482-56-1	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Alphahydroxybenzeneacetic acid, (+-)-	611-72-3	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Aluminon	569-58-4	5.0E+02 TEEL3	7.5E-03 TEEL2	1.3E-03 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Aluminum acetate, basic	7360-44-3	2.0E+02 TEEL3	4.5E+01 TEEL2	2.7E+01 TEEL1	
Aluminum carbide	1299-86-1	3.5E+01 TEEL3	6.7E+00 TEEL2	6.7E+00 TEEL1	
Aluminum chloride	7446-70-0	5.0E+02 TEEL3	6.0E+01 TEEL2	9.9E+00 TEEL1	
Aluminum chloride hexahydrate	7784-13-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Aluminum fluoride	7784-18-1	4.0E+01 TEEL3	7.5E+00 TEEL2	6.2E+00 TEEL1	
Aluminum hexafluorosilicate	17099-70-6	3.5E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
Aluminum hydroxide	21645-51-2	1.3E+02 TEEL3	1.3E+02 TEEL2	1.2E+01 TEEL1	
Aluminum nitrate	13473-90-0	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Aluminum nitrate nonahydrate	7784-27-2	5.0E+02 TEEL3	1.5E+02 TEEL2	7.0E+01 TEEL1	
Aluminum oxide	1344-28-1	2.5E+01 TEEL3	1.5E+01 TEEL2	1.5E+00 TEEL1	irrit eyes irrit resp sys irrit skin
Aluminum oxide hydrate	1333-84-2	2.5E+01 TEEL3	1.5E+01 TEEL2	1.5E+00 TEEL1	
Aluminum phosphate	7784-30-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Aluminum phosphate solution	13530-50-2	3.0E+02 TEEL3	6.0E+01 TEEL2	6.0E+01 TEEL1	
Aluminum phosphide	20859-73-8	8.5E+00 AEGL3_1hr	4.7E+00 AEGL2_1hr		
Aluminum potassium sulfate	10043-67-1	1.0E+02 TEEL3	4.8E+01 TEEL2	4.8E+01 TEEL1	
Aluminum potassium sulfate, dodecahydrate	7784-24-9	5.0E+02 TEEL3	1.3E+02 TEEL2	8.8E+01 TEEL1	
Aluminum sulfate	10043-01-3	5.0E+02 TEEL3	3.2E+01 TEEL2	3.2E+01 TEEL1	
Aluminum yellow 4A	10343-58-5	2.5E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Aluminum(III) isopropylate	555-31-7	5.0E+02 TEEL3	3.8E+01 TEEL2	3.8E+01 TEEL1	
Aluminum, elemental	7429-90-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+00 TEEL1	irrit eyes irrit resp sys irrit skin
Amberjet 4200-Cl	60177-39-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Amberlite	100915-96-6	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Amberlite IR-120(PLUS) ion-exchange resin	78922-04-0	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Amberlite IR-120plus	9002-23-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Amberlite IRA-400(CI)	9002-24-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Amberlite XAD-16, -7, -4 resin	104219-63-8	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Amberlite XAD-2	9060-05-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Amberlite XAD-7	37380-43-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Amberlite ZAD-16	9003-69-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Amberlyst 15	9037-24-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Amino-1,3-naphthalenedisulfonic acid, 7-	86-65-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Amino-1-propanol, 3-	156-87-6	5.0E+02 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Amino-2,6-dinitrotoluene, 4-	6393-42-6	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Amino-2-methyl-2-propanol, 1-	2854-16-2	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Amino-4,6-dinitrotoluene, 2-	35572-78-2	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Aminoanthraquinone, 2-	117-79-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Aminobenzoic acid, 2-	118-92-3	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Aminobenzoic acid, 4-	150-13-0	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Aminodiphenyl, p-	92-67-1	2.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	acute hemorrhagic cystitis ataxia carc dizz drow dysp head lass methemo urinary burning
Aminoethylethanolamine	111-41-1	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Aminoethylpiperazine, 1-	140-31-8	5.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Aminoheptane, 3-	28292-42-4	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Aminophenol, 2-	95-55-6	5.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Aminophenol, 3-	591-27-5	1.3E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Aminopropriophenone, 4-	70-69-9	7.5E+01 TEEL3	5.6E+00 TEEL2	3.5E+00 TEEL1	
Aminopterin	54-62-6	2.5E+01 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Aminopyrazine	5049-61-6	2.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Aminopyridine, 4-	504-24-5	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
Amiton	78-53-5	3.3E+00 TEEL3	3.3E+00 TEEL2	2.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Amiton oxalate	3734-97-2	3.0E+00 TEEL3	3.0E+00 TEEL2	1.5E+00 TEEL1	
Amitrole	61-82-5	5.0E+02 TEEL3	1.3E+02 TEEL2	6.0E-01 TEEL1	
					anor
					ataxia
					depres (thyroid func suppression)
					dysp
					incr body temperature
					irrit eyes
					irrit skin
					lass
					musc spasm
					salv
					skin dryness
Ammonia	7664-41-7	7.7E+02 AEGL3_1hr*	1.1E+02 AEGL2_1hr*	2.1E+01 AEGL1_1hr*	
					chest pain
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					cough
					discomfort
					dizz
					dizz
					dysp
					head
					head
					hyperpnea

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					incr
					inebri
					inebri
					irrit
					irrit
					irrit
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					irrit

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit
					irrit
					irrit
					irrit
					irrit
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					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit eyes
					irrit nose
					irrit throat
					lac
					lac
					liquid: frostbite
					mal
					mal
					mal

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					mal mal mal mal mal mal mal mal mal musc musc musc pink frothy sputum pulm edema skin burns vesic wheez
Ammonium acetate	631-61-8	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Ammonium aluminum fluoride	7784-19-2	4.3E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Ammonium benzoate	1863-63-4	3.5E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Ammonium bicarbonate	1066-33-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Ammonium bifluoride	1341-49-7	3.8E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Ammonium bisulfate	7803-63-6	2.5E+00 TEEL3	5.0E-01 TEEL2	7.5E-02 TEEL1	
Ammonium bisulfite	10192-30-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium bromide	12124-97-9	5.0E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Ammonium carbamate	1111-78-0	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Ammonium carbonate	506-87-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ammonium chloride	12125-02-9	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+01 TEEL1	cough dysp irrit eyes irrit resp sys irrit skin pulm sens
Ammonium chromate	7788-98-9	4.4E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Ammonium citrate	7632-50-0	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Ammonium citrate tribasic	3458-72-8	1.9E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Ammonium dichromate	7789-09-5	3.6E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Ammonium ferrous sulfate hexahydrate	7783-85-9	5.0E+02 TEEL3	1.6E+01 TEEL2	9.6E+00 TEEL1	
Ammonium fluoride	12125-01-8	4.9E+02 TEEL3	4.9E+00 TEEL2	4.9E+00 TEEL1	
Ammonium fluoroborate	13826-83-0	3.5E+02 TEEL3	6.0E+00 TEEL2	3.5E+00 TEEL1	
Ammonium formate	540-69-2	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Ammonium hydrogen oxalate hemihydrate	37541-72-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Ammonium hydroxide	1336-21-6	1.5E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Ammonium iodide	12027-06-4	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Ammonium iron (III) sulfate	10138-04-2	1.3E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Ammonium lactate	515-98-0	5.0E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Ammonium lignin sulfonate	8061-53-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium molybdate	13106-76-8	3.0E+02 TEEL3	1.0E+02 TEEL2	6.1E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ammonium molybdate (VI) tetrahydrate	12054-85-2	1.5E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Ammonium molybdenum oxide	27546-07-2	5.0E+02 TEEL3	8.8E+00 TEEL2	8.8E+00 TEEL1	
Ammonium molybdophosphate	12026-66-3	4.0E+02 TEEL3	8.2E+01 TEEL2	4.9E+01 TEEL1	
Ammonium molydbate	11098-84-3	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+00 TEEL1	
Ammonium nitrate	6484-52-2	5.0E+02 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Ammonium oxalate	1113-38-8	2.0E+01 TEEL3	4.0E+00 TEEL2	5.0E-01 TEEL1	
Ammonium oxalate hydrate	6009-70-7	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Ammonium oxalate monohydrate	5972-73-6	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Ammonium pentaborate	12007-89-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium perchlorate	7790-98-9	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Ammonium permanganate	13446-10-1	5.0E+02 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Ammonium persulfate	7727-54-0	1.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Ammonium picrate	131-74-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium polyacrylate	9003-03-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium salt	14307-43-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium silicofluoride	16919-19-0	3.9E+02 TEEL3	2.0E+01 TEEL2	1.2E+01 TEEL1	
Ammonium sulfamate	7773-06-0	5.0E+02 TEEL3	3.5E+02 TEEL2	3.0E+01 TEEL1	cough dysp irrit eyes irrit nose

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit throat
Ammonium sulfate	7783-20-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Ammonium sulfite	10196-04-0	1.0E+01 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	
Ammonium sulfite monohydrate	7783-11-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ammonium tartrate	3164-29-2	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Ammonium thiocyanate	1762-95-4	2.0E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Ammonium thiosulfate	7783-18-8	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Ammonium tungstate(VI)	11120-25-5	4.1E+00 TEEL3	4.1E+00 TEEL2	4.1E+00 TEEL1	
Ammonium vanadate	7803-55-6	7.5E-01 TEEL3	3.2E-01 TEEL2	4.0E-02 TEEL1	
Ammonium-d4 deuteroxide	13550-49-7	7.5E+02 TEEL3	1.3E+02 TEEL2	2.5E+01 TEEL1	
Amosite	12172-73-5	1.0E+02 TEEL3	2.0E+01 TEEL2	5.0E-02 TEEL1	
Amphetamine	300-62-9	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
Amyl acetate	628-63-7	5.0E+03 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	derm irrit eyes irrit nose narco possible CNS depres
Amyl alcohol	71-41-0	1.3E+02 TEEL3	7.5E+01 TEEL2	7.5E+01 TEEL1	
Amylamine	110-58-7	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Amyltrichlorosilane	107-72-2	2.8E+02 AEGL3_1hr	6.1E+01 AEGL2_1hr	5.0E+00 AEGL1_1hr	
Anhydrone	10034-81-8	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Aniline	62-53-3	7.6E+01 AEGL3_1hr	4.6E+01 AEGL2_1hr	3.0E+01 AEGL1_1hr	
					anxi
					ataxia
					carc
					cirr
					cyan
					cyan
					dizz
					dizz
					dysp
					dysp on effort
					ftg
					ftg
					head
					head
					hypox
					hypox
					irrit eyes
					lass
					methemo
					syncope
					tacar
					tacar
					weak
Anisidine, o-	90-04-0	5.0E+01 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
					carc
					cyan
					dizz
					head
					RBC Heinz bodies
Anisidine, p-	104-94-9	5.0E+01 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
					cyan
					dizz
					head
					RBC Heinz bodies
Anisole	100-66-3	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Anthracene	120-12-7	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Anthracenedisulfonic acid, 2,6-	2861-02-1	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Anthraquinone	84-65-1	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Antimony pentachloride	7647-18-9	1.2E+02 TEEL3	6.1E+00 TEEL2	3.7E+00 TEEL1	
Antimony pentafluoride	7783-70-2	8.9E+01 TEEL3	2.7E+00 TEEL2	8.9E-01 TEEL1	
Antimony pentasulfide	1315-04-4	8.3E+01 TEEL3	4.2E+00 TEEL2	2.5E+00 TEEL1	
Antimony potassium tartrate	28300-74-5	1.3E+02 TEEL3	6.5E+00 TEEL2	3.9E+00 TEEL1	
Antimony trichloride	10025-91-9	9.4E+01 TEEL3	9.4E-01 TEEL2	9.4E-01 TEEL1	
Antimony trifluoride	7783-56-4	7.3E+01 TEEL3	4.0E+00 TEEL2	7.3E-01 TEEL1	
Antimony trioxide	1309-64-4	6.0E+01 TEEL3	4.0E+00 TEEL2	1.8E+00 TEEL1	
Antimony, elemental	7440-36-0	5.0E+01 TEEL3	2.0E+01 TEEL2	1.5E+00 TEEL1	anor cough diarr dizz head insom irrit eyes irrit mouth irrit nose irrit skin irrit throat nau stomach cramps unable to smell properly vomit
Antimycin A	1397-94-0	1.3E+01 TEEL3	1.8E+00 TEEL2	1.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
ANTU	86-88-4	1.0E+02 TEEL3	1.0E+01 TEEL2	9.0E-01 TEEL1	after ingestion of large doses: coarse pulm rales after ingestion of large doses: cyan after ingestion of large doses: dysp after ingestion of large doses: vomit liver damage
Aqua regia	8007-56-5	4.0E+02 TEEL3	7.5E+01 TEEL2	4.0E+00 TEEL1	
Arginine, L-	74-79-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Argon	7440-37-1	6.0E+05 TEEL3	3.5E+05 TEEL2	1.0E+05 TEEL1	
Aroclor 1016	12674-11-2	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1016/1242 mixture	0-312*	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1221	11104-28-2	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1232	11141-16-5	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1242	53469-21-9	5.0E+00 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	carc chloracne irrit eyes liver damage repro effects
Aroclor 1248	12672-29-6	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1254	11097-69-1	5.0E+00 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	carc chloracne irrit eyes liver damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					repro effects
Aroclor 1260	11096-82-5	5.0E+00 TEEL3	1.5E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1260/1262 mixture	0-313*	5.0E+00 TEEL3	1.5E+00 TEEL2	6.0E-01 TEEL1	
Aroclor 1262	37324-23-5	5.0E+00 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Aroclor 1268	11100-14-4	5.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Aromatic hydrocarbon solvents	64742-95-6	3.5E+03 TEEL3	3.5E+03 TEEL2	3.5E+03 TEEL1	
Aromatic isocyanate mixture	X-210*	1.3E+02 TEEL3	2.0E+01 TEEL2	4.0E+00 TEEL1	
Arsenic acid	1327-52-2	9.5E+00 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Arsenic compounds	As cmpds	5.0E+00 TEEL3	2.0E+00 TEEL2	3.5E-01 TEEL1	
Arsenic pentoxide	1303-28-2	7.7E+00 TEEL3	7.7E+00 TEEL2	1.0E+00 TEEL1	
Arsenic trioxide	1327-53-3	9.1E+00 AEGL3_1hr	3.0E+00 AEGL2_1hr	4.0E-01 TEEL1	
Arsenous trichloride	7784-34-1	7.5E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Arsine	7784-42-1	1.6E+00 AEGL3_1hr*	5.0E-01 AEGL2_1hr*	1.5E-01 TEEL1*	abdom pain back pain bronze skin carc dizz dysp head hema jaun lass liquid: frostbite mal nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					peri neur
					vomit
Asbestos	1332-21-4				
					asbestosis (chronic exposure): dysp
					asbestosis (chronic exposure): finger clubbing
					asbestosis (chronic exposure): interstitial fib
					asbestosis (chronic exposure): restricted pulm function
					carc
					irrit eyes
Ascaridole	512-85-6	7.5E+01 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Ascarite (II) ®	81133-20-2	2.5E+00 TEEL3	5.0E-01 TEEL2	3.0E-01 TEEL1	
Ascorbic acid	50-81-7	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Asphalt	8052-42-4	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
					carc
					irrit eyes
					irrit resp sys
Auramine	2465-27-2	6.0E+01 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Azaserine	115-02-6	7.5E+01 TEEL3	2.5E-01 TEEL2	4.0E-02 TEEL1	
Azinphos ethyl	2642-71-9	1.5E+02 TEEL3	3.9E+00 TEEL2	2.0E+00 TEEL1	
Azinphos methyl	86-50-0	1.0E+01 TEEL3	7.0E-01 TEEL2	6.0E-01 TEEL1	
					aching eyes
					anor
					blurred vision
					card irreg
					chest tight
					convuls
					cyan
					diarr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head lac lar spasm low BP miosis nau para rhin salv sweat twitch vomit wheez
Azobis(2-methylpropionitrile), 2,2'-	78-67-1	3.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Azodicarbamide	123-77-3	2.0E+02 TEEL3	2.0E+02 TEEL2	1.3E+02 TEEL1	
Barbituric acid	67-52-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Barium acetate	543-80-6	9.3E+01 TEEL3	4.7E+00 TEEL2	2.8E+00 TEEL1	
Barium carbonate	513-77-9	5.0E+01 TEEL3	6.0E+00 TEEL2	1.5E+00 TEEL1	
Barium chloride	10361-37-2	5.0E+01 TEEL3	1.5E+01 TEEL2	1.5E+00 TEEL1	extrasystoles gastroenteritis hypokalemia irrit eyes irrit skin irrit upper resp sys musc spasm skin burns slow pulse
Barium chloride dihydrate	10326-27-9	8.9E+01 TEEL3	4.5E+00 TEEL2	2.7E+00 TEEL1	
Barium chromate	10294-40-3	7.4E+01 TEEL3	1.3E+00 TEEL2	7.4E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Barium cyanide	542-62-1	6.9E+01 TEEL3	3.5E+00 TEEL2	2.1E+00 TEEL1	
Barium diphenylamine sulfonate	6211-24-1	2.3E+02 TEEL3	1.2E+01 TEEL2	6.9E+00 TEEL1	
Barium fluoride	7787-32-8	6.4E+01 TEEL3	6.4E+01 TEEL2	1.9E+00 TEEL1	
Barium hydroxide	17194-00-2	6.2E+01 TEEL3	3.1E+00 TEEL2	1.9E+00 TEEL1	
Barium hydroxide octahydrate	12230-71-6	1.2E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Barium metaborate	13701-59-2	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Barium nitrate	10022-31-8	9.5E+01 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	extrasystoles gastroenteritis hypokalemia irrit eyes irrit skin irrit upper resp sys musc spasm skin burns slow pulse
Barium oxide	1304-28-5	5.6E+01 TEEL3	2.8E+00 TEEL2	1.7E+00 TEEL1	
Barium permanganate	7787-36-2	3.4E+01 TEEL3	3.4E+01 TEEL2	2.1E+01 TEEL1	
Barium peroxide	1304-29-6	6.2E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Barium stearate	6865-35-6	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Barium sulfate	7727-43-7	5.0E+02 TEEL3	3.5E+02 TEEL2	3.0E+01 TEEL1	benign pneumoconiosis (baritosis) irrit eyes irrit nose irrit upper resp sys
Barium, elemental	7440-39-3	5.0E+01 TEEL3	5.0E+01 TEEL2	1.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Bathophenanthroline	1662-01-7	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Baygon	114-26-1	2.0E+01 TEEL3	2.0E+01 TEEL2	1.5E+00 TEEL1	abdom cramps blurred vision diarr head lass miosis musc twitch nau salv sweat vomit
Bentonite	1302-78-9	3.0E+01 TEEL3	3.0E+01 TEEL2	3.0E+01 TEEL1	
Benzal chloride	98-87-3	7.5E+01 TEEL3	2.3E+00 TEEL2	1.3E+00 TEEL1	
Benzaldehyde	100-52-7	6.0E+02 TEEL3	1.5E+01 TEEL2	1.5E+01 TEEL1	
Benzamide	55-21-0	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Benzenamine, sulfate (2:1)	542-16-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Benzene	71-43-2	1.3E+04 AEGL3_1hr	2.6E+03 AEGL2_1hr	1.7E+02 AEGL1_1hr	anor bone marrow depres carc derm dizz head irrit eyes irrit nose irrit resp sys irrit skin lass nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					staggered gait
Benzene D6	1076-43-3	1.3E+04 TEEL3	2.5E+03 TEEL2	1.5E+02 TEEL1	
Benzenearsonic acid	98-05-5	2.7E-01 TEEL3	2.7E-01 TEEL2	2.7E-01 TEEL1	
Benzenesulfonic acid chloride	98-09-9	2.0E+02 TEEL3	2.0E+02 TEEL2	1.3E+02 TEEL1	
Benzenetetracarboxylic dianhydride, 1,2,4,5-	89-32-7	1.5E+01 TEEL3	1.5E+01 TEEL2	5.0E+00 TEEL1	
Benzenethiol	108-98-5	7.2E+00 AEGL3_1hr	2.4E+00 AEGL2_1hr	4.5E-01 TLV_TWA_irr*	CNS depres cough cyan derm dizz dysp head irrit eyes irrit resp sys irrit skin kidney damage liver damage nau pneu pulm edema spleen damage vomit wheez
Benzidine	92-87-5	1.3E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	acute cystitis acute liver disorders carc derm hema irreg urination painful urination

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					secondary anemia from hemolysis
Benzo(a)anthracene	56-55-3	1.5E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Benzo(a)pyrene	50-32-8	8.0E+01 TEEL3	1.5E+01 TEEL2	6.0E-01 TEEL1	
Benzo(b)fluoranthene	205-99-2	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Benzo(g,h,i)perylene	191-24-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Benzo(k)fluoranthene	207-08-9	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Benzo-4,7,13,16,21,24-hexaoxa-1,10-diazabicyclo(8.8.8)hexacosane, 5,6-	31250-18-7	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Benzoic acid	65-85-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Benzoic acid, sodium salt	532-32-1	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Benzoin oxime	441-38-3	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Benzonitrile	100-47-0	2.4E+02 TEEL3	9.3E+01 TEEL2	1.3E+01 TEEL1	
Benzophenone	119-61-9	5.0E+02 TEEL3	3.5E+02 TEEL2	1.5E+00 TEEL1	
Benzothiazole	95-16-9	1.5E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Benzotriazole	95-14-7	2.5E+02 TEEL3	5.0E-01 TEEL2	7.5E-02 TEEL1	
Benzotrichloride	98-07-7	1.0E+01 TEEL3	7.0E+00 TEEL2	1.0E+00 TEEL1	
Benzotrifluoride	98-08-8	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Benzoyl chloride	98-88-4	1.1E+02 ERPG3	2.9E+01 ERPG2	1.7E+00 ERPG1	
Benzoyl peroxide	94-36-0	5.0E+02 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	
					irrit eyes irrit muc memb

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin sens derm
Benzyl acetate	140-11-4	1.5E+02 TEEL3	6.1E+01 TLV_TWA_irr*	6.1E+01 TLV_TWA_irr*	
Benzyl alcohol	100-51-6	6.0E+02 TEEL3	6.0E+02 TEEL2	2.5E+02 TEEL1	
Benzyl benzoate	120-51-4	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Benzyl bromide	100-39-0	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Benzyl chloride	100-44-7	2.6E+02 TEEL3	5.3E+01 TEEL2	5.2E+00 TEEL1	head irrit eyes irrit nose irrit skin irrity lass pulm edema skin eruption
Benzyl chloroformate	501-53-1	2.0E+01 AEGL3_1hr	6.8E+00 AEGL2_1hr	1.0E+00 TEEL1	
Benzyl cyanide	140-29-4	3.0E+01 TEEL3	4.3E+00 TEEL2	6.0E-01 TEEL1	
Benzylamine	100-46-9	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Benzyldimethylamine	103-83-3	2.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Benzyldimethylstearylammonium chloride	122-19-0	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Benzylmagnesium chloride	6921-34-2	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Benzyltrimethylammonium hydroxide	100-85-6	1.3E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Beryllium chloride	7787-47-5	3.6E+01 TEEL3	4.4E-02 TEEL2	1.8E-02 TEEL1	
Beryllium fluoride	7787-49-7	2.1E+01 TEEL3	2.6E-02 TEEL2	1.0E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Beryllium hydroxide	13327-32-7	1.9E+01 TEEL3	2.4E-01 TEEL2	3.5E-02 TEEL1	
Beryllium nitrate	13597-99-4	5.9E+01 TEEL3	7.4E+00 TEEL2	1.0E+00 TEEL1	
Beryllium oxide	1304-56-9	1.1E+01 TEEL3	1.4E+00 TEEL2	2.0E-01 TEEL1	
Beryllium, elemental	7440-41-7	1.0E-01 ERPG3	2.5E-02 ERPG2	3.5E-03 TEEL1	berylliosis (chronic exposure): anor berylliosis (chronic exposure): chest pain berylliosis (chronic exposure): clubbing of fingers berylliosis (chronic exposure): cough berylliosis (chronic exposure): cyan berylliosis (chronic exposure): lass berylliosis (chronic exposure): low-weight berylliosis (chronic exposure): pulm insufficiency carc derm irrit eyes
Betaine	107-43-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Bibenzyl	103-29-7	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Bidrin	141-66-2	8.8E-01 AEGL3_1hr	2.9E-01 AEGL2_1hr	1.5E-01 TEEL1	abdom cramps anor anxi diarr dizz head inco lac

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lass mal musc twitch nau restless rhinitis salv sweat tremor vomit
Bioxiran	1464-53-5	3.5E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Biphenyl, 1,1-	92-52-4	1.0E+02 TEEL3	6.1E+01 AEGL2_1hr	7.5E+00 TEEL1	head irrit eyes irrit throat lass liver damage nau numb limbs
Biphenylol, 4-	92-69-3	6.0E+01 TEEL3	6.0E+01 TEEL2	3.5E+01 TEEL1	
Bis(2,3-epoxypropoxy) butane, 1,4-	2425-79-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Bis(2-chloro-1-methylethyl) ether	108-60-1	6.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Bis(2-chloroethoxy)methane	111-91-1	4.0E+01 TEEL3	4.0E+01 TEEL2	1.5E+01 TEEL1	
Bis(2-chloroethyl) ether	111-44-4	6.0E+02 TEEL3	1.5E+02 TEEL2	6.0E+01 TEEL1	carc cough in animals: pulm edema irrit nose irrit resp sys irrit throat lac liver damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau vomit
Bis(2-chloroethylthio)methane	63869-13-6	5.0E+00 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Bis(2-chloroethylthio)-n-butane, 1,4-	142868-93-7	6.0E+00 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Bis(2-chloroethylthio)-n-pentane, 1,5-	142868-94-8	7.5E+00 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Bis(2-chloroethylthio)-n-propane, 1,3-	63905-10-2	6.0E+00 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Bis(2-chloroethylthioethyl)ether	63918-89-8	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Bis(2-chloroethylthiomethyl)ether	63918-90-1	6.0E+00 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Bis(2-dimethylaminoethyl)ether	3033-62-3	1.0E+02 TEEL3	1.0E+02 TEEL2	1.0E+00 TEEL1	in animals: irrit eyes in animals: irrit skin neurological disorders possible urinary dist
Bis(2-ethylhexyl) hydrogen phosphate	298-07-7	2.0E+00 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	
Bis(2-ethylhexyl) phenyl phosphate	16368-97-1	7.5E+00 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Bis(2-ethylhexyl) phthalate	117-81-7	5.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	carc in animals: liver damage irrit eyes irrit muc memb terato effects
Bis(2-methylstyryl)benzene, 4-	13280-61-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	5.0E+02 TEEL3	3.0E+02 TEEL2	3.0E+01 TEEL1	irrit eyes irrit resp sys irrit skin
Bis(chloromethyl) ether	542-88-1	8.5E-01 AEGL3_1hr	2.1E-01 AEGL2_1hr	3.0E-02 TEEL1	blood-stained sputum

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					bronchial secretions carc corn damage cough decr pulm function dysp edema irrit eyes irrit muc memb irrit resp sys irrit skin nec pulm congestion wheez
Bis(chloromethyl)oxetane, 3,3-	78-71-7	7.5E+01 TEEL3	2.0E+00 TEEL2	1.3E+00 TEEL1	
Bis(trifluoromethyl)benzene, 1,3-	402-31-3	4.7E+02 TEEL3	2.4E+01 TEEL2	1.4E+01 TEEL1	
Bis[(benzo-15-crown-5)-4-methyl]pimelate	69271-98-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bisbutenylenetetrahydrofurfal	126-15-8	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Bischloromethyl ketone	534-07-6	2.0E+00 TEEL3	2.0E+00 TEEL2	4.0E-01 TEEL1	
Bismuth acetate	22306-37-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bismuth germanate	12233-56-6	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Bismuth hydroxide	10361-43-0	1.0E+02 TEEL3	3.0E+00 TEEL2	1.0E+00 TEEL1	
Bismuth iodide	7787-64-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Bismuth nitrate	10361-44-1	5.0E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Bismuth oxide	1304-76-3	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Bismuth oxychloride	7787-59-9	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Bismuth subnitrate	1304-85-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Bismuth(III) nitrate, pentahydrate	10035-06-0	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Bismuth, elemental	7440-69-9	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Bisphenol A	80-05-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Bisphenol A diglycidyl ether	1675-54-3	6.0E+00 TEEL3	6.0E+00 TEEL2	3.5E+00 TEEL1	
Bisphenol A epon 829 polymer	25036-25-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Bis-tris propane	64431-96-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bitoscanate	4044-65-9	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
BoBCalix	X-213*	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Borane methyl sulfide complex	13292-87-0	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Borane-tetrahydrofuran	14044-65-6	1.3E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Borate	14213-97-9	5.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Borax	1303-96-4	5.0E+02 TEEL3	2.0E+02 TEEL2	5.3E+01 TEEL1	cough derm dysp epis irrit eyes irrit skin irrit upper resp sys
Boric acid	10043-35-3	1.3E+02 TEEL3	1.0E+02 TEEL2	6.0E+00 TEEL1	
Boric acid, tributyl ester	688-74-4	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Boron	7440-42-8	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Boron carbide	12069-32-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Boron nitride	10043-11-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Boron oxide	1303-86-2	5.0E+02 TEEL3	3.0E+02 TEEL2	3.0E+01 TEEL1	conj cough irrit eyes irrit resp sys irrit skin skin eryt
Boron tribromide	10294-33-4	4.1E+02 AEGL3_1hr	7.5E+01 AEGL2_1hr	3.4E+00 AEGL1_1hr	dysp eye burns irrit eyes irrit resp sys irrit skin pulm edema skin burns
Boron trichloride	10294-34-5	1.3E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Boron trifluoride	7637-07-2	1.1E+02 AEGL3_1hr*	3.7E+01 AEGL2_1hr*	2.5E+00 AEGL1_1hr*	epis eye burns in animals: kidney damage in animals: pneu irrit eyes irrit nose irrit resp sys irrit skin skin burns
Boron trifluoride diethyl etherate	109-63-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Boron trifluoride-dimethyl ether	353-42-4	1.1E+02 TEEL3	3.7E+01 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Botulinum toxin-A	93384-43-1	3.0E-05 TEEL3	3.0E-08 TEEL2	4.0E-09 TEEL1	
Botulinum toxin-B	93384-44-2	1.5E-05 TEEL3	1.5E-05 TEEL2	1.3E-05 TEEL1	
Botulinum toxin-F	0-307*	1.0E-05 TEEL3	1.5E-06 TEEL2	2.0E-07 TEEL1	
Botulinum, clostridium	0-308*	6.0E-07 TEEL3	1.2E-07 TEEL2	1.5E-08 TEEL1	
Bovine albumin	9048-46-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Brilliant blue	2650-18-2	6.0E-02 TEEL3	6.0E-02 TEEL2	6.0E-02 TEEL1	
Bromadiolone	28772-56-7	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Bromine	7726-95-6	5.6E+01 AEGL3_1hr	1.6E+00 AEGL2_1hr	2.2E-01 AEGL1_1hr	abdom pain cough diarr dizz epis eye burns feeling of oppression head lac measle-like eruptions pneu pulm edema skin burns
Bromine chloride	13863-41-7	3.6E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	2.4E+00 AEGL1_1hr	
Bromine pentafluoride	7789-30-2	2.4E+02 AEGL3_1hr	7.2E+00 AEGL2_1hr	1.0E+00 TEEL1	corn nec cough dysp irrit eyes irrit resp sys irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					kidney inj liver inj pulm edema skin burns
Bromine trifluoride	7787-71-5	1.2E+02 AEGL3_1hr	1.1E+01 AEGL2_1hr	6.7E-01 AEGL1_1hr	
Bromo-1-chloro-5,5-dimethylhydantoin, 3-	126-06-7	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Bromo-2-chloro-1,1,2-trifluoroethane, 1-	354-06-3	4.0E+04 TEEL3	7.5E+03 TEEL2	1.3E+03 TEEL1	
Bromo-3-chloro-5,5-dimethylhydanton, 1-	16079-88-2	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Bromoacetaldehyde diethyl acetul	2032-35-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Bromoacetic acid	79-08-3	4.0E+00 TEEL3	7.5E-01 TEEL2	1.3E-01 TEEL1	
Bromoacetone	598-31-2	5.5E+00 AEGL3_1hr	1.8E+00 AEGL2_1hr	6.2E-02 AEGL1_1hr	
Bromobenzene	108-86-1	2.0E+03 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Bromochlorobenzene, 3-	108-37-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bromochlorobenzene, 4-	106-39-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bromochlorodifluoromethane	353-59-3	3.5E+04 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
Bromochloromethane	74-97-5	1.0E+04 TEEL3	1.0E+04 TEEL2	3.0E+03 TEEL1	CNS depres conf dizz irrit eyes irrit skin irrit throat pulm edema
Bromocresol green	76-60-8	5.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Bromocresol purple	115-40-2	5.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Bromocyclohexanol, cis-2-	16536-57-5	3.0E+02 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Bromodichloromethane	75-27-4	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Bromoethene	593-60-2	2.0E+02 TEEL3	1.5E+02 TEEL2	6.0E+00 TEEL1	carc conf dizz inco irrit eyes irrit skin liquid: frostbite narco nau vomit
Bromoethylmagnesium	925-90-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Bromofluorobenzene, p-	460-00-4	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Bromoform	75-25-2	7.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	CNS depres irrit eyes irrit resp sys irrit skin kidney damage liver damage
Bromohexane	111-25-1	3.0E+04 TEEL3	6.0E+03 TEEL2	7.5E+02 TEEL1	
Bromonaphthalene	90-11-9	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Bromonitromethane	563-70-2	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Bromophenol blue	115-39-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Bromophenyl phenyl ether, 4-	101-55-3	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Bromopropane, 1-	106-94-5	1.3E+04 TEEL3	1.3E+04 TEEL2	1.5E+02 TEEL1	
Bromopropane, 2-	75-26-3	1.3E+05 TEEL3	6.0E+04 TEEL2	7.5E+03 TEEL1	
Bromopyrene, 3-	1714-29-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bromosuccinimide, N-	128-08-5	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Bromothymol blue	76-59-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Bromotrichloromethane	75-62-7	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Bromotrifluoroethylene	598-73-2	6.0E+02 TEEL3	3.5E+02 TEEL2	2.0E+01 TEEL1	
Bromotrimethylsilane	2857-97-8	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Brown menhaden fish oil	68440-42-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Brucine	357-57-3	4.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Buffer solution, aqueous	7732-18-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Butadiene monoxide	930-22-3	7.5E+01 TEEL3	7.5E+01 TEEL2	3.0E+01 TEEL1	
Butadiene, 1,3-	106-99-0	4.9E+04 AEGL3_1hr	1.2E+04 AEGL2_1hr	1.5E+03 AEGL1_1hr	carc dizz drow irrit eyes irrit nose irrit throat liquid: frostbite repro effects terato effects
Butane	106-97-8	1.3E+05 AEGL3_1hr	4.0E+04 AEGL2_1hr	1.3E+04 AEGL1_1hr	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					asphy drow liquid: frostbite narco
Butanediol dinitrate, 1,4-	3457-91-8	2.0E+01 TEEL3	3.0E+00 TEEL2	7.5E-01 TEEL1	
Butanediol, 1,3-	107-88-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Butanediol, 1,4-	110-63-4	2.5E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Butanenitrile	109-74-0	1.3E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	abdom pain conf convuls dizz dysp head irrit eyes irrit resp sys irrit skin lass nau vomit
Butanethiol	109-79-5	1.5E+03 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	conf cyan head in animals: inco in animals: lass in animals: narco irrit eyes irrit skin kidney damage liver damage mal musc weak nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					pulm irrit sweat vomit
Butanol, 1-	71-36-3	4.0E+03 TEEL3	1.5E+02 TEEL2	6.1E+01 TLV_TWA_irr*	blurred vision CNS depres corn inflamm derm dizz drow head hearing loss irrit eyes irrit nose irrit throat lac photo possible auditory nerve damage
Butanol, aluminum salt, 2-	2269-22-9	4.0E+02 TEEL3	9.1E+01 TEEL2	5.5E+01 TEEL1	
Butanone oxamine	96-29-7	4.0E+02 TEEL3	4.0E+02 TEEL2	1.5E+02 TEEL1	
Butene, 1-	106-98-9	1.5E+05 TEEL3	3.0E+04 TEEL2	1.5E+03 TEEL1	
Butene, 2-	107-01-7	1.5E+05 TEEL3	3.0E+03 TEEL2	1.5E+03 TEEL1	
Butene, cis-2-	590-18-1	7.5E+05 TEEL3	5.0E+05 TEEL2	1.5E+05 TEEL1	
Butene, trans-2-	624-64-6	1.5E+05 TEEL3	3.0E+04 TEEL2	1.5E+03 TEEL1	
Butoxyethanol acetate, 2-	112-07-2	1.0E+03 TEEL3	6.0E+02 TEEL2	4.0E+02 TEEL1	CNS depres head hema hemolysis irrit eyes irrit nose

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin irrit throat vomit
Butoxypolypropylene glycol	9003-13-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Butyl acetate, n-	123-86-4	1.4E+04 ERPG3	9.5E+02 ERPG2	2.4E+01 ERPG1	
					drow head irrit eyes irrit skin irrit upper resp sys narco
Butyl acetate, sec-	105-46-4	7.5E+03 TEEL3	1.5E+03 TEEL2	9.5E+02 TLV_TWA_irr*	
					drow dry skin dryness upper resp sys head irrit eyes narco
Butyl acetate, tert-	540-88-5	6.0E+03 TEEL3	4.0E+03 TEEL2	2.5E+03 TEEL1	
					derm head inflamm eyes irrit upper resp tract itch eyes narco
Butyl acetoacetate, tert-	1694-31-1	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Butyl acrylate resin, n-	9003-49-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Butyl acrylate, n-	141-32-2	2.5E+03 AEGL3_1hr	6.8E+02 AEGL2_1hr	4.4E+01 AEGL1_1hr	
					dysp irrit eyes irrit skin irrit upper resp sys sens derm
Butyl alcohol, sec-	78-92-2	6.0E+03 TEEL3	1.3E+03 TEEL2	4.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit nose irrit skin irrit throat narco
Butyl benzyl phthalate	85-68-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+01 TEEL1	
Butyl butyrate	109-21-7	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Butyl chloroformate, n-	592-34-7	3.7E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	1.5E+00 TEEL1	
Butyl glycidyl ether, n-	2426-08-6	1.3E+03 TEEL3	3.0E+01 TEEL2	1.6E+01 TLV_TWA_irr*	
Butyl isocyanate, n-	111-36-4	1.0E+00 AEGL3_1hr	9.3E-02 AEGL2_1hr	5.3E-02 AEGL1_1hr	CNS depres irrit eyes irrit nose irrit skin narco possible hemato effects skin sens
Butyl levulinate	2052-15-5	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Butyl lithium	109-72-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.2E+02 TEEL1	
Butyl methacrylate	97-88-1	5.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Butyl myristate	110-36-1	3.5E+03 TEEL3	6.0E+02 TEEL2	1.0E+02 TEEL1	
Butyl perbenzoate, tert-	614-45-9	4.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Butyl propanoate	590-01-2	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	
Butyl titanate	5593-70-4	1.3E+03 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Butyl-2-methylcyclopropane, T-1-	38851-70-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Butylamine, (S)-2-	513-49-5	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Butylamine, 4-(diethoxymethylsilyl)-	3037-72-7	4.5E+01 TEEL3	4.5E+01 TEEL2	6.0E+00 TEEL1	
Butylamine, n-	109-73-9	7.5E+02 TEEL3	1.5E+01 TEEL2	6.0E+00 TEEL1	head irrit eyes irrit nose irrit skin irrit throat skin burns skin flush
Butylamine, sec	13952-84-6	6.0E+01 TEEL3	3.0E+01 TEEL2	6.0E+00 TEEL1	
Butylamine, tert-	75-64-9	4.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Butylated hydroxytoluene	128-37-0	4.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	in animals: decr growth rate in animals: incr liver weight irrit eyes irrit skin
Butylbenzene, n-	104-51-8	7.5E+03 TEEL3	1.5E+03 TEEL2	2.0E+02 TEEL1	
Butylbenzene, sec-	135-98-8	7.5E+02 TEEL3	4.0E+00 TEEL2	5.0E-01 TEEL1	
Butylbenzene, tert-	98-06-6	1.3E+03 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Butylchloride, t-	507-20-0	7.5E+03 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Butylcyclohexane	1678-93-9	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Butylcyclohexanone, p-tert-	98-53-3	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Butylene carbonate	4437-85-8	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Butylphosphonic acid	3321-64-0	2.0E+00 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Butylpyrocatechol, 4-tert	98-29-3	5.0E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Butyltrichlorosilane	7521-80-4	2.6E+02 AEGL3_1hr	5.7E+01 AEGL2_1hr	4.7E+00 AEGL1_1hr	
Butynediol, 1,4-	110-65-6	3.0E+01 TEEL3	2.0E+01 TEEL2	6.0E-01 TEEL1	
Butyraldehyde	123-72-8	4.0E+01 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Butyric acid	107-92-6	7.5E+02 TEEL3	7.5E+02 TEEL2	1.5E+02 TEEL1	
Butyric acid, sodium salt	156-54-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Butyrolactone, gamma-	96-48-0	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
BZ	53800-72-9	6.9E-01 AEGL3_1hr	3.7E-02 AEGL2_1hr	2.0E-02 TEEL1	blurred vision decreased mental performance decreased salivation delirium dry mouth halu poor coordination rapid pulse restless stupor
Cacodylic acid	75-60-5	2.5E+02 TEEL3	4.0E+00 TEEL2	1.5E+00 TEEL1	
Cadmium acetate	543-90-8	1.9E+01 TEEL3	1.5E-01 TEEL2	6.2E-02 TEEL1	
Cadmium bromide	7789-42-6	2.2E+01 TEEL3	7.5E+00 TEEL2	7.3E-02 TEEL1	
Cadmium carbonate	513-78-0	1.4E+01 TEEL3	7.7E-02 TEEL2	4.6E-02 TEEL1	
Cadmium chloride	10108-64-2	1.5E+01 TEEL3	5.0E-01 TEEL2	4.9E-02 TEEL1	
Cadmium chloride hemipentahydrate	7790-78-5	1.8E+01 TEEL3	5.0E+00 TEEL2	6.1E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cadmium dinitrite	7790-83-2	1.6E+01 TEEL3	9.1E-02 TEEL2	5.5E-02 TEEL1	
Cadmium fluoride	7790-79-6	1.2E+01 TEEL3	6.7E-02 TEEL2	4.0E-02 TEEL1	
Cadmium hydroxide	21041-95-2	1.2E+01 TEEL3	6.5E-02 TEEL2	3.9E-02 TEEL1	
Cadmium nitrate	10325-94-7	1.9E+01 TEEL3	1.1E-01 TEEL2	6.3E-02 TEEL1	
Cadmium nitrate tetrahydrate	10022-68-1	2.5E+01 TEEL3	5.0E+00 TEEL2	6.0E-01 TEEL1	
Cadmium oxide	1306-19-0	1.0E+01 TEEL3	4.0E+00 TEEL2	3.4E-02 TEEL1	anos carc chest tight chills cough diarr dysp emphy head mild anemia musc ache nau prot pulm edema subs pain vomit
Cadmium stearate	2223-93-0	5.5E+01 TEEL3	1.3E+01 TEEL2	1.8E-01 TEEL1	
Cadmium sulfate	10124-36-4	1.7E+01 TEEL3	9.3E-02 TEEL2	5.6E-02 TEEL1	
Cadmium sulfate, hydrate	7790-84-3	2.8E+01 TEEL3	3.0E-01 TEEL2	9.4E-02 TEEL1	
Cadmium sulfide	1306-23-6	1.2E+01 TEEL3	1.2E+01 TEEL2	3.9E-02 TEEL1	
Cadmium, elemental	7440-43-9	4.7E+00 AEGL3_1hr	7.6E-01 AEGL2_1hr	1.0E-01 AEGL1_1hr	anos

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					carc chest tight chills cough diarr dysp emphy head mild anemia musc ache nau prot pulm edema subs pain vomit
Calcium acetate	62-54-4	3.0E+01 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	
Calcium arsenate	7778-44-1	1.3E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
					carc derm GI dist in animals: liver damage lass palmar planter hyperkeratoses peri neur skin hyperpig
Calcium carbide	75-20-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Calcium carbonate	471-34-1	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
					cough cough irrit eyes irrit muc memb irrit resp sys irrit skin irrit upper resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lac lac rhin rhin sneez sneez
Calcium chloride	10043-52-4	4.0E+02 TEEL3	2.0E+01 TEEL2	3.5E+00 TEEL1	
Calcium chloride dihydrate	10035-04-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Calcium chloride hexahydrate	7774-34-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Calcium chloride hydrate	22691-02-7	4.5E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Calcium chromate	13765-19-0	4.5E+01 TEEL3	1.3E+00 TEEL2	9.0E-02 TEEL1	
Calcium cyanamide	156-62-7	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+00 TEEL1	
					antabuse-like effects cough dizz head irrit eyes irrit resp sys irrit skin low BP nau rapid breath skin burns skin sens vomit
Calcium cyanide	592-01-8	2.8E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	3.8E+00 AEGL1_1hr	
Calcium fluoride	7789-75-5	5.0E+02 TEEL3	2.0E+02 TEEL2	1.5E+01 TEEL1	
Calcium formate	544-17-2	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Calcium hydride	7789-78-8	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Calcium hydroxide	1305-62-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	bron cough eye burns irrit eyes irrit skin irrit upper resp sys pneu skin burns skin vesic
Calcium hypochlorite	7778-54-3	3.5E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Calcium metasilicate	10101-39-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Calcium monohydrogen phosphate dihydrate	7789-77-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Calcium nitrate	10124-37-5	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Calcium nitrate tetrahydrate	13477-34-4	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Calcium nitrite	13780-06-8	5.0E+01 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Calcium oxalate	563-72-4	5.0E+01 TEEL3	5.0E+01 TEEL2	1.5E+01 TEEL1	
Calcium oxalate, hydrate	5794-28-5	6.0E+01 TEEL3	6.0E+01 TEEL2	1.5E+01 TEEL1	
Calcium oxide	1305-78-8	2.5E+01 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	derm irrit eyes irrit skin irrit upper resp tract perf nasal septum pneu ulcer
Calcium phosphate	10103-46-5	3.5E+02 TEEL3	3.5E+01 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Calcium phosphate tribasic	12167-74-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Calcium phosphide	1305-99-3	1.3E+01 AEGL3_1hr	7.5E+00 AEGL2_1hr	1.0E+00 TEEL1	
Calcium sulfate	7778-18-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	conj epis irrit eyes irrit skin irrit upper resp sys rhinitis
Calcium sulfate dihydrate	10101-41-4	7.5E+01 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Calcium trifluoromethyl sulfonate	55120-75-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Calcium, elemental	7440-70-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Camphor	76-22-2	2.0E+02 TEEL3	3.0E+01 TEEL2	1.9E+01 TEEL1	diarr dizz epilep convuls excitement head irrit eyes irrit muc memb irrit skin nau vomit
Cantharidin	56-25-7	4.3E+00 TEEL3	4.3E+00 TEEL2	2.5E+00 TEEL1	
Caprolactam	105-60-2	2.0E+01 TEEL3	5.0E+00 TLV_TWA_irr*	5.0E+00 TLV_TWA_irr*	abdom cramps asthma conf derm diarr dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					epis head irrit eyes irrit resp sys irrit skin irrity kidney inj liver inj nau skin sens vomit
Caprolactone	502-44-3	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Caprylyl chloride	111-64-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
CAPSO	73463-39-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Captan	133-06-2	5.0E+02 TEEL3	3.0E+01 TEEL2	1.5E+01 TEEL1	blurred vision carc derm diarr dysp irrit eyes irrit skin irrit upper resp sys skin sens vomit
Carbachol chloride	51-83-2	1.5E+01 TEEL3	1.5E+01 TEEL2	7.5E+00 TEEL1	
Carbaryl	63-25-2	1.0E+02 TEEL3	1.5E+01 TEEL2	5.0E+00 TEEL1	abdom cramps blurred vision convuls cyan diarr irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lac miosis nau possible repro effects rhin salv sweat tremor vomit
Carbazole	86-74-8	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Carbazole violet	6358-30-1	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Carbethoxyethylidine	5717-37-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Carbitol acetate	112-15-2	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Carbofuran	1563-66-2	5.0E-01 TEEL3	4.3E-01 TEEL2	3.0E-01 TEEL1	abdom cramps blurred vision convuls diarr head inco lass miosis musc twitch nau salv sweat vomit
Carbon	7440-44-0	5.0E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	black sputum cough decr pulm func dysp lung fib

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Carbon black	1333-86-4	5.0E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
					cough
					in presence of polycyclic aromatic hydrocarbons: carc
					irrit eyes
Carbon dioxide	124-38-9	7.5E+04 TEEL3	5.0E+04 TEEL2	5.0E+04 TEEL1	
					asphy
					coma
					convuls
					dizz
					dysp
					frostbite (liq, dry ice)
					head
					incr BP
					incr card output
					incr heart rate
					mal
					pares
					restless
					sweat
Carbon disulfide	75-15-0	1.5E+03 AEGL3_1hr	5.0E+02 AEGL2_1hr	4.0E+01 AEGL1_1hr	
					anor
					anxi
					coronary heart disease
					derm
					dizz
					eye burns
					gastritis
					head
					kidney inj
					lass
					liver inj
					low weight
					ocular changes
					Parkinson-like syndrome
					polyneur
					poor sleep
					psychosis

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					repro effects
					skin burns
Carbon monoxide	630-08-0	3.8E+02 AEGL3_1hr*	9.5E+01 AEGL2_1hr*	9.5E+01 TEEL1*	
					angina
					conf
					cyan
					depres S_T segment of electrocardiogram
					dizz
					halu
					head
					lass
					nau
					syncope
					tachypnea
Carbon tetrachloride	56-23-5	3.3E+03 AEGL3_1hr	1.2E+03 AEGL2_1hr	2.8E+02 AEGL1_1hr	
					carc
					CNS depres
					dizz
					drow
					inco
					irrit eyes
					irrit skin
					kidney inj
					liver inj
					nau
					vomit
Carbon tetrafluoride	75-73-0	7.5E+04 TEEL3	1.5E+04 TEEL2	2.5E+03 TEEL1	
Carbon trifluoride	75-46-7	3.0E+05 TEEL3	6.0E+04 TEEL2	7.5E+03 TEEL1	
Carbonyl fluoride	353-50-4	2.2E+00 AEGL3_1hr	7.6E-01 AEGL2_1hr	7.6E-01 TEEL1	
					chronic exposure: GI pain
					chronic exposure: musc fib
					chronic exposure: skeletal fluorosis
					cough
					dysp

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					eye burns irrit eyes irrit muc memb irrit resp sys irrit skin lac liquid: frostbite pulm edema skin burns
Carbonyl sulfide	463-58-1	3.7E+02 AEGL3_1hr	1.4E+02 AEGL2_1hr	7.5E+01 TEEL1	
Carbonyldiphthalic anhydride, 4,4'-	2421-28-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Carbophenothion	786-19-6	6.8E+00 TEEL3	6.8E+00 TEEL2	4.0E+00 TEEL1	
Carboxymethyl cellulose	9000-11-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Carboxymethyl sepharose	68894-07-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Casein	9000-71-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Castor oil	8001-79-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Catechol	120-80-9	1.0E+02 TEEL3	4.0E+01 TEEL2	2.3E+01 TLV_TWA_irr*	burn eyes convuls derm incr BP irrit eyes irrit resp sys irrit skin kidney inj lac skin sens
Cellulase	9012-54-8	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Cellulose	9004-34-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit skin
Cellulose acetate butanoate	9004-36-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Cellulose, 2-(diethylamino)ethyl ether	9013-34-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ceric ammonium nitrate	16774-21-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ceric ammonium sulfate	7637-03-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ceric ammonium sulfate, dihydrate	10378-47-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ceric oxide	1306-38-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Cerium	7440-45-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Cerium acetate	537-00-8	1.0E+01 TEEL3	2.0E+00 TEEL2	3.5E-01 TEEL1	
Cerium chloride	7790-86-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Cerium fluoride	7758-88-5	5.0E+02 TEEL3	4.3E+01 TEEL2	2.6E+01 TEEL1	
Cerium nitrate hexahydrate	10294-41-4	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Cerium oxalate	139-42-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Cerium sulfate	13590-82-4	1.0E+02 TEEL3	2.0E+01 TEEL2	3.5E+00 TEEL1	
Cerium(IV) hydroxide	12014-56-1	3.5E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	
Cerous sulfate	13454-94-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Cesium carbonate	534-17-8	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Cesium chloride	7647-17-8	5.0E+02 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cesium fluoride	13400-13-0	5.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Cesium hydroxide	21351-79-1	2.5E+02 TEEL3	7.5E+00 TEEL2	2.0E+00 TEEL1	eye burns irrit eyes irrit skin irrit upper resp sys skin burns
Cesium iodide	7789-17-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Cesium nitrate	7789-18-6	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Cesium oxide	20281-00-9	5.0E+02 TEEL3	1.1E+01 TEEL2	6.7E+00 TEEL1	
Cesium, elemental	7440-46-2	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Charcoal, activated	64365-11-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Chloral	75-87-6	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Chloral hydrate	302-17-0	1.3E+02 TEEL3	1.3E+02 TEEL2	2.5E+01 TEEL1	
Chloramben	133-90-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Chloramine-T	127-65-1	2.5E+02 TEEL3	2.0E+00 TEEL2	2.5E-01 TEEL1	
Chlordane	57-74-9	1.0E+02 TEEL3	5.0E+01 TEEL2	1.5E+00 TEEL1	abdom pain anuria ataxia blurred vision carc conf convuls cough delirium diarr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: kidney damage in animals: liver damage in animals: lung damage irrity nau tremor vomit
Chlordecone	143-50-0	4.0E+01 TEEL3	6.0E-01 TEEL2	3.0E-03 TEEL1	
					anxi ataxia carc chest pain head kidney damage liver damage low sperm count skin eryt testicular atrophy tremor vis dist
Chlorfenvinphos	470-90-6	1.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Chlorflurazole	3615-21-2	1.3E+01 TEEL3	1.3E+01 TEEL2	7.5E+00 TEEL1	
Chloride	16887-00-6	1.5E+01 TEEL3	3.6E+00 TEEL2	1.5E+00 TEEL1	
					apathy delirium heat stroke impaired coord weariness
Chlorine	7782-50-5	5.8E+01 AEGL3_1hr*	5.8E+00 AEGL2_1hr*	1.5E+00 AEGL1_1hr*	
					burning mouth burning nose burning of eyes choking cough derm

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz head hypox irrit irrit irrit irrit irrit irrit irrit irrit irrit irrit lac liquid: frostbite nau pneu pulm edema rhin subs pain syncope vomit
Chlorine dioxide	10049-04-4	6.6E+00 TEEL3	3.0E+00 TEEL2	4.1E-01 TEEL1	 bron chronic bron cough irrit eyes irrit nose irrit throat pulm edema wheez
Chlorine pentafluoride	13637-63-3	4.3E+01 AEGL3_1hr	5.3E+00 AEGL2_1hr	1.6E+00 AEGL1_1hr	
Chlorine trifluoride	7790-91-2	7.9E+01 AEGL3_1hr	7.6E+00 AEGL2_1hr	4.5E-01 AEGL1_1hr	 eye burns (liq or high vap conc) in animals: corn ulcer

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: lac pulm edema resp irrit skin burns (liq or high vap conc)
Chlorite (sodium chlorite)	7758-19-2	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Chlormephos	24934-91-6	3.5E+01 TEEL3	7.0E+00 TEEL2	4.0E+00 TEEL1	
Chlormequat chloride	999-81-5	7.5E+00 TEEL3	7.0E+00 TEEL2	1.0E+00 TEEL1	
Chloro-1,3-butadiene	126-99-8	1.0E+03 TEEL3	3.6E+01 TLV_TWA_irr*	3.6E+01 TLV_TWA_irr*	alopecia anxi carc derm irrit eyes irrit resp sys irrit skin irrity repro effects
Chloro-1-butanol, 4-	928-51-8	4.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Chloro-2,4-dinitrobenzene, 1-	97-00-7	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Chloro-2-nitrophenol, 4-	89-64-5	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Chloro-4-nitrophenol, 2-	619-08-9	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Chloroacetaldehyde	107-20-0	3.2E+01 AEGL3_1hr	7.1E+00 AEGL2_1hr	4.2E+00 AEGL1_1hr	eye damage irrit eyes irrit muc memb irrit skin pulm edema resp sys sens skin burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					skin sens
Chloroacetaldehyde dimethyl acetal	97-97-2	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Chloroacetic acid	79-11-8	7.5E+01 TEEL3	2.6E+01 AEGL2_1hr	6.0E+00 TEEL1	
Chloroacetic acid, sodium salt	3926-62-3	4.0E+01 TEEL3	4.0E+01 TEEL2	7.1E+00 TEEL1	
Chloroacetone	78-95-5	4.9E+01 AEGL3_1hr	1.7E+01 AEGL2_1hr	2.0E+00 TEEL1	
Chloroacetonitrile	107-14-2	2.1E+02 AEGL3_1hr	9.9E+01 AEGL2_1hr	1.3E+01 TEEL1	
Chloroacetyl chloride	79-04-9	2.4E+02 AEGL3_1hr	7.4E+00 AEGL2_1hr	1.8E-01 AEGL1_1hr	cough dysp eye burns irrit eyes irrit resp sys irrit skin lac skin burns wheez
Chloroamphenicol	56-75-7	3.5E+02 TEEL3	7.5E+00 TEEL2	1.5E+00 TEEL1	
Chloroaniline, 4-	106-47-8	3.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Chlorobenzene	108-90-7	1.8E+03 AEGL3_1hr	6.9E+02 AEGL2_1hr	4.6E+01 AEGL1_1hr	CNS depres drow in animals: kidney inj in animals: liver inj in animals: lung inj inco irrit eyes irrit nose irrit skin
Chlorobenzene sulfonic acid, p-	98-66-8	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Chlorobenzilate	510-15-6	3.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Chlorobenzotrifluoride, 2-	88-16-4	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Chlorobenzylidene malononitrile, o-	2698-41-1	1.1E+01 AEGL3_1hr	5.0E-01 AEGL2_1hr	5.0E-02 AEGL1_1hr	blepharospasm burn eyes chest tight conj cough eryt eryt eyelids head irrit throat lac pain eyes vesic skin
Chlorobutane, 1-	109-69-3	3.0E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Chlorobutane, 2-	78-86-4	1.3E+04 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Chlorocyclohexanol, trans-2-	6628-80-4	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Chlorodecane, 1-	1002-69-3	7.5E+03 TEEL3	1.5E+03 TEEL2	1.0E+03 TEEL1	
Chlorodiethylaluminum	96-10-6	5.0E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Chlorodifluoromethane	75-45-6	3.0E+04 TEEL3	3.0E+04 TEEL2	4.0E+03 TEEL1	asphy card arrhy conf drow heart palp irrit resp sys kidney inj liquid: frostbite liver inj

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					ringing in ears spleen inj
Chloroethanesulfonyl chloride, 2-	1622-32-8	1.5E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Chloroethyl chloroformate	627-11-2	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
Chloroethyl vinyl ether, 2-	110-75-8	1.0E+02 TEEL3	2.0E+01 TEEL2	3.5E+00 TEEL1	
Chloroethylchloromethylsulfide, 2-	2625-76-5	1.5E+00 TEEL3	1.0E-01 TEEL2	6.0E-02 TEEL1	
Chloroform	67-66-3	1.6E+04 AEGL3_1hr	3.1E+02 AEGL2_1hr	4.9E+01 TLV_TWA*	anes anes carc conf conf dizz dizz enlarged liver enlarged liver head head irrit eyes irrit skin irrit skin lass lass mental dullness mental dullness nau nau
Chloroform-d	865-49-6	1.5E+04 TEEL3	3.0E+02 TEEL2	1.0E+01 TEEL1	
Chlorohydrin	96-24-2	6.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Chloro-m-cresol, p-	59-50-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Chloromethyl methyl ether	107-30-2	6.6E+00 AEGL3_1hr	1.5E+00 AEGL2_1hr	7.5E-01 TEEL1	blood stained-sputum bronchial secretions carc cough irrit eyes irrit muc memb irrit skin low weight pneu pulm congestion pulm congestion pulm edema skin burns skin nec wheez
Chloromethyl(trichloro)silane	1558-25-4	2.5E+02 AEGL3_1hr	5.5E+01 AEGL2_1hr	4.5E+00 AEGL1_1hr	
Chloronaphthalene, alpha-	90-13-1	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Chloronaphthalene, beta-	91-58-7	5.0E+02 TEEL3	1.5E+02 TEEL2	6.0E-01 TEEL1	
Chloronitrobenzene, m-	121-73-3	1.5E+02 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Chloronitrobenzene, p-	100-00-5	1.0E+02 TEEL3	1.0E+02 TEEL2	1.9E+00 TEEL1	anemia anoxia bone marrow changes carc in animals: hema kidney changes methemo repro effects spleen changes unpleasant taste
Chloropentafluoroethane	76-15-3	2.0E+06 TEEL3	3.0E+04 TEEL2	1.5E+04 TEEL1	card arrhy

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					card asphy dizz drow heart palp inco liquid: derm liquid: frostbite narco nau vomit
Chloroperoxybenzoic acid, 3-	937-14-4	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Chlorophacinone	3691-35-8	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Chlorophenol, 2-	95-57-8	2.0E+03 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Chlorophenol, 3-	108-43-0	2.5E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Chlorophenol, 4-	106-48-9	4.0E+02 TEEL3	4.0E+02 TEEL2	4.0E+02 TEEL1	
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5E-01 TEEL3	5.0E-02 TEEL2	7.5E-03 TEEL1	
Chlorophenyl thiourea, 2-	5344-82-1	4.6E+00 TEEL3	4.6E+00 TEEL2	2.5E+00 TEEL1	
Chloropicrin	76-06-2	9.4E+00 AEGL3_1hr	1.0E+00 AEGL2_1hr	3.4E-01 AEGL1_1hr	cough irrit eyes irrit resp sys irrit skin lac nau pulm edema vomit
Chloropicrin/methyl bromide mixture	8004-09-9	9.3E+00 TEEL3	1.0E+00 TEEL2	3.3E-01 TEEL1	
Chloroplatanic acid	16941-12-1	8.4E+00 TEEL3	1.5E+00 TEEL2	2.5E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Chloropropane, 2-	75-29-6	5.0E+04 TEEL3	5.0E+04 TEEL2	5.0E+02 TEEL1	
Chloropropionitrile, 3-	542-76-7	4.0E+01 TEEL3	7.5E+00 TEEL2	4.0E+00 TEEL1	
Chloropropylene, 2-	557-98-2	1.0E+05 TEEL3	6.0E+04 TEEL2	1.0E+04 TEEL1	
Chloropropyl-n-octylsulfoxide, 3-	3569-57-1	5.0E+02 TEEL3	8.0E+00 TEEL2	5.0E+00 TEEL1	
Chlorosarin	1445-76-7	1.3E-01 TEEL3	4.0E-02 TEEL2	3.0E-03 TEEL1	
Chlorosoman	7040-57-5	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Chlorosulfonic acid	7790-94-5	2.5E+01 AEGL3_1hr	4.4E+00 AEGL2_1hr	4.8E-01 AEGL1_1hr	
Chlorothalonil	1897-45-6	3.0E+01 TEEL3	3.0E+01 TEEL2	7.5E+00 TEEL1	
Chlorotoluene, o-	95-49-8	2.5E+03 TEEL3	2.5E+03 TEEL2	4.0E+02 TEEL1	anes cough derm drow inco irrit eyes irrit muc memb irrit skin kidney inj liver inj
Chlorotoluene, p-	106-43-4	4.0E+03 TEEL3	1.5E+03 TEEL2	2.0E+02 TEEL1	
Chlorotrifluoroethene, homopolymer	9002-83-9	5.0E+02 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Chlorotrifluoroethylene	79-38-9	2.0E+03 AEGL3_1hr	4.1E+02 AEGL2_1hr	7.6E+01 AEGL1_1hr	
Chlorotrifluoromethane	75-72-9	1.0E+05 TEEL3	2.0E+04 TEEL2	1.3E+04 TEEL1	
Chloroxuron	1982-47-4	5.0E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Chlorpyrifos	2921-88-2	2.0E+01 TEEL3	1.5E+01 TEEL2	6.0E-01 TEEL1	abdom cramps bluish lips bluish skin blurred vision diarr lar spasm miosis nau salv vomit wheez
Chlorsulfuron	64902-72-3	5.0E+02 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Chlorthiophos	21923-23-9	7.8E+00 TEEL3	7.8E+00 TEEL2	1.0E+00 TEEL1	
Chromate	11104-59-9	1.7E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Chromic acetate	1066-30-4	1.1E+02 TEEL3	1.1E+01 TEEL2	6.6E+00 TEEL1	
Chromic acid	7738-94-5	3.4E+01 TEEL3	2.3E-01 TEEL2	1.1E-01 TEEL1	
Chromic acid ester	11115-74-5	1.8E+01 TEEL3	1.2E-01 TEEL2	5.9E-02 TEEL1	
Chromic chloride	10025-73-7	7.6E+01 TEEL3	1.0E+01 TEEL2	4.6E+00 TEEL1	
Chromic hydroxide	1308-14-1	5.0E+01 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Chromic sulfate	10101-53-8	9.4E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Chromic trioxide	1333-82-0	2.9E+01 TEEL3	1.0E-02 TEEL2	9.6E-03 TEEL1	carc eosin eye conj eye inj irrit resp sys kidney damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					leucyt leupen liver damage nasal septum perf sens derm skin ulcers
Chromite	1308-31-2	5.0E+02 TEEL3	5.4E+00 TEEL2	3.2E+00 TEEL1	
Chromium (III) acetate hydroxide	39430-51-8	1.2E+02 TEEL3	1.3E+01 TEEL2	7.2E+00 TEEL1	
Chromium (III) nitrate	13548-38-4	1.1E+02 TEEL3	1.1E+01 TEEL2	6.9E+00 TEEL1	
Chromium carbonyl	13007-92-6	6.4E+01 TEEL3	4.2E+01 TEEL2	6.0E+00 TEEL1	
Chromium hydroxide	12626-43-6	4.4E+01 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Chromium nitrate	10103-47-6	2.4E+02 TEEL3	2.4E+01 TEEL2	1.4E+01 TEEL1	
Chromium nitrate nonahydrate	7789-02-8	1.9E+02 TEEL3	2.5E+01 TEEL2	1.2E+01 TEEL1	
Chromium oxide	1308-38-9	3.7E+01 TEEL3	3.7E+01 TEEL2	1.5E+01 TEEL1	
Chromium perchlorate, hydrated	13537-21-8	1.7E+02 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Chromium potassium sulfate dodecahydrate	7788-99-0	2.4E+02 TEEL3	4.0E+01 TEEL2	1.4E+01 TEEL1	
Chromium trichloride hexahydrate	10060-12-5	1.3E+02 TEEL3	1.3E+02 TEEL2	1.0E+02 TEEL1	
Chromium(III) fluoride	7788-97-8	5.2E+01 TEEL3	5.2E+00 TEEL2	3.1E+00 TEEL1	
Chromium(III) oxide hydroxide	20770-05-2	4.1E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Chromium, elemental	7440-47-3	2.5E+02 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
					irrit eyes irrit skin lung fib (histologic)
Chromous chloride	10049-05-5	5.0E+02 TEEL3	7.5E+00 TEEL2	3.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Chrysazin	117-10-2	2.0E+02 TEEL3	2.0E+02 TEEL2	7.5E+01 TEEL1	
Chrysene	218-01-9	8.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Chrysotile asbestos	12001-29-5	2.5E+02 TEEL3	2.5E+02 TEEL2	5.0E-02 TEEL1	
Cinnamaldehyde	104-55-2	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Cinnamic aldehyde, trans-	14371-10-9	1.5E+03 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Citric acid	77-92-9	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Citric acid monohydrate	5949-29-1	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Citric acid, trisodium salt, dihydrate	6132-04-3	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Coal tar pitch volatiles (high temperature)	65996-93-2	8.0E+01 TEEL3	3.0E+01 TEEL2	6.0E-01 TEEL1	bron carc derm
Coal tar, aerosol	0-311*	5.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Cobalt	7440-48-4	2.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	asthma cough decr pulm func derm diffuse nodular fib dysp low weight resp hypersensitivity wheez
Cobalt (II) bromide	7789-43-7	1.5E+02 TEEL3	3.7E-01 TEEL2	2.2E-01 TEEL1	
Cobalt (II) chloride-hexahydrate	7791-13-1	3.5E+02 TEEL3	2.0E+01 TEEL2	2.4E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cobalt (II) oxide	1307-96-6	2.5E+01 TEEL3	2.0E+01 TEEL2	1.3E-01 TEEL1	
Cobalt acetate tetrahydrate	6147-53-1	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Cobalt carbonyl	10210-68-1	6.0E+01 TEEL3	2.7E+01 TEEL2	2.7E-01 TEEL1	cough decr pulm func dysp in animals: kidney inj in animals: liver inj irrit eyes irrit muc memb irrit skin pulm edema wheez
Cobalt chloride	7646-79-9	5.0E+02 TEEL3	2.5E+01 TEEL2	1.3E-01 TEEL1	
Cobalt hydrocarbonyl	16842-03-8	3.0E+00 ERPG3	9.1E-01 ERPG2	3.0E-01 TEEL1	cough decr pulm func dysp in animals: irrit resp sys pulm edema
Cobalt hydroxide	21041-93-0	7.5E-01 TEEL3	1.6E-01 TEEL2	9.5E-02 TEEL1	
Cobalt nitrate	10141-05-6	1.5E+02 TEEL3	1.5E+00 TEEL2	1.9E-01 TEEL1	
Cobalt nitrate hexahydrate	10026-22-9	3.0E+02 TEEL3	5.0E-01 TEEL2	3.0E-01 TEEL1	
Cobalt oxide	1308-06-1	2.7E+01 TEEL3	1.4E-01 TEEL2	1.4E-01 TEEL1	
Cobalt sulfate	10124-43-3	1.5E+02 TEEL3	6.0E+00 TEEL2	1.6E-01 TEEL1	
Cobalt sulfate heptahydrate	10026-24-1	2.5E+02 TEEL3	2.5E+02 TEEL2	2.9E-01 TEEL1	
Cobalt tetraphenylporphine	14172-90-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cobalt(ii) perchlorate, hexahydrate	13478-33-6	6.0E+01 TEEL3	6.2E-01 TEEL2	3.7E-01 TEEL1	
Cobalt(II) sulfate hydrate	60459-08-7	1.5E+00 TEEL3	3.0E-01 TEEL2	1.8E-01 TEEL1	
Cobalt,bis(3-fluorosalicylaldehyde)ethlenediimine-	62207-76-5	1.5E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Cobaltous carbonate hydrate	513-79-1	2.5E+02 TEEL3	2.0E-01 TEEL2	1.2E-01 TEEL1	
Colchicine	64-86-8	9.0E-01 TEEL3	9.0E-01 TEEL2	1.3E-01 TEEL1	
Colep	2665-30-7	8.0E+00 TEEL3	8.0E+00 TEEL2	5.0E+00 TEEL1	
Colophony	8050-09-7	4.0E+01 TEEL3	4.0E+01 TEEL2	3.0E-01 TEEL1	
Coper hydroxide	20427-59-2	1.5E+02 TEEL3	7.7E+00 TEEL2	4.6E+00 TEEL1	
Copper (I) chloride	7758-89-6	1.6E+02 TEEL3	7.8E+00 TEEL2	4.7E+00 TEEL1	
Copper (II) acatate monoydrate	6046-93-1	3.1E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Copper (II) chloride dihydrate	10125-13-0	2.7E+02 TEEL3	1.3E+01 TEEL2	8.1E+00 TEEL1	
Copper (II) sulfate pentahydrate	7758-99-8	3.9E+02 TEEL3	1.5E+02 TEEL2	1.2E+01 TEEL1	
Copper carbonate hydroxide	12069-69-1	1.7E+02 TEEL3	8.7E+00 TEEL2	5.2E+00 TEEL1	
Copper chloride	7447-39-4	2.1E+02 TEEL3	1.1E+01 TEEL2	6.3E+00 TEEL1	
Copper compounds	Cu cmpds	1.0E+02 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Copper cyanide	544-92-3	2.5E+01 TEEL3	7.0E+00 TEEL2	4.2E+00 TEEL1	
Copper nitrate	3251-23-8	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Copper oxide	1317-39-1	1.1E+02 TEEL3	1.5E+01 TEEL2	6.8E-01 TEEL1	
Copper sulfate	7758-98-7	2.5E+02 TEEL3	6.0E+00 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Copper sulfide	22205-45-4	1.3E+02 TEEL3	6.3E+00 TEEL2	3.8E+00 TEEL1	
Copper(II) perchlorate, dihydrate	17031-32-2	4.7E+02 TEEL3	2.4E+01 TEEL2	1.4E+01 TEEL1	
Copper(II) sulfide	1317-40-4	1.5E+02 TEEL3	7.5E+00 TEEL2	4.5E+00 TEEL1	
Corn oil	8001-30-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Coumaphos	56-72-4	1.3E+02 TEEL3	3.0E+01 TEEL2	1.5E-01 TEEL1	
Coumarin	91-64-5	1.3E+02 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Coumatetralyl	5836-29-3	1.7E+01 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Creosote	8001-58-9	8.0E+01 TEEL3	8.0E+01 TEEL2	6.0E-01 TEEL1	
Cresol, m-	108-39-4	1.0E+03 TEEL3	1.0E+02 TEEL2	2.0E+01 TEEL1	CNS effects: conf CNS effects: depres CNS effects: resp fail derm dysp eye burns irreg rapid resp irrit eyes irrit muc memb irrit skin kidney damage liver damage lung damage pancreas damage skin burns weak pulse
Cresol, o-	95-48-7	1.0E+03 TEEL3	1.0E+02 TEEL2	2.0E+01 TEEL1	CNS effects: conf CNS effects: depres

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					CNS effects: resp fail derm dysp eye burns irreg rapid resp irrit eyes irrit muc memb irrit skin kidney damage liver damage lung damage pancreas damage skin burns weak pulse
Cresol, p-	106-44-5	1.0E+03 TEEL3	1.0E+02 TEEL2	2.0E+01 TEEL1	CNS effects: conf CNS effects: depres CNS effects: resp fail derm dysp eye burns irreg rapid resp irrit eyes irrit muc memb irrit skin kidney damage liver damage lung damage pancreas damage skin burns weak pulse
Cresyl violet acetate	10510-54-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Crimidine	535-89-7	1.2E+00 TEEL3	1.2E+00 TEEL2	7.5E-01 TEEL1	
Cristobalite	14464-46-1	2.5E+01 TEEL3	2.5E+01 TEEL2	7.5E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Crocidolite	12001-28-4	2.5E+02 TEEL3	1.0E+01 TEEL2	5.0E-02 TEEL1	
Crotonaldehyde	4170-30-3	4.0E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	5.4E-01 AEGL1_1hr	
					in animals: dysp
					in animals: irrit skin
					in animals: pulm edema
					irrit
					irrit
					irrit
					irrit
					irrit eyes
					irrit resp sys
					lac
					pares
Crotonaldehyde, trans-	123-73-9	4.0E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	5.4E-01 AEGL1_1hr	
					irrit
					irrit
					irrit
					irrit
					lac
					pares
Crotonic acid	3724-65-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Crystal violet	548-62-9	1.5E+02 TEEL3	1.5E+00 TEEL2	2.5E-01 TEEL1	
Cs7SB	X-209*	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Cube resins (other than Rotenone)	0-583*	1.3E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Cumene	98-82-8	3.6E+03 AEGL3_1hr	1.5E+03 AEGL2_1hr	2.5E+02 AEGL1_1hr	
					coma
					derm
					head
					irrit eyes
					irrit muc memb
					irrit skin
					narco

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cumene hydroperoxide	80-15-9	1.5E+02 TEEL3	1.5E+02 TEEL2	3.0E+01 TEEL1	
Cumenol methylcarbamate, m-	64-00-6	1.6E+01 TEEL3	1.6E+01 TEEL2	1.0E+01 TEEL1	
Cupferron	135-20-6	7.5E+01 TEEL3	7.5E+01 TEEL2	2.5E+01 TEEL1	
Cupric acetate	142-71-2	2.0E+02 TEEL3	1.4E+01 TEEL2	8.6E+00 TEEL1	
Cupric nitrate hemipentahydrate	19004-19-4	3.8E+02 TEEL3	1.9E+01 TEEL2	1.1E+01 TEEL1	
Cupric oxalate	814-91-5	2.4E+02 TEEL3	1.3E+01 TEEL2	7.3E+00 TEEL1	
Cupric oxide	1317-38-0	1.3E+02 TEEL3	1.3E+00 TEEL2	7.5E-01 TEEL1	discoloration hair discoloration skin irrit eyes irrit upper resp sys metal fume fever: chills metal fume fever: cough metal fume fever: dry throat metal fume fever: fever metal fume fever: lass metal fume fever: musc ache metal fume fever: nau metallic or sweet taste
Cyanamide	420-04-2	3.5E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	antabuse-like effects eye burns irrit eyes irrit resp sys irrit skin lac miosis salv skin burns twitch
Cyanic acid	420-05-3	3.5E+02 TEEL3	7.5E+01 TEEL2	4.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cyanide	57-12-5	2.5E+01 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	giddiness head nau palp tremors weak
Cyanoacetamide	107-91-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Cyanogen	460-19-5	5.3E+01 AEGL3_1hr	1.8E+01 AEGL2_1hr	4.3E+00 AEGL1_1hr	bradycardia cherry red lips convuls dizz head hypernea irrit eyes irrit nose irrit upper resp sys lac liquid: frostbite loss of appetite low weight tachypnea
Cyanogen bromide	506-68-3	4.4E+01 TEEL3	4.4E+01 TEEL2	4.4E+01 TEEL1	
Cyanogen chloride	506-77-4	1.0E+01 ERPG3*	1.0E+00 ERPG2*	7.5E-01 TEEL1(old)*	conf cough delayed pulm edema dizz head irreg heartbeat irrit eyes irrit skin (liquid) irrit upper resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lass nau vomit
Cyanogen iodide	506-78-5	1.8E+02 TEEL3	1.8E+02 TEEL2	8.8E+01 TEEL1	
Cyanoguanidine	461-58-5	2.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Cyanophos	2636-26-2	2.5E+01 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Cyanuric acid	108-80-5	5.0E+02 TEEL3	2.5E+01 TEEL2	1.0E+01 TEEL1	
Cyanuric fluoride	675-14-9	4.3E+01 TEEL3	1.7E-01 TEEL2	1.7E-01 TEEL1	
Cyclohexane	110-82-7	4.0E+03 TEEL3	4.0E+03 TEEL2	1.0E+03 TEEL1	coma derm drow irrit eyes irrit resp sys irrit skin narco
Cyclohexane-1,2-dinitrilotetraacetic acid, trans-	13291-61-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Cyclohexanedimethanol, cis and trans, 1,4-	105-08-8	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Cyclohexanol	108-93-0	1.5E+03 TEEL3	2.0E+02 TEEL2	2.0E+02 TEEL1	irrit eyes irrit nose irrit skin irrit throat narco
Cyclohexanone	108-94-1	2.5E+03 TEEL3	2.0E+02 TEEL2	2.0E+02 TEEL1	coma derm head in animals: kidney damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: liver damage irrit eyes irrit muc memb irrit skin narco
Cyclohexene	110-83-8	6.0E+03 TEEL3	1.5E+03 TEEL2	1.0E+03 TEEL1	
					drow irrit eyes irrit resp sys irrit skin
Cycloheximide	66-81-9	2.0E+00 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Cyclohexyl isocyanate	3173-53-3	5.1E-01 AEGL3_1hr	1.0E-01 TEEL2	6.0E-02 TEEL1	
Cyclohexyl methyl phosphonic acid	1932-60-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Cyclohexylamine	108-91-8	1.2E+02 AEGL3_1hr	3.5E+01 AEGL2_1hr	7.3E+00 AEGL1_1hr	
					cough diarr dizz drow eye burns irrit eyes irrit muc memb irrit resp sys irrit skin nau pulm edema skin burns skin sens vomit
Cyclohexylethanol, 2-	4442-79-9	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Cycloocta-1,5-diene	111-78-4	4.0E+04 TEEL3	7.5E+03 TEEL2	1.3E+03 TEEL1	
Cyclooctane	292-64-8	2.5E+03 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Cyclooctatetraene, 1,3,5,7-	629-20-9	1.5E+06 TEEL3	1.0E+06 TEEL2	2.5E+05 TEEL1	
Cyclooctene, cis-	931-87-3	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Cyclopentane	287-92-3	4.0E+04 TEEL3	1.0E+04 TEEL2	5.0E+03 TEEL1	cracking skin dizz dry skin euph inco irrit eyes irrit nose irrit skin irrit throat nau stupor vomit
Cyclopentanone	120-92-3	2.0E+03 TEEL3	1.5E+02 TEEL2	7.5E+01 TEEL1	
Cyclopropane	75-19-4	1.0E+05 TEEL3	6.0E+03 TEEL2	1.0E+03 TEEL1	
Cytidylic acid	63-37-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
D&C Red No. 19	81-88-9	5.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
D&C red no. 9	5160-02-1	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
DDD	72-54-8	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
DDE	72-55-9	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
DDT	50-29-3	5.0E+02 TEEL3	2.0E+00 TEEL2	1.0E+00 TEEL1	anxi carc conf convuls dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head irrit eyes irrit skin lass mal pares face pares lips pares tongue paresis hands tremor vomit
Decaborane	17702-41-9	1.5E+01 TEEL3	1.0E+01 TEEL2	7.5E-01 TEEL1	convuls dizz drow head in animals: dysp in animals: lass inco kidney damage lass liver damage local musc spasm nau tremor
Decahydronaphthalene	91-17-8	4.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Decalin, cis-	493-01-6	4.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Decalin, trans-	493-02-7	4.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Decamethylcyclopentasiloxane	541-02-6	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Decanal	112-31-2	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Decane	124-18-5	2.5E+04 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Decanol, 1-	112-30-1	5.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Decene, homopolymer, hydrogenated, 1-	68037-01-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Demeton	8065-48-3	1.0E+01 TEEL3	2.0E+00 TEEL2	1.5E-01 TEEL1	abdom cramps aching eyes anor ataxia card irreg chest tight coma conf convuls cyan diarr dizz head irrit eyes irrit skin lar spasm lass local sweat low BP miosis musc fasc nau para rhin salv vomit wheez
Demeton-S-methyl	919-86-8	2.0E+02 TEEL3	5.0E+00 TEEL2	1.5E-01 TEEL1	
Deoxyribonucleac acid	9007-49-2	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Deuterium	7782-39-0	6.0E+04 TEEL3	3.5E+04 TEEL2	1.0E+04 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Deuterium oxide	7789-20-0	1.5E+05 TEEL3	3.5E+04 TEEL2	5.0E+03 TEEL1	
Deuterochloric acid	7698-05-7	1.5E+02 TEEL3	3.5E+01 TEEL2	2.5E+00 TEEL1	
Dextran	9004-54-0	5.0E+02 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Dextran sulfate sodium	9011-18-1	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
D-Gluconic acid	526-95-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
D-Glucose, monohydrate	14431-43-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Di(2-ethylhexyl)adipate	103-23-1	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Di(ethylene glycol) diacrylate	4074-88-8	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Diacetone alcohol	123-42-2	7.5E+03 TEEL3	2.4E+02 TLV_TWA_irr*	2.4E+02 TLV_TWA_irr*	corn damage in animals: liver damage in animals: narco damage irrit eyes irrit nose irrit skin irrit throat
Diacetoxydibutyl stannane	1067-33-0	7.4E+01 TEEL3	7.5E+00 TEEL2	5.9E-01 TEEL1	
Diacetyl	431-03-8	4.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Diacetyl peroxide	110-22-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Dialifor	10311-84-9	5.0E+00 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Diallyl glycol carbonate	142-22-3	1.3E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Diallyl phthalate	131-17-9	2.5E+02 TEEL3	2.5E+02 TEEL2	5.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Diallyldimethylammonium chloride	7398-69-8	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Diallylmethylammonium chloride polymer	26062-79-3	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Diaminodiphenylsulfone	80-08-0	4.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Diaminodipropylamine, 3,3-	56-18-8	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Diammonium citrate	3012-65-5	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Diammonium phosphate	7783-28-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Diammonium sulfide	12135-76-1	4.0E+01 TEEL3	4.0E+01 TEEL2	2.5E+01 TEEL1	
Diamond	7782-40-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Dianisidine dihydrochloride	20325-40-0	7.5E+00 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Diatomaceous earth	61790-53-2	5.0E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Diatomaceous silica, calcined	91053-39-3	5.0E+02 TEEL3	1.5E+00 TEEL2	9.0E-01 TEEL1	
Diatomite	68855-54-9	5.0E+02 TEEL3	1.5E+00 TEEL2	9.0E-01 TEEL1	
Diazabicyclo(2,2,2)octane, 1,4-	280-57-9	5.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Diazoacetic acid	623-73-4	1.5E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Diazomethane	334-88-3	3.5E+00 TEEL3	3.5E+00 TEEL2	1.0E+00 TEEL1	asthma chest pain cough fever flush skin head irrit eyes lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liquid: frostbite pneu pulm edema short breath
Dibenz(a,h)anthracene	53-70-3	1.5E+01 TEEL3	1.5E-02 TEEL2	2.5E-03 TEEL1	
Dibenzo(a,e)pyrene	192-65-4	5.0E-01 TEEL3	1.0E-01 TEEL2	1.5E-02 TEEL1	
Dibenzofuran	132-64-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dibenzo-p-dioxin	262-12-4	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Diborane	19287-45-7	4.2E+00 AEGL3_1hr*	1.1E+00 AEGL2_1hr*	1.5E-01 TEEL1*	chest tight chills dizz fever head hemorr in animals: kidney damage in animals: liver damage lass musc fasc nau nonproductive cough precordial pain pulm edema short breath tremor
Dibromo-3-chloropropane, 1,2-	96-12-8	1.5E+02 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	carc drow irrit eyes irrit nose irrit skin irrit throat kidney inj

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liver inj nau pulm edema sterility vomit
Dibromo-4-nitrophenol, 2,6-	99-28-5	5.0E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Dibromochloromethane	124-48-1	1.5E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Dibromoethane, 1,2-	106-93-4	3.5E+02 AEGL3_1hr	1.8E+02 AEGL2_1hr	1.3E+02 AEGL1_1hr	
					carc derm with vesic heart damage irrit eyes irrit resp sys irrit skin kidney damage liver damage repro effects spleen damage
Dibromomethane	74-95-3	7.5E+03 TEEL3	1.5E+03 TEEL2	2.0E+02 TEEL1	
Dibromo-phenol, 2,6-	608-33-3	2.5E+00 TEEL3	2.5E+00 TEEL2	5.0E-01 TEEL1	
Dibromopropane, 1,3-	109-64-8	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Dibromotetrafluoroethane	124-73-2	1.5E+05 TEEL3	3.5E+04 TEEL2	5.0E+03 TEEL1	
Dibutyl butylphosphonate	78-46-6	5.0E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Dibutyl ether	142-96-1	2.0E+03 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Dibutyl peroxide, tert-	110-05-4	2.5E+03 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Dibutyl phosphate	107-66-4	2.5E+02 TEEL3	5.0E+01 TEEL2	1.5E+01 TEEL1	
					head irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys irrit skin
Dibutyl phosphite	1809-19-4	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Dibutyl phthalate	84-74-2	5.0E+02 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	irrit eyes irrit stomach irrit upper resp sys
Dibutylboron triflate	60669-69-4	5.0E+02 TEEL3	6.0E+01 TEEL2	3.6E+01 TEEL1	
Dibutylhexamethylenediamine, N,N'-	4835-11-4	7.5E+01 TEEL3	2.2E+01 TEEL2	3.0E+00 TEEL1	
DIC hydrochloride	4261-68-1	1.3E+00 TEEL3	2.5E-01 TEEL2	3.5E-02 TEEL1	
Dichloran	99-30-9	5.0E+02 TEEL3	7.5E-02 TEEL2	1.3E-02 TEEL1	
Dichloro-2-butene, 1,4-	764-41-0	7.5E+02 TEEL3	1.3E+01 TEEL2	7.5E-02 TEEL1	
Dichloro-2-propanol, 1,3-	96-23-1	2.5E+02 TEEL3	2.5E+02 TEEL2	1.0E+02 TEEL1	
Dichloroacetic acid	79-43-6	1.3E+03 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Dichloroacetyl chloride	79-36-7	3.1E+02 AEGL3_1hr	9.6E+00 AEGL2_1hr	2.4E-01 AEGL1_1hr	
Dichloroacetylene	7572-29-4	1.5E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	cranial nerve palsy head in animals: low-weight in animals: brain inj in animals: carc in animals: kidney inj in animals: liver inj intense jaw pain loss of appetite nau vomit
Dichloroamine	3400-09-7	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dichlorobenzene, 1,2-	95-50-1	1.3E+03 TEEL3	3.0E+02 TEEL2	3.0E+02 TEEL1	irrit eyes irrit nose kidney damage liver damage skin blisters
Dichlorobenzene, 1,3-	541-73-1	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Dichlorobenzene, 1,4-	106-46-7	7.5E+02 TEEL3	1.5E+02 TEEL2	6.0E+01 TLV_TWA_irr*	anor cirr head in animals: carc in animals: kidney inj in animals: liver inj irrit eyes jaun low weight nau profuse rhinitis swell periorb vomit
Dichlorobenzidine, 3,3'-	91-94-1	2.0E+03 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	carc caustic burns dizz dysuria frequent urination GI upset head hema skin derm skin sens upper resp infection
Dichlorobutene-2, trans-1,4-	110-57-6	4.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dichlorocyclohexane, 1,1-	2108-92-1	1.5E+02 TEEL3	3.5E+01 TEEL2	4.0E+00 TEEL1	
Dichlorocyclohexane, trans-1,2-	822-86-6	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Dichlorodifluoromethane	75-71-8	7.5E+04 TEEL3	5.0E+04 TEEL2	1.5E+04 TEEL1	asphy card arrest card arrhy dizz liquid: frostbite tremor uncon
Dichloroethane, 1,1-	75-34-3	1.3E+04 TEEL3	1.3E+04 TEEL2	1.3E+03 TEEL1	CNS depres irrit skin kidney damage liver damage lung damage
Dichloroethane, 1,2-	107-06-2	1.2E+03 ERPG3	8.1E+02 ERPG2	2.0E+02 ERPG1	carc CNS depres corn opac CVS damage derm irrit eyes kidney damage liver damage nau vomit
Dichloroethanol acetate, 1,2-	10140-87-1	4.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Dichloroethylaluminum	563-43-9	1.0E+01 TEEL3	6.0E+00 TEEL2	6.0E+00 TEEL1	
Dichloroethylbenzene	1331-29-9	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Dichloroethylene, 1,1-	75-35-4	4.0E+03 ERPG3	2.0E+03 ERPG2	2.5E+02 TEEL1	carc

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz dysp head irrit eyes irrit skin irrit throat kidney dist liver dist nau pneu
Dichloroethylene, 1,2-	540-59-0	4.0E+03 TEEL3	4.0E+03 TEEL2	2.5E+03 TEEL1	CNS depres irrit eyes irrit resp sys
Dichloroethylene, cis-1,2-	156-59-2	3.4E+03 AEGL3_1hr	2.0E+03 AEGL2_1hr	5.6E+02 AEGL1_1hr	
Dichloroethylene, trans-	156-60-5	6.7E+03 AEGL3_1hr	4.0E+03 AEGL2_1hr	1.1E+03 AEGL1_1hr	
Dichlorofluoromethane	75-43-4	2.0E+04 TEEL3	4.0E+02 TEEL2	1.3E+02 TEEL1	asphy card arrest card arrhy liquid: frostbite
Dichlorohexane, 1,2-	2162-92-7	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Dichlorohexane, 1,6-	2163-00-0	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Dichloromethane-D2	1665-00-5	2.5E+04 TEEL3	2.0E+03 TEEL2	6.0E+02 TEEL1	
Dichloromethylphenylsilane	149-74-6	2.0E+01 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Dichlorooctane, 1,8-	2162-99-4	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Dichlorophen	97-23-4	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Dichlorophenol, 2,4-	120-83-2	1.3E+02 ERPG3	1.3E+01 ERPG2	1.3E+00 ERPG1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dichlorophenol, 2,6-	87-65-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Dichlorophenoxy acetic acid, 2,4-	94-75-7	1.0E+02 TEEL3	4.0E+01 TEEL2	1.0E+01 TEEL1	convuls derm hyporeflexia in animals: kidney inj in animals: liver inj lass musc twitch stupor
Dichloropropane	26638-19-7	1.5E+03 TEEL3	1.5E+03 TEEL2	1.3E+03 TEEL1	
Dichloropropane, 1,1-	78-99-9	2.0E+03 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Dichloropropane, 1,2-	78-87-5	1.5E+03 TEEL3	1.5E+03 TEEL2	1.3E+03 TEEL1	carc dizz drow in animals: CNS depres irrit eyes irrit resp sys irrit skin kidney damage liver damage
Dichloropropane, 1,3-	142-28-9	1.5E+03 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Dichloropropane, 2,2-	594-20-7	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Dichloropropene, 1,1-	563-58-6	7.5E+02 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
Dichloropropene, 1,2-	563-54-2	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dichloropropene, 1,3-	542-75-6	2.0E+03 TEEL3	6.0E+02 TEEL2	1.0E+02 TEEL1	carc dizz eye burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head in animals: kidney damage in animals: liver damage irrit eyes irrit resp sys irrit skin lac liver damage skin burns
Dichloropropene, 2,3-	78-88-6	4.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Dichloropropene, cis-1,2-	6923-20-2	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dichloropropene, cis-1,3-	10061-01-5	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Dichloropropene, trans-1,3-	10061-02-6	7.5E+02 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Dichlorosilane	4109-96-0	2.1E+02 AEGL3_1hr	4.5E+01 AEGL2_1hr	3.7E+00 AEGL1_1hr	
Dichlorotetrafluoroethane	76-14-2	1.0E+05 TEEL3	1.0E+05 TEEL2	2.0E+04 TEEL1	
					asphy card arrest card arrhy irrit resp sys liquid: frostbite
Dichlorotetrafluoroethane (MEG)	1320-37-2	5.0E+05 TEEL3	5.0E+05 TEEL2	2.0E+05 TEEL1	
Dichlorvos	62-73-7	7.2E+01 AEGL3_1hr	5.1E+00 AEGL2_1hr	9.9E-01 AEGL1_1hr	
					aching eyes anor ataxia card irreg chest tight convuls cyan diarr dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head irrit eyes irrit skin lar spasm low BP miosis musc fasc nau para rhin salv sweat vomit wheez
Dicyclohexano-18-crown-6	16069-36-6	7.5E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Dicyclohexyl	92-51-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dicyclohexylcarbodiimide	538-75-0	1.0E+02 TEEL3	6.0E-02 TEEL2	1.0E-02 TEEL1	
Dicyclopentadiene	77-73-6	4.1E+02 ERPG3	2.7E+01 ERPG2	5.4E-02 ERPG1	
					cough head in animals: kidney damage in animals: lung damage inco irrit eyes irrit nose irrit skin irrit throat skin blisters sneez
Didecyl dimethyl ammonium chloride	7173-51-5	3.5E+01 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Dieldrin	60-57-1	5.0E+01 TEEL3	2.5E+01 TEEL2	7.5E-01 TEEL1	
					carc clonic convuls

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					coma dizz head in animals: kidney damage in animals: liver damage mal myoclonic limb jerks nau sweat tonic convuls vomit
Diesel fuel marine	77650-28-3	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Diesel fuels	68334-30-5	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Diethanolamine	111-42-2	3.0E+02 TEEL3	3.0E+02 TEEL2	1.5E+02 TEEL1	 corn nec cough eye burns irrit eyes irrit nose irrit skin irrit throat lac skin burns sneez
Diethanollauramide	120-40-1	1.0E+03 TEEL3	1.0E+00 TEEL2	1.3E-01 TEEL1	
Diethenylethylbenzene, polymer with ethenylbenzene	69011-20-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Diethoxydimethylsilane	78-62-6	3.0E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Diethyl (methylthiomethyl) phosphonate	28460-01-7	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Diethyl (trichloromethyl)phosphonate	866-23-9	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Diethyl benzene isomers	25340-17-4	2.7E+03 ERPG3	5.5E+02 ERPG2	5.5E+01 ERPG1	
Diethyl carbonate	105-58-8	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Diethyl chlorophosphate	814-49-3	8.0E+00 TEEL3	8.0E+00 TEEL2	5.0E+00 TEEL1	
Diethyl ethylphosphonate	78-38-6	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Diethyl ketone	96-22-0	3.0E+03 TEEL3	1.0E+03 TEEL2	1.0E+03 TEEL1	cough irrit eyes irrit muc memb irrit resp sys irrit skin sneez
Diethyl malonate	105-53-3	6.0E+03 TEEL3	1.3E+03 TEEL2	1.5E+02 TEEL1	
Diethyl mercury	627-44-1	2.6E+00 TEEL3	5.2E-02 TEEL2	3.9E-02 TEEL1	
Diethyl methylphosphonate	683-08-9	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Diethyl oxalate	95-92-1	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Diethyl phosphite	762-04-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Diethyl phthalate	84-66-2	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	dizz head in animals: repro effects irrit eyes irrit nose irrit skin irrit throat lac lass in arms & legs nau numb in arms & legs

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					pain in arms & legs possible polyneur dysfunc possible vestibular dist spasms in arms & legs
Diethyl pyrocarbonate	1609-47-8	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Diethyl succinate	123-25-1	3.5E+03 TEEL3	7.5E+02 TEEL2	1.0E+02 TEEL1	
Diethyl sulfate	64-67-5	1.5E+02 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Diethyl tartrate	87-91-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Diethyl telluride	627-54-3	1.0E+01 TEEL3	6.0E+00 TEEL2	3.0E-01 TEEL1	
Diethylamine	109-89-7	6.0E+02 TEEL3	2.0E+02 TEEL2	4.0E+01 TEEL1	in animals: myocardial degeneration irrit eyes irrit resp sys irrit skin myocardial degeneration
Diethylaminoacetone	1620-14-0	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Diethylaminoethanol, 2-	100-37-8	5.0E+02 TEEL3	1.0E+02 TEEL2	5.0E+01 TEEL1	irrit eyes irrit resp sys irrit skin nau vomit
Diethylaminopropylamine	104-78-9	2.5E+02 TEEL3	5.0E+01 TEEL2	6.0E+00 TEEL1	
Diethylaniline, N,N-	91-66-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Diethylbenzene, m-	141-93-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Diethylbenzene, o-	135-01-3	5.0E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Diethyldichlorosilane	1719-53-5	6.4E+02 AEGL3_1hr	1.4E+02 AEGL2_1hr	1.2E+01 AEGL1_1hr	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Diethylene glycol	111-46-6	7.5E+02 TEEL3	7.5E+02 TEEL2	2.0E+02 TEEL1	
Diethylene glycol diacetate	628-68-2	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	
Diethylene glycol dibutyl ether	112-73-2	1.5E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Diethylene glycol diethyl ether	112-36-7	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Diethylene glycol dimethyl ether	111-96-6	2.0E+03 TEEL3	2.0E+03 TEEL2	7.5E+01 TEEL1	
Diethylene glycol hexyl ether	112-59-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Diethylene glycol methyl ether	111-77-3	1.0E+02 TEEL3	1.0E+02 TEEL2	2.0E+01 TEEL1	
Diethylene glycol monobutyl ether	112-34-5	2.5E+03 TEEL3	6.0E+02 TEEL2	1.0E+02 TEEL1	
Diethylene glycol monoethyl ether	111-90-0	2.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Diethylene triamine	111-40-0	7.5E+00 TEEL3	6.0E+00 TEEL2	4.2E+00 TLV_TWA_irr*	cough derm dysp eye nec irrit eyes irrit muc memb irrit skin irrit upper resp sys pulm sens skin nec skin sens
Diethylenetriaminepentaacetic acid	67-43-6	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Diethylphosphatoethyltriethoxy silane	757-44-8	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Diethylstilbestrol	56-53-1	1.5E+01 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Diethylthiourea, N,N'-	105-55-5	1.3E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Diethylurea, 1,3-	623-76-7	2.5E+03 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Diethylzinc	557-20-0	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Difluoroethane, 1,1-	75-37-6	6.8E+04 ERPG3	4.1E+04 ERPG2	2.7E+04 ERPG1	
Difluoromethane	75-10-5	7.5E+05 TEEL3	1.0E+05 TEEL2	6.0E+03 TEEL1	
Difluorotetrachloroethane, 1,2-	76-12-0	1.5E+04 TEEL3	1.5E+04 TEEL2	1.3E+03 TEEL1	in animals: narco in animals: conj in animals: irrit eyes in animals: irrit skin in animals: pulm edema
Digitoxin	71-63-6	2.5E-01 TEEL3	1.8E-01 TEEL2	2.5E-02 TEEL1	
Diglycidyl ether	2238-07-5	5.0E+01 TEEL3	5.0E+01 TEEL2	5.0E+01 TEEL1	carc in animals: hemato sys effects in animals: kidney damage in animals: liver damage in animals: lung damage irrit eyes irrit resp sys irrit skin repro effects skin burns
Diglycolamine	929-06-6	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Digoxin	20830-75-5	3.5E-01 TEEL3	2.0E-01 TEEL2	1.3E-01 TEEL1	
Dihydro-2h-pyran, 3,4-	110-87-2	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Dihydro-3-(Nonenyl)-2,5-furandione	28928-97-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dihydro-3-(tetrapropenyl)furan-2,5-dione	26544-38-7	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Dihydro-4-methyl furan, 2,3-	34314-83-5	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Dihydroxy-1,3-indandione, 2,2-	485-47-2	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Dihydroxy-2-butene, 1,4-	110-64-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Dihydroxybenzoic acid, 2,4-	89-86-1	3.5E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Dihydroxynaphthalene-2,7-disulfonic acid, disodium salt dihydrate, 4,5-	5808-22-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Diiodomethane	75-11-6	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Diisoamylamine	544-00-3	7.5E+02 TEEL3	1.5E+02 TEEL2	1.0E+02 TEEL1	
Diisobutyl ketone	108-83-8	3.0E+03 TEEL3	3.0E+02 TEEL2	3.0E+02 TEEL1	derm dizz head irrit eyes irrit nose irrit skin irrit throat kidney damage liver damage
Di-isobutylaluminum hydride	1191-15-7	5.0E+03 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Diisobutylamine	110-96-3	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Diisooctyl phosphate	27215-10-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Diisopropyl ether	108-20-3	6.0E+03 TEEL3	1.3E+03 TEEL2	1.3E+03 TEEL1	derm in animals: dizz in animals: drow

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: narco in animals: uncon irrit eyes irrit nose irrit skin resp discomfort
Diisopropyl methylphosphonate	1445-75-6	3.5E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Diisopropyl peroxydicabonate	105-64-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Diisopropylamine	108-18-9	7.5E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
					head irrit eyes irrit resp sys irrit skin nau vis dist vomit
Diisopropylaminoethanol, 2-	96-80-0	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Diisopropylbenzene, 1,4-	100-18-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Diisopropylethylamine, n,n-	7087-68-5	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Diisopropylfluorophosphate	55-91-4	3.6E+00 TEEL3	3.6E+00 TEEL2	2.0E+00 TEEL1	
Diispropylbenzene	25321-09-9	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Diketene	674-82-8	6.2E+01 AEGL3_1hr	2.1E+01 AEGL2_1hr	3.4E+00 ERPG1	
Dilauroyl peroxide	105-74-8	3.5E-01 TEEL3	6.0E-02 TEEL2	1.0E-02 TEEL1	
Dimefox	115-26-4	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Dimethicone	9016-00-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dimethoate	60-51-5	3.0E+01 TEEL3	3.0E+01 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dimethoxybenzene, 1,3-	151-10-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Dimethoxybenzene, O-	91-16-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Dimethoxybenzidine, 3,3'-	119-90-4	4.0E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	in animals: carc in animals: kidney damage in animals: liver damage in animals: spleen changes in animals: thyroid changes irrit skin
Dimethoxybutane, 2,2-	3453-99-4	4.0E+03 TEEL3	7.5E+02 TEEL2	1.0E+02 TEEL1	
Dimethoxydiphenylsilane	6843-66-9	1.5E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Dimethoxyethane, 1,2-	110-71-4	4.0E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Dimethyl acetamide, N, N-	127-19-5	1.0E+03 TEEL3	1.0E+03 TEEL2	2.5E+02 TEEL1	delusions depres drow halu irrit skin jaun liver damage
Dimethyl butane, 2,2-	75-83-2	7.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	
Dimethyl carbamoly chloride	79-44-7	5.0E+02 TEEL3	1.0E+01 TEEL2	6.0E-02 TEEL1	carc cough dysp eye burns head irrit eyes irrit nose irrit resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin irrit throat larnygitis liver inj nau skin burns vomit wheez
Dimethyl carbonate	616-38-6	5.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Dimethyl cyclopentanol, 1,3-	19550-46-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dimethyl dichlorosilane	75-78-5	2.8E+02 AEGL3_1hr	6.9E+01 AEGL2_1hr	4.8E+00 AEGL1_1hr	
Dimethyl disulfide	624-92-0	9.6E+02 ERPG3	1.9E+02 ERPG2	3.9E-02 ERPG1	
Dimethyl glyoxime	95-45-4	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Dimethyl hydrogen phosphite	868-85-9	6.8E+02 AEGL3_1hr	4.3E+02 AEGL2_1hr	6.0E+01 TEEL1	
Dimethyl mercury	593-74-8	2.3E+00 TEEL3	4.6E-02 TEEL2	3.5E-02 TEEL1	
Dimethyl methylphosphonate	756-79-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Dimethyl phosphorochloridothioate	2524-03-0	1.5E+02 TEEL3	3.2E+01 TEEL2	4.0E+00 TEEL1	
Dimethyl phthalate	131-11-3	5.0E+02 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	irrit eyes irrit upper resp sys stomach pain
Dimethyl succinate	106-65-0	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Dimethyl sulfate	77-78-1	8.3E+00 AEGL3_1hr	6.2E-01 AEGL2_1hr	1.2E-01 AEGL1_1hr	analgesia aphonia carc chest pain

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					conj cyan delirium diarr dizz dysp dysphagia dysphonia dysuria eye burns fever head hema irrit eyes irrit nose periorb edema photo productive cough prot skin burns vomit
Dimethyl sulfide	75-18-3	1.3E+04 ERPG3	2.5E+03 ERPG2	1.3E+00 ERPG1	
Dimethyl sulfone	67-71-0	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Dimethyl sulfoxide	67-68-5	6.0E+03 TEEL3	7.5E+02 TEEL2	7.5E+02 TEEL1	
Dimethyl(polysiloxane)	70131-67-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Dimethyl-1,3-dioxolane-4-methanol, 2,2-	100-79-8	3.0E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Dimethyl-2-pentene, (E)-3,4-	4914-92-5	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Dimethyl-3-nitrobenzene, 1,2-	83-41-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dimethyl-3-pentanone, 2,4-	565-80-0	4.0E+03 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dimethylacrylamide, N,N-	2680-03-7	2.0E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Dimethylamine	124-40-3	4.6E+02 AEGL3_1hr*	1.2E+02 AEGL2_1hr*	1.8E+01 AEGL1_1hr*	conj cough derm dysp irrit nose irrit throat liquid: frostbite pulm edema sneez
Dimethylaminoazobenzene, 4-	60-11-7	7.5E+01 TEEL3	7.5E+01 TEEL2	5.0E+01 TEEL1	bloody sputum bronchial secretions carc contact derm cough dysp dysuria enlarged liver frequent urination hema kidney dist liver dist wheez
Dimethylaminobenzaldehyde, p-	100-10-7	2.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dimethylaminoethanol, 2-	108-01-0	6.0E+02 TEEL3	6.0E+02 TEEL2	1.3E+02 TEEL1	
Dimethylammonium-dimethylcarbamate	4137-10-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Dimethylaniline, N,N-	121-69-7	5.0E+02 TEEL3	5.0E+01 TEEL2	5.0E+01 TEEL1	anoxia symptoms: ataxia anoxia symptoms: cyan anoxia symptoms: dizz anoxia symptoms: lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					anoxia symptoms: methemo
Dimethylbenzidine, 3,3'-	119-93-7	1.0E+02 TEEL3	1.7E+01 TLV_TWA*	1.7E+01 TLV_TWA*	carc in animals: kidney damage in animals: liver damage irrit eyes irrit nose
Dimethylchlorosilane	1066-35-9	3.9E+02 AEGL3_1hr	8.5E+01 AEGL2_1hr	7.0E+00 AEGL1_1hr	
Dimethylcyclohexane, cis-1,4-	624-29-3	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Dimethyldecane, 2,2-	17302-37-3	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Dimethyldicyclopentadiene	26472-00-4	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Dimethyldimethoxysilane	1112-39-6	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Dimethylethyl hydroperoxide	75-91-2	2.0E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Dimethylformamide	68-12-2	5.4E+02 AEGL3_1hr	2.7E+02 AEGL2_1hr	6.0E+00 ERPG1	colic derm enlarged liver face flush high BP in animals: heart damage in animals: kidney damage irrit eyes irrit resp sys irrit skin liver damage nau vomit
Dimethylheptane, 2,2-	1071-26-7	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Dimethylhexane, 3,3-	563-16-6	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dimethylhydrazine, 1,1-	57-14-7	2.7E+01 AEGL3_1hr	7.4E+00 AEGL2_1hr	1.3E+00 TEEL1	
					anoxia
					carc
					chest pain
					choking
					convuls
					drow
					dysp
					dysp
					head
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit eyes
					irrit skin
					liver inj
					nau
					nau
					nau
					nau
					nau
					tight
					vomit
					vomit
					weak
Dimethylhydrazine, 1,2-	540-73-8	2.7E+01 AEGL3_1hr	7.4E+00 AEGL2_1hr	4.0E+00 TEEL1	
					dysp
					head
					irrit
					irrit
					irrit
					irrit
					irrit
					nau
					nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau nau tight vomit vomit weak
Dimethylphenol, 2,4-	105-67-9	5.0E+02 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Dimethylphenol, 2,6-	576-26-1	1.3E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Dimethylpolysilane	28883-63-8	2.5E+01 TEEL3	1.0E+01 TEEL2	2.5E+00 TEEL1	
Dimethyl-p-phenylenediamine, N,N-	99-98-9	1.0E+00 TEEL3	1.3E-01 TEEL2	7.5E-02 TEEL1	
Dimethylpyridine, 2,4-	108-47-4	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Dimethyltetrahydrofuran, 2,5-	1003-38-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Dimetilan	644-64-4	2.5E+01 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Di-N-amylamine	2050-92-2	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Di-n-butylamine	111-92-2	2.5E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Dinitraniline orange	3468-63-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dinitroaniline, 2,4-	97-02-9	1.3E+01 TEEL3	7.5E-01 TEEL2	1.0E-01 TEEL1	
Dinitrobenzene, 1,2-	528-29-0	5.0E+01 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
					anemia anoxia bad taste burning mouth central scotomas cyan dry throat liver damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					thirst vis dist yellowing eyes yellowing hair yellowing skin
Dinitrobenzene, 1,3-	99-65-0	5.0E+01 TEEL3	2.5E+01 TEEL2	3.0E+00 TEEL1	
					anemia anoxia bad taste burning mouth central scotomas cyan dry throat liver damage thirst vis dist yellowing eyes yellowing hair yellowing skin
Dinitrobenzene, 1,4-	100-25-4	5.0E+01 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
					anemia anoxia bad taste burning mouth central scotomas cyan dry throat liver damage thirst vis dist yellowing eyes yellowing hair yellowing skin
Dinitro-o-cresol, 4,6-	534-52-1	5.0E+00 TEEL3	5.0E-01 TEEL2	2.0E-01 TEEL1	
					coma cough excess thirst

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					fever head hyperpnea lass profuse sweat sense of well being short breath tacar
Dinitrophenol	25550-58-7	4.0E+00 TEEL3	7.5E-01 TEEL2	1.0E-01 TEEL1	
Dinitrophenol, 2,3-	66-56-8	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Dinitrophenol, 2,4-	51-28-5	3.0E+01 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Dinitrophenol, 2,6-	573-56-8	1.5E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Dinitrosopiperazine	140-79-4	6.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Dinitrotoluene	25321-14-6	5.0E+01 TEEL3	1.3E+01 TEEL2	6.0E-01 TEEL1	anemia anoxia carc cyan jaun repro effects
Dinitrotoluene, 2,4-	121-14-2	5.0E+01 TEEL3	5.0E+01 TEEL2	6.0E-01 TEEL1	
Dinitrotoluene, 2,6-	606-20-2	5.0E+01 TEEL3	6.0E+00 TEEL2	6.0E-01 TEEL1	
Dinitrotoluene, 3,4-	610-39-9	5.0E+01 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Di-n-octadecyl phosphite	19047-85-9	2.0E+00 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	
Di-n-octyl phthalate	117-84-0	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Dinoseb	88-85-7	1.0E+01 TEEL3	4.5E+00 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dinoterb	1420-07-1	2.5E+01 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Dioctyl sebacate	122-62-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Dioctyl sodium sulfosuccinate	577-11-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Dioxane, 1,4-	123-91-1	2.7E+03 AEGL3_1hr	1.2E+03 AEGL2_1hr	6.1E+01 AEGL1_1hr	carc drow head irrit eyes irrit nose irrit skin irrit throat kidney failure liver damage nau vomit
Dioxathion	78-34-2	1.5E+02 TEEL3	3.4E+00 TEEL2	3.0E-01 TEEL1	abdom cramps chest tight conf diarr dizz drow head irrit eyes irrit skin lass miosis musc fasc nau rhin salv vomit
Dioxolane	646-06-0	7.5E+03 TEEL3	2.1E+02 TEEL2	1.5E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dipentaerythritol	126-58-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dipentyl pentylphosphonate	6418-56-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Diphacinone	82-66-6	5.0E+02 TEEL3	9.0E-01 TEEL2	5.0E-01 TEEL1	
Diphenyl mercury	587-85-9	1.8E+01 TEEL3	1.8E-01 TEEL2	1.8E-01 TEEL1	
Diphenyl o-cresol phosphate	26444-49-5	5.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Diphenylamine	122-39-4	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+01 TEEL1	bladder inj cough eczema heart rate hema hypertension in animals: terato effects incr BP irrit eyes irrit muc memb irrit skin methemo prot sneez tacar
Diphenylboronic acid	524-95-8	5.0E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Diphenyldichloroarsine	712-48-1	1.2E+00 AEGL3_1hr	3.9E-01 AEGL2_1hr	3.9E-01 TEEL1	
Diphenyldichlorosilane	80-10-4	5.2E+02 AEGL3_1hr	1.1E+02 AEGL2_1hr	9.3E+00 AEGL1_1hr	
Diphenylguanidine, 1,3-	102-06-7	1.3E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Diphenylhydrazine, 1,2-	122-66-7	1.3E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Diphenylmethane	101-81-5	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Diphenyloxazole, 2,5-	92-71-7	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Dipicolinic acid	499-83-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dipropyl ketone	123-19-3	1.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	CNS depres decr breath dizz drow in animals: liver inj irrit eyes irrit skin narco
Dipropylamine	142-84-7	5.0E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Dipropylene glycol monomethyl ether	34590-94-8	3.5E+03 TEEL3	1.5E+03 TEEL2	7.5E+02 TEEL1	dizz head irrit eyes irrit nose irrit throat lass
Direct black 38	1937-37-7	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Disodium (2-ethylhexyl)phosphate	18541-72-5	2.0E+00 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	
Disodium 3,6-endoxohexahydrophthalate	129-67-9	2.0E+01 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Disodium ethylenediaminediacetate	38011-25-5	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Disodium ethylenediaminetetraacetate dihydrate	6381-92-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Disodium pyrophosphate	7758-16-9	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Distillates, petroleum, solvent-refined light naphthenic	64741-97-5	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Disulfiram	97-77-8	1.3E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	dizz head irrit eyes irrit resp sys irrit skin lass liver damage metallic taste peri neur restless sens derm tremor
Disulfoton	298-04-4	7.5E+01 TEEL3	2.0E+00 TEEL2	1.5E-01 TEEL1	abdom cramps blurred vision card irreg chest tight diarr dizz dysp eye burns head irrit eyes irrit skin lass miosis musc fasc nau rhin salv skin burns vomit
Disulfur dichloride	10025-67-9	8.3E+01 TEEL3	3.5E+01 TEEL2	2.9E+00 TEEL1	cough

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					eye burns irrit eyes irrit muc memb irrit skin lac pulm edema skin burns
Di-tert-butyl dicarbonate	24424-99-5	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Di-tert-butyl-hydroquinone, 2,5-	88-58-4	4.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Dithiazanine iodide	514-73-8	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	
Dithiobiuret	541-53-7	5.0E+00 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Dithiodiethanol, 2,2-	1892-29-1	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Dithioertythritol, 1,4-	6892-68-8	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Diurethane dimethacrylate	72869-86-4	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Divinyl benzene	1321-74-0	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	in animals: CNS depres irrit eyes irrit resp sys irrit skin skin burns
Divinyl benzene, m-	108-57-6	2.0E+03 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Dodecamethylcyclohexasiloxane	540-97-6	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dodecane	112-40-3	1.5E+02 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Dodecenylsuccinic anhydride	25377-73-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Dodecyl alcohol	112-53-8	5.0E+02 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Dodecyl mercaptan	112-55-0	2.0E+01 TEEL3	4.0E+00 TEEL2	8.3E-01 TLV_TWA_irr*	abdom pain conf cough cyan dizz dysp irrit eyes irrit resp sys irrit skin lass nau skin sens
Dodecyl methacrylate	142-90-5	5.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Dodecylbenzene sulfonic acid	27176-87-0	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Dodecylphenol, 4-	27193-86-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Dodecyltrichlorosilane	4484-72-4	4.1E+02 AEGL3_1hr	9.1E+01 AEGL2_1hr	7.5E+00 AEGL1_1hr	
Dowex 50WX4	11113-61-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dowex 50X8 ion-exchange resin	11119-67-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dysprosium	7429-91-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Dysprosium oxide	1308-87-8	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
EDTA, dipotassium salt, dihydrate	2001-94-7	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Emetine dihydrochloride	316-42-7	4.0E-01 TEEL3	4.0E-01 TEEL2	1.5E-01 TEEL1	
Endosulfan	115-29-7	3.5E+01 TEEL3	8.0E-01 TEEL2	3.0E-01 TEEL1	agitation conf convuls

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					decr testis weight dry mouth flushing head in animals: kidney inj in animals: liver inj irrit skin nau tremor
Endothion	2778-04-3	1.7E+01 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Endrin	72-20-8	2.0E+00 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
					abdom discomfort aggressiveness anor conf dizz drow epilep convuls head in animals: liver damage insom lass nau stupor vomit
Epibatidine	140111-52-0	2.5E-02 TEEL3	2.5E-02 TEEL2	4.0E-03 TEEL1	
Epibromohydrin	3132-64-7	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Epichlorohydrin	106-89-8	2.7E+02 AEGL3_1hr	9.1E+01 AEGL2_1hr	2.2E+01 AEGL1_1hr	
					abdom pain carc cough cyan irrit eyes irrit skin with deep pain

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau repro effects resp distress vomit
Epinephrine	51-43-4	2.5E-03 TEEL3	2.5E-03 TEEL2	2.5E-03 TEEL1	
Epon 1001 resin	25068-38-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Epoxy resin	25928-94-3	6.0E+00 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Epoxybutane, 1,2-	106-88-7	9.7E+02 AEGL3_1hr	4.1E+02 AEGL2_1hr	2.1E+02 AEGL1_1hr	
Erbium (III) oxide	12061-16-4	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Erbium nitrate pentahydrate	10031-51-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ergocalciferol	50-14-6	4.0E+01 TEEL3	4.0E+01 TEEL2	2.5E+01 TEEL1	
Ergotamine tartrate	379-79-3	6.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Ethane	74-84-0	3.0E+04 TEEL3	6.0E+03 TEEL2	3.5E+03 TEEL1	
Ethanedioic acid, dimethyl ester	553-90-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Ethanedithiol, 1,2-	540-63-6	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Ethanediyl-bis, 1,1'-(1,2-(oxy))bisbenzene	104-66-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethanol	64-17-5	6.0E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	
					anemia cough drow head irrit eyes irrit nose irrit skin lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liver damage narco repro effects terato effects
Ethanol, titanium(4+) salt	3087-36-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethanolamine	141-43-5	7.5E+01 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	
					drow irrit eyes irrit resp sys irrit skin
Ethenylsilanetriol triacetate	4130-08-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethidium bromide	1239-45-8	2.0E+01 TEEL3	4.0E+00 TEEL2	5.0E-01 TEEL1	
Ethienocarb	58270-08-9	9.0E+00 TEEL3	9.0E+00 TEEL2	5.0E+00 TEEL1	
Ethion	563-12-2	3.5E+02 TEEL3	1.3E+01 TEEL2	1.5E-01 TEEL1	
					abdom cramps blurred vision card irreg chest tight diarr dizz dysp head irrit eyes irrit skin lass miosis musc fasc nau rhin salv vomit
Ethoprop	13194-48-4	2.6E+01 TEEL3	2.6E+01 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ethoxyethanol, 2-	110-80-5	1.5E+03 TEEL3	7.5E+01 TEEL2	5.0E+01 TEEL1	in animals: blood changes in animals: irrit eyes in animals: irrit resp sys in animals: kidney damage in animals: liver damage in animals: lung damage in animals: repro effects in animals: terato effects
Ethoxyethyl acetate, 2-	111-15-9	2.5E+03 TEEL3	2.5E+03 TEEL2	4.0E+02 TEEL1	in animals: repro effects in animals: terato effects irrit eyes irrit nose kidney damage para vomit
Ethoxyethyl methacrylate, 2-	2370-63-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Ethoxylated alcohols, C16-18	68439-49-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Ethoxylated nonylphenol	9016-45-9	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Ethyl 3-ethoxypropionate	763-69-9	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Ethyl acetate	141-78-6	7.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	derm irrit eyes irrit nose irrit skin irrit throat narco
Ethyl acetoacetate	141-97-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Ethyl acrylate	140-88-5	9.8E+02 AEGL3_1hr	1.5E+02 AEGL2_1hr	3.4E+01 AEGL1_1hr	carc irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys irrit skin
Ethyl Alcohol D	925-93-9	6.0E+03 TEEL3	2.0E+03 TEEL2	2.0E+03 TEEL1	
Ethyl alpha-hydroxy isobutyrate	80-55-7	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Ethyl amyl ketone	541-85-5	5.0E+02 TEEL3	1.3E+02 TEEL2	1.3E+02 TEEL1	
					coma derm head irrit eyes irrit muc memb irrit skin narco
Ethyl benzoate	93-89-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Ethyl bromide	74-96-4	7.5E+03 TEEL3	7.5E+03 TEEL2	4.0E+03 TEEL1	
					card arrest card arrhy CNS depres irrit eyes irrit resp sys irrit skin kidney disease liver disease pulm edema
Ethyl bromoacetate	105-36-2	6.0E-01 TEEL3	1.3E-01 TEEL2	2.0E-02 TEEL1	
Ethyl butyl ketone	106-35-4	4.0E+03 TEEL3	7.5E+02 TEEL2	3.5E+02 TEEL1	
					coma derm head irrit eyes irrit muc memb irrit skin narco
Ethyl carbamate	51-79-6	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ethyl cellulose	9004-57-3	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Ethyl chloride	75-00-3	1.0E+04 TEEL3	1.0E+04 TEEL2	5.0E+03 TEEL1	abdom cramps card arrest card arrhy inco inebri kidney damage liver damage
Ethyl chloroacetate	105-39-5	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Ethyl chloroformate	541-41-3	2.1E+01 AEGL3_1hr	7.1E+00 AEGL2_1hr	4.0E+00 TEEL1	
Ethyl ether	60-29-7	6.0E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	dizz drow excited head irrit eyes irrit skin irrit upper resp sys narco nau vomit
Ethyl formate	109-94-4	4.0E+03 TEEL3	1.5E+03 TEEL2	7.5E+02 TEEL1	in animals: narco irrit eyes irrit upper resp sys
Ethyl isocyanate	109-90-0	4.7E-01 AEGL3_1hr	1.5E-01 AEGL2_1hr		
Ethyl lactate	687-47-8	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Ethyl mercaptan	75-08-1	9.1E+02 AEGL3_1hr	3.0E+02 AEGL2_1hr	2.5E+00 AEGL1_1hr	cyan head

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: inco in animals: lass irrit muc memb kidney damage liver damage narco nau
Ethyl mercury chloride	107-27-7	2.6E+00 TEEL3	5.3E-02 TEEL2	4.0E-02 TEEL1	
Ethyl methacrylate	97-63-2	4.0E+03 TEEL3	4.0E+03 TEEL2	6.0E+02 TEEL1	
Ethyl nitrite	109-95-5	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Ethyl O-2-diisopropylaminoethylmethylphosphonite, QL O-	57856-11-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	5.0E+00 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
					abdom cramps anor card irreg chest tight convuls cyan diarr head irrit eyes irrit skin lac lar spasm low BP miosis nau para rhin salv wheez

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ethyl propionate	105-37-3	4.0E+03 TEEL3	7.5E+02 TEEL2	1.0E+02 TEEL1	
Ethyl silicate polymer	11099-06-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethyl-1-hexanol, 2-	104-76-7	1.1E+03 ERPG3	5.3E+02 ERPG2	5.3E-01 ERPG1	
Ethyl-2-methylheptane, 3-	14676-29-0	1.0E+04 TEEL3	2.0E+03 TEEL2	2.5E+02 TEEL1	
Ethyl-4-hydroxybenzoate	120-47-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Ethylamine	75-04-7	5.0E+02 AEGL3_1hr	9.0E+01 AEGL2_1hr	1.4E+01 AEGL1_1hr	derm irrit eyes irrit resp sys irrit skin skin burns
Ethylbenzaldehyde	22927-13-5	6.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Ethylbenzene	100-41-4	3.5E+03 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	coma derm head irrit eyes irrit muc memb irrit skin narco
Ethylbis(2-chloroethyl)amine	538-07-8	3.7E-01 AEGL3_1hr	2.2E-02 AEGL2_1hr	1.3E-02 TEEL1	
Ethylchlorothioformate	2941-64-2	4.0E+00 AEGL3_1hr	1.3E+00 AEGL2_1hr	7.5E-01 TEEL1	
Ethyldichloroarsine	598-14-1	8.6E-02 AEGL3_1hr	2.9E-02 AEGL2_1hr	2.3E-02 TEEL1	
Ethylene	74-85-1	1.0E+04 TEEL3	1.5E+03 TEEL2	6.0E+02 TEEL1	
Ethylene carbonate	96-49-1	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Ethylene chlorohydrin	107-07-3	4.0E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	3.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					collapse coma delirium dizz head inco irrit muc memb kidney damage liver damage low BP nau numb shock thirst vis dist vomit
Ethylene diamine	107-15-3	4.9E+01 AEGL3_1hr	2.4E+01 AEGL2_1hr	2.4E+01 AEGL2_1hr*	 asthma asthma asthma asthma cough irrit irrit irrit nose irrit resp sys kidney damage liver damage phlegm resp sens derm wheez
Ethylene fluorohydrin	371-62-0	3.5E+00 TEEL3	6.0E-02 TEEL2	3.5E-02 TEEL1	
Ethylene glycol	107-21-1	1.5E+02 TEEL3	1.0E+02 TEEL2	2.5E+01 TEEL1	 abdom pain CNS depres

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					convuls dizz irrit eyes irrit nose irrit skin irrit throat lass nau skin sens stupor vomit
Ethylene glycol diacetate	111-55-7	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Ethylene glycol dimethacrylate	97-90-5	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Ethylene glycol monobutyl ether	111-76-2	3.5E+03 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
					CNS depres head hema hemolysis irrit eyes irrit nose irrit skin irrit throat vomit
Ethylene glycol monopropyl ether	2807-30-9	4.0E+03 TEEL3	3.5E+02 TEEL2	7.5E+01 TEEL1	
Ethylene glycol mono-sec-butyl ether	7795-91-7	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Ethylene oxide	75-21-8	3.6E+02 AEGL3_1hr*	8.1E+01 AEGL2_1hr*	9.0E+00 TEEL1 (fixed)*	
					cyan diarr drow dysp EKG abnor eye burns (liq or high vap conc) head

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: carc in animals: convuls in animals: kidney damage in animals: liver damage inco irrit eyes irrit nose irrit skin irrit throat lass liquid: frostbite nau peculiar taste pulm edema repro effects skin burns (liq or high vap conc) vomit
Ethylene thiourea	96-45-7	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	in animals: carc in animals: goiter in animals: terato effects in animals: thickening of the skin irrit eyes
Ethylene/vinyl acetate copolmer	24937-78-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethylenediamine dihydrochloride	333-18-6	6.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Ethylenediaminetetraacetic acid	60-00-4	1.5E+02 TEEL3	1.5E+02 TEEL2	1.3E+02 TEEL1	
Ethylenediaminetetraacetic acid tetrasodium salt	10378-23-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Ethylenediaminetetraacetic acid, disodium salt	139-33-3	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Ethylenediaminetetraacetic acid, ferric ammonium s	21265-50-9	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ethylenedinitrilo)tetra-2-propanol, 1,1',1",1'"-(	102-60-3	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Ethyleneimine	151-56-4	1.7E+01 AEGL3_1hr	8.1E+00 AEGL2_1hr	1.5E-01 TEEL1	carc dizz eye burns head irrit eyes irrit nose irrit skin irrit throat kidney damage liver damage nau pulm edema skin sens vomit
Ethylheptane, 4-	2216-32-2	1.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Ethylhexanoic acid	149-57-5	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Ethylhexyl bromide, 2-	18908-66-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethylhexylchloroformate, 2-	24468-13-1	2.3E+01 AEGL3_1hr	7.6E+00 AEGL2_1hr	1.0E+00 TEEL1	
Ethylidene norbornene	16219-75-3	2.5E+03 ERPG3	4.9E+02 ERPG2	9.8E-01 ERPG1	bone marrow effects chemical pneu (aspir liquid) cough dysp head in animals: kidney inj in animals: liver inj in animals: urogenital inj irrit eyes irrit nose

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin irrit throat nau olfactory changes taste changes vomit
Ethylmagnesium chloride	2386-64-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ethylphosphorodichloridate	1498-51-7	4.0E+01 AEGL3_1hr	4.0E+00 AEGL2_1hr		
Ethylthiocyanate	542-90-5	1.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Ethyltoluene, o-	611-14-3	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Ethyltoluene, p-	622-96-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Etidronic acid	2809-21-4	5.0E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Europium	7440-53-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Europium (III) oxide	1308-96-9	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Europium diiodide	22015-35-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Extracts, petroleum, middle distillate solvent	64742-06-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Farnesol	4602-84-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Fats and Glyceridic oils, neat's-foot	8002-64-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Fenamiphos	22224-92-6	2.1E+00 AEGL3_1hr	7.0E-01 AEGL2_1hr	1.5E-01 TEEL1	
					abdom cramps blurred vision card irreg chest tight diarr dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dysp head lass miosis musc fasc nau rhin salv vomit
Fensulfothion	115-90-2	1.3E+01 TEEL3	2.0E+00 TEEL2	3.0E-02 TEEL1	
					abdom cramps blurred vision card irreg chest tight diarr dizz dysp head irrit skin lass miosis musc fasc nau rhin salv vomit
Fenthion	55-38-9	4.0E+01 TEEL3	4.0E+01 TEEL2	1.5E-01 TEEL1	
					abdom cramps blurred vision card irreg chest tight diarr dizz dysp head lass miosis

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					musc fasc nau rhin salv vomit
Ferric ammonium citrate	1185-57-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.4E+00 TEEL1	
Ferric ammonium sulfate dodecahydrate	7783-83-7	2.0E+02 TEEL3	4.3E+01 TEEL2	2.6E+01 TEEL1	
Ferric chloride	7705-08-0	1.3E+02 TEEL3	1.0E+01 TEEL2	2.9E+00 TEEL1	
Ferric chloride, hexahydrate	10025-77-1	1.0E+02 TEEL3	1.0E+02 TEEL2	7.5E+01 TEEL1	
Ferric fluoride	7783-50-8	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Ferric hydroxide	1309-33-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Ferric nitrate	10421-48-4	5.0E+02 TEEL3	2.2E+01 TEEL2	1.3E+01 TEEL1	
Ferric nitrate, nonahydrate	7782-61-8	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Ferric oxide	1309-37-1	5.0E+02 TEEL3	4.0E+01 TEEL2	1.5E+01 TEEL1	benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis) irrit eyes irrit resp sys irrit skin
Ferric phosphate	10045-86-0	6.0E+01 TEEL3	1.4E+01 TEEL2	8.3E+00 TEEL1	
Ferric sulfate	10028-22-5	7.5E+01 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
Ferrous ammonium sulfate	10045-89-3	1.3E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Ferrous carbonate	563-71-3	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Ferrous chloride	7758-94-3	2.0E+02 TEEL3	1.1E+01 TEEL2	6.8E+00 TEEL1	
Ferrous hydroxide	18624-44-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Ferrous sulfamate	14017-39-1	6.0E+01 TEEL3	1.4E+01 TEEL2	8.4E+00 TEEL1	
Ferrous sulfate	7720-78-7	3.5E+02 TEEL3	1.4E+01 TEEL2	8.2E+00 TEEL1	
Ferrous sulfate heptahydrate	7782-63-0	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Ferrous sulfide	12068-85-8	5.0E+01 TEEL3	1.1E+01 TEEL2	6.4E+00 TEEL1	
Fibrous glass filter media	65997-17-3	5.0E+02 TEEL3	6.0E+01 TEEL2	1.5E+01 TEEL1	
Fisherbrand vacuum pump oil	64742-65-0	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	
Fluenetil	4301-50-2	6.0E+00 TEEL3	6.0E+00 TEEL2	3.5E+00 TEEL1	
Fluoboric acid	16872-11-0	2.9E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Fluoranthene	206-44-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Fluorene	86-73-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Fluorescein	2321-07-5	2.5E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Fluoride	16984-48-8	2.5E+02 TEEL3	1.3E+01 TEEL2	7.5E+00 TEEL1	
Fluoride, sodium	7681-49-4	5.0E+02 TEEL3	5.5E+00 TEEL2	5.5E+00 TEEL1	abdom pain calcification of ligaments of pelvis calcification of ligaments of ribs derm diarr irrit eyes irrit resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau salv stiff spine sweat thirst
Fluorine	7782-41-4	2.0E+01 AEGL3_1hr*	7.8E+00 AEGL2_1hr*	2.6E+00 AEGL1_1hr*	eye burns in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit resp sys lar spasm pulm edema skin burns wheez
Fluoro-4-nitrophenol, 2-	403-19-0	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Fluoro-6-nitrophenol, 2-	1526-17-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Fluoroacetamide	640-19-7	5.8E+00 TEEL3	5.8E+00 TEEL2	3.5E+00 TEEL1	
Fluoroacetic acid	144-49-0	2.0E+00 TEEL3	4.7E-01 TEEL2	2.5E-01 TEEL1	
Fluoroacetyl chloride	359-06-8	1.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Fluorobenzene	462-06-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Fluorosulfonic acid	7789-21-1	3.0E+01 ERPG3	1.0E+01 ERPG2	2.0E+00 ERPG1	
Fluorotrimethylsilane	420-56-4	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Fluorouracil	51-21-8	1.0E+02 TEEL3	1.9E+01 TEEL2	2.5E+00 TEEL1	
Fonofos	944-22-9	2.0E+02 TEEL3	1.3E+00 TEEL2	3.0E-01 TEEL1	abdom cramps blurred vision

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					card irreg chest tight diarr dizz dysp head lass miosis musc fasc nau rhin salv vomit
Forane	26675-46-7	3.5E+04 TEEL3	3.5E+04 TEEL2	3.5E+04 TEEL1	
Formaldehyde	50-00-0	6.9E+01 AEGL3_1hr*	1.7E+01 AEGL2_1hr*	1.1E+00 AEGL1_1hr*	 carc carc cough derm irrit eyes irrit nose irrit resp sys irrit throat lac wheez
Formaldehyde cyanohydrin	107-16-4	1.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	 abdom pain conf convuls dizz dysp head irrit eyes irrit resp sys irrit skin lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau vomit
Formaldehyde hydrosulfite	149-44-0	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Formaldehyde, melamine polymer, methylated	68002-20-0	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Formamide	75-12-7	2.5E+03 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	acidosis drow in animals: repro effects irrit eyes irrit muc memb irrit skin lass nau skin eruptions
Formetanate hydrochloride	23422-53-9	1.8E+01 TEEL3	1.8E+01 TEEL2	1.0E+01 TEEL1	
Formic acid	64-18-6	5.0E+01 TEEL3	1.5E+01 TEEL2	1.5E+01 TEEL1	cough derm dysp irrit eyes irrit skin irrit throat lac nau rhin skin burns
Formic acid butyl ester	592-84-7	4.0E+03 TEEL3	4.0E+03 TEEL2	6.0E+02 TEEL1	
Formothion	2540-82-1	1.0E+01 TEEL3	2.7E-01 TEEL2	1.5E-01 TEEL1	
Formparanate	17702-57-7	7.2E+00 TEEL3	7.2E+00 TEEL2	4.0E+00 TEEL1	
Formylpiperidine, 1-	2591-86-8	4.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Fosthietan	21548-32-3	4.7E+00 TEEL3	4.7E+00 TEEL2	2.5E+00 TEEL1	
Fuberidazole	3878-19-1	1.3E+02 TEEL3	3.3E+00 TEEL2	2.0E+00 TEEL1	
Fuel oil no. 2	68476-30-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Fuel oil, residual	68476-33-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Fuller's earth	8031-18-3	5.0E+02 TEEL3	1.3E+02 TEEL2	6.0E+00 TEEL1	
Fulminic acid	506-85-4	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Fumaric acid	110-17-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Furan	110-00-9	5.3E+01 AEGL3_1hr	1.9E+01 AEGL2_1hr	1.0E+01 TEEL1	
Furfural	98-01-1	3.9E+02 ERPG3	3.9E+01 ERPG2	7.9E+00 ERPG1	derm head irrit eyes irrit skin irrit upper resp sys
Furfuryl alcohol	98-00-0	3.0E+02 TEEL3	6.0E+01 TEEL2	6.0E+01 TEEL1	body temperature depres derm diarr diuresis dizz irrit eyes irrit muc memb nau resp depres vomit
Furoic acid, ethyl ester	614-99-3	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Fusariotoxin T2	21259-20-1	4.0E-01 TEEL3	3.0E-02 TEEL2	4.0E-03 TEEL1	diarr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					generalized burning erythema mental confusion nau vomit
Gadolinium	7440-54-2	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Gadolinium (III) oxide	12064-62-9	5.0E+02 TEEL3	5.0E+01 TEEL2	6.0E+00 TEEL1	
Gadolinium chloride hexahydrate	13450-84-5	7.5E+01 TEEL3	7.5E+01 TEEL2	7.5E+01 TEEL1	
Gadolinium hydroxide	16469-18-4	7.5E+01 TEEL3	2.5E+00 TEEL2	7.5E-01 TEEL1	
Gallic acid monohydrate	5995-86-8	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Gallium	7440-55-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Gallium oxide	12024-21-4	5.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Gallium trichloride	13450-90-3	1.0E+02 TEEL3	3.2E+01 TEEL2	2.0E+01 TEEL1	
Gallium trifluoride	7783-51-9	1.3E+02 TEEL3	2.8E+01 TEEL2	1.7E+01 TEEL1	
gamma-Aminopropyltriethoxysilane	919-30-2	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Gasoline	8006-61-9		7.5E+03 AEGL2_1hr	7.3E+02 AEGL1_1hr	blurred vision carc chemical pneu (aspir liquid) conf convuls derm dizz head irrit eyes irrit muc memb irrit skin lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					possible kidney damage possible liver damage slurred speech
Gelatin	9000-70-8	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Germanium	7440-56-4	5.0E+02 TEEL3	2.5E-01 TEEL2	3.5E-02 TEEL1	
Germanium oxide	1310-53-8	5.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Germanium tetrafluoride	7783-58-6	4.9E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Germanium tetrahydride	7782-65-2	1.6E+00 AEGL3_1hr	5.3E-01 AEGL2_1hr	5.3E-01 AEGL2_1hr*	dizz dysp fainting head hemolytic effects kidney inj mal nau vomit
Giemsa's stain	51811-82-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Glucose, alpha-D-	492-62-6	5.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Glucose, d-	50-99-7	5.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Glutamic acid, L-	56-86-0	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Gluteraldehyde	111-30-8	2.0E+01 ERPG3	4.1E+00 ERPG2	8.2E-01 ERPG1	asthma cough derm irrit eyes irrit resp sys irrit skin nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					sens skin vomit
Glycerin	56-81-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	 head irrit eyes irrit resp sys irrit skin kidney inj nau vomit
Glycerine carbonate	931-40-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Glyceryl monostearate	31566-31-1	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Glycidaldehyde	765-34-4	7.5E+01 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Glycidol	556-52-5	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	 irrit eyes irrit nose irrit skin irrit throat narco
Glycidoxypropyltrimethoxysilane	2530-83-8	5.0E+02 TEEL3	5.0E+02 TEEL2	4.0E+02 TEEL1	
Glycidyl acrylate	106-90-1	6.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Glycine	56-40-6	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Glycolic acid	79-14-1	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Glycols, polyethylene, dimethyl ether	24991-55-7	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Glycols, polyethylene, mono(p-octylphenyl) ether	26636-32-8	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Glycoluril	496-46-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Glyoxal	107-22-2	7.5E+01 TEEL3	7.5E+01 TEEL2	3.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Gold	7440-57-5	1.0E+02 TEEL3	1.0E+02 TEEL2	2.5E+01 TEEL1	
Graphite	7782-42-5	5.0E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	black sputum cough decr pulm func dysp lung fib
Grease	68153-81-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Guanidine hydrochloride	50-01-1	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Guanidine thiocyanate	593-84-0	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Guanylurea Sulfate	591-01-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Hafnium	7440-58-6	5.0E+01 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	in animals: irrit eyes in animals: irrit muc memb in animals: irrit skin in animals: liver damage
Hafnium oxide	12055-23-1	5.9E+01 TEEL3	3.0E+00 TEEL2	1.8E+00 TEEL1	
HCFC-141b	1717-00-6	1.4E+04 AEGL3_1hr	8.1E+03 AEGL2_1hr	4.8E+03 AEGL1_1hr	
HCFC-142b	75-68-3	1.0E+05 ERPG3	6.2E+04 ERPG2	4.1E+04 ERPG1	
Heavy naphthenic distillate	64741-53-3	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Helium	7440-59-7	6.0E+04 TEEL3	3.5E+04 TEEL2	1.0E+04 TEEL1	
Hematoxylin	517-28-2	1.0E+01 TEEL3	2.0E+00 TEEL2	2.5E-01 TEEL1	
Hepes	7365-45-9	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Heptachlor	76-44-8	3.5E+01 TEEL3	3.5E+01 TEEL2	1.5E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: carc in animals: convuls in animals: liver damage in animals: tremor
Heptachlor epoxide	1024-57-3	6.0E+00 TEEL3	6.0E+00 TEEL2	1.5E-01 TEEL1	
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4				
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7				
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9				
Heptadecane	629-78-7	1.5E+04 TEEL3	3.5E+03 TEEL2	5.0E+02 TEEL1	
Heptafluorobutyric acid	375-22-4	6.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Heptane, n-	142-82-5	3.0E+03 TEEL3	1.6E+03 TLV_TWA_irr*	1.6E+03 TLV_TWA_irr*	chemical pneu (aspir liquid) derm dizz inco loss of appetite nau stupor uncon
Heptanoic acid	111-14-8	3.0E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Heptanol, 1-	111-70-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+01 TEEL1	
Heptene, 1-	592-76-7	7.5E+05 TEEL3	1.5E+05 TEEL2	2.0E+04 TEEL1	
Hexaammonium molybdate	12027-67-7	5.0E+02 TEEL3	4.3E+00 TEEL2	2.6E+00 TEEL1	
Hexachloroacetone	116-16-5	2.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hexachlorobenzene	118-74-1	2.0E+02 TEEL3	1.5E+00 TEEL2	6.0E-03 TEEL1	
Hexachlorobutadiene	87-68-3	1.1E+02 ERPG3	3.2E+01 ERPG2	1.1E+01 ERPG1	in animals: carc in animals: irrit eyes in animals: irrit resp sys in animals: irrit skin in animals: kidney damage
Hexachlorocyclohexane, alpha-	319-84-6	5.0E+02 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
Hexachlorocyclohexane, beta-	319-85-7	5.0E+02 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
Hexachlorocyclohexane, technical	608-73-1	3.0E+02 TEEL3	4.0E+00 TEEL2	5.0E-01 TEEL1	
Hexachlorocyclopentadiene	77-47-4	2.0E-01 TEEL3	2.0E-01 TEEL2	2.0E-01 TEEL1	cough diarr dysp eye burns in animals: kidney inj in animals: liver inj irrit eyes irrit resp sys irrit skin lac nau pulm edema salv skin burns sneez vomit
Hexachlorodibenzodioxin, 1,2,3,4,7,8-	39227-28-6				
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9				
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9				

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9				
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5				
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7				
Hexachlorodibenzo-p-dioxin, mixture	19408-74-3				
Hexachloroethane	67-72-1	3.0E+03 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	in animals: carc in animals: kidney damage irrit eyes irrit muc memb irrit skin
Hexachloronaphthalene	1335-87-1	2.0E+00 TEEL3	2.0E-01 TEEL2	2.0E-01 TEEL1	acne-form derm coma conf jaun nau
Hexachlorophene	70-30-4	2.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Hexachloropropene	1888-71-7	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Hexadecanamine, 1-	143-27-1	7.5E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Hexadecane	544-76-3	5.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Hexadecanoic acid	57-10-3	5.0E+01 TEEL3	5.0E+01 TEEL2	5.0E+01 TEEL1	
Hexadecanol, 1-	36653-82-4	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Hexadecene, 1-	629-73-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Hexadecylpyridinium chloride, 1	123-03-5	1.0E+01 TEEL3	2.0E+00 TEEL2	2.5E-01 TEEL1	
Hexadecyltrimethylammonium bromide	57-09-0	1.5E+02 TEEL3	7.5E-01 TEEL2	1.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hexadecyltrimethylammonium chloride	112-02-7	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Hexafluoro-2-butyne	692-50-2	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Hexafluoroacetone	684-16-2	5.4E+02 AEGL3_1hr	1.4E+00 AEGL2_1hr	6.8E-01 TLV_TWA*	in animals: kidney inj in animals: repro effects in animals: terato effects irrit eyes irrit muc memb irrit resp sys irrit skin liquid: frostbite pulm edema
Hexafluorobenzene	392-56-3	1.3E+04 TEEL3	1.3E+04 TEEL2	3.5E+03 TEEL1	
Hexafluorodisodium silicate, 2-	16893-85-9	5.0E+00 TEEL3	5.0E+00 TEEL2	4.1E+00 TEEL1	
Hexafluoroethane	76-16-4	2.5E+05 TEEL3	2.5E+05 TEEL2	2.5E+05 TEEL1	
Hexafluoropropylene	116-15-4	2.9E+03 AEGL3_1hr	5.6E+02 AEGL2_1hr	2.5E+02 AEGL1_1hr	
Hexamethyl phosphoramide	680-31-9	1.0E+03 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	abdom pain carc dysp irrit eyes irrit resp sys irrit skin
Hexamethylcyclotrisiloxane	541-05-9	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Hexamethyldisilazane	999-97-3	3.5E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Hexamethyldisiloxane	107-46-0	2.0E+03 TEEL3	2.0E+03 TEEL2	7.5E+02 TEEL1	
Hexamethylene diisocyanate	822-06-0	2.0E+01 TEEL3	1.3E-01 TEEL2	1.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					asthma bron corn damage cough dysp irrit eyes irrit resp sys irrit skin pulm edema skin blisters wheez
Hexamethylene diisocyanate polymer	28182-81-2	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Hexamethylene glycol	629-11-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Hexamethyleneimine	111-49-9	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Hexamethylenetetraamine	100-97-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Hexamethylenetetramine chloroallyl chloride	4080-31-3	2.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Hexanal	66-25-1	7.5E+02 TEEL3	7.5E+02 TEEL2	1.5E+02 TEEL1	
Hexane, commercial	110-54-3	3.0E+04 AEGL3_1hr	1.2E+04 AEGL2_1hr	1.5E+03 TEEL1	chemical pneu (aspir liquid) derm dizz head irrit eyes irrit nose nau peri neur: musc weak peri neur: numb extremities
Hexanehexol, 1,2,3,4,5,6-	69-65-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Hexanenitrile	628-73-9	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hexanethiol, n-	111-31-9	5.0E+02 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	cyan drow head incr respiration irrit eyes irrit nose irrit skin irrit throat lass nau vomit
Hexanitrostilbene	20062-22-0	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Hexanoic acid	142-62-1	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Hexanol, 2-	626-93-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Hexanol, n-	111-27-3	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Hexanone, 2-	591-78-6	6.0E+03 TEEL3	6.0E+03 TEEL2	4.0E+01 TEEL1	derm drow head irrit eyes irrit nose peri neur: lass peri neur: pares
Hexanone, 3-	589-38-8	1.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Hexanoyl chloride	142-61-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Hexaphenylcyclotrisiloxane	512-63-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Hexene	592-41-6	1.7E+04 ERPG3	1.7E+03 ERPG2	2.5E+02 TEEL1	
Hexylene glycol	107-41-5	1.5E+03 TEEL3	1.3E+02 TEEL2	5.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					CNS depres derm dizz head inco irrit eyes irrit resp sys irrit skin nau skin sens
Hexyltrichlorosilane	928-65-4	3.0E+02 AEGL3_1hr	6.6E+01 AEGL2_1hr	5.4E+00 AEGL1_1hr	
HFC-134A	811-97-2	1.1E+05 AEGL3_1hr	5.4E+04 AEGL2_1hr	3.3E+04 AEGL1_1hr	
HMX	2691-41-0	5.0E+02 TEEL3	7.5E-01 TEEL2	1.3E-01 TEEL1	
Holmium	7440-60-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Holmium trioxide	12055-62-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Humic acid, sodium salt	68131-04-4	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Hyamine 3500	68424-85-1	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Hydrazine	302-01-2	4.6E+01 AEGL3_1hr*	1.7E+01 AEGL2_1hr*	1.3E-01 AEGL1_1hr*	carc convuls derm dizz eye burns in animals: bron in animals: pulm edema irrit eyes irrit nose irrit skin irrit throat kidney damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liver damage nau skin burns temporary blindness
Hydrazine hydrate, aequeous solutions	10217-52-4	7.5E+00 TEEL3	7.5E-01 TEEL2	1.0E-01 TEEL1	
Hydrazine monohydrate	7803-57-8	5.0E+01 TEEL3	7.5E-03 TEEL2	1.0E-03 TEEL1	
Hydrazine monohydrochloride	2644-70-4	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Hydrazine sulfate	10034-93-2	2.5E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Hydrazine, dihydrochloride	5341-61-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Hydrogen	1333-74-0	3.0E+04 TEEL3	1.5E+04 TEEL2	5.0E+03 TEEL1	
Hydrogen bromide	10035-10-6	4.0E+02 TEEL3	7.3E+01 TEEL2	3.3E+00 TEEL1	
					irrit eyes irrit nose irrit skin irrit throat liquid: frostbite solution: eye burns solution: skin burns
Hydrogen chloride	7647-01-0	1.5E+02 AEGL3_1hr*	3.3E+01 AEGL2_1hr*	2.7E+00 AEGL1_1hr*	
					choking cough derm in animals: lar spasm irrit irrit larynx irrit nose irrit throat liquid: frostbite pulm edema solution: eye burns solution: skin burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hydrogen cyanide	74-90-8	1.7E+01 AEGL3_1hr*	7.8E+00 AEGL2_1hr*	2.2E+00 AEGL1_1hr*	anor asphy blood changes conf dizz ftg giddiness head head head head head head incr rate and depth of respiration or respiration slow and gasping irrit lass nau nau nau nau nau numb palp thyroid changes tremors tremors vertigo vomit vomit weak weak weak weak weak weak

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hydrogen fluoride	7664-39-3	3.6E+01 AEGL3_1hr*	2.0E+01 AEGL2_1hr*	8.2E-01 AEGL1_1hr*	
					bone changes
					bron
					cough
					eye burns
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit
					irrit eyes
					irrit nose
					irrit skin
					irrit throat
					pulm edema
					rhinitis
					skin burns
					tight
					wheez
Hydrogen iodide	10034-85-2	6.3E+02 TEEL3	1.2E+02 TEEL2	5.2E+00 TEEL1	
Hydrogen peroxide	7722-84-1	1.4E+02 ERPG3	7.0E+01 ERPG2	1.4E+01 ERPG1	
					bleaching hair
					corn ulcer
					eryt
					irrit eyes
					irrit nose
					irrit throat
					vesic skin
Hydrogen peroxide, 30% solution	0-314*	4.0E+02 TEEL3	2.0E+02 TEEL2	4.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hydrogen potassium phthalate	877-24-7	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Hydrogen selenide	7783-07-5	7.3E+00 AEGL3_1hr*	2.4E+00 AEGL2_1hr*	3.5E-01 TEEL1*	diarr dizz garlic breath in animals: pneu irrit eyes irrit nose irrit throat lass liquid: frostbite liver damage metallic taste nau vomit
Hydrogen sulfide	7783-06-4	7.0E+01 AEGL3_1hr*	3.8E+01 AEGL2_1hr*	7.1E-01 AEGL1_1hr*	apnea coma conj convuls corn vesic dizz eye pain GI dist head insom irrit eyes irrit resp sys irrity lac lass liquid: frostbite photo
Hydrogenated terphenyls	61788-32-7	7.5E+03 TEEL3	3.0E+01 TEEL2	1.5E+01 TEEL1	hemato damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit resp sys irrit skin kidney damage liver damage
Hydroquinone	123-31-9	5.0E+01 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
					CNS excitement collapse colored urine delirium derm dizz irrit eyes: conj irrit skin kera musc twitch nau rapid breath sens suffocation
Hydrotreated heavy paraffinic distillate	64742-54-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Hydrotreated light naphthenic distillate	64742-53-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Hydroxy-2-methylpropanoic acid, 2-	594-61-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Hydroxy-4'hydroxyethoxy-2-methylpropiophenone, 2-	106797-53-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Hydroxyapatite	1306-06-5	5.0E+02 TEEL3	6.0E+01 TEEL2	3.5E+01 TEEL1	
Hydroxyethyl methacrylate, 2-	868-77-9	5.0E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Hydroxyethylenediaminetriacetic acid	150-39-0	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Hydroxylamine	7803-49-8	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Hydroxylamine hydrochloride	5470-11-1	6.0E+01 TEEL3	6.0E+01 TEEL2	3.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Hydroxylamine nitrate	13465-08-2	1.5E+02 TEEL3	4.0E+01 TEEL2	1.5E+01 TEEL1	
Hydroxylamine sulfate	10039-54-0	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Hydroxy-n-phenylbenzamide, N-	304-88-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Hydroxyphenyl benzothiazole	3411-95-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Hydroxyphenylacetic acid, 1-A	90-64-2	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Hydroxypropyl cellulose	9004-64-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Hydroxyquinoline sulfate, 8-	134-31-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Hypophosphorous acid	6303-21-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Hypophosphorous acid-d3	57583-56-9	6.0E+02 TEEL3	1.3E+02 TEEL2	7.5E+01 TEEL1	
Imidazole	288-32-4	1.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Imidazole hydrochloride	1467-16-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Imidazole, substituted	38668-46-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Iminodiacetic acid	142-73-4	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Iminodiacetic acid disodium salt	928-72-3	3.5E+03 TEEL3	6.0E+02 TEEL2	1.0E+02 TEEL1	
Iminodiacetic acid, disodium salt hydrate	17593-73-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Indan	496-11-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Indene	95-13-6	1.5E+03 TEEL3	2.4E+01 TLV_TWA*	2.4E+01 TLV_TWA*	in animals: chemical pneu (aspir liquid) in animals: derm

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: irrit eyes in animals: irrit muc memb in animals: irrit skin In animals: kidney inj in animals: liver inj in animals: skin sens in animals: spleen inj
Indeno(1,2,3-cd)pyrene	193-39-5	1.5E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Indigo carmine	860-22-0	7.5E+01 TEEL3	7.5E+01 TEEL2	6.0E+01 TEEL1	
Indium (III) oxide	1312-43-2	5.0E+02 TEEL3	6.0E-01 TEEL2	3.6E-01 TEEL1	
Indium and compounds	7440-74-6	3.5E+00 TEEL3	6.0E-01 TEEL2	1.0E-01 TEEL1	irrit eyes irrit resp sys irrit skin possible blood effects possible heart effects possible kidney effects possible liver effects pulm edema
Indium oxide vapor	0-318*	5.0E+02 TEEL3	1.0E+02 TEEL2	3.2E-01 TEEL1	
Indium sulfate	13464-82-9	4.0E+00 TEEL3	1.1E+00 TEEL2	6.8E-01 TEEL1	
Indium trichloride	10025-82-8	1.0E+00 TEEL3	1.0E+00 TEEL2	5.8E-01 TEEL1	
Indole-3-carboxaldehyde, 1H-	487-89-8	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Iodic acid	7782-68-5	2.0E+01 TEEL3	1.4E+00 TEEL2	1.4E+00 TEEL1	
Iodine	7553-56-2	5.2E+01 ERPG3	5.2E+00 ERPG2	1.0E+00 ERPG1	chest tight cutaneous hypersensitivity head irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit nose irrit skin lac rash skin burns
Iodine-125	17144-19-3	5.0E+01 TEEL3	5.0E+00 TEEL2	1.0E+00 TEEL1	
Iodobenzene	591-50-4	2.7E+01 TEEL3	2.7E+01 TEEL2	1.6E+00 TEEL1	
Iodoethane	75-03-6	1.5E+01 TEEL3	7.5E-01 TEEL2	7.5E-01 TEEL1	
Iodopropynyl butylcarbamate	55406-53-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Iotalamic acid	2276-90-6	8.1E+01 TEEL3	1.6E+00 TEEL2	1.6E+00 TEEL1	
Iridium, elemental	7439-88-5	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Iron	7439-89-6	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Iron (II) chloride tetrahydrate	13478-10-9	4.0E+01 TEEL3	7.5E+00 TEEL2	3.6E+00 TEEL1	
Iron carbide	12011-67-5	5.0E+02 TEEL3	2.7E+01 TEEL2	1.6E+01 TEEL1	
Iron hydroxide oxide	20344-49-4	5.0E+02 TEEL3	4.0E+01 TEEL2	2.4E+01 TEEL1	
Iron oxide	1317-61-9	5.0E+02 TEEL3	3.5E+01 TEEL2	2.1E+01 TEEL1	
Iron pentacarbonyl	13463-40-6	1.4E+00 AEGL3_1hr	4.8E-01 AEGL2_1hr	4.8E-01 TEEL1	
					cough cyan degenerative changes in CNS dizz dysp fever head irrit eyes irrit muc memb

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys kidney inj liver inj lung inj nau vomit
Iron(II) perchlorate hexahydrate	13520-69-9	1.5E+02 TEEL3	3.2E+01 TEEL2	1.9E+01 TEEL1	
Iron(III) perchlorate	13537-24-1	1.5E+02 TEEL3	3.2E+01 TEEL2	1.9E+01 TEEL1	
Iron(III) sulfate heptahydrate	35139-28-7	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Isoamyl acetate	123-92-2	5.0E+03 TEEL3	1.0E+03 TEEL2	5.0E+02 TEEL1	
					derm in animals: narco irrit eyes irrit nose irrit skin irrit throat
Isoamyl alcohol	123-51-3	1.5E+03 TEEL3	4.0E+02 TEEL2	4.0E+02 TEEL1	
					cough diarr dizz dysp head in animals: narco irrit eyes irrit nose irrit skin irrit throat nau skin cracking vomit
Isoamyl nitrite	110-46-3	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Isobenzan	297-78-9	2.0E+00 TEEL3	2.0E+00 TEEL2	1.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Isobutanol-2-amine	124-68-5	5.0E+02 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Isobutenyl chloride	563-47-3	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Isobutyl acetate	110-19-0	6.0E+03 TEEL3	1.3E+03 TEEL2	7.1E+02 TLV_TWA_irr*	anes drow head in animals: narco irrit eyes irrit skin irrit upper resp sys
Isobutyl alcohol	78-83-1	5.0E+03 TEEL3	5.0E+03 TEEL2	3.5E+03 TEEL1	drow head in animals: narco irrit eyes irrit skin irrit throat skin cracking
Isobutyl chloride	513-36-0	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Isobutyl chloroformate	543-27-1	3.7E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	3.5E+00 TEEL1	
Isobutyl isobutyrate	97-85-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Isobutylamine	78-81-9	1.0E+02 TEEL3	2.0E+01 TEEL2	6.0E+00 TEEL1	
Isobutyraldehyde	78-84-2	5.0E+03 TEEL3	5.0E+03 TEEL2	7.5E+02 TEEL1	
Isobutyric acid	79-31-2	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Isobutyric anhydride	97-72-3	6.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Isobutyronitrile	78-82-0	1.9E+02 AEGL3_1hr	5.1E+01 AEGL2_1hr	2.8E+01 ERPG1	abdom pain conf

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					convuls dizz dysp head irrit eyes irrit nose irrit skin irrit throat lass nau vomit
Isocyanatoethyl methacrylate	30674-80-7	6.3E+00 ERPG3	6.3E-01 ERPG2	3.5E-01 TEEL1	
Isocyanic acid	75-13-8	6.0E+00 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Isocyanic acid 3,4-dichlorophenyl ester	102-36-3	5.0E+02 TEEL3	1.4E+01 TEEL2	7.5E+00 TEEL1	
Isodrin	465-73-6	7.0E+00 TEEL3	7.0E+00 TEEL2	4.0E+00 TEEL1	
Isolan	119-38-0	5.6E+00 TEEL3	5.6E+00 TEEL2	3.5E+00 TEEL1	
Isonate 181	0-310*	7.5E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Isopentane	78-78-4	6.0E+04 TEEL3	1.8E+03 TLV_TWA_irr*	1.8E+03 TLV_TWA_irr*	
Isophorone	78-59-1	1.0E+03 TEEL3	2.5E+01 TEEL2	2.0E+01 TEEL1	derm dizz head in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit throat lass mal narco

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau
Isophorone diisocyanate	4098-71-9	1.3E+01 TEEL3	1.2E+00 TEEL2	1.5E-01 TEEL1	asthma bron chest tight cough dysp irrit eyes irrit resp sys irrit skin possible resp sens pulm edema sore throat wheez
Isoprene	78-79-5	1.1E+04 ERPG3	2.8E+03 ERPG2	1.4E+01 ERPG1	
Isopropanol	67-63-0	5.0E+03 TEEL3	1.0E+03 TEEL2	1.0E+03 TEEL1	dizz drow dry cracking skin head in animals: narco irrit eyes irrit nose irrit throat
Isopropyl acetate	108-21-4	7.5E+03 TEEL3	7.5E+02 TEEL2	7.5E+02 TEEL1	derm in animals: narco irrit eyes irrit nose irrit skin
Isopropyl chloroformate	108-23-6	5.0E+01 AEGL3_1hr	1.7E+01 AEGL2_1hr	2.0E+00 TEEL1	
Isopropyl myristate	110-27-0	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Isopropyl nitrate	1712-64-7	3.0E+03 TEEL3	6.0E+02 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Isopropylamine	75-31-0	1.5E+03 TEEL3	3.0E+02 TEEL2	2.5E+01 TEEL1	derm eye burns irrit eyes irrit nose irrit skin irrit throat pulm edema skin burns vis dist
Isopropylmagnesium chloride	1068-55-9	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Isopropyltoluene, p-	99-87-6	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Jeffamine M-600	77110-54-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Jet Fuel-5 (JP-5)	70892-10-3		1.1E+03 AEGL2_1hr	2.9E+02 AEGL1_1hr	
JP-5/JP-8 jet fuel	94114-58-6	1.1E+03 TEEL3	1.1E+03 TEEL2	2.9E+02 TEEL1	
Kaolin	1332-58-7	5.0E+02 TEEL3	1.3E+02 TEEL2	6.0E+00 TEEL1	chronic pulm fib stomach granuloma
Kerosene	8008-20-6	1.1E+03 TEEL3	1.1E+03 AEGL2_1hr	2.9E+02 AEGL1_1hr	burning sensation in chest chemical pneu (aspir liquid) conf derm diarr drow head inco irrit eyes irrit nose irrit skin irrit throat lass

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau restless vomit
Ketene	463-51-4	3.4E+00 AEGL3_1hr	1.1E+00 AEGL2_1hr	3.3E-01 AEGL1_1hr	 irrit eyes irrit nose irrit resp sys irrit skin irrit throat pulm edema
Krypton	7439-90-9	1.3E+06 TEEL3	7.5E+05 TEEL2	2.0E+05 TEEL1	
Kyanite	1302-76-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	
Lactic acid	50-21-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Lactic acid, monosodium salt	312-85-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lactonitrile	78-97-7	1.5E+02 TEEL3	1.8E+01 TEEL2	1.0E+01 TEEL1	
Lactose, beta-D	5965-66-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lanthanum	7439-91-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lanthanum (III) nitrate, hexahydrate	10277-43-7	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Lanthanum boride	12008-21-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lanthanum carbonate	6487-39-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lanthanum chloride	10099-58-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Lanthanum fluoride	13709-38-1	5.0E+02 TEEL3	4.3E+01 TEEL2	2.6E+01 TEEL1	
Lanthanum hydroxide	14507-19-8	2.5E+00 TEEL3	2.0E+00 TEEL2	7.5E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Lanthanum oxide	1312-81-8	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Lanthanum phosphate	14913-14-5	3.0E+00 TEEL3	3.0E+00 TEEL2	7.5E-01 TEEL1	
Laromin C 260	6864-37-5	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Laureth 4 [USAN]	9002-92-0	4.0E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Lauryl sulfate	151-41-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Lead (II) arsenite	10031-13-7	1.4E+01 TEEL3	1.4E-01 TEEL2	8.4E-02 TEEL1	
Lead acetate	301-04-2	5.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Lead acetate (II), trihydrate	6080-56-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Lead acid arsenate	7784-40-9	2.3E+01 TEEL3	2.3E+01 TEEL2	1.4E-01 TEEL1	
Lead and compounds (inorganic)	7439-92-1	1.0E+02 TEEL3	2.5E-01 TEEL2	1.5E-01 TEEL1	abdom pain anemia anor colic constip encephalopathy facial pallor gingival lead line hypotension insom irrit eyes kidney disease lass low weight malnut para ankles para wrist tremor

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Lead arsenate	3687-31-8	3.0E+01 TEEL3	2.0E+01 TEEL2	1.8E-01 TEEL1	
Lead bromide	10031-22-8	1.8E+02 TEEL3	4.4E-01 TEEL2	2.7E-01 TEEL1	
Lead carbonate	598-63-0	1.3E+02 TEEL3	4.0E+00 TEEL2	1.9E-01 TEEL1	
Lead chloride	7758-95-4	1.3E+02 TEEL3	7.5E+00 TEEL2	2.0E-01 TEEL1	
Lead chromate	7758-97-6	9.3E+01 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Lead dioxide	1309-60-0	1.2E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Lead fluoborate	13814-96-5	1.8E+02 TEEL3	4.6E-01 TEEL2	2.8E-01 TEEL1	
Lead fluoride	7783-46-2	1.2E+02 TEEL3	1.5E+01 TEEL2	1.8E-01 TEEL1	
Lead hydroxide	19783-14-3	1.2E+02 TEEL3	3.0E-01 TEEL2	1.7E-01 TEEL1	
Lead iodide	10101-63-0	2.2E+02 TEEL3	5.6E-01 TEEL2	3.3E-01 TEEL1	
Lead nitrate	10099-74-8	1.6E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Lead oxide	1317-36-8	1.1E+02 TEEL3	5.4E-02 TEEL2	5.4E-02 TEEL1	
Lead phosphate	7446-27-7	1.3E+02 TEEL3	3.0E+01 TEEL2	2.0E-01 TEEL1	
Lead subacetate	1335-32-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Lead sulfate	7446-14-2	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Lead sulfide	1314-87-0	1.2E+02 TEEL3	1.2E+02 TEEL2	1.7E-01 TEEL1	
Lead tetroxide	1314-41-6	1.1E+02 TEEL3	2.8E-01 TEEL2	1.7E-01 TEEL1	
Lead(II) perchlorate hydrate	13453-62-8	2.2E+02 TEEL3	5.6E-01 TEEL2	3.3E-01 TEEL1	
Leptophos	21609-90-5	3.0E+01 TEEL3	3.0E+01 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Lethane 384	112-56-1	4.0E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Lewisite 2	40334-69-8	7.4E-01 TEEL3	1.2E-01 TEEL2	1.2E-01 TEEL1	
Lewisite 3	40334-70-1	7.4E-01 TEEL3	1.2E-01 TEEL2	1.2E-01 TEEL1	
Lignosulfonic acid	8062-15-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Limonene, D-	5989-27-5	2.0E+03 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Lindane	58-89-9	5.0E+01 TEEL3	5.0E+01 TEEL2	1.5E+00 TEEL1	aplastic anemia clonic convuls cyan head in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit skin irrit throat musc spasm nau resp difficulty
Linseed oil	8001-26-1	6.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Lithium	7439-93-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Lithium acetate dihydrate	6108-17-4	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Lithium aluminate	12003-67-7	3.0E+02 TEEL3	6.1E+01 TEEL2	3.7E+01 TEEL1	
Lithium aluminum hydride	16853-85-3	3.5E+01 TEEL3	7.5E+00 TEEL2	2.8E+00 TEEL1	
Lithium aluminum oxide	11089-89-7	6.0E+01 TEEL3	1.3E+01 TEEL2	7.3E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Lithium azide	19597-69-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lithium borohydride	16949-15-8	4.0E+01 TEEL3	1.2E+01 TEEL2	1.2E+01 TEEL1	
Lithium bromide	7550-35-8	5.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Lithium carbonate	554-13-2	2.0E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Lithium chloride	7447-41-8	6.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Lithium chromate	14307-35-8	3.8E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Lithium deuteride	13587-16-1	5.0E-01 TEEL3	1.0E-01 TEEL2	2.5E-02 TEEL1	
Lithium diisopropylamide	4111-54-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lithium fluoride	7789-24-4	3.4E+02 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Lithium hydride	7580-67-8	5.0E-01 ERPG3	1.0E-01 ERPG2	2.5E-02 ERPG1	blurred vision esophagus burns (if ingested) eye burns irrit eyes irrit skin mental conf mouth burns (if ingested) musc twitches nau skin burns
Lithium hydroxide	1310-65-2	1.0E+02 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Lithium hydroxide monohydrate	1310-66-3	1.0E+02 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Lithium iodide	10377-51-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lithium metaborate	13453-69-5	2.0E+02 TEEL3	4.6E+01 TEEL2	2.8E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Lithium molybdate	13568-40-6	5.0E+02 TEEL3	9.1E+00 TEEL2	9.1E+00 TEEL1	
Lithium niobium oxide	12031-63-9	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Lithium nitrate	7790-69-4	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Lithium nitride	26134-62-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lithium perchlorate	7791-03-9	6.0E-02 TEEL3	1.0E-02 TEEL2	1.5E-03 TEEL1	
Lithium silicon	68848-64-6	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Lithium stearate	4485-12-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Lithium sulfate	10377-48-7	5.0E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Lithium tetraborate	12007-60-2	5.0E+02 TEEL3	1.6E+02 TEEL2	9.4E+01 TEEL1	
Lithium triethylborodeuteride	74540-86-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lithium triethylborohydride, super-hydride	22560-16-3	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
LPG	68476-85-7	3.5E+03 TEEL3	3.5E+03 TEEL2	3.5E+03 TEEL1	asphy dizz drow liquid: frostbite
Lubricating oils, refined used	68476-77-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Lutetium	7439-94-3	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Lutetium oxide	12032-20-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Magnesite	7760-50-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	cough irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys irrit skin
Magnesium	7439-95-4	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	 apathy delirium heat stroke impaired coord laxative effects weariness
Magnesium acetate tetrahydrate	16674-78-5	1.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Magnesium aluminum phosphide	0-139*	9.0E+00 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	
Magnesium carbonate basic	39409-82-0	5.0E+02 TEEL3	2.5E+02 TEEL2	1.5E+02 TEEL1	
Magnesium chloride	7786-30-3	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Magnesium chloride hexahydrate	7791-18-6	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Magnesium ethoxide	2414-98-4	5.0E+02 TEEL3	2.4E+02 TEEL2	1.4E+02 TEEL1	
Magnesium fluoride	7783-40-6	4.1E+02 TEEL3	2.1E+01 TEEL2	1.2E+01 TEEL1	
Magnesium hydroxide	1309-42-8	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Magnesium iodate tetrahydrate	7790-32-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Magnesium nitrate	10377-60-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Magnesium oxide	1309-48-4	5.0E+02 TEEL3	1.5E+02 TEEL2	3.0E+01 TEEL1	 irrit eyes irrit nose metal fume fever: chest pain metal fume fever: cough metal fume fever: flu-like fever
Magnesium Phosphide	12057-74-8	9.9E+00 AEGL3_1hr	5.5E+00 AEGL2_1hr	3.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Magnesium silicate	1343-88-0	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Magnesium sulfate	7487-88-9	1.3E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Magnesium sulfate heptahydrate	10034-99-8	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Malachite green	569-64-2	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Malathion	121-75-5	3.9E+02 AEGL3_1hr	1.2E+02 AEGL2_1hr	1.5E+01 AEGL1_1hr	abdom cramps aching eyes anor ataxia blurred vision chest tight conf diarr dizz head irrit eyes irrit skin lac lar spasm miosis nau rhin salv vomit wheez
Maleic acid	110-16-7	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Maleic acid, disodium salt	371-47-1	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Maleic anhydride	108-31-6	8.0E+01 ERPG3	8.0E+00 ERPG2	8.0E-01 ERPG1	bronchial asthma conj

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					derm double vision irrit nose irrit upper resp sys photo vision
Maleic hydrazide	123-33-1	5.0E+02 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Malic acid	617-48-1	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Malonic acid	141-82-2	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Malononitrile	109-77-3	2.7E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	7.5E+00 TEEL1	abdom pain conf convuls dizz dysp head irrit eyes irrit nose irrit skin irrit throat lass nau vomit
Mancozeb	8018-01-7	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+00 TEEL1	
Manganese	7439-96-5	5.0E+02 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	asthenia insom kidney damage lass low-back pain mal mental conf metal fume fever: chest tight metal fume fever: cough

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					metal fume fever: dry throat metal fume fever: dysp metal fume fever: flu-like fever metal fume fever: rales Parkinson's vomit
Manganese (II) chloride	7773-01-5	5.0E+02 TEEL3	1.2E+01 TEEL2	6.9E+00 TEEL1	
Manganese (II) chloride tetrahydrate	13446-34-9	5.0E+02 TEEL3	1.8E+02 TEEL2	1.1E+01 TEEL1	
Manganese (II) nitrate	10377-66-9	5.0E+02 TEEL3	1.6E+01 TEEL2	9.8E+00 TEEL1	
Manganese (II) sulfate monohydrate	10034-96-5	5.0E+02 TEEL3	1.5E+01 TEEL2	9.2E+00 TEEL1	
Manganese carbonate	598-62-9	5.0E+02 TEEL3	1.1E+01 TEEL2	6.3E+00 TEEL1	
Manganese dioxide	1313-13-9	5.0E+02 TEEL3	7.9E+01 TEEL2	4.8E+00 TEEL1	
Manganese hydroxide	18933-05-6	5.0E+02 TEEL3	8.1E+00 TEEL2	4.9E+00 TEEL1	
Manganese oxide	1344-43-0	5.0E+02 TEEL3	6.5E+00 TEEL2	7.5E-01 TEEL1	
					asthenia insom kidney damage lass low-back pain mal mental conf pneu vomit
Manganese sulfate	7785-87-7	5.0E+02 TEEL3	1.4E+01 TEEL2	8.3E+00 TEEL1	
Manganese sulfide	18820-29-6	5.0E+02 TEEL3	7.9E+00 TEEL2	9.5E-01 TEEL1	
Manganese(II) nitrate hydrate	15710-66-4	5.0E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Manganese(III) oxide	1317-34-6	5.0E+02 TEEL3	7.2E+01 TEEL2	4.3E+00 TEEL1	
Mastic absolute	61789-92-2	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Melamine	108-78-1	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Menadione	66-71-7	3.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Mephosfolan	950-10-7	9.0E+00 TEEL3	9.0E+00 TEEL2	5.0E+00 TEEL1	
Mercaptobenzothiazole, 2-	149-30-4	4.0E+01 TEEL3	4.0E+01 TEEL2	1.5E+01 TEEL1	
Mercaptoethanol, 2-	60-24-2	6.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Mercuric acetate	1600-27-7	3.2E+00 TEEL3	3.2E+00 TEEL2	4.8E-02 TEEL1	
Mercuric chloride	7487-94-7	1.4E+01 TEEL3	1.4E+01 TEEL2	2.0E+00 TEEL1	
Mercuric cyanide	592-04-1	1.3E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Mercuric iodide	7774-29-0	2.3E+01 TEEL3	2.3E-01 TEEL2	5.7E-02 TEEL1	
Mercuric nitrate monohydrate	7782-86-7	1.4E+01 TEEL3	1.4E-01 TEEL2	3.5E-02 TEEL1	
Mercuric sulfate	7783-35-9	1.5E+01 TEEL3	1.5E-01 TEEL2	3.7E-02 TEEL1	
Mercuric thiocyanate	592-85-8	1.6E+01 TEEL3	1.6E-01 TEEL2	4.0E-02 TEEL1	
Mercuric trifluoroacetate	13257-51-7	4.3E+00 TEEL3	8.5E-02 TEEL2	6.4E-02 TEEL1	
Mercurol	12002-19-6	1.0E+01 TEEL3	1.0E-01 TEEL2	2.5E-02 TEEL1	
Mercurous chloride	7546-30-7	1.2E+01 TEEL3	1.2E-01 TEEL2	2.9E-02 TEEL1	
Mercurous nitrate	10415-75-5	1.3E+01 TEEL3	1.3E-01 TEEL2	3.3E-02 TEEL1	
Mercurous oxide	15829-53-5	1.0E+01 TEEL3	1.0E-01 TEEL2	2.6E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Mercury (II) oxide	21908-53-2	1.1E+01 TEEL3	1.1E+00 TEEL2	1.5E-01 TEEL1	
Mercury nitrate	10045-94-0	1.6E+01 TEEL3	1.6E-01 TEEL2	4.1E-02 TEEL1	
Mercury(I) chloride	10112-91-1	1.2E+01 TEEL3	1.2E+00 TEEL2	1.5E-01 TEEL1	
Mercury(II) nitrate monohydrate	7783-34-8	1.7E+01 TEEL3	1.7E-01 TEEL2	4.3E-02 TEEL1	
Mercury, elemental	7439-97-6	8.9E+00 AEGL3_1hr	1.7E+00 AEGL2_1hr	3.0E-01 TEEL1	anor bron chest pain cough dysp GI dist head indecision insom irrit eyes irrit skin irrity lass low weight pneu prot salv stomatitis tremor
Mesityl oxide	141-79-7	5.0E+03 TEEL3	1.0E+02 TEEL2	1.0E+02 TEEL1	CNS effects coma in animals: kidney damage in animals: liver damage irrit eyes irrit muc memb irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					narco
Metaphosphoric acid	37267-86-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Methacrolein diacetate	10476-95-6	4.4E+01 TEEL3	4.4E+01 TEEL2	2.5E+01 TEEL1	
Methacrylaldehyde	78-85-3	1.3E+01 AEGL3_1hr	8.0E+00 AEGL2_1hr	5.7E-01 AEGL1_1hr	
Methacrylamide	79-39-0	2.0E+02 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Methacrylic acid	79-41-4	7.7E+02 AEGL3_1hr	2.1E+02 AEGL2_1hr	2.4E+01 AEGL1_1hr	
					eye burns
					irrit eyes
					irrit muc memb
					irrit skin
					skin burns
Methacrylic anhydride	760-93-0	1.5E+02 TEEL3	4.5E+00 TEEL2	2.5E+00 TEEL1	
Methacrylonitrile	126-98-7	6.9E+01 AEGL3_1hr	3.6E+01 AEGL2_1hr	2.7E+00 AEGL1_1hr	
					in animals: convuls
					in animals: loss of motor control in hind limbs
					irrit eyes
					irrit skin
					lac
Methacryloyl chloride	920-46-7	2.5E+01 TEEL3	6.0E-01 TEEL2	3.5E-01 TEEL1	
Methamidophos	10265-92-6	8.1E+00 AEGL3_1hr	3.6E+00 AEGL2_1hr	1.9E+00 AEGL1_1hr	
Methan-d3-ol-d	811-98-3	1.0E+04 TEEL3	3.0E+03 TEEL2	7.5E+02 TEEL1	
Methane	74-82-8	1.3E+05 TEEL3	3.0E+03 TEEL2	2.0E+03 TEEL1	
Methane-d3	676-80-2	4.0E+04 TEEL3	4.0E+03 TEEL2	2.0E+03 TEEL1	
Methanesulfonic acid	75-75-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Methanesulfonic acid ethyl ester	62-50-0	1.5E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Methanesulfonyl chloride	124-63-0	2.9E+01 AEGL3_1hr	9.8E+00 AEGL2_1hr	1.3E+00 TEEL1	
Methanesulfonyl fluoride	558-25-8	1.4E+01 TEEL3	1.4E+01 TEEL2	7.5E+00 TEEL1	
Methanol	67-56-1	9.3E+03 AEGL3_1hr	2.8E+03 AEGL2_1hr	6.9E+02 AEGL1_1hr	derm dizz drow head irrit eyes irrit skin irrit upper resp sys nau optic nerve damage (blindness) vis dist vomit
Methidathion	950-37-8	4.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Methiocarb	2032-65-7	1.5E+01 TEEL3	1.5E+01 TEEL2	7.5E+00 TEEL1	
Methomyl	16752-77-5	1.7E+01 AEGL3_1hr	5.7E+00 AEGL2_1hr	5.7E+00 AEGL2_1hr*	abdom cramps blurred vision dysp irrit eyes kidney damage lass liver damage miosis musc twitch nau salv vomit
Methoxybenzaldehyde	123-11-5	5.0E+02 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Methoxychlor	72-43-5	5.0E+02 TEEL3	2.5E+02 TEEL2	3.0E+01 TEEL1	in animals: carc

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: convuls in animals: fasc in animals: kidney damage in animals: liver damage in animals: trembling
Methoxyethanol, 2-	109-86-4	6.0E+02 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
					anemic pallor ataxia drow head in animals: repro effects in animals: terato effects irrit eyes irrit nose irrit throat lass tremor
Methoxyethyl acetate, 2-	110-49-6	1.0E+03 TEEL3	2.5E+01 TEEL2	1.5E+00 TEEL1	
					brain damage in animals: narco irrit eyes irrit nose irrit throat kidney damage repro effects terato effects
Methoxyethyl mercuric acetate	151-38-2	3.2E+00 TEEL3	3.2E+00 TEEL2	4.8E-02 TEEL1	
Methoxyethylamine, 2-	109-85-3	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Methoxyphenol, 4-	150-76-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
					CNS depres eye burns irrit eyes irrit nose irrit skin irrit throat

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit upper resp sys skin burns
Methoxypropylamine, 3-	5332-73-0	1.5E+02 TEEL3	5.0E+01 TEEL2	5.0E+01 TEEL1	
Methoxytrimethylsilane	1825-61-2	2.0E+01 TEEL3	7.5E+00 TEEL2	2.0E+00 TEEL1	
Methyl 2-chloroacrylate	80-63-7	3.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Methyl 2-cyanoacrylate	137-05-3	6.0E+01 TEEL3	6.0E+01 TEEL2	1.5E+01 TEEL1	
					blurred vision irrit eyes irrit nose irrit skin lac rhinitis
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	61898-95-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Methyl acetate	79-20-9	7.5E+03 TEEL3	1.5E+03 TEEL2	7.5E+02 TEEL1	
					chest tight drow head in animals: narco irrit eyes irrit nose irrit skin irrit throat optic nerve atrophy
Methyl acetylene	74-99-7	2.5E+03 TEEL3	2.5E+03 TEEL2	2.5E+03 TEEL1	
					anes hyperexcitability irrit resp sys liquid: frostbite tremor
Methyl acetylene-propadiene mixture	59355-75-8	1.0E+04 TEEL3	4.0E+03 TEEL2	4.0E+03 TEEL1	
					anes conf excitement

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys liquid: frostbite
Methyl acrylate	96-33-3	7.5E+02 TEEL3	2.5E+01 TEEL2	7.0E+00 TLV_TWA_irr*	 irrit eyes irrit skin irrit upper resp sys
Methyl alcohol-d	1455-13-6	1.0E+04 TEEL3	2.5E+03 TEEL2	7.5E+02 TEEL1	
Methyl aniline, N-	100-61-8	4.0E+02 TEEL3	1.0E+01 TEEL2	7.5E+00 TEEL1	 cyan dizz dysp head kidney damage lass liver damage methemo pulm edema
Methyl benzoate	93-58-3	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Methyl bromide	74-83-9	2.9E+03 AEGL3_1hr*	8.2E+02 AEGL2_1hr*	8.0E+01 PEL-C*	 carc convuls dizz dysp hand tremor head inco irrit eyes irrit resp sys irrit skin liquid: frostbite mal musc weak nau skin vesic vis dist

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					vomit
Methyl bromoacetate	96-32-2	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Methyl chloride	74-87-3	6.2E+03 AEGL3_1hr	1.9E+03 AEGL2_1hr	2.0E+02 TEEL1	
					carc
					coma
					convuls
					dizz
					kidney damage
					liquid: frostbite
					liver damage
					nau
					repro effects
					slurred speech
					stagger
					terato effects
					vis dist
					vomit
Methyl chlorocarbonate	79-22-1	2.6E+01 AEGL3_1hr	8.5E+00 AEGL2_1hr	1.3E+00 TEEL1	
Methyl chlorosilane	68937-17-7	3.3E+02 AEGL3_1hr	7.3E+01 AEGL2_1hr	5.9E+00 AEGL1_1hr	
Methyl cyclopentadienyl manganese tricarbonyl	12108-13-3	7.5E+00 TEEL3	6.0E-01 TEEL2	6.0E-01 TEEL1	
					dizz
					head
					in animals: kidney inj
					in animals: lass
					in animals: liver inj
					in animals: severe clonic spasms
					in animals: slow respiration
					in animals: tremor
					irrit eyes
					nau
Methyl demeton methyl	2587-90-8	2.0E+01 TEEL3	2.0E+01 TEEL2	1.3E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Methyl dichloroarsine	593-89-5	1.6E-01 AEGL3_1hr	5.3E-02 AEGL2_1hr	5.3E-02 TEEL1	
Methyl dichlorosilane	75-54-7	2.2E+02 AEGL3_1hr	5.2E+01 AEGL2_1hr	4.2E+00 AEGL1_1hr	
Methyl ether	115-10-6	1.3E+05 TEEL3	7.5E+03 TEEL2	5.0E+03 TEEL1	
Methyl ethyl ketone	78-93-3	1.2E+04 AEGL3_1hr	8.0E+03 AEGL2_1hr	5.9E+02 AEGL1_1hr	derm dizz head irrit eyes irrit nose irrit skin vomit
Methyl ethyl ketone peroxide	1338-23-4	1.5E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	abdom pain blisters blurred vision cough derm diarr dysp in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit skin irrit throat pulm edema scars skin vomit
Methyl fluoride	593-53-3	4.5E+02 TEEL3	2.2E+01 TEEL2	1.3E+01 TEEL1	
Methyl fluoroacetate	453-18-9	5.0E+00 TEEL3	3.5E-01 TEEL2	5.0E-02 TEEL1	
Methyl fluorosulfate	421-20-5	1.3E+00 TEEL3	2.5E-01 TEEL2	3.5E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Methyl formate	107-31-3	1.0E+04 TEEL3	2.0E+03 TEEL2	3.5E+02 TEEL1	chest tight CNS depres dysp in animals: narco in animals: pulm edema irrit eyes irrit nose vis dist
Methyl hydrazine	60-34-4	5.1E+00 AEGL3_1hr*	1.7E+00 AEGL2_1hr*	3.5E-01 TEEL1*	anoxia ataxia carc convuls cyan diarr irrit eyes irrit resp sys irrit skin tremor vomit
Methyl iodide	74-88-4	1.7E+03 AEGL3_1hr	4.8E+02 AEGL2_1hr	1.3E+02 AEGL1_1hr	ataxia carc derm dizz drow irrit eyes irrit resp sys irrit skin nau slurred speech vomit
Methyl isoamyl ketone	110-12-3	7.5E+03 TEEL3	7.5E+03 TEEL2	6.0E+02 TEEL1	coma derm head

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: kidney damage in animals: liver damage irrit eyes irrit muc memb irrit skin narco
Methyl isobutyl ketone	108-10-1	2.0E+03 TEEL3	3.0E+02 TEEL2	3.0E+02 TEEL1	
					coma derm head in animals: kidney damage in animals: liver damage irrit eyes irrit muc memb irrit skin narco
Methyl isocyanate	624-83-9	4.7E-01 AEGL3_1hr*	1.6E-01 AEGL2_1hr*	5.8E-02 ERPG1*	
					asthma chest pain cough dysp eye damage in animals: pulm edema irrit irrit irrit irrit irrit irrit irrit irrit irrit irrit irrit eyes irrit nose irrit skin irrit throat

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lac lac lac lac lac pulm secretions resp sens skin damage
Methyl isopropyl ketone	563-80-4	2.0E+03 TEEL3	7.0E+02 TLV_TWA_irr*	7.0E+02 TLV_TWA_irr*	 cough irrit eyes irrit muc memb irrit resp sys irrit skin
Methyl isothiocyanate	556-61-6	2.1E+02 AEGL3_1hr	6.9E+01 AEGL2_1hr	2.4E+00 AEGL1_1hr	
Methyl magnesium bromide	75-16-1	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Methyl mercaptan	74-93-1	1.3E+02 AEGL3_1hr	9.2E+01 AEGL2_1hr	9.8E-03 ERPG1	 convuls cyan irrit eyes irrit resp sys irrit skin liquid: frostbite narco
Methyl methacrylate	80-62-6	2.3E+03 AEGL3_1hr	4.9E+02 AEGL2_1hr	7.0E+01 AEGL1_1hr	 derm irrit eyes irrit nose irrit skin irrit throat
Methyl n-amyl ketone	110-43-0	3.5E+03 TEEL3	6.0E+02 TEEL2	4.0E+02 TEEL1	 coma derm head irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit muc memb irrit skin narco
Methyl nitrate	598-58-3	1.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Methyl nonafluorobutyl ether	163702-07-6	1.5E+05 AEGL3_1hr	8.4E+04 AEGL2_1hr	2.6E+04 AEGL1_1hr	
Methyl orange,sodium salt	547-58-0	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Methyl parathion	298-00-0	3.5E+00 AEGL3_1hr	1.2E+00 AEGL2_1hr	6.0E-02 TEEL1	
					abdom cramps blurred vision card irreg chest tight diarr dizz dysp head irrit eyes irrit skin lass miosis musc fasc nau rhin salv vomit
Methyl phencapton	3735-23-7	1.0E+02 TEEL3	1.1E+01 TEEL2	6.0E+00 TEEL1	
Methyl phosphonothioic dichloride	676-98-2	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Methyl phosphonous dichloride	676-83-5	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Methyl propyl ketone	107-87-9	5.0E+03 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
					coma derm head

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit skin narco
Methyl salicylate	119-36-8	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Methyl sulfoxide-d6	2206-27-1	6.0E+03 TEEL3	7.5E+02 TEEL2	7.5E+02 TEEL1	
Methyl tertiary butyl ether	1634-04-4	1.9E+04 AEGL3_1hr	2.1E+03 AEGL2_1hr	1.8E+02 AEGL1_1hr	
Methyl thiocyanate	556-64-9	7.5E+01 TEEL3	7.5E+01 TEEL2	4.0E+01 TEEL1	
Methyl trifluoromethanesulfonate	333-27-7	5.0E+02 TEEL3	3.6E+01 TEEL2	2.2E+01 TEEL1	
Methyl vinyl carbinol	598-32-3	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Methyl vinyl ketone	78-94-4	6.9E+00 AEGL3_1hr	3.4E+00 AEGL2_1hr	4.9E-01 AEGL1_1hr	
Methyl-1H-benzotriazole	29385-43-1	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Methyl-1-phenyl-2-pyrazolin-5-one, 3-	89-25-8	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Methyl-1-propen-1-one, 2-	598-26-5	1.0E+01 TEEL3	2.0E+00 TEEL2	2.5E-01 TEEL1	
Methyl-2-pyrrolidinone, 1-	872-50-4	1.0E+02 TEEL3	1.0E+02 TEEL2	4.0E+01 TEEL1	
Methyl-5-nitroaniline, 2-	99-55-8	2.5E+02 TEEL3	1.5E+02 TEEL2	3.0E+00 TEEL1	
Methyl-5-vinylpyridine, 2-	140-76-1	4.0E+01 TEEL3	1.9E+00 TEEL2	1.0E+00 TEEL1	
Methylal	109-87-5	6.0E+03 TEEL3	6.0E+03 TEEL2	6.0E+03 TEEL1	anes irrit eyes irrit skin irrit upper resp sys
Methylamine hydrochloride	593-51-1	5.0E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Methylaniline, 2-	95-53-4	2.0E+02 TEEL3	2.0E+01 TEEL2	2.0E+01 TEEL1	anoxia carc cyan derm dizz drow eye burns head irrit eyes lass micro hema
Methylaziridine, 1-	1072-44-2	2.0E+02 TEEL3	4.0E+00 TEEL2	4.0E+00 TEEL1	
Methylbutanamide, 3-	541-46-8	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Methylbutene	563-46-2	1.0E+06 TEEL3	6.0E+05 TEEL2	1.5E+05 TEEL1	
Methylcellulose	9004-67-5	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Methylcholanthrene, 3-	56-49-5	7.5E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Methylcyclohexane	108-87-2	5.0E+03 TEEL3	5.0E+03 TEEL2	5.0E+03 TEEL1	dizz drow in animals: narco irrit eyes irrit nose irrit skin irrit throat
Methylcyclohexanone	1331-22-2	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Methylcyclohexanone, o-	583-60-8	2.5E+03 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	derm in animals: irrit eyes in animals: irrit muc memb

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					narco
Methylcyclopentane	96-37-7	1.3E+04 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Methylene chloride	75-09-2	2.4E+04 AEGL3_1hr	1.9E+03 AEGL2_1hr	6.9E+02 AEGL1_1hr	
					carc
					dizz
					drow
					irrit eyes
					irrit skin
					lass
					nau
					numb limbs
					tingle limbs
Methylene diphenyl diisocyanate	101-68-8	2.5E+01 ERPG3	2.0E+00 ERPG2	2.0E-01 ERPG1	
					asthma
					chest pain
					cough
					dysp
					irrit eyes
					irrit nose
					irrit throat
					pulm secretions
					resp sens
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	5.0E+02 TEEL3	5.0E+00 TEEL2	3.0E-01 TEEL1	
					carc
					cyan
					hema
					kidney irrit
					methemo
					nau
Methylene-bis(4-cyclohexylisocyanate)	5124-30-1	2.0E+00 TEEL3	1.0E-01 TEEL2	5.4E-02 TLV_TWA_irr*	
					chest tight
					cough
					dry throat
					dysp
					irrit eyes
					irrit resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit skin pulm edema resp sens skin blisters skin sens wheez
Methylenebis(isocyanatobenzene), tripropylene glycol, dipropylene glycol po	68092-58-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Methylenedianiline, 4,4'-	101-77-9	1.5E+02 TEEL3	4.0E+00 TEEL2	8.1E-01 TLV_TWA*	hepatitis in animals: carc in animals: heart damage in animals: liver damage in animals: spleen damage irrit eyes jaun myocardial damage
Methylethyl hydroperoxide, 1-	3031-75-2	6.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Methylfuran, 2-	534-22-5	1.5E+02 TEEL3	1.5E+02 TEEL2	6.0E+01 TEEL1	
Methylheptane, 4-	589-53-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Methylimidazole	822-36-6	3.0E+02 TEEL3	3.0E+02 TEEL2	6.0E+01 TEEL1	
Methylimidazole, 1-	616-47-7	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Methyllithium	917-54-4	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Methylmagnesium chloride	676-58-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Methylmercuric dicyanamide	502-39-6	3.0E+00 TEEL3	3.0E+00 TEEL2	4.5E-02 TEEL1	
Methylmercury	22967-92-6	2.1E+00 TEEL3	4.3E-02 TEEL2	3.2E-02 TEEL1	
Methylnaphthalene, 1-	90-12-0	5.0E+02 TEEL3	2.0E+01 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Methylnapthalene, 2-	91-57-6	5.0E+02 TEEL3	3.5E+00 TEEL2	3.0E+00 TEEL1	
Methylnitrosopiperidine, 3-	13603-07-1	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Methyl-N'-nitro-N-nitrosoguanidine, N-	70-25-7	4.0E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Methyl-N-nitroso-1-propanamine, N-	924-46-9	1.5E+01 TEEL3	7.5E-01 TEEL2	1.3E-01 TEEL1	
Methylpentane, 2-	107-83-5	7.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	
Methylphenylthiourea, 2-	614-78-8	5.0E+01 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Methylphosphonic acid	993-13-5	1.0E+01 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	
Methylphosphonic dichloride	676-97-1	1.5E+01 TEEL3	1.4E+00 TEEL2	2.0E-01 TEEL1	
Methylphosphonic difluoride	676-99-3	1.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Methylphosphonothioic acid-O-ethyl O-[4-(methylthi	2703-13-1	1.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Methylpropane, 2-	75-28-5	3.5E+04 TEEL3	1.0E+04 TEEL2	6.0E+03 TEEL1	asphy drow liquid: frostbite narco
Methylpropene, 2-	115-11-7	2.0E+05 TEEL3	3.0E+03 TEEL2	1.5E+03 TEEL1	
Methylpyridine, 2-	109-06-8	1.3E+03 TEEL3	2.0E+01 TEEL2	2.0E+01 TEEL1	
Methylpyridine, 3-	108-99-6	2.5E+03 TEEL3	5.0E+02 TEEL2	2.0E+01 TEEL1	
Methylpyrrolidine	120-94-5	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Methylstyrene, alpha-	98-83-9	3.5E+03 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	derm

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					drow irrit eyes irrit nose irrit skin irrit throat
Methyltetrahydrofuran, 2-	96-47-9	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Methyltetrahydrophthalic anhydride	26590-20-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Methylthiophenyl dimethyl phosphate, 4-	3254-63-5	7.0E+00 TEEL3	7.0E+00 TEEL2	4.0E+00 TEEL1	
Methyltriacetoxysilane	4253-34-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Methyltrichlorosilane	75-79-6	2.0E+02 AEGL3_1hr	4.5E+01 AEGL2_1hr	3.7E+00 AEGL1_1hr	
Methyltriethoxysilane	2031-67-6	4.0E+03 TEEL3	7.5E+02 TEEL2	1.3E+02 TEEL1	
Methyltrimethoxysilane	1185-55-3	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Methyltrioctylammonium chloride	5137-55-3	1.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Methylvinyldichlorosilane	124-70-9	2.9E+02 AEGL3_1hr	6.3E+01 AEGL2_1hr	5.2E+00 AEGL1_1hr	
Metolcarb	1129-41-5	2.0E+02 TEEL3	4.8E+00 TEEL2	3.0E+00 TEEL1	
Mexacarbate	315-18-4	1.4E+01 TEEL3	1.4E+01 TEEL2	7.5E+00 TEEL1	
Mica	12001-26-2	5.0E+02 TEEL3	1.5E+01 TEEL2	9.0E+00 TEEL1	cough dysp irrit eyes lass low weight pneumoconiosis
Michler's ketone	90-94-8	4.0E+01 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Mineral oil, white	8042-47-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Mineral spirits	64475-85-0	7.5E+03 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
Mirex	2385-85-5	1.0E+02 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Mitomycin C	50-07-7	2.3E+01 TEEL3	2.3E+01 TEEL2	1.3E+01 TEEL1	
Molybdenum	7439-98-7	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	anemia in animals: anor in animals: diarr in animals: dysp in animals: inco in animals: irrit eyes in animals: irrit nose in animals: irrit throat in animals: kidney damage in animals: listlessness in animals: liver damage in animals: low weight
Molybdenum (IV) oxide	18868-43-4	5.0E+02 TEEL3	3.5E+00 TEEL2	2.0E+00 TEEL1	
Molybdenum (IV) sulfide	1317-33-5	5.0E+02 TEEL3	8.3E+01 TEEL2	5.0E+01 TEEL1	
Molybdenum carbide	12069-89-5	5.0E+02 TEEL3	5.6E+01 TEEL2	3.4E+01 TEEL1	
Molybdenum hexacarbonyl	13939-06-5	5.0E+02 TEEL3	1.4E+02 TEEL2	8.3E+01 TEEL1	
Molybdenum orange	12656-85-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Molybdenum pentachloride	10241-05-1	5.0E+02 TEEL3	5.0E+02 TEEL2	4.3E+00 TEEL1	
Molybdenum silicide	12136-78-6	5.0E+02 TEEL3	7.9E+01 TEEL2	4.8E+01 TEEL1	
Molybdenum trioxide	1313-27-5	5.0E+02 TEEL3	7.5E-01 TEEL2	7.5E-01 TEEL1	
Molybdic acid	7782-91-4	5.0E+02 TEEL3	4.2E+00 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Molybdophosphoric acid hydrate	51429-74-4	5.0E+02 TEEL3	4.0E+00 TEEL2	2.4E+00 TEEL1	
Molybdophosphoric acid, X-hydrate	12026-57-2	5.0E+02 TEEL3	4.0E+00 TEEL2	2.4E+00 TEEL1	
Monoammonium phosphate	7722-76-1	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Monochloramine	10599-90-3	1.0E+01 TEEL3	2.0E+00 TEEL2	3.5E-01 TEEL1	
Monocrotophos	6923-22-4	7.3E-01 AEGL3_1hr	2.4E-01 AEGL2_1hr	1.5E-01 TEEL1	abdom cramps blurred vision convuls diarr dizz dysp in animals: possible terato effects irrit eyes miosis nau salv vomit
Monomethylamine	74-89-5	4.4E+02 AEGL3_1hr*	8.0E+01 AEGL2_1hr*	1.9E+01 AEGL1_1hr*	conj cough derm irrit eyes irrit resp sys irrit skin liquid: frostbite muc memb burns skin burns
Monosodium citrate	18996-35-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Montmorillonite	1318-93-0	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Morpholine	110-91-8	5.0E+03 TEEL3	1.0E+02 TEEL2	1.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					cough in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit resp sys irrit skin vis dist
Morpholinepropanesulfonic acid, 4-	1132-61-2	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Muscimol	2763-96-4	2.0E+01 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Mustard gas sulfoxide	5819-08-9	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Myoglobins	9008-45-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
N-(3-Trimethoxysilylpropyl) ethylenediamine	1760-24-3	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
N,n,n-Tributyl-1-butanaminium iodide	311-28-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
N,N-Dimethyl-1,3-propanediamine	109-55-7	7.5E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
N,N-Dimethyl-1-butanamine	927-62-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
N,N-dimethyl-2-Propanamine	996-35-0	7.5E+01 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
N,N'-Methylenebisacrylamide	110-26-9	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Nabumetone	42924-53-8	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Nadic methyl anhydride	25134-21-8	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Naphtha	8030-30-6	4.0E+03 TEEL3	4.0E+03 TEEL2	1.5E+03 TEEL1	
					derm dizz drow in animals: kidney damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: liver damage irrit eyes irrit nose irrit skin
Naphtha, hydrotreated heavy	64742-48-9	7.5E+03 TEEL3	6.0E+03 TEEL2	3.5E+03 TEEL1	
Naphtha, petroleum, light straight-run	64741-46-4	4.0E+03 TEEL3	4.0E+03 TEEL2	1.5E+03 TEEL1	
Naphthalenamine, 1-	134-32-7	3.5E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
					ataxia carc derm dysp dysuria hema hemorrhagic cystitis methemo
Naphthalene	91-20-3	1.3E+03 TEEL3	7.5E+01 TEEL2	7.5E+01 TEEL1	
					abdom pain conf corn damage derm excitement head hema irrit bladder irrit eyes jaun mal nau optical neuritis profuse sweat renal shutdown vomit
Naphthalene, bis(1-methylethyl)-	38640-62-9	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Naphthenic acid, lead salts	61790-14-5	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Naphthoquinone, 1,4-	130-15-4	7.5E+01 TEEL3	7.5E+01 TEEL2	2.5E+01 TEEL1	
Naphthylamine, 2-	91-59-8	3.0E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	ataxia carc derm dysp dysuria hema hemorrhagic cystitis methemo
Naptha (petroleum), heavy catalytic cracked	64741-54-4	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Napthtalene acetamide, 1-	86-86-2	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
n-Butanol-d10	34193-38-9	5.0E+03 TEEL3	1.5E+02 TEEL2	6.0E+01 TEEL1	
n-Butyl bromide	109-65-9	1.0E+04 TEEL3	2.0E+03 TEEL2	3.0E+02 TEEL1	
Neodecanoic acid	26896-20-8	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Neodecanoic acid, calcium salt (2:1)	27253-33-4	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Neodymium	7440-00-8	1.0E-01 TEEL3	2.0E-02 TEEL2	2.5E-03 TEEL1	
Neodymium (III) oxide	1313-97-9	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Neodymium bromide	13536-80-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Neodymium fluoride	13709-42-7	5.0E+02 TEEL3	4.4E+01 TEEL2	2.7E+01 TEEL1	
Neodymium nitrate, pentahydrate	14517-29-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Neodymium trichloride	10024-93-8	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Neon	7440-01-9	3.0E+05 TEEL3	1.5E+05 TEEL2	5.0E+04 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Nickel (II) bromide	13462-88-9	3.7E+01 TEEL3	1.9E+00 TEEL2	1.1E+00 TEEL1	
Nickel (II) chloride hexahydrate	7791-20-0	4.1E+01 TEEL3	4.1E+01 TEEL2	1.2E+00 TEEL1	
Nickel (II) formate	3349-06-2	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Nickel (II) hydroxide	12054-48-7	1.6E+01 TEEL3	1.6E+00 TEEL2	9.5E-01 TEEL1	
Nickel (II) hydroxide carbonate hydrate	39430-27-8	2.1E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Nickel (II) nitrate hexahydrate	13478-00-7	5.0E+01 TEEL3	5.0E+01 TEEL2	1.5E+00 TEEL1	
Nickel (II) nitrite	17861-62-0	1.0E+01 TEEL3	5.0E-01 TEEL2	3.0E-01 TEEL1	
Nickel (III) hydroxide	12125-56-3	1.9E+01 TEEL3	1.9E+00 TEEL2	1.1E+00 TEEL1	
Nickel acetate tetrahydrate	6018-89-9	4.2E+01 TEEL3	3.2E-01 TEEL2	1.9E-01 TEEL1	
Nickel aluminide	12003-78-0	1.4E+01 TEEL3	1.4E+00 TEEL2	8.1E-01 TEEL1	
Nickel ammonium sulfate	15699-18-0	4.9E+01 TEEL3	5.0E+00 TEEL2	4.9E+00 TEEL1	
Nickel carbonate	3333-67-3	2.0E+01 TEEL3	2.0E+00 TEEL2	1.2E+00 TEEL1	
Nickel carbonyl	13463-39-3	1.1E+00 AEGL3_1hr	2.5E-01 AEGL2_1hr	2.5E-01 TEEL1	carc convuls cough cyan delirium dizz epigastric pain head hyperpnea in animals: repro effects in animals: terato effects

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lass leucyt nau pneu subs pain vomit
Nickel chloride	7718-54-9	2.2E+01 TEEL3	1.1E+00 TEEL2	6.6E-01 TEEL1	
Nickel compounds	Ni cmpds	1.0E+02 TEEL3	5.0E+01 TEEL2	4.5E+00 TEEL1	
Nickel cyanide	557-19-7	1.9E+01 TEEL3	9.4E+00 TEEL2	1.1E+00 TEEL1	
Nickel fluoride	13940-83-5	2.9E+01 TEEL3	3.0E+00 TEEL2	1.7E+00 TEEL1	
Nickel oxalate dihydrate	6018-94-6	2.5E+01 TEEL3	1.3E+01 TEEL2	7.5E+00 TEEL1	
Nickel oxide	1313-99-1	1.3E+01 TEEL3	1.3E+01 TEEL2	7.6E-01 TEEL1	
Nickel perchlorate	13637-71-3	6.2E+01 TEEL3	6.2E+00 TEEL2	3.7E+00 TEEL1	
Nickel sulfamate	13770-89-3	4.3E+01 TEEL3	2.1E+00 TEEL2	1.3E+00 TEEL1	
Nickel sulfate	7786-81-4	2.6E+01 TEEL3	2.6E-01 TEEL2	2.6E-01 TEEL1	
Nickel sulfate hexahydrate	10101-97-0	4.5E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Nickel(2+) stearate	2223-95-2	1.1E+02 TEEL3	5.3E+01 TEEL2	3.2E+01 TEEL1	
Nickel, (carbonato(2-))tet	12607-70-4	1.7E+01 TEEL3	1.7E+00 TEEL2	1.0E+00 TEEL1	
Nickelous nitrate	13138-45-9	3.1E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Nicotinamide	98-92-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Nicotine	54-11-5	5.0E+00 TEEL3	3.5E+00 TEEL2	1.5E+00 TEEL1	
					abdom pain card arrhy

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					conf convuls diarr dizz dysp head hearing dist in animals: terato effects inco lass nau salv vis dist vomit
Nicotine sulfate	65-30-5	9.0E+00 TEEL3	9.0E+00 TEEL2	9.0E+00 TEEL1	
Nicotinic acid	59-67-6	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Niobium carbide	12069-94-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Niobium chloride	10026-12-7	5.0E+02 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Niobium pentoxide	1313-96-8	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Nitrapyrin	1929-82-4	4.0E+02 TEEL3	2.0E+01 TEEL2	2.0E+01 TEEL1	no adverse effects noted in ingestion studies with animals
Nitrate	14797-55-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Nitric acid	7697-37-2	2.4E+02 AEGL3_1hr*	6.2E+01 AEGL2_1hr*	1.4E+00 AEGL1_1hr*	bron delayed pulm edema dental erosion irrit eyes irrit muc memb irrit skin pneu
Nitric acid, butyl ester	928-45-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Nitric acid, cerium(4+) salt (4:1)	13093-17-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Nitric acid, ethyl ester	625-58-1	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Nitric acid, pentyl ester	1002-16-0	1.3E+04 TEEL3	2.5E+03 TEEL2	4.0E+02 TEEL1	
Nitric acid, praseodymium (3+) salt	10361-80-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Nitric oxide	10102-43-9				drow irrit eyes irrit nose irrit throat methemo uncon wet skin
Nitrilotriacetic acid	139-13-9	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Nitrilotriacetic acid trisodium salt monohydrate	18662-53-8	5.0E+02 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Nitrilotriacetic acid, disodium salt	15467-20-6	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Nitrilotris tri-phosphonic acid	6419-19-8	5.0E+02 TEEL3	3.5E+01 TEEL2	1.0E+01 TEEL1	
Nitroaniline, 2-	88-74-4	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Nitroaniline, 3-	99-09-2	2.0E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Nitroaniline, 4-	100-01-6	3.0E+02 TEEL3	3.0E+02 TEEL2	9.0E+00 TEEL1	anemia ataxia convuls cyan diarr dysp irrit nose

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit throat irrity jaun methemo resp arrest tacar tachypnea vomit
Nitrobenzene	98-95-3	1.0E+03 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
					anemia anoxia derm in animals: kidney damage in animals: liver damage in animals: testicular effects irrit eyes irrit skin methemo
Nitrobenzyl chloride, 4-	100-14-1	1.3E+02 TEEL3	2.8E+01 TEEL2	1.5E+01 TEEL1	
Nitrocellulose	9004-70-0	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Nitrocyclohexane	1122-60-7	6.0E+01 TEEL3	1.5E+00 TEEL2	7.5E-01 TEEL1	
Nitrocyclohexene, 1-	2562-37-0	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Nitrodiphenyl, 4-	92-93-3	5.0E+02 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
					acute hemorrhagic cystitis ataxia carc dizz drow dysp head lass methemo urinary burning

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Nitrodiphenylamine, 2-	119-75-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Nitroethane	79-24-3	3.0E+03 TEEL3	6.0E+02 TEEL2	3.1E+02 TLV_TWA_irr*	derm in animals: dysp in animals: edema in animals: kidney inj in animals: lac in animals: liver inj in animals: narco in animals: pulm rales
Nitrogen	7727-37-9	1.0E+06 TEEL3	1.0E+06 TEEL2	7.5E+05 TEEL1	
Nitrogen chloride	10025-85-1	1.0E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Nitrogen dioxide	10102-44-0	3.8E+01 AEGL3_1hr*	2.3E+01 AEGL2_1hr*	9.4E-01 AEGL1_1hr*	chest pain chronic bron cough cyan decr pulm func dysp irrit eyes irrit nose irrit throat mucoid frothy sputum pulm edema tacar tachypnea
Nitrogen mustard	51-75-2	3.7E-01 AEGL3_1hr	2.2E-02 AEGL2_1hr	3.0E-03 TEEL1	
Nitrogen mustard hydrochloride	55-86-7	4.0E+00 TEEL3	4.0E+00 TEEL2	2.5E+00 TEEL1	
Nitrogen tetroxide	10544-72-6	3.8E+01 AEGL3_1hr	2.3E+01 AEGL2_1hr	9.4E-01 AEGL1_1hr	
Nitrogen trifluoride	7783-54-2	2.5E+03 AEGL3_1hr	1.5E+03 AEGL2_1hr	5.8E+02 AEGL1_1hr	dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head in animals: anoxia in animals: cyan kidney inj lass liver inj methemo
Nitrogen trioxide	10544-73-7	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Nitroglycerin	55-63-0	7.5E+01 TEEL3	2.0E+00 TEEL2	4.6E-01 TLV_TWA*	
					abdom pain angina CNS depres delirium dizz flush hypotension irrit skin methemo nau palp throb head vomit
Nitromethane	75-52-5	1.5E+03 TEEL3	1.5E+03 TEEL2	1.5E+02 TEEL1	
					convuls derm in animals: irrit eyes in animals: irrit resp sys liver damage narco
Nitromethane d3	13031-32-8	2.0E+03 TEEL3	2.5E+02 TEEL2	1.5E+02 TEEL1	
Nitronium Tetrafluoroborate	13826-86-3	4.4E+02 TEEL3	2.2E+01 TEEL2	1.3E+01 TEEL1	
Nitrophenol (mixed isomers)	25154-55-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Nitrophenol, 2-	88-75-5	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Nitrophenol, 3-	554-84-7	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Nitrophenol, 4-	100-02-7	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Nitropropane, 1-	108-03-2	3.5E+03 TEEL3	4.0E+02 TEEL2	2.5E+02 TEEL1	diarr head in animals: kidney damage in animals: liver damage irrit eyes nau vomit
Nitropropane, 2-	79-46-9	3.5E+02 TEEL3	1.5E+02 TEEL2	1.0E+02 TEEL1	anor carc diarr head irrit eyes irrit nose irrit resp sys irrit skin kidney damage liver damage nau vomit
Nitropyrene, 1-	5522-43-0	1.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Nitropyridine N-oxide, 4-	1124-33-0	8.0E+01 TEEL3	8.0E+01 TEEL2	5.0E+01 TEEL1	
Nitrosodimethylamine, N-	62-75-9	1.0E+02 TEEL3	1.9E+01 TEEL2	1.0E+01 TEEL1	abdom cramps carc decr kidney func decr liver func decr pulm func diarr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					enlarged liver fever head jaun nau vomit
Nitrosodiphenylamine, 4-	156-10-5	1.5E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Nitrosodiphenylamine, N-	86-30-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Nitrosodipropylamine, N-	621-64-7	2.0E+02 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Nitrosomorpholine	59-89-2	3.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Nitroso-N-methylurea, N-	684-93-5	5.0E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Nitrosophenol, 4-	104-91-6	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Nitrosotoluene, o-	611-23-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Nitrosyl chloride	2696-92-6	6.0E+00 TEEL3	1.3E+00 TEEL2	2.0E-01 TEEL1	
Nitrosylsulfuric acid	7782-78-7	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Nitrotoluene, m-	99-08-1	1.0E+03 TEEL3	5.0E+01 TEEL2	3.5E+01 TEEL1	anoxia ataxia cyan dizz dysp head lass nau tacar vomit
Nitrotoluene, o-	88-72-2	1.0E+03 TEEL3	5.0E+01 TEEL2	3.5E+01 TEEL1	anoxia

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					ataxia cyan dizz dysp head lass nau tacar vomit
Nitrotoluene, p-	99-99-0	1.0E+03 TEEL3	5.0E+02 TEEL2	3.5E+01 TEEL1	
					anoxia ataxia cyan dizz dysp head lass nau tacar vomit
Nitrous acid	7782-77-6	1.8E+02 TEEL3	4.6E+01 TEEL2	1.0E+00 TEEL1	
Nitrous oxide	10024-97-2	3.5E+04 TEEL3	1.5E+04 TEEL2	2.5E+02 TEEL1	
					asphy drow drow head liquid: frostbite repro effects
N-Methylbutylamine	110-68-9	7.5E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
N-Methylformamide	123-39-7	1.0E+03 TEEL3	7.5E+02 TEEL2	1.3E+02 TEEL1	
N-Methylpyrrole	96-54-8	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
n-Nonanoic acid	112-05-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
n-Octadecane	593-45-3	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Nonacosane	630-03-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Nonanal	124-19-6	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Nonane	111-84-2	7.5E+03 TEEL3	5.0E+03 TEEL2	3.0E+03 TEEL1	chemical pneu (aspir liquid) conf dizz drow head inco irrit eyes irrit nose irrit skin irrit throat nau tremor
Nonanenitrile	2243-27-8	7.5E+02 TEEL3	1.5E+02 TEEL2	1.5E+02 TEEL1	
Nonanone, 2-	821-55-6	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Nonyl alcohol	143-08-8	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Nonyl phenol (mixed isomers)	25154-52-3	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Nonyl phenol, 4- (branched)	84852-15-3	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Nonylphenol ethoxylate	127087-87-0	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Nonylphenol, 4-	104-40-5	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Nonylphenoxypolyethoxyethanol	68412-54-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Nonyltrichlorosilane	5283-67-0	3.5E+02 AEGL3_1hr	7.8E+01 AEGL2_1hr	6.4E+00 AEGL1_1hr	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Norbormide	991-42-4	3.8E+00 TEEL3	3.8E+00 TEEL2	2.0E+00 TEEL1	
N-Vinylformamide	13162-05-5	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-	3268-87-9				
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	39001-02-0				
Octachloronaphthalene	2234-13-1	1.0E+00 TEEL3	3.0E-01 TEEL2	3.0E-01 TEEL1	acne-form derm jaun liver damage
Octacosane	630-02-4	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Octadecanoic acid	57-11-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Octadecanol, 1-	112-92-5	7.5E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Octadecyl methacrylate	32360-05-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Octadecyltrichlorosilane	112-04-9	5.2E+02 AEGL3_1hr	1.2E+02 AEGL2_1hr	9.5E+00 AEGL1_1hr	
Octafluorocyclobutane	115-25-3	2.5E+06 TEEL3	2.5E+06 TEEL2	6.0E+05 TEEL1	
Octamethylcyclotetrasiloxane	556-67-2	4.0E+03 TEEL3	3.0E+03 TEEL2	4.0E+02 TEEL1	
Octamethylpyrophosphoramide	152-16-9	3.5E+00 TEEL3	8.0E-01 TEEL2	5.0E-01 TEEL1	
Octanal, 1-	124-13-0	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Octane	111-65-9	4.0E+03 TEEL3	1.5E+03 TEEL2	1.4E+03 TLV_TWA_irr*	chemical pneu (aspir liquid) derm drow in animals: narco irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit nose
Octanedione, 2,5-	3214-41-3	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Octanenitrile	124-12-9	7.5E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Octanethiol, 1-	111-88-6	7.5E+02 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
					cyan drow head incr respiration irrit eyes irrit nose irrit skin irrit throat lass nau vomit
Octanoic acid	124-07-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Octanone, 2-	111-13-7	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Octaphenylcyclotetrasiloxane	546-56-5	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Octene, 1-	111-66-0	9.2E+03 ERPG3	3.7E+03 ERPG2	1.8E+02 ERPG1	
Octyl alcohol	111-87-5	3.5E+02 TEEL3	5.0E+01 TEEL2	5.0E+01 TEEL1	
Octyl(phenyl)-N,N-diisobutylcarbamoylmethylphosphi	83242-95-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Octyltrichlorosilane	5283-66-9	3.3E+02 AEGL3_1hr	7.4E+01 AEGL2_1hr	6.1E+00 AEGL1_1hr	
Oil gas	z-0035	1.3E+04 TEEL3	3.5E+03 TEEL2	5.0E+02 TEEL1	
Oil mist, mineral	8012-95-1	5.0E+02 TEEL3	2.5E+01 TEEL2	1.0E+01 TEEL1	
					irrit eyes irrit resp sys irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Oleum	8014-95-7	1.6E+02 AEGL3_1hr	6.3E+01 AEGL2_1hr	2.0E-01 AEGL1_1hr	
Orthoarsenic acid	7778-39-4	9.5E+00 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Orthoformic acid, trimethyl ester	149-73-5	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Osmium	7440-04-2	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Osmium tetroxide	20816-12-0	4.2E+01 AEGL3_1hr	8.7E-02 AEGL2_1hr	6.0E-03 TEEL1	conj cough derm dysp head irrit eyes irrit resp sys lac vis dist
Otto fuel	106602-80-6	9.0E+01 TEEL3	7.0E+00 TEEL2	1.2E+00 TEEL1	
Ouabain	630-60-4	1.3E+01 TEEL3	8.3E+00 TEEL2	5.0E+00 TEEL1	
Oxalic acid	144-62-7	5.0E+02 TEEL3	4.0E+01 TEEL2	2.0E+00 TEEL1	collapse convuls cyan eye burns irrit eyes irrit muc memb irrit skin kidney damage local pain shock
Oxalic acid dihydrate	6153-56-6	5.0E+02 TEEL3	1.0E+02 TEEL2	2.0E+00 TEEL1	
Oxalyl chlorine	79-37-8	1.0E+03 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Oxamide	471-46-5	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Oxamyl	23135-22-0	5.3E+00 AEGL3_1hr	1.8E+00 AEGL2_1hr	1.2E+00 AEGL1_1hr	
Oxathiane, 1,4-	15980-15-1	1.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Oxone, monopersulfate compound	37222-66-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Oxydiacetic acid	110-99-6	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Oxydianiline	101-80-4	3.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Oxydiphenoxarsine, 10,10'-	58-36-6	1.4E+01 TEEL3	1.4E+01 TEEL2	2.0E+00 TEEL1	
Oxydisulfoton	2497-07-6	3.5E+00 TEEL3	3.5E+00 TEEL2	2.0E+00 TEEL1	
Oxygen difluoride	7783-41-7	5.5E+00 AEGL3_1hr	1.8E+00 AEGL2_1hr	2.5E-01 TEEL1	eye burns (from contact with the gas under pressure) head irrit eyes irrit resp sys irrit skin pulm edema skin burns (from contact with the gas under pressure)
Ozone	10028-15-6	1.0E+01 TEEL3	2.0E+00 TEEL2	4.0E-01 TLV-TWA	chronic resp disease irrit eyes irrit muc memb pulm edema
Palladium	7440-05-3	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Palladium chloride	7647-10-1	5.0E+02 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Palladium hydroxide	12135-22-7	7.5E+01 TEEL3	2.5E+00 TEEL2	3.0E-01 TEEL1	
Paraffin liquid	8020-83-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Paraffin wax fume	8002-74-2	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	discomfort irrit eyes irrit resp sys irrit skin nau
Paraffins, petroleum, normal C5-C20	64771-72-8	5.0E+04 TEEL3	1.0E+04 TEEL2	6.0E+03 TEEL1	
Paraformaldehyde	30525-89-4	1.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Paraldehyde	123-63-7	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Paraquat	4685-14-7	1.5E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Paraquat dichloride	1910-42-5	1.0E+00 TEEL3	5.0E-01 TEEL2	5.0E-01 TEEL1	derm epis fingernail damage heart damage irrit eyes irrit GI tract irrit nose irrit resp sys irrit skin irrit throat kidney damage liver damage
Paraquat methosulfate	2074-50-2	4.0E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Parathion	56-38-2	2.0E+00 AEGL3_1hr*	1.5E+00 AEGL2_1hr*	3.0E-01 TEEL1(old)*	abdom cramps anor ataxia card irreg chest tight coma

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					conf convuls cyan diarr dizz head irrit eyes irrit resp sys irrit skin lar spasm lass low BP miosis musc fasc nau para rhin salv sweat vomit wheez
Paris green	12002-03-8	2.2E+01 TEEL3	2.2E+01 TEEL2	3.4E+00 TEEL1	
Particulate material, unspecified	PNOS	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	irrit eyes irrit skin irrit throat irrit upper resp sys
Pentaborane	19624-22-7	1.8E+00 AEGL3_1hr	3.6E-01 AEGL2_1hr	4.0E-02 TEEL1	behavioral changes convuls dizz drow head inco irrit eyes irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					tonic spasm abdom tonic spasm face tonic spasm limbs tonic spasm neck tremor
Pentachlordibenzofuran, 2,3,4,7,8-	57117-31-4				
Pentachlorobenzene	608-93-5	4.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6				
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4				
Pentachloroethane	76-01-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	in animals: irreg respiration in animals: irrit eyes in animals: irrit skin in animals: kidney changes in animals: lass in animals: liver changes in animals: lung changes in animals: musc inco in animals: restless
Pentachloronitrobenzene	82-68-8	5.0E+02 TEEL3	3.0E+02 TEEL2	1.5E+00 TEEL1	
Pentachlorophenol	87-86-5	2.5E+00 TEEL3	2.5E+00 TEEL2	2.5E+00 TEEL1	anor chest pain cough derm dizz dysp head high fever irrit eyes irrit nose irrit throat

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lass low weight nau sneez sweat vomit
Pentadecane	629-62-9	3.0E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Pentadecanoic acid	1002-84-2	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Pentadecylamine	2570-26-5	1.0E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Pentaerythritol	115-77-5	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	irrit eyes irrit resp sys
Pentaerythritol tetra(3-mercaptopropionate)	95823-35-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Pentaerythritol tetranitrate	78-11-5	5.0E+02 TEEL3	3.5E-01 TEEL2	5.0E-02 TEEL1	
Pentafluorobenzoic acid	602-94-8	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Pentane, n-	109-66-0	4.0E+03 TEEL3	1.8E+03 TLV_TWA_irr*	1.8E+03 TLV_TWA_irr*	chemical pneu (aspir liquid) derm drow in animals: narco irrit eyes irrit nose irrit skin
Pentanedione, 2,4-	123-54-6	4.0E+02 TEEL3	4.0E+02 TEEL2	2.0E+02 TEEL1	
Pentanenitrile	110-59-8	7.5E+01 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	
Pentanol, 2-	6032-29-7	1.3E+03 TEEL3	3.5E+02 TEEL2	3.5E+02 TEEL1	cough diarr dizz

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dysp head in animals: narco irrit eyes irrit nose irrit skin irrit throat nau skin cracking vomit
Pentanol, 3-	584-02-1	1.5E+03 TEEL3	4.0E+02 TEEL2	4.0E+02 TEEL1	
Pentatriacontane	630-07-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Pentene, 1-	109-67-1	2.0E+05 TEEL3	1.5E+04 TEEL2	2.5E+03 TEEL1	
Pentobarbital sodium	57-33-0	5.0E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Peptone	73049-73-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Peracetic acid	79-21-0	1.5E+01 AEGL3_1hr	1.6E+00 AEGL2_1hr	5.3E-01 AEGL1_1hr	
Perchloric acid	7601-90-3	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Perchloroethylene	127-18-4	8.1E+03 AEGL3_1hr	1.6E+03 AEGL2_1hr	2.4E+02 AEGL1_1hr	carc dizz drow flush face flush neck head inco irrit eyes irrit nose irrit resp sys irrit skin irrit throat

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liver damage nau skin eryt
Perchloromethyl mercaptan	594-42-3	6.8E+00 AEGL3_1hr	2.3E+00 AEGL2_1hr	9.9E-02 AEGL1_1hr	acidosis anuria coarse rales cough deep breath pain dysp irrit eyes irrit nose irrit skin irrit throat kidney damage lac liver damage pallor tacar vomit
Perchloryl fluoride	7616-94-6	5.0E+01 AEGL3_1hr	1.7E+01 AEGL2_1hr	6.3E+00 AEGL1_1hr	in animals: anoxia in animals: cyan in animals: dizz in animals: head in animals: lass in animals: methemo in animals: pneu in animals: pulm edema irrit resp sys liquid: frostbite
Percoll	65455-52-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Perfluoro compounds	86508-42-1	3.5E+05 TEEL3	6.0E+04 TEEL2	7.5E+03 TEEL1	
Perfluoro-2-butyltetrahydrofuran	335-36-4	3.4E+02 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Perfluoroisobutylene	382-21-8	2.7E+00 AEGL3_1hr	9.0E-01 AEGL2_1hr	1.0E-01 TEEL1	
Perfluorooctanic acid	335-67-1	7.5E+01 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Perfluorophenanthrene	306-91-2	3.4E+02 TEEL3	1.7E+01 TEEL2	1.0E+01 TEEL1	
Perfluoropolyalkylether	60164-51-4	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Periodic acid	10450-60-9	2.6E+01 TEEL3	1.8E+00 TEEL2	1.8E+00 TEEL1	
Perlite	93763-70-3	5.0E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	irrit eyes irrit skin irrit throat irrit upper resp sys
Peroxydicarbonic acid, disodium salt	3313-92-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Persulfate, potassium	7727-21-1	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Petalite	1302-66-5	2.5E+02 TEEL3	5.7E+01 TEEL2	3.4E+01 TEEL1	
Petrolatum	8009-03-8	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Petroleum	8002-05-9	4.0E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	chemical pneu (aspir liquid) dizz drow dry cracked skin head irrit eyes irrit nose irrit throat nau
Petroleum coke, calcined	64743-05-1	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Petroleum distillates, clay-treated light naphthen	64742-45-6	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Petroleum distillates, hydrotreated middle	64742-46-7	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Petroleum distillates, low boiling	68477-31-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Petroleum ether	8032-32-4	4.0E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	chemical pneu (aspir liquid) CNS depres derm irrit eyes irrit upper resp sys
Petroleum sulfonates	61789-85-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
p-Fluoroaniline	371-40-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Phenacetin	62-44-2	6.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Phenaglycodol	79-93-6	3.5E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Phenanthrene	85-01-8	2.0E+01 TEEL3	2.0E+01 TEEL2	6.0E+00 TEEL1	
Phenanthroline ferrous sulfate, 1,10-	14634-91-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Phenol	108-95-2	7.7E+02 ERPG3	8.9E+01 AEGL2_1hr	5.8E+01 AEGL1_1hr	anor convuls cyan dark urine derm irrit eyes irrit nose irrit throat kidney damage lass liver damage low weight musc ache musc pain

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					ochronosis skin burns tremor twitch
Phenol red, sodium salt	34487-61-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Phenol, 2,6-bis(1,1-dimethylethyl)-4-ethyl-	4130-42-1	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Phenol, polymer with formaldehyde, oxiranylmethyl ether	28064-14-4	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Phenolphthalein	77-09-8	4.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Phenyl chloroformate	1885-14-9	3.7E+00 AEGL3_1hr	1.2E+00 AEGL2_1hr	1.5E-01 TEEL1	
Phenyl dichloroarsine	696-28-6	1.8E-01 AEGL3_1hr	6.1E-02 AEGL2_1hr	6.1E-02 TEEL1	
Phenyl ether vapor	101-84-8	6.0E+02 TEEL3	1.3E+02 TEEL2	1.3E+01 TEEL1	irrit eyes irrit nose irrit skin nau
Phenyl isocyanate.	103-71-9	1.2E+00 AEGL3_1hr	7.3E-01 AEGL2_1hr	9.7E-02 AEGL1_1hr	
Phenyl isopropanol	617-94-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Phenyl mercaptan	108-98-5	7.2E+00 AEGL3_1hr	2.4E+00 AEGL2_1hr	4.5E-01 TLV_TWA*	
Phenyl sepharose	69106-59-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Phenyl-1,2-propanedione, 1-	579-07-7	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Phenylacetylene	536-74-3	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Phenylazophenylamine, p-	60-09-3	7.5E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Phenylborinic acid	98-80-6	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Phenylcyclohexane	827-52-1	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Phenylene diisocyanate, 1,4-	104-49-4	3.5E+01 TEEL3	3.5E+01 TEEL2	1.0E+01 TEEL1	
Phenylenediamine dihydrochloride, 1,2-	615-28-1	1.3E+02 TEEL3	1.3E+02 TEEL2	3.0E+01 TEEL1	
Phenylenediamine dihydrochloride, 1,4-	624-18-0	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Phenylenediamine, m-	108-45-2	1.3E+02 TEEL3	1.0E+01 TEEL2	3.0E-01 TEEL1	
Phenylenediamine, o-	95-54-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E-01 TEEL1	
Phenylenediamine, p-	106-50-3	2.5E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	bronchial asthma irrit larynx irrit pharynx sens derm
Phenylhydrazine	100-63-0	6.0E+01 TEEL3	2.0E+00 TEEL2	1.3E+00 TEEL1	carc cyan dysp hemolytic anemia jaun kidney damage skin sens vascular thrombosis
Phenylhydrazine hydrochloride	59-88-1	2.5E+02 TEEL3	2.5E+02 TEEL2	1.5E+02 TEEL1	
Phenylmagnesium bromide	100-58-3	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Phenylmercuric acetate	62-38-4	1.7E+01 TEEL3	1.7E+01 TEEL2	1.7E+01 TEEL1	
Phenylphenol, 2-	90-43-7	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Phenylphenol, o-	132-27-4	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Phenylphosphine	638-21-1	7.5E+01 TEEL3	2.0E-01 TEEL2	1.3E-01 TEEL1	in animals: loss of appetite in animals: anemia in animals: blood changes in animals: derm in animals: diarr in animals: hind leg tremor in animals: lac in animals: testicular degeneration
Phenylpropanolamine hydrochloride	154-41-6	5.0E+02 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Phenylsilatrane	2097-19-0	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Phenylthiourea	103-85-5	3.0E+00 TEEL3	3.0E+00 TEEL2	1.5E+00 TEEL1	
Phenyltriethoxysilane	780-69-8	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Phenyltrimethoxysilane	2996-92-1	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Phenylxylyl ethane	40766-31-2	5.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Phenylxylylethane	6196-95-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Phloroglucinol dihydrate	6099-90-7	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Phorate	298-02-2	1.2E-01 AEGL3_1hr	4.0E-02 AEGL2_1hr	4.0E-02 AEGL2_1hr*	abdom cramps anor ataxia card irreg chest tight coma conf convuls cyan diarr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz head irrit eyes irrit resp sys irrit skin lar spasm lass low BP miosis musc fasc nau para rhin salv sweat vomit wheez
Phosacetim	4104-14-7	3.7E+00 TEEL3	3.7E+00 TEEL2	2.0E+00 TEEL1	
Phosdrin	7786-34-7	3.7E+01 TEEL3	4.0E+00 TEEL2	3.0E-01 TEEL1	
					abdom cramps anor ataxia card irreg chest tight convuls cyan diarr head irrit eyes irrit resp sys irrit skin lar spasm low BP miosis nau para

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					rhin salv vomit wheez
Phosfolan	947-02-4	9.0E+00 TEEL3	9.0E+00 TEEL2	5.0E+00 TEEL1	
Phosgene	75-44-5	3.0E+00 AEGL3_1hr*	1.2E+00 AEGL2_1hr*	4.0E-01 TEEL1*	
					chest pain cough cough cyan dry burning throat dysp foamy sputum inj irrit irrit irrit irrit irrit eyes liquid: frostbite pulmonary edema vomit
Phosgene oxime	1794-86-1	1.3E+01 AEGL3_1hr	8.3E-02 AEGL2_1hr	2.8E-02 AEGL1_1hr	
Phosmet	732-11-6	4.0E+01 TEEL3	5.4E-01 TEEL2	7.5E-02 TEEL1	
Phosphamidon	13171-21-6	9.0E-01 AEGL3_1hr	3.0E-01 AEGL2_1hr	1.5E-01 TEEL1	
Phosphine	7803-51-2	5.0E+00 AEGL3_1hr	2.8E+00 AEGL2_1hr	1.3E+00 TEEL1	
					abdom pain chest tight chills diarr dysp liquid: frostbite musc pain

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau pulm edema stupor or syncope thirst vomit
Phosphomolybdic acid	11104-88-4	5.0E+02 TEEL3	4.2E+00 TEEL2	2.5E+00 TEEL1	
Phosphonic acid	13598-36-2	5.0E+02 TEEL3	1.3E-01 TEEL2	1.5E-02 TEEL1	
Phosphoric acid	7664-38-2	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+00 TEEL1	
					burns derm eye burns irrit eyes irrit skin irrit upper resp sys skin burns
Phosphoric acid, sodium salt	7632-05-5	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Phosphorous acid	10294-56-1	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+00 TEEL1	
Phosphorous pentafluoride	7647-19-0	3.0E+02 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	
Phosphorous trifluoride	7783-55-3	4.0E+02 TEEL3	2.0E+01 TEEL2	1.0E+01 TEEL1	
Phosphorus	7723-14-0	4.7E+01 AEGL3_1hr	1.1E+01 AEGL2_1hr	3.7E+00 AEGL1_1hr	
					abdom pain anemia cachexia dental pain eye burns irrit eyes jaun jaw pain nau resp tract burns salv

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					skin burns swell
Phosphorus (red)	0-142*	5.0E+00 TEEL3	3.0E+00 TEEL2	1.5E-01 TEEL1	
Phosphorus oxychloride	10025-87-3	5.3E+00 AEGL3_1hr*	3.0E+00 TEEL2*	3.0E+00 TEEL1*	abdom pain cough dizz dysp eye burns head irrit eyes irrit resp sys irrit skin lass nau neph pulm edema skin burns vomit
Phosphorus pentachloride	10026-13-8	7.0E+01 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	bron derm irrit eyes irrit resp sys irrit skin
Phosphorus pentasulfide	1314-80-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+00 TEEL1	apnea coma conj pain convuls corn vesic dizz GI dist head insom irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys irrit skin irrity kerato-conj lac lass photo
Phosphorus pentoxide	1314-56-3	5.0E+01 ERPG3	1.0E+01 ERPG2	1.0E+00 ERPG1	
Phosphorus trichloride	7719-12-2	3.2E+01 AEGL3_1hr*	1.1E+01 AEGL2_1hr*	1.9E+00 AEGL1_1hr*	
					eye burns irrit eyes irrit nose irrit skin irrit throat pulm edema skin burns
Phosphorus trioxide	1314-24-5	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Phosphorus, white	12185-10-3	6.0E-01 TEEL3	6.0E-01 TEEL2	2.0E-01 TEEL1	
Phthalic acid, m-	121-91-5	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Phthalic acid, o-	88-99-3	5.0E+02 TEEL3	5.0E-01 TEEL2	6.0E-02 TEEL1	
Phthalic acid, p-	100-21-0	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Phthalic anhydride	85-44-9	6.0E+01 TEEL3	4.0E+01 TEEL2	1.2E+01 TEEL1	
					bron bronchial asthma conj derm in animals: kidney damage in animals: liver damage irrit eyes irrit skin irrit upper resp sys

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nasal ulcer bleeding
Phthaloyl dichloride	88-95-9	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Phyllomedusin	26145-48-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Physostigmine	57-47-6	4.5E+00 TEEL3	4.5E+00 TEEL2	2.5E+00 TEEL1	
Physostigmine, salicylate (1:1)	57-64-7	2.5E+00 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
Picolinic acid	98-98-6	1.5E+02 TEEL3	1.5E+02 TEEL2	3.5E+01 TEEL1	
Picric acid	88-89-1	7.5E+01 TEEL3	1.5E+01 TEEL2	3.0E-01 TEEL1	album prot anuria bitter taste GI dist hema hepatitis irrit eyes irrit skin lass myalgia neph polyuria sens derm yellow-stained hair yellow-stained skin
Picrotoxin	124-87-8	1.5E+01 TEEL3	1.5E+01 TEEL2	7.5E+00 TEEL1	
Pigment green 36	14302-13-7	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Pigment yellow 14	5468-75-7	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Pinacolone	75-97-8	4.0E+03 TEEL3	7.5E+02 TEEL2	2.0E+01 TEEL1	
Pinacolyl alcohol	464-07-3	3.5E+03 TEEL3	3.5E+03 TEEL2	3.0E+03 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Pinene, alpha-	80-56-8	1.5E-02 TEEL3	3.5E-03 TEEL2	5.0E-04 TEEL1	
Piperazine	110-85-0	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Piperidine	110-89-4	3.8E+02 AEGL3_1hr	1.1E+02 AEGL2_1hr	2.3E+01 AEGL1_1hr	
Piperonyl butoxide	51-03-6	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	
Pirimifos-ethyl	23505-41-1	6.0E+01 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Pivalic anhydride	1538-75-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Platinum (II) cyanide	592-06-3	5.1E+00 TEEL3	1.3E-02 TEEL2	7.6E-03 TEEL1	
Platinum, metal	7440-06-4	4.0E+00 TEEL3	4.0E+00 TEEL2	3.0E+00 TEEL1	derm irrit resp sys irrit skin
Poloxanlene	9003-11-6	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Poly(dimethylsiloxane), ethoxylated, dihydroxy terminated	68037-63-8	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Poly(dimethylsiloxane), hydride terminated	70900-21-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Poly(ethylene glycol methyl ether)	9004-74-4	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Poly(ethylene glycol)diacrylate	26570-48-9	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Poly(oxyethylene)(2) stearyl ether	9005-00-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Poly(sodium 4-styrenesulfonate)	25704-18-1	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Poly(Styrene-co-divinylbenzene)	69011-14-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyacrylic acid	9003-01-4	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Polyamide 6	25038-54-4	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Polychlorinated biphenyls	1336-36-3	5.0E+00 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Polyether polyol ester	X-212*	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Polyethylbenzene residue	68987-42-8	7.5E+02 TEEL3	1.5E+02 ERPG2	2.0E+01 TEEL1	
Polyethylene	9002-88-4	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Polyethylene glycol	25322-68-3	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Polyethylene glycol 20M	37225-26-6	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Polyethylene glycol dimethacrylate	25852-47-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyethylene glycol mono-4-nonylphenyl ether N-2	26027-38-3	6.0E+01 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Polyethyleneimine	9002-98-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Polyglycol 15-200: (Calthane NF and ND "B")	9082-00-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Polyisocyanate prepolymer mixture	0-309*	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Polymaleic acid	26099-09-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polymeric MDI	9016-87-9	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Polymerized linseed oil	67746-08-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Polymethyl methacrylate	9011-14-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Polymethylhydrosiloxane	63148-57-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyoxyethylene (20) sorbitan monolaurate	9005-64-5	5.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Polyoxyethylene monooctylphenyl ether	9036-19-5	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Polyoxyethylene sorbitan monopalmitate	9005-66-7	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Polyoxyethylene(4)lauryl ether	5274-68-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyoxypropylene polyamine	39423-51-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyphosphoric acid	8017-16-1	2.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Polypropylene	9003-07-0	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Polypropylene glycol	25322-69-4	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Polypropylene glycol, (chloromethyl)oxirane polymer	9072-62-2	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Polyquaternium-7	26590-05-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polysorbate 85	9005-70-3	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Polysulfone resin	25135-51-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polytetrafluoroethylene	9002-84-0	3.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Polytetramethylene glycol, polypropylene glycol, toluene diisocyanate polym	65636-36-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Polyurethane foam	9009-54-5	2.5E+01 TEEL3	5.0E+00 TEEL2	6.0E-01 TEEL1	
Polyvinyl alcohol	9002-89-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Polyvinyl chloride	9002-86-2	2.0E+02 TEEL3	4.0E+01 TEEL2	3.0E+00 TEEL1	
Polyvinylpyrrolidone K-30	9003-39-8	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Polyvinylpyrrolidone-iodine complex	25655-41-8	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Potassium	7440-09-7	3.0E+02 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Potassium acetate	127-08-2	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Potassium acid fluoride	7789-29-9	5.0E+02 TEEL3	2.6E+01 TEEL2	1.5E+01 TEEL1	
Potassium antimonate	29638-69-5	1.1E+02 TEEL3	5.3E+00 TEEL2	3.1E+00 TEEL1	
Potassium arsenate	7784-41-0	1.2E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Potassium arsenite	10124-50-2	2.7E+01 TEEL3	1.4E+01 TEEL2	2.0E+00 TEEL1	
Potassium bicarbonate	298-14-6	5.0E+02 TEEL3	6.0E+01 TEEL2	3.5E+01 TEEL1	
Potassium bi-iodate	13455-24-8	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Potassium bisulfate	7646-93-7	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Potassium bromate	7758-01-2	6.0E+01 TEEL3	6.0E+01 TEEL2	3.0E-01 TEEL1	
Potassium bromide	7758-02-3	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Potassium carbonate	584-08-7	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Potassium chlorate	3811-04-9	3.5E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Potassium chloride	7447-40-7	1.5E+01 TEEL3	1.5E+01 TEEL2	5.0E+00 TEEL1	
Potassium chromate (VI)	7789-00-6	5.6E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Potassium citrate	866-84-2	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Potassium citrate, monohydrate	6100-05-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Potassium cyanide	151-50-8	4.0E+01 AEGL3_1hr	1.9E+01 AEGL2_1hr	5.3E+00 AEGL1_1hr	asphy blood changes conf head incr rate resp irrit eyes irrit skin irrit upper resp sys lass nau slow gasping resp thyroid changes vomit
Potassium dichromate	7778-50-9	4.2E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Potassium dideuterium phosphate	13761-79-0	1.5E-02 TEEL3	7.5E-03 TEEL2	4.0E-03 TEEL1	
Potassium ferricyanide	13746-66-2	5.0E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Potassium ferrocyanide	13943-58-3	5.9E+01 TEEL3	5.9E+01 TEEL2	3.5E+01 TEEL1	
Potassium fluoride	7789-23-3	5.0E+02 TEEL3	3.8E+01 TEEL2	2.3E+01 TEEL1	
Potassium fluoride dihydrate	13455-21-5	5.0E+02 TEEL3	6.2E+01 TEEL2	3.7E+01 TEEL1	
Potassium formate	590-29-4	5.0E+02 TEEL3	5.0E+02 TEEL2	6.0E+01 TEEL1	
Potassium glycolate	1932-50-9	3.5E+03 TEEL3	6.0E+02 TEEL2	7.5E+01 TEEL1	
Potassium gold cyanide	554-07-4	1.4E+02 TEEL3	1.4E+02 TEEL2	8.3E+01 TEEL1	
Potassium hexacyanoferate (II) trihydrate	14459-95-1	6.8E+01 TEEL3	6.8E+01 TEEL2	4.1E+01 TEEL1	
Potassium hexafluorosilicate	16871-90-2	6.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Potassium hexahydroxoantimonate (V)	12208-13-8	1.1E+02 TEEL3	5.4E+00 TEEL2	3.2E+00 TEEL1	
Potassium hydride	7693-26-7	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Potassium hydroxide	1310-58-3	1.3E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	cough diarr eye burns irrit eyes irrit resp sys irrit skin skin burns sneez vomit
Potassium iodate	7758-05-6	6.0E+01 TEEL3	6.0E+01 TEEL2	6.0E+01 TEEL1	
Potassium iodide	7681-11-0	3.0E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Potassium metaborate	13709-94-9	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Potassium molybdate	13446-49-6	5.0E+02 TEEL3	6.2E+00 TEEL2	3.7E+00 TEEL1	
Potassium niobate	12030-85-2	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Potassium nitrate	7757-79-1	5.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Potassium nitrite	7758-09-0	5.0E+02 TEEL3	7.5E-01 TEEL2	1.0E-01 TEEL1	
Potassium oxalate	583-52-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Potassium oxalate monohydrate	6487-48-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Potassium oxide	12136-45-7	1.3E+02 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Potassium perchlorate	7778-74-7	5.0E+02 TEEL3	5.0E+02 TEEL2	4.0E+02 TEEL1	
Potassium periodate	7790-21-8	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Potassium permanganate	7722-64-7	5.0E+02 TEEL3	1.4E+01 TEEL2	8.6E+00 TEEL1	
Potassium phosphate dibasic trihydrate	16788-57-1	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Potassium phosphate, dibasic	7758-11-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Potassium phosphate, monobasic	7778-77-0	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Potassium phosphate, tribasic	7778-53-2	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Potassium Phosphide	20770-41-6	2.2E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	7.5E+00 TEEL1	
Potassium polysilicate	1312-76-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Potassium pyrophosphate	7320-34-5	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Potassium pyrosulfate	7790-62-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Potassium pyrosulfite	16731-55-8	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Potassium selenate	7790-59-2	2.8E+00 TEEL3	2.8E+00 TEEL2	1.7E+00 TEEL1	
Potassium selenite	10431-47-7	2.6E+00 TEEL3	2.6E+00 TEEL2	1.6E+00 TEEL1	
Potassium silicate	10006-28-7	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Potassium silver cyanide	506-61-6	1.8E+01 TEEL3	1.8E+01 TEEL2	2.5E+00 TEEL1	
Potassium stannate trihydrate	12142-33-5	1.3E+02 TEEL3	1.3E+01 TEEL2	7.5E+00 TEEL1	
Potassium sulfate	7778-80-5	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Potassium sulfite	10117-38-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Potassium tellurite	7790-58-1	5.0E+01 TEEL3	3.5E+00 TEEL2	6.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Potassium tert-butoxide	865-47-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Potassium tetrafluoroborate(1-)	14075-53-7	4.1E+02 TEEL3	2.1E+02 TEEL2	1.2E+02 TEEL1	
Potassium tetraphenyl boron	3244-41-5	2.5E+01 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Potassium thiocyanate	333-20-0	6.0E+01 TEEL3	6.0E+01 TEEL2	3.5E+01 TEEL1	
Potassium tungstate	7790-60-5	5.3E+00 TEEL3	5.3E+00 TEEL2	5.3E+00 TEEL1	
Praseodymium (stable)	7440-10-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Praseodymium oxide	11113-81-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Praseodymium(III,IV) oxide	12037-29-5	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Promecarb	2631-37-0	2.5E+01 TEEL3	1.6E+01 TEEL2	1.0E+01 TEEL1	
Propanamine, 1-	107-10-8	6.0E+02 TEEL3	6.0E+02 TEEL2	1.3E+02 TEEL1	
Propane	74-98-6	6.0E+04 AEGL3_1hr	3.1E+04 AEGL2_1hr	9.9E+03 AEGL1_1hr	asphy conf dizz excitation liquid: frostbite
Propane sultone	1120-71-4	2.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	carc irrit eyes irrit resp sys irrit skin
Propanediamine, 1,2-	78-90-0	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Propanediamine, 1,3-	109-76-2	1.3E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Propanethiol, 1-	107-03-9	2.5E+03 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	cyan

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz head in animals: kidney damage in animals: liver damage irrit eyes irrit nose irrit resp sys irrit skin irrit throat nau
Propanol, ((1-methyl-1,2-ethanediyl)bis(oxy))bis-	24800-44-0	1.3E+03 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Propanol, 1(or 2)-propoxy-	30136-13-1	1.3E+03 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Propargyl alcohol	107-19-7	1.7E+02 AEGL3_1hr	3.7E+01 AEGL2_1hr	5.7E+00 AEGL1_1hr	 CNS depres in animals: kidney damage in animals: liver damage irrit muc memb irrit skin
Propargyl bromide	106-96-7	2.0E+01 TEEL3	3.0E-02 TEEL2	3.0E-02 TEEL1	
Propiolactone, beta-	57-57-8	4.0E+01 TEEL3	1.5E+01 TEEL2	1.5E+00 TEEL1	 carc corn opac dysuria frequent urination hema irrit skin skin blisters skin burns
Propionaldehyde	123-38-6	2.0E+03 AEGL3_1hr	6.2E+02 AEGL2_1hr	1.1E+02 AEGL1_1hr	
Propionic acid	79-09-4	1.0E+03 TEEL3	4.0E+01 TEEL2	4.0E+01 TEEL1	 abdom pain blurred vision corn burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit nose irrit skin irrit throat nau skin burns vomit
Propionic acid, sodium salt	137-40-6	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Propionic anhydride	123-62-6	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Propionitrile	107-12-0	8.3E+01 AEGL3_1hr	1.6E+01 AEGL2_1hr	1.3E+01 TEEL1	chest pain convuls in animals: kidney damage in animals: liver damage irrit eyes irrit resp sys irrit skin lass nau stupor vomit
Propionyl chloride	79-03-8	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Propyl acetate, n-	109-60-4	6.0E+03 TEEL3	1.0E+03 TEEL2	1.0E+03 TEEL1	in animals: derm in animals: irrit eyes in animals: irrit nose in animals: irrit throat in animals: narco
Propyl alcohol, n-	71-23-8	2.0E+03 TEEL3	6.0E+02 TEEL2	6.0E+02 TEEL1	abdom cramps ataxia diarr drow dry cracking skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					GI pain head in animals: narco irrit eyes irrit nose irrit throat nau vomit
Propyl chlorocarbonate	109-61-5	5.5E+01 AEGL3_1hr	1.9E+01 AEGL2_1hr	1.0E+01 TEEL1	
Propyl nitrate, n-	627-13-4	2.0E+03 TEEL3	4.0E+02 TEEL2	1.5E+02 TEEL1	
					anoxia cyan dizz dysp head in animals: irrit eyes in animals: irrit skin lass methemo
Propyl-1-butanamine, N-	20193-21-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Propylbenzene, n-	103-65-1	1.5E+04 TEEL3	3.0E+03 TEEL2	4.0E+02 TEEL1	
Propylene	115-07-1	3.5E+04 TEEL3	4.0E+03 TEEL2	2.5E+03 TEEL1	
Propylene carbonate, 1,2-	108-32-7	1.3E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Propylene glycol	57-55-6	5.0E+02 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	
Propylene glycol dinitrate	6423-43-4	8.8E+01 AEGL3_1hr	6.8E+00 AEGL2_1hr	1.2E+00 AEGL1_1hr	
					conj head head head head head

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head head head head head head head head head impaired balance in animals: kidney damage in animals: liver damage irrit irrit irrit irrit irrit eyes methemo vis dist
Propylene glycol monomethyl ether	107-98-2	2.5E+03 TEEL3	1.0E+03 TEEL2	5.0E+02 TEEL1	 diarr dizz drow head inco irrit eyes irrit nose irrit skin irrit throat nau vomit
Propylene glycol monomethyl ether acetate	108-65-6	2.7E+04 TEEL3	5.4E+03 TEEL2	2.7E+02 TEEL1	
Propylene glycol mono-n-butyl ether	10215-33-5	2.5E+03 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
Propylene oxide	75-56-9	2.1E+03 AEGL3_1hr*	6.9E+02 AEGL2_1hr*	1.7E+02 AEGL1_1hr*	 carc

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit resp sys irrit skin skin blisters skin burns
Propyleneimine	75-55-8	5.4E+01 AEGL3_1hr	2.8E+01 AEGL2_1hr	7.5E-01 TEEL1	
					carc eye burns skin burns
Propyltrichlorosilane	141-57-1	1.6E+02 AEGL3_1hr	3.5E+01 AEGL2_1hr	2.9E+00 AEGL1_1hr	
Prothoate	2275-18-5	7.5E+00 TEEL3	1.7E+00 TEEL2	1.0E+00 TEEL1	
P-Tert-butyl benzoic acid	98-73-7	2.0E+02 TEEL3	5.0E+01 TEEL2	6.0E+00 TEEL1	
P-Tert-butylphenol	98-54-4	5.0E+02 TEEL3	7.5E-01 TEEL2	5.0E-01 TEEL1	
p-Thiocresol	106-45-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
P-Toluenesulfonamide	70-55-3	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
P-Toluenesulfonic acid, methyl ester	80-48-8	1.5E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Pyrene	129-00-0	1.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Pyrethrin I	121-21-1	1.0E+02 TEEL3	2.5E+01 TEEL2	1.0E+01 TEEL1	
Pyrethrins and Rotenone mixture	0-581*	2.0E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Pyridine	110-86-1	3.0E+03 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	
					anor anxi derm dizz head insom irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					kidney damage liver damage nau
Pyridine-D5	7291-22-7	3.5E+03 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	
Pyriminil	53558-25-1	2.0E+01 TEEL3	6.2E+00 TEEL2	3.5E+00 TEEL1	
Pyrogallic acid	87-66-1	2.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Pyromellitic acid	89-05-4	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Pyrrole	109-97-7	1.0E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Pyrrolidine	123-75-1	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Pyrrolidinone, 2-	616-45-5	1.5E+02 TEEL3	6.0E+01 TEEL2	1.0E+01 TEEL1	
Quaternary ammonium compounds, coco alkylbis(hydroxyethyl)methyl, □ chlorides	70750-47-9	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Quaternary ammonium compounds, coco alkylbis(hydroxyethyl)methyl, □ nitrates (salts)	71487-00-8	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Quinhydrone	106-34-3	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Quinoline	91-22-5	1.5E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Quinolinol, 8-	148-24-3	5.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Quinone	106-51-4	1.0E+02 TEEL3	2.0E+01 TEEL2	1.3E+00 TEEL1	conj irrit eyes irrit skin kera
RDX	121-82-4	4.0E+01 TEEL3	4.0E+01 TEEL2	3.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					convuls dizz head insom irrit eyes irrit skin irrity lass nau tremor vomit
Resorcinol	108-46-3	7.5E+01 TEEL3	7.5E+01 TEEL2	7.5E+01 TEEL1	bluish skin convuls cyan derm dizz drow dysp hema hypothermia incr heart rate irrit eyes irrit nose irrit skin irrit throat irrit upper resp sys kidney changes liver changes methemo restless spleen changes
Rexyn	69011-49-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Rhenium (VII) oxide	1314-68-7	3.0E+01 TEEL3	6.5E+00 TEEL2	3.9E+00 TEEL1	
Rhenium hexafluoride	10049-17-9	5.0E+02 TEEL3	3.3E+01 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Rhodamine 6G	989-38-8	2.5E+00 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Rhodium	7440-16-6	1.0E+02 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	possible resp sens
Rhodium (III) oxide	12036-35-0	1.2E+02 TEEL3	6.2E+00 TEEL2	3.7E+00 TEEL1	
Rhodium (IV) oxide	12137-27-8	2.6E+00 TEEL3	5.0E-01 TEEL2	7.5E-02 TEEL1	
Rhodium hydroxide	21656-02-0	3.0E+00 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Riboflavine	83-88-5	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Ricin	9009-86-3	4.8E-03 AEGL3_1hr			
Rotenone	83-79-4	1.3E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	abdom pain clonic convuls inco irrit eyes irrit resp sys irrit skin musc tremor nau numb muc memb stupor vomit
Rubber solvent	64742-89-8	4.0E+03 TEEL3	7.5E+02 TEEL2	4.0E+02 TEEL1	
Rubidium	7440-17-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Rubidium bromide	7789-39-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Rubidium chloride	7791-11-9	5.0E+02 TEEL3	3.5E-01 TEEL2	5.0E-02 TEEL1	
Rubidium hydroxide	1310-82-3	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Rubidium nitrate	13126-12-0	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Ruthenium	7440-18-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Ruthenium (IV) oxide	12036-10-1	1.5E+01 TEEL3	1.5E+01 TEEL2	1.3E+01 TEEL1	
Ruthenium trichloride	10049-08-8	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Safranine	477-73-6	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Safrole	94-59-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Salcomine	14167-18-1	4.0E+02 TEEL3	3.9E+01 TEEL2	2.0E+01 TEEL1	
Salicylaldehyde	90-02-8	2.0E+02 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Salicylic acid	69-72-7	4.0E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Salicylic acid, monoammonium salt	528-94-9	5.0E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Salicylic acid, phenyl ester	118-55-8	5.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Samarium	7440-19-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Samarium (III) oxide	12060-58-1	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Samarium nitrate	10361-83-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Samarium(ii) iodide solution	32248-43-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Samarium(III) chloride hexahydrate	13465-55-9	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Saxitoxin	35523-89-8	3.5E-03 TEEL3	6.0E-04 TEEL2	1.0E-04 TEEL1	
Scandium	7440-20-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Scandium oxide	12060-08-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
sec-Butyl chloroformate	17462-58-7	3.7E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	1.5E+00 TEEL1	
Sec-butyllithium	598-30-1	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Selenious acid	7783-00-8	2.5E+02 TEEL3	2.5E+02 TEEL2	9.8E-01 TEEL1	
Selenium	7782-49-2	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	bron chills cirr derm dysp eye burns fever garlic breath GI dist head in animals: anemia irrit eyes irrit nose irrit skin irrit throat kidney damage liver nec metallic taste skin burns spleen damage vis dist
Selenium dioxide	7446-08-4	1.5E+02 TEEL3	1.4E+00 TEEL2	8.4E-01 TEEL1	
Selenium hexafluoride	7783-79-1	2.1E+00 AEGL3_1hr	6.9E-01 AEGL2_1hr	4.2E-01 AEGL1_1hr	edema in animals: pulm irrit
Selenium oxychloride	7791-23-3	1.0E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Selenium sulfide	7488-56-4	6.0E+01 TEEL3	1.8E+00 TEEL2	1.1E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Semicarbazide hydrochloride	563-41-7	1.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Sephacryl s-200, superfine	65546-95-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sephacryl s-300	82785-74-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sepharose CL 4B	61970-08-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sesquimustard	3563-36-8	6.0E+00 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Sethoxydim	74051-80-2	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Silica gel	1343-98-2	5.0E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Silica gel dessicant	63231-67-4	5.0E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Silica gel, silica precipitated	112926-00-8	5.0E+02 TEEL3	1.0E+02 TEEL2	1.8E+01 TEEL1	
Silica, amorphous	7631-86-9	5.0E+02 TEEL3	1.3E+02 TEEL2	1.8E+01 TEEL1	irrit eyes pneumoconiosis
Silica, amorphous fume	69012-64-2	5.0E+02 TEEL3	1.5E+00 TEEL2	9.0E-01 TEEL1	
Silica, amorphous fumed	112945-52-5	5.0E+02 TEEL3	3.0E+01 TEEL2	1.8E+01 TEEL1	
Silica, crystalline quartz	14808-60-7	5.0E+01 TEEL3	1.3E-01 TEEL2	7.5E-02 TEEL1	carc cough decr pulm func dysp irrit eyes progressive resp symptoms (silicosis) wheez
Silicic acid	7699-41-4	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Silicic acid, aluminum calcium sodium salt	1344-01-0	6.0E+01 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Silicofluoric acid	16961-83-4	5.0E+01 TEEL3	1.6E+01 TEEL2	9.5E+00 TEEL1	
Silicon	7440-21-3	5.0E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	cough irrit eyes irrit skin irrit upper resp sys
Silicon (II) oxide	10097-28-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Silicon carbide, fibrous	409-21-2	5.0E+02 TEEL3	2.5E+02 TEEL2	4.5E+01 TEEL1	cough irrit eyes irrit skin irrit upper resp sys
Silicon nitride	12033-89-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Silicon tetrafluoride	7783-61-1	4.3E+01 AEGL3_1hr	1.4E+01 AEGL2_1hr	2.1E-01 AEGL1_1hr	
Silicon tetrahydride	7803-62-5	3.5E+02 AEGL3_1hr	1.7E+02 AEGL2_1hr	1.3E+02 AEGL1_1hr	head irrit eyes irrit muc memb irrit skin nau
Silicone	63148-62-9	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Silicone oil	63148-58-3	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Siloprene k 1000	63394-02-5	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Siloxanes and Silicones, di-Me, Me hydrogen	68037-59-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Siloxanes and Silicones, di-Me, Me vinyl, vinyl group-terminated	68083-18-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Siloxanes and silicones, di-Me, reaction products	67762-90-7	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Siloxanes and Silicones, di-Me, vinyl group-terminated	68083-19-2	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Silver	7440-22-4	1.0E+01 TEEL3	5.0E-01 TEEL2	3.0E-01 TEEL1	blue-gray eyes blue-gray nasal septum blue-gray skin blue-gray throat GI dist irrit skin ulceration skin
Silver carbonate	534-16-7	1.3E+01 TEEL3	6.4E-02 TEEL2	3.8E-02 TEEL1	
Silver chloride	7783-90-6	1.3E+01 TEEL3	6.6E-02 TEEL2	4.0E-02 TEEL1	
Silver cyanide	506-64-9	1.3E+02 TEEL3	1.3E+02 TEEL2	7.7E+01 TEEL1	
Silver hydroxide	z-0060	1.2E+01 TEEL3	6.0E-02 TEEL2	3.5E-02 TEEL1	
Silver nitrate	7761-88-8	1.6E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Silver nitrite	7783-99-5	1.4E+01 TEEL3	7.5E-02 TEEL2	4.3E-02 TEEL1	
Silver oxide	20667-12-3	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Silvex	93-72-1	2.5E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Soda lime	8006-28-8	2.5E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Sodium	7440-23-5	5.0E+01 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
Sodium acetate	127-09-3	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Sodium acetate trihydrate	6131-90-4	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium aluminate	11138-49-1	2.0E+02 TEEL3	4.4E+01 TEEL2	2.6E+01 TEEL1	
Sodium aluminum hydride	13770-96-2	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Sodium aluminum silicate	73987-94-7	5.0E+02 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	
Sodium antimony	11112-10-0	1.0E+02 TEEL3	5.1E+00 TEEL2	3.0E+00 TEEL1	
Sodium arsenate	7631-89-2	1.4E+01 TEEL3	1.4E+01 TEEL2	7.5E+00 TEEL1	
Sodium arsenite	7784-46-5	8.7E+00 TEEL3	8.7E+00 TEEL2	1.3E+00 TEEL1	
Sodium azide	26628-22-8	2.0E+01 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	blurred vision bradycardia dizz head irrit eyes irrit skin kidney changes lass low BP
Sodium bicarbonate	144-55-8	5.0E+02 TEEL3	2.0E+00 TEEL2	3.5E-01 TEEL1	
Sodium bifluoride	1333-83-1	4.1E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Sodium bis(2-methoxyethoxy) aluminum hydride	22722-98-1	3.5E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	
Sodium bismuthate	12232-99-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Sodium bisulfate	7681-38-1	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Sodium bisulfate monohydrate	10034-88-5	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Sodium bisulfite	7631-90-5	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit skin
Sodium borohydride	16940-66-2	7.5E+00 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Sodium bromate	7789-38-0	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Sodium bromide	7647-15-6	5.0E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Sodium cacodylate	124-65-2	5.0E+02 TEEL3	4.0E+01 TEEL2	3.2E+00 TEEL1	
Sodium carbonate	497-19-8	5.0E+02 TEEL3	2.5E-01 TEEL2	4.0E-02 TEEL1	
Sodium carbonate monohydrate	5968-11-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Sodium carboxymethyl cellulose	9004-32-4	5.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Sodium chlorate	7775-09-9	7.5E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Sodium chloride	7647-14-5	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Sodium chromate	7775-11-3	4.7E+01 TEEL3	7.5E-01 TEEL2	1.3E-01 TEEL1	
Sodium chromate tetrahydrate	10034-82-9	8.7E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Sodium cobaltinitrite	13600-98-1	1.5E+01 TEEL3	3.0E+00 TEEL2	4.0E-01 TEEL1	
Sodium cyanide	143-33-9	3.0E+01 AEGL3_1hr	1.4E+01 AEGL2_1hr	4.0E+00 AEGL1_1hr	asphy blood changes conf head incr resp rate irrit eyes irrit skin lass nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					slow gasping respiration thyroid changes vomit
Sodium cyclopentadienylide	4984-82-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium deuteroxide	14014-06-3	5.0E+01 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
Sodium dichromate	10588-01-9	3.8E+01 TEEL3	3.8E+01 TEEL2	2.0E+01 TEEL1	
Sodium dichromate dihydrate (VI)	7789-12-0	4.3E+01 TEEL3	7.2E-01 TEEL2	4.3E-01 TEEL1	
Sodium diethydithiocarbamate	148-18-5	5.0E+02 TEEL3	2.5E+02 TEEL2	6.0E+00 TEEL1	
Sodium diethyldithiocarbamate trihydrate	20624-25-3	5.0E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Sodium dihydrogen phosphate	10049-21-5	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+02 TEEL1	
Sodium dithionate dihydrate	7631-94-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium dodecylbenzenesulfonate	25155-30-0	2.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Sodium ethoxide	141-52-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Sodium ferricyanide	14402-89-2	2.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Sodium ferrocyanide	13601-19-9	5.0E+02 TEEL3	2.7E+01 TEEL2	1.6E+01 TEEL1	
Sodium fluoroacetate	62-74-8	2.5E+00 TEEL3	5.0E-01 TEEL2	1.5E-01 TEEL1	
					anxi auditory halu card arrhy convuls ectopic heartbeat facial pares kidney damage liver damage nystagmus

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					pulm edema pulsus altenans tacar twitch face musc vomit
Sodium formate	141-53-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Sodium gluconate	527-07-1	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Sodium glycinate	6000-44-8	5.0E+02 TEEL3	1.0E+02 TEEL2	1.3E+01 TEEL1	
Sodium glycolate	2836-32-0	3.0E+03 TEEL3	7.5E+02 TEEL2	1.3E+02 TEEL1	
Sodium hexametaphosphate	10124-56-8	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Sodium hexamethyldisilazane	1070-89-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium hydride	7646-69-7	4.0E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Sodium hydrosulfite	7775-14-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium hydroxide	1310-73-2	5.0E+01 ERPG3	5.0E+00 ERPG2	5.0E-01 ERPG1	eye burns irrit eyes irrit muc memb irrit skin pneu skin burns temporary loss of hair
Sodium hypobromite	13824-96-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium hypochlorite	7681-52-9	5.0E+02 TEEL3	5.0E+01 TEEL2	2.0E+00 TEEL1	
Sodium hypochlorite pentahydrate	10022-70-5	5.0E+02 TEEL3	1.5E+00 TEEL2	2.0E-01 TEEL1	
Sodium hypophosphite hydrate	123333-67-5	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium iodate	7681-55-2	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Sodium iodide	7681-82-5	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Sodium lactate	72-17-3	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Sodium lauryl sulfate	151-21-3	5.0E+02 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Sodium metabisulfite	7681-57-4	1.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	irrit eyes irrit muc memb irrit skin
Sodium metaborate	7775-19-1	5.0E+02 TEEL3	2.0E+02 TEEL2	3.7E+01 TEEL1	
Sodium metaphosphate	10361-03-2	3.5E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Sodium metasilicate	6834-92-0	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Sodium metasilicate pentahydrate	10213-79-3	3.5E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	
Sodium metasilicate, nonahydrate	13517-24-3	5.0E+02 TEEL3	1.0E+02 TEEL2	6.1E+01 TEEL1	
Sodium metavanadate	13718-26-8	3.0E+01 TEEL3	1.2E+00 TEEL2	1.5E-01 TEEL1	
Sodium methylate	124-41-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Sodium molybdate	7631-95-0	5.0E+02 TEEL3	1.0E+01 TEEL2	3.2E+00 TEEL1	
Sodium molybdate, dihydrate	10102-40-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+01 TEEL1	
Sodium monoxide	12401-86-4	5.0E+01 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
Sodium m-periodate	7790-28-5	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
Sodium nitrate	7631-99-4	1.0E+02 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium nitrite	7632-00-0	6.0E+01 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Sodium o-benzyl-p-chlorophenate	3184-65-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium orthovanadate	13721-39-6	1.3E+02 TEEL3	1.8E+00 TEEL2	2.5E-01 TEEL1	
Sodium oxalate	62-76-0	3.0E+01 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Sodium oxide	1313-59-3	5.0E+01 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
Sodium pentachlorophenate	131-52-2	7.5E+01 TEEL3	2.4E+01 TEEL2	3.5E+00 TEEL1	
Sodium perborate	7632-04-4	5.0E+02 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Sodium perchlorate	7601-89-0	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Sodium perchlorate monohydrate	7791-07-3	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Sodium permanganate	10101-50-5	5.0E+02 TEEL3	1.3E+01 TEEL2	7.8E+00 TEEL1	
Sodium peroxide	1313-60-6	5.0E+01 TEEL3	5.0E+00 TEEL2	5.0E-01 TEEL1	
Sodium perrhenate	13472-33-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Sodium persulfate	7775-27-1	1.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	
Sodium phophate dibasic	7558-79-4	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Sodium phosphate decahydrate	13472-36-1	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Sodium phosphate dibasic dodecahydrate	10039-32-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Sodium phosphate monobasic	7558-80-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Sodium phosphate tribasic dodecahydrate	10101-89-0	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium phosphate, dibasic heptahydrate	7782-85-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	
Sodium phosphate, tribasic	7601-54-9	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+00 TEEL1	
Sodium Phosphide	12058-85-4	1.5E+01 AEGL3_1hr	8.2E+00 AEGL2_1hr	5.0E+00 TEEL1	
Sodium polyphosphate	68915-31-1	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Sodium polytungstate	12141-67-2	1.5E+02 TEEL3	3.5E+01 TEEL2	1.4E+01 TEEL1	
Sodium potassium alloys	11135-81-2	5.0E+01 TEEL3	5.0E+00 TEEL2	4.8E-01 TEEL1	
Sodium potassium tartrate	304-59-6	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Sodium potassium tartrate, tetrahydrate	6381-59-5	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Sodium p-tert-amylphenate	31366-95-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium pyruvate (pyruvic acid, sodium salt)	113-24-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium salicylate	54-21-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Sodium selenate	13410-01-0	1.6E+00 TEEL3	1.6E+00 TEEL2	1.4E+00 TEEL1	
Sodium selenite	10102-18-8	3.0E+00 TEEL3	2.3E+00 TEEL2	1.3E+00 TEEL1	
Sodium silicate	1344-09-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Sodium silicoaluminate	1344-00-9	5.0E+02 TEEL3	1.5E+02 TEEL2	1.0E+01 TEEL1	
Sodium stannate	12058-66-1	1.8E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
Sodium stearate	822-16-2	1.5E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Sodium succinate	150-90-3	4.0E+03 TEEL3	7.5E+02 TEEL2	1.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium succinate, hexahydrate	6106-21-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Sodium sulfate	7757-82-6	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Sodium sulfhydrate	16721-80-5	6.0E+00 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Sodium sulfide	1313-82-2	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Sodium sulfide, nonahydrate	1313-84-4	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Sodium sulfite	7757-83-7	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Sodium tartrate dihydrate	6106-24-7	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Sodium tellurite	10102-20-2	2.5E+01 TEEL3	7.5E+00 TEEL2	5.2E-01 TEEL1	
Sodium tetraborate	1330-43-4	5.0E+02 TEEL3	2.8E+01 TEEL2	2.8E+01 TEEL1	cough derm dysp epis irrit eyes irrit skin irrit upper resp sys
Sodium tetrafluoroborate(1-)	13755-29-8	3.6E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
Sodium tetraphenyl borate	143-66-8	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Sodium thiocyanate	540-72-7	1.0E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Sodium thiosulfate	7772-98-7	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Sodium thiosulfate pentahydrate	10102-17-7	5.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Sodium titanate	12034-34-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sodium tridecylbenzene sulfonate	26248-24-8	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sodium triethylborohydride	17979-81-6	1.5E+02 TEEL3	6.8E+01 TEEL2	6.8E+01 TEEL1	
Sodium trimetaphosphate	7785-84-4	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Sodium tripolyphosphate	7758-29-4	5.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Sodium tungstate	13472-45-2	5.0E+02 TEEL3	3.0E+00 TEEL2	3.0E+00 TEEL1	
Sodium tungstate dihydrate	10213-10-2	7.5E+01 TEEL3	1.5E+01 TEEL2	5.4E+00 TEEL1	
Sodium uranate	66018-57-3	1.6E+01 TEEL3	3.0E+00 TEEL2	9.4E-01 TEEL1	
Solvent naphtha, petroleum, heavy aliph.	64742-96-7	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Solvent naphtha, petroleum, medium aliphatic	64742-88-7	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Solvent yellow 3	97-56-3	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Solvent-refined heavy paraffinic distillate	64741-88-4	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Sorbitan monolaurate	5959-89-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sorbitan monostearate polyoxyethylene	9005-67-8	5.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Sorbitan trioleate	26266-58-0	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Sorbitan, monolaurate	1338-39-2	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Sorbitan, monooleate	1338-43-8	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Sorbitan, monooleate polyoxyethylene	9005-65-6	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Sorbitan, monostearate	1338-41-6	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sorbitol	50-70-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Soybean oil	8001-22-7	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Squalane	111-01-3	7.5E+03 TEEL3	1.5E+03 TEEL2	2.5E+02 TEEL1	
Squalen	111-02-4	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Stannic chloride	7646-78-8	2.2E+02 TEEL3	5.0E+00 TEEL2	4.4E+00 TEEL1	
Stannous chloride	7772-99-8	1.6E+02 TEEL3	5.0E+01 TEEL2	9.6E+00 TEEL1	
Stannous octoate	301-10-0	8.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Starch	9005-25-8	5.0E+02 TEEL3	5.0E+02 TEEL2	3.0E+01 TEEL1	chest pain cough derm irrit eyes irrit muc memb irrit skin rhin
Stibine	7803-52-3	4.9E+01 AEGL3_1hr	7.7E+00 AEGL2_1hr	1.0E+00 TEEL1	abdom pain head hema hemolytic anemia jaun lass lumbar pain nau pulm irrit
Stilbene	588-59-0	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Stoddard solvent	8052-41-3	2.0E+04 TEEL3	1.5E+03 TEEL2	5.7E+02 TLV_TWA_irr*	chemical pneu (aspir liquid) derm

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dizz in animals: kidney damage irrit eyes irrit nose irrit throat
Strontium carbonate	1633-05-2	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Strontium chloride heptahydrate	10476-85-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Strontium hydroxide	18480-07-4	7.5E+01 TEEL3	2.0E+01 TEEL2	7.5E-01 TEEL1	
Strontium nitrate	10042-76-9	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Strontium oxalate	814-95-9	7.5E+01 TEEL3	6.0E+01 TEEL2	2.5E+01 TEEL1	
Strontium Phosphide	12504-13-1	2.4E+01 AEGL3_1hr	1.3E+01 AEGL2_1hr	3.0E+00 TEEL1	
Strontium sulfate	7759-02-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Strontium, stable	7440-24-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Strychnine	57-24-9	3.0E+00 TEEL3	3.0E-01 TEEL2	3.0E-01 TEEL1	anxi cyan incr acuity of perception incr reflex excitability restless stiff facial musc stiff neck tetanic convuls with opisthotonos
Strychnine sulfate (2:1)	60-41-3	3.0E+01 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
Styrene	100-42-5	4.7E+03 TEEL3	5.5E+02 TEEL2	8.5E+01 TEEL1	conf defatting derm dizz drow

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					head irrit eyes irrit nose irrit resp sys lass mal narco possible liver inj repro effects unsteady gait
Styrene oxide	96-09-3	2.5E+02 TEEL3	2.5E+02 TEEL2	6.0E+01 TEEL1	
Styrene, polymer	9003-53-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Styrene-allyl alcohol copolymer	25119-62-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Succinic acid	110-15-6	5.0E+02 TEEL3	2.0E+02 TEEL2	2.5E+01 TEEL1	
Succinic anhydride	108-30-5	5.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Succinimidyl-6-(beta-maleimido propionamido)hexanoate	0-582*	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Sucrose	57-50-1	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	cough irrit eyes irrit skin irrit upper resp sys
Sucrose, diacetate hexaisobutyrate	126-13-6	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Sulfamic acid	5329-14-6	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Sulfamic acid, sodium salt (1:1)	13845-18-6	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Sulfanilamide	63-74-1	5.0E+02 TEEL3	2.0E+01 TEEL2	3.0E+00 TEEL1	
Sulfanilic acid	121-57-3	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Sulfosalicylic acid	97-05-2	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Sulfosalicylic acid, dihydrate, crystal	5965-83-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Sulfur (precipitated)	7704-34-9	1.3E+01 TEEL3	2.5E+00 TEEL2	4.0E-01 TEEL1	
Sulfur dioxide	7446-09-5	7.9E+01 AEGL3_1hr*	2.0E+00 AEGL2_1hr*	5.2E-01 AEGL1_1hr*	choking cough irrit eyes irrit nose irrit throat liquid: frostbite reflex bronchoconstriction rhin
Sulfur hexafluoride	2551-62-4	3.0E+04 TEEL3	3.0E+04 TEEL2	1.5E+04 TEEL1	asphy: incr breath rate asphy: pulse rate convuls emotional upset lass liquid: frostbite nau slight musc inco vomit
Sulfur pentafluoride	5714-22-7	1.0E+01 TEEL3	1.0E-01 TEEL2	1.0E-01 TEEL1	in animals: hemorr in animals: pulm edema irrit eyes irrit resp sys irrit skin
Sulfur tetrafluoride	7783-60-0	7.5E+00 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	eye burns (from SF4 releasing hydrofluoric acid on exposure to moisture) in animals: dysp in animals: lass in animals: rhin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit skin liquid: frostbite skin burns (from SF4 releasing hydrofluoric acid on exposure to moisture)
Sulfur trioxide	7446-11-9	1.6E+02 AEGL3_1hr*	8.7E+00 AEGL2_1hr*	2.0E-01 AEGL1_1hr*	
Sulfuric acid	7664-93-9	1.6E+02 AEGL3_1hr*	8.7E+00 AEGL2_1hr*	2.0E-01 AEGL1_1hr*	
					bron conj dental erosion derm emphy eye burns irrit eyes irrit nose irrit skin irrit throat pulm edema skin burns stomatis
Sulfuric Acid D2	13813-19-9	1.6E+02 TEEL3	8.7E+00 TEEL2	2.0E-01 TEEL1	
Sulfuric acid, thallium salt	10031-59-1	1.6E+01 TEEL3	2.0E+00 TEEL2	3.2E-01 TEEL1	
Sulfuric acid, zirconium(4+) salt (2:1), tetrahydrate	7446-31-3	2.0E+02 TEEL3	3.9E+01 TEEL2	3.9E+01 TEEL1	
Sulfurous acid	7782-99-2	1.5E+00 TEEL3	3.0E-01 TEEL2	4.0E-02 TEEL1	
Sulfuryl chloride	7791-25-5	6.1E+01 AEGL3_1hr	2.0E+01 AEGL2_1hr	1.7E+00 ERPG1	
Sulfuryl fluoride	2699-79-8	2.7E+02 AEGL3_1hr	8.8E+01 AEGL2_1hr	4.0E+01 TEEL1	
					conj in animals: convuls in animals: kidney inj

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: narco in animals: narco in animals: pulm edema in animals: tremor liquid: frostbite pares pharyngitis rhinitis
Talc	14807-96-6	5.0E+02 TEEL3	1.0E+01 TEEL2	2.0E+00 TEEL1	 fibrotic pneumoconiosis irrit eyes
Tall oil (alkyd resin)	68333-62-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tantalum	7440-25-7	5.0E+02 TEEL3	2.0E+02 TEEL2	1.0E+01 TEEL1	 in animals: pulm irrit irrit eyes irrit skin
Tantalum (V) fluoride	7783-71-3	5.0E+02 TEEL3	3.6E+01 TEEL2	2.2E+01 TEEL1	
Tantalum carbide	12070-06-3	5.0E+02 TEEL3	5.0E+02 TEEL2	1.1E+01 TEEL1	
Tantalum oxide	1314-61-0	5.0E+02 TEEL3	6.0E+01 TEEL2	1.2E+01 TEEL1	
Tantalum(V) ethoxide	6074-84-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tartaric acid	87-69-4	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Tartaric acid, monopotassium salt	868-14-4	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Tartaric acid, monosodium salt	526-94-3	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
TCDD, 2,3,7,8-	1746-01-6	7.5E-03 TEEL3	7.5E-03 TEEL2	1.5E-03 TEEL1	 allergic derm chloracne GI dist in animals: carc in animals: hemorr

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: kidney damage in animals: liver damage irrit eyes porphyria possible repro effects possible terato effects
Tellurium and compounds	13494-80-9	2.5E+01 TEEL3	2.0E+01 TEEL2	3.0E-01 TEEL1	
					anor derm drow dry mouth garlic breath in animals: CNS changes in animals: RBC changes metallic taste nau no sweat sweat
Tellurium hexafluoride	7783-80-4	5.2E-01 AEGL3_1hr	1.8E-01 AEGL2_1hr	1.8E-01 AEGL2_1hr*	
					dysp garlic breath head in animals: pulm edema
Tellurium oxide	7446-07-3	3.1E+01 TEEL3	5.0E+00 TEEL2	3.8E-01 TEEL1	
Tellurium tetrachloride	10026-07-0	5.3E+01 TEEL3	1.5E+01 TEEL2	6.3E-01 TEEL1	
Terbium	7440-27-9	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Terbium oxide (Tb2O3)	12036-41-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Terbium(III,IV) oxide	12037-01-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Terbufos	13071-79-9	1.0E+00 TEEL3	1.0E+00 TEEL2	3.0E-02 TEEL1	
Terephthaloyl chloride	100-20-9	5.0E+02 TEEL3	2.0E+01 TEEL2	2.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Terphenyl, p-	92-94-4	5.0E+02 TEEL3	9.0E+00 TEEL2	1.3E+00 TEEL1	head in animals: kidney damage in animals: liver damage irrit eyes irrit muc memb irrit skin sore throat thermal skin burns
Terphenyls	26140-60-3	5.0E+02 TEEL3	9.0E+00 TEEL2	1.3E+00 TEEL1	
Tert butyllithium	594-19-4	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Tert-amyl methyl ether	994-05-8	6.0E+02 TEEL3	6.0E+02 TEEL2	6.0E+02 TEEL1	
Tert-butyl alcohol	75-65-0	5.0E+03 TEEL3	5.0E+03 TEEL2	4.0E+02 TEEL1	drow irrit eyes irrit nose irrit skin irrit throat narco
Tert-Butyl isocyanate	1609-86-5	2.5E+01 TEEL3	5.0E+00 TEEL2	7.5E-01 TEEL1	
tert-Butyl Methyl-d3 Ether	29366-08-3	2.0E+04 TEEL3	2.0E+03 TEEL2	1.5E+02 TEEL1	
Tert-pentane	463-82-1	4.0E+03 TEEL3	1.8E+03 TLV_TWA_irr*	1.8E+03 TLV_TWA_irr*	
tert-Pentyl alcohol	75-85-4	4.0E+02 TEEL3	4.0E+02 TEEL2	4.0E+02 TEEL1	
Tetraammine palladium (II) nitrate	13601-08-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Tetrabutylammonium bromide	1643-19-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tetrabutylammonium dihydrogen phosphate	5574-97-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tetrabutylammonium fluoride	429-41-4	5.0E+02 TEEL3	1.7E+02 TEEL2	1.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tetrabutylammonium hydroxide	2052-49-5	6.0E+00 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Tetrabutylammonium nitrate	1941-27-1	7.5E+00 TEEL3	1.5E+00 TEEL2	2.5E-01 TEEL1	
Tetrachlorobenzene, 1,2,3,4-	634-66-2	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Tetrachlorobenzene, 1,2,4,5-	95-94-3	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Tetrachlorodibenzofuran, 2,3,7,8-	51207-31-9				
Tetrachloroethane	25322-20-7	3.0E+03 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
Tetrachloroethane, 1,1,1,2-	630-20-6	1.5E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	in animals: liver changes irreg respiration irrit eyes irrit skin lass musc inco restless
Tetrachloroethane, 1,1,2,2-	79-34-5	6.0E+02 TEEL3	2.0E+02 TEEL2	2.0E+01 TEEL1	abdom pain carc derm hepatitis jaun kidney damage leucyt liver tend nau tremor fingers vomit
Tetrachlorohexafluorobutane, 2,2,3,3-	375-34-8	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Tetrachlorosilane	10026-04-7	1.7E+02 TEEL3	3.8E+01 TEEL2	3.1E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tetracyanoquinodimethane, 7,7,8,8,-	1518-16-7	5.0E+01 TEEL3	1.0E+01 TEEL2	1.3E+00 TEEL1	
Tetracycline hydrochloride	64-75-5	5.0E+02 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Tetradecafluorohexane	355-42-0	3.5E+05 TEEL3	6.0E+04 TEEL2	7.5E+03 TEEL1	
Tetradecane	629-59-4	1.0E+04 TEEL3	2.5E+00 TEEL2	4.0E-01 TEEL1	
Tetradecanoic acid	544-63-8	3.5E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Tetradecyltrimethylammonium bromide	1119-97-7	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Tetraethoxysilane	78-10-4	2.6E+03 ERPG3	8.5E+02 ERPG2	2.1E+02 ERPG1	in animals: anemia in animals: dysp in animals: kidney damage in animals: lac in animals: liver damage in animals: narco in animals: pulm edema in animals: tremor irrit eyes irrit nose
Tetraethyl ammonium bromide	71-91-0	4.0E+01 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Tetraethyl dithiopyrophosphate	3689-24-5	1.0E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	anor blurred vision card irreg Cheyne-Stokes respiration convuls cyan diarr eye pain head irrit eyes irrit skin

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					lac lass local sweat low BP nau para rhin twitch vomit
Tetraethyl lead	78-00-2	6.2E+01 TEEL3	4.0E+00 TEEL2	4.7E-01 TEEL1	anor anxi bradycardia coma conf convuls halu hyper-reflexia hypotension hypothermia insom irrit eyes lass low weight mania nau pallor psychosis spasticity tremor
Tetraethyl pyrophosphate	107-49-3	5.0E+00 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	anor blurred vision card irreg chest tight Cheyne-Stokes respiration convuls

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					cyan diarr eye pain head lac lass low BP nau para rhin sweat twitch vomit
Tetraethyl tin	597-64-8	5.0E+01 TEEL3	7.0E+00 TEEL2	4.0E-01 TEEL1	
Tetraethylammonium chloride	56-34-8	5.0E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Tetraethylammonium hydroxide	77-98-5	3.5E+01 TEEL3	7.5E+00 TEEL2	1.0E+00 TEEL1	
Tetraethylammoniumiodide	68-05-3	4.3E+01 TEEL3	2.0E+00 TEEL2	2.0E+00 TEEL1	
Tetraethylene glycol	112-60-7	5.0E+02 TEEL3	5.0E+02 TEEL2	3.5E+02 TEEL1	
Tetraethylene glycol diacrylate	17831-71-9	3.5E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Tetraethylenepentamine	112-57-2	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Tetrafluoroethylene	116-14-3	1.4E+04 AEGL3_1hr	2.3E+03 AEGL2_1hr	9.0E+02 AEGL1_1hr	
Tetrafluorohydrazine	10036-47-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Tetrahydrofuran	109-99-9	1.5E+04 ERPG3	1.5E+03 ERPG2	2.9E+02 ERPG1	CNS depres dizz head irrit eyes

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit upper resp sys nau
Tetrahydrofuran-d8	1693-74-9	1.5E+04 TEEL3	1.5E+03 TEEL2	3.0E+02 TEEL1	
Tetrahydrophthalic anhydride	85-43-8	5.0E+02 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Tetrahydrothiophene-1,1-dioxide	126-33-0	2.0E+02 TEEL3	2.0E+02 TEEL2	2.0E+02 TEEL1	
Tetralin	119-64-2	1.0E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Tetramethoxysilane	681-84-5	8.7E+00 AEGL3_1hr	5.7E+00 AEGL2_1hr	5.7E+00 AEGL2_1hr*	corn damage (following even short-term exposure to the vapor) irrit eyes kidney inj lung inj pulm edema
Tetramethyl ammonium hydroxide	75-59-2	2.0E+00 TEEL3	2.0E+00 TEEL2	7.5E-01 TEEL1	
Tetramethyl ammonium, tetrahydroborate(1-)	16883-45-7	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Tetramethyl butanediamine	97-84-7	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Tetramethyl ethylene diamine	110-18-9	6.0E+02 TEEL3	6.0E+02 TEEL2	1.5E+02 TEEL1	
Tetramethyl lead	75-74-1	5.2E+01 TEEL3	4.0E+00 TEEL2	5.8E-01 TEEL1	anor anxi bad dreams coma convuls delirium hypotension insom mania nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					restless
Tetramethyl silane	75-76-3	3.5E+02 TEEL3	7.5E+01 TEEL2	5.0E+01 TEEL1	
Tetramethyl-5-decyne-4,7-diol, 2,4,7,9-	126-86-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tetramethylammonium bromide	64-20-0	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Tetramethylammonium hydroxide pentahydrate	10424-65-4	4.0E+00 TEEL3	4.0E+00 TEEL2	1.5E+00 TEEL1	
Tetramethylammonium silicate	53116-81-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tetranitromethane	509-14-8	1.4E+01 AEGL3_1hr	4.2E+00 AEGL2_1hr	4.2E+00 AEGL2_1hr*	chest pain cyan dizz dysp head irrit eyes irrit nose irrit skin irrit throat methemo skin burns
Tetraphenylarsonium chloride	507-28-8	2.5E+01 TEEL3	1.4E+01 TEEL2	8.4E+00 TEEL1	
Tetrapotassium ethylenediaminetetraacetate	5964-35-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.5E+01 TEEL1	
Tetrapropoxysilane	682-01-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Tetrapropylammonium hydroxide	4499-86-9	1.5E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Tetrapropylorthotitanate	3087-37-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tetrasodium ethylenediaminetetraacetate	64-02-8	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tetrasodium pyrophosphate	7722-88-5	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	derm irrit eyes irrit nose irrit skin irrit throat
Thallic oxide	1314-32-5	2.0E+01 TEEL3	2.0E+00 TEEL2	1.3E+00 TEEL1	
Thallium	7440-28-0	3.0E+00 TEEL3	3.0E+00 TEEL2	5.0E-01 TEEL1	abdom pain alopecia chest pain chorea convuls diarr kidney damage liver damage nau pares legs peri neuritis psychosis ptosis pulm edema retster tight strabismus tremor vomit
Thallium (I) acetate	563-68-8	1.9E+01 TEEL3	2.5E+00 TEEL2	3.9E-01 TEEL1	
Thallium (I) carbonate	6533-73-9	1.7E+01 TEEL3	2.0E+00 TEEL2	3.4E-01 TEEL1	
Thallium (I) chloride	7791-12-0	1.8E+01 TEEL3	2.0E+00 TEEL2	3.5E-01 TEEL1	
Thallium (I) nitrate	10102-45-1	2.0E+01 TEEL3	2.0E+01 TEEL2	3.9E-01 TEEL1	
Thallium (I) sulfate	7446-18-6	1.9E+01 TEEL3	2.0E+00 TEEL2	3.7E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Thallium (III) perchlorate hexahydrate	15596-83-5	4.5E+01 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	
Thallium oxide	1314-12-1	1.5E+01 TEEL3	5.2E-01 TEEL2	3.1E-01 TEEL1	
Thallous malonate	2757-18-8	7.5E+00 TEEL3	2.0E+00 TEEL2	1.3E+00 TEEL1	
Thenoyltrifluoroacetone	326-91-0	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Thioacetamide	62-55-5	1.3E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Thioacetic acid	507-09-5	3.0E+01 TEEL3	4.0E-01 TEEL2	6.0E-02 TEEL1	
Thiobis(4-chloro-6-methylphenol), 2,2'-	4418-66-0	1.3E+00 TEEL3	1.3E+00 TEEL2	7.5E-01 TEEL1	
Thiocarbazide	2231-57-4	1.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Thiodiglycol	111-48-8	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Thiofanox	39196-18-4	3.0E+01 TEEL3	8.5E+00 TEEL2	5.0E+00 TEEL1	
Thioglycolic acid	68-11-1	2.0E+01 TEEL3	4.0E+00 TEEL2	3.8E+00 TLV_TWA_irr*	blisters corn damage in animals: convuls in animals: gasping respirations in animals: lass irrit eyes irrit nose irrit skin irrit throat lac skin burns
Thionazin	297-97-2	3.5E+00 TEEL3	3.5E+00 TEEL2	2.0E+00 TEEL1	
Thionyl chloride	7719-09-7	6.8E+01 AEGL3_1hr	1.2E+01 AEGL2_1hr	9.7E-01 ERPG1	eye burns

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit muc memb irrit skin skin burns
Thiophosphoryl chloride	3982-91-0	6.0E+01 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Thiosemicarbazide	79-19-6	9.2E+00 TEEL3	9.2E+00 TEEL2	5.0E+00 TEEL1	
Thiourea	62-56-6	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Thiram	137-26-8	1.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	antabuse-like effects derm irrit eyes irrit muc memb irrit skin
Thorium	7440-29-1	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Thorium (IV) nitrate	13823-29-5	2.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Thorium oxalate	2040-52-0	5.0E+02 TEEL3	2.1E+02 TEEL2	1.3E+02 TEEL1	
Thorium oxide	1314-20-1	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Thorium perchlorate	16045-17-3	5.0E+02 TEEL3	1.6E+02 TEEL2	9.4E+01 TEEL1	
Thulium	7440-30-4	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Thulium oxide	12036-44-1	3.0E+02 TEEL3	6.0E+01 TEEL2	3.4E+01 TEEL1	
Thulium trichloride	13537-18-3	5.0E+02 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Thymol blue	76-61-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Thyodene	9005-84-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tin (II) chloride dihydrate	10025-69-1	1.9E+02 TEEL3	2.0E+01 TEEL2	1.1E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tin (II) sulfate	7488-55-3	1.8E+02 TEEL3	1.8E+01 TEEL2	1.1E+01 TEEL1	
Tin fluoroborate	13814-97-6	2.5E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Tin oxide	18282-10-5	5.0E+02 TEEL3	1.3E+01 TEEL2	7.6E+00 TEEL1	decr pulm func Stannosis (benign pneumoconiosis): dysp
Tin(II) oxide	1332-29-2	6.0E+01 TEEL3	1.3E+01 TEEL2	7.6E+00 TEEL1	
Tin(IV) isopropoxide	1184-61-8	8.7E+01 TEEL3	1.5E+01 TEEL2	7.0E-01 TEEL1	
Tin, inorganic	7440-31-5	1.0E+02 TEEL3	1.0E+02 TEEL2	6.0E+00 TEEL1	in animals: diarr in animals: para with musc twitch in animals: vomit irrit eyes irrit resp sys irrit skin
Tirpate	26419-73-8	1.0E+00 TEEL3	1.0E+00 TEEL2	6.0E-01 TEEL1	
Titanium	7440-32-6	6.0E+01 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	
Titanium (II) oxide	12137-20-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Titanium (III) fluoride	7783-63-3	4.6E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Titanium boride	12045-63-5	1.5E+02 TEEL3	3.2E+01 TEEL2	1.9E+01 TEEL1	
Titanium carbide	12070-08-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Titanium dioxide	13463-67-7	5.0E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	carc lung fib
Titanium hydride	7704-98-5	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Titanium isopropoxide	546-68-9	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Titanium tetrachloride	7550-45-0	4.4E+01 AEGL3_1hr	7.8E+00 AEGL2_1hr	5.0E+00 ERPG1	
Titanium trichloride	7705-07-9	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
t-Octyl mercaptan	141-59-3	1.1E+01 AEGL3_1hr	3.6E+00 AEGL2_1hr		
Toluene	108-88-3	1.7E+04 AEGL3_1hr	4.5E+03 AEGL2_1hr	7.5E+02 AEGL1_1hr	anxi conf derm dilated pupils dizz euph head insom irrit eyes irrit nose kidney damage lac lass liver damage musc ftg pares
Toluene 2,4-diisocyanate	584-84-9	3.6E+00 AEGL3_1hr	5.9E-01 AEGL2_1hr	1.4E-01 AEGL1_1hr	abdom pain asthma bron bronchospasm wheez carc chest pain choking conj conj conj derm

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dysp irrit irrit irrit irrit irrit irrit irrit eyes irrit nose irrit skin irrit throat lac lac nau paroxysmal cough pulm edema retster soreness skin sens vomit
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5	1.3E+01 TEEL3	1.3E+01 TEEL2	5.0E+00 TEEL1	
Toluene-2,4-diamine	95-80-7	2.5E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
					ataxia bluish skin carc convuls cyan derm dizz head irrit eyes irrit nose irrit skin irrit throat lass liver inj methemo

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					nau resp depres tacar vomit
Toluene-2,6-diamine	823-40-5	1.5E+02 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Toluene-d8	2037-26-5	1.5E+04 TEEL3	5.0E+03 TEEL2	7.5E+02 TEEL1	
Toluenediisocyanate, 2,6-	91-08-7	3.6E+00 AEGL3_1hr	5.9E-01 AEGL2_1hr	1.4E-01 AEGL1_1hr	
					irrit irrit irrit irrit irrit irrit irrit irrit irrit lac
Toluenesulfonyl chloride, p-	98-59-9	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Toluenesulphonic acid monohydrate, p-	6192-52-5	5.0E+02 TEEL3	2.0E+02 TEEL2	3.0E+01 TEEL1	
Toluenethiol, m-	108-40-7	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Toluidine, m-	108-44-1	2.0E+02 TEEL3	2.0E+02 TEEL2	3.5E+01 TEEL1	
					anemia convuls cyan derm hema irrit eyes irrit skin lass low BP methemo nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					vomit
Toluidine, p-	106-49-0	1.5E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
					anemia
					carc
					convuls
					cyan
					derm
					hema
					irrit eyes
					irrit skin
					lass
					low BP
					methemo
					nau
					vomit
Tolyltriazole, sodium salt	64665-57-2	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Toxaphene	8001-35-2	2.0E+02 TEEL3	2.0E+01 TEEL2	1.0E+00 TEEL1	
					agitation
					carc
					conf
					convuls
					dry skin
					nau
					reddening skin
					tremor
					uncon
Tranid	15271-41-7	1.9E+01 TEEL3	1.9E+01 TEEL2	1.0E+01 TEEL1	
Tri(2-butoxyethyl) phosphate	78-51-3	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Triacetin	102-76-1	5.0E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Triamiphos	1031-47-6	1.0E+01 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Triazofos	24017-47-8	1.3E+02 TEEL3	2.8E+00 TEEL2	1.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tribenzylamine	620-40-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tributyl (2,4-dichlorobenzyl) phosphonium chloride	115-78-6	7.5E+01 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Tributyl citrate	77-94-1	1.3E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Tributyl phosphate	126-73-8	3.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	head irrit eyes irrit resp sys irrit skin nau
Tributyl tetradecyl phosphonium chloride	81741-28-8	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Tributylamine	102-82-9	6.0E+01 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Tributylphosphine	998-40-3	3.0E+02 TEEL3	6.0E+01 TEEL2	7.5E+00 TEEL1	
Trichloro(dichlorophenyl) silane	27137-85-5	3.8E+02 AEGL3_1hr	8.4E+01 AEGL2_1hr	6.9E+00 AEGL1_1hr	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	1.5E+04 TEEL3	1.0E+04 TEEL2	1.0E+04 TEEL1	CNS depres derm drow in animals: card arrhy in animals: narco irrit skin irrit throat
Trichloro-2,2,2-trifluoroethane, 1,1,1-	354-58-5	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Trichloroacetic acid	76-03-9	1.5E+02 TEEL3	1.5E+01 TEEL2	6.7E+00 TLV_TWA_irr*	cough delayed pulm edema derm diarr dysp

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					eye burns irrit eyes irrit nose irrit resp sys irrit skin irrit throat salv skin burns vomit
Trichloroacetyl chloride	76-02-8	5.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Trichlorobenzene, 1,2,3-	87-61-6	5.0E+02 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	
Trichlorobenzene, 1,2,4-	120-82-1	3.0E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
					in animals: kidney damage in animals: liver damage in animals: possible terato effects irrit eyes irrit muc memb irrit skin
Trichloroethane, 1,1,1-	71-55-6	2.3E+04 AEGL3_1hr	3.3E+03 AEGL2_1hr	1.3E+03 AEGL1_1hr	
					card arrhy CNS depres derm head irrit eyes irrit skin lass liver damage poor equi
Trichloroethane, 1,1,2-	79-00-5	5.0E+02 TEEL3	7.5E+01 TEEL2	5.5E+01 TLV_TWA*	
					carc CNS depres derm irrit eyes irrit nose kidney damage

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					liver damage
Trichloroethylene	79-01-6	2.0E+04 AEGL3_1hr	2.4E+03 AEGL2_1hr	7.0E+02 AEGL1_1hr	carc card arrhy derm dizz drow head irrit eyes irrit skin lass liver inj nau pares tremor vis dist vomit
Trichloroethylsilane	115-21-9	2.2E+02 AEGL3_1hr	4.9E+01 AEGL2_1hr	4.0E+00 AEGL1_1hr	
Trichlorofluoromethane	75-69-4	1.0E+04 TEEL3	7.5E+03 TEEL2	5.0E+03 TEEL1	asphy card arrest card arrhy derm inco liquid: frostbite tremor
Trichlorofon	52-68-6	5.0E+02 TEEL3	1.3E+01 TEEL2	3.0E+00 TEEL1	
Trichloroisocyanuric acid	87-90-1	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Trichloronaphthalene	1321-65-9	5.0E+01 TEEL3	2.5E+01 TEEL2	1.5E+01 TEEL1	anor dizz jaun liver inj nau

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Trichloronate	327-98-0F	3.0E+02 TEEL3	1.0E+01 TEEL2	6.0E+00 TEEL1	
Trichlorophenol, 2,3,6-	933-75-5	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Trichlorophenol, 2,4,5-	95-95-4	3.5E+02 TEEL3	3.5E+02 TEEL2	3.0E+01 TEEL1	
Trichlorophenol, 2,4,6-	88-06-2	3.5E+02 TEEL3	3.5E+02 TEEL2	1.0E+02 TEEL1	
Trichlorophenoxyacetic acid	93-76-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	acne-like rash in animals: ataxia irrit skin liver damage
Trichlorophenylsilane	98-13-5	2.9E+02 AEGL3_1hr	6.3E+01 AEGL2_1hr	5.2E+00 AEGL1_1hr	
Trichloropropane, 1,2,3-	96-18-4	6.0E+02 TEEL3	3.0E+02 TEEL2	1.5E+02 TEEL1	carc CNS depres in animals: kidney inj in animals: liver inj irrit eyes irrit nose irrit throat
Trichlorosilane	10025-78-2	1.8E+02 TEEL3	4.0E+01 TEEL2	3.3E+00 TEEL1	
Tricresol	1319-77-3	1.0E+03 TEEL3	1.0E+02 TEEL2	6.0E+01 TEEL1	
Tridecane	629-50-5	5.0E+01 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Tridodecylamine	102-87-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Triethanolamine	102-71-6	5.0E+02 TEEL3	2.0E+01 TEEL2	5.0E+00 TEEL1	
Triethoxysilane	998-30-1	6.7E+01 ERPG3	2.7E+01 ERPG2	3.4E+00 ERPG1	
Triethoxyvinylsilane	78-08-0	1.3E+04 TEEL3	2.5E+03 TEEL2	4.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Triethyl phosphate	78-40-0	5.0E+02 TEEL3	5.0E+02 TEEL2	2.0E+02 TEEL1	
Triethyl phosphite	122-52-1	1.5E+03 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Triethylaluminum	97-93-8	2.5E+02 TEEL3	5.0E+01 TEEL2	8.5E+00 TEEL1	
Triethylamine	121-44-8	7.5E+02 TEEL3	1.3E+01 TEEL2	1.3E+01 TEEL1	in animals: kidney damage in animals: liver damage in animals: myocardial damage irrit eyes irrit resp sys irrit skin
Triethylammonium bicarbonate	15715-58-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Triethylbenzenes	25340-18-5	4.0E+03 TEEL3	7.5E+02 TEEL2	1.3E+02 TEEL1	
Triethylene glycol	112-27-6	5.0E+02 TEEL3	5.0E+02 TEEL2	5.0E+02 TEEL1	
Triethylene glycol dimethacrylate	109-16-0	5.0E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Triethylene glycol monomethyl ether	112-35-6	5.0E+02 TEEL3	5.0E+02 TEEL2	1.3E+02 TEEL1	
Triethylenetetramine	112-24-3	1.0E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	
Triethyloxonium tetrafluoroborate	368-39-8	5.0E+02 TEEL3	3.1E+01 TEEL2	1.9E+01 TEEL1	
Triethylphosphorothionate	126-68-1	1.3E+02 TEEL3	2.5E+01 TEEL2	4.0E+00 TEEL1	
Trifluoroacetaldehyde hydrate	421-53-4	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	
Trifluoroacetic acid	76-05-1	7.5E+01 TEEL3	7.5E+01 TEEL2	7.5E+01 TEEL1	
Trifluoroacetic acid anhydride	407-25-0	4.6E+02 TEEL3	2.3E+01 TEEL2	1.4E+01 TEEL1	
Trifluoroacetyl chloride	354-32-5	1.3E+03 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Trifluorobromomethane	75-63-8	2.5E+05 TEEL3	1.5E+05 TEEL2	2.0E+04 TEEL1	card arrhy dizz liquid: frostbite
Trifluoroethanol, 2,2,2-	75-89-8	2.5E+02 TEEL3	2.5E+02 TEEL2	3.5E+01 TEEL1	
Trifluoromethanesulfonic acid	1493-13-6	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Trifluoromethanesulfonic anhydride	358-23-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Trifluoromethyl iodide	2314-97-8	3.5E+04 TEEL3	3.5E+04 TEEL2	3.5E+04 TEEL1	
Trifluoromethylaniline, 3-	98-16-8	1.5E+02 TEEL3	4.4E+00 TEEL2	2.5E+00 TEEL1	
Trifluralin	1582-09-8	3.0E+02 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	
Triisobutyl aluminum	100-99-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Trilauryl phosphite	3076-63-9	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Trimethoxy(3,3,3-fluoropropyl) silane	429-60-7	5.0E+02 TEEL3	5.0E+01 TEEL2	2.9E+01 TEEL1	
Trimethoxyboroxine	102-24-9	5.0E+02 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Trimethoxysilane	2487-90-3	1.2E+01 AEGL3_1hr	4.1E+00 AEGL2_1hr	2.5E+00 ERPG1	
Trimethyl borate	121-43-7	2.5E+03 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Trimethyl N', 2-hydroxyethyl-propylenediamine	82136-26-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Trimethyl octane	98060-52-7	6.0E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Trimethyl phosphate	512-56-1	3.5E+02 TEEL3	3.5E+02 TEEL2	7.5E+01 TEEL1	
Trimethyl phosphite	121-45-9	1.6E+03 AEGL3_1hr	3.1E+02 AEGL2_1hr	3.1E+01 AEGL1_1hr	derm in animals: terato effects

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit skin irrit upper resp sys
Trimethyl-1,3-pentanediol monoisobutyrate, 2,2,4-	25265-77-4	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Trimethylacetic acid	75-98-9	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Trimethylacetyl chloride	3282-30-2	7.9E+00 AEGL3_1hr	2.6E+00 AEGL2_1hr	1.5E+00 TEEL1	
Trimethylaluminum	75-24-1	1.3E+02 TEEL3	2.7E+01 TEEL2	1.6E+01 TEEL1	
Trimethylamine	75-50-3	9.2E+02 AEGL3_1hr	2.9E+02 AEGL2_1hr	1.9E+01 AEGL1_1hr	blurred vision corn nec cough delayed pulm edema dysp irrit eyes irrit nose irrit resp sys irrit skin irrit throat liquid: frostbite skin burns
Trimethylammonium chloride	75-57-0	2.0E+01 TEEL3	4.0E+00 TEEL2	6.0E-01 TEEL1	
Trimethylaniline, 2,4,6-	88-05-1	4.0E+01 TEEL3	2.9E+00 TEEL2	4.0E-01 TEEL1	
Trimethylbenzene, 1,2,3-	526-73-8	7.5E+03 TEEL3	1.8E+03 AEGL2_1hr	6.9E+02 AEGL1_1hr	bron chemical pneu (aspir liquid) conf dizz drow head hypochromic anemia inco

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit eyes irrit nose irrit resp sys irrit skin irrit throat lass nau vomit
Trimethylbenzene, 1,2,4-	95-63-6	7.5E+03 TEEL3	1.8E+03 AEGL2_1hr	6.9E+02 AEGL1_1hr	 bron chemical pneu (aspir liquid) conf dizz drow head hypochromic anemia inco irrit eyes irrit nose irrit resp sys irrit skin irrit throat lass nau vomit
Trimethylbenzene, 1,3,5-	108-67-8	2.5E+03 TEEL3	1.8E+03 AEGL2_1hr	6.9E+02 AEGL1_1hr	 bron chemical pneu (aspir liquid) conf dizz drow head hypochromic anemia inco irrit eyes irrit nose

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					irrit resp sys irrit skin irrit throat lass nau vomit
Trimethylchlorosilane	75-77-4	4.4E+02 AEGL3_1hr	9.8E+01 AEGL2_1hr	8.0E+00 AEGL1_1hr	
Trimethylene oxide	503-30-0	7.5E+01 TEEL3	2.0E+00 TEEL2	3.0E-01 TEEL1	
Trimethylgallium	1445-79-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Trimethylhexane, 2,2,5-	3522-94-9	7.5E+03 TEEL3	1.5E+03 TEEL2	3.5E+02 TEEL1	
Trimethylolpropane ethoxylate	50586-59-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Trimethylolpropane phosphite	824-11-3	6.0E+00 TEEL3	2.5E+00 TEEL2	3.5E-01 TEEL1	
Trimethylopropane methylated copolymer	71342-93-3	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Trimethylpentane, 2,2,4-	540-84-1	4.0E+03 TEEL3	1.5E+03 TEEL2	1.5E+03 TEEL1	
Trimethylphosphine	594-09-2	3.5E+01 TEEL3	6.0E+00 TEEL2	1.0E+00 TEEL1	
Trimethylpyridine, 2,4,6-	108-75-8	7.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Trimethylsilanol	1066-40-6	1.5E+01 TEEL3	7.5E+00 TEEL2	1.5E+00 TEEL1	
Trimethylsilylmethyllithium	1822-00-0	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Trimethyltin chloride	1066-45-1	4.2E+01 TEEL3	2.0E+01 TEEL2	3.4E-01 TEEL1	
Trinitrobenzene, 1,3,5-	99-35-4	1.3E+02 TEEL3	2.5E+01 TEEL2	3.5E+00 TEEL1	
Trinitrochlorobenzene	28260-61-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Trinitrophenylmethylnitramine	479-45-8	5.0E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					anemia coryza cough edema on cheeks edema on nasal folds edema on neck eryt head insom irrity itch kera kidney damage lass lass liver damage mal nau sens derm sneez vomit
Trinitrotoluene, 2,4,6-	118-96-7	5.0E+02 TEEL3	7.5E+00 TEEL2	1.3E+00 TEEL1	anemia card irreg cataract cough cyan irrit muc memb irrit skin jaun kidney damage leucyt liver damage musc pain peri neur sens derm sneez

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					sore throat
Trioctylamine	1116-76-3	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Trioctylphosphine	4731-53-7	5.0E+01 TEEL3	1.0E+01 TEEL2	1.5E+00 TEEL1	
Trioctylphosphine oxide	78-50-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Triorthocresyl phosphate	78-30-8	6.0E+02 TEEL3	7.5E+00 TEEL2	4.0E+00 TEEL1	
					cramps in calves GI dist para pares in feet or hands peri neur weak feet wrist drop
Tripentaerythritol	78-24-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Triphenyl phosphate	115-86-6	5.0E+02 TEEL3	5.0E+02 TEEL2	9.0E+00 TEEL1	
					in animals: musc weak in animals: para minor changes in blood enzymes
Triphenyl phosphine	603-35-0	5.0E+02 TEEL3	4.0E+01 TEEL2	5.0E+00 TEEL1	
Triphenyl phosphite	101-02-0	2.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Triphenylborane	960-71-4	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Triphenylethoxysilane	1516-80-9	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Triphenylolmethane triglycidyl ether	66072-38-6	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Triphenyltin acetate	900-95-8	8.6E+01 TEEL3	2.0E+01 TEEL2	6.9E-01 TEEL1	
Triphenyltin chloride	639-58-7	8.1E+01 TEEL3	2.0E+01 TEEL2	6.5E-01 TEEL1	
Tripropyl phosphate	513-08-6	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Tripropylamine	102-69-2	2.0E+03 TEEL3	4.0E+02 TEEL2	6.0E+01 TEEL1	
Tripropylene glycol	1638-16-0	1.5E+03 TEEL3	7.5E-01 TEEL2	1.3E-01 TEEL1	
Tripropylene glycol monomethyl ether	25498-49-1	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Tris(2-aminoethyl)amine	4097-89-6	1.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Tris(2-chloroethyl)amine	555-77-1	3.7E-01 AEGL3_1hr	2.2E-02 AEGL2_1hr	3.0E-03 TEEL1	
Tris(2-chloroethyl)phosphate	115-96-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.0E+01 TEEL1	
Tris(2-ethylhexyl)phosphate	78-42-2	1.3E+01 TEEL3	1.3E+01 TEEL2	1.3E+01 TEEL1	
Tris(dimethylaminomethyl)phenol, 2,4,6-	90-72-2	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Tris(hydroxymethyl) aminomethane hydrochloride	1185-53-1	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Tris(hydroxymethyl)aminomethane	77-86-1	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Trisodium arsenate	13464-38-5	1.4E+01 TEEL3	1.4E-01 TEEL2	8.3E-02 TEEL1	
Trisodium citrate	68-04-2	6.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Trisodium ethylenediaminetriacetate	139-89-9	4.0E+02 TEEL3	7.5E+01 TEEL2	1.3E+01 TEEL1	
Triton X-100	9002-93-1	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	
Triuranium octaoxide	1344-59-8	5.0E+01 ERPG3	1.0E+01 ERPG2	7.1E-01 TEEL1	
Trizma acetate	6850-28-8	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	
Trypan blue	72-57-1	5.0E+02 TEEL3	5.0E-01 TEEL2	7.5E-02 TEEL1	
Trypsin	9002-07-7	3.0E+01 TEEL3	6.0E-01 TEEL2	7.5E-02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Trypsinogen	9002-08-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Tungslosilicic acid	11130-20-4	1.5E+02 TEEL3	3.3E+01 TEEL2	1.3E+01 TEEL1	
Tungsten	7440-33-7	5.0E+02 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	blood changes cough diffuse pulm fib irrit eyes irrit resp sys irrit skin loss of appetite nau
Tungsten (IV) oxide	12036-22-5	1.5E+02 TEEL3	3.0E+01 TEEL2	1.2E+01 TEEL1	
Tungsten boride	12007-09-9	1.3E+02 TEEL3	2.7E+01 TEEL2	1.1E+01 TEEL1	
Tungsten carbide	12070-12-1	1.3E+02 TEEL3	2.7E+01 TEEL2	1.1E+01 TEEL1	blood changes cough diffuse pulm fib irrit eyes irrit resp sys irrit skin loss of appetite nau possible skin sens to cobalt possible skin sens to nickel
Tungsten hexafluoride	7783-82-6	4.0E+01 TEEL3	8.1E+00 TEEL2	4.9E+00 TEEL1	
Tungsten trioxide	1314-35-8	4.0E+02 TEEL3	4.0E+02 TEEL2	1.3E+01 TEEL1	
Tungsten(iv) chloride	13470-13-8	4.0E+01 TEEL3	8.9E+00 TEEL2	5.3E+00 TEEL1	
Tungstic acid	7783-03-1	1.5E+02 TEEL3	3.5E+01 TEEL2	1.4E+01 TEEL1	
Turpentine	8006-64-2	4.0E+03 TEEL3	1.1E+02 TLV_TWA_irr*	1.1E+02 TLV_TWA_irr*	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					abdom pain chemical pneu (aspir liquid) convuls diarr dizz head hema irrit eyes irrit nose irrit skin irrit throat kidney damage nau prot skin sens vomit
Undecane	1120-21-4	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Undecanone, 2-	112-12-9	2.0E+03 TEEL3	3.0E+01 TEEL2	4.0E+00 TEEL1	
Uranine	518-47-8	5.0E+02 TEEL3	2.5E+02 TEEL2	4.0E+01 TEEL1	
Uranium	7440-61-1	1.0E+01 TEEL3	2.0E+00 TEEL2	6.0E-01 TEEL1	blood changes carc. Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g. radon) derm in animals: lung damage in animals: lymph node damage kidney damage
Uranium dioxide	1344-57-6	3.0E+01 ERPG3	1.0E+01 ERPG2	6.8E-01 TEEL1	
Uranium hexafluoride	7783-81-5	3.6E+01 AEGL3_1hr	9.6E+00 AEGL2_1hr	3.6E+00 AEGL1_1hr	inj
Uranium oxide	1344-58-7	3.0E+00 ERPG3	5.0E-01 ERPG2	5.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Uranium telluride A	0-317*	1.7E+01 TEEL3	3.5E+00 TEEL2	1.0E+00 TEEL1	
Uranium, highly soluble salts	HZ1800-90-T	1.0E+01 TEEL3	2.0E+00 TEEL2	6.0E-01 TEEL1	carc. Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g. radon) casts in urine chest rales conj cough high BUN lac nau prot RBC in urine short breath skin burns vomit
Uranium, insoluble compounds	0-149*	1.0E+01 TEEL3	2.0E+00 TEEL2	6.0E-01 TEEL1	
Uranyl acetate	541-09-3	1.8E+01 TEEL3	3.5E+00 TEEL2	1.1E+00 TEEL1	
Uranyl fluoride	13536-84-0	1.3E+01 TEEL3	2.5E+00 TEEL2	7.8E-01 TEEL1	
Uranyl nitrate	10102-06-4	1.7E+01 TEEL3	3.0E+00 TEEL2	9.9E-01 TEEL1	
Uranyl nitrate hexahydrate	13520-83-7	2.1E+01 TEEL3	1.3E+00 TEEL2	1.3E+00 TEEL1	
Urea	57-13-6	5.0E+02 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	
Urea peroxide	124-43-6	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Urea, substituted	17526-94-2	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Valeric acid	109-52-4	5.0E+02 TEEL3	5.0E+02 TEEL2	7.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Valinomycin	2001-95-8	2.5E+00 TEEL3	2.5E+00 TEEL2	1.5E+00 TEEL1	
Vanadium	7440-62-2	3.5E+01 TEEL3	5.0E-01 TEEL2	7.5E-02 TEEL1	
Vanadium (III) sulfate	13701-70-7	1.3E+02 TEEL3	1.9E-01 TEEL2	2.5E-02 TEEL1	
Vanadium pentoxide	1314-62-1	3.5E+01 TEEL3	7.0E+00 TEEL2	1.0E+00 TEEL1	bron bron cough cough drow dysp eczema eczema fine rales fine rales green tongue green tongue irrit eyes irrit skin irrit throat irrit throat metallic taste metallic taste wheez wheez
Vanadium sulfate	16785-81-2	3.1E+02 TEEL3	4.5E+00 TEEL2	6.0E-01 TEEL1	
Vanadium tetrachloride	7632-51-1	1.3E+02 TEEL3	1.9E-01 TEEL2	2.5E-02 TEEL1	
Vanadium trioxide	1314-34-7	5.2E+01 TEEL3	7.4E+00 TEEL2	1.0E+00 TEEL1	
Vanadium, trichlorooxo	7727-18-6	7.5E+02 TEEL3	1.3E+00 TEEL2	1.5E-01 TEEL1	
Vanadyl sulfate	27774-13-6	1.1E+02 TEEL3	1.6E+00 TEEL2	2.0E-01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Vegetable oil mist	68956-68-3	5.0E+02 TEEL3	7.5E+01 TEEL2	4.5E+01 TEEL1	irrit eyes irrit resp sys irrit skin lac
Veratraldehyde	120-14-9	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Vermiculite, exfoliated	1318-00-9	2.5E+01 TEEL3	5.0E+00 TEEL2	5.0E+00 TEEL1	
Vinyl acetate	108-05-4	2.1E+03 AEGL3_1hr	6.3E+02 AEGL2_1hr	2.4E+01 AEGL1_1hr	cough eye burns hoarseness irrit eyes irrit nose irrit skin irrit throat loss of smell skin blisters
Vinyl acetate-vinyl chloride copolymers	9003-22-9	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+02 TEEL1	
Vinyl chloride	75-01-4	1.2E+04 AEGL3_1hr	3.1E+03 AEGL2_1hr	6.4E+02 AEGL1_1hr	abdom pain carc enlarged liver GI bleeding lass liquid: frostbite pallor or cyan of extremities
Vinyl cyclohexene dioxide	106-87-6	5.0E+02 TEEL3	1.3E+01 TEEL2	2.0E+00 TEEL1	in animals: carc in animals: irrit eyes in animals: irrit resp sys in animals: irrit skin in animals: leupen in animals: nec thymus in animals: skin sens

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: testicular atrophy
Vinyl ethyl ether	109-92-2	5.0E+03 TEEL3	1.0E+03 TEEL2	1.5E+02 TEEL1	
Vinyl fluoride	75-02-5	1.5E+05 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	conf dizz head inco liquid: frostbite narco nau vomit
Vinyl sulfoxide	1115-15-7	7.5E+01 TEEL3	1.5E+01 TEEL2	2.5E+00 TEEL1	
Vinyl Terminated Dimethyl-Diphenylsiloxane Copolymer	68951-96-2	5.0E+02 TEEL3	5.0E+02 TEEL2	2.5E+02 TEEL1	
Vinyl trichlorosilane	75-94-5	2.2E+02 AEGL3_1hr	4.8E+01 AEGL2_1hr	4.0E+00 AEGL1_1hr	
Vinyl-2-pyrrolidone, N-	88-12-0	3.5E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Vinylbenzylchloride	1592-20-7	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Vinylcyclohexene, 4-	100-40-3	1.5E+04 TEEL3	2.0E+02 TEEL2	1.3E+00 TEEL1	
Vinylidene fluoride	75-38-7	1.5E+05 TEEL3	6.0E+03 TEEL2	4.0E+03 TEEL1	dizz head liquid: frostbite nau
Vinylmagnesium bromide	1826-67-1	1.5E+02 TEEL3	3.5E+01 TEEL2	5.0E+00 TEEL1	
Vinylpyrrolidone/vinyl acetate copolymer	25086-89-9	2.5E+02 TEEL3	2.5E+02 TEEL2	2.5E+02 TEEL1	
Vinyltrimethoxysilane	2768-02-7	7.5E+03 TEEL3	7.5E+03 TEEL2	2.5E+03 TEEL1	
Virginia refrigeration oil 150 and 300	64742-52-5	5.0E+02 TEEL3	3.0E+02 TEEL2	4.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Warfarin	81-81-2	1.0E+02 TEEL3	2.0E+01 TEEL2	3.0E-01 TEEL1	abdom pain abnor hematologic indices back pain bleeding lips epis fecal blood hema hematoma arms hematoma legs muc memb hemorr petechial rash vomit
Warfarin sodium	129-06-6	9.0E+00 TEEL3	9.0E+00 TEEL2	5.0E+00 TEEL1	
Wax	71808-29-2	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Xenon	7440-63-3	2.0E+06 TEEL3	1.3E+06 TEEL2	3.5E+05 TEEL1	
Xylene, m-	108-38-3	4.0E+03 TEEL3	7.5E+02 TEEL2	6.0E+02 TEEL1	abdom pain anor corn vacuolization derm dizz drow excitement inco irrit eyes irrit nose irrit skin irrit throat nau staggering gait vomit
Xylene, o-	95-47-6	4.0E+03 TEEL3	7.5E+02 TEEL2	6.0E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					abdom pain anor corn vacuolization derm dizz drow excitement inco irrit eyes irrit nose irrit skin irrit throat nau staggering gait vomit
Xylene, p-	106-42-3	4.0E+03 TEEL3	7.5E+02 TEEL2	6.0E+02 TEEL1	abdom pain anor corn vacuolization derm dizz drow excitement inco irrit eyes irrit nose irrit skin irrit throat nau staggering gait vomit
Xylenes, total	1330-20-7	1.1E+04 AEGL3_1hr	4.0E+03 AEGL2_1hr	5.6E+02 AEGL1_1hr	
Xylenol orange tetrasodium salt	3618-43-7	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Xylidine	1300-73-8	2.5E+02 TEEL3	1.3E+01 TEEL2	7.5E+00 TEEL1	anoxia

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					cyan kidney damage liver damage lung damage methemo
Xylidine, 2,3-	87-59-2	4.0E+02 TEEL3	7.5E+01 TEEL2	1.0E+01 TEEL1	
Xylidine, 2,6-	87-62-7	3.5E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Xylylene dichloride	28347-13-9	7.5E+01 TEEL3	2.0E+00 TEEL2	1.3E+00 TEEL1	
Yeast extract	8013-01-2	5.0E+02 TEEL3	4.0E+02 TEEL2	5.0E+01 TEEL1	
Ytterbium fluoride	13760-80-0	5.0E+02 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	
Ytterbium oxide	1314-37-0	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Yttrium	7440-65-5	5.0E+02 TEEL3	5.0E+00 TEEL2	3.0E+00 TEEL1	
					in animals: eye inj in animals: possible liver damage in animals: pulm irrit irrit eyes
Yttrium chloride, hexahydrate	10025-94-2	5.0E+02 TEEL3	5.0E+02 TEEL2	1.0E+01 TEEL1	
Yttrium trioxide	1314-36-9	5.0E+02 TEEL3	4.0E+01 TEEL2	3.8E+00 TEEL1	
Zeolites, CaA	68989-20-8	5.0E+02 TEEL3	1.5E+02 TEEL2	2.5E+01 TEEL1	
Zeolites, NaA	68989-22-0	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Zinc acetate	557-34-6	5.0E+02 TEEL3	6.0E+00 TEEL2	7.5E-01 TEEL1	
Zinc acetate dihydrate	5970-45-6	3.5E+02 TEEL3	3.5E+02 TEEL2	7.5E+01 TEEL1	
Zinc bromide	7699-45-8	2.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Zinc carbonate	3486-35-9	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
Zinc carbonate hydroxide	5263-02-5	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Zinc chloride fume	7646-85-7	5.0E+01 TEEL3	5.0E+01 TEEL2	2.0E+00 TEEL1	chest pain conj copious sputum cor pulmonale cough cyan dysp fever irrit eyes irrit nose irrit skin irrit throat pneu pulm edema pulm fib skin burns tachypnea
Zinc chromate	13530-65-9	1.5E+01 TEEL3	1.0E+00 TEEL2	1.5E-01 TEEL1	
Zinc cyanide	557-21-1	1.1E+02 TEEL3	2.3E+01 TEEL2	2.3E+01 TEEL1	
Zinc fluoride	7783-49-5	5.0E+02 TEEL3	1.3E+02 TEEL2	2.0E+01 TEEL1	
Zinc hydroxide	20427-58-1	6.0E+01 TEEL3	1.5E+00 TEEL2	6.0E-01 TEEL1	
Zinc nitrate	7779-88-6	5.0E+02 TEEL3	1.3E+02 TEEL2	1.5E+01 TEEL1	
Zinc nitrate hexahydrate	10196-18-6	5.0E+02 TEEL3	1.0E+02 TEEL2	1.5E+01 TEEL1	
Zinc oxide	1314-13-2	5.0E+02 TEEL3	1.5E+01 TEEL2	1.0E+01 TEEL1	blurred vision chest tight decr pulm func

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					dysp head lass lass low back pain mal metal fume fever: chills metal fume fever: cough metal fume fever: dry throat metal fume fever: fever metal fume fever: musc ache metal fume fever: nau metallic taste rales vomit
Zinc perchlorate	13637-61-1	2.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	
Zinc perchlorate hexahydrate	10025-64-6	6.0E+01 TEEL3	1.3E+01 TEEL2	1.5E+00 TEEL1	
Zinc phenolsulfonate	127-82-2	5.0E+02 TEEL3	1.5E+01 TEEL2	2.0E+00 TEEL1	
Zinc phosphate	7779-90-0	2.5E+02 TEEL3	5.0E+01 TEEL2	6.0E+00 TEEL1	
Zinc phosphide	1314-84-7	1.9E+01 AEGL3_1hr	1.1E+01 AEGL2_1hr	1.5E+00 TEEL1	
Zinc stearate	557-05-1	1.5E+02 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	cough irrit eyes irrit skin irrit upper resp sys
Zinc sulfate	7733-02-0	5.0E+02 TEEL3	3.5E+00 TEEL2	5.0E-01 TEEL1	
Zinc sulfate heptahydrate	7446-20-0	2.0E+02 TEEL3	2.0E+02 TEEL2	2.0E+02 TEEL1	
Zinc, metallic	7440-66-6	5.0E+02 TEEL3	4.0E+01 TEEL2	6.0E+00 TEEL1	
Zirconium	7440-67-7	5.0E+01 TEEL3	1.0E+01 TEEL2	1.0E+01 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	CASRN	AMEG_1hCRIT	AMEG_1hMARG	AMEG_1hNEG	Health Effects
					in animals: irrit muc memb in animals: irrit skin lung granulomas skin granulomas X-ray evidence of retention in lungs
Zirconium boride	12045-64-6	6.2E+01 TEEL3	6.2E+01 TEEL2	1.2E+01 TEEL1	
Zirconium carbide	12070-14-3	6.3E+01 TEEL3	1.3E+01 TEEL2	1.3E+01 TEEL1	
Zirconium chloride	10026-11-6	1.3E+02 TEEL3	2.6E+01 TEEL2	2.6E+01 TEEL1	
Zirconium dinitrate oxide hydrate	14985-18-3	1.4E+02 TEEL3	2.7E+01 TEEL2	2.7E+01 TEEL1	
Zirconium fluoride	7783-64-4	5.0E+02 TEEL3	1.1E+02 TEEL2	6.6E+01 TEEL1	
Zirconium hydride	7704-99-6	5.1E+01 TEEL3	5.1E+01 TEEL2	1.0E+01 TEEL1	
Zirconium hydroxide	14475-63-9	8.7E+01 TEEL3	1.8E+01 TEEL2	1.8E+01 TEEL1	
Zirconium nitrate	13746-89-9	1.9E+02 TEEL3	3.7E+01 TEEL2	3.7E+01 TEEL1	
Zirconium nitride	25658-42-8	5.8E+01 TEEL3	1.2E+01 TEEL2	1.2E+01 TEEL1	
Zirconium oxide	1314-23-4	6.8E+01 TEEL3	1.4E+01 TEEL2	1.4E+01 TEEL1	
Zirconium oxychloride octahydrate	13520-92-8	1.8E+02 TEEL3	3.5E+01 TEEL2	3.5E+01 TEEL1	
Zirconium potassium fluoride	16923-95-8	5.0E+02 TEEL3	1.9E+02 TEEL2	1.1E+02 TEEL1	
Zirconium silicate	10101-52-7	1.0E+02 TEEL3	5.1E+01 TEEL2	2.1E+01 TEEL1	
Zirconyl chloride	7699-43-6	9.8E+01 TEEL3	9.8E+01 TEEL2	2.0E+01 TEEL1	
Zirconyl nitrate	13826-66-9	1.3E+02 TEEL3	2.5E+01 TEEL2	2.5E+01 TEEL1	
Zonyl FSN	65545-80-4	5.0E+02 TEEL3	5.0E+02 TEEL2	1.5E+02 TEEL1	

Table D-1: Basis for 1-Hour Air MEGs and Potential Health Effects

Chemical Name	*CASRN*	*AMEG_1hCRIT*	*AMEG_1hMARG*	*AMEG_1hNEG*	*Health Effects*

Units:
mg/m3 = milligrams per cubic meter

Notes:
All Air Military Exposure Guidelines (AMEGs) are provided in mg/m³ (asbestos and refractory ceramic fibers are in f/cc)
CASRN = Chemical Abstract Service Registry Number
AMEG_1hCRIT = 1-hour Critical Air MEG
AMEG_1hMARG = 1-hour Marginal Air MEG
AMEG_1hNEG = 1-hour Negligible Air MEG
TWA = Time Weighted Average
irr = irritant. Used to notate TLV_TWA values that were not adjusted for exposure duration for the Air MEGs

Sources:
AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2006)
ERPG = American Industrial Hygiene Association Emergency Response Planning Guidelines (AIHA 2005)
TEEL = U.S. Department of Energy Temporary Emergency Exposure Limits (DOE 2004)*
TLV = ACGIH Threshold Limit Value (ACGIH 2005)
CEGL = U.S. Navy/NRC Continuous Exposure Guidance Levels (U.S. Navy/NRC 2004)

* Air MEGs based on TEELs should be considered interim values. The TEELs do not undergo the rigorous peer review of AEGLs and ERPGs, are subject to change, and are intended to serve as interim values until AEGLs or ERPGs are published AMEGs based on TEELs carry a higher level of uncertainty.

Health Effects data was obtained from the National Institute of Occupational Safety and Health Pocket Guide (NIOSH 1997).
Health Effects terms are defined in Table B-2 of Appendix B.

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
2,2-Dimethylpentane	590-35-2	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
2,3-Dimethylpentane	565-59-3	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
2,4-Dimethylpentane	108-08-7	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
2-Methylhexane	591-76-4	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
3-Carene	13466-78-9	1.1E+02	TLV_TWA	2.7E+01	TLV_TWA
3-Methylhexane	589-34-4	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
Acetaldehyde	75-07-0	8.1E+01	AEGL1_8hr	3.6E+00	CEGL
Acetic acid	64-19-7	1.2E+01	ERPG1*	8.4E+00	TLV_TWA_irr
Acetic acid 2-methylbutyl ester	624-41-9	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Acetone	67-64-1	4.7E+02	AEGL1_8hr	4.7E+02	CEGL
Acetone cyanohydrin	75-86-5	3.5E+00	AEGL1_8hr		
Acetonitrile	75-05-8	2.2E+01	AEGL1_8hr	8.2E+00	TLV_TWA
Acetophenone	98-86-2	4.9E+01	TLV_TWA_irr	1.7E+01	TLV_TWA_irr
Acetylene tetrabromide	79-27-6	1.4E+00	TLV_TWA	3.5E-01	TLV_TWA
Acetylsalicylic acid	50-78-2	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Acrolein	107-02-8	7.0E-02	AEGL1_8hr*	4.6E-02	CEGL
Acrylamide	79-06-1	3.0E-02	TLV_TWA	7.3E-03	TLV_TWA
Acrylic acid	79-10-7	4.4E+00	AEGL1_8hr	2.0E+00	TLV_TWA_irr
Acrylonitrile	107-13-1	4.3E+00	TLV-TWA*	1.5E-01	MRLi_acute
Adamsite	578-94-9	8.3E-04	AEGL1_8hr		
Adipic acid	124-04-9	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Adiponitrile	111-69-3	8.8E+00	TLV_TWA	2.2E+00	TLV_TWA
Alachlor	15972-60-8	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Aldrin	309-00-2	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Allyl alcohol	107-18-6	5.0E+00	AEGL1_8hr*	4.1E-01	TLV_TWA_irr
Allyl chloride	107-05-1	8.8E+00	AEGL1_8hr	7.7E-01	TLV_TWA
Allyl glycidyl ether	106-92-3	4.7E+00	TLV_TWA_irr	1.6E+00	TLV_TWA_irr
Allyl propyl disulfide	2179-59-1	3.0E+00	TLV_TWA_irr	1.0E+00	TLV_TWA_irr
Allylamine	107-11-9	9.8E-01	AEGL1_8hr		
Allyltrichlorosilane	107-37-9	4.3E+00	AEGL1_8hr		
Aluminum, elemental	7429-90-5	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Aminopyridine, 2-	504-29-0	1.9E+00	TLV_TWA	4.7E-01	TLV_TWA
Amitrole	61-82-5	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Ammonia	7664-41-7	2.1E+01	AEGL1_8hr*	7.0E+00	CEGL

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Ammonium chloride	12125-02-9	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Ammonium perfluorooctanoate	3825-26-1	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Ammonium sulfamate	7773-06-0	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Amyl acetate	628-63-7	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Amyl acetate, sec-	626-38-0	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Amyltrichlorosilane	107-72-2	5.0E+00	AEGL1_8hr		
Aniline	62-53-3	3.8E+00	AEGL1_8hr	1.9E+00	TLV_TWA
Anisidine, o-	90-04-0	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Anisidine, p-	104-94-9	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Antimony, elemental	7440-36-0	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
ANTU	86-88-4	3.0E-01	TLV_TWA_irr	1.0E-01	TLV_TWA_irr
Aroclor 1242	53469-21-9	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Aroclor 1254	11097-69-1	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Arsenic compounds	As cmpds	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Arsine	7784-42-1	1.6E-02	TLV_TWA*	3.9E-03	TLV_TWA
Asphalt	8052-42-4	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Atrazine	1912-24-9	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Azinphos methyl	86-50-0	2.0E-01	TLV_TWA	1.4E-02	MRLi_acute
Barium sulfate	7727-43-7	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Barium, elemental	7440-39-3	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Baygon	114-26-1	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Benomyl	17804-35-2	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Benzene	71-43-2	2.9E+01	AEGL1_8hr	6.4E-01	CEGL
Benzenethiol	108-98-5	4.5E-01	TLV_TWA_irr	1.5E-01	TLV_TWA_irr
Benzoyl peroxide	94-36-0	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Benzyl acetate	140-11-4	6.1E+01	TLV_TWA_irr	2.1E+01	TLV_TWA_irr
Benzyl chloride	100-44-7	5.2E+00	TLV_TWA_irr	1.8E+00	TLV_TWA_irr
Beryllium, elemental	7440-41-7	5.0E-05	TLV_TWA	1.4E-05	IRIS_sub*
beta-Pinene	127-91-3	1.1E+02	TLV_TWA	2.7E+01	TLV_TWA
Bidrin	141-66-2	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Biphenyl, 1,1-	92-52-4	1.3E+00	TLV_TWA	3.1E-01	TLV_TWA
Bis(2-chloroethyl) ether	111-44-4	2.9E+01	TLV_TWA_irr	1.0E+01	TLV_TWA_irr
Bis(2-dimethylaminoethyl)ether	3033-62-3	3.3E-01	TLV_TWA_irr	1.1E-01	TLV_TWA_irr
Bis(2-ethylhexyl) phthalate	117-81-7	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Bis(chloromethyl) ether	542-88-1	4.7E-03	TLV_TWA_irr	1.6E-03	TLV_TWA_irr
Bismuth telluride	1304-82-1	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Borates, pentahydrate	12179-04-3	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Borax	1303-96-4	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Boric acid	10043-35-3	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Boron	7440-42-8			6.8E-03	MRLi_acute
Boron oxide	1303-86-2	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Boron tribromide	10294-33-4	3.4E+00	AEGL1_8hr		
Boron trifluoride	7637-07-2	2.5E+00	AEGL1_8hr*		
Bromacil	314-40-9	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Bromine	7726-95-6	2.2E-01	AEGL1_8hr	2.2E-01	TLVirr*
Bromine chloride	13863-41-7	2.4E+00	AEGL1_8hr		
Bromine pentafluoride	7789-30-2	7.2E-01	TLV_TWA_irr	2.5E-01	TLV_TWA_irr
Bromine trifluoride	7787-71-5	6.7E-01	AEGL1_8hr		
Bromoacetone	598-31-2	6.2E-02	AEGL1_8hr		
Bromochloromethane	74-97-5	1.1E+03	TLV_TWA	2.6E+02	TLV_TWA
Bromoethene	593-60-2	2.2E+00	TLV_TWA	5.4E-01	TLV_TWA
Bromoform	75-25-2	5.2E+00	TLV_TWA_irr	2.0E+00	TLV_TWA_irr*
Bromopropane, 1-	106-94-5	5.0E+01	TLV_TWA	1.2E+01	TLV_TWA
Butadiene, 1,3-	106-99-0	1.5E+03	AEGL1_8hr	1.5E-01	MRLi_acute
Butane	106-97-8	1.3E+04	AEGL1_8hr	5.8E+02	TLV_TWA
Butanethiol	109-79-5	1.8E+00	TLV_TWA_irr	6.3E-01	TLV_TWA_irr
Butanol, 1-	71-36-3	6.1E+01	TLV_TWA_irr	2.1E+01	TLV_TWA_irr
Butene	25167-67-3	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Butene, 1-	106-98-9	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Butene, 2-	107-01-7	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Butene, cis-2-	590-18-1	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Butene, trans-2-	624-64-6	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Butoxyethanol acetate, 2-	112-07-2	1.3E+02	TLV_TWA_irr	4.5E+01	TLV_TWA_irr
Butyl acetate, n-	123-86-4	2.4E+01	ERPG1*	2.4E+01	ERPG1*
Butyl acetate, sec-	105-46-4	9.5E+02	TLV_TWA_irr	3.3E+02	TLV_TWA_irr
Butyl acetate, tert-	540-88-5	9.5E+02	TLV_TWA_irr	3.3E+02	TLV_TWA_irr
Butyl acrylate, n-	141-32-2	4.4E+01	AEGL1_8hr	3.6E+00	TLV_TWA_irr
Butyl alcohol, sec-	78-92-2	3.0E+02	TLV_TWA_irr	1.0E+02	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Butyl glycidyl ether, n-	2426-08-6	1.6E+01	TLV_TWA	3.9E+00	TLV_TWA
Butyl isocyanate, n-	111-36-4	5.3E-02	AEGL1_8hr		
Butyl lactate, N-	138-22-7	3.0E+01	TLV_TWA_irr	1.0E+01	TLV_TWA_irr
Butylated hydroxytoluene	128-37-0	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Butylphenol, 2-sec-	89-72-5	3.1E+01	TLV_TWA_irr	1.1E+01	TLV_TWA_irr
Butyltoluene, p-tert-	98-51-1	6.1E+00	TLV_TWA_irr	2.1E+00	TLV_TWA_irr
Butyltrichlorosilane	7521-80-4	4.7E+00	AEGL1_8hr		
Cadmium, elemental	7440-43-9	4.1E-02	AEGL1_8hr	2.1E-05	MRLi_acute
Calcium chromate	13765-19-0	1.0E-03	TLV_TWA	2.4E-04	TLV_TWA
Calcium cyanamide	156-62-7	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Calcium cyanide	592-01-8	1.9E+00	AEGL1_8hr		
Calcium hydroxide	1305-62-0	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Calcium oxide	1305-78-8	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Calcium sulfate	7778-18-9	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Calcium sulfate dihydrate	10101-41-4	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Calcium sulfate hemihydrate	10034-76-1	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Camphor	76-22-2	1.2E+01	TLV_TWA_irr	4.3E+00	TLV_TWA_irr
Caprolactam	105-60-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Captafol	2425-06-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Captan	133-06-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Carbaryl	63-25-2	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Carbofuran	1563-66-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Carbon dioxide	124-38-9	1.4E+04	CEGL*	1.4E+04	CEGL
Carbon disulfide	75-15-0	2.1E+01	AEGL1_8hr	7.6E-01	TLV_TWA
Carbon monoxide	630-08-0	2.9E+01	TLV_TWA*	1.0E+01	CEGL
Carbon tetrabromide	558-13-4	1.4E+00	TLV_TWA_irr	4.6E-01	TLV_TWA_irr
Carbon tetrachloride	56-23-5	1.2E+02	AEGL1_8hr	7.7E+00	TLV_TWA
Carbonyl fluoride	353-50-4	7.6E-01	TEEL*		
Catechol	120-80-9	2.3E+01	TLV_TWA_irr	7.7E+00	TLV_TWA_irr
Cellulose	9004-34-6	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Cesium hydroxide	21351-79-1	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Chlordane	57-74-9	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Chlorinated diphenyl oxide	31242-93-0	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Chlorine	7782-50-5	1.5E+00	AEGL1_8hr*	2.9E-01	CEGL

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Chlorine dioxide	10049-04-4	2.8E-01	TLV_TWA_irr	9.4E-02	TLV_TWA_irr
Chlorine pentafluoride	13637-63-3	1.6E+00	AEGL1_8hr		
Chlorine trifluoride	7790-91-2	4.5E-01	AEGL1_8hr		
Chloro-1,3-butadiene	126-99-8	3.6E+01	TLV_TWA_irr	1.2E+01	TLV_TWA_irr
Chloroacetaldehyde	107-20-0	7.1E-01	AEGL1_8hr		
Chloroacetaldehyde	107-20-0	7.1E-01	AEGL1_8hr		
Chloroacetic acid	79-11-8	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Chloroacetophenone, 2-	532-27-4	3.2E-01	TLV_TWA_irr	1.1E-01	TLV_TWA_irr
Chloroacetyl chloride	79-04-9	1.8E-01	AEGL1_8hr	7.9E-02	TLV_TWA_irr
Chlorobenzene	108-90-7	4.6E+01	AEGL1_8hr	1.1E+01	TLV_TWA
Chlorobenzylidene malononitrile, o-	2698-41-1	5.0E-02	AEGL1_8hr		
Chlorodifluoromethane	75-45-6	3.5E+03	TLV_TWA	8.7E+02	TLV_TWA
Chloroform	67-66-3	4.9E+01	TLV_TWA	4.9E+00	CEGL
Chloromethyl(trichloro)silane	1558-25-4	4.5E+00	AEGL1_8hr		
Chloronitrobenzene, p-	100-00-5	6.4E-01	TLV_TWA	1.6E-01	TLV_TWA
Chloronitropropane	600-25-9	1.0E+01	TLV_TWA_irr	3.5E+00	TLV_TWA_irr
Chloropentafluoroethane	76-15-3	6.3E+03	TLV_TWA	1.5E+03	TLV_TWA
Chloropicrin	76-06-2	3.4E-01	AEGL1_8hr	2.3E-01	TLV_TWA_irr
Chloropropionic acid, 2-	598-78-7	4.4E-01	TLV_TWA_irr	1.5E-01	TLV_TWA_irr
Chlorostyrene, o-	2039-87-4	2.8E+02	TLV_TWA	6.9E+01	TLV_TWA
Chlorosulfonic acid	7790-94-5	1.0E-01	AEGL1_8hr		
Chlorotoluene, o-	95-49-8	2.6E+02	TLV_TWA_irr	8.9E+01	TLV_TWA_irr
Chlorotrifluoroethylene	79-38-9	4.8E+01	AEGL1_8hr		
Chlorpyrifos	2921-88-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Chromate	11104-59-9	5.0E-02	TLV_TWA_irr	1.7E-02	TLV_TWA_irr
Chromium, elemental	7440-47-3	1.0E-02	TLV_TWA_irr	3.4E-03	TLV_TWA_irr
Chromyl chloride	14977-61-8	1.6E-01	TLV_TWA	3.9E-02	TLV_TWA
Clopidol	2971-90-6	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Coal dust, anthracite	Coal dust a	4.0E-01	TLV_TWA	9.8E-02	TLV_TWA
Coal dust, bituminous	Coal dust b	9.0E-01	TLV_TWA	2.2E-01	TLV_TWA
Coal tar pitch volatiles (high temperature)	65996-93-2	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Cobalt	7440-48-4	2.0E-02	TLV_TWA	4.9E-03	TLV_TWA
Cobalt carbonyl	10210-68-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Cobalt hydrocarbonyl	16842-03-8	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Copper fume	Cu fume	2.0E-01	TLV_TWA_irr	6.8E-02	TLV_TWA_irr
Coumaphos	56-72-4	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Cresol, m-	108-39-4	2.0E+01	TLV_TWA_irr	6.8E+00	TLV_TWA_irr
Cresol, o-	95-48-7	2.0E+01	TLV_TWA_irr	6.8E+00	TLV_TWA_irr
Cresol, p-	106-44-5	2.0E+01	TLV_TWA_irr	6.8E+00	TLV_TWA_irr
Cristobalite	14464-46-1	2.5E-02	TLV_TWA	6.1E-03	TLV_TWA
Crotonaldehyde	4170-30-3	5.4E-01	AEGL1_8hr		
Crotonaldehyde, trans-	123-73-9	5.4E-01	AEGL1_8hr		
Crufomate	299-86-5	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Cumene	98-82-8	2.5E+02	AEGL1_8hr	8.4E+01	TLV_TWA_irr
Cyanamide	420-04-2	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Cyanogen	460-19-5	2.1E+00	AEGL1_8hr	2.1E+00	AEGL1_8hr*
Cyanogen chloride	506-77-4	7.5E-01	TEEL1*		
Cyclohexane	110-82-7	3.4E+02	TLV_TWA	8.4E+01	TLV_TWA
Cyclohexanol	108-93-0	2.0E+02	TLV_TWA_adj*	7.0E+01	TLV_TWA_irr
Cyclohexanone	108-94-1	7.7E+01	TLV_TWA	1.9E+01	TLV_TWA
Cyclohexene	110-83-8	1.0E+03	TLV_TWA_adj*	3.5E+02	TLV_TWA_irr
Cyclohexylamine	108-91-8	7.3E+00	AEGL1_8hr	7.3E+00	AEGL1_8hr*
Cyclopentadiene	542-92-7	2.0E+02	TLV_TWA_irr	6.9E+01	TLV_TWA_irr
Cyclopentane	287-92-3	1.7E+03	TLV_TWA_irr	5.9E+02	TLV_TWA_irr
Cyhexatin	13121-70-5	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Dalapon	75-99-0	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
DDT	50-29-3	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Decaborane	17702-41-9	2.5E-01	TLV_TWA	6.1E-02	TLV_TWA
Demeton	8065-48-3	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Demeton-S-methyl	919-86-8	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Diacetone alcohol	123-42-2	2.4E+02	TLV_TWA_irr	8.1E+01	TLV_TWA_irr
Diazinon	333-41-5	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Diazomethane	334-88-3	3.4E-01	TLV_TWA_irr	1.2E-01	TLV_TWA_irr
Diborane	19287-45-7	1.1E-01	TLV_TWA*	2.8E-02	TLV_TWA
Dibromoethane, 1,2-	106-93-4	3.5E+01	AEGL1_8hr		
Dibutyl phenyl phosphate	2528-36-1	3.5E+00	TLV_TWA_irr	1.2E+00	TLV_TWA_irr
Dibutyl phosphate	107-66-4	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Dibutyl phthalate	84-74-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Dibutylethanolamine	102-81-8	3.5E+00	TLV_TWA_irr	1.2E+00	TLV_TWA_irr
Dichloro-1-nitroethane	594-72-9	1.2E+01	TLV_TWA_irr	4.0E+00	TLV_TWA_irr
Dichloro-2-butene, 1,4-	764-41-0	2.6E-02	TLV_TWA_irr	8.8E-03	TLV_TWA_irr
Dichloro-5,5-dimethylhydantoin	118-52-5	2.0E-01	TLV_TWA_irr	6.8E-02	TLV_TWA_irr
Dichloroacetic acid	79-43-6	2.6E+00	TLV_TWA	6.5E-01	TLV_TWA
Dichloroacetyl chloride	79-36-7	2.4E-01	AEGL1_8hr		
Dichlorobenzene, 1,2-	95-50-1	1.5E+02	TLV_TWA_irr	5.1E+01	TLV_TWA_irr
Dichlorobenzene, 1,4-	106-46-7	6.0E+01	TLV_TWA_irr	8.2E+00	MRLi_acute
Dichlorodifluoromethane	75-71-8	4.9E+03	TLV_TWA	1.5E+03	CEGL
Dichloroethane, 1,1-	75-34-3	4.0E+02	TLV_TWA_irr	1.4E+02	TLV_TWA_irr
Dichloroethane, 1,2-	107-06-2	4.0E+01	TLV_TWA	9.9E+00	TLV_TWA
Dichloroethylene, 1,1-	75-35-4	2.0E+01	TLV_TWA	5.9E-01	CEGL
Dichloroethylene, 1,2-	540-59-0	7.9E+02	TLV_TWA	1.9E+02	TLV_TWA
Dichloroethylene, cis-1,2-	156-59-2	5.6E+02	AEGL1_8hr	1.9E+02	TLV_TWA
Dichloroethylene, trans-	156-60-5	1.1E+03	AEGL1_8hr	5.4E-01	MRLi_acute
Dichlorofluoromethane	75-43-4	4.2E+01	TLV_TWA	4.2E+00	CEGL
Dichlorophenoxy acetic acid, 2,4-	94-75-7	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Dichloropropane, 1,2-	78-87-5	4.6E+01	TLV_TWA_irr	1.6E-01	MRLi_acute
Dichloropropene, 1,3-	542-75-6	4.5E+00	TLV_TWA_irr	1.6E+00	TLV_TWA_irr
Dichloropropene, 2,3-	78-88-6			6.2E-03	MRLi_acute
Dichlorosilane	4109-96-0	3.7E+00	AEGL1_8hr		
Dichlorotetrafluoroethane	76-14-2	7.0E+03	TLV_TWA	8.7E+02	CEGL
Dichlorvos	62-73-7	9.9E-01	AEGL1_8hr	1.2E-02	MRLi_acute
Dicyclopentadiene	77-73-6	5.4E-02	ERPG1*	1.4E-02	PPRTV_sub*
Dicyclopentadienyl iron	102-54-5	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Dieldrin	60-57-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Diesel fuel marine	77650-28-3	1.0E+02	TLV_TWA_irr	3.4E+01	TLV_TWA_irr
Diesel fuels	68334-30-5	1.0E+02	TLV_TWA_irr	3.4E+01	TLV_TWA_irr
Diethanolamine	111-42-2	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Diethyl ketone	96-22-0	7.0E+02	TLV_TWA_irr	2.4E+02	TLV_TWA_irr
Diethyl phthalate	84-66-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Diethylamine	109-89-7	1.5E+01	TLV_TWA_irr	5.1E+00	TLV_TWA_irr
Diethylaminoethanol, 2-	100-37-8	9.6E+00	TLV_TWA_irr	3.3E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Diethyldichlorosilane	1719-53-5	5.8E+00	AEGL1_8hr		
Diethylene triamine	111-40-0	4.2E+00	TLV_TWA_irr	1.4E+00	TLV_TWA_irr
Difluorodibromomethane	75-61-6	8.6E+02	TLV_TWA_irr	2.9E+02	TLV_TWA_irr
Difluorotetrachloroethane, 1,2-	76-12-0	4.2E+02	TLV_TWA	1.0E+02	TLV_TWA
Difluorotetrachloroethane, 2,2-	76-11-9	8.3E+02	TLV_TWA	2.0E+02	TLV_TWA
Diglycidyl ether	2238-07-5	5.3E-02	TLV_TWA_irr	1.8E-02	TLV_TWA_irr
Diisobutyl ketone	108-83-8	1.5E+02	TLV_TWA_irr	5.0E+01	TLV_TWA_irr
Diisopropyl ether	108-20-3	1.0E+03	TLV_TWA_irr	3.6E+02	TLV_TWA_irr
Diisopropylamine	108-18-9	2.1E+01	TLV_TWA_irr	7.1E+00	TLV_TWA_irr
Dimethyl acetamide, N, N-	127-19-5	3.6E+01	TLV_TWA	8.7E+00	TLV_TWA
Dimethyl carbamoly chloride	79-44-7	2.2E-02	TLV_TWA_irr	7.5E-03	TLV_TWA_irr
Dimethyl dichlorosilane	75-78-5	4.8E+00	AEGL1_8hr		
Dimethyl disulfide	624-92-0	3.9E-02	ERPG1*		
Dimethyl phthalate	131-11-3	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Dimethyl sulfate	77-78-1	4.5E-02	AEGL1_8hr	4.5E-02	AEGL1_8hr*
Dimethyl sulfide	75-18-3	1.3E+00	ERPG1*	1.3E+00	ERPG1*
Dimethylamine	124-40-3	1.8E+01	AEGL1_8hr*	3.2E+00	TLV_TWA_irr
Dimethylaniline, N,N-	121-69-7	2.5E+01	TLV_TWA	6.1E+00	TLV_TWA
Dimethylbenzidine, 3,3'-	119-93-7	1.7E+01	TLV_TWA	4.2E+00	TLV_TWA
Dimethylchlorosilane	1066-35-9	7.0E+00	AEGL1_8hr		
Dimethylethoxysilane	14857-34-2	2.1E+00	TLV_TWA_irr	7.3E-01	TLV_TWA_irr
Dimethylformamide	68-12-2	6.0E+00	ERPG1*	6.0E+00	ERPG1*
Dimethylhydrazine, 1,1-	57-14-7	2.5E-02	TLV_TWA_irr	8.4E-03	TLV_TWA_irr
Dimethypropyl acetate, 1,1-	625-16-1	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Dinitolmide	148-01-6	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Dinitrobenzene (mixed isomers)	0-323*	1.0E+00	TLV_TWA	2.5E-01	TLV_TWA
Dinitrobenzene, 1,2-	528-29-0	1.0E+00	TLV_TWA	2.5E-01	TLV_TWA
Dinitrobenzene, 1,3-	99-65-0	1.0E+00	TLV_TWA	2.5E-01	TLV_TWA
Dinitrobenzene, 1,4-	100-25-4	1.0E+00	TLV_TWA	2.5E-01	TLV_TWA
Dinitro-o-cresol, 4,6-	534-52-1	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Dinitrotoluene	25321-14-6	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Dioxane, 1,4-	123-91-1	6.1E+01	AEGL1_8hr	4.9E+00	MRLi_acute
Dioxathion	78-34-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Dioxolane	646-06-0	6.1E+01	TLV_TWA	1.5E+01	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Diphenylamine	122-39-4	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Diphenyldichlorosilane	80-10-4	9.3E+00	AEGL1_8hr		
Dipropyl ketone	123-19-3	2.3E+02	TLV_TWA_irr	8.0E+01	TLV_TWA_irr
Dipropylene glycol monomethyl ether	34590-94-8	6.1E+02	TLV_TWA_irr	2.1E+02	TLV_TWA_irr
Diquat	2764-72-9	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Diquat	85-00-7	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Diquat dibromide monohydrate	6385-62-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Disulfiram	97-77-8	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Disulfoton	298-04-4	5.0E-02	TLV_TWA	4.1E-03	MRLi_acute
Diuron	330-54-1	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Divinyl benzene	1321-74-0	5.3E+01	TLV_TWA_irr	1.8E+01	TLV_TWA_irr
Dodecyl mercaptan	112-55-0	8.3E-01	TLV_TWA_irr	2.8E-01	TLV_TWA_irr
Dodecyltrichlorosilane	4484-72-4	7.5E+00	AEGL1_8hr		
Endosulfan	115-29-7	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Endrin	72-20-8	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Enflurane	13838-16-9	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Epichlorohydrin	106-89-8	2.2E+01	AEGL1_8hr	6.5E-01	TLV_TWA_irr
Epoxybutane, 1,2-	106-88-7	2.1E+02	AEGL1_8hr		
Ethanolamine	141-43-5	7.5E+00	TLV_TWA_irr	1.2E+00	CEGL
Ethion	563-12-2	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Ethoxyethanol, 2-	110-80-5	1.8E+01	TLV_TWA	4.5E+00	TLV_TWA
Ethoxyethyl acetate, 2-	111-15-9	2.7E+01	TLV_TWA	6.6E+00	TLV_TWA
Ethyl acetate	141-78-6	1.4E+03	TLV_TWA_irr	4.9E+02	TLV_TWA_irr
Ethyl acrylate	140-88-5	3.4E+01	AEGL1_8hr	7.0E+00	TLV_TWA_irr
Ethyl amyl ketone	541-85-5	5.2E+01	TLV_TWA	1.3E+01	TLV_TWA
Ethyl bromide	74-96-4	2.2E+01	TLV_TWA	5.5E+00	TLV_TWA
Ethyl butyl ketone	106-35-4	2.3E+02	TLV_TWA_irr	8.0E+01	TLV_TWA_irr
Ethyl chloride	75-00-3	2.6E+02	TLV_TWA	2.7E+01	MRLi_acute
Ethyl cyanoacrylate	7085-85-0	1.0E+00	TLV_TWA_irr	3.5E-01	TLV_TWA_irr
Ethyl ether	60-29-7	1.2E+03	TLV_TWA_irr	4.2E+02	TLV_TWA_irr
Ethyl formate	109-94-4	3.0E+02	TLV_TWA_irr	1.0E+02	TLV_TWA_irr
Ethyl mercaptan	75-08-1	2.5E+00	AEGL1_8hr	4.4E-01	TLV_TWA_irr
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Ethyl tert-butyl ether	637-92-3	2.1E+01	TLV_TWA_irr	7.2E+00	TLV_TWA_irr
Ethylamine	75-04-7	1.4E+01	AEGL1_8hr	3.2E+00	TLV_TWA_irr
Ethylbenzene	100-41-4			3.0E+01	MRLi_acute
Ethylene	74-85-1	2.3E+02	TLV_TWA	5.6E+01	TLV_TWA
Ethylene diamine	107-15-3	2.4E+01	AEGL2_1hr*	8.4E+00	TLV_TWA_irr
Ethylene glycol	107-21-1			1.0E+01	CEGL
Ethylene glycol dinitrate	628-96-6	3.1E-01	TLV_TWA	7.6E-02	TLV_TWA
Ethylene glycol monobutyl ether	111-76-2	9.7E+01	TLV_TWA_irr	2.0E+01	MRLi_acute
Ethylene oxide	75-21-8	1.8E+00	TLV_TWA*	4.4E-01	TLV_TWA
Ethyleneimine	151-56-4	8.8E-02	TLV_TWA_irr	3.0E-02	TLV_TWA_irr
Ethylhexanoic acid	149-57-5	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Ethylpropyl ethanoate, 1-	620-11-1	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Fenamiphos	22224-92-6	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Fensulfothion	115-90-2	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Fenthion	55-38-9	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Ferbam	14484-64-1	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Ferric oxide	1309-37-1	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Ferrovanadium	12604-58-9	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Fluoride	16984-48-8	2.5E+00	TLV_TWA_irr	8.6E-01	TLV_TWA_irr
Fluorine	7782-41-4	2.6E+00	AEGL1_8hr*	1.1E-02	MRLi_acute
Fonofos	944-22-9	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Formaldehyde	50-00-0	1.1E+00	AEGL1_8hr*	3.7E-01	CEGL
Formamide	75-12-7	1.8E+01	TLV_TWA_irr	6.3E+00	TLV_TWA_irr
Formic acid	64-18-6	9.4E+00	TLV_TWA_irr	3.2E+00	TLV_TWA_irr
Fuel oil no. 2	68476-30-2	1.0E+02	TLV_TWA_irr	1.4E-02	MRLi_acute
Fuel oil no. 2-D	68476-34-6	1.0E+02	TLV_TWA_irr	3.4E+01	TLV_TWA_irr
Fuel oil no. 4	68476-31-3	1.0E+02	TLV_TWA_irr	3.4E+01	TLV_TWA_irr
Furfural	98-01-1	7.9E+00	TLV_TWA_irr	2.7E+00	TLV_TWA_irr
Furfuryl alcohol	98-00-0	4.0E+01	TLV_TWA_irr	1.4E+01	TLV_TWA_irr
Gallium arsenide	1303-00-0	3.0E-04	TLV_TWA	7.3E-05	TLV_TWA
Gasoline	8006-61-9	7.3E+02	AEGL1_8hr		
Germanium tetrahydride	7782-65-2	5.3E-01	AEGL2_1hr*	1.5E-01	TLV_TWA
Glycerin	56-81-5	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Glycidol	556-52-5	6.1E+00	TLV_TWA_irr	2.1E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Glyoxal	107-22-2	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Graphite	7782-42-5	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Gypsum	13397-24-5	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Hafnium	7440-58-6	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Halothane	151-67-7	4.0E+02	TLV_TWA	9.9E+01	TLV_TWA
HCFC-141b	1717-00-6	4.8E+03	AEGL1_8hr		
Heptachlor	76-44-8	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Heptachlor epoxide	1024-57-3	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Heptane, n-	142-82-5	1.6E+03	TLV_TWA_irr	5.6E+02	TLV_TWA_irr
Hexachlorobenzene	118-74-1	2.0E-03	TLV_TWA	4.9E-04	TLV_TWA
Hexachlorobutadiene	87-68-3	2.1E-01	TLV_TWA_irr	7.3E-02	TLV_TWA_irr
Hexachlorocyclopentadiene	77-47-4	1.1E-01	TLV_TWA_irr	7.6E-02	MRL_inter*
Hexachloroethane	67-72-1	9.7E+00	TLV_TWA_irr	9.7E+00	TLV_TWA_irr*
Hexachloronaphthalene	1335-87-1	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Hexafluoroacetone	684-16-2	6.8E-01	TLV_TWA	1.7E-01	TLV_TWA
Hexafluoropropylene	116-15-4	5.1E+01	AEGL1_8hr	1.5E-01	TLV_TWA
Hexamethylene diamine	124-09-4	2.4E+00	TLV_TWA_irr	8.1E-01	TLV_TWA_irr
Hexamethylene diisocyanate	822-06-0	3.4E-02	TLV_TWA_irr	1.2E-02	TLV_TWA_irr
Hexane, commercial	110-54-3	1.8E+02	TLV_TWA_irr	6.0E+01	TLV_TWA_irr
Hexane, other isomers	Hexane isom	1.8E+03	TLV_TWA_irr	6.0E+02	TLV_TWA_irr
Hexanone, 2-	591-78-6	2.0E+01	TLV_TWA	5.0E+00	TLV_TWA
Hexene	592-41-6	1.7E+02	TLV_TWA	4.2E+01	TLV_TWA
Hexyl acetate, sec-	108-84-9	2.9E+02	TLV_TWA_irr	1.0E+02	TLV_TWA_irr
Hexyltrichlorosilane	928-65-4	5.4E+00	AEGL1_8hr		
HFC-134A	811-97-2	3.3E+04	AEGL1_8hr		
Hydrazine	302-01-2	1.3E-01	AEGL1_8hr*	3.9E-02	CEGL
Hydrogen	1333-74-0			1.7E+02	CEGL
Hydrogen chloride	7647-01-0	2.7E+00	AEGL1_8hr*	1.5E+00	CEGL
Hydrogen cyanide	74-90-8	1.1E+00	AEGL1_8hr*		
Hydrogen fluoride	7664-39-3	8.2E-01	AEGL1_8hr*	3.3E-02	CEGL
Hydrogen peroxide	7722-84-1	1.4E+00	TLV_TWA_irr	4.8E-01	TLV_TWA_irr
Hydrogen selenide	7783-07-5	2.0E-01	TLV_TWA_irr*	5.7E-02	TLV_TWA_irr
Hydrogen sulfide	7783-06-4	4.6E-01	AEGL1_8hr*	4.6E-01	AEGL1_8hr*
Hydrogenated terphenyls	61788-32-7	4.9E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Hydroquinone	123-31-9	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Hydrotreated heavy paraffinic distillate	64742-54-7			3.0E-01	CEGL
Indene	95-13-6	2.4E+01	TLV_TWA	5.8E+00	TLV_TWA
Indium and compounds	7440-74-6	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Iodine	7553-56-2	1.0E-01	TLV_TWA	2.5E-02	TLV_TWA
Iodoform	75-47-8	9.7E+00	TLV_TWA	2.4E+00	TLV_TWA
Iron pentacarbonyl	13463-40-6	4.8E-01	AEGL2_1h*	2.0E-01	TLV_TWA
Iron salts, soluble	Fe salts	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Isoamyl acetate	123-92-2	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Isoamyl alcohol	123-51-3	3.6E+02	TLV_TWA_irr	1.2E+02	TLV_TWA_irr
Isobutyl acetate	110-19-0	7.1E+02	TLV_TWA_irr	2.4E+02	TLV_TWA_irr
Isobutyl alcohol	78-83-1	1.5E+02	TLV_TWA_irr	5.2E+01	TLV_TWA_irr
Isooctyl alcohol	26952-21-6	2.7E+02	TLV_TWA_irr	9.1E+01	TLV_TWA_irr
Isopentane	78-78-4	1.8E+03	TLV_TWA_irr	6.1E+02	TLV_TWA_irr
Isophorone diisocyanate	4098-71-9	4.5E-02	TLV_TWA	1.1E-02	TLV_TWA
Isopropanol	67-63-0	4.9E+02	TLV_TWA_irr	2.5E+00	CEGL
Isopropoxyethanol	109-59-1	1.1E+02	TLV_TWA	2.6E+01	TLV_TWA
Isopropyl acetate	108-21-4	4.2E+02	TLV_TWA_irr	1.4E+02	TLV_TWA_irr
Isopropyl glycidyl ether	4016-14-2	2.4E+02	TLV_TWA_irr	8.1E+01	TLV_TWA_irr
Isopropylamine	75-31-0	1.2E+01	TLV_TWA_irr	4.1E+00	TLV_TWA_irr
Isopropylaniline, N-	768-52-5	1.1E+01	TLV_TWA	2.7E+00	TLV_TWA
Jet Fuel-5 (JP-5)	70892-10-3	2.9E+02	AEGL1_8hr		
Kaolin	1332-58-7	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Kerosene	8008-20-6	2.9E+02	AEGL1_8hr	6.8E+01	TLV_TWA_irr
Kerosene, hydrodesulfurized	64742-81-0	2.0E+02	TLV_TWA	4.9E+01	TLV_TWA
Ketene	463-51-4	1.5E-01	AEGL1_8hr	2.9E-01	TLV_TWA_irr
Ketene	463-51-4	1.5E-01	AEGL1_8hr	1.5E-01	AEGL1_8hr*
Lead and compounds (inorganic)	7439-92-1	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Lead chromate	7758-97-6	1.2E-02	TLV_TWA	2.9E-03	TLV_TWA
Lindane	58-89-9	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Lithium bromide	7550-35-8			1.0E+00	CEGL
Lithium hydride	7580-67-8	2.5E-02	TLV_TWA_irr	8.6E-03	TLV_TWA_irr
Magnesium oxide	1309-48-4	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Malathion	121-75-5	1.5E+01	AEGL1_8hr	1.4E-01	MRLi_acute

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Manganese cyclopentadienyl tricarbonyl	12079-65-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Mercury, alkyl compounds	Hg alkyl	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Mercury, aryl compounds	Hg aryl	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Mercury, elemental	7439-97-6	2.5E-02	TLV_TWA	1.0E-02	CEGL
Mesityl oxide	141-79-7	6.0E+01	TLV_TWA_irr	2.1E+01	TLV_TWA_irr
Methacrylaldehyde	78-85-3	5.7E-01	AEGL1_8hr		
Methacrylic acid	79-41-4	2.4E+01	AEGL1_8hr	2.4E+01	AEGL1_8hr*
Methacrylonitrile	126-98-7	2.7E+00	AEGL1_8hr		
Methamidophos	10265-92-6	6.1E-01	AEGL1_8hr		
Methane	74-82-8	6.6E+02	TLV_TWA	6.6E+02	TLV_TWA*
Methanol	67-56-1	3.5E+02	AEGL1_8hr	1.3E+01	CEGL
Methomyl	16752-77-5	2.5E+00	TLV_TWA	6.1E-01	TLV_TWA
Methoxychlor	72-43-5	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Methoxyethanol, 2-	109-86-4	3.1E-01	TLV_TWA	7.6E-02	TLV_TWA
Methoxyethyl acetate, 2-	110-49-6	4.8E-01	TLV_TWA	1.2E-01	TLV_TWA
Methoxyphenol, 4-	150-76-5	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Methyl 2-cyanoacrylate	137-05-3	9.1E-01	TLV_TWA_irr	3.1E-01	TLV_TWA_irr
Methyl acetate	79-20-9	6.1E+02	TLV_TWA_irr	2.1E+02	TLV_TWA_irr
Methyl acetylene	74-99-7	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
Methyl acetylene-propadiene mixture	59355-75-8	1.6E+03	TLV_TWA	4.0E+02	TLV_TWA
Methyl acrylate	96-33-3	7.0E+00	TLV_TWA_irr	2.4E+00	TLV_TWA_irr
Methyl aniline, N-	100-61-8	2.2E+00	TLV_TWA	5.4E-01	TLV_TWA
Methyl bromide	74-83-9	4.0E+00	TLV_TWA_irr*	1.3E-01	MRLi_acute
Methyl chloride	74-87-3	1.0E+02	TLV_TWA	7.1E-01	MRLi_acute
Methyl chlorosilane	68937-17-7	5.9E+00	AEGL1_8hr		
Methyl cyclopentadienyl manganese tricarbonyl	12108-13-3	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Methyl demeton	8022-00-2	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Methyl dichlorosilane	75-54-7	4.2E+00	AEGL1_8hr		
Methyl ethyl ketone	78-93-3	5.9E+02	AEGL1_8hr	2.0E+02	TLV_TWA_irr
Methyl formate	107-31-3	2.5E+02	TLV_TWA_irr	8.4E+01	TLV_TWA_irr
Methyl hydrazine	60-34-4	2.0E-02	TLV_TWA_irr*	6.5E-03	TLV_TWA_irr
Methyl iodide	74-88-4	6.4E+01	AEGL1_8hr	4.0E+00	TLV_TWA_irr
Methyl isoamyl ketone	110-12-3	2.3E+02	TLV_TWA_irr	8.0E+01	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Methyl isobutyl carbinol	108-11-2	1.0E+02	TLV_TWA_irr	3.6E+01	TLV_TWA_irr
Methyl isobutyl ketone	108-10-1	8.2E+01	TLV_TWA_irr	2.8E+01	TLV_TWA_irr
Methyl isocyanate	624-83-9	2.0E-02	AEGL2_8hr*	1.6E-02	TLV_TWA_irr
Methyl isopropyl ketone	563-80-4	7.0E+02	TLV_TWA_irr	2.4E+02	TLV_TWA_irr
Methyl isothiocyanate	556-61-6	2.4E+00	AEGL1_8hr		
Methyl mercaptan	74-93-1	9.8E-03	ERPG1*	9.8E-03	ERPG1*
Methyl methacrylate	80-62-6	7.0E+01	AEGL1_8hr	7.0E+01	AEGL1_8hr*
Methyl n-amyl ketone	110-43-0	2.3E+02	TLV_TWA_irr	8.0E+01	TLV_TWA_irr
Methyl nonafluorobutyl ether	163702-07-6	2.6E+04	AEGL1_8hr		
Methyl parathion	298-00-0	2.0E-02	TLV_TWA	4.9E-03	TLV_TWA
Methyl tertiary butyl ether	1634-04-4	1.8E+02	AEGL1_8hr	4.9E+00	MRLi_acute
Methyl vinyl ketone	78-94-4	4.9E-01	AEGL1_8hr		
Methyl vinyl ketone	98-94-4	4.9E-01	AEGL1_8hr		
Methyl-5-nitroaniline, 2-	99-55-8	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Methylal	109-87-5	3.1E+03	TLV_TWA_irr	1.1E+03	TLV_TWA_irr
Methylaniline, 2-	95-53-4	8.8E+00	TLV_TWA	2.1E+00	TLV_TWA
Methylcyclohexane	108-87-2	1.6E+03	TLV_TWA_irr	5.5E+02	TLV_TWA_irr
Methylcyclohexanol	25639-42-3	2.3E+02	TLV_TWA_irr	8.0E+01	TLV_TWA_irr
Methylcyclohexanone, o-	583-60-8	2.3E+02	TLV_TWA_irr	7.9E+01	TLV_TWA_irr
Methylene chloride	75-09-2	1.7E+02	TLV_TWA	1.4E+00	MRLi_acute
Methylene diphenyl diisocyanate	101-68-8	5.1E-02	TLV_TWA	1.3E-02	TLV_TWA
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	1.1E-01	TLV_TWA	2.7E-02	TLV_TWA
Methylene-bis(4-cyclohexylisocyanate)	5124-30-1	5.4E-02	TLV_TWA_irr	1.8E-02	TLV_TWA_irr
Methylenedianiline, 4,4'-	101-77-9	8.1E-01	TLV_TWA	2.0E-01	TLV_TWA
Methylnaphthalene, 1-	90-12-0	2.9E+00	TLV_TWA_irr	1.0E+00	TLV_TWA_irr
Methylnapthalene, 2-	91-57-6	2.9E+00	TLV_TWA_irr	1.0E+00	TLV_TWA_irr
Methylpropene, 2-	115-11-7	5.7E+02	TLV_TWA	1.4E+02	TLV_TWA
Methylstyrene, alpha-	98-83-9	4.8E+01	TLV_TWA_irr	1.7E+01	TLV_TWA_irr
Methyltrichlorosilane	75-79-6	3.7E+00	AEGL1_8hr		
Methylvinyldichlorosilane	124-70-9	5.2E+00	AEGL1_8hr		
Metribuzin	21087-64-9	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Mica	12001-26-2	3.0E+00	TLV_TWA	7.3E-01	TLV_TWA
Molybdenum	7439-98-7	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Monocrotophos	6923-22-4	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Monomethylamine	74-89-5	1.9E+01	AEGL1_8hr*	2.2E+00	TLV_TWA_irr
Morpholine	110-91-8	7.1E+01	TLV_TWA_irr	2.4E+01	TLV_TWA_irr
Naled	300-76-5	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Naphthalene	91-20-3	5.2E+01	TLV_TWA_irr	1.8E+01	TLV_TWA_irr
N-Ethylmorpholine	100-74-3	2.4E+01	TLV_TWA_irr	8.1E+00	TLV_TWA_irr
Nickel	7440-02-0	1.5E+00	TLV_TWA	3.7E-01	TLV_TWA
Nickel carbonyl	13463-39-3	2.5E-01	TEEL1*	2.5E-01	TEEL1*
Nickel insoluble inorganic compounds	Ni insol inorg	2.0E-01	TLV_TWA_irr	6.8E-02	TLV_TWA_irr
Nickel subsulfide	12035-72-2	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Nickel, soluble salts	Ni sol salts	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Nicotine	54-11-5	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Nitrapyrin	1929-82-4	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Nitric acid	7697-37-2	1.4E+00	AEGL1_8hr*	1.4E+00	AEGL1_8hr*
Nitric oxide	10102-43-9	3.7E+00	CEGL*	3.7E+00	CEGL*
Nitroaniline, 4-	100-01-6	3.0E+00	TLV_TWA	7.3E-01	TLV_TWA
Nitrobenzene	98-95-3	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Nitroethane	79-24-3	3.1E+02	TLV_TWA_irr	1.1E+02	TLV_TWA_irr
Nitrogen dioxide	10102-44-0	9.4E-01	AEGL1_8hr*	9.4E-01	AEGL1_8hr*
Nitrogen tetroxide	10544-72-6	9.4E-01	AEGL1_8hr		
Nitrogen trifluoride	7783-54-2	7.3E+01	AEGL1_8hr	7.1E+00	TLV_TWA
Nitroglycerin	55-63-0	4.6E-01	TLV_TWA	1.1E-01	TLV_TWA
Nitromethane	75-52-5	5.0E+01	TLV_TWA	1.2E+01	TLV_TWA
Nitropropane, 1-	108-03-2	9.1E+01	TLV_TWA_irr	3.1E+01	TLV_TWA_irr
Nitropropane, 2-	79-46-9	3.6E+01	TLV_TWA	8.9E+00	TLV_TWA
Nitrotoluene, m-	99-08-1	1.1E+01	TLV_TWA	2.7E+00	TLV_TWA
Nitrotoluene, o-	88-72-2	1.1E+01	TLV_TWA	2.7E+00	TLV_TWA
Nitrotoluene, p-	99-99-0	1.1E+01	TLV_TWA	2.7E+00	TLV_TWA
Nitrous oxide	10024-97-2	9.0E+01	TLV_TWA	2.2E+01	TLV_TWA
Nonane	111-84-2	1.0E+03	TLV_TWA_irr	3.6E+02	TLV_TWA_irr
Nonyltrichlorosilane	5283-67-0	6.4E+00	AEGL1_8hr		
Octachloronaphthalene	2234-13-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Octadecyltrichlorosilane	112-04-9	9.5E+00	AEGL1_8hr		
Octane	111-65-9	1.4E+03	TLV_TWA_irr	4.8E+02	TLV_TWA_irr
Octyltrichlorosilane	5283-66-9	6.1E+00	AEGL1_8hr		

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Oil mist, mineral	8012-95-1	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Oleum	8014-95-7	2.0E-01	AEGL1_8hr		
Osmium tetroxide	20816-12-0	2.1E-03	TLV_TWA_irr	7.1E-04	TLV_TWA_irr
Oxalic acid	144-62-7	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Oxamyl	23135-22-0	3.2E-01	AEGL1_8hr		
Oxybis(benzenesulfonyl hydrazide), 4,4'-	80-51-3	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Ozone	10028-15-6	3.9E-01	TLV_TWA_irr	3.9E-02	CEGL
Paraffin wax fume	8002-74-2	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr
Paraquat	4685-14-7	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Parathion	56-38-2	5.0E-02	TLV_TWA*	1.2E-02	TLV_TWA
Pentaborane	19624-22-7	1.3E-02	TLV_TWA	3.2E-03	TLV_TWA
Pentachloronaphthalene	1321-64-8	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Pentachloronitrobenzene	82-68-8	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Pentachlorophenol	87-86-5	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Pentaerythritol	115-77-5	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Pentane, n-	109-66-0	1.8E+03	TLV_TWA_irr	6.1E+02	TLV_TWA_irr
Peracetic acid	79-21-0	5.3E-01	AEGL1_8hr		
Perchloroethylene	127-18-4	2.4E+02	AEGL1_8hr	9.3E-01	MRLi_acute
Perchloromethyl mercaptan	594-42-3	9.9E-02	AEGL1_8hr	9.9E-02	AEGL1_8hr*
Perchloryl fluoride	7616-94-6	2.5E+00	AEGL1_8hr	2.5E+00	AEGL1_8hr*
Perfluorobutyl ethylene	19430-93-4	1.0E+03	TLV_TWA	2.5E+02	TLV_TWA
Persulfates	persufate	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Phenol	108-95-2	2.4E+01	AEGL1_8hr	6.6E+00	TLV_TWA_irr
Phenothiazine	92-84-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Phenyl ether vapor	101-84-8	7.0E+00	TLV_TWA_irr	2.4E+00	TLV_TWA_irr
Phenyl glycidyl ether	122-60-1	6.1E-01	TLV_TWA_irr	2.1E-01	TLV_TWA_irr
Phenyl isocyanate.	103-71-9	9.7E-02	AEGL1_8hr		
Phenyl mercaptan	108-98-5	4.5E-01	TLV_TWA	1.1E-01	TLV_TWA
Phenylenediamine, m-	108-45-2	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Phenylenediamine, o-	95-54-5	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Phenylenediamine, p-	106-50-3	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Phenylhydrazine	100-63-0	4.4E-01	TLV_TWA	1.1E-01	TLV_TWA
Phorate	298-02-2	4.0E-02	AEGL2_1hr*	1.2E-02	TLV_TWA
Phosdrin	7786-34-7	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Phosgene	75-44-5	1.6E-01	AEGL2_8hr*	4.0E-02	CEGL
Phosgene oxime	1794-86-1	3.5E-03	AEGL1_8hr		
Phosphine	7803-51-2	4.2E-01	TLV_TWA_irr	1.4E-01	TLV_TWA_irr
Phosphoric acid	7664-38-2	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Phosphorus	7723-14-0	4.7E-01	AEGL1_8hr		
Phosphorus (yellow)	0-143*	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Phosphorus oxychloride	10025-87-3	6.0E-01	TLV_TWA_irr*	2.1E-01	TLV_TWA_irr
Phosphorus pentachloride	10026-13-8	8.5E-01	TLV_TWA_irr	2.9E-01	TLV_TWA_irr
Phosphorus pentasulfide	1314-80-3	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Phosphorus trichloride	7719-12-2	1.9E+00	AEGL1_8hr*	3.8E-01	TLV_TWA_irr
Phosphorus, white	12185-10-3			1.4E-02	MRLi_acute
Phthalic acid, p-	100-21-0	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Phthalic anhydride	85-44-9	6.1E+00	TLV_TWA_irr	2.1E+00	TLV_TWA_irr
Phthalodinitrile, m-	626-17-5	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Picloram	1918-02-1	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Picric acid	88-89-1	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Pindone	83-26-1	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Pinene, alpha-	80-56-8	2.0E+01	TLV_TWA	4.9E+00	TLV_TWA
Piperazine dihydrochloride	142-64-3	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Piperidine	110-89-4	5.9E+00	AEGL1_8hr		
Platinum, metal	7440-06-4	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Platinum, soluble salts	Pt sol salts	2.0E-03	TLV_TWA_irr	6.8E-04	TLV_TWA_irr
Polyvinyl chloride	9002-86-2	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Portland cement	65997-15-1	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Potassium cyanide	151-50-8	2.7E+00	AEGL1_8hr		
Propane	74-98-6	9.9E+03	AEGL1_8hr	4.4E+02	TLV_TWA
Propargyl alcohol	107-19-7	5.7E+00	AEGL1_8hr	7.9E-01	TLV_TWA_irr
Propiolactone, beta-	57-57-8	1.5E+00	TLV_TWA_irr	5.0E-01	TLV_TWA_irr
Propionaldehyde	123-38-6	1.1E+02	AEGL1_8hr	1.6E+01	TLV_TWA_irr
Propionic acid	79-09-4	3.0E+01	TLV_TWA_irr	1.0E+01	TLV_TWA_irr
Propyl acetate, n-	109-60-4	8.4E+02	TLV_TWA_irr	2.9E+02	TLV_TWA_irr
Propyl alcohol, n-	71-23-8	2.5E+02	TLV_TWA_irr	8.4E+01	TLV_TWA_irr
Propyl nitrate, n-	627-13-4	1.1E+02	TLV_TWA	2.6E+01	TLV_TWA
Propylene	115-07-1	8.6E+02	TLV_TWA_irr	2.9E+02	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Propylene chlorohydrin	127-00-4	3.9E+00	TLV_TWA	9.5E-01	TLV_TWA
Propylene glycol dinitrate	6423-43-4	2.0E-01	AEGL1_8hr	2.7E-02	CEGL
Propylene glycol monoacrylate	999-61-1	2.7E+00	TLV_TWA_irr	9.1E-01	TLV_TWA_irr
Propylene glycol monomethyl ether	107-98-2	3.7E+02	TLV_TWA_irr	1.3E+02	TLV_TWA_irr
Propylene oxide	75-56-9	1.7E+02	AEGL1_8hr*	1.6E+00	TLV_TWA_irr
Propylenechlorohydrin	78-89-7	3.9E+00	TLV_TWA	9.5E-01	TLV_TWA
Propyleneimine	75-55-8	4.7E-01	TLV_TWA_irr	1.6E-01	TLV_TWA_irr
Propyltrichlorosilane	141-57-1	2.9E+00	AEGL1_8hr		
Pyrethrum	8003-34-7	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Pyridine	110-86-1	2.9E+00	TLV_TWA_irr	9.8E-01	TLV_TWA_irr
Quinone	106-51-4	4.4E-01	TLV_TWA_irr	1.5E-01	TLV_TWA_irr
RDX	121-82-4	5.0E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Resorcinol	108-46-3	4.5E+01	TLV_TWA_irr	1.5E+01	TLV_TWA_irr
Rhodium	7440-16-6	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Rhodium soluble compounds	RH sol	1.0E-02	TLV_TWA_irr	3.4E-03	TLV_TWA_irr
Ronnel	299-84-3	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Rotenone	83-79-4	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Rubber dust	9006-04-6	1.0E-03	TLV_TWA	2.4E-04	TLV_TWA
Selenium	7782-49-2	2.0E-01	TLV_TWA_irr	6.8E-02	TLV_TWA_irr
Selenium hexafluoride	7783-79-1	1.3E-01	AEGL1_8hr	9.7E-02	TLV_TWA
Sesone	136-78-7	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Silica, crystalline quartz	14808-60-7	2.5E-02	TLV_TWA	6.1E-03	TLV_TWA
Silica, crystalline tripoli	1317-95-9	2.5E-02	TLV_TWA	6.1E-03	TLV_TWA
Silicon carbide, nonfibrous, inhalable	Sil carb inhal	3.0E+00	TLV_TWA	7.3E-01	TLV_TWA
Silicon tetrafluoride	7783-61-1	2.1E-01	AEGL1_8hr		
Silicon tetrahydride	7803-62-5	6.6E+00	TLV_TWA_irr	2.2E+00	TLV_TWA_irr
Silver	7440-22-4	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Silver soluble compounds	Ag sol cmpds	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Soapstone, respirable dust	sil soap resp	3.0E+00	TLV_TWA	7.3E-01	TLV_TWA
Sodium bisulfite	7631-90-5	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Sodium cyanide	143-33-9	2.0E+00	AEGL1_8hr		
Sodium fluoroacetate	62-74-8	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Sodium metabisulfite	7681-57-4	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Sodium tetraborate	1330-43-4	2.0E+00	TLV_TWA_irr	6.8E-01	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Starch	9005-25-8	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Stearates	stearates	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Stibine	7803-52-3	5.1E-01	TLV_TWA_irr	1.7E-01	TLV_TWA_irr
Stoddard solvent	8052-41-3	5.7E+02	TLV_TWA_irr	2.0E+02	TLV_TWA_irr
Strontium chromate	7789-06-2	5.0E-04	TLV_TWA	1.2E-04	TLV_TWA
Strychnine	57-24-9	1.5E-01	TLV_TWA	3.7E-02	TLV_TWA
Styrene	100-42-5	8.5E+01	TLV_TWA_irr	5.8E+00	MRLi_acute
Sucrose	57-50-1	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Sulfometuron methyl	74222-97-2	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Sulfur dioxide	7446-09-5	5.2E-01	AEGL1_8hr*	5.2E-01	AEGL1_8hr*
Sulfur hexafluoride	2551-62-4	6.0E+03	TLV_TWA	1.5E+03	TLV_TWA
Sulfur trioxide	7446-11-9	2.0E-01	AEGL1_8hr*		
Sulfuric acid	7664-93-9	2.0E-01	AEGL1_8hr*	4.9E-02	TLV_TWA
Sulfuryl fluoride	2699-79-8	2.1E+01	TLV_TWA_irr	7.1E+00	TLV_TWA_irr
Sulprofos	35400-43-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Talc	14807-96-6	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Tellurium and compounds	13494-80-9	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Tellurium hexafluoride	7783-80-4	1.8E-01	AEGL2_1hr*	6.8E-02	TLV_TWA_irr
Temephos	3383-96-8	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Terbufos	13071-79-9	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Tert-amyl methyl ether	994-05-8	8.4E+01	TLV_TWA	2.0E+01	TLV_TWA
Tert-butyl alcohol	75-65-0	3.0E+02	TLV_TWA_irr	1.0E+02	TLV_TWA_irr
Tert-pentane	463-82-1	1.8E+03	TLV_TWA_irr	6.1E+02	TLV_TWA_irr
Tetrachloroethane, 1,1,2,2-	79-34-5	6.9E+00	TLV_TWA	1.7E+00	TLV_TWA
Tetrachloronaphthalene	1335-88-2	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Tetraethoxysilane	78-10-4	8.5E+01	TLV_TWA_irr	2.9E+01	TLV_TWA_irr
Tetraethyl dithiopyrophosphate	3689-24-5	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Tetraethyl lead	78-00-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Tetraethyl pyrophosphate	107-49-3	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Tetrafluoroethylene	116-14-3	3.7E+02	AEGL1_8hr	2.0E+00	TLV_TWA
Tetrafluoroethylene	116-14-3	3.7E+02	AEGL1_8hr	2.0E+00	TLV_TWA
Tetrahydrofuran	109-99-9	1.5E+02	TLV_TWA_irr	5.0E+01	TLV_TWA_irr
Tetrakis (hydroxymethyl) phosphonium chloride	124-64-1	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Tetrakis (hydroxymethyl) phosphonium sulfate	55566-30-8	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Tetramethoxysilane	681-84-5	5.7E+00	AEGL2_1hr*	1.5E+00	TLV_TWA
Tetramethyl lead	75-74-1	1.5E-01	TLV_TWA	3.7E-02	TLV_TWA
Tetramethyl succinonitrile	3333-52-6	2.8E+00	TLV_TWA	6.8E-01	TLV_TWA
Tetranitromethane	509-14-8	4.0E-02	TLV_TWA_irr	1.4E-02	TLV_TWA_irr
Thioglycolic acid	68-11-1	3.8E+00	TLV_TWA_irr	1.3E+00	TLV_TWA_irr
Thiram	137-26-8	5.0E-02	TLV_TWA_irr	1.7E-02	TLV_TWA_irr
Tin organic compounds	Sn organ cmpd	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Tin oxide	18282-10-5	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Tin, inorganic	7440-31-5	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Titanium dioxide	13463-67-7	1.0E+01	TLV_TWA	2.4E+00	TLV_TWA
Toluene	108-88-3	7.5E+02	AEGL1_8hr	7.5E+01	CEGL
Toluene 2,4-diisocyanate	584-84-9	7.1E-02	AEGL1_8hr		
Toluenediisocyanate, 2,6-	91-08-7	7.1E-02	AEGL1_8hr		
Toluidine, m-	108-44-1	8.8E+00	TLV_TWA	2.1E+00	TLV_TWA
Toluidine, p-	106-49-0	8.8E+00	TLV_TWA	2.1E+00	TLV_TWA
Toxaphene	8001-35-2	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Tributyl phosphate	126-73-8	2.2E+00	TLV_TWA_irr	7.5E-01	TLV_TWA_irr
Trichloro(dichlorophenyl) silane	27137-85-5	6.9E+00	AEGL1_8hr		
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	7.7E+03	TLV_TWA	7.7E+02	CEGL
Trichloroacetic acid	76-03-9	6.7E+00	TLV_TWA_irr	2.3E+00	TLV_TWA_irr
Trichloroethane, 1,1,1-	71-55-6	1.3E+03	AEGL1_8hr	7.5E+00	MRLi_acute
Trichloroethane, 1,1,2-	79-00-5	5.5E+01	TLV_TWA	1.3E+01	TLV_TWA
Trichloroethylene	79-01-6	4.1E+02	AEGL1_8hr	7.4E+00	MRLi_acute
Trichloroethylsilane	115-21-9	4.0E+00	AEGL1_8hr		
Trichlorofluoromethane	75-69-4			5.6E+02	CEGL
Trichlorofon	52-68-6	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Trichloronaphthalene	1321-65-9	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA
Trichlorophenoxyacetic acid	93-76-5	1.0E+01	TLV_TWA_irr	3.4E+00	TLV_TWA_irr
Trichlorophenylsilane	98-13-5	5.2E+00	AEGL1_8hr		
Trichloropropane, 1,2,3-	96-18-4	6.0E+01	TLV_TWA	1.2E-03	MRLi_acute
Tricresol	1319-77-3	2.0E+01	TLV_TWA_irr	6.8E+00	TLV_TWA_irr
Triethanolamine	102-71-6	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	CASRN	AMEG_8h (mg/m³)		AMEG_14d (mg/m³)	
Triethylamine	121-44-8	4.1E+00	TLV_TWA_irr	1.4E+00	TLV_TWA_irr
Trifluorobromomethane	75-63-8	6.1E+03	TLV_TWA	6.1E+02	CEGL
Triglycidyl isocyanurate	2451-62-9	5.0E-02	TLV_TWA	1.2E-02	TLV_TWA
Trimellitic anhydride	552-30-7	5.0E-04	TLV_TWA	1.2E-04	TLV_TWA
Trimethyl benzene	25551-13-7	1.2E+02	TLV_TWA_irr	4.2E+01	TLV_TWA_irr
Trimethyl phosphite	121-45-9	1.3E+01	AEGL1_8hr	3.5E+00	TLV_TWA_irr
Trimethylamine	75-50-3	1.9E+01	AEGL1_8hr	4.1E+00	TLV_TWA_irr
Trimethylbenzene, 1,2,3-	526-73-8	2.2E+02	AEGL1_8hr		
Trimethylbenzene, 1,2,4-	95-63-6	2.2E+02	AEGL1_8hr		
Trimethylbenzene, 1,3,5-	108-67-8	2.2E+02	AEGL1_8hr		
Trimethylbenzene, 1,3,5-	108-67-8	2.2E+02	AEGL1_8hr		
Trimethylchlorosilane	75-77-4	8.0E+00	AEGL1_8hr		
Trinitrophenylmethylnitramine	479-45-8	1.5E+00	TLV_TWA	3.7E-01	TLV_TWA
Trinitrotoluene, 2,4,6-	118-96-7	1.0E-01	TLV_TWA_irr	3.4E-02	TLV_TWA_irr
Triorthocresyl phosphate	78-30-8	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Triphenyl phosphate	115-86-6	3.0E+00	TLV_TWA_irr	1.0E+00	TLV_TWA_irr
Tungsten	7440-33-7	5.0E+00	TLV_TWA_irr	1.7E+00	TLV_TWA_irr
Tungsten, soluble compounds	W sol	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Turpentine	8006-64-2	1.1E+02	TLV_TWA_irr	3.8E+01	TLV_TWA_irr
Uranium compounds	0-287*	2.0E-01	TLV_TWA	4.9E-02	TLV_TWA
Valeraldehyde, n-	110-62-3	1.8E+02	TLV_TWA_irr	6.0E+01	TLV_TWA_irr
Vanadium	7440-62-2			5.5E-04	MRLi_acute
Vanadium pentoxide	1314-62-1	5.0E-02	TLV_TWA_irr	1.4E-04	MRLi_acute*
Vinyl acetate	108-05-4	2.4E+01	AEGL1_8hr	1.2E+01	TLV_TWA_irr
Vinyl chloride	75-01-4	1.8E+02	AEGL1_8hr	8.8E-01	MRLi_acute
Vinyl cyclohexene dioxide	106-87-6	5.7E-01	TLV_TWA_irr	2.0E-01	TLV_TWA_irr
Vinyl fluoride	75-02-5	1.9E+00	TLV_TWA	4.6E-01	TLV_TWA
Vinyl toluene	25013-15-4	2.4E+02	TLV_TWA_irr	8.3E+01	TLV_TWA_irr
Vinyl trichlorosilane	75-94-5	4.0E+00	AEGL1_8hr		
Vinyl-2-pyrrolidone, N-	88-12-0	2.3E-01	TLV_TWA	5.6E-02	TLV_TWA
Vinylcyclohexene, 4-	100-40-3	4.4E-01	TLV_TWA_irr	1.5E-01	TLV_TWA_irr
Vinylidene fluoride	75-38-7	1.3E+03	TLV_TWA	3.2E+02	TLV_TWA
Warfarin	81-81-2	1.0E-01	TLV_TWA	2.4E-02	TLV_TWA
Wood dust	wood dust	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA

Table D-2: Basis for 8-Hour and 14-Day Air MEGs

Chemical Name	*CASRN*	*AMEG_8h (mg/m³)*		*AMEG_14d (mg/m³)*	
Wood dust, western red cedar	wood dust cedar	5.0E-01	TLV_TWA	1.2E-01	TLV_TWA
Wood dusts (birch, mahogany, teak, walnut)	Wood dust (othe	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Xylene, m-	108-38-3	4.3E+02	TLV_TWA_irr	1.5E+02	TLV_TWA_irr
Xylene, o-	95-47-6	4.3E+02	TLV_TWA_irr	1.5E+02	TLV_TWA_irr
Xylene, p-	106-42-3	4.3E+02	TLV_TWA_irr	1.5E+02	TLV_TWA_irr
Xylenes, total	1330-20-7	5.6E+02	AEGL1_8hr	2.2E+02	CEGL
Xylidine	1300-73-8	2.5E+00	TLV_TWA	6.1E-01	TLV_TWA
Yttrium	7440-65-5	1.0E+00	TLV_TWA	2.4E-01	TLV_TWA
Zinc chloride fume	7646-85-7	1.0E+00	TLV_TWA_irr	3.4E-01	TLV_TWA_irr
Zinc chromate	11103-86-9	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Zinc chromate	13530-65-9	1.0E-02	TLV_TWA	2.4E-03	TLV_TWA
Zinc oxide	1314-13-2	2.0E+00	TLV_TWA	4.9E-01	TLV_TWA
Zirconium	7440-67-7	5.0E+00	TLV_TWA	1.2E+00	TLV_TWA

Units:
mg/m3 = milligrams per cubic meter

Notes:
All Air Military Exposure Guidelines (AMEGs) are provided in mg/m³
CASRN = Chemical Abstract Service Registry Number
adj = adjusted
irr = irritant. Used to notate TLV_TWA values that were not adjusted for exposure duration for the Air MEGs.
TWA = Time Weighted Average

Sources:
AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2006)
ERPG = American Industrial Hygiene Association Emergency Response Planning Guidelines (AIHA 2005)
CEGL = U.S. Navy/NRC Continuous Exposure Guidance Levels (U.S. Navy/NRC 2004)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
TEEL = U.S. Department of Energy Temporary Emergency Exposure Limits (DOE 2004)*
TLV = ACGIH Threshold Limit Value (ACGIH 2005)

* Air MEGs based on TEELs should be considered interim values. The TEELs do not undergo the rigorous peer review of AEGLs and ERPGs, are subject to change, and are intended to serve as interim values until AEGLs or ERPGs are published AMEGs based on TEELs carry a higher level of uncertainty.

See Table D-1 for Health Effects data.

Table D-3: Basis for Chemical Warfare Agents Air MEGs

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*		*24-hour Air MEGs (mg/m³)*	
GA	77-81-6	NEG	0.0069	AEGL1_10min	0.0028	AEGL1_1hr	0.001	AEGL1_8hr	0.0003	AEGL1-based
		MARG	0.14	EC16_mild_10min	0.058	EC16_mild_1hr	0.02	EC16_mild_8hr	0.0067	EC16_mild_24hr
		CRIT	0.22	EC50_mild_10min	0.091	EC50_mild_1hr	0.032	EC50_mild_8hr	0.011	EC50_mild_24hr
		CAT	11	EC50_sev_10min	4.6	EC50_sev_1hr	1.6	EC50_sev_8hr	0.54	EC50_sev_24hr
GB	107-44-8	NEG	0.0069	AEGL1_10min	0.0028	AEGL1_1hr	0.001	AEGL1_8hr	0.0003	AEGL1-based
		MARG	0.14	EC16_mild_10min	0.058	EC16_mild_1hr	0.02	EC16_mild_8hr	0.0067	EC16_mild_24hr
		CRIT	0.22	EC50_mild_10min	0.091	EC50_mild_1hr	0.032	EC50_mild_8hr	0.011	EC50_mild_24hr
		CAT	5.6	EC50_sev_10min	2.3	EC50_sev_1hr	0.81	EC50_sev_8hr	0.27	EC50_sev_24hr
GD	96-64-0	NEG	0.0035	AEGL1_10min	0.0014	AEGL1_1hr	0.0005	AEGL1_8hr	0.0002	AEGL1-based
		MARG	0.061	EC16_mild_10min	0.025	EC16_mild_1hr	0.009	EC16_mild_8hr	0.003	EC16_mild_24hr
		CRIT	0.089	EC50_mild_10min	0.037	EC50_mild_1hr	0.013	EC50_mild_8hr	0.0043	EC50_mild_24hr
		CAT	5.6	EC50_sev_10min	2.3	EC50_sev_1hr	0.81	EC50_sev_8hr	0.27	EC50_sev_24hr
GF	329-99-7	NEG	0.0035	AEGL1_10min	0.0014	AEGL1_1hr	0.0005	AEGL1_8hr	0.0002	AEGL1-based
		MARG	0.057	EC16_mild_10min	0.023	EC16_mild_1hr	0.008	EC16_mild_8hr	0.0027	EC16_mild_24hr
		CRIT	0.089	EC50_mild_10min	0.037	EC50_mild_1hr	0.013	EC50_mild_8hr	0.0043	EC50_mild_24hr
		CAT	5.6	EC50_sev_10min	2.3	EC50_sev_1hr	0.81	EC50_sev_8hr	0.27	EC50_sev_24hr
HD	505-60-2	NEG	0.4	AEGL1_10min	0.067	AEGL1_1hr	0.008	AEGL1_8hr	0.003	AEGL1-based
		MARG	1.2	EC16_mild_10min	0.19	EC16_mild_1hr	0.024	EC16_mild_8hr	0.0081	EC16_mild_24hr
		CRIT	2.5	EC50_mild_10min	0.42	EC50_mild_1hr	0.052	EC01_sev_8hr	0.012	EC01_sev_24hr
		CAT	10	EC50_sev_10min	1.7	EC50_sev_1hr	0.21	EC50_sev_8hr	0.07	EC50_sev_24hr

Table D-3: Basis for Chemical Warfare Agents Air MEGs

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*		*24-hour Air MEGs (mg/m³)*	
VX	50782-69-9	NEG	0.00057	AEGL1_10min	0.00017	AEGL1_1hr	0.000071	AEGL1_8hr	0.000024	AEGL1-based
		MARG	0.013	EC16_mild_10min	0.0051	EC16_mild_1hr	0.0018	EC16_mild_8hr	0.0006	EC16_mild_24hr
		CRIT	0.022	EC50_mild_10min	0.009	EC50_mild_1hr	0.003	EC50_mild_8hr	0.001	EC50_mild_24hr
		CAT	2.2	EC50_sev_10min	0.91	EC50_sev_1hr	0.32	EC50_sev_8hr	0.11	EC50_sev_24hr

Units:
mg/m3 = milligrams per cubic meter

Notes:
All Air Military Exposure Guidelines are provided in milligrams per cubic meter (mg/m³)
CASRN = Chemical Abstract Service Registry Number
NEG = Negligible
MARG = Marginal
CRIT = Critical
CAT = Catastrophic

Sources:
AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2007)
USACHPPM – Acute Toxicity Estimation and Operational Risk Management of Chemical Warfare Agent Exposures (USACHPPM 2004)
EC = Effective Concentration
PTE = Population Threshold Estimate
See Table B-1 for a complete list of acronyms and term descriptions.

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
1,4-Dichloro-cis-2-butene	1476-11-5			1.1E-03	PPRTV	1.1E-03	ca
Acetaldehyde	75-07-0	6.2E-02	IRIS_sub	2.2E+00	IRIS	6.2E-02	nc
Acetone	67-64-1	2.1E+01	MRL_inter			2.1E+01	nc
Acetone cyanohydrin	75-86-5	4.1E-02	PPRTV_sub			4.1E-02	nc
Acetonitrile	75-05-8	4.1E-02	IRIS_chr			4.1E-02	nc
Acrolein	107-02-8	1.4E-04	IRIS_sub			1.4E-04	nc
Acrylamide	79-06-1	4.1E-03	IRIS_chr	4.8E-02	IRIS	4.1E-03	nc
Acrylic acid	79-10-7	2.1E-03	IRIS_sub			2.1E-03	nc
Acrylonitrile	107-13-1	3.4E-01	HEAST_sub	7.1E-02	IRIS	7.1E-02	ca
Adiponitrile	111-69-3	4.1E-02	PPRTV_sub			4.1E-02	nc
Aldrin	309-00-2			9.8E-04	IRIS	9.8E-04	ca
Allyl alcohol	107-18-6	6.8E-04	PPRTV_sub			6.8E-04	nc
Allyl chloride	107-05-1	6.8E-03	IRIS_sub			6.8E-03	nc
Aluminum, elemental	7429-90-5	3.4E-03	PPRTV_chr			3.4E-03	nc
Ammonia	7664-41-7	6.8E-02	PPRTV_sub			6.8E-02	nc
Aniline	62-53-3	6.8E-03	IRIS_sub			6.8E-03	nc
Antimony trioxide	1309-64-4	1.4E-04	PPRTV_sub			1.4E-04	nc
Aramite	140-57-8			6.8E-01	IRIS	6.8E-01	ca
Aromatic hydrocarbon solvents	64742-95-6	6.8E-01	PPRTV_sub			6.8E-01	nc
Arsenic, elemental	7440-38-2			1.1E-03	IRIS	1.1E-03	ca
Arsine	7784-42-1	3.4E-05	IRIS_chr			3.4E-05	nc
Asbestos	1332-21-4			2.1E-05	IRIS	2.1E-05	ca
Azinphos methyl	86-50-0	6.8E-03	MRL_inter			6.8E-03	nc
Azobenzene	103-33-3			1.5E-01	IRIS	1.5E-01	ca
Barium, elemental	7440-39-3	3.4E-03	HEAST_sub			3.4E-03	nc
Benzene	71-43-2	5.5E-02	PPRTV_sub	6.1E-01	IRIS	5.5E-02	nc
Benzidine	92-87-5			7.2E-05	IRIS	7.2E-05	ca
Benzoic acid	65-85-0	1.4E-03	PPRTV_sub			1.4E-03	nc
Beryllium, elemental	7440-41-7	1.4E-05	IRIS_sub	2.0E-03	IRIS	1.4E-05	nc
Bis(2-chloro-1-methylethyl) ether	108-60-1			4.8E-01	HEAST	4.8E-01	ca
Bis(2-chloroethyl) ether	111-44-4	8.0E-02	MRL_inter	1.5E-02	IRIS	1.5E-02	ca

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Bis(chloromethyl) ether	542-88-1	9.7E-04	MRL_inter	7.7E-05	IRIS	7.7E-05	ca
Boron	7440-42-8	1.4E-02	HEAST_sub			1.4E-02	nc
Boron trifluoride	7637-07-2	4.8E-03	HEAST_sub			4.8E-03	nc
Bromobenzene	108-86-1	1.4E-01	IRIS_sub			1.4E-01	nc
Bromochloromethane	74-97-5	6.8E-02	PPRTV_sub			6.8E-02	nc
Bromodichloromethane	75-27-4	1.4E-02	PPRTV_sub			1.4E-02	nc
Bromoethene	593-60-2	2.1E-03	HEAST_sub	1.5E-01	HEAST	2.1E-03	nc
Bromoform	75-25-2			4.4E+00	IRIS	4.4E+00	ca
Butadiene, 1,3-	106-99-0	1.4E-03	IRIS_chr	1.6E-01	IRIS	1.4E-03	nc
Butyl alcohol, sec-	78-92-2	2.1E+01	PPRTV_sub			2.1E+01	nc
Butyltin compounds	z-136	2.7E-04	PPRTV_sub			2.7E-04	nc
Cadmium, elemental	7440-43-9	6.8E-06	MRL_chr	2.7E-03	IRIS	6.8E-06	nc
Carbon disulfide	75-15-0	4.8E-01	HEAST_sub			4.8E-01	nc
Carbon tetrachloride	56-23-5	1.3E-01	MRL_inter	8.0E-01	IRIS	1.3E-01	nc
Ceric oxide	1306-38-3	6.2E-03	IRIS_sub			6.2E-03	nc
Chlordane	57-74-9	1.4E-04	MRL_inter	1.3E-02	HEAST	1.4E-04	nc
Chlorine	7782-50-5	4.0E-03	MRL_inter			4.0E-03	nc
Chloro-1,3-butadiene	126-99-8	4.8E-02	HEAST_sub			4.8E-02	nc
Chloroacetophenone, 2-	532-27-4	2.1E-05	IRIS_chr			2.1E-05	nc
Chlorobenzene	108-90-7	3.4E-01	PPRTV_sub			3.4E-01	nc
Chlorobenzilate	510-15-6			6.1E-02	HEAST	6.1E-02	ca
Chlorobenzotrifluoride, 4-	98-56-6	2.1E+00	PPRTV_sub			2.1E+00	nc
Chlorodifluoromethane	75-45-6	3.4E+01	IRIS_chr			3.4E+01	nc
Chloroform	67-66-3	1.7E-01	MRL_inter	2.1E-01	IRIS	1.7E-01	nc
Chloronitrobenzene, o-	88-73-3	6.8E-05	PPRTV_sub			6.8E-05	nc
Chloropropane, 2-	75-29-6	6.8E-01	HEAST_sub			6.8E-01	nc
Chromium (III)	16065-83-1	3.4E-03	MRL_inter			3.4E-03	nc
Chromium (VI)	18540-29-9	6.8E-04	IRIS_sub	4.0E-04	IRIS	4.0E-04	ca
Cobalt	7440-48-4	1.4E-05	PPRTV_sub	5.3E-10	PPRTV	5.3E-10	ca
Coke oven emissions	8007-45-2			7.7E-03	IRIS	7.7E-03	ca
Commercial Hexane	Com Hexane	1.8E+01	PPRTV_sub			1.8E+01	nc
Cumene	98-82-8	2.7E+00	IRIS_sub			2.7E+00	nc

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Cyclohexane	110-82-7	4.1E+00	IRIS_chr			4.1E+00	nc
Cyclopentadiene	542-92-7	2.1E+00	HEAST_sub			2.1E+00	nc
DDT	50-29-3			4.9E-02	IRIS	4.9E-02	ca
Diazinon	333-41-5	6.8E-03	MRL_inter			6.8E-03	nc
Dibromo-3-chloropropane, 1,2-	96-12-8	1.4E-03	PPRTV_sub	8.0E-10	PPRTV	8.0E-10	ca
Dibromoethane, 1,2-	106-93-4	1.4E-03	HEAST_sub	8.0E-03	IRIS	1.4E-03	nc
Dichloro-2-butene, 1,4-	764-41-0			1.1E-03	PPRTV	1.1E-03	ca
Dichlorobenzene, 1,2-	95-50-1	1.4E+00	HEAST_sub			1.4E+00	nc
Dichlorobenzene, 1,4-	106-46-7	1.6E+00	IRIS_sub			1.6E+00	nc
Dichlorobutene-2, trans-1,4-	110-57-6			1.1E-03	PPRTV	1.1E-03	ca
Dichlorodifluoromethane	75-71-8	1.4E+00	HEAST_sub			1.4E+00	nc
Dichloroethane, 1,2-	107-06-2	1.7E+00	MRL_chr	1.8E-01	IRIS	1.8E-01	ca
Dichloroethylene, 1,1-	75-35-4	5.4E-02	MRL_inter	1.4E-02	HEAST	1.4E-02	ca
Dichloroethylene, trans-	156-60-5	5.4E-01	MRL_inter			5.4E-01	nc
Dichloropropane, 1,2-	78-87-5	8.2E-03	IRIS_sub			8.2E-03	nc
Dichloropropene, 1,3-	542-75-6	2.5E-02	MRL_inter	1.2E+00	IRIS	2.5E-02	nc
Dichlorvos	62-73-7	1.9E-03	MRL_inter			1.9E-03	nc
Dicyclopentadiene	77-73-6	1.4E-02	PPRTV_sub			1.4E-02	nc
Dieldrin	60-57-1			1.0E-03	IRIS	1.0E-03	ca
Diesel engine exhaust	Diesel	3.4E-03	IRIS_chr			3.4E-03	nc
Diethylene glycol monobutyl ether	112-34-5	6.8E-04	PPRTV_sub			6.8E-04	nc
Diethylene glycol monoethyl ether	111-90-0	2.1E-03	PPRTV_sub			2.1E-03	nc
Difluoroethane, 1,1-	75-37-6	2.7E+01	IRIS_chr			2.7E+01	nc
Diisopropyl ether	108-20-3	2.7E+00	PPRTV_sub			2.7E+00	nc
Dimethylformamide	68-12-2	4.8E-02	PPRTV_sub			4.8E-02	nc
Dimethylhydrazine, 1,1-	57-14-7	5.5E-06	PPRTV_sub			5.5E-06	nc
Dioxane, 1,4-	123-91-1	2.5E+00	MRL_inter			2.5E+00	nc
Diphenylhydrazine, 1,2-	122-66-7			2.2E-02	IRIS	2.2E-02	ca
Disulfoton	298-04-4	1.4E-04	MRL_inter			1.4E-04	nc
EMPA	1832-53-7	2.1E-02	Munro			2.1E-02	nc
Epichlorohydrin	106-89-8	6.8E-03	PPRTV_sub	4.0E+00	IRIS	6.8E-03	nc

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Epoxybutane, 1,2-	106-88-7	1.4E-02	IRIS_chr			1.4E-02	nc
Ethoxyethanol, 2-	110-80-5	1.4E+00	IRIS_sub			1.4E+00	nc
Ethoxyethyl acetate, 2-	111-15-9	2.1E-01	HEAST_sub			2.1E-01	nc
Ethyl chloride	75-00-3	2.7E+00	PPRTV_sub			2.7E+00	nc
Ethyl ether	60-29-7	2.1E+00	PPRTV_sub			2.1E+00	nc
Ethylbenzene	100-41-4	2.1E+00	MRL_inter			2.1E+00	nc
Ethylene glycol monobutyl ether	111-76-2	9.9E+00	MRL_inter			9.9E+00	nc
Ethylene oxide	75-21-8	1.1E-01	MRL_inter	4.8E-02	HEAST	4.8E-02	ca
Formaldehyde	50-00-0	2.5E-02	MRL_inter	3.7E-01	IRIS	2.5E-02	nc
Furfural	98-01-1	3.4E-01	HEAST_sub			3.4E-01	nc
Glycidaldehyde	765-34-4	6.8E-03	HEAST_sub			6.8E-03	nc
HCFC-142b	75-68-3	3.4E+01	IRIS_chr			3.4E+01	nc
HD	505-60-2	1.4E-05	MRL_inter			1.4E-05	nc
Heptachlor	76-44-8			3.7E-03	IRIS	3.7E-03	ca
Heptachlor epoxide	1024-57-3			1.8E-03	IRIS	1.8E-03	ca
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4			1.1E-05	HEAST	1.1E-05	ca
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7			1.1E-05	HEAST	1.1E-05	ca
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9			1.1E-05	HEAST	1.1E-05	ca
Hexachlorobenzene	118-74-1			1.0E-02	IRIS	1.0E-02	ca
Hexachlorobutadiene	87-68-3			2.2E-01	IRIS	2.2E-01	ca
Hexachlorocyclohexane, alpha-	319-84-6			2.7E-03	IRIS	2.7E-03	ca
Hexachlorocyclohexane, beta-	319-85-7			9.0E-03	IRIS	9.0E-03	ca
Hexachlorocyclohexane, technical	608-73-1			9.4E-03	IRIS	9.4E-03	ca
Hexachlorocyclopentadiene	77-47-4	7.6E-02	MRL_inter			7.6E-02	nc
Hexachlorodibenzodioxin, 1,2,3,4,7,8-	39227-28-6			1.1E-06	HEAST	1.1E-06	ca
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9			1.1E-06	HEAST	1.1E-06	ca
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9			1.1E-06	HEAST	1.1E-06	ca
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9			1.1E-06	HEAST	1.1E-06	ca

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5			1.1E-06	HEAST	1.1E-06	ca
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7			1.1E-06	HEAST	1.1E-06	ca
Hexachloroethane	67-72-1	4.0E+01	MRL_inter	1.2E+00	IRIS	1.2E+00	ca
Hexamethylene diisocyanate	822-06-0	1.4E-04	MRL_inter			1.4E-04	nc
Hexane, commercial	110-54-3	1.4E+00	PPRTV_sub			1.4E+00	nc
Hexanone, 2-	591-78-6	2.1E-01	IRIS_sub			2.1E-01	nc
HFC-134A	811-97-2	5.5E+01	IRIS_chr			5.5E+01	nc
Hydrazine	302-01-2	6.2E-05	PPRTV_sub	9.8E-04	IRIS	6.2E-05	nc
Hydrogen chloride	7647-01-0	1.4E-02	IRIS_chr			1.4E-02	nc
Hydrogen cyanide	74-90-8	6.2E-03	IRIS_sub			6.2E-03	nc
Hydrogen sulfide	7783-06-4	1.4E-02	IRIS_sub			1.4E-02	nc
JP-4 jet fuel	50815-00-4	6.2E+00	MRL_inter			6.2E+00	nc
Kerosene	8008-20-6	6.8E-03	MRL_inter			6.8E-03	nc
Lewisite oxide	3088-37-7	3.4E-01	Munro			3.4E-01	nc
Malathion	121-75-5	1.4E-02	MRL_inter			1.4E-02	nc
Manganese	7439-96-5	3.4E-05	IRIS_chr			3.4E-05	nc
Mercury, elemental	7439-97-6	2.1E-04	HEAST_sub			2.1E-04	nc
Methacrylonitrile	126-98-7	4.8E-03	HEAST_sub			4.8E-03	nc
Methoxyethanol, 2-	109-86-4	1.4E-01	IRIS_sub			1.4E-01	nc
Methyl bromide	74-83-9	6.8E-02	PPRTV_sub			6.8E-02	nc
Methyl chloride	74-87-3	6.2E-01	IRIS_sub	2.7E+00	HEAST	6.2E-01	nc
Methyl ethyl ketone	78-93-3	6.8E-01	HEAST_sub			6.8E-01	nc
Methyl isobutyl ketone	108-10-1	5.5E-01	HEAST_sub			5.5E-01	nc
Methyl methacrylate	80-62-6	4.8E-01	IRIS_chr			4.8E-01	nc
Methyl tertiary butyl ether	1634-04-4	1.7E+00	MRL_inter			1.7E+00	nc
Methylene chloride	75-09-2	7.1E-01	MRL_inter	1.0E+01	IRIS	7.1E-01	nc
Methylene diphenyl diisocyanate	101-68-8	1.4E-05	HEAST_sub			1.4E-05	nc
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4			1.3E-01	HEAST	1.3E-01	ca
Methylphosphonic acid	993-13-5	1.6E-02	Munro			1.6E-02	nc
Midrange Aliphatic Hydrocarbon Streams	Mid HC stream	6.8E-02	PPRTV_sub			6.8E-02	nc

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Naphthalene	91-20-3	2.1E-03	IRIS_chr			2.1E-03	nc
Nickel compounds	Ni cmpds	1.4E-04	MRL_inter			1.4E-04	nc
Nickel refinery dust	Ni ref dust			2.0E-02	IRIS	2.0E-02	ca
Nickel subsulfide	12035-72-2			1.0E-02	IRIS	1.0E-02	ca
Nitroaniline, 2-	88-74-4	2.7E-04	PPRTV_sub			2.7E-04	nc
Nitrobenzene	98-95-3	1.4E-02	HEAST_sub	1.2E-01	IRIS	1.4E-02	nc
Nitromethane	75-52-5	4.1E-02	PPRTV_sub	5.3E-07	PPRTV	5.3E-07	ca
Nitrophenol, 2-	88-75-5	3.4E-04	PPRTV_sub			3.4E-04	nc
Nitropropane, 2-	79-46-9	1.4E-02	HEAST_sub	1.8E-03	HEAST	1.8E-03	ca
Nitrosodiethylamine, N-	55-18-5			1.1E-04	IRIS	1.1E-04	ca
Nitrosodimethylamine, N-	62-75-9			3.4E-04	IRIS	3.4E-04	ca
Nitroso-di-n-butylamine, N-	924-16-3			3.0E-03	IRIS	3.0E-03	ca
Nitrosopyrrolidine, N-	930-55-2			7.9E-03	IRIS	7.9E-03	ca
Nonane	111-84-2	1.4E+00	PPRTV_sub			1.4E+00	nc
Octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-	3268-87-9			3.7E-04	HEAST	3.7E-04	ca
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	39001-02-0			3.7E-04	HEAST	3.7E-04	ca
Pentachlordibenzofuran, 2,3,4,7,8-	57117-31-4			3.7E-07	HEAST	3.7E-07	ca
Pentachlorodibenzofuran , 1,2,3,7,8-	57117-41-6			3.7E-06	HEAST	3.7E-06	ca
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4			1.1E-07	HEAST	1.1E-07	ca
Pentane, n-	109-66-0	6.8E+00	PPRTV_sub			6.8E+00	nc
Perchloroethylene	127-18-4	1.9E-01	MRL_chr			1.9E-01	nc
Phosgene	75-44-5	6.2E-04	IRIS_sub			6.2E-04	nc
Phosphine	7803-51-2	2.1E-03	IRIS_sub			2.1E-03	nc
Phosphoric acid	7664-38-2	6.8E-02	IRIS_sub			6.8E-02	nc
Phthalic anhydride	85-44-9	8.2E-02	HEAST_sub			8.2E-02	nc
Polychlorinated biphenyls	1336-36-3			4.2E-02	IRIS	4.2E-02	ca
Propionaldehyde	123-38-6	5.5E-02	IRIS_sub			5.5E-02	nc
Propylene glycol	57-55-6	1.9E-02	MRL_inter			1.9E-02	nc
Propylene glycol dinitrate	6423-43-4	1.9E-04	MRL_inter			1.9E-04	nc
Propylene glycol monomethyl ether	107-98-2	1.4E+01	IRIS_sub			1.4E+01	nc

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	CASRN	PMEGnc		PMEGca		PMEG	
Propylene oxide	75-56-9	2.1E-02	HEAST_sub	1.3E+00	IRIS	2.1E-02	nc
Refractory ceramic fibers	ref ceramic fiber	2.1E-02	MRL_chr			2.1E-02	nc
Styrene	100-42-5	5.8E-01	MRL_chr			5.8E-01	nc
TCDD, 2,3,7,8-	1746-01-6			1.1E-07	HEAST	1.1E-07	ca
Tetrachlorodibenzofuran, 2,3,7,8-	51207-31-9			1.1E-06	HEAST	1.1E-06	ca
Tetrachloroethane, 1,1,1,2-	630-20-6			6.5E-01	IRIS	6.5E-01	ca
Tetrachloroethane, 1,1,2,2-	79-34-5			8.3E-02	IRIS	8.3E-02	ca
Titanium tetrachloride	7550-45-0	6.8E-03	MRL_inter			6.8E-03	nc
Toluene	108-88-3	3.4E+00	PPRTV_sub			3.4E+00	nc
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5	4.8E-05	IRIS_chr			4.8E-05	nc
Toxaphene	8001-35-2			1.5E-02	IRIS	1.5E-02	ca
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	2.1E+01	HEAST_sub			2.1E+01	nc
Trichlorobenzene, 1,2,4-	120-82-1	1.4E-02	PPRTV_sub			1.4E-02	nc
Trichloroethane, 1,1,1-	71-55-6	2.6E+00	MRL_inter			2.6E+00	nc
Trichloroethane, 1,1,2-	79-00-5			3.0E-01	IRIS	3.0E-01	ca
Trichloroethylene	79-01-6	3.7E-01	MRL_inter			3.7E-01	nc
Trichlorofluoromethane	75-69-4	6.8E-01	PPRTV_sub			6.8E-01	nc
Trichlorophenol, 2,4,6-	88-06-2			1.5E+00	IRIS	1.5E+00	ca
Trichloropropane, 1,2,3-	96-18-4	2.1E-03	IRIS_sub			2.1E-03	nc
Trichloropropene, 1,2,3-	96-19-5	2.1E-03	PPRTV_sub			2.1E-03	nc
Triethylamine	121-44-8	4.8E-02	IRIS_sub			4.8E-02	nc
Trimethylbenzene, 1,2,4-	95-63-6	4.8E-02	PPRTV_sub			4.8E-02	nc
Trimethylbenzene, 1,3,5-	108-67-8	6.8E-03	PPRTV_sub			6.8E-03	nc
Trimethylbenzene, 1,3,5-	108-67-8	6.8E-03	PPRTV_sub			6.8E-03	nc
Uranium, highly soluble salts	HZ1800-90-T	2.7E-04	MRL_inter			2.7E-04	nc
Vanadium	7440-62-2	6.8E-05	MRL_chr			6.8E-05	nc
Vanadium pentoxide	1314-62-1	6.8E-05	PPRTV_sub	5.8E-04	PPRTV	6.8E-05	nc
Vinyl acetate	108-05-4	2.4E-02	MRL_inter			2.4E-02	nc
Vinyl chloride	75-01-4	5.3E-02	MRL_inter	1.1E+00	IRIS	5.3E-02	nc
Vinyl toluene	25013-15-4	2.7E-02	HEAST_sub			2.7E-02	nc

Table D-4: Preliminary 1-Year Air MEGs

Chemical Name	*CASRN*	*PMEGnc*	*PMEGca*	*PMEG*
Xylenes, total	1330-20-7	2.7E-01 PPRTV_sub		2.7E-01 nc

Units:
f/cc = fibers of asbestos per cubic centimeter
mg/m3 = milligrams per cubic meter
mg/kg-day = milligrams per kilogram day
µg/m3 = micrograms per cubic meter
µg/L = micrograms per liter

Notes:
All Preliminary 1-Year Air Military Exposure Guidelines (PMEGs) are provided in milligrams per cubic meter (mg/m^3) (asbestos and refractory ceramic fibers are in f/cc)
CASRN = Chemical Abstract Service Registry Number
CSFi = Inhalation Cancer Slope Factor
CSFo = Oral Cancer Slope Factor
URi = Inhalation Unit Risk Factor
URi = Oral Unit Risk Factor
RfC = Reference Concentration
RfDo = Oral Reference Dose
nc = non-cancer
ca = cancer
sub = subchronic
chr = chronic
inter = intermediate

Sources:
HBESL = Health Based Enviromental Screening Level (USACHPPM/ORNL 1999)
HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
Munro = Munro et al 1999
PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
EPA_Reg6 = EPA Human Health Medium-Specific Screening Values (Tox Values noted from NCEA) (EPA Region 6 2008).

* IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.5.2 further describes adjustments made to IRIS values.

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
1,4-Dichloro-cis-2-butene	1476-11-5	1.1E-03	ca PPRTV			1.1E-03	PPRTV
2,2-Dimethylpentane	590-35-2			4.0E+02	TLV_TWA	4.0E+02	TLVadj
2,3-Dimethylpentane	565-59-3			4.0E+02	TLV_TWA	4.0E+02	TLVadj
2,4-Dimethylpentane	108-08-7			4.0E+02	TLV_TWA	4.0E+02	TLVadj
2-Methylhexane	591-76-4			4.0E+02	TLV_TWA	4.0E+02	TLVadj
3-Carene	13466-78-9			2.7E+01	TLV_TWA	2.7E+01	TLVadj
3-Methylhexane	589-34-4			4.0E+02	TLV_TWA	4.0E+02	TLVadj
Acetaldehyde	75-07-0	6.2E-02	nc IRIS_sub			6.2E-02	IRIS_sub
Acetic acid	64-19-7			8.4E+00	TLV_TWA_irr	8.4E+00	TLVirr
Acetic acid 2-methylbutyl ester	624-41-9			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Acetone	67-64-1	2.1E+01	nc MRL_inter	4.1E+02	TLV_TWA_irr	2.1E+01	MRL_inter
Acetone cyanohydrin	75-86-5	4.1E-02	nc PPRTV_sub			4.1E-02	PPRTV_sub
Acetonitrile	75-05-8	4.1E-02	nc IRIS_chr	8.2E+00	TLV_TWA	4.1E-02	IRIS_chr
Acetophenone	98-86-2			1.7E+01	TLV_TWA_irr	1.7E+01	TLVirr
Acetylene tetrabromide	79-27-6			3.5E-01	TLV_TWA	3.5E-01	TLVadj
Acetylsalicylic acid	50-78-2			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Acrolein	107-02-8	1.4E-04	nc IRIS_sub			1.4E-04	IRIS_sub
Acrylamide	79-06-1	4.1E-03	nc IRIS_chr	7.3E-03	TLV_TWA	4.1E-03	IRIS_chr
Acrylic acid	79-10-7	2.1E-03	nc IRIS_sub	2.0E+00	TLV_TWA_irr	2.1E-03	IRIS_sub
Acrylonitrile	107-13-1	7.1E-02	ca IRIS	1.1E+00	TLV_TWA	7.1E-02	IRIS
Adipic acid	124-04-9			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Adiponitrile	111-69-3	4.1E-02	nc PPRTV_sub	2.2E+00	TLV_TWA	4.1E-02	PPRTV_sub
Alachlor	15972-60-8			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Aldrin	309-00-2	9.8E-04	ca IRIS	1.2E-02	TLV_TWA	9.8E-04	IRIS

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Allyl alcohol	107-18-6	6.8E-04	nc PPRTV_sub	4.1E-01	TLV_TWA_irr	6.8E-04	PPRTV_sub
Allyl chloride	107-05-1	6.8E-03	nc IRIS_sub	7.7E-01	TLV_TWA	6.8E-03	IRIS_sub
Allyl glycidyl ether	106-92-3			1.6E+00	TLV_TWA_irr	1.6E+00	TLVirr
Allyl propyl disulfide	2179-59-1			1.0E+00	TLV_TWA_irr	1.0E+00	TLVirr
Aluminum, elemental	7429-90-5	3.4E-03	nc PPRTV_chr	3.4E-01	TLV_TWA_irr	3.4E-03	PPRTV_chr
Aminopyridine, 2-	504-29-0			4.7E-01	TLV_TWA	4.7E-01	TLVadj
Amitrole	61-82-5			4.9E-02	TLV_TWA	4.9E-02	TLVadj
Ammonia	7664-41-7	6.8E-02	nc PPRTV_sub	6.0E+00	TLV_TWA_irr	6.8E-02	PPRTV_sub
Ammonium chloride	12125-02-9			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Ammonium perfluorooctanoate	3825-26-1			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Ammonium sulfamate	7773-06-0			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Amyl acetate	628-63-7			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Amyl acetate, sec-	626-38-0			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Aniline	62-53-3	6.8E-03	nc IRIS_sub	1.9E+00	TLV_TWA	6.8E-03	IRIS_sub
Anisidine, o-	90-04-0			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Anisidine, p-	104-94-9			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Antimony trioxide	1309-64-4	1.4E-04	nc PPRTV_sub			1.4E-04	PPRTV_sub
Antimony, elemental	7440-36-0			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
ANTU	86-88-4			1.0E-01	TLV_TWA_irr	1.0E-01	TLVirr
Aramite	140-57-8	6.8E-01	ca IRIS			6.8E-01	IRIS
Aroclor 1242	53469-21-9			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Aroclor 1254	11097-69-1			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Aromatic hydrocarbon solvents	64742-95-6	6.8E-01	nc PPRTV_sub			6.8E-01	PPRTV_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG		Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Arsenic compounds	As cmpds				2.4E-03	TLV_TWA	2.4E-03	TLVadj
Arsenic, elemental	7440-38-2	1.1E-03	ca	IRIS			1.1E-03	IRIS
Arsine	7784-42-1	3.4E-05	nc	IRIS_chr	3.9E-03	TLV_TWA	3.4E-05	IRIS_chr
Asbestos	1332-21-4	2.1E-05	ca	IRIS			2.1E-02	IRIS*
Asphalt	8052-42-4				1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Atrazine	1912-24-9				1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Azinphos methyl	86-50-0	6.8E-03	nc	MRL_inter	4.9E-02	TLV_TWA	6.8E-03	MRL_inter
Azobenzene	103-33-3	1.5E-01	ca	IRIS			1.5E-01	IRIS
Barium sulfate	7727-43-7				2.4E+00	TLV_TWA	2.4E+00	TLVadj
Barium, elemental	7440-39-3	3.4E-03	nc	HEAST_sub	1.7E-01	TLV_TWA_irr	3.4E-03	HEAST_sub
Baygon	114-26-1				1.2E-01	TLV_TWA	1.2E-01	TLVadj
Benomyl	17804-35-2				3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Benzene	71-43-2	5.5E-02	nc	PPRTV_sub	3.9E-01	TLV_TWA	5.5E-02	PPRTV_sub
Benzenethiol	108-98-5				1.5E-01	TLV_TWA_irr	1.5E-01	TLVirr
Benzidine	92-87-5	7.2E-05	ca	IRIS			7.2E-05	IRIS
Benzoic acid	65-85-0	1.4E-03	nc	PPRTV_sub			1.4E-03	PPRTV_sub
Benzoyl peroxide	94-36-0				1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Benzyl acetate	140-11-4				2.1E+01	TLV_TWA_irr	2.1E+01	TLVirr
Benzyl chloride	100-44-7				1.8E+00	TLV_TWA_irr	1.8E+00	TLVirr
Beryllium, elemental	7440-41-7	1.4E-05	nc	IRIS_sub	1.2E-05	TLV_TWA	1.4E-05	IRIS_sub
beta-Pinene	127-91-3				2.7E+01	TLV_TWA	2.7E+01	TLVadj
Bidrin	141-66-2				1.2E-02	TLV_TWA	1.2E-02	TLVadj
Biphenyl, 1,1-	92-52-4				3.1E-01	TLV_TWA	3.1E-01	TLVadj
Bis(2-chloro-1-methylethyl) ether	108-60-1	4.8E-01	ca	HEAST			4.8E-01	HEAST

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Bis(2-chloroethyl) ether	111-44-4	1.5E-02	ca IRIS	1.0E+01	TLV_TWA_irr	1.5E-02	IRIS
Bis(2-dimethylaminoethyl)ether	3033-62-3			1.1E-01	TLV_TWA_irr	1.1E-01	TLVirr
Bis(2-ethylhexyl) phthalate	117-81-7			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Bis(chloromethyl) ether	542-88-1	7.7E-05	ca IRIS	1.6E-03	TLV_TWA_irr	7.7E-05	IRIS
Bismuth telluride	1304-82-1			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Borates, pentahydrate	12179-04-3			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Borax	1303-96-4			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Boric acid	10043-35-3			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Boron	7440-42-8	1.4E-02	nc HEAST_sub			6.8E-03	MRLi_acute*
Boron oxide	1303-86-2			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Boron trifluoride	7637-07-2	4.8E-03	nc HEAST_sub			4.8E-03	HEAST_sub
Bromacil	314-40-9			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Bromine	7726-95-6			2.2E-01	TLV_TWA_irr	2.2E-01	TLVirr*
Bromine pentafluoride	7789-30-2			2.5E-01	TLV_TWA_irr	2.5E-01	TLVirr
Bromobenzene	108-86-1	1.4E-01	nc IRIS_sub			1.4E-01	IRIS_sub
Bromochloromethane	74-97-5	6.8E-02	nc PPRTV_sub	2.6E+02	TLV_TWA	6.8E-02	PPRTV_sub
Bromodichloromethane	75-27-4	1.4E-02	nc PPRTV_sub			1.4E-02	PPRTV_sub
Bromoethene	593-60-2	2.1E-03	nc HEAST_sub	5.4E-01	TLV_TWA	2.1E-03	HEAST_sub
Bromoform	75-25-2	4.4E+00	ca IRIS	1.8E+00	TLV_TWA_irr	2.0E+00	TLV_TWA*
Bromopropane, 1-	106-94-5			1.2E+01	TLV_TWA	1.2E+01	TLVadj
Butadiene, 1,3-	106-99-0	1.4E-03	nc IRIS_chr	1.1E+00	TLV_TWA	1.4E-03	IRIS_chr
Butane	106-97-8			5.8E+02	TLV_TWA	5.8E+02	TLVadj
Butanethiol	109-79-5			6.3E-01	TLV_TWA_irr	6.3E-01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Butanol, 1-	71-36-3			2.1E+01	TLV_TWA_irr	2.1E+01	TLVirr
Butene	25167-67-3			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Butene, 1-	106-98-9			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Butene, 2-	107-01-7			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Butene, cis-2-	590-18-1			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Butene, trans-2-	624-64-6			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Butoxyethanol acetate, 2-	112-07-2			4.5E+01	TLV_TWA_irr	4.5E+01	TLVirr
Butyl acetate, n-	123-86-4			2.4E+02	TLV_TWA_irr	2.4E+01	ERPG1*
Butyl acetate, sec-	105-46-4			3.3E+02	TLV_TWA_irr	3.3E+02	TLVirr
Butyl acetate, tert-	540-88-5			3.3E+02	TLV_TWA_irr	3.3E+02	TLVirr
Butyl acrylate, n-	141-32-2			3.6E+00	TLV_TWA_irr	3.6E+00	TLVirr
Butyl alcohol, sec-	78-92-2	2.1E+01	nc PPRTV_sub	1.0E+02	TLV_TWA_irr	2.1E+01	PPRTV_sub
Butyl glycidyl ether, n-	2426-08-6			3.9E+00	TLV_TWA	3.9E+00	TLVadj
Butyl lactate, N-	138-22-7			1.0E+01	TLV_TWA_irr	1.0E+01	TLVirr
Butylated hydroxytoluene	128-37-0			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Butylphenol, 2-sec-	89-72-5			1.1E+01	TLV_TWA_irr	1.1E+01	TLVirr
Butyltin compounds	z-136	2.7E-04	nc PPRTV_sub			2.7E-04	PPRTV_sub
Butyltoluene, p-tert-	98-51-1			2.1E+00	TLV_TWA_irr	2.1E+00	TLVirr
Cadmium, elemental	7440-43-9	6.8E-06	nc MRL_chr	4.9E-04	TLV_TWA	6.8E-06	MRL_chr
Calcium chromate	13765-19-0			2.4E-04	TLV_TWA	2.4E-04	TLVadj
Calcium cyanamide	156-62-7			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Calcium hydroxide	1305-62-0			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Calcium oxide	1305-78-8			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Calcium sulfate	7778-18-9			2.4E+00	TLV_TWA	2.4E+00	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG		Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Calcium sulfate dihydrate	10101-41-4				2.4E+00	TLV_TWA	2.4E+00	TLVadj
Calcium sulfate hemihydrate	10034-76-1				2.4E+00	TLV_TWA	2.4E+00	TLVadj
Camphor	76-22-2				4.3E+00	TLV_TWA_irr	4.3E+00	TLVirr
Caprolactam	105-60-2				1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Captafol	2425-06-1				2.4E-02	TLV_TWA	2.4E-02	TLVadj
Captan	133-06-2				1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Carbaryl	63-25-2				1.2E-01	TLV_TWA	1.2E-01	TLVadj
Carbofuran	1563-66-2				2.4E-02	TLV_TWA	2.4E-02	TLVadj
Carbon dioxide	124-38-9				2.2E+03	TLV_TWA	2.2E+03	TLVadj
Carbon disulfide	75-15-0	4.8E-01	nc	HEAST_sub	7.6E-01	TLV_TWA	4.8E-01	HEAST_sub
Carbon monoxide	630-08-0				7.0E+00	TLV_TWA	7.0E+00	TLVadj
Carbon tetrabromide	558-13-4				4.6E-01	TLV_TWA_irr	4.6E-01	TLVirr
Carbon tetrachloride	56-23-5	1.3E-01	nc	MRL_inter	7.7E+00	TLV_TWA	1.3E-01	MRL_inter
Carbonyl fluoride	353-50-4				1.8E+00	TLV_TWA_irr		
Catechol	120-80-9				7.7E+00	TLV_TWA_irr	7.7E+00	TLVirr
Cellulose	9004-34-6				3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Ceric oxide	1306-38-3	6.2E-03	nc	IRIS_sub			6.2E-03	IRIS_sub
Cesium hydroxide	21351-79-1				6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Chlordane	57-74-9	1.4E-04	nc	MRL_inter	1.2E-01	TLV_TWA	1.4E-04	MRL_inter
Chlorinated diphenyl oxide	31242-93-0				1.2E-01	TLV_TWA	1.2E-01	TLVadj
Chlorine	7782-50-5	4.0E-03	nc	MRL_inter	5.0E-01	TLV_TWA_irr	4.0E-03	MRL_inter
Chlorine dioxide	10049-04-4				9.4E-02	TLV_TWA_irr	9.4E-02	TLVirr
Chloro-1,3-butadiene	126-99-8	4.8E-02	nc	HEAST_sub	1.2E+01	TLV_TWA_irr	4.8E-02	HEAST_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Chloroacetic acid	79-11-8			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Chloroacetophenone, 2-	532-27-4	2.1E-05	nc IRIS_chr	1.1E-01	TLV_TWA_irr	2.1E-05	IRIS_chr
Chloroacetyl chloride	79-04-9			7.9E-02	TLV_TWA_irr	7.9E-02	TLVirr
Chlorobenzene	108-90-7	3.4E-01	nc PPRTV_sub	1.1E+01	TLV_TWA	3.4E-01	PPRTV_sub
Chlorobenzilate	510-15-6	6.1E-02	ca HEAST			6.1E-02	HEAST
Chlorobenzotrifluoride, 4-	98-56-6	2.1E+00	nc PPRTV_sub			2.1E+00	PPRTV_sub
Chlorodifluoromethane	75-45-6	3.4E+01	nc IRIS_chr	8.7E+02	TLV_TWA	3.4E+01	IRIS_chr
Chloroform	67-66-3	1.7E-01	nc MRL_inter	1.2E+01	TLV_TWA	1.7E-01	MRL_inter
Chloronitrobenzene, o-	88-73-3	6.8E-05	nc PPRTV_sub			6.8E-05	PPRTV_sub
Chloronitrobenzene, p-	100-00-5			1.6E-01	TLV_TWA	1.6E-01	TLVadj
Chloronitropropane	600-25-9			3.5E+00	TLV_TWA_irr	3.5E+00	TLVirr
Chloropentafluoroethane	76-15-3			1.5E+03	TLV_TWA	1.5E+03	TLVadj
Chloropicrin	76-06-2			2.3E-01	TLV_TWA_irr	2.3E-01	TLVirr
Chloropropane, 2-	75-29-6	6.8E-01	nc HEAST_sub			6.8E-01	HEAST_sub
Chloropropionic acid, 2-	598-78-7			1.5E-01	TLV_TWA_irr	1.5E-01	TLVirr
Chlorostyrene, o-	2039-87-4			6.9E+01	TLV_TWA	6.9E+01	TLVadj
Chlorotoluene, o-	95-49-8			8.9E+01	TLV_TWA_irr	8.9E+01	TLVirr
Chlorpyrifos	2921-88-2			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Chromate	11104-59-9			1.7E-02	TLV_TWA_irr	1.7E-02	TLVirr
Chromium (III)	16065-83-1	3.4E-03	nc MRL_inter			3.4E-03	MRL_inter
Chromium (VI)	18540-29-9	4.0E-04	ca IRIS			4.0E-04	IRIS
Chromium, elemental	7440-47-3			3.4E-03	TLV_TWA_irr	3.4E-03	TLVirr
Chromyl chloride	14977-61-8			3.9E-02	TLV_TWA	3.9E-02	TLVadj
Clopidol	2971-90-6			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Coal dust, anthracite	Coal dust a			9.8E-02	TLV_TWA	9.8E-02	TLVadj
Coal dust, bituminous	Coal dust b			2.2E-01	TLV_TWA	2.2E-01	TLVadj
Coal tar pitch volatiles (high temperature)	65996-93-2			4.9E-02	TLV_TWA	4.9E-02	TLVadj
Cobalt	7440-48-4	5.3E-10	ca PPRTV	4.9E-03	TLV_TWA	5.3E-10	PPRTV
Cobalt carbonyl	10210-68-1			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Cobalt hydrocarbonyl	16842-03-8			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Coke oven emissions	8007-45-2	7.7E-03	ca IRIS			7.7E-03	IRIS
Commercial Hexane	Com Hexane	1.8E+01	nc PPRTV_sub			1.8E+01	PPRTV_sub
Copper fume	Cu fume			6.8E-02	TLV_TWA_irr	6.8E-02	TLVirr
Coumaphos	56-72-4			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Cresol, m-	108-39-4			6.8E+00	TLV_TWA_irr	6.8E+00	TLVirr
Cresol, o-	95-48-7			6.8E+00	TLV_TWA_irr	6.8E+00	TLVirr
Cresol, p-	106-44-5			6.8E+00	TLV_TWA_irr	6.8E+00	TLVirr
Cristobalite	14464-46-1			6.1E-03	TLV_TWA	6.1E-03	TLVadj
Crufomate	299-86-5			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Cumene	98-82-8	2.7E+00	nc IRIS_sub	8.4E+01	TLV_TWA_irr	2.7E+00	IRIS_sub
Cyanamide	420-04-2			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Cyanogen	460-19-5			7.3E+00	TLV_TWA_irr	7.3E+00	TLVirr
Cyclohexane	110-82-7	4.1E+00	nc IRIS_chr	8.4E+01	TLV_TWA	4.1E+00	IRIS_chr
Cyclohexanol	108-93-0			7.0E+01	TLV_TWA_irr	7.0E+01	TLVirr
Cyclohexanone	108-94-1			1.9E+01	TLV_TWA	1.9E+01	TLVadj
Cyclohexene	110-83-8			3.5E+02	TLV_TWA_irr	3.5E+02	TLVirr
Cyclohexylamine	108-91-8			1.4E+01	TLV_TWA_irr	7.3E+00	AEGL1_8hr*
Cyclopentadiene	542-92-7	2.1E+00	nc HEAST_sub	6.9E+01	TLV_TWA_irr	2.1E+00	HEAST_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Cyclopentane	287-92-3			5.9E+02	TLV_TWA_irr	5.9E+02	TLVirr
Cyhexatin	13121-70-5			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Dalapon	75-99-0			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
DDT	50-29-3	4.9E-02	ca IRIS	2.4E-01	TLV_TWA	4.9E-02	IRIS
Decaborane	17702-41-9			6.1E-02	TLV_TWA	6.1E-02	TLVadj
Demeton	8065-48-3			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Demeton-S-methyl	919-86-8			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Diacetone alcohol	123-42-2			8.1E+01	TLV_TWA_irr	8.1E+01	TLVirr
Diazinon	333-41-5	6.8E-03	nc MRL_inter	2.4E-03	TLV_TWA	2.4E-03	TLV_TWA*
Diazomethane	334-88-3			1.2E-01	TLV_TWA_irr	1.2E-01	TLVirr
Diborane	19287-45-7			2.8E-02	TLV_TWA	2.8E-02	TLVadj
Dibromo-3-chloropropane, 1,2-	96-12-8	8.0E-10	ca PPRTV			8.0E-10	PPRTV
Dibromoethane, 1,2-	106-93-4	1.4E-03	nc HEAST_sub			1.4E-03	HEAST_sub
Dibutyl phenyl phosphate	2528-36-1			1.2E+00	TLV_TWA_irr	1.2E+00	TLVirr
Dibutyl phosphate	107-66-4			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Dibutyl phthalate	84-74-2			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Dibutylethanolamine	102-81-8			1.2E+00	TLV_TWA_irr	1.2E+00	TLVirr
Dichloro-1-nitroethane	594-72-9			4.0E+00	TLV_TWA_irr	4.0E+00	TLVirr
Dichloro-2-butene, 1,4-	764-41-0	1.1E-03	ca PPRTV	8.8E-03	TLV_TWA_irr	1.1E-03	PPRTV
Dichloro-5,5-dimethylhydantoin	118-52-5			6.8E-02	TLV_TWA_irr	6.8E-02	TLVirr
Dichloroacetic acid	79-43-6			6.5E-01	TLV_TWA	6.5E-01	TLVadj
Dichlorobenzene, 1,2-	95-50-1	1.4E+00	nc HEAST_sub	5.1E+01	TLV_TWA_irr	1.4E+00	HEAST_sub
Dichlorobenzene, 1,4-	106-46-7	1.6E+00	nc IRIS_sub	2.1E+01	TLV_TWA_irr	1.6E+00	IRIS_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Dichlorobutene-2, trans-1,4-	110-57-6	1.1E-03	ca PPRTV			1.1E-03	PPRTV
Dichlorodifluoromethane	75-71-8	1.4E+00	nc HEAST_sub	1.2E+03	TLV_TWA	1.4E+00	HEAST_sub
Dichloroethane, 1,1-	75-34-3			1.4E+02	TLV_TWA_irr	1.4E+02	TLVirr
Dichloroethane, 1,2-	107-06-2	1.8E-01	ca IRIS	9.9E+00	TLV_TWA	1.8E-01	IRIS
Dichloroethylene, 1,1-	75-35-4	1.4E-02	ca HEAST	4.8E+00	TLV_TWA	1.4E-02	HEAST
Dichloroethylene, 1,2-	540-59-0			1.9E+02	TLV_TWA	1.9E+02	TLVadj
Dichloroethylene, cis-1,2-	156-59-2			1.9E+02	TLV_TWA	1.9E+02	TLVadj
Dichloroethylene, trans-	156-60-5	5.4E-01	nc MRL_inter	1.9E+02	TLV_TWA	5.4E-01	MRL_inter
Dichlorofluoromethane	75-43-4			1.0E+01	TLV_TWA	4.2E+00	CEGL*
Dichlorophenoxy acetic acid, 2,4-	94-75-7			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Dichloropropane, 1,2-	78-87-5	8.2E-03	nc IRIS_sub	1.6E+01	TLV_TWA_irr	8.2E-03	IRIS_sub
Dichloropropene, 1,3-	542-75-6	2.5E-02	nc MRL_inter	1.6E+00	TLV_TWA_irr	2.5E-02	MRL_inter
Dichlorotetrafluoroethane	76-14-2			1.7E+03	TLV_TWA	8.7E+02	CEGL*
Dichlorvos	62-73-7	1.9E-03	nc MRL_inter	2.4E-02	TLV_TWA	1.9E-03	MRL_inter
Dicyclopentadiene	77-73-6	1.4E-02	nc PPRTV_sub	9.3E+00	TLV_TWA_irr	1.4E-02	PPRTV_sub
Dicyclopentadienyl iron	102-54-5			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Dieldrin	60-57-1	1.0E-03	ca IRIS	2.4E-02	TLV_TWA	1.0E-03	IRIS
Diesel engine exhaust	Diesel	3.4E-03	nc IRIS_chr			3.4E-03	IRIS_chr
Diesel fuel marine	77650-28-3			3.4E+01	TLV_TWA_irr	3.4E+01	TLVirr
Diesel fuels	68334-30-5			3.4E+01	TLV_TWA_irr	3.4E+01	TLVirr
Diethanolamine	111-42-2			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Diethyl ketone	96-22-0			2.4E+02	TLV_TWA_irr	2.4E+02	TLVirr
Diethyl phthalate	84-66-2			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Diethylamine	109-89-7			5.1E+00	TLV_TWA_irr	5.1E+00	TLVirr
Diethylaminoethanol, 2-	100-37-8			3.3E+00	TLV_TWA_irr	3.3E+00	TLVirr
Diethylene glycol monobutyl ether	112-34-5	6.8E-04	nc PPRTV_sub			6.8E-04	PPRTV_sub
Diethylene glycol monoethyl ether	111-90-0	2.1E-03	nc PPRTV_sub			2.1E-03	PPRTV_sub
Diethylene triamine	111-40-0			1.4E+00	TLV_TWA_irr	1.4E+00	TLVirr
Difluorodibromomethane	75-61-6			2.9E+02	TLV_TWA_irr	2.9E+02	TLVirr
Difluoroethane, 1,1-	75-37-6	2.7E+01	nc IRIS_chr			2.7E+01	IRIS_chr
Difluorotetrachloroethane, 1,2-	76-12-0			1.0E+02	TLV_TWA	1.0E+02	TLVadj
Difluorotetrachloroethane, 2,2-	76-11-9			2.0E+02	TLV_TWA	2.0E+02	TLVadj
Diglycidyl ether	2238-07-5			1.8E-02	TLV_TWA_irr	1.8E-02	TLVirr
Diisobutyl ketone	108-83-8			5.0E+01	TLV_TWA_irr	5.0E+01	TLVirr
Diisopropyl ether	108-20-3	2.7E+00	nc PPRTV_sub	3.6E+02	TLV_TWA_irr	2.7E+00	PPRTV_sub
Diisopropylamine	108-18-9			7.1E+00	TLV_TWA_irr	7.1E+00	TLVirr
Dimethyl acetamide, N, N-	127-19-5			8.7E+00	TLV_TWA	8.7E+00	TLVadj
Dimethyl carbamoly chloride	79-44-7			7.5E-03	TLV_TWA_irr	7.5E-03	TLVirr
Dimethyl disulfide	624-92-0			6.6E-01	TLV_TWA_irr		
Dimethyl phthalate	131-11-3			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Dimethyl sulfate	77-78-1			1.8E-01	TLV_TWA_irr	4.5E-02	AEGL1_8hr*
Dimethyl sulfide	75-18-3			8.7E+00	TLV_TWA_irr	1.3E+00	ERPG1*
Dimethylamine	124-40-3			3.2E+00	TLV_TWA_irr	3.2E+00	TLVirr
Dimethylaniline, N,N-	121-69-7			6.1E+00	TLV_TWA	6.1E+00	TLVadj
Dimethylbenzidine, 3,3'-	119-93-7			4.2E+00	TLV_TWA	4.2E+00	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Dimethylethoxysilane	14857-34-2			7.3E-01	TLV_TWA_irr	7.3E-01	TLVirr
Dimethylformamide	68-12-2	4.8E-02	nc PPRTV_sub	7.3E+00	TLV_TWA	4.8E-02	PPRTV_sub
Dimethylhydrazine, 1,1-	57-14-7	5.5E-06	nc PPRTV_sub	8.4E-03	TLV_TWA_irr	5.5E-06	PPRTV_sub
Dimethypropyl acetate, 1,1-	625-16-1			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Dinitolmide	148-01-6			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Dinitrobenzene (mixed isomers)	0-323*			2.5E-01	TLV_TWA	2.5E-01	TLVadj
Dinitrobenzene, 1,2-	528-29-0			2.5E-01	TLV_TWA	2.5E-01	TLVadj
Dinitrobenzene, 1,3-	99-65-0			2.5E-01	TLV_TWA	2.5E-01	TLVadj
Dinitrobenzene, 1,4-	100-25-4			2.5E-01	TLV_TWA	2.5E-01	TLVadj
Dinitro-o-cresol, 4,6-	534-52-1			4.9E-02	TLV_TWA	4.9E-02	TLVadj
Dinitrotoluene	25321-14-6			4.9E-02	TLV_TWA	4.9E-02	TLVadj
Dioxane, 1,4-	123-91-1	2.5E+00	nc MRL_inter	2.5E+01	TLV_TWA_irr	2.5E+00	MRL_inter
Dioxathion	78-34-2			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Dioxolane	646-06-0			1.5E+01	TLV_TWA	1.5E+01	TLVadj
Diphenylamine	122-39-4			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Diphenylhydrazine, 1,2-	122-66-7	2.2E-02	ca IRIS			2.2E-02	IRIS
Dipropyl ketone	123-19-3			8.0E+01	TLV_TWA_irr	8.0E+01	TLVirr
Dipropylene glycol monomethyl ether	34590-94-8			2.1E+02	TLV_TWA_irr	2.1E+02	TLVirr
Diquat	2764-72-9			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Diquat	85-00-7			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Diquat dibromide monohydrate	6385-62-2			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Disulfiram	97-77-8			4.9E-01	TLV_TWA	4.9E-01	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Disulfoton	298-04-4	1.4E-04	nc MRL_inter	1.2E-02	TLV_TWA	1.4E-04	MRL_inter
Diuron	330-54-1			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Divinyl benzene	1321-74-0			1.8E+01	TLV_TWA_irr	1.8E+01	TLVirr
Dodecyl mercaptan	112-55-0			2.8E-01	TLV_TWA_irr	2.8E-01	TLVirr
EMPA	1832-53-7	2.1E-02	nc Munro			2.1E-02	Munro
Endosulfan	115-29-7			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Endrin	72-20-8			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Enflurane	13838-16-9			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Epichlorohydrin	106-89-8	6.8E-03	nc PPRTV_sub	6.5E-01	TLV_TWA_irr	6.8E-03	PPRTV_sub
Epoxybutane, 1,2-	106-88-7	1.4E-02	nc IRIS_chr			1.4E-02	IRIS_chr
Ethanolamine	141-43-5			2.6E+00	TLV_TWA_irr	1.2E+00	CEGL*
Ethion	563-12-2			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Ethoxyethanol, 2-	110-80-5	1.4E+00	nc IRIS_sub	4.5E+00	TLV_TWA	1.4E+00	IRIS_sub
Ethoxyethyl acetate, 2-	111-15-9	2.1E-01	nc HEAST_sub	6.6E+00	TLV_TWA	2.1E-01	HEAST_sub
Ethyl acetate	141-78-6			4.9E+02	TLV_TWA_irr	4.9E+02	TLVirr
Ethyl acrylate	140-88-5			7.0E+00	TLV_TWA_irr	7.0E+00	TLVirr
Ethyl amyl ketone	541-85-5			1.3E+01	TLV_TWA	1.3E+01	TLVadj
Ethyl bromide	74-96-4			5.5E+00	TLV_TWA	5.5E+00	TLVadj
Ethyl butyl ketone	106-35-4			8.0E+01	TLV_TWA_irr	8.0E+01	TLVirr
Ethyl chloride	75-00-3	2.7E+00	nc PPRTV_sub	6.5E+01	TLV_TWA	2.7E+00	PPRTV_sub
Ethyl cyanoacrylate	7085-85-0			3.5E-01	TLV_TWA_irr	3.5E-01	TLVirr
Ethyl ether	60-29-7	2.1E+00	nc PPRTV_sub	4.2E+02	TLV_TWA_irr	2.1E+00	PPRTV_sub
Ethyl formate	109-94-4			1.0E+02	TLV_TWA_irr	1.0E+02	TLVirr
Ethyl mercaptan	75-08-1			4.4E-01	TLV_TWA_irr	4.4E-01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Ethyl tert-butyl ether	637-92-3			7.2E+00	TLV_TWA_irr	7.2E+00	TLVirr
Ethylamine	75-04-7			3.2E+00	TLV_TWA_irr	3.2E+00	TLVirr
Ethylbenzene	100-41-4	2.1E+00	nc MRL_inter			2.1E+00	MRL_inter
Ethylene	74-85-1			5.6E+01	TLV_TWA	5.6E+01	TLVadj
Ethylene diamine	107-15-3			8.4E+00	TLV_TWA_irr	8.4E+00	TLVirr
Ethylene glycol dinitrate	628-96-6			7.6E-02	TLV_TWA	7.6E-02	TLVadj
Ethylene glycol monobutyl ether	111-76-2	9.9E+00	nc MRL_inter	3.3E+01	TLV_TWA_irr	9.9E+00	MRL_inter
Ethylene oxide	75-21-8	4.8E-02	ca HEAST	4.4E-01	TLV_TWA	4.8E-02	HEAST
Ethyleneimine	151-56-4			3.0E-02	TLV_TWA_irr	3.0E-02	TLVirr
Ethylhexanoic acid	149-57-5			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Ethylpropyl ethanoate, 1-	620-11-1			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Fenamiphos	22224-92-6			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Fensulfothion	115-90-2			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Fenthion	55-38-9			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Ferbam	14484-64-1			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Ferric oxide	1309-37-1			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Ferrovanadium	12604-58-9			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Fluoride	16984-48-8			8.6E-01	TLV_TWA_irr	8.6E-01	TLVirr
Fluorine	7782-41-4			5.3E-01	TLV_TWA_irr	1.1E-02	MRLi_acute*
Fonofos	944-22-9			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Formaldehyde	50-00-0	2.5E-02	nc MRL_inter			2.5E-02	MRL_inter
Formamide	75-12-7			6.3E+00	TLV_TWA_irr	6.3E+00	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Formic acid	64-18-6			3.2E+00	TLV_TWA_irr	3.2E+00	TLVirr
Fuel oil no. 2	68476-30-2			3.4E+01	TLV_TWA_irr	1.4E-02	MRLi_acute*
Fuel oil no. 2-D	68476-34-6			3.4E+01	TLV_TWA_irr	3.4E+01	TLVirr
Fuel oil no. 4	68476-31-3			3.4E+01	TLV_TWA_irr	3.4E+01	TLVirr
Furfural	98-01-1	3.4E-01	nc HEAST_sub	2.7E+00	TLV_TWA_irr	3.4E-01	HEAST_sub
Furfuryl alcohol	98-00-0			1.4E+01	TLV_TWA_irr	1.4E+01	TLVirr
Gallium arsenide	1303-00-0			7.3E-05	TLV_TWA	7.3E-05	TLVadj
Germanium tetrahydride	7782-65-2			1.5E-01	TLV_TWA	1.5E-01	TLVadj
Glycerin	56-81-5			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Glycidaldehyde	765-34-4	6.8E-03	nc HEAST_sub			6.8E-03	HEAST_sub
Glycidol	556-52-5			2.1E+00	TLV_TWA_irr	2.1E+00	TLVirr
Glyoxal	107-22-2			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Graphite	7782-42-5			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Gypsum	13397-24-5			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Hafnium	7440-58-6			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Halothane	151-67-7			9.9E+01	TLV_TWA	9.9E+01	TLVadj
HCFC-142b	75-68-3	3.4E+01	nc IRIS_chr			3.4E+01	IRIS_chr
HD	505-60-2	1.4E-05	nc MRL_inter			1.4E-05	MRL_inter
Heptachlor	76-44-8	3.7E-03	ca IRIS	1.2E-02	TLV_TWA	3.7E-03	IRIS
Heptachlor epoxide	1024-57-3	1.8E-03	ca IRIS	1.2E-02	TLV_TWA	1.8E-03	IRIS
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4	1.1E-05	ca HEAST				
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7	1.1E-05	ca HEAST				
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9	1.1E-05	ca HEAST				

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis		TLVadj	TLV Type	AMEG 1y	Basis
Heptane, n-	142-82-5				5.6E+02	TLV_TWA_irr	5.6E+02	TLVirr
Hexachlorobenzene	118-74-1	1.0E-02	ca	IRIS	4.9E-04	TLV_TWA	4.9E-04	TLV_TWA*
Hexachlorobutadiene	87-68-3	2.2E-01	ca	IRIS	7.3E-02	TLV_TWA_irr	7.3E-02	TLV_TWA_irr*
Hexachlorocyclohexane, alpha-	319-84-6	2.7E-03	ca	IRIS			2.7E-03	IRIS
Hexachlorocyclohexane, beta-	319-85-7	9.0E-03	ca	IRIS			9.0E-03	IRIS
Hexachlorocyclohexane, technical	608-73-1	9.4E-03	ca	IRIS			9.4E-03	IRIS
Hexachlorocyclopentadiene	77-47-4	7.6E-02	nc	MRL_inter	3.8E-02	TLV_TWA_irr	7.6E-02	MRL_inter
Hexachlorodibenzodioxin, 1,2,3,4,7,8-	39227-28-6	1.1E-06	ca	HEAST				
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9	1.1E-06	ca	HEAST				
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9	1.1E-06	ca	HEAST				
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9	1.1E-06	ca	HEAST				
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5	1.1E-06	ca	HEAST				
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7	1.1E-06	ca	HEAST				
Hexachloroethane	67-72-1	1.2E+00	ca	IRIS	3.3E+00	TLV_TWA_irr	1.2E+00	IRIS
Hexachloronaphthalene	1335-87-1				4.9E-02	TLV_TWA	4.9E-02	TLVadj
Hexafluoroacetone	684-16-2				1.7E-01	TLV_TWA	1.7E-01	TLVadj
Hexafluoropropylene	116-15-4				1.5E-01	TLV_TWA	1.5E-01	TLVadj
Hexamethylene diamine	124-09-4				8.1E-01	TLV_TWA_irr	8.1E-01	TLVirr
Hexamethylene diisocyanate	822-06-0	1.4E-04	nc	MRL_inter	1.2E-02	TLV_TWA_irr	1.4E-04	MRL_inter
Hexane, commercial	110-54-3	1.4E+00	nc	PPRTV_sub	6.0E+01	TLV_TWA_irr	1.4E+00	PPRTV_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Hexane, other isomers	Hexane isom			6.0E+02	TLV_TWA_irr	6.0E+02	TLVirr
Hexanone, 2-	591-78-6	2.1E-01	nc IRIS_sub	5.0E+00	TLV_TWA	2.1E-01	IRIS_sub
Hexene	592-41-6			4.2E+01	TLV_TWA	4.2E+01	TLVadj
Hexyl acetate, sec-	108-84-9			1.0E+02	TLV_TWA_irr	1.0E+02	TLVirr
HFC-134A	811-97-2	5.5E+01	nc IRIS_chr			5.5E+01	IRIS_chr
Hydrazine	302-01-2	6.2E-05	nc PPRTV_sub	4.5E-03	TLV_TWA_irr	6.2E-05	PPRTV_sub
Hydrogen chloride	7647-01-0	1.4E-02	nc IRIS_chr			1.4E-02	IRIS_chr
Hydrogen cyanide	74-90-8	6.2E-03	nc IRIS_sub			6.2E-03	IRIS_sub
Hydrogen fluoride	7664-39-3			1.0E-01	TLV_TWA	3.3E-02	CEGL*
Hydrogen peroxide	7722-84-1			4.8E-01	TLV_TWA_irr	4.8E-01	TLVirr
Hydrogen selenide	7783-07-5			5.7E-02	TLV_TWA_irr	5.7E-02	TLVirr
Hydrogen sulfide	7783-06-4	1.4E-02	nc IRIS_sub	3.4E-01	TLV_TWA	1.4E-02	IRIS_sub
Hydrogenated terphenyls	61788-32-7			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Hydroquinone	123-31-9			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Indene	95-13-6			5.8E+00	TLV_TWA	5.8E+00	TLVadj
Indium and compounds	7440-74-6			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Iodine	7553-56-2			2.5E-02	TLV_TWA	2.5E-02	TLVadj
Iodoform	75-47-8			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Iron pentacarbonyl	13463-40-6			2.0E-01	TLV_TWA	2.0E-01	TLVadj
Iron salts, soluble	Fe salts			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Isoamyl acetate	123-92-2			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Isoamyl alcohol	123-51-3			1.2E+02	TLV_TWA_irr	1.2E+02	TLVirr
Isobutyl acetate	110-19-0			2.4E+02	TLV_TWA_irr	2.4E+02	TLVirr
Isobutyl alcohol	78-83-1			5.2E+01	TLV_TWA_irr	5.2E+01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Isooctyl alcohol	26952-21-6			9.1E+01	TLV_TWA_irr	9.1E+01	TLVirr
Isopentane	78-78-4			6.1E+02	TLV_TWA_irr	6.1E+02	TLVirr
Isophorone diisocyanate	4098-71-9			1.1E-02	TLV_TWA	1.1E-02	TLVadj
Isopropanol	67-63-0			1.7E+02	TLV_TWA_irr	2.5E+00	CEGL*
Isopropoxyethanol	109-59-1			2.6E+01	TLV_TWA	2.6E+01	TLVadj
Isopropyl acetate	108-21-4			1.4E+02	TLV_TWA_irr	1.4E+02	TLVirr
Isopropyl glycidyl ether	4016-14-2			8.1E+01	TLV_TWA_irr	8.1E+01	TLVirr
Isopropylamine	75-31-0			4.1E+00	TLV_TWA_irr	4.1E+00	TLVirr
Isopropylaniline, N-	768-52-5			2.7E+00	TLV_TWA	2.7E+00	TLVadj
JP-4 jet fuel	50815-00-4	6.2E+00	nc MRL_inter			6.2E+00	MRL_inter
Kaolin	1332-58-7			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Kerosene	8008-20-6	6.8E-03	nc MRL_inter	6.8E+01	TLV_TWA_irr	6.8E-03	MRL_inter
Kerosene, hydrodesulfurized	64742-81-0			4.9E+01	TLV_TWA	4.9E+01	TLVadj
Ketene	463-51-4			2.1E-01	TLV_TWA		
Ketene	463-51-4			2.9E-01	TLV_TWA_irr	2.9E-01	TLVirr
Lead and compounds (inorganic)	7439-92-1			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Lead chromate	7758-97-6			2.9E-03	TLV_TWA	2.9E-03	TLVadj
Lewisite oxide	3088-37-7	3.4E-01	nc Munro			3.4E-01	Munro
Lindane	58-89-9			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Lithium hydride	7580-67-8			8.6E-03	TLV_TWA_irr	8.6E-03	TLVirr
Magnesium oxide	1309-48-4			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Malathion	121-75-5	1.4E-02	nc MRL_inter	2.4E-01	TLV_TWA	1.4E-02	MRL_inter
Manganese	7439-96-5	3.4E-05	nc IRIS_chr			3.4E-03	Adjusted IRIS RfC

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Manganese cyclopentadienyl tricarbonyl	12079-65-1			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Mercury, alkyl compounds	Hg alkyl			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Mercury, aryl compounds	Hg aryl			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Mercury, elemental	7439-97-6	2.1E-04	nc HEAST_sub	6.1E-03	TLV_TWA	2.1E-04	HEAST_sub
Mesityl oxide	141-79-7			2.1E+01	TLV_TWA_irr	2.1E+01	TLVirr
Methacrylic acid	79-41-4			2.4E+01	TLV_TWA_irr	2.4E+01	AEGL1_8hr*
Methacrylonitrile	126-98-7	4.8E-03	nc HEAST_sub			4.8E-03	HEAST_sub
Methane	74-82-8			1.6E+02	TLV_TWA	1.6E+02	TLVadj
Methanol	67-56-1			6.4E+01	TLV_TWA	1.3E+01	CEGL*
Methomyl	16752-77-5			6.1E-01	TLV_TWA	6.1E-01	TLVadj
Methoxychlor	72-43-5			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Methoxyethanol, 2-	109-86-4	1.4E-01	nc IRIS_sub	7.6E-02	TLV_TWA	7.6E-02	TLV_TWA*
Methoxyethyl acetate, 2-	110-49-6			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Methoxyphenol, 4-	150-76-5			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Methyl 2-cyanoacrylate	137-05-3			3.1E-01	TLV_TWA_irr	3.1E-01	TLVirr
Methyl acetate	79-20-9			2.1E+02	TLV_TWA_irr	2.1E+02	TLVirr
Methyl acetylene	74-99-7			4.0E+02	TLV_TWA	4.0E+02	TLVadj
Methyl acetylene-propadiene mixture	59355-75-8			4.0E+02	TLV_TWA	4.0E+02	TLVadj
Methyl acrylate	96-33-3			2.4E+00	TLV_TWA_irr	2.4E+00	TLVirr
Methyl aniline, N-	100-61-8			5.4E-01	TLV_TWA	5.4E-01	TLVadj
Methyl bromide	74-83-9	6.8E-02	nc PPRTV_sub	1.3E+00	TLV_TWA_irr	6.8E-02	PPRTV_sub
Methyl chloride	74-87-3	6.2E-01	nc IRIS_sub	2.5E+01	TLV_TWA	6.2E-01	IRIS_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Methyl cyclopentadienyl manganese tricarbonyl	12108-13-3			4.9E-02	TLV_TWA	4.9E-02	TLVadj
Methyl demeton	8022-00-2			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Methyl ethyl ketone	78-93-3	6.8E-01	nc HEAST_sub	2.0E+02	TLV_TWA_irr	6.8E-01	HEAST_sub
Methyl formate	107-31-3			8.4E+01	TLV_TWA_irr	8.4E+01	TLVirr
Methyl hydrazine	60-34-4			6.5E-03	TLV_TWA_irr	6.5E-03	TLVirr
Methyl iodide	74-88-4			4.0E+00	TLV_TWA_irr	4.0E+00	TLVirr
Methyl isoamyl ketone	110-12-3			8.0E+01	TLV_TWA_irr	8.0E+01	TLVirr
Methyl isobutyl carbinol	108-11-2			3.6E+01	TLV_TWA_irr	3.6E+01	TLVirr
Methyl isobutyl ketone	108-10-1	5.5E-01	nc HEAST_sub	2.8E+01	TLV_TWA_irr	5.5E-01	HEAST_sub
Methyl isocyanate	624-83-9			1.6E-02	TLV_TWA_irr	1.6E-02	TLVirr
Methyl isopropyl ketone	563-80-4			2.4E+02	TLV_TWA_irr	2.4E+02	TLVirr
Methyl mercaptan	74-93-1			2.4E-01	TLV_TWA	9.8E-03	ERPG1*
Methyl methacrylate	80-62-6	4.8E-01	nc IRIS_chr	7.0E+01	TLV_TWA_irr	4.8E-01	IRIS_chr
Methyl n-amyl ketone	110-43-0			8.0E+01	TLV_TWA_irr	8.0E+01	TLVirr
Methyl parathion	298-00-0			4.9E-03	TLV_TWA	4.9E-03	TLVadj
Methyl tertiary butyl ether	1634-04-4	1.7E+00	nc MRL_inter	4.4E+01	TLV_TWA	1.7E+00	MRL_inter
Methyl-5-nitroaniline, 2-	99-55-8			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Methylal	109-87-5			1.1E+03	TLV_TWA_irr	1.1E+03	TLVirr
Methylaniline, 2-	95-53-4			2.1E+00	TLV_TWA	2.1E+00	TLVadj
Methylcyclohexane	108-87-2			5.5E+02	TLV_TWA_irr	5.5E+02	TLVirr
Methylcyclohexanol	25639-42-3			8.0E+01	TLV_TWA_irr	8.0E+01	TLVirr
Methylcyclohexanone, o-	583-60-8			7.9E+01	TLV_TWA_irr	7.9E+01	TLVirr
Methylene chloride	75-09-2	7.1E-01	nc MRL_inter	4.2E+01	TLV_TWA	7.1E-01	MRL_inter

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Methylene diphenyl diisocyanate	101-68-8	1.4E-05	nc HEAST_sub	1.3E-02	TLV_TWA	1.4E-05	HEAST_sub
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	1.3E-01	ca HEAST	2.7E-02	TLV_TWA	2.7E-02	TLV_TWA*
Methylene-bis(4-cyclohexylisocyanate)	5124-30-1			1.8E-02	TLV_TWA_irr	1.8E-02	TLVirr
Methylenedianiline, 4,4'-	101-77-9			2.0E-01	TLV_TWA	2.0E-01	TLVadj
Methylnaphthalene, 1-	90-12-0			1.0E+00	TLV_TWA_irr	1.0E+00	TLVirr
Methylnapthalene, 2-	91-57-6			1.0E+00	TLV_TWA_irr	1.0E+00	TLVirr
Methylphosphonic acid	993-13-5	1.6E-02	nc Munro			1.6E-02	Munro
Methylpropene, 2-	115-11-7			1.4E+02	TLV_TWA	1.4E+02	TLVadj
Methylstyrene, alpha-	98-83-9			1.7E+01	TLV_TWA_irr	1.7E+01	TLVirr
Metribuzin	21087-64-9			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Mica	12001-26-2			7.3E-01	TLV_TWA	7.3E-01	TLVadj
Midrange Aliphatic Hydrocarbon Streams	Mid HC stream	6.8E-02	nc PPRTV_sub			6.8E-02	PPRTV_sub
Molybdenum	7439-98-7			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Monocrotophos	6923-22-4			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Monomethylamine	74-89-5			2.2E+00	TLV_TWA_irr	2.2E+00	TLVirr
Morpholine	110-91-8			2.4E+01	TLV_TWA_irr	2.4E+01	TLVirr
Naled	300-76-5			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Naphthalene	91-20-3	2.1E-03	nc IRIS_chr	1.8E+01	TLV_TWA_irr	2.1E-03	IRIS_chr
N-Ethylmorpholine	100-74-3			8.1E+00	TLV_TWA_irr	8.1E+00	TLVirr
Nickel	7440-02-0			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Nickel carbonyl	13463-39-3			1.2E-01	TLV_TWA_irr	1.2E-01	TLVirr
Nickel compounds	Ni cmpds	1.4E-04	nc MRL_inter			1.4E-04	MRL_inter

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Nickel insoluble inorganic compounds	Ni insol inorg			6.8E-02	TLV_TWA_irr	6.8E-02	TLVirr
Nickel refinery dust	Ni ref dust	2.0E-02	ca IRIS			2.0E-02	IRIS
Nickel subsulfide	12035-72-2	1.0E-02	ca IRIS	3.4E-02	TLV_TWA_irr	1.0E-02	IRIS
Nicotine	54-11-5			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Nitrapyrin	1929-82-4			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Nitric acid	7697-37-2			1.8E+00	TLV_TWA_irr	1.4E+00	AEGL1_8hr*
Nitric oxide	10102-43-9			1.1E+01	TLV_TWA_irr	3.7E+00	CEGL*
Nitroaniline, 2-	88-74-4	2.7E-04	nc PPRTV_sub			2.7E-04	PPRTV_sub
Nitroaniline, 4-	100-01-6			7.3E-01	TLV_TWA	7.3E-01	TLVadj
Nitrobenzene	98-95-3	1.4E-02	nc HEAST_sub	1.2E+00	TLV_TWA	1.4E-02	HEAST_sub
Nitroethane	79-24-3			1.1E+02	TLV_TWA_irr	1.1E+02	TLVirr
Nitrogen dioxide	10102-44-0			1.9E+00	TLV_TWA_irr	9.4E-01	AEGL1_8hr*
Nitrogen trifluoride	7783-54-2			7.1E+00	TLV_TWA	7.1E+00	TLVadj
Nitroglycerin	55-63-0			1.1E-01	TLV_TWA	1.1E-01	TLVadj
Nitromethane	75-52-5	5.3E-07	ca PPRTV	1.2E+01	TLV_TWA	5.3E-07	PPRTV
Nitrophenol, 2-	88-75-5	3.4E-04	nc PPRTV_sub			3.4E-04	PPRTV_sub
Nitropropane, 1-	108-03-2			3.1E+01	TLV_TWA_irr	3.1E+01	TLVirr
Nitropropane, 2-	79-46-9	1.8E-03	ca HEAST	8.9E+00	TLV_TWA	1.8E-03	HEAST
Nitrosodiethylamine, N-	55-18-5	1.1E-04	ca IRIS			1.1E-04	IRIS
Nitrosodimethylamine, N-	62-75-9	3.4E-04	ca IRIS			3.4E-04	IRIS
Nitroso-di-n-butylamine, N-	924-16-3	3.0E-03	ca IRIS			3.0E-03	IRIS
Nitrosopyrrolidine, N-	930-55-2	7.9E-03	ca IRIS			7.9E-03	IRIS
Nitrotoluene, m-	99-08-1			2.7E+00	TLV_TWA	2.7E+00	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Nitrotoluene, o-	88-72-2			2.7E+00	TLV_TWA	2.7E+00	TLVadj
Nitrotoluene, p-	99-99-0			2.7E+00	TLV_TWA	2.7E+00	TLVadj
Nitrous oxide	10024-97-2			2.2E+01	TLV_TWA	2.2E+01	TLVadj
Nonane	111-84-2	1.4E+00	nc PPRTV_sub	3.6E+02	TLV_TWA_irr	1.4E+00	PPRTV_sub
Octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-	3268-87-9	3.7E-04	ca HEAST				
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	39001-02-0	3.7E-04	ca HEAST				
Octachloronaphthalene	2234-13-1			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Octane	111-65-9			4.8E+02	TLV_TWA_irr	4.8E+02	TLVirr
Oil mist, mineral	8012-95-1			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Osmium tetroxide	20816-12-0			7.1E-04	TLV_TWA_irr	7.1E-04	TLVirr
Oxalic acid	144-62-7			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Oxybis(benzenesulfonyl hydrazide), 4,4'-	80-51-3			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Ozone	10028-15-6			1.3E-01	TLV_TWA_irr	3.9E-02	CEGL
Paraffin wax fume	8002-74-2			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Paraquat	4685-14-7			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Parathion	56-38-2			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Pentaborane	19624-22-7			3.2E-03	TLV_TWA	3.2E-03	TLVadj
Pentachlordibenzofuran, 2,3,4,7,8-	57117-31-4	3.7E-07	ca HEAST				
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6	3.7E-06	ca HEAST				
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4	1.1E-07	ca HEAST				
Pentachloronaphthalene	1321-64-8			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Pentachloronitrobenzene	82-68-8			1.2E-01	TLV_TWA	1.2E-01	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Pentachlorophenol	87-86-5			1.2E-01	TLV_TWA	1.2E-01	TLVadj
Pentaerythritol	115-77-5			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Pentane, n-	109-66-0	6.8E+00	nc PPRTV_sub	6.1E+02	TLV_TWA_irr	6.8E+00	PPRTV_sub
Perchloroethylene	127-18-4	1.9E-01	nc MRL_chr	5.8E+01	TLV_TWA_irr	1.9E-01	MRL_chr
Perchloromethyl mercaptan	594-42-3			2.6E-01	TLV_TWA_irr	9.9E-02	AEGL1_8hr*
Perchloryl fluoride	7616-94-6			4.3E+00	TLV_TWA_irr		
Perfluorobutyl ethylene	19430-93-4			2.5E+02	TLV_TWA	2.5E+02	TLVadj
Persulfates	persufate			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Phenol	108-95-2			6.6E+00	TLV_TWA_irr	6.6E+00	TLVirr
Phenothiazine	92-84-2			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Phenyl ether vapor	101-84-8			2.4E+00	TLV_TWA_irr	2.4E+00	TLVirr
Phenyl glycidyl ether	122-60-1			2.1E-01	TLV_TWA_irr	2.1E-01	TLVirr
Phenyl mercaptan	108-98-5			1.1E-01	TLV_TWA	1.1E-01	TLVadj
Phenylenediamine, m-	108-45-2			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Phenylenediamine, o-	95-54-5			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Phenylenediamine, p-	106-50-3			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Phenylhydrazine	100-63-0			1.1E-01	TLV_TWA	1.1E-01	TLVadj
Phorate	298-02-2			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Phosdrin	7786-34-7			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Phosgene	75-44-5	6.2E-04	nc IRIS_sub	1.4E-01	TLV_TWA_irr	6.2E-04	IRIS_sub
Phosphine	7803-51-2	2.1E-03	nc IRIS_sub	1.4E-01	TLV_TWA_irr	2.1E-03	IRIS_sub
Phosphoric acid	7664-38-2	6.8E-02	nc IRIS_sub	3.4E-01	TLV_TWA_irr	6.8E-02	IRIS_sub
Phosphorus (yellow)	0-143*			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Phosphorus oxychloride	10025-87-3			2.1E-01	TLV_TWA_irr	2.1E-01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Phosphorus pentachloride	10026-13-8			2.9E-01	TLV_TWA_irr	2.9E-01	TLVirr
Phosphorus pentasulfide	1314-80-3			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Phosphorus trichloride	7719-12-2			3.8E-01	TLV_TWA_irr	3.8E-01	TLVirr
Phthalic acid, p-	100-21-0			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Phthalic anhydride	85-44-9	8.2E-02	nc HEAST_sub	2.1E+00	TLV_TWA_irr	8.2E-02	HEAST_sub
Phthalodinitrile, m-	626-17-5			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Picloram	1918-02-1			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Picric acid	88-89-1			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Pindone	83-26-1			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Pinene, alpha-	80-56-8			4.9E+00	TLV_TWA	4.9E+00	TLVadj
Piperazine dihydrochloride	142-64-3			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Platinum, metal	7440-06-4			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Platinum, soluble salts	Pt sol salts			6.8E-04	TLV_TWA_irr	6.8E-04	TLVirr
Polychlorinated biphenyls	1336-36-3	4.2E-02	ca IRIS			4.2E-02	IRIS
Polyvinyl chloride	9002-86-2			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Portland cement	65997-15-1			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Propane	74-98-6			4.4E+02	TLV_TWA	4.4E+02	TLVadj
Propargyl alcohol	107-19-7			7.9E-01	TLV_TWA_irr	7.9E-01	TLVirr
Propiolactone, beta-	57-57-8			5.0E-01	TLV_TWA_irr	5.0E-01	TLVirr
Propionaldehyde	123-38-6	5.5E-02	nc IRIS_sub	1.6E+01	TLV_TWA_irr	5.5E-02	IRIS_sub
Propionic acid	79-09-4			1.0E+01	TLV_TWA_irr	1.0E+01	TLVirr
Propyl acetate, n-	109-60-4			2.9E+02	TLV_TWA_irr	2.9E+02	TLVirr
Propyl alcohol, n-	71-23-8			8.4E+01	TLV_TWA_irr	8.4E+01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Propyl nitrate, n-	627-13-4			2.6E+01	TLV_TWA	2.6E+01	TLVadj
Propylene	115-07-1			2.9E+02	TLV_TWA_irr	2.9E+02	TLVirr
Propylene chlorohydrin	127-00-4			9.5E-01	TLV_TWA	9.5E-01	TLVadj
Propylene glycol	57-55-6	1.9E-02	nc MRL_inter			1.9E-02	MRL_inter
Propylene glycol dinitrate	6423-43-4	1.9E-04	nc MRL_inter	8.3E-02	TLV_TWA	1.9E-04	MRL_inter
Propylene glycol monoacrylate	999-61-1			9.1E-01	TLV_TWA_irr	9.1E-01	TLVirr
Propylene glycol monomethyl ether	107-98-2	1.4E+01	nc IRIS_sub	1.3E+02	TLV_TWA_irr	1.4E+01	IRIS_sub
Propylene oxide	75-56-9	2.1E-02	nc HEAST_sub	1.6E+00	TLV_TWA_irr	2.1E-02	HEAST_sub
Propylenechlorohydrin	78-89-7			9.5E-01	TLV_TWA	9.5E-01	TLVadj
Propyleneimine	75-55-8			1.6E-01	TLV_TWA_irr	1.6E-01	TLVirr
Pyrethrum	8003-34-7			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Pyridine	110-86-1			9.8E-01	TLV_TWA_irr	9.8E-01	TLVirr
Quinone	106-51-4			1.5E-01	TLV_TWA_irr	1.5E-01	TLVirr
RDX	121-82-4			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Refractory ceramic fibers	ref ceramic fiber	2.1E-02	nc MRL_chr			2.1E-02	MRL_chr
Resorcinol	108-46-3			1.5E+01	TLV_TWA_irr	1.5E+01	TLVirr
Rhodium	7440-16-6			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Rhodium soluble compounds	RH sol			3.4E-03	TLV_TWA_irr	3.4E-03	TLVirr
Ronnel	299-84-3			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Rotenone	83-79-4			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Rubber dust	9006-04-6			2.4E-04	TLV_TWA	2.4E-04	TLVadj
Selenium	7782-49-2			6.8E-02	TLV_TWA_irr	6.8E-02	TLVirr
Selenium hexafluoride	7783-79-1			9.7E-02	TLV_TWA	9.7E-02	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Sesone	136-78-7			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Silica, crystalline quartz	14808-60-7			6.1E-03	TLV_TWA	6.1E-03	TLVadj
Silica, crystalline tripoli	1317-95-9			6.1E-03	TLV_TWA	6.1E-03	TLVadj
Silicon carbide, nonfibrous, inhalable	Sil carb inhal			7.3E-01	TLV_TWA	7.3E-01	TLVadj
Silicon tetrahydride	7803-62-5			2.2E+00	TLV_TWA_irr	2.2E+00	TLVirr
Silver	7440-22-4			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Silver soluble compounds	Ag sol cmpds			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Soapstone, respirable dust	sil soap resp			7.3E-01	TLV_TWA	7.3E-01	TLVadj
Sodium bisulfite	7631-90-5			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Sodium fluoroacetate	62-74-8			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Sodium metabisulfite	7681-57-4			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Sodium tetraborate	1330-43-4			6.8E-01	TLV_TWA_irr	6.8E-01	TLVirr
Starch	9005-25-8			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Stearates	stearates			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Stibine	7803-52-3			1.7E-01	TLV_TWA_irr	1.7E-01	TLVirr
Stoddard solvent	8052-41-3			2.0E+02	TLV_TWA_irr	2.0E+02	TLVirr
Strontium chromate	7789-06-2			1.2E-04	TLV_TWA	1.2E-04	TLVadj
Strychnine	57-24-9			3.7E-02	TLV_TWA	3.7E-02	TLVadj
Styrene	100-42-5	5.8E-01	nc MRL_chr	2.9E+01	TLV_TWA_irr	5.8E-01	MRL_chr
Sucrose	57-50-1			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Sulfometuron methyl	74222-97-2			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Sulfur hexafluoride	2551-62-4			1.5E+03	TLV_TWA	1.5E+03	TLVadj
Sulfuric acid	7664-93-9			4.9E-02	TLV_TWA	4.9E-02	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Sulfuryl fluoride	2699-79-8			7.1E+00	TLV_TWA_irr	7.1E+00	TLVirr
Sulprofos	35400-43-2			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Talc	14807-96-6			4.9E-01	TLV_TWA	4.9E-01	TLVadj
TCDD, 2,3,7,8-	1746-01-6	1.1E-07	ca HEAST			1.1E-07	HEAST
Tellurium and compounds	13494-80-9			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Tellurium hexafluoride	7783-80-4			6.8E-02	TLV_TWA_irr	6.8E-02	TLVirr
Temephos	3383-96-8			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Terbufos	13071-79-9			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Tert-amyl methyl ether	994-05-8			2.0E+01	TLV_TWA	2.0E+01	TLVadj
Tert-butyl alcohol	75-65-0			1.0E+02	TLV_TWA_irr	1.0E+02	TLVirr
Tert-pentane	463-82-1			6.1E+02	TLV_TWA_irr	6.1E+02	TLVirr
Tetrachlorodibenzofuran, 2,3,7,8-	51207-31-9	1.1E-06	ca HEAST				
Tetrachloroethane, 1,1,1,2-	630-20-6	6.5E-01	ca IRIS			6.5E-01	IRIS
Tetrachloroethane, 1,1,2,2-	79-34-5	8.3E-02	ca IRIS	1.7E+00	TLV_TWA	8.3E-02	IRIS
Tetrachloronaphthalene	1335-88-2			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Tetraethoxysilane	78-10-4			2.9E+01	TLV_TWA_irr	2.9E+01	TLVirr
Tetraethyl dithiopyrophosphate	3689-24-5			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Tetraethyl lead	78-00-2			2.4E-02	TLV_TWA	2.4E-02	TLVadj
Tetraethyl pyrophosphate	107-49-3			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Tetrafluoroethylene	116-14-3			2.0E+00	TLV_TWA	2.0E+00	TLVadj
Tetrafluoroethylene	116-14-3			2.0E+00	TLV_TWA	2.0E+00	TLVadj
Tetrahydrofuran	109-99-9			5.0E+01	TLV_TWA_irr	5.0E+01	TLVirr

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Tetrakis (hydroxymethyl) phosphonium chloride	124-64-1			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Tetrakis (hydroxymethyl) phosphonium sulfate	55566-30-8			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Tetramethoxysilane	681-84-5			1.5E+00	TLV_TWA	1.5E+00	TLVadj
Tetramethyl lead	75-74-1			3.7E-02	TLV_TWA	3.7E-02	TLVadj
Tetramethyl succinonitrile	3333-52-6			6.8E-01	TLV_TWA	6.8E-01	TLVadj
Tetranitromethane	509-14-8			1.4E-02	TLV_TWA_irr	1.4E-02	TLVirr
Thioglycolic acid	68-11-1			1.3E+00	TLV_TWA_irr	1.3E+00	TLVirr
Thiram	137-26-8			1.7E-02	TLV_TWA_irr	1.7E-02	TLVirr
Tin organic compounds	Sn organ cmpd			3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Tin oxide	18282-10-5			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Tin, inorganic	7440-31-5			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Titanium dioxide	13463-67-7			2.4E+00	TLV_TWA	2.4E+00	TLVadj
Titanium tetrachloride	7550-45-0	6.8E-03	nc MRL_inter			6.8E-03	MRL_inter
Toluene	108-88-3	3.4E+00	nc PPRTV_sub	1.8E+01	TLV_TWA	3.4E+00	PPRTV_sub
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5	4.8E-05	nc IRIS_chr			4.8E-05	IRIS_chr
Toluidine, m-	108-44-1			2.1E+00	TLV_TWA	2.1E+00	TLVadj
Toluidine, p-	106-49-0			2.1E+00	TLV_TWA	2.1E+00	TLVadj
Toxaphene	8001-35-2	1.5E-02	ca IRIS	1.2E-01	TLV_TWA	1.5E-02	IRIS
Tributyl phosphate	126-73-8			7.5E-01	TLV_TWA_irr	7.5E-01	TLVirr
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	2.1E+01	nc HEAST_sub	1.9E+03	TLV_TWA	2.1E+01	HEAST_sub
Trichloroacetic acid	76-03-9			2.3E+00	TLV_TWA_irr	2.3E+00	TLVirr
Trichlorobenzene, 1,2,4-	120-82-1	1.4E-02	nc PPRTV_sub			1.4E-02	PPRTV_sub

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Trichloroethane, 1,1,1-	71-55-6	2.6E+00	nc MRL_inter	4.7E+02	TLV_TWA	2.6E+00	MRL_inter
Trichloroethane, 1,1,2-	79-00-5	3.0E-01	ca IRIS	1.3E+01	TLV_TWA	3.0E-01	IRIS
Trichloroethylene	79-01-6	3.7E-01	nc MRL_inter	1.3E+01	TLV_TWA	3.7E-01	MRL_inter
Trichlorofluoromethane	75-69-4	6.8E-01	nc PPRTV_sub			6.8E-01	PPRTV_sub
Trichlorofon	52-68-6			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Trichloronaphthalene	1321-65-9			1.2E+00	TLV_TWA	1.2E+00	TLVadj
Trichlorophenol, 2,4,6-	88-06-2	1.5E+00	ca IRIS			1.5E+00	IRIS
Trichlorophenoxyacetic acid	93-76-5			3.4E+00	TLV_TWA_irr	3.4E+00	TLVirr
Trichloropropane, 1,2,3-	96-18-4	2.1E-03	nc IRIS_sub	1.5E+01	TLV_TWA	1.2E-03	MRLi_acute*
Trichloropropene, 1,2,3-	96-19-5	2.1E-03	nc PPRTV_sub			2.1E-03	PPRTV_sub
Tricresol	1319-77-3			6.8E+00	TLV_TWA_irr	6.8E+00	TLVirr
Triethanolamine	102-71-6			1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Triethylamine	121-44-8	4.8E-02	nc IRIS_sub	1.4E+00	TLV_TWA_irr	4.8E-02	IRIS_sub
Trifluorobromomethane	75-63-8			1.5E+03	TLV_TWA	6.1E+02	CEGL*
Triglycidyl isocyanurate	2451-62-9			1.2E-02	TLV_TWA	1.2E-02	TLVadj
Trimellitic anhydride	552-30-7			1.2E-04	TLV_TWA	1.2E-04	TLVadj
Trimethyl benzene	25551-13-7			4.2E+01	TLV_TWA_irr	4.2E+01	TLVirr
Trimethyl phosphite	121-45-9			3.5E+00	TLV_TWA_irr	3.5E+00	TLVirr
Trimethylamine	75-50-3			4.1E+00	TLV_TWA_irr	4.1E+00	TLVirr
Trimethylbenzene, 1,2,4-	95-63-6	4.8E-02	nc PPRTV_sub			4.8E-02	PPRTV_sub
Trimethylbenzene, 1,3,5-	108-67-8	6.8E-03	nc PPRTV_sub			6.8E-03	PPRTV_sub
Trimethylbenzene, 1,3,5-	108-67-8	6.8E-03	nc PPRTV_sub			6.8E-03	PPRTV_sub
Trinitrophenylmethylnitramine	479-45-8			3.7E-01	TLV_TWA	3.7E-01	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG		Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Trinitrotoluene, 2,4,6-	118-96-7				3.4E-02	TLV_TWA_irr	3.4E-02	TLVirr
Triorthocresyl phosphate	78-30-8				2.4E-02	TLV_TWA	2.4E-02	TLVadj
Triphenyl phosphate	115-86-6				1.0E+00	TLV_TWA_irr	1.0E+00	TLVirr
Tungsten	7440-33-7				1.7E+00	TLV_TWA_irr	1.7E+00	TLVirr
Tungsten, soluble compounds	W sol				3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Turpentine	8006-64-2				3.8E+01	TLV_TWA_irr	3.8E+01	TLVirr
Uranium compounds	0-287*				4.9E-02	TLV_TWA	4.9E-02	TLVadj
Uranium, highly soluble salts	HZ1800-90-T	2.7E-04	nc	MRL_inter			2.7E-04	MRL_inter
Valeraldehyde, n-	110-62-3				6.0E+01	TLV_TWA_irr	6.0E+01	TLVirr
Vanadium	7440-62-2	6.8E-05	nc	MRL_chr			6.8E-05	MRL_chr
Vanadium pentoxide	1314-62-1	6.8E-05	nc	PPRTV_sub	1.7E-02	TLV_TWA_irr	1.4E-04	MRLi_acute*
Vinyl acetate	108-05-4	2.4E-02	nc	MRL_inter	1.2E+01	TLV_TWA_irr	2.4E-02	MRL_inter
Vinyl chloride	75-01-4	5.3E-02	nc	MRL_inter	6.3E-01	TLV_TWA	5.3E-02	MRL_inter
Vinyl cyclohexene dioxide	106-87-6				2.0E-01	TLV_TWA_irr	2.0E-01	TLVirr
Vinyl fluoride	75-02-5				4.6E-01	TLV_TWA	4.6E-01	TLVadj
Vinyl toluene	25013-15-4	2.7E-02	nc	HEAST_sub	8.3E+01	TLV_TWA_irr	2.7E-02	HEAST_sub
Vinyl-2-pyrrolidone, N-	88-12-0				5.6E-02	TLV_TWA	5.6E-02	TLVadj
Vinylcyclohexene, 4-	100-40-3				1.5E-01	TLV_TWA_irr	1.5E-01	TLVirr
Vinylidene fluoride	75-38-7				3.2E+02	TLV_TWA	3.2E+02	TLVadj
Warfarin	81-81-2				2.4E-02	TLV_TWA	2.4E-02	TLVadj
Wood dust	wood dust				2.4E-01	TLV_TWA	2.4E-01	TLVadj
Wood dust, western red cedar	wood dust cedar				1.2E-01	TLV_TWA	1.2E-01	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y	Basis
Wood dusts (birch, mahogany, teak, walnut)	Wood dust (others)			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Xylene, m-	108-38-3			1.5E+02	TLV_TWA_irr	2.7E-01	PPRTV_sub*
Xylene, o-	95-47-6			1.5E+02	TLV_TWA_irr	2.7E-01	PPRTV_sub*
Xylene, p-	106-42-3			1.5E+02	TLV_TWA_irr	2.7E-01	PPRTV_sub*
Xylenes, total	1330-20-7	2.7E-01	nc PPRTV_sub	1.5E+02	TLV_TWA_irr	2.7E-01	PPRTV_sub
Xylidine	1300-73-8			6.1E-01	TLV_TWA	6.1E-01	TLVadj
Yttrium	7440-65-5			2.4E-01	TLV_TWA	2.4E-01	TLVadj
Zinc chloride fume	7646-85-7			3.4E-01	TLV_TWA_irr	3.4E-01	TLVirr
Zinc chromate	11103-86-9			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Zinc chromate	13530-65-9			2.4E-03	TLV_TWA	2.4E-03	TLVadj
Zinc oxide	1314-13-2			4.9E-01	TLV_TWA	4.9E-01	TLVadj
Zirconium	7440-67-7			1.2E+00	TLV_TWA	1.2E+00	TLVadj

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	*CASRN*	*PMEG*	*Endpoint and Basis*	*TLVadj*	*TLV Type*	*AMEG 1y Basis*

Units:
f/cc = fibers of asbestos per cubic centimeter
mg/m3 = milligrams per cubic meter

Notes:
CASRN = Chemical Abstract Service Registry Number
AMEG = Air Military Exposure Guideline
PMEG = Perliminary 1-year Air MEG
nc = non-cancer
ca = cancer
sub = subchronic
chr = chronic
inter = intermediate
adj = adjusted
irr = irritant. Used to notate TLV_TWA values that were not adjusted for exposure duration for the Air MEGs.
TWA = Time Weighted Average
RfC = Reference Concentration
All Air Military Exposure Guidelines (AMEGs) are provided in mg/m³ (asbestos and refractory ceramic fibers are in f/cc)

Sources:
- AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2007)
- CEGL = U.S. Navy/NRC Continuous Exposure Guidance Levels (U.S. Navy/NRC 2004)
- ERPG = American Industrial Hygiene Association Emergency Response Planning Guidelines (AIHA 2005)
- HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
- IRIS = EPA Integrated Risk Information System (EPA 2005a)*
- MRL = ATSDR Minimal Risk Level (ATSDR 2004)
- Munro = Munro et al 1999
- PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
- EPA_Reg6 = EPA Region 6 Human Health Medium-Specific Screening Values (Tox Values from NCEA)(EPA Region 6 2008)
- TLV = ACGIH Threshold Limit Value (ACGIH 2005)

* IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.5.2 further describes adjustments made to IRIS values.

Particulate Matter MEGS for both 1 year and 24 hour timeframes may be found in Section 4.5 Tables 4-17 and 4-18

Table D-5: Basis for the 1-Year Air MEGs

Particulate Matter MEGS may be found in section 4.5

Chemical Name	CASRN	PMEG	Endpoint and Basis	TLVadj	TLV Type	AMEG 1y Basis

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*	
Acrolein	107-02-8	NEG	7.0E-02	AEGL1_10min*	7.0E-02	AEGL1_1hr*	7.0E-02	AEGL1_8hr*
		MARG	1.0E+00	AEGL2_10min*	2.3E-01	AEGL2_1hr*	2.3E-01	AEGL2_8h*
		CRIT	1.4E+01	AEGL3_10min*	3.2E+00	AEGL3_1hr*	6.2E-01	AEGL3_8h*
Acrylonitrile	107-13-1	NEG	1.0E+01	AEGL1_10min*	2.2E+01	ERPG-1*	4.3E+00	TLV-TWA*
		MARG	6.3E+02	AEGL2_10min*	7.6E+01	ERPG-2*	1.9E+01	AEGL2_8h*
		CRIT	1.0E+03	AEGL3_10min*	1.6E+02	ERPG-3*	4.1E+01	AEGL3_8h*
Allyl alcohol	107-18-6	NEG	5.0E+00	AEGL1_10min*	5.0E+00	AEGL1_1hr*	5.0E+00	AEGL1_8hr*
		MARG	1.0E+01	AEGL2_10min*	1.0E+01	AEGL2_1hr*	1.0E+01	AEGL2_8h*
		CRIT	8.6E+01	AEGL3_10min*	4.8E+01	AEGL3_1hr*	2.4E+01	AEGL3_8h*
Ammonia	7664-41-7	NEG	2.1E+01	AEGL1_10min*	2.1E+01	AEGL1_1hr*	2.1E+01	AEGL1_8hr*
		MARG	1.5E+02	AEGL2_10min*	1.1E+02	AEGL2_1hr*	7.7E+01	AEGL2_8h*
		CRIT	1.9E+03	AEGL3_10min*	7.7E+02	AEGL3_1hr*	2.7E+02	AEGL3_8h*
Arsine	7784-42-1	NEG	9.6E-01	AEGL2_10min*	1.5E-01	TEEL1*	1.6E-02	TLV_TWA*
		MARG	9.6E-01	AEGL2_10min*	5.0E-01	AEGL2_1hr*	6.0E-02	AEGL2_8h*
		CRIT	2.9E+00	AEGL3_10min*	1.6E+00	AEGL3_1hr*	2.0E-01	AEGL3_8h*
Boron trifluoride	7637-07-2	NEG	2.5E+00	AEGL1_10min*	2.5E+00	AEGL1_1hr*	2.5E+00	AEGL1_8hr*
		MARG	4.7E+01	AEGL2_10min*	3.7E+01	AEGL2_1hr*	1.2E+01	AEGL2_8h*
		CRIT	1.4E+02	AEGL3_10min*	1.1E+02	AEGL3_1hr*	3.6E+01	AEGL3_8h*
Carbon monoxide	630-08-0	NEG	9.5E+01	TEEL1*	9.5E+01	TEEL1*	2.9E+01	TLV_TWA*
		MARG	4.8E+02	AEGL2_10min*	9.5E+01	AEGL2_1hr*	3.1E+01	AEGL2_8h*
		CRIT	1.9E+03	AEGL3_10min*	3.8E+02	AEGL3_1hr*	1.5E+02	AEGL3_8h*
Chlorine	7782-50-5	NEG	1.5E+00	AEGL1_10min*	1.5E+00	AEGL1_1hr*	1.5E+00	AEGL1_8hr*
		MARG	8.1E+00	AEGL2_10min*	5.8E+00	AEGL2_1hr*	2.1E+00	AEGL2_8h*
		CRIT	1.5E+02	AEGL3_10min*	5.8E+01	AEGL3_1hr*	2.1E+01	AEGL3_8h*

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*	
Cyanogen chloride	506-77-4	NEG	7.5E-01	TEEL1*	7.5E-01	TEEL1(old)*	7.5E-01	TEEL1*
		MARG	1.0E+00	ERPG2*	1.0E+00	ERPG2*	1.0E+00	ERPG2*
		CRIT	1.0E+01	ERPG3*	1.0E+01	ERPG3*	1.0E+01	ERPG3*
Diborane	19287-45-7	NEG	1.5E-01	TEEL1*	1.5E-01	TEEL1*	1.1E-01	TLV_TWA*
		MARG	2.2E+00	AEGL2_10min*	1.1E+00	AEGL2_1hr*	1.4E-01	AEGL2_8h*
		CRIT	8.0E+00	AEGL3_10min*	4.2E+00	AEGL3_1hr*	5.1E-01	AEGL3_8h*
Dimethylamine	124-40-3	NEG	1.8E+01	AEGL1_10min*	1.8E+01	AEGL1_1hr*	1.8E+01	AEGL1_8hr*
		MARG	2.4E+02	AEGL2_10min*	1.2E+02	AEGL2_1hr*	5.9E+01	AEGL2_8h*
		CRIT	8.9E+02	AEGL3_10min*	4.6E+02	AEGL3_1hr*	2.2E+02	AEGL3_8h*
Ethylene oxide	75-21-8	NEG	9.0E+00	TEEL1 (fixed)*	9.0E+00	TEEL1 (fixed)*	1.8E+00	TLV_TWA*
		MARG	1.4E+02	AEGL2_10min*	8.1E+01	AEGL2_1hr*	1.4E+01	AEGL2_8h*
		CRIT	6.5E+02	AEGL3_10min*	3.6E+02	AEGL3_1hr*	6.3E+01	AEGL3_8h*
Fluorine	7782-41-4	NEG	2.6E+00	AEGL1_10min*	2.6E+00	AEGL1_1hr*	2.6E+00	AEGL1_8hr*
		MARG	3.1E+01	AEGL2_10min*	7.8E+00	AEGL2_1hr*	3.6E+00	AEGL2_8h*
		CRIT	5.6E+01	AEGL3_10min*	2.0E+01	AEGL3_1hr*	8.9E+00	AEGL3_8h*
Formaldehyde	50-00-0	NEG	1.1E+00	AEGL1_10min*	1.1E+00	AEGL1_1hr*	1.1E+00	AEGL1_8hr*
		MARG	1.7E+01	AEGL2_10min*	1.7E+01	AEGL2_1hr*	1.7E+01	AEGL2_8h*
		CRIT	1.2E+02	AEGL3_10min*	6.9E+01	AEGL3_1hr*	4.3E+01	AEGL3_8h*
Hydrazine	302-01-2	NEG	1.3E-01	AEGL1_10min*	1.3E-01	AEGL1_1hr*	1.3E-01	AEGL1_8hr*
		MARG	3.0E+01	AEGL2_10min*	1.7E+01	AEGL2_1hr*	2.1E+00	AEGL2_8h*
		CRIT	8.4E+01	AEGL3_10min*	4.6E+01	AEGL3_1hr*	5.8E+00	AEGL3_8h*
Hydrogen chloride	7647-01-0	NEG	2.7E+00	AEGL1_10min*	2.7E+00	AEGL1_1hr*	2.7E+00	AEGL1_8hr*
		MARG	1.5E+02	AEGL2_10min*	3.3E+01	AEGL2_1hr*	1.6E+01	AEGL2_8h*
		CRIT	9.4E+02	AEGL3_10min*	1.5E+02	AEGL3_1hr*	3.9E+01	AEGL3_8h*

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*	
Hydrogen cyanide	74-90-8	NEG	2.8E+00	AEGL1_10min*	2.2E+00	AEGL1_1hr*	1.1E+00	AEGL1_8hr*
		MARG	1.9E+01	AEGL2_10min*	7.8E+00	AEGL2_1hr*	2.8E+00	AEGL2_8h*
		CRIT	3.0E+01	AEGL3_10min*	1.7E+01	AEGL3_1hr*	7.3E+00	AEGL3_8h*
Hydrogen fluoride	7664-39-3	NEG	8.2E-01	AEGL1_10min*	8.2E-01	AEGL1_1hr*	8.2E-01	AEGL1_8hr*
		MARG	7.8E+01	AEGL2_10min*	2.0E+01	AEGL2_1hr*	9.8E+00	AEGL2_8h*
		CRIT	1.4E+02	AEGL3_10min*	3.6E+01	AEGL3_1hr*	1.8E+01	AEGL3_8h*
Hydrogen selenide	7783-07-5	NEG	3.5E-01	TEEL1*	3.5E-01	TEEL1*	2.0E-01	TLV_TWA_irr*
		MARG	6.0E+00	AEGL2_10min*	2.4E+00	AEGL2_1hr*	8.6E-01	AEGL2_8h*
		CRIT	1.8E+01	AEGL3_10min*	7.3E+00	AEGL3_1hr*	2.6E+00	AEGL3_8h*
Hydrogen sulfide	7783-06-4	NEG	1.1E+00	AEGL1_10min*	7.1E-01	AEGL1_1hr*	4.6E-01	AEGL1_8hr*
		MARG	5.7E+01	AEGL2_10min*	3.8E+01	AEGL2_1hr*	2.4E+01	AEGL2_8h*
		CRIT	1.1E+02	AEGL3_10min*	7.0E+01	AEGL3_1hr*	4.3E+01	AEGL3_8h*
Lewisite	541-25-3	NEG	3.0E-03	AR 385-61*				
		MARG	6.5E-01	AEGL2_10min*			1.8E-02	AEGL2_8hr*
		CRIT	2.5E+00	FM 3-11.9*			5.2E-02	FM 3-11.9*
Methyl bromide	74-83-9	NEG	7.5E+01	TEEL1 (fixed)*	8.0E+01	PEL-C*	4.0E+00	TLV_TWA_irr*
		MARG	3.7E+03	AEGL2_10min*	8.2E+02	AEGL2_1hr*	2.6E+02	AEGL2_8h*
		CRIT	1.3E+04	AEGL3_10min*	2.9E+03	AEGL3_1hr*	5.0E+02	AEGL3_8h*
Methyl hydrazine	60-34-4	NEG	3.5E-01	TEEL1*	3.5E-01	TEEL1*	2.0E-02	TLV_TWA_irr*
		MARG	1.0E+01	AEGL2_10min*	1.7E+00	AEGL2_1hr*	2.1E-01	AEGL2_8h*
		CRIT	3.0E+01	AEGL3_10min*	5.1E+00	AEGL3_1hr*	6.4E-01	AEGL3_8h*
Methyl isocyanate	624-83-9	NEG	5.8E-02	ERPG1*	5.8E-02	ERPG1*	2.0E-02	AEGL2_8hr*
		MARG	9.3E-01	AEGL2_10min*	1.6E-01	AEGL2_1hr*	2.0E-02	AEGL2_8h*
		CRIT	2.8E+00	AEGL3_10min*	4.7E-01	AEGL3_1hr*	6.0E-02	AEGL3_8h*

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*	
Monomethylamine	74-89-5	NEG	1.9E+01	AEGL1_10min*	1.9E+01	AEGL1_1hr*	1.9E+01	AEGL1_8hr*
		MARG	2.0E+02	AEGL2_10min*	8.0E+01	AEGL2_1hr*	2.7E+01	AEGL2_8h*
		CRIT	1.2E+03	AEGL3_10min*	4.4E+02	AEGL3_1hr*	1.4E+02	AEGL3_8h*
Nitric acid	7697-37-2	NEG	1.4E+00	AEGL1_10min*	1.4E+00	AEGL1_1hr*	1.4E+00	AEGL1_8hr*
		MARG	1.1E+02	AEGL2_10min*	6.2E+01	AEGL2_1hr*	7.7E+00	AEGL2_8h*
		CRIT	4.4E+02	AEGL3_10min*	2.4E+02	AEGL3_1hr*	2.8E+01	AEGL3_8h*
Nitrogen dioxide	10102-44-0	NEG	9.4E-01	AEGL1_10min*	9.4E-01	AEGL1_1hr*	9.4E-01	AEGL1_8hr*
		MARG	3.8E+01	AEGL2_10min*	2.3E+01	AEGL2_1hr*	1.3E+01	AEGL2_8h*
		CRIT	6.4E+01	AEGL3_10min*	3.8E+01	AEGL3_1hr*	2.1E+01	AEGL3_8h*
Parathion	56-38-2	NEG	3.0E-01	TEEL1(old)*	3.0E-01	TEEL1(old)*	5.0E-02	TLV_TWA*
		MARG	2.8E+00	AEGL2_10min*	1.5E+00	AEGL2_1hr*	4.8E-01	AEGL2_8h*
		CRIT	3.6E+00	AEGL3_10min*	2.0E+00	AEGL3_1hr*	6.3E-01	AEGL3_8h*
Phosgene	75-44-5	NEG	4.0E-01	TEEL1*	4.0E-01	TEEL1*	1.6E-01	AEGL2_8hr*
		MARG	2.5E+00	AEGL2_10min*	1.2E+00	AEGL2_1hr*	1.6E-01	AEGL2_8h*
		CRIT	1.5E+01	AEGL3_10min*	3.0E+00	AEGL3_1hr*	3.4E-01	AEGL3_8h*
Phosphorus oxychloride	10025-87-3	NEG	3.0E+00	TEEL1*	3.0E+00	TEEL1*	6.0E-01	TLV_TWA_irr*
		MARG	3.0E+00	TEEL2*	3.0E+00	TEEL2*		*
		CRIT	6.9E+00	AEGL3_10min*	5.3E+00	AEGL3_1hr*	1.7E+00	AEGL3_8h*
Phosphorus trichloride	7719-12-2	NEG	1.9E+00	AEGL1_10min*	1.9E+00	AEGL1_1hr*	1.9E+00	AEGL1_8hr*
		MARG	1.4E+01	AEGL2_10min*	1.1E+01	AEGL2_1hr*	4.7E+00	AEGL2_8h*
		CRIT	3.9E+01	AEGL3_10min*	3.2E+01	AEGL3_1hr*	1.0E+01	AEGL3_8h*
Propylene oxide	75-56-9	NEG	1.7E+02	AEGL1_10min*	1.7E+02	AEGL1_1hr*	1.7E+02	AEGL1_8hr*
		MARG	1.1E+03	AEGL2_10min*	6.9E+02	AEGL2_1hr*	2.0E+02	AEGL2_8h*
		CRIT	3.1E+03	AEGL3_10min*	2.1E+03	AEGL3_1hr*	6.2E+02	AEGL3_8h*

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*		*10-min Air MEGs (mg/m³)*		*1-hour Air MEGs (mg/m³)*		*8-hour Air MEGs (mg/m³)*	
Sulfur dioxide	7446-09-5	NEG	5.2E-01	AEGL1_10min*	5.2E-01	AEGL1_1hr*	5.2E-01	AEGL1_8hr*
		MARG	2.0E+00	AEGL2_10min*	2.0E+00	AEGL2_1hr*	2.0E+00	AEGL2_8h*
		CRIT	7.9E+01	AEGL3_10min*	7.9E+01	AEGL3_1hr*	2.5E+01	AEGL3_8h*
Sulfur trioxide	7446-11-9	NEG	2.0E-01	AEGL1_10min*	2.0E-01	AEGL1_1hr*	2.0E-01	AEGL1_8hr*
		MARG	8.7E+00	AEGL2_10min*	8.7E+00	AEGL2_1hr*	8.7E+00	AEGL2_8h*
		CRIT	2.7E+02	AEGL3_10min*	1.6E+02	AEGL3_1hr*	9.3E+01	AEGL3_8h*
Sulfuric acid	7664-93-9	NEG	2.0E-01	AEGL1_10min*	2.0E-01	AEGL1_1hr*	2.0E-01	AEGL1_8hr*
		MARG	8.7E+00	AEGL2_10min*	8.7E+00	AEGL2_1hr*	8.7E+00	AEGL2_8h*
		CRIT	2.7E+02	AEGL3_10min*	1.6E+02	AEGL3_1hr*	9.3E+01	AEGL3_8h*

Table D-6: Basis for Short-Term Air MEGs for Key TICs of Military Concern

Name	*CASRN*	*10-min Air MEGs (mg/m³)*	*1-hour Air MEGs (mg/m³)*	*8-hour Air MEGs (mg/m³)*

Units:
mg/m3 = milligrams per cubic meter

Notes:
All Air Military Exposure Guidelines (MEGs) are provided in mg/m³
TICs = Toxic Industrial Chemicals
CASRN = Chemical Abstract Service Registry Number
NEG = Negligible
MARG = Marginal
CRIT = Critical
irr = irritant. Used to notate TLV_TWA values that were not adjusted for exposure duration for the Air MEGs.
TWA = Time Weighted Average

Sources:
- AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2007)
- ERPG = American Industrial Hygiene Association Emergency Response Planning Guidelines (AIHA 2005)
- TEEL = U.S. Department of Energy Temporary Emergency Exposure Limits (DOE 2004)*
- TLV = ACGIH Threshold Limit Value (ACGIH 2005)

See Table B-1 for a complete list of acronyms and term descriptions.

* Air MEGs based on TEELs should be considered interim values. The TEELs do not undergo the rigorous peer review of AEGLs and ERPGs, are subject to change, and are intended to serve as interim values until AEGLs or ERPGs are published AMEGs based on TEELs carry a higher level of uncertainty.

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Acetic acid	64-19-7	6.1E+02	8.6E+01	1.2E+01	1.2E+01	8.4E+00	8.4E+00	Hier order-air	8h, 14d lowered
		ERPG3	ERPG2	ERPG1	ERPG1*	TLV_TWA_irr	TLVirr		
	Rationale:	Changed 8h and 14 day values from 25 mg/m³, TLV_TWA_irr to more conservative ERPG1.							
Acetophenone	98-86-2	3.5E+02	5.0E+01	4.9E+01	4.9E+01	1.7E+01	1.7E+01	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	Changed 1-hour NEG value from 30 mg/m³ to more defensible TLV_TWA_irr value.							
Acrolein	107-02-8	3.2E+00	2.3E-01	7.0E-02	7.0E-02	4.6E-02	1.4E-04	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	IRIS_sub		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Acrylonitrile	107-13-1	1.6E+02	7.6E+01	2.2E+01	4.3E+00	1.5E-01	7.1E-02	Alt method-air	10min, 1hr, 8hr
		ERPG-3*	ERPG-2*	ERPG-1*	TLV-TWA*	MRLi_acute	IRIS		
	Rationale:	See RD-230 section 4.2.5							
Allyl Alcohol	107-18-6	4.8E+01	1.0E+01	5.0E+00	5.0E+00	4.1E-01	6.8E-04	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA_irr	PPRTV_sub		
	Rationale:	See RD-230 section 4.2.5							
Aluminum phosphide	20859-73-8	8.5E+00	4.7E+00					Hier order-air	1hNEG deleted
		AEGL3_1hr	AEGL2_1hr						
	Rationale:	Deleted 1hNEG based on TEEL since higher than AEGL-based MARG and CRIT values. AEGL-1 not recommended due to insufficient data.							
Ammonia	7664-41-7	7.7E+02	1.1E+02	2.1E+01	2.1E+01	7.0E+00	6.8E-02	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	PPRTV_sub		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Arsine	7784-42-1	1.6E+00	5.0E-01	1.5E-01	1.6E-02	3.9E-03	3.4E-05	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1*	TLV_TWA*	TLV_TWA	IRIS_chr		
	Rationale:	Changed Based on the 2008 CHPPM Report							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Asbestos	1332-21-4						2.1E-02 IRIS*	Units; Alt method-	1h values and 1y
	Rationale:	Deleted 1h values because not considered an acute hazard. Changed 1y value to match appropriate value for f/cm³ (or f/cc or f/mL) units. Unit identification will be added as a footnote.							
Benzenethiol	108-98-5	7.2E+00 AEGL3_1hr	2.4E+00 AEGL2_1hr	4.5E-01 TLV_TWA_irr*	4.5E-01 TLV_TWA_irr	1.5E-01 TLV_TWA_irr	1.5E-01 TLVirr	Hier order-air	1hr NEG
	Rationale:	1hr NEG set equal to the 8hr NEG because TLV's better source and TEEL was based on a TLV, but rounded.							
Benzyl acetate	140-11-4	1.5E+02 TEEL3	6.1E+01 TLV_TWA_irr*	6.1E+01 TLV_TWA_irr*	6.1E+01 TLV_TWA_irr	2.1E+01 TLV_TWA_irr	2.1E+01 TLVirr	Hier order-air	1hNEG, 1hMARG raised
	Rationale:	1hNEG and 1hMARG values based on TEEL raised to match 8hr value based on TLV since better source.							
Beryllium, elemental	7440-41-7	1.0E-01 ERPG3	2.5E-02 ERPG2	3.5E-03 TEEL1	5.0E-05 TLV_TWA	1.4E-05 IRIS_sub*	1.4E-05 IRIS_sub	Hier order-air	14d values changed
	Rationale:	14d value raised slightly from 1.22e-5 (TLV) to 1.37e-5 (IRIS_sub) (1y value)							
Boron	7440-42-8	2.5E+02 TEEL3	5.0E+01 TEEL2	7.5E+00 TEEL1		6.8E-03 MRLi_acute	6.8E-03 MRLi_acute*	Hier order-air	1y value lowered
	Rationale:	1y value lowred slightly from 1.37e-2 (HEAST_sub) to 6.85e-3 (MRLi_Acute) (14d value)							
Boron Triflouride	7637-07-2	1.1E+02 AEGL3_1hr*	3.7E+01 AEGL2_1hr*	2.5E+00 AEGL1_1hr*	2.5E+00 AEGL1_8hr*		4.8E-03 HEAST_sub	Alt method-air	10min, 1hr, 8hr
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Bromine	7726-95-6	5.6E+01 AEGL3_1hr	1.6E+00 AEGL2_1hr	2.2E-01 AEGL1_1hr	2.2E-01 AEGL1_8hr	2.2E-01 TLVirr*	2.2E-01 TLVirr*	Hier order-air	14d, 1yr
	Rationale:	Changed 14 day and 1 year value of 0.224 mg/m³, TLV_TWA_irr manually adjusted value to match AEGL8hr value because 0.216 was close and AEGL better source.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Bromoform	75-25-2	7.5E+03 TEEL3	3.5E+02 TEEL2	5.0E+01 TEEL1	5.2E+00 TLV_TWA_irr	2.0E+00 TLV_TWA_irr*	2.0E+00 TLV_TWA*	Hier order-air	14d and 1y values adjusted
Rationale:	14d and 1y values adjusted to 2 from 1.77 (TLV_TWA) and 4.35 (IRIS) to solve hierarchy problem								
Bromomethane	74-83-9	2.9E+03 AEGL3_1hr*	8.2E+02 AEGL2_1hr*	8.0E+01 PEL-C*	4.0E+00 TLV_TWA_irr*	1.3E-01 MRLi_acute	6.8E-02 PPRTV_sub	Alt method-air	All
Rationale:	TEEL is corrected to the OSHA-PEL of 80 mg/m3. 1 hour MEG is adopted for 10 min NEG MEG in asbence of AEGL1. Based on 2008 CHPPM Chem Vapor Acquisition Report see RD-230 section 4.2.5								
Butanol, 1-	71-36-3	4.0E+03 TEEL3	1.5E+02 TEEL2	6.1E+01 TLV_TWA_irr*	6.1E+01 TLV_TWA_irr	2.1E+01 TLV_TWA_irr	2.1E+01 TLVirr	Hier order-air	1hr NEG
Rationale:	1hr NEG set equal to the 8hr NEG because TLV's better source and TEEL was based on a TLV, but rounded.								
Butyl acetate, n-	123-86-4	1.4E+04 ERPG3	9.5E+02 ERPG2	2.4E+01 ERPG1	2.4E+01 ERPG1*	2.4E+01 ERPG1*	2.4E+01 ERPG1*	Hier order-air	8h, 14d, 1y lowered
Rationale:	Changed 8h and 14 day values from 710 mg/m³, TLV_TWA_irr and 1 year value from 240 mg/m³, TLVirr to more conservative ERPG1.								
Butyl acetate, sec-	105-46-4	7.5E+03 TEEL3	1.5E+03 TEEL2	9.5E+02 TLV_TWA_irr*	9.5E+02 TLV_TWA_irr	3.3E+02 TLV_TWA_irr	3.3E+02 TLVirr	Hier order-air	1hNEG raised
Rationale:	1hNEG value based on TEEL raised to match 8hr value based on TLV since better source.								
Butyl glycidyl ether, n-	2426-08-6	1.3E+03 TEEL3	3.0E+01 TEEL2	1.6E+01 TLV_TWA_irr*	1.6E+01 TLV_TWA	3.9E+00 TLV_TWA	3.9E+00 TLVadj	Hier order-air	1hNEG raised
Rationale:	1hNEG value based on TEEL raised to match 8hr value based on TLV since better source.								
Caprolactam	105-60-2	2.0E+01 TEEL3	5.0E+00 TLV_TWA_irr*	5.0E+00 TLV_TWA_irr*	5.0E+00 TLV_TWA_irr	1.7E+00 TLV_TWA_irr	1.7E+00 TLVirr	Hier order-air	1hNEG, 1hMARG raised
Rationale:	1hNEG and 1hMARG values based on TEEL raised to match 8h value based on TLV since better source.								
Carbon dioxide	124-38-9	7.5E+04 TEEL3	5.0E+04 TEEL2	5.0E+04 TEEL1	1.4E+04 CEGL*	1.4E+04 CEGL	2.2E+03 TLVadj	Hier order-air	8h raised
Rationale:	8h TLV-based value raised to match 14d CEGL value since CEGL better source for deployment exposures.								

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Carbon Monoxide	630-08-0	3.8E+02	9.5E+01	9.5E+01	2.9E+01	1.0E+01	7.0E+00	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1*	TLV_TWA*	CEGL	TLVadj		
	Rationale:	We adopt the TEEL value since ERPG1 is > AEGL2 for the 1 hour value. The 1 hr MEG is then adopted as the 10 min NEG MEG. Based on 2008 CHPPM Chem Vapor Acquisition Report							
Carbonyl fluoride	353-50-4	2.2E+00	7.6E-01	7.6E-01	7.6E-01			Hier order-air	1y, 14d deleted 8hNEG lowered
		AEGL3_1hr	AEGL2_1hr	TEEL1	TEEL*				
	Rationale:	8h NEG (TLV) lowered to 1h NEG (TEEL), 14d and 1y values ereased because greater than TEEL.							
Catechol	120-80-9	1.0E+02	4.0E+01	2.3E+01	2.3E+01	7.7E+00	7.7E+00	Hier order-air	1h NEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1h NEG (TEEL) raised slightly to 8h NEG (TLV)							
Chlorine	7782-50-5	5.8E+01	5.8E+00	1.5E+00	1.5E+00	2.9E-01	4.0E-03	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	MRL_inter		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Chloro-1,3-butadiene	126-99-8	1.0E+03	3.6E+01	3.6E+01	3.6E+01	1.2E+01	4.8E-02	Hier order-air	1hNEG, 1hMARG raised
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	HEAST_sub		
	Rationale:	1hNEG and 1hMARG values based on TEEL raised to match 8h value based on TLV since better source.							
Chloroform	67-66-3	1.6E+04	3.1E+02	4.9E+01	4.9E+01	4.9E+00	1.7E-01	Hier order-air	1hNEG raised
		AEGL3_1hr	AEGL2_1hr	TLV_TWA*	TLV_TWA	CEGL	MRL_inter		
	Rationale:	1hNEG value based on TEEL raised to match 8h value based on TLV since better source.							
Cyanogen	460-19-5	5.3E+01	1.8E+01	4.3E+00	2.1E+00	2.1E+00	7.3E+00	Hier order-air	14d NEG lowered, 1y deleted
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	AEGL1_8hr*	TLVirr		
	Rationale:	14d NEG (TLV) was lowered to match the 8h (AEGL) value, since the 8h is lower than the 14 day MEG this should still be protective. 1y was removed because it was higher than the 14d value, and didin't want to move an AEGL into a 1y value.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Cyanogen Chloride	506-77-4	1.0E+01 ERPG3*	1.0E+00 ERPG2*	7.5E-01 TEEL1(old)*	7.5E-01 TEEL1*			Alt method-air	10min, 1hr, 8hr
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report. See RD-230 section 4.2.5							
Cyclohexanol	108-93-0	1.5E+03 TEEL3	2.0E+02 TEEL2	2.0E+02 TEEL1	2.0E+02 TLV_TWA_adj*	7.0E+01 TLV_TWA_irr	7.0E+01 TLVirr	Alt method-air	8hr lowered to 1hrNEG
	Rationale:	The 8hr and value was based on a TLV_TWA value that was adjusted down to the 1 hour NEG MEG value to insure it was not greater than the 1 hour negligible MEG							
Cyclohexene	110-83-8	6.0E+03 TEEL3	1.5E+03 TEEL2	1.0E+03 TEEL1	1.0E+03 TLV_TWA_adj*	3.5E+02 TLV_TWA_irr	3.5E+02 TLVirr	Alt method-air	8hr lowered to 1hrNEG
	Rationale:	The 8hr and value was based on a TLV_TWA value that was adjusted down to the 1 hour NEG MEG value to insure it was not greater than the 1 hour negligible MEG							
Cyclohexylamine	108-91-8	1.2E+02 AEGL3_1hr	3.5E+01 AEGL2_1hr	7.3E+00 AEGL1_1hr	7.3E+00 AEGL1_8hr	7.3E+00 AEGL1_8hr*	7.3E+00 AEGL1_8hr*	Hier order-air	14d, 1y lowered
	Rationale:	Changed 14 day value from 41 mg/m³, TLV_TWA_irr and 1 year value from 14 mg/m³, TLVirr to more conservative AEGL1_1hr/AEGL1_8hr.							
Diacetone alcohol	123-42-2	7.5E+03 TEEL3	2.4E+02 TLV_TWA_irr*	2.4E+02 TLV_TWA_irr*	2.4E+02 TLV_TWA_irr	8.1E+01 TLV_TWA_irr	8.1E+01 TLVirr	Hier order-air	1hMARG, 1hNEG raised
	Rationale:	Increased from 200 to 240 mg/m³ to match 8h value. Difference due to rounding - same value for TEEL1 and TLV. Also data entry revision for CRIT.							
Diazinon	333-41-5				1.0E-02 TLV_TWA	2.4E-03 TLV_TWA	2.4E-03 TLV_TWA*	Hier order-air	1y lowered
	Rationale:	1y value based on MRL lowered to more conservative TLV-based 14d value.							
Diborane	19287-45-7	4.2E+00 AEGL3_1hr*	1.1E+00 AEGL2_1hr*	1.5E-01 TEEL1*	1.1E-01 TLV_TWA*	2.8E-02 TLV_TWA	2.8E-02 TLVadj	Alt method-air	All
	Rationale:	No AEGL-1 value, CVR (CHPPM 2008) adopted TEEL1							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Dichlorobenzene, 1,4-	106-46-7	7.5E+02	1.5E+02	6.0E+01	6.0E+01	8.2E+00	1.6E+00	Hier order-air	1h NEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	MRLi_acute	IRIS_sub		
	Rationale:	1h NEG (TEEL) raised slightly to 8h NEG (TLV)							
Dichlorofluoromethane	75-43-4	2.0E+04	4.0E+02	1.3E+02	4.2E+01	4.2E+00	4.2E+00	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	CEGL	CEGL*		
	Rationale:	Changed 1 year value from 10 mg/m³, TLVadj to more conservative CEGL							
Dichlorotetrafluoroethane	76-14-2	1.0E+05	1.0E+05	2.0E+04	7.0E+03	8.7E+02	8.7E+02	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	CEGL	CEGL*		
	Rationale:	Changed 1 year value from 1700 mg/m³, TLVadj to more conservative CEGL; made data entry corrections.							
Dicyclopentadiene	77-73-6	4.1E+02	2.7E+01	5.4E-02	5.4E-02	1.4E-02	1.4E-02	Hier order-air	8h NEG, 14d NEG
		ERPG3	ERPG2	ERPG1	ERPG1*	PPRTV_sub*	PPRTV_sub		
	Rationale:	8h NEG (TLV) lowered to 1h NEG (ERPG), 14d NEG (TLV) lowered to 1y NEG (PPRTV_sub) hierarchy							
Diethylene triamine	111-40-0	7.5E+00	6.0E+00	4.2E+00	4.2E+00	1.4E+00	1.4E+00	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1hNEG value based on TEEL raised to match 8h value based on TLV since better source.							
Dimethyl disulfide	624-92-0	9.6E+02	1.9E+02	3.9E-02	3.9E-02			Hier order-air	14d, 1y deleted 8h lowered
		ERPG3	ERPG2	ERPG1	ERPG1*				
	Rationale:	14d (TLV) and 1y (TLV) deleted because greater than 1h (ERPG). 8h (TLV) lowered to 1h (ERPG) hierarchy							
Dimethyl sulfate	77-78-1	8.3E+00	6.2E-01	1.2E-01	4.5E-02	4.5E-02	4.5E-02	Hier order-air	14d, 1y lowered
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	AEGL1_8hr*	AEGL1_8hr*		
	Rationale:	Changed 14 day value from 0.18 mg/m³, TLV_TWA_irr and 1 year value from 0.18 mg/m³, TLVirr to more conservative AEGL1_8hr.							
Dimethyl sulfide	75-18-3	1.3E+04	2.5E+03	1.3E+00	1.3E+00	1.3E+00	1.3E+00	Hier order-air	8h, 14d, 1y lowered
		ERPG3	ERPG2	ERPG1	ERPG1*	ERPG1*	ERPG1*		
	Rationale:	Changed 8h value from 25 mg/m³, TLV_TWA_irr and 14d and 1 year values from 8.7 mg/m³, TLVirr to more conservative ERPG1.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Dimethylamine	124-40-3	4.6E+02	1.2E+02	1.8E+01	1.8E+01	3.2E+00	3.2E+00	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA_irr	TLVirr		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Dimethylbenzidine, 3,3'-	119-93-7	1.0E+02	1.7E+01	1.7E+01	1.7E+01	4.2E+00	4.2E+00	Hier order-air	1h NEG and MARG
		TEEL3	TLV_TWA*	TLV_TWA*	TLV_TWA	TLV_TWA	TLVadj		
	Rationale:	1h NEG and MARG (TEEL) higher than the 8h NEG (TLV) set equal to the 8h NEG							
Dimethylformamide	68-12-2	5.4E+02	2.7E+02	6.0E+00	6.0E+00	6.0E+00	4.8E-02	Hier order-air	8h, 14d lowered
		AEGL3_1hr	AEGL2_1hr	ERPG1	ERPG1*	ERPG1*	PPRTV_sub		
	Rationale:	Changed 8 hour value from 30 mg/m³, TLV_TWA and 14 day value from 7.3 mg/m³, TLV_TWA to more conservative ERPG1.							
Dodecyl mercaptan	112-55-0	2.0E+01	4.0E+00	8.3E-01	8.3E-01	2.8E-01	2.8E-01	Hier order-air	1h NEG
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1h NEG (TEEL) greater than the 8h NEG (TLV) Set the 1 hour value equal to the TLV							
Ethanolamine	141-43-5	7.5E+01	7.5E+01	1.5E+01	7.5E+00	1.2E+00	1.2E+00	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	CEGL	CEGL*		
	Rationale:	Changed 1 year value from 2.6 mg/m³, TLVirr to more conservative CEGL.							
Ethylene diamine	107-15-3	4.9E+01	2.4E+01	2.4E+01	2.4E+01	8.4E+00	8.4E+00	Hier order-air	1h, 8h, 14d lowered
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	AEGL2_1hr*	TLV_TWA_irr	TLVirr		
	Rationale:	Reduced 1h and 8h values from 25 to 24 to match the AEGL2 since all were so close (due to rounding). Changed 14d and 1 year values to be based on the TLV.							
Ethylene Oxide	75-21-8	3.6E+02	8.1E+01	9.0E+00	1.8E+00	4.4E-01	4.8E-02	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1 (fixed)*	TLV_TWA*	TLV_TWA	HEAST		
	Rationale:	No AEGL, or ERPG values. CHPPM 2008 Chem Vapor Report adopted TEEL (with corrections)							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Fluorine	7782-41-4	2.0E+01	7.8E+00	2.6E+00	2.6E+00	1.1E-02	1.1E-02	Hier order-air	All
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	MRLi_acute	MRLi_acute*		
	Rationale:	1y MEG lowered to match 14d value based on acute MRL. The original 1y value was based on the TLV-TWA irritant. The more conservative MRL based MEG was used to be conservative.							
Formaldehyde	50-00-0	6.9E+01	1.7E+01	1.1E+00	1.1E+00	3.7E-01	2.5E-02	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	MRL_inter		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Fuel oil no. 2	68476-30-2	5.0E+02	5.0E+02	1.0E+02	1.0E+02	1.4E-02	1.4E-02	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	MRLi_acute	MRLi_acute*		
	Rationale:	TLV-based 1y value lowered significantly to match MRL-based 14d value in order to be protective.							
Gasoline	8006-61-9		7.5E+03	7.3E+02	7.3E+02			Hier order-air	1h CRIT deleted
			AEGL2_1hr	AEGL1_1hr	AEGL1_8hr				
	Rationale:	1h CRIT deleted because it was based on a TEEL and higher than the AEGL2_1hr							
Germanium tetrahydride	7782-65-2	1.6E+00	5.3E-01	5.3E-01	5.3E-01	1.5E-01	1.5E-01	Hier order-air	1h NEG, 8h NEG
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	AEGL2_1hr*	TLV_TWA	TLVadj		
	Rationale:	1h NEG (TEEL) and 8h NEG (TLV) were both lowered to the AEGL2_1h value							
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Heptane, n-	142-82-5	3.0E+03	1.6E+03	1.6E+03	1.6E+03	5.6E+02	5.6E+02	Hier order-air	1nNEG, 1hMARG raised
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1h values based on TEELs raised to match 8h values based on TLV since a better data source.							
Hexachlorobenzene	118-74-1	2.0E+02	1.5E+00	6.0E-03	2.0E-03	4.9E-04	4.9E-04	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	TLV_TWA	TLV_TWA*		
	Rationale:	IRIS-based 1y value lowered to match TLV-based 14d value because 1y value significantly higher than 1hNEG, 8h, and 14d values.							
Hexachlorobutadiene	87-68-3	1.1E+02	3.2E+01	1.1E+01	2.1E-01	7.3E-02	7.3E-02	Hier order-air	1y lowered
		ERPG3	ERPG2	ERPG1	TLV_TWA_irr	TLV_TWA_irr	TLV_TWA_irr*		
	Rationale:	Changed 1 year value from 0.22 mg/m³, IRIS to slightly more conservative TLV_TWA_irr.							
Hexachlorocyclopentadiene	77-47-4	2.0E-01	2.0E-01	2.0E-01	1.1E-01	7.6E-02	7.6E-02	Hier order-air	14d value raised
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	MRL_inter*	MRL_inter		
	Rationale:	14d value was raised from 3.82e-2 (TLV) to 7.64e-2 (MRL) (1y value)							
Hexachlorodibenzodioxin, 1,2,3,4,7,8-	39227-28-6							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachlorodibenzo-p-dioxin, mixture	19408-74-3							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Hexachloroethane	67-72-1	3.0E+03 TEEL3	5.0E+01 TEEL2	3.0E+01 TEEL1	9.7E+00 TLV_TWA_irr	9.7E+00 TLV_TWA_irr*	1.2E+00 IRIS	Hier order-air	14d lowered
	Rationale:	Changed 14d value based on MRLi_acute to more conservative TLV irritant-based 8h value.							
Hexafluoroacetone	684-16-2	5.4E+02 AEGL3_1hr	1.4E+00 AEGL2_1hr	6.8E-01 TLV_TWA*	6.8E-01 TLV_TWA	1.7E-01 TLV_TWA	1.7E-01 TLVadj	Hier order-air	1h NEG
	Rationale:	1h NEG (TEEL) greater than the 8h NEG (TLV) Set the 1 hour value equal to the TLV							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Hydrazine	302-01-2	4.6E+01	1.7E+01	1.3E-01	1.3E-01	3.9E-02	6.2E-05	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	PPRTV_sub		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Hydrogen Chloride	7647-01-0	1.5E+02	3.3E+01	2.7E+00	2.7E+00	1.5E+00	1.4E-02	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	IRIS_chr		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Hydrogen Cyanide	74-90-8	1.7E+01	7.8E+00	2.2E+00	1.1E+00		6.2E-03	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*		IRIS_sub		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Hydrogen Fluoride	7664-39-3	3.6E+01	2.0E+01	8.2E-01	8.2E-01	3.3E-02	3.3E-02	Hier order-air	All
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	CEGL	CEGL*		
	Rationale:	1y value was lowered to the 14 day CEGL based value							
Hydrogen Selenide	7783-07-5	7.3E+00	2.4E+00	3.5E-01	2.0E-01	5.7E-02	5.7E-02	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1*	TLV_TWA_irr*	TLV_TWA_irr	TLVirr		
	Rationale:	No AEGL-1 value, CVR (CHPPM 2008) adopted TEEL1							
Hydrogen Sulfide	7783-06-4	7.0E+01	3.8E+01	7.1E-01	4.6E-01	4.6E-01	1.4E-02	Hier order-air	All
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	AEGL1_8hr*	IRIS_sub		
	Rationale:	Changed 14 day value from 1.4 mg/m³, CEGL to more conservative AEGL1_8hr.							
Indene	95-13-6	1.5E+03	2.4E+01	2.4E+01	2.4E+01	5.8E+00	5.8E+00	Hier order-air	1hNEG, 1hMARG raised
		TEEL3	TLV_TWA*	TLV_TWA*	TLV_TWA	TLV_TWA	TLVadj		
	Rationale:	1hNEG, 1hMARG value based on TEEL raised to TLV irritant-based 8h value.							
Iron pentacarbonyl	13463-40-6	1.4E+00	4.8E-01	4.8E-01	4.8E-01	2.0E-01	2.0E-01	Hier order-air	8h lowered
		AEGL3_1hr	AEGL2_1hr	TEEL1	AEGL2_1h*	TLV_TWA	TLVadj		
	Rationale:	TLV-based 8h value lowered to match 1h values since based on AEGLs and are more protective.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Isobutyl acetate	110-19-0	6.0E+03	1.3E+03	7.1E+02	7.1E+02	2.4E+02	2.4E+02	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-base 1hNEG raised to match 8h TLV-based value since more defensible source.							
Isopentane	78-78-4	6.0E+04	1.8E+03	1.8E+03	1.8E+03	6.1E+02	6.1E+02	Hier order-air	1hMARG, 1hNEG raised
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-base 1h values raised to match 8h TLV-based value since more defensible source.							
Isopropanol	67-63-0	5.0E+03	1.0E+03	1.0E+03	4.9E+02	2.5E+00	2.5E+00	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	CEGL	CEGL*		
	Rationale:	TLV-based 1y value lowered to match CEGL-based 14d value since CEGL is a more approp source for deployment exposures and more protective value.							
Ketene	463-51-4	3.4E+00	1.1E+00	3.3E-01	1.5E-01	1.5E-01		Hier order-air	14d NEG lowered, 1y deleted
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	AEGL1_8hr*			
	Rationale:	14d NEG (TLV) was lowered to match the 8h (AEGL) value, since the 8h is lower than the 14 day MEG this should still be protective. 1y was removed because it was higher than the 14d value, and didin't want to move an AEGL into a 1y value.							
Lewisite	541-25-3	4.2E-01	1.2E-01	3.0E-03	3.0E-03			Alt method-air	10min, 1hr, 8hr
		FM 3-11.9*	AEGL2_1hr*	AR 385-61*	AR 385-61*				
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Manganese	7439-96-5	5.0E+02	5.0E+00	3.0E+00			3.4E-03	Alt method-air	1y value adjusted
		TEEL3	TEEL2	TEEL1			Adjusted IRIS Rf C*		
	Rationale:	The manganese RfC is based on a LOAEL and has an uncertainty factor of 1000 applied. This is a very conservative number that is safe for a continuous lifetime exposure for even sensitive members of the population. The current uncertainty factor for manganese reflects two issues that can be eliminated for the military population, the sensitive individual factor and the less-than-chronic exposure period used to derive the RfC. We eliminate the two factors discussed above for sensitive individuals (10) and less-than-chronic exposure period (10) we get a modified RfC.							
Methacrylic acid	79-41-4	7.7E+02	2.1E+02	2.4E+01	2.4E+01	2.4E+01	2.4E+01	Hier order-air	14d, 1yr lowered
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	AEGL1_8hr*	AEGL1_8hr*		
	Rationale:	The 14d and 1y values were lowered to match the more conservative 8h AEGL1 used as the 8h MEG.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Methane	74-82-8	1.3E+05	3.0E+03	2.0E+03	6.6E+02	6.6E+02	1.6E+02	Hier order-air	14d lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	TLV_TWA*	TLVadj		
	Rationale:	CEGL-based 14d value lowered to match 8h TLV-based MEG because the CEGL value is old (1984) and is higher than both the TLV-TWA and TEEL1-2 values which are more recent.							
Methanol	67-56-1	9.3E+03	2.8E+03	6.9E+02	3.5E+02	1.3E+01	1.3E+01	Hier order-air	1y value lowered
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	CEGL	CEGL*		
	Rationale:	TLV-based 1y MEG lowered to match the CEGL-based 14d value. The CEGL value was final in 2004 and was adopted as the 1y MEG to be protective.							
Methomyl	16752-77-5	1.7E+01	5.7E+00	5.7E+00	2.5E+00	6.1E-01	6.1E-01	Hier order-air	1h NEG
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	TLV_TWA	TLV_TWA	TLVadj		
	Rationale:	1h NEG (TEEL) lowered to AEGL2_1h value							
Methoxyethanol, 2-	109-86-4	6.0E+02	7.5E+00	1.0E+00	3.1E-01	7.6E-02	7.6E-02	Hier order-air	1y value lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	TLV_TWA	TLV_TWA*		
	Rationale:	1y value based on IRIS_sub lowered to reflect the TLV-adj value of the 14d MEG to be protective.							
Methyl acrylate	96-33-3	7.5E+02	2.5E+01	7.0E+00	7.0E+00	2.4E+00	2.4E+00	Hier order-air	1hNEG value raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG raised slightly to match the TLV-based 8h value since TLVs are a better data source.							
Methyl Hydrazine	60-34-4	5.1E+00	1.7E+00	3.5E-01	2.0E-02	6.5E-03	6.5E-03	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1*	TLV_TWA_irr*	TLV_TWA_irr	TLVirr		
	Rationale:	No AEGL-1 value, CVR (CHPPM 2008) adopted TEEL1							
Methyl Isocyanate	624-83-9	4.7E-01	1.6E-01	5.8E-02	2.0E-02	1.6E-02	1.6E-02	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	ERPG1*	AEGL2_8hr*	TLV_TWA_irr	TLVirr		
	Rationale:	No AEGL-1 value, CHPPM 2008 report adopted the ERPG1 as the 10 min value. For the 8 hour value the TLV was higher than the AEGL2_8hr, so the AEGL2_8h was adopted as the 8hr NEG MEG, the other 8h values were rounded to match the 2008 CVR							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Methyl isopropyl ketone	563-80-4	2.0E+03	7.0E+02	7.0E+02	7.0E+02	2.4E+02	2.4E+02	Hier order-air	1hNEG, 1hMARG raised
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1h values raised slightly to match TLV-based 8h value since TLVs a better data source.							
Methyl mercaptan	74-93-1	1.3E+02	9.2E+01	9.8E-03	9.8E-03	9.8E-03	9.8E-03	Hier order-air	8h, 14d, 1y values lowered
		AEGL3_1hr	AEGL2_1hr	ERPG1	ERPG1*	ERPG1*	ERPG1*		
	Rationale:	TLV-based 8h, 14d and 1y MEGs raised to match ERPG1-based 1h value. The ERPG1 was final in 2005 and is significantly lower (100x) than the TLV-TWA.							
Methyl methacrylate	80-62-6	2.3E+03	4.9E+02	7.0E+01	7.0E+01	7.0E+01	4.8E-01	Hier order-air	14d value lowered
		AEGL3_1hr	AEGL2_1hr	AEGL1_1hr	AEGL1_8hr	AEGL1_8hr*	IRIS_chr		
	Rationale:	TLV-based 14 day value lowered to match 8h AEGL-based MEG to be conservative.							
Methylamine	74-89-5	4.4E+02	8.0E+01	1.9E+01	1.9E+01	2.2E+00	2.2E+00	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA_irr	TLVirr		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	5.0E+02	5.0E+00	3.0E-01	1.1E-01	2.7E-02	2.7E-02	Hier order-air	1y value lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	TLV_TWA	TLV_TWA*		
	Rationale:	HEAST-based 1y MEG lowered to the TLV-adj value for the 14d MEG in order to be conservative and because HEAST is an older data source.							
Methylene-bis(4-cyclohexylisocyanate)	5124-30-1	2.0E+00	1.0E-01	5.4E-02	5.4E-02	1.8E-02	1.8E-02	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG raised slightly to match 8h TLV-based MEG since TLVs a better data source.							
Methylenedianiline, 4,4'-	101-77-9	1.5E+02	4.0E+00	8.1E-01	8.1E-01	2.0E-01	2.0E-01	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA*	TLV_TWA	TLV_TWA	TLVadj		
	Rationale:	TEEL-based 1hNEG raised slightly to match 8h TLV-based MEG since TLVs a better data source.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Nickel carbonyl	13463-39-3	1.1E+00 AEGL3_1hr	2.5E-01 AEGL2_1hr	2.5E-01 TEEL1	2.5E-01 TEEL1*	2.5E-01 TEEL1*	1.2E-01 TLVirr	Hier order-air	8h,14d values lowered
	Rationale:	TLV-based 8h and 14d values lowered slightly to match the AEGL2 and TEEL1 value since AEGL value is final.							
Nitric Acid	7697-37-2	2.4E+02 AEGL3_1hr*	6.2E+01 AEGL2_1hr*	1.4E+00 AEGL1_1hr*	1.4E+00 AEGL1_8hr*	1.4E+00 AEGL1_8hr*	1.4E+00 AEGL1_8hr*	Hier order-air	All
	Rationale:	TLV-based 14d and 1y values lowered slightly to match 8h AEGL1-based MEG to be conservative. Values were very similar for all durations since nitric acid is an irritant.							
Nitric oxide	10102-43-9				3.7E+00 CEGL*	3.7E+00 CEGL*	3.7E+00 CEGL*	Hier order-air	1hNEG, 8h values raised, 1y value lowered
	Rationale:	The CEGL-based 14d MEG was used in place of the AEGL-based 1hNEG and 8h values and the TLV-based 1y value. The CEGL was final in 2004 but the interim AEGLs actually do not recommend any values for nitric oxide - they are for NO2 instead due to insuf data							
Nitroethane	79-24-3	3.0E+03 TEEL3	6.0E+02 TEEL2	3.1E+02 TLV_TWA_irr*	3.1E+02 TLV_TWA_irr	1.1E+02 TLV_TWA_irr	1.1E+02 TLVirr	Hier order-air	1hNEG raised
	Rationale:	Slightly raised the 1hNEG value to match the 8h TLV-based MEG since the TLVs are a better data source.							
Nitrogen Dioxide	10102-44-0	3.8E+01 AEGL3_1hr*	2.3E+01 AEGL2_1hr*	9.4E-01 AEGL1_1hr*	9.4E-01 AEGL1_8hr*	9.4E-01 AEGL1_8hr*	9.4E-01 AEGL1_8hr*	Hier order-air	All
	Rationale:	Lowered the CEGL-based 14d value to match the 8h AEGL based value since slighly more protective and includes dev effects and females unlike CEGLs. Also lowered TLV-based 1y to match 8h MEG since slightly higher.							
Nitroglycerin	55-63-0	7.5E+01 TEEL3	2.0E+00 TEEL2	4.6E-01 TLV_TWA*	4.6E-01 TLV_TWA	1.1E-01 TLV_TWA	1.1E-01 TLVadj	Hier order-air and	1hNEG raised
	Rationale:	TEEL-based 1hNEG raised to match TLV-based 8h MEG since the TLVs are a better data source.							
Octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-	3268-87-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	39001-02-0							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Octane	111-65-9	4.0E+03	1.5E+03	1.4E+03	1.4E+03	4.8E+02	4.8E+02	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG raised to match TLV-based 8h MEG since the TLVs are a better data source.							
Ozone	10028-15-6	1.0E+01	2.0E+00	4.0E-01	3.9E-01	3.9E-02	3.9E-02	Hier order-air	1y value lowered
		TEEL3	TEEL2	TLV-TWA	TLV_TWA_irr	CEGL	CEGL		
	Rationale:	1y value was lowered to the 14d CEGL based value							
Parathion	56-38-2	2.0E+00	1.5E+00	3.0E-01	5.0E-02	1.2E-02	1.2E-02	Alt method-air	All
		AEGL3_1hr*	AEGL2_1hr*	TEEL1(old)*	TLV_TWA*	TLV_TWA	TLVadj		
	Rationale:	No AEGL-1 value, CVR (CHPPM 2008) adopted TEEL1, see RD-230 section 4.2.5							
Pentachlordibenzofuran, 2,3,4,7,8-	57117-31-4							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Pentane, n-	109-66-0	4.0E+03 TEEL3	1.8E+03 TLV_TWA_irr*	1.8E+03 TLV_TWA_irr*	1.8E+03 TLV_TWA_irr	6.1E+02 TLV_TWA_irr	6.8E+00 PPRTV_sub	Hier order-air	1hMARG, 1hNEG raised
	Rationale:	TEEL-based 1hNEG and 1hMARG raised to match TLV-based 8h MEG since the TLVs are a better data source.							
Perchloromethyl mercaptan	594-42-3	6.8E+00 AEGL3_1hr	2.3E+00 AEGL2_1hr	9.9E-02 AEGL1_1hr	9.9E-02 AEGL1_8hr	9.9E-02 AEGL1_8hr*	9.9E-02 AEGL1_8hr*	Hier order-air	14d, 1y lowered
	Rationale:	TLV-based 14d and 1y values lowered to match 8h AEGL-based value to be conservative.							
Perchloryl fluoride	7616-94-6	5.0E+01 AEGL3_1hr	1.7E+01 AEGL2_1hr	6.3E+00 AEGL1_1hr	2.5E+00 AEGL1_8hr	2.5E+00 AEGL1_8hr*		Hier order-air	14d NEG lowered, 1y deleted
	Rationale:	14d NEG (TLV) was lowered to match the 8h (AEGL) value, since the 8h is lower than the 14 day MEG this should still be protective. 1y was removed because it was higher than the 14d value, and didin't want to move an AEGL into a 1y value.							
Phenyl mercaptan	108-98-5	7.2E+00 AEGL3_1hr	2.4E+00 AEGL2_1hr	4.5E-01 TLV_TWA*	4.5E-01 TLV_TWA	1.1E-01 TLV_TWA	1.1E-01 TLVadj	Hier order-air	1h NEG
	Rationale:	TEEL-based 1hNEG raised slightly to match 8h TLV-based MEG since TLVs a better data source.							
Phorate	298-02-2	1.2E-01 AEGL3_1hr	4.0E-02 AEGL2_1hr	4.0E-02 AEGL2_1hr*	4.0E-02 AEGL2_1hr*	1.2E-02 TLV_TWA	1.2E-02 TLVadj	Hier order-air	1h NEG, 8h NEG
	Rationale:	1h NEG (TEEL) and 8h NEG (TLV) lowered to AEGL2_1h value							
Phosgene	75-44-5	3.0E+00 AEGL3_1hr*	1.2E+00 AEGL2_1hr*	4.0E-01 TEEL1*	1.6E-01 AEGL2_8hr*	4.0E-02 CEGL	6.2E-04 IRIS_sub	Alt method-air	All
	Rationale:	No AEGL-1 value, CHPPM 2008 report adopted the TEEL1 as the 10 min value. For the 8 hour value the TLV was higher than the AEGL2_8hr, so the AEGL2_8h was adopted as the 8hr NEG MEG							
Phosphorous Oxychloride	10025-87-3	5.3E+00 AEGL3_1hr*	3.0E+00 TEEL2*	3.0E+00 TEEL1*	6.0E-01 TLV_TWA_irr*	2.1E-01 TLV_TWA_irr	2.1E-01 TLVirr	Alt method-air	All
	Rationale:	No AEGL values, CHPPM 2008 Chem Vapor Report adopted TEELs							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Phosphorous Trichloride	7719-12-2	3.2E+01	1.1E+01	1.9E+00	1.9E+00	3.8E-01	3.8E-01	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA_irr	TLVirr		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Propylene Oxide	75-56-9	2.1E+03	6.9E+02	1.7E+02	1.7E+02	1.6E+00	2.1E-02	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA_irr	HEAST_sub		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Stoddard solvent	8052-41-3	2.0E+04	1.5E+03	5.7E+02	5.7E+02	2.0E+02	2.0E+02	Hier order-air	1h NEG MEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1h MEGs raised slightly to match TLV-based 8h MEG since the TLVs are a better data source.							
Sulfur Dioxide	7446-09-5	7.9E+01	2.0E+00	5.2E-01	5.2E-01	5.2E-01	5.2E-01	Hier order-air	All
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	AEGL1_8hr*	AEGL1_8hr*		
	Rationale:	The selected 14-d and 1-yr MEG values do not following the standard hierarchy because the values derived by following the hierarchy result in values (2 ppm TLV, 1 ppm CEGL, and 0.7 ppm adjusted TLV® for irritants) and that were higher than the 8-hr MEG ba							
Sulfur Trioxide	7446-11-9	1.6E+02	8.7E+00	2.0E-01	2.0E-01			Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*				
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Sulfuric Acid	7664-93-9	1.6E+02	8.7E+00	2.0E-01	2.0E-01	4.9E-02	4.9E-02	Alt method-air	10min, 1hr, 8hr
		AEGL3_1hr*	AEGL2_1hr*	AEGL1_1hr*	AEGL1_8hr*	TLV_TWA	TLVadj		
	Rationale:	Rounded values to match CHPPM 2008 Chem Vapor Acquisition Report							
Tellurium hexafluoride	7783-80-4	5.2E-01	1.8E-01	1.8E-01	1.8E-01	6.8E-02	6.8E-02	Hier order-air	1h NEG, 8h NEG
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	AEGL2_1hr*	TLV_TWA_irr	TLVirr		
	Rationale:	1h NEG (TEEL) and 8h NEG (TLV) lowered to AEGL2_1h value							
Tert-pentane	463-82-1	4.0E+03	1.8E+03	1.8E+03	1.8E+03	6.1E+02	6.1E+02	Hier order-air	1hMARG, 1hNEG raised
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG and 1hMARG raised to match TLV-based 8h MEG since the TLVs are a better data source.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Tetrachlorodibenzofuran, 2,3,7,8-	51207-31-9							Alt method-air	1h and 1y values deleted
	Rationale:	Dioxins now assessed using AMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Tetramethoxysilane	681-84-5	8.7E+00	5.7E+00	5.7E+00	5.7E+00	1.5E+00	1.5E+00	Hier order-air	1hNEG, 8h lowered
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	AEGL2_1hr*	TLV_TWA	TLVadj		
	Rationale:	1hNEG and 8h values lowered slightly to match AEGL-based 1hMARG. Although the AEGLs are proposed, the difference in values was small and was made to be protective.							
Tetranitromethane	509-14-8	1.4E+01	4.2E+00	4.2E+00	4.0E-02	1.4E-02	1.4E-02	Hier order-air	1h NEG
		AEGL3_1hr	AEGL2_1hr	AEGL2_1hr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	1h NEG (TEEL) lowered to AEGL2_1h value							
Thioglycolic acid	68-11-1	2.0E+01	4.0E+00	3.8E+00	3.8E+00	1.3E+00	1.3E+00	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG raised slightly to match TLV-based 8h MEG since the TLVs are a better data source.							
Trichloroacetic acid	76-03-9	1.5E+02	1.5E+01	6.7E+00	6.7E+00	2.3E+00	2.3E+00	Hier order-air	1hNEG raised
		TEEL3	TEEL2	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG raised slightly to match TLV-based 8h MEG since the TLVs are a better data source.							
Trichloroethane, 1,1,2-	79-00-5	5.0E+02	7.5E+01	5.5E+01	5.5E+01	1.3E+01	3.0E-01	Hier order-air and	1hNEG raised
		TEEL3	TEEL2	TLV_TWA*	TLV_TWA	TLV_TWA	IRIS		
	Rationale:	TEEL-based 1hNEG raised slightly to match TLV-based 8h MEG since the TLVs are a better data source.							
Trichloropropane, 1,2,3-	96-18-4	6.0E+02	3.0E+02	1.5E+02	6.0E+01	1.2E-03	1.2E-03	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	MRLi_acute	MRLi_acute*		
	Rationale:	IRIS based 1y value lowered slightly to match the MRL-based 14d value to be conservative.							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	CASRN	1 hour Air MEGs and Basis CRIT, MARG, NEG			AMEG_8h and Basis	AMEG_14d and Basis	AMEG_1y and Basis	Reason Unique	MEGs Impacted
Trifluorobromomethane	75-63-8	2.5E+05	1.5E+05	2.0E+04	6.1E+03	6.1E+02	6.1E+02	Hier order-air	1y lowered
		TEEL3	TEEL2	TEEL1	TLV_TWA	CEGL	CEGL*		
	Rationale:	TLV-based 1y value lowered to match CEGL-based 14d value to be conservative.							
Turpentine	8006-64-2	4.0E+03	1.1E+02	1.1E+02	1.1E+02	3.8E+01	3.8E+01	Hier order-air	1h NEG, MARG
		TEEL3	TLV_TWA_irr*	TLV_TWA_irr*	TLV_TWA_irr	TLV_TWA_irr	TLVirr		
	Rationale:	TEEL-based 1hNEG, 1h MARG raised slightly to match 8h TLV-based MEG since TLVs a better data source.							
Vanadium pentoxide	1314-62-1	3.5E+01	7.0E+00	1.0E+00	5.0E-02	1.4E-04	1.4E-04	Alt method-air	14d, 1y values
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	MRLi_acute*	MRLi_acute*		
	Rationale:	MRLi_acute used for 14d and 1y, as for Vanadium.							
Xylene, m-	108-38-3	4.0E+03	7.5E+02	6.0E+02	4.3E+02	1.5E+02	2.7E-01	Alt method-air	1yr MEG changed
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	TLV_TWA_irr	PPRTV_sub*		
	Rationale:	1y MEG changed from TLV Value of 149 to PPRTV value for total Xylenes							
Xylene, o-	95-47-6	4.0E+03	7.5E+02	6.0E+02	4.3E+02	1.5E+02	2.7E-01	Alt method-air	1yr MEG changed
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	TLV_TWA_irr	PPRTV_sub*		
	Rationale:	1y MEG changed from TLV Value of 149 to PPRTV value for total Xylenes							
Xylene, p-	106-42-3	4.0E+03	7.5E+02	6.0E+02	4.3E+02	1.5E+02	2.7E-01	Alt method-air	1yr MEG changed
		TEEL3	TEEL2	TEEL1	TLV_TWA_irr	TLV_TWA_irr	PPRTV_sub*		
	Rationale:	1y MEG changed from TLV Value of 149 to PPRTV value for total Xylenes							

Table D-7: Basis for Air MEGs Derived Using Unique Methods

Chemical Name	*CASRN*	*1 hour Air MEGs and Basis CRIT, MARG, NEG*	*AMEG_8h and Basis*	*AMEG_14d and Basis*	*AMEG_1y and Basis*	*Reason Unique*	*MEGs Impacted*

Units:
f/cc = fibers of asbestos per cubic centimeter
mg/m3 = milligrams per cubic meter

Notes:
All Air Military Exposure Guidelines (MEGs) are provided in mg/m³ (asbestos and refractory ceramic fibers are in f/cc)
AMEG = Air Military Exposure Guideline
CASRN = Chemical Abstract Service Registry Number
NEG = Negligible
MARG = Marginal
CRIT = Critical
adj = adjusted
chr = chronic
inter = intermediate
sub = subchronic
irr = irritant. Used to notate TLV_TWA values that were not adjusted for exposure duration for the Air MEGs.
TWA = Time Weighted Average
RfC = Reference Concentration

Sources:
AEGL = EPA/NRC Acute Exposure Guideline Level (EPA/NRC 2006)
CEGL = U.S. Navy/NRC Continuous Exposure Guidance Levels (U.S. Navy/NRC 2004)
EPA_Reg6 = EPA Region 6 Human Health Medium-Specific Screening Values (Tox Values from NCEA)(EPA Region 6 2008)
ERPG = American Industrial Hygiene Association Emergency Response Planning Guidelines (AIHA 2005)
HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
TEEL = U.S. Department of Energy Temporary Emergency Exposure Limits (DOE 2004)*
TLV = ACGIH Threshold Limit Value (ACGIH 2005)

APPENDIX E

DEVELOPMENT OF THE WATER MILITARY EXPOSURE GUIDELINES

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Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Acifluorfen-sodium	62476-59-9	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Acrylamide	79-06-1	2.1E+00	HA1d_adj	7.0E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Acrylonitrile	107-13-1	1.4E+00	MRLoA_adj	4.7E-01	MRLoA_adj	1.4E+00	MRLoA_adj	4.7E-01	MRLoA_adj
Alachlor	15972-60-8	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Aldicarb	116-06-3	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj	1.4E-02	HA10d_adj	4.7E-03	HA10d_adj
Aldicarb sulfone	1646-88-4	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj	1.4E-02	HA10d_adj	4.7E-03	HA10d_adj
Aldicarb sulfoxide	1646-87-3	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj	1.4E-02	HA10d_adj	4.7E-03	HA10d_adj
Ametryn	834-12-8	1.3E+01	HA1d_adj	4.2E+00	HA1d_adj	1.3E+01	HA10d_adj	4.2E+00	HA10d_adj
Ammonium sulfamate	7773-06-0	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj	2.8E+01	HA10d_adj	9.3E+00	HA10d_adj
Antimony, elemental	7440-36-0	1.4E-02	HA1d_adj	6.0E-03	MCL*	1.4E-02	HA10d_adj	6.0E-03	MCL*
Arsenic, elemental	7440-38-2	3.0E-01	TSFWS_ST5‡	1.0E-01	TSFWS_ST15‡	6.0E-02	TSFWS_LT5‡	2.0E-02	TSFWS_LT15‡
Atrazine	1912-24-9	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Azinphos methyl	86-50-0	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Benzene	71-43-2	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Beryllium, elemental	7440-41-7	4.2E+01	HA1d_adj	1.4E+01	HA1d_adj	4.2E+01	HA10d_adj	1.4E+01	HA10d_adj
Bis(2-chloroisopropyl) ether	39638-32-9	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	5.6E+00	HA10d_adj	1.9E+00	HA10d_adj
Boron	7440-42-8	5.6E+00	HA1d_adj*	1.9E+00	HA1d_adj*	2.8E+00	IRIS_sub*	9.3E-01	IRIS_sub*
Bromacil	314-40-9	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Bromobenzene	108-86-1	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	5.6E+00	HA10d_adj	1.9E+00	HA10d_adj
Bromochloromethane	74-97-5	7.0E+01	HA1d_adj	2.3E+01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Bromodichloromethane	75-27-4	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	8.4E-01	HA10d_adj	2.8E-01	HA10d_adj
Bromoform	75-25-2	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj				
Butylate	2008-41-5	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
BZ	53800-72-9	7.0E-03	TSFWS_ST5‡	2.3E-03	TSFWS_ST15‡				
Cadmium, elemental	7440-43-9	5.6E-02	HA1d_adj	1.9E-02	HA1d_adj	5.6E-02	HA10d_adj	1.9E-02	HA10d_adj
Carbaryl	63-25-2	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Carbofuran	1563-66-2					7.0E-02	HA10d_adj_chr	2.3E-02	HA10d_adj_chr
Carbon tetrachloride	56-23-5	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Carboxin	5234-68-4	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Chloramben	133-90-4	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
Chlordane	57-74-9	8.4E-02	HA1d_adj	2.8E-02	HA1d_adj	8.4E-02	HA10d_adj	2.8E-02	HA10d_adj
Chlordecone	143-50-0	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Chlorfenvinphos	470-90-6	2.8E-02	MRLoA_adj	9.3E-03	MRLoA_adj	2.8E-02	MRLoA_adj	9.3E-03	MRLoA_adj
Chloride	16887-00-6	6.0E+02	TSFWS_ST5‡	6.0E+02	TSFWS_ST15‡	6.0E+02	TSFWS_LT5‡	6.0E+02	TSFWS_LT15‡
Chlorine	7782-50-5	4.2E+00	HA1d_adj	4.0E+00	MRDL*	4.2E+00	HA10d_adj	4.0E+00	MRDL*
Chlorite	14998-27-7					1.4E+00	MRL_inter_nc*	1.0E+00	MCL*
Chlorite (sodium chlorite)	7758-19-2	1.1E+00	HA1d_adj	3.7E-01	HA1d_adj	1.1E+00	HA10d_adj	3.7E-01	HA10d_adj
Chloroacetic acid	79-11-8	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Chlorobenzene	108-90-7	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	5.6E+00	HA10d_adj	1.9E+00	HA10d_adj
Chloroform	67-66-3	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	5.6E+00	HA10d_adj	1.9E+00	HA10d_adj
Chlorophenol, 2-	95-57-8	7.0E-01	HA1d_adj	2.3E-01	HA1d_adj	7.0E-01	HA10d_adj	2.3E-01	HA10d_adj
Chlorophenol, 4-	106-48-9	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Chlorothalonil	1897-45-6	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Chlorotoluene, o-	95-49-8	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Chlorpyrifos	2921-88-2	4.2E-02	HA1d_adj	1.4E-02	HA1d_adj	4.2E-02	HA10d_adj	1.4E-02	HA10d_adj
Chlorthal	2136-79-0	1.4E+02	HA1d_adj	4.7E+01	HA1d_adj	1.4E+02	HA10d_adj	4.7E+01	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Chromium, elemental	7440-47-3	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Copper compounds	Cu cmpds	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Cumene	98-82-8	1.5E+01	HA1d_adj	5.1E+00	HA1d_adj	1.5E+01	HA10d_adj	5.1E+00	HA10d_adj
Cyanazine	21725-46-2	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Cyanide	57-12-5	6.0E+00	TSFWS_ST5‡	2.0E+00	TSFWS_ST15‡	6.0E+00	TSFWS_LT5‡	2.0E+00	TSFWS_LT15‡
Cyhalothrin	68085-85-8	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Cypermethrin	52315-07-8	2.8E-01	MRLoA_adj	9.3E-02	MRLoA_adj	2.8E-01	MRLoA_adj	9.3E-02	MRLoA_adj
Dacthal	1861-32-1	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Dalapon	75-99-0	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
DDT	50-29-3	7.0E-03	MRLoA_adj	2.3E-03	MRLoA_adj	7.0E-03	MRLoA_adj	2.3E-03	MRLoA_adj
Di(2-ethylhexyl)adipate	103-23-1	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj	2.8E+01	HA10d_adj	9.3E+00	HA10d_adj
Diazinon	333-41-5	2.8E-02	HA1d_adj	9.3E-03	HA1d_adj	2.8E-02	HA10d_adj	9.3E-03	HA10d_adj
Dibromo-3-chloropropane, 1,2-	96-12-8	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	7.0E-02	HA10d_adj	2.3E-02	HA10d_adj
Dichloroacetic acid	79-43-6	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Dichlorobenzene, 1,2-	95-50-1	1.3E+01	HA1d_adj	4.2E+00	HA1d_adj	1.3E+01	HA10d_adj	4.2E+00	HA10d_adj
Dichlorobenzene, 1,3-	541-73-1	1.3E+01	HA1d_adj	4.2E+00	HA1d_adj	1.3E+01	HA10d_adj	4.2E+00	HA10d_adj
Dichlorobenzene, 1,4-	106-46-7	1.5E+01	HA1d_adj	5.1E+00	HA1d_adj	1.5E+01	HA10d_adj	5.1E+00	HA10d_adj
Dichlorodifluoromethane	75-71-8	5.6E+01	HA1d_adj	1.9E+01	HA1d_adj	5.6E+01	HA10d_adj	1.9E+01	HA10d_adj
Dichloroethylene, 1,1-	75-35-4	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Dichloroethylene, cis-1,2-	156-59-2	5.6E+00	HA1d_adj	1.9E+00	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Dichloroethylene, trans-	156-60-5	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj				
Dichlorophenoxy acetic acid, 2,4-	94-75-7	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Dichloropropane, 1,2-	78-87-5	1.4E+00	MRLoA_adj	4.7E-01	MRLoA_adj				

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Dichlorvos	62-73-7	5.6E-02	MRLoA_adj	1.9E-02	MRLoA_adj	5.6E-02	MRLoA_adj	1.9E-02	MRLoA_adj
Dimethrin	70-38-2	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	1.4E+01	HA10d_adj	4.7E+00	HA10d_adj
Dimethyl methylphosphonate	756-79-6	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Dinitrobenzene, 1,3-	99-65-0	5.6E-02	HA1d_adj	1.9E-02	HA1d_adj	5.6E-02	HA10d_adj	1.9E-02	HA10d_adj
Dinitro-o-cresol, 4,6-	534-52-1	5.6E-02	MRLoA_adj	1.9E-02	MRLoA_adj	5.6E-02	MRLoA_adj	1.9E-02	MRLoA_adj
Dinitrotoluene, 2,4-	121-14-2	7.0E-01	HA1d_adj	2.3E-01	HA1d_adj	7.0E-01	HA10d_adj	2.3E-01	HA10d_adj
Dinitrotoluene, 2,6-	606-20-2	5.6E-01	HA1d_adj	1.9E-01	HA1d_adj	5.6E-01	HA10d_adj	1.9E-01	HA10d_adj
Di-n-octyl phthalate	117-84-0	4.2E+01	MRLoA_adj	1.4E+01	MRLoA_adj	4.2E+01	MRLoA_adj	1.4E+01	MRLoA_adj
Dinoseb	88-85-7	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Diphenamid	957-51-7	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Disulfoton	298-04-4	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj	1.4E-02	HA10d_adj	4.7E-03	HA10d_adj
Diuron	330-54-1	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Endothall	145-73-3	1.1E+00	HA1d_adj	3.7E-01	HA1d_adj	1.1E+00	HA10d_adj	3.7E-01	HA10d_adj
Endrin	72-20-8	2.8E-02	HA1d_adj	9.3E-03	HA1d_adj				
Epichlorohydrin	106-89-8	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Ethion	563-12-2	2.8E-02	MRLoA_adj	9.3E-03	MRLoA_adj	2.8E-02	MRLoA_adj	9.3E-03	MRLoA_adj
Ethylene glycol	107-21-1	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj				
Ethylene glycol monobutyl ether	111-76-2	5.6E+00	MRLoA_adj	1.9E+00	MRLoA_adj	5.6E+00	MRLoA_adj	1.9E+00	MRLoA_adj
Ethylene thiourea	96-45-7	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Fenamiphos	22224-92-6	1.3E-02	HA1d_adj	4.2E-03	HA1d_adj	1.3E-02	HA10d_adj	4.2E-03	HA10d_adj
Fluometuron	2164-17-2	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Fonofos	944-22-9	2.8E-02	HA1d_adj	9.3E-03	HA1d_adj	2.8E-02	HA10d_adj	9.3E-03	HA10d_adj
Formaldehyde	50-00-0	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Fusariotoxin T2	21259-20-1	2.6E-02	TSFWS_ST5‡	8.7E-03	TSFWS_ST15‡				
GA	77-81-6	1.4E-01	TSFWS_ST5‡	4.6E-02	TSFWS_ST15‡				
GB	107-44-8	2.8E-02	TSFWS_ST5‡	9.3E-03	TSFWS_ST15‡				
GD	96-64-0	1.2E-02	TSFWS_ST5‡	4.0E-03	TSFWS_ST15‡				
Glyphosate	1071-83-6	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj	2.8E+01	HA10d_adj	9.3E+00	HA10d_adj
HD	505-60-2	1.4E-01	TSFWS_ST5‡	4.7E-02	TSFWS_ST15‡	1.4E-01	TSFWS_ST5‡*	4.7E-02	TSFWS_ST5‡*
Heptachlor	76-44-8	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj	1.4E-02	HA10d_adj	4.7E-03	HA10d_adj
Heptachlor epoxide	1024-57-3	1.4E-02	HA1d_adj	4.7E-03	HA1d_adj				
Hexachlorobenzene	118-74-1	7.0E-02	HA1d_adj	2.3E-02	HA1d_adj	7.0E-02	HA10d_adj	2.3E-02	HA10d_adj
Hexachlorobutadiene	87-68-3	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Hexachlorocyclohexane, beta-	319-85-7	7.0E-01	MRLoA_adj	2.3E-01	MRLoA_adj	7.0E-01	MRLoA_adj	2.3E-01	MRLoA_adj
Hexachloroethane	67-72-1	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Hexane, commercial	110-54-3	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	5.6E+00	HA10d_adj	1.9E+00	HA10d_adj
Hexazinone	51235-04-2	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
HMX	2691-41-0	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Hydrogen cyanide	74-90-8	6.0E-03	TSFWS_ST5‡	2.0E-03	TSFWS_ST15‡	6.0E-03	TSFWS_LT5‡	2.0E-03	TSFWS_LT15‡
Iodine	7553-56-2	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Isopropyl methyl phosphonic acid	1832-54-8	4.2E+01	HA1d_adj	1.4E+01	HA1d_adj	4.2E+01	HA10d_adj	1.4E+01	HA10d_adj
Lewisite	541-25-3	8.0E-02	TSFWS_ST5‡	2.7E-02	TSFWS_ST15‡				
Lindane	58-89-9	6.0E-01	TSFWS_ST5‡	2.0E-01	TSFWS_ST15‡	6.0E-01	TSFWS_LT5‡	2.0E-01	TSFWS_LT15‡
Magnesium	7439-95-4	1.0E+02	TSFWS_ST5‡	3.0E+01	TSFWS_ST15‡	1.0E+02	TSFWS_LT5‡	3.0E+01	TSFWS_LT15‡
Malathion	121-75-5	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Maleic hydrazide	123-33-1	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	1.4E+01	HA10d_adj	4.7E+00	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
MCPA	94-74-6	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Methomyl	16752-77-5	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Methoxychlor	72-43-5	7.0E-02	HA1d_adj	4.0E-02	MCL*	7.0E-02	HA10d_adj	4.0E-02	MCL*
Methyl bromide	74-83-9	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Methyl chloride	74-87-3	1.3E+01	HA1d_adj	4.2E+00	HA1d_adj				
Methyl ethyl ketone	78-93-3	1.1E+02	HA1d_adj	3.5E+01	HA1d_adj				
Methyl parathion	298-00-0	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Methyl tertiary butyl ether	1634-04-4	5.6E+00	MRLoA_adj	1.9E+00	MRLoA_adj	5.6E+00	MRLoA_adj	1.9E+00	MRLoA_adj
Methylene chloride	75-09-2	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Methylenedianiline, 4,4'-	101-77-9	2.8E+00	MRLoA_adj	9.3E-01	MRLoA_adj	2.8E+00	MRLoA_adj	9.3E-01	MRLoA_adj
Metolachlor	51218-45-2	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Metribuzin	21087-64-9	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Molybdenum	7439-98-7	1.1E-01	HA1d_adj	3.7E-02	HA1d_adj	1.1E-01	HA10d_adj	3.7E-02	HA10d_adj
Nickel	7440-02-0	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	1.4E+00	HA10d_adj	4.7E-01	HA10d_adj
Nitroglycerin	55-63-0	7.0E-03	HA1d_adj	2.3E-03	HA1d_adj	7.0E-03	HA10d_adj	2.3E-03	HA10d_adj
Nitroguanidine	556-88-7	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj	1.4E+01	HA10d_adj	4.7E+00	HA10d_adj
Nitrosodipropylamine, N-	621-64-7	1.3E+00	MRLoA_adj	4.4E-01	MRLoA_adj	1.3E+00	MRLoA_adj	4.4E-01	MRLoA_adj
Oxamyl	23135-22-0					3.5E-01	IRIS_chr*	2.0E-01	MCL*
Paraquat dichloride	1910-42-5	1.4E-01	HA1d_adj	4.7E-02	HA1d_adj	1.4E-01	HA10d_adj	4.7E-02	HA10d_adj
Pentachlorophenol	87-86-5	1.4E+00	HA1d_adj	4.7E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Perchloroethylene	127-18-4	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Permethrin	52645-53-1	4.2E+00	MRLoA_adj	1.4E+00	MRLoA_adj	4.2E+00	MRLoA_adj	1.4E+00	MRLoA_adj
Phenol	108-95-2	8.4E+00	HA1d_adj	2.8E+00	HA1d_adj	8.4E+00	HA10d_adj	2.8E+00	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Picloram	1918-02-1	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj	2.8E+01	HA10d_adj	9.3E+00	HA10d_adj
Polybrominated biphenyl mixture	67774-32-7	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj	1.4E-01	MRLoA_adj	4.7E-02	MRLoA_adj
Pronamide	23950-58-5	1.1E+00	HA1d_adj	3.7E-01	HA1d_adj	1.1E+00	HA10d_adj	3.7E-01	HA10d_adj
Propham	122-42-9	7.0E+00	HA1d_adj	2.3E+00	HA1d_adj	7.0E+00	HA10d_adj	2.3E+00	HA10d_adj
Silver	7440-22-4	2.8E-01	HA1d_adj	1.0E-01	BW Std*	2.8E-01	HA10d_adj	1.0E-01	BW Std*
Silvex	93-72-1	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj	2.8E-01	HA10d_adj	9.3E-02	HA10d_adj
Sodium bromate	7789-38-0	2.8E-01	HA1d_adj	9.3E-02	HA1d_adj				
Strontium, stable	7440-24-6	3.5E+01	HA1d_adj	1.2E+01	HA1d_adj	3.5E+01	HA10d_adj	1.2E+01	HA10d_adj
Styrene	100-42-5	1.4E+00	MRLoA_adj	4.7E-01	MRLoA_adj	1.4E+00	MRLoA_adj	4.7E-01	MRLoA_adj
Sulfate	14808-79-8	3.0E+02	TSFWS_ST5‡	2.5E+02	TSFWS‡*	3.0E+02	TSFWS_LT5‡	2.5E+02	TSFWS‡*
TCDD, 2,3,7,8-	1746-01-6	1.4E-06	HA1d_adj	4.7E-07	HA1d_adj				
Tebuthiuron	34014-18-1	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
Terbacil	5902-51-2	4.2E-01	HA1d_adj	1.4E-01	HA1d_adj	4.2E-01	HA10d_adj	1.4E-01	HA10d_adj
Terbufos	13071-79-9	7.0E-03	HA1d_adj	2.3E-03	HA1d_adj	7.0E-03	HA10d_adj	2.3E-03	HA10d_adj
Tetrachloroethane, 1,1,1,2-	630-20-6	2.8E+00	HA1d_adj	9.3E-01	HA1d_adj	2.8E+00	HA10d_adj	9.3E-01	HA10d_adj
Tetrachloroethane, 1,1,2,2-	79-34-5	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
Thallium	7440-28-0	9.8E-03	HA1d_adj	3.3E-03	HA1d_adj	9.8E-03	HA10d_adj	3.3E-03	HA10d_adj
Toluene	108-88-3	2.8E+01	HA1d_adj	9.3E+00	HA1d_adj				
Tri(2-butoxyethyl) phosphate	78-51-3	6.7E+01	MRLoA_adj	2.2E+01	MRLoA_adj	6.7E+01	MRLoA_adj	2.2E+01	MRLoA_adj
Tributyl phosphate	126-73-8	1.5E+01	MRLoA_adj	5.1E+00	MRLoA_adj	1.5E+01	MRLoA_adj	5.1E+00	MRLoA_adj
Trichloroacetic acid	76-03-9	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
Trichlorobenzene, 1,2,4-	120-82-1					7.0E-02	MCL*	7.0E-02	MCL*
Trichlorobenzene, 1,3,5-	108-70-3	8.4E-01	HA1d_adj	2.8E-01	HA1d_adj	8.4E-01	HA10d_adj	2.8E-01	HA10d_adj

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	CASRN	WMEG_7d5L		WMEG_7d15L		WMEG_14d5L		WMEG_14d15L	
Trichloroethane, 1,1,1-	71-55-6	1.4E+02	HA1d_adj	4.7E+01	HA1d_adj	8.4E+01	IRIS_sub_nc*	2.8E+01	IRIS_sub_nc*
Trichloroethane, 1,1,2-	79-00-5	8.4E-01	HA1d_adj	2.8E-01	HA1d_adj	5.6E-01	HA10d_adj	1.9E-01	HA10d_adj
Trichloroethylene	79-01-6	2.8E+00	MRLoA_adj	9.3E-01	MRLoA_adj	2.8E+00	MRLoA_adj	9.3E-01	MRLoA_adj
Trichlorofluoromethane	75-69-4	9.8E+00	HA1d_adj	3.3E+00	HA1d_adj	9.8E+00	HA10d_adj	3.3E+00	HA10d_adj
Trichlorophenol, 2,4,6-	88-06-2	4.2E-02	HA1d_adj	1.4E-02	HA1d_adj	4.2E-02	HA10d_adj	1.4E-02	HA10d_adj
Trichloropropane, 1,2,3-	96-18-4	8.4E-01	HA1d_adj	2.8E-01	HA1d_adj	8.4E-01	HA10d_adj	2.8E-01	HA10d_adj
Trifluralin	1582-09-8	1.1E-01	HA1d_adj	3.7E-02	HA1d_adj	1.1E-01	HA10d_adj	3.7E-02	HA10d_adj
Trimethylbenzene, 1,3,5-	108-67-8	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj				
Trimethylbenzene, 1,3,5-	108-67-8	1.4E+01	HA1d_adj	4.7E+00	HA1d_adj				
Trinitrotoluene, 2,4,6-	118-96-7	2.8E-02	HA1d_adj	9.3E-03	HA1d_adj	2.8E-02	HA10d_adj	9.3E-03	HA10d_adj
Vinyl chloride	75-01-4	4.2E+00	HA1d_adj	1.4E+00	HA1d_adj	4.2E+00	HA10d_adj	1.4E+00	HA10d_adj
VX	50782-69-9	1.5E-02	TSFWS_ST5‡	5.0E-03	TSFWS_ST15‡				
Xylenes, total	1330-20-7	5.6E+01	HA1d_adj	1.9E+01	HA1d_adj	5.6E+01	HA10d_adj	1.9E+01	HA10d_adj
Zinc, metallic	7440-66-6	8.4E+00	HA1d_adj	5.0E+00	BW Std*	8.4E+00	HA10d_adj	5.0E+00	BW Std*

Table E-1: Basis for the Short-Term Water MEGs

Chemical Name	*CASRN*	*WMEG_7d5L*	*WMEG_7d15L*	*WMEG_14d5L*	*WMEG_14d15L*

Units:
mg/L = milligrams per liter

Notes:
All Water Military Exposure Guidelines (WMEGs) are provided in mg/L
CASRN = Chemical Abstract Service Registry Number
WMEG_7d5 = 7 day WMEG for ingestion rate of 5 L/day
WMEG_7d15 = 7 day WMEG for ingestion rate of 15 L/day
WMEG_14d5 = 14 day WMEG for ingestion rate of 5 L/day
WMEG_14d15 = 14 day WMEG for ingestion rate of 15 L/day

chr = chronic
adj = adjusted
ST5 = short-term TSFWS based on ingestion rate of 5 L/day (HQDA 2005)
ST15 = short-term TSFWS based on ingestion rate of 15 L/day (HQDA 2005)
LT5 = long-term TSFWS based on ingestion rate of 5 L/day (HQDA 2005)
LT15 = long-term TSFWS based on ingestion rate of 15 L/day (HQDA 2005)

Sources:
BWStd = U.S. Food and Drug Administration (FDA) bottled water standard (BWstd) (FDA 2006)
HA = EPA Drinking Water Health Advisories (EPA 2004c)
MCL = U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) (EPA 2006)
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
TSFWS = Tri-Service Field Drinking Water Standard (HQDA 2005)

‡All TSFWS values are based on 2005 edition due of TBMED 577. The new TBMED577 short term potability standards are a subset of the previous 2005 TBMED577 standards.

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
2,4,6-Tribromophenol	118-79-6	1.3E+00	PPRTV_sub	nc	4.2E-01	PPRTV_sub	nc
Acenaphthene	83-32-9	8.4E+00	IRIS_sub	nc	2.8E+00	IRIS_sub	nc
Acephate	30560-19-1	5.6E-02	HEAST_sub	nc	1.9E-02	HEAST_sub	nc
Acetochlor	34256-82-1	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Acetone	67-64-1	3.8E+01	IRIS_sub	nc	1.3E+01	IRIS_sub	nc
Acetone cyanohydrin	75-86-5	4.2E-01	PPRTV_sub	nc	1.4E-01	PPRTV_sub	nc
Acetonitrile	75-05-8	8.4E-01	HEAST_sub	nc	2.8E-01	HEAST_sub	nc
Acetophenone	98-86-2	1.4E+01	IRIS_sub	nc	4.7E+00	IRIS_sub	nc
Acifluorfen-sodium	62476-59-9	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Acrolein	107-02-8	5.6E-02	MRL_inter	nc	1.9E-02	MRL_inter	nc
Acrylamide	79-06-1	2.8E-02	MRL_inter	nc	9.3E-03	MRL_inter	nc
Acrylic acid	79-10-7	7.0E+00	HEAST_sub	nc	2.3E+00	HEAST_sub	nc
Acrylonitrile	107-13-1	1.4E-01	MRL_inter	nc	4.7E-02	MRL_inter	nc
Adipic acid	124-04-9	2.8E+01	PPRTV_sub	nc	9.3E+00	PPRTV_sub	nc
Alachlor	15972-60-8	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Alar	1596-84-5	2.1E+00	IRIS_chr	nc	7.0E-01	IRIS_chr	nc
Aldicarb	116-06-3	1.4E-02	HEAST_sub	nc	4.7E-03	HEAST_sub	nc
Aldicarb sulfone	1646-88-4	1.4E-02	IRIS_chr	nc	4.7E-03	IRIS_chr	nc
Aldrin	309-00-2	5.6E-04	PPRTV_sub	nc	1.9E-04	PPRTV_sub	nc
Ally	74223-64-6	3.5E+00	IRIS_chr	nc	1.2E+00	IRIS_chr	nc
Allyl alcohol	107-18-6	5.6E-02	PPRTV_sub	nc	1.9E-02	PPRTV_sub	nc
Aluminum phosphide	20859-73-8	5.6E-03	HEAST_sub	nc	1.9E-03	HEAST_sub	nc
Amdro	67485-29-4	4.2E-02	IRIS_sub	nc	1.4E-02	IRIS_sub	nc
Ametryn	834-12-8	1.3E+00	IRIS_sub	nc	4.2E-01	IRIS_sub	nc
Aminophenol, 3-	591-27-5	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Aminophenol, 4-	123-30-8	2.8E+00	PPRTV_sub	nc	9.3E-01	PPRTV_sub	nc
Aminopyridine, 4-	504-24-5	2.8E-03	HEAST_sub	nc	9.3E-04	HEAST_sub	nc
Amitraz	33089-61-1	3.5E-02	IRIS_chr	nc	1.2E-02	IRIS_chr	nc
Ammonium perchlorate	7790-98-9	9.8E-03	IRIS_chr	nc	3.3E-03	IRIS_chr	nc
Ammonium sulfamate	7773-06-0	2.8E+01	IRIS_sub	nc	9.3E+00	IRIS_sub	nc
Aniline	62-53-3	1.7E+01	IRIS	ca	5.7E+00	IRIS	ca

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Anthracene	120-12-7	1.4E+01	PPRTV_sub	nc	4.7E+00	PPRTV_sub	nc
Antimony pentoxide	1314-60-9	7.0E-03	HEAST_sub	nc	2.3E-03	HEAST_sub	nc
Antimony potassium tartrate	28300-74-5	1.3E-02	HEAST_sub	nc	4.2E-03	HEAST_sub	nc
Antimony potassium tartrate anhydrous	11071-15-1	5.6E-03	PPRTV_sub	nc	1.9E-03	PPRTV_sub	nc
Antimony tetroxide	1332-81-6	5.6E-03	HEAST_sub	nc	1.9E-03	HEAST_sub	nc
Antimony trioxide	1309-64-4	7.0E+00	PPRTV_sub	nc	2.3E+00	PPRTV_sub	nc
Antimony, elemental	7440-36-0	6.0E-03	MCL*		6.0E-03	MCL*	
Apollo	74115-24-5	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Aramite	140-57-8	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Aroclor 1016	12674-11-2	2.9E-03	IRIS_sub	nc	9.8E-04	IRIS_sub	nc
Aroclor 1254	11097-69-1	8.4E-04	IRIS_sub	nc	2.8E-04	IRIS_sub	nc
Arsenic, elemental	7440-38-2	6.0E-02	TSFWS_LT5‡*		2.0E-02	TSFWS_LT15 **	
Asbestos	1332-21-4	7.0E+06	MCL		7.0E+06	MCL	
Assure	76578-14-8	1.3E-01	IRIS_chr	nc	4.2E-02	IRIS_chr	nc
Asulam	3337-71-1	7.0E-01	IRIS_chr	nc	2.3E-01	IRIS_chr	nc
Atrazine	1912-24-9	4.2E-02	MRL_inter	nc	1.4E-02	MRL_inter	nc
Avermectin B1	65195-55-3	5.6E-03	IRIS_chr	nc	1.9E-03	IRIS_chr	nc
Azinphos methyl	86-50-0	4.2E-02	MRL_inter	nc	1.4E-02	MRL_inter	nc
Azobenzene	103-33-3	8.9E-01	IRIS	ca	3.0E-01	IRIS	ca
Barium, elemental	7440-39-3	2.0E+00	MCL*		2.0E+00	MCL*	
Baygon	114-26-1	5.6E-02	IRIS_chr	nc	1.9E-02	IRIS_chr	nc
Bayleton	43121-43-3	4.2E-01	IRIS_chr	nc	1.4E-01	IRIS_chr	nc
Baythroid	68359-37-5	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
Benefin	1861-40-1	4.2E+00	HEAST_sub	nc	1.4E+00	HEAST_sub	nc
Benomyl	17804-35-2	7.0E-01	IRIS_chr	nc	2.3E-01	IRIS_chr	nc
Bentazon	25057-89-0	4.2E-01	IRIS_chr	nc	1.4E-01	IRIS_chr	nc
Benzene	71-43-2	1.4E-01	PPRTV_sub	nc	4.7E-02	PPRTV_sub	nc
Benzenethiol	108-98-5	1.4E-03	HEAST_sub	nc	4.7E-04	HEAST_sub	nc
Benzidine	92-87-5	4.3E-04	IRIS	ca	1.4E-04	IRIS	ca
Benzo(a)pyrene	50-32-8	1.3E-02	IRIS	ca	4.5E-03	IRIS	ca
Benzoic acid	65-85-0	5.6E+01	PPRTV_sub	nc	1.9E+01	PPRTV_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Benzotrichloride	98-07-7	7.5E-03	IRIS	ca	2.5E-03	IRIS	ca
Beryllium, elemental	7440-41-7	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Bidrin	141-66-2	1.4E-03	IRIS_chr	nc	4.7E-04	IRIS_chr	nc
Bifenox	42576-02-3	1.4E+01	PPRTV_sub	nc	4.7E+00	PPRTV_sub	nc
Biphenthrin	82657-04-3	2.1E-01	IRIS_chr	nc	7.0E-02	IRIS_chr	nc
Biphenyl, 1,1-	92-52-4	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Bis(2-chloro-1-methylethyl) ether	108-60-1	5.6E-01	IRIS_chr	nc	1.9E-01	IRIS_chr	nc
Bis(2-chloroethoxy)methane	111-91-1	4.2E-01	PPRTV_sub	nc	1.4E-01	PPRTV_sub	nc
Bis(2-chloroethyl) ether	111-44-4	8.9E-02	IRIS	ca	3.0E-02	IRIS	ca
Bis(2-chloroisopropyl) ether	39638-32-9	5.6E-01	HEAST_sub	nc	1.9E-01	HEAST_sub	nc
Bis(2-ethylhexyl) phthalate	117-81-7	2.8E+00	IRIS_sub	nc	9.3E-01	IRIS_sub	nc
Bis(chloromethyl) ether	542-88-1	4.5E-04	IRIS	ca	1.5E-04	IRIS	ca
Bisphenol A	80-05-7	7.0E+00	IRIS_sub	nc	2.3E+00	IRIS_sub	nc
Boron	7440-42-8	2.8E+00	IRIS_chr	nc	9.3E-01	IRIS_sub*	
Bromate	15541-45-4	5.6E-02	IRIS_chr	nc	1.9E-02	IRIS_chr	nc
Bromobenzene	108-86-1	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Bromodichloromethane	75-27-4	1.1E-01	PPRTV_sub	nc	3.7E-02	PPRTV_sub	nc
Bromoform	75-25-2	4.2E-01	PPRTV_sub	nc	1.4E-01	PPRTV_sub	nc
Bromophos	2104-96-3	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Bromoxynil	1689-84-5	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Bromoxynil octanoate	1689-99-2	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Busan	21564-17-0	4.2E+00	HEAST_sub	nc	1.4E+00	HEAST_sub	nc
Butanol, 1-	71-36-3	1.4E+01	IRIS_sub	nc	4.7E+00	IRIS_sub	nc
Butyl alcohol, sec-	78-92-2	2.8E+01	PPRTV_sub	nc	9.3E+00	PPRTV_sub	nc
Butyl benzyl phthalate	85-68-7	2.8E+01	IRIS_sub	nc	9.3E+00	IRIS_sub	nc
Butyl glycolyl butyl phthalate	85-70-1	1.4E+01	IRIS_chr	nc	4.7E+00	IRIS_chr	nc
Butylate	2008-41-5	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Butyltin compounds	z-136	4.2E-03	PPRTV_sub	nc	1.4E-03	PPRTV_sub	nc
Cacodylic acid	75-60-5	2.8E-01	MRL_chr	nc	9.3E-02	MRL_chr	nc
Cadmium, elemental	7440-43-9	7.0E-03	IRIS_chr	nc	5.0E-03	MCL*	
Calcium cyanide	592-01-8	5.6E-01	HEAST_sub	nc	1.9E-01	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Caprolactam	105-60-2	7.0E+00	HEAST_sub	nc	2.3E+00	HEAST_sub	nc
Captafol	2425-06-1	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Captan	133-06-2	1.8E+00	HEAST_sub	nc	6.1E-01	HEAST_sub	nc
Carbaryl	63-25-2	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Carbazole	86-74-8	4.9E+00	HEAST	ca	1.6E+00	HEAST	ca
Carbofuran	1563-66-2	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Carbon disulfide	75-15-0	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Carbon tetrachloride	56-23-5	1.7E-01	IRIS_sub	nc	5.6E-02	IRIS_sub	nc
Carbosulfan	55285-14-8	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc
Carboxin	5234-68-4	1.4E+00	IRIS_chr	nc	4.7E-01	IRIS_chr	nc
Chloral	75-87-6	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Chloral hydrate	302-17-0	1.4E+00	IRIS_chr	nc	4.7E-01	IRIS_chr	nc
Chloramben	133-90-4	2.1E-01	IRIS_chr	nc	7.0E-02	IRIS_chr	nc
Chloranil	118-75-2	2.4E-01	HEAST	ca	8.1E-02	HEAST	ca
Chlordane	57-74-9	8.4E-03	MRL_inter	nc	2.8E-03	MRL_inter	nc
Chlordecone	143-50-0	7.0E-03	MRL_inter	nc	2.3E-03	MRL_inter	nc
Chlorfenvinphos	470-90-6	2.8E-02	MRL_inter	nc	9.3E-03	MRL_inter	nc
Chlorimuron-ethyl	90982-32-4	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Chlorine	7782-50-5	4.0E+00	MRDL*		4.0E+00	MRDL*	
Chlorite	14998-27-7	1.4E+00	MRL_inter	nc	1.0E+00	MCL*	
Chlorite (sodium chlorite)	7758-19-2	1.4E+00	MRL_inter	nc	4.7E-01	MRL_inter	nc
Chloro-1,3-butadiene	126-99-8	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Chloro-2-methylaniline hydrochloride, 4-	3165-93-3	2.1E-01	HEAST	ca	7.1E-02	HEAST	ca
Chloro-2-methylaniline, 4-	95-69-2	1.7E-01	HEAST	ca	5.6E-02	HEAST	ca
Chloroacetaldehyde	107-20-0	3.6E-01	PPRTV	ca	1.2E-01	PPRTV	ca
Chloroacetaldehyde	107-20-0	3.6E-01	PPRTV	ca	1.2E-01	PPRTV	ca
Chloroacetic acid	79-11-8	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Chloroaniline, 4-	106-47-8	7.0E-03	PPRTV_sub	nc	2.3E-03	PPRTV_sub	nc
Chlorobenzene	108-90-7	9.8E-01	PPRTV_sub	nc	3.3E-01	PPRTV_sub	nc
Chlorobenzilate	510-15-6	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Chlorobenzotrifluoride, 4-	98-56-6	4.2E-01	PPRTV_sub	nc	1.4E-01	PPRTV_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Chlorobutane, 1-	109-69-3	9.8E-01	PPRTV_sub	nc	3.3E-01	PPRTV_sub	nc
Chloroform	67-66-3	1.4E+00	MRL_inter	nc	4.7E-01	MRL_inter	nc
Chloronaphthalene, beta-	91-58-7	2.8E+00	PPRTV_sub	nc	9.3E-01	PPRTV_sub	nc
Chloronitrobenzene, o-	88-73-3	2.8E-01	PPRTV_sub	nc	9.3E-02	PPRTV_sub	nc
Chlorophenol, 2-	95-57-8	1.1E-01	PPRTV_sub	nc	3.7E-02	PPRTV_sub	nc
Chlorothalonil	1897-45-6	2.1E-01	HEAST_sub	nc	7.0E-02	HEAST_sub	nc
Chlorotoluene, o-	95-49-8	2.8E+00	IRIS_sub	nc	9.3E-01	IRIS_sub	nc
Chlorotoluene, p-	106-43-4	9.8E+00	PPRTV_sub	nc	3.3E+00	PPRTV_sub	nc
Chlorpropham	101-21-3	2.8E+00	IRIS_chr	nc	9.3E-01	IRIS_chr	nc
Chlorpyrifos	2921-88-2	4.2E-02	MRL_inter	nc	1.4E-02	MRL_inter	nc
Chlorpyrifos methyl	5598-13-0	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Chlorsulfuron	64902-72-3	7.0E-01	IRIS_chr	nc	2.3E-01	IRIS_chr	nc
Chlorthiophos	60238-56-4	1.1E-02	HEAST_sub	nc	3.7E-03	HEAST_sub	nc
Chromium (III)	16065-83-1	2.1E+01	HEAST_sub	nc	7.0E+00	HEAST_sub	nc
Chromium (VI)	18540-29-9	1.3E-01	IRIS_sub	nc	4.2E-02	IRIS_sub	nc
Cobalt	7440-48-4	4.2E-02	PPRTV_sub	nc	1.4E-02	PPRTV_sub	nc
Copper compounds	Cu cmpds	1.4E-01	MRL_inter	nc	4.7E-02	MRL_inter	nc
Copper cyanide	544-92-3	7.0E-01	IRIS_sub	nc	2.3E-01	IRIS_sub	nc
Cresol, m-	108-39-4	7.0E+00	IRIS_sub	nc	2.3E+00	IRIS_sub	nc
Cresol, o-	95-48-7	7.0E+00	IRIS_sub	nc	2.3E+00	IRIS_sub	nc
Cresol, p-	106-44-5	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Crotonaldehyde, trans-	123-73-9	5.2E-02	HEAST	ca	1.7E-02	HEAST	ca
Cumene	98-82-8	4.2E+00	IRIS_sub	nc	1.4E+00	IRIS_sub	nc
Cyanazine	21725-46-2	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Cyanide	57-12-5	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Cyanogen	460-19-5	5.6E-01	HEAST_sub	nc	1.9E-01	HEAST_sub	nc
Cyanogen bromide	506-68-3	1.3E+00	HEAST_sub	nc	4.2E-01	HEAST_sub	nc
Cyanogen chloride	506-77-4	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Cyclohexanone	108-94-1	7.0E+01	IRIS_chr	nc	2.3E+01	IRIS_chr	nc
Cyclohexylamine	108-91-8	4.2E+00	HEAST_sub	nc	1.4E+00	HEAST_sub	nc
Cyhalothrin	68085-85-8	1.4E-01	MRL_inter	nc	4.7E-02	MRL_inter	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Cypermethrin	52315-07-8	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc
Cyromazine	66215-27-8	1.1E-01	IRIS_chr	nc	3.5E-02	IRIS_chr	nc
Dacthal	1861-32-1	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Dalapon	75-99-0	4.2E-01	HEAST_sub	nc	2.0E-01	MCL*	
Danitol	39515-41-8	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
DDD	72-54-8	4.1E-01	IRIS	ca	1.4E-01	IRIS	ca
DDE	72-55-9	2.9E-01	IRIS	ca	9.6E-02	IRIS	ca
DDT	50-29-3	7.0E-03	MRL_inter	nc	2.3E-03	MRL_inter	nc
Decabromodiphenyl ether	1163-19-5	2.9E-01	IRIS_sub	nc	9.8E-02	IRIS_sub	nc
Demeton	8065-48-3	5.6E-04	IRIS_chr	nc	1.9E-04	IRIS_chr	nc
Di(2-ethylhexyl)adipate	103-23-1	8.4E+00	IRIS_chr	nc	2.8E+00	IRIS_chr	nc
Diallate	2303-16-4	1.6E+00	HEAST	ca	5.4E-01	HEAST	ca
Diazinon	333-41-5	2.8E-02	MRL_inter	nc	9.3E-03	MRL_inter	nc
Dibenzofuran	132-64-9	5.6E-02	PPRTV_sub	nc	1.9E-02	PPRTV_sub	nc
Dibromo-3-chloropropane, 1,2-	96-12-8	2.8E-02	PPRTV_sub	nc	9.3E-03	PPRTV_sub	nc
Dibromobenzene, 1,4-	106-37-6	1.4E+00	IRIS_sub	nc	4.7E-01	IRIS_sub	nc
Dibromochloromethane	124-48-1	9.8E-01	PPRTV_sub	nc	3.3E-01	PPRTV_sub	nc
Dibromoethane, 1,2-	106-93-4	4.9E-02	IRIS	ca	1.6E-02	IRIS	ca
Dibromomethane	74-95-3	1.3E-01	PPRTV_sub	nc	4.2E-02	PPRTV_sub	nc
Dibutyl phthalate	84-74-2	1.4E+01	IRIS_sub	nc	4.7E+00	IRIS_sub	nc
Dibutyl tin dichloride	683-18-1	7.0E-02	MRL_inter	nc	2.3E-02	MRL_inter	nc
Dicamba	1918-00-9	4.2E-01	HEAST_sub	nc	1.4E-01	HEAST_sub	nc
Dichloroacetic acid	79-43-6	1.7E-01	IRIS_sub	nc	5.6E-02	IRIS_sub	nc
Dichlorobenzene, 1,2-	95-50-1	8.4E+00	MRL_inter	nc	2.8E+00	MRL_inter	nc
Dichlorobenzene, 1,3-	541-73-1	2.8E-01	MRL_inter	nc	9.3E-02	MRL_inter	nc
Dichlorobenzene, 1,4-	106-46-7	9.8E-01	MRL_inter	nc	3.3E-01	MRL_inter	nc
Dichlorobenzidine, 3,3'-	91-94-1	2.2E-01	IRIS	ca	7.3E-02	IRIS	ca
Dichlorodifluoromethane	75-71-8	1.3E+01	HEAST_sub	nc	4.2E+00	HEAST_sub	nc
Dichloroethane, 1,1-	75-34-3	2.8E+01	PPRTV_sub	nc	9.3E+00	PPRTV_sub	nc
Dichloroethane, 1,2-	107-06-2	1.1E+00	IRIS	ca	3.6E-01	IRIS	ca
Dichloroethylene, 1,1-	75-35-4	1.3E-01	HEAST_sub	nc	4.2E-02	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Dichloroethylene, 1,2-	540-59-0	1.3E-01	HEAST_sub	nc	4.2E-02	HEAST_sub	nc
Dichloroethylene, cis-1,2-	156-59-2	1.4E+00	PPRTV_sub	nc	4.7E-01	PPRTV_sub	nc
Dichloroethylene, trans-	156-60-5	2.8E+00	IRIS_sub	nc	9.3E-01	IRIS_sub	nc
Dichlorophenol, 2,4-	120-83-2	2.8E-01	PPRTV_sub	nc	9.3E-02	PPRTV_sub	nc
Dichlorophenoxy acetic acid, 2,4-	94-75-7	1.4E-01	HEAST_sub	nc	7.0E-02	MCL*	
Dichlorophenoxybutyric acid, 2,4-	94-82-6	1.1E+00	IRIS_sub	nc	3.7E-01	IRIS_sub	nc
Dichloropropane, 1,2-	78-87-5	9.8E-01	MRL_inter	nc	3.3E-01	MRL_inter	nc
Dichloropropane, 1,3-	142-28-9	2.8E+00	PPRTV_sub	nc	9.3E-01	PPRTV_sub	nc
Dichloropropanol, 2,3-	616-23-9	4.2E-02	IRIS_chr	nc	1.4E-02	IRIS_chr	nc
Dichloropropene, 1,3-	542-75-6	5.6E-01	MRL_inter	nc	1.9E-01	MRL_inter	nc
Dichlorvos	62-73-7	4.2E-02	MRL_inter	nc	1.4E-02	MRL_inter	nc
Dicyclopentadiene	77-73-6	1.1E+00	PPRTV_sub	nc	3.7E-01	PPRTV_sub	nc
Dieldrin	60-57-1	1.4E-03	MRL_inter	nc	4.7E-04	MRL_inter	nc
Diethyl phthalate	84-66-2	1.1E+02	IRIS_sub	nc	3.7E+01	IRIS_sub	nc
Diethylene glycol monobutyl ether	112-34-5	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Diethylene glycol monoethyl ether	111-90-0	8.4E+00	PPRTV_sub	nc	2.8E+00	PPRTV_sub	nc
Diethylformamide	617-84-5	1.4E-02	PPRTV_sub	nc	4.7E-03	PPRTV_sub	nc
Diethylstilbestrol	56-53-1	2.1E+01	HEAST	ca	7.0E+00	HEAST	ca
Difenzoquat	43222-48-6	1.1E+00	IRIS_chr	nc	3.7E-01	IRIS_chr	nc
Diflubenzuron	35367-38-5	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Diisopropyl methylphosphonate	1445-75-6	1.1E+01	IRIS_sub	nc	3.7E+00	IRIS_sub	nc
Dimethipin	55290-64-7	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Dimethoate	60-51-5	2.8E-03	HEAST_sub	nc	9.3E-04	HEAST_sub	nc
Dimethoxybenzidine, 3,3'-	119-90-4	7.0E+00	HEAST	ca	2.3E+00	HEAST	ca
Dimethyl methylphosphonate	756-79-6	8.4E-01	PPRTV_sub	nc	2.8E-01	PPRTV_sub	nc
Dimethyl terephthalate	120-61-6	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Dimethylaniline hydrochloride, 2,4-	21436-96-4	1.7E-01	HEAST	ca	5.6E-02	HEAST	ca
Dimethylaniline, 2,4-	95-68-1	1.3E-01	HEAST	ca	4.4E-02	HEAST	ca
Dimethylaniline, N,N-	121-69-7	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Dimethylbenzidine, 3,3'-	119-93-7	8.9E-03	PPRTV	ca	3.0E-03	PPRTV	ca

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Dimethylformamide	68-12-2	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Dimethylhydrazine, 1,2-	540-73-8	1.1E-02	MRL_inter	nc	3.7E-03	MRL_inter	nc
Dimethylphenol, 2,4-	105-67-9	7.0E-01	PPRTV_sub	nc	2.3E-01	PPRTV_sub	nc
Dimethylphenol, 2,6-	576-26-1	8.4E-02	IRIS_sub	nc	2.8E-02	IRIS_sub	nc
Dimethylphenol, 3,4-	95-65-8	1.4E-01	IRIS_sub	nc	4.7E-02	IRIS_sub	nc
Dinitrobenzene, 1,2-	528-29-0	1.4E-02	PPRTV_sub	nc	4.7E-03	PPRTV_sub	nc
Dinitrobenzene, 1,3-	99-65-0	1.4E-02	IRIS_sub	nc	4.7E-03	IRIS_sub	nc
Dinitro-o-cresol, 4,6-	534-52-1	5.6E-02	MRL_inter	nc	1.9E-02	MRL_inter	nc
Dinitro-o-cyclohexyl phenol, 4,6-	131-89-5	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Dinitrophenol, 2,4-	51-28-5	2.8E-01	PPRTV_sub	nc	9.3E-02	PPRTV_sub	nc
Dinitrotoluene	25321-14-6	1.4E-01	IRIS	ca	4.8E-02	IRIS	ca
Dinitrotoluene, 2,4-	121-14-2	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Dinitrotoluene, 2,6-	606-20-2	1.4E-01	PPRTV_sub	nc	4.7E-02	PPRTV_sub	nc
Di-n-octyl phthalate	117-84-0	5.6E+00	MRL_inter	nc	1.9E+00	MRL_inter	nc
Dinoseb	88-85-7	1.4E-02	HEAST_sub	nc	7.0E-03	MCL*	
Dioxane, 1,4-	123-91-1	8.4E+00	MRL_inter	nc	2.8E+00	MRL_inter	nc
Diphenamid	957-51-7	4.2E-01	IRIS_chr	nc	1.4E-01	IRIS_chr	nc
Diphenylamine	122-39-4	3.5E-01	HEAST_sub	nc	1.2E-01	HEAST_sub	nc
Diphenylhydrazine, 1,2-	122-66-7	1.2E-01	IRIS	ca	4.1E-02	IRIS	ca
Diquat	85-00-7	3.1E-02	IRIS_chr	nc	2.0E-02	MCL*	
Direct black 38	1937-37-7	1.1E-02	HEAST	ca	3.8E-03	HEAST	ca
Direct blue 6	2602-46-2	1.2E-02	HEAST	ca	4.0E-03	HEAST	ca
Direct brown 95	16071-86-6	1.1E-02	HEAST	ca	3.5E-03	HEAST	ca
Disulfoton	298-04-4	1.3E-03	MRL_inter	nc	4.2E-04	MRL_inter	nc
Dithiane, 1,4-	505-29-3	1.4E+00	IRIS_sub	nc	4.7E-01	IRIS_sub	nc
Diuron	330-54-1	2.8E-02	IRIS_chr	nc	9.3E-03	IRIS_chr	nc
Dodine	2439-10-3	5.6E-02	IRIS_chr	nc	1.9E-02	IRIS_chr	nc
EA 2192	73207-98-4	8.4E-06	Munro	nc	2.8E-06	Munro	nc
EMPA	1832-53-7	3.5E-01	Munro	nc	1.2E-01	Munro	nc
Endosulfan	115-29-7	7.0E-02	MRL_inter	nc	2.3E-02	MRL_inter	nc
Endothall	145-73-3	2.8E-01	HEAST_sub	nc	1.0E-01	MCL*	

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Endrin	72-20-8	2.8E-02	MRL_inter	nc	9.3E-03	MRL_inter	nc
Epichlorohydrin	106-89-8	8.4E-02	PPRTV_sub	nc	2.8E-02	PPRTV_sub	nc
EPTC	759-94-4	3.5E-01	HEAST_sub	nc	1.2E-01	HEAST_sub	nc
Ethephon	16672-87-0	7.0E-02	IRIS_chr	nc	2.3E-02	IRIS_chr	nc
Ethion	563-12-2	2.8E-02	MRL_inter	nc	9.3E-03	MRL_inter	nc
Ethoxyethanol, 2-	110-80-5	7.0E+00	HEAST_sub	nc	2.3E+00	HEAST_sub	nc
Ethyl acetate	141-78-6	1.3E+02	IRIS_sub	nc	4.2E+01	IRIS_sub	nc
Ethyl acrylate	140-88-5	2.0E+00	HEAST	ca	6.8E-01	HEAST	ca
Ethyl chloride	75-00-3	1.4E+00	PPRTV_sub	nc	4.7E-01	PPRTV_sub	nc
Ethyl ether	60-29-7	7.0E+00	PPRTV_sub	nc	2.3E+00	PPRTV_sub	nc
Ethyl methacrylate	97-63-2	1.3E+00	HEAST_sub	nc	4.2E-01	HEAST_sub	nc
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	1.4E-03	IRIS_sub	nc	4.7E-04	IRIS_sub	nc
Ethylbenzene	100-41-4	7.0E+00	MRL_inter	nc	7.0E-01	MCL*	
Ethylene cyanohydrin	109-78-4	1.4E+00	PPRTV_sub	nc	4.7E-01	PPRTV_sub	nc
Ethylene diamine	107-15-3	2.8E+00	PPRTV_sub	nc	9.3E-01	PPRTV_sub	nc
Ethylene glycol	107-21-1	1.1E+01	MRL_inter	nc	3.7E+00	MRL_inter	nc
Ethylene glycol monobutyl ether	111-76-2	9.8E-01	MRL_inter	nc	3.3E-01	MRL_inter	nc
Ethylene oxide	75-21-8	9.6E-02	HEAST	ca	3.2E-02	HEAST	ca
Ethylene thiourea	96-45-7	1.1E-03	HEAST_sub	nc	3.7E-04	HEAST_sub	nc
Ethylphthalyl ethyl glycolate	84-72-0	4.2E+01	IRIS_chr	nc	1.4E+01	IRIS_chr	nc
Express	101200-48-0	1.1E-01	IRIS_chr	nc	3.7E-02	IRIS_chr	nc
Fenamiphos	22224-92-6	3.5E-03	IRIS_chr	nc	1.2E-03	IRIS_chr	nc
Fluometuron	2164-17-2	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Fluoranthene	206-44-0	5.6E+00	MRL_inter	nc	1.9E+00	MRL_inter	nc
Fluorene	86-73-7	5.6E+00	IRIS_sub	nc	1.9E+00	IRIS_sub	nc
Fluoride	16984-48-8	4.0E+00	IRIS_chr*		2.0E+00	IRIS_chr*	
Fluorine	7782-41-4	8.4E-01	HEAST_sub	nc	2.8E-01	HEAST_sub	nc
Fluridone	59756-60-4	1.1E+00	HEAST_sub	nc	3.7E-01	HEAST_sub	nc
Flurprimidol	56425-91-3	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Flutolanil	66332-96-5	8.4E-01	IRIS_chr	nc	2.8E-01	IRIS_chr	nc
Fluvalinate	69409-94-5	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Folpet	133-07-3	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Fomesafen	72178-02-0	5.2E-01	IRIS	ca	1.7E-01	IRIS	ca
Fonofos	944-22-9	2.8E-02	IRIS_chr	nc	9.3E-03	IRIS_chr	nc
Formaldehyde	50-00-0	4.2E+00	MRL_inter	nc	1.4E+00	MRL_inter	nc
Fosetyl-aluminum	39148-24-8	4.2E+01	IRIS_chr	nc	1.4E+01	IRIS_chr	nc
Furan	110-00-9	1.4E-01	IRIS_sub	nc	4.7E-02	IRIS_sub	nc
Furazolidone	67-45-8	2.6E-02	HEAST	ca	8.6E-03	HEAST	ca
Furfural	98-01-1	4.2E-01	IRIS_sub	nc	1.4E-01	IRIS_sub	nc
Furium	531-82-8	2.0E-03	HEAST	ca	6.5E-04	HEAST	ca
Furmecyclox	60568-05-0	3.3E+00	IRIS	ca	1.1E+00	IRIS	ca
Glufosinate ammonium	77182-82-2	5.6E-02	IRIS_sub	nc	1.9E-02	IRIS_sub	nc
Glycidaldehyde	765-34-4	5.6E-02	IRIS_sub	nc	1.9E-02	IRIS_sub	nc
Glyphosate	1071-83-6	1.4E+00	IRIS_chr	nc	7.0E-01	MCL*	
Haloxyfop-methyl	69806-40-2	7.0E-04	IRIS_chr	nc	2.3E-04	IRIS_chr	nc
Harmony	79277-27-3	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
HD	505-60-2	9.8E-04	MRL_inter	nc	3.3E-04	MRL_inter	nc
Heptachlor	76-44-8	1.4E-03	MRL_inter	nc	4.7E-04	MRL_inter	nc
Heptachlor epoxide	1024-57-3	2.0E-04	MCL*		2.0E-04	MCL*	
Hexabromobenzene	87-82-1	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Hexachlorobenzene	118-74-1	1.4E-03	MRL_inter	nc	1.0E-03	MCL*	
Hexachlorobutadiene	87-68-3	1.4E-02	PPRTV_sub	nc	4.7E-03	PPRTV_sub	nc
Hexachlorocyclohexane, alpha-	319-84-6	1.6E-02	IRIS	ca	5.2E-03	IRIS	ca
Hexachlorocyclohexane, beta-	319-85-7	8.4E-03	MRL_inter	nc	2.8E-03	MRL_inter	nc
Hexachlorocyclohexane, technical	608-73-1	5.4E-02	IRIS	ca	1.8E-02	IRIS	ca
Hexachlorocyclopentadiene	77-47-4	2.5E-01	IRIS_sub	nc	8.4E-02	IRIS_sub	nc
Hexachloroethane	67-72-1	1.4E-01	IRIS_sub	nc	4.7E-02	IRIS_sub	nc
Hexachlorophene	70-30-4	1.3E-02	IRIS_sub	nc	4.2E-03	IRIS_sub	nc
Hexane, commercial	110-54-3	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Hexanone, 2-	591-78-6	7.0E-02	IRIS_chr	nc	2.3E-02	IRIS_chr	nc
Hexazinone	51235-04-2	4.6E-01	IRIS_chr	nc	1.5E-01	IRIS_chr	nc
HMX	2691-41-0	7.0E+00	IRIS_sub	nc	2.3E+00	IRIS_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Hydrazine	302-01-2	3.3E-02	IRIS	ca	1.1E-02	IRIS	ca
Hydrogen sulfide	7783-06-4	4.2E-01	HEAST_sub	nc	1.4E-01	HEAST_sub	nc
Hydroquinone	123-31-9	1.6E+00	PPRTV	ca	5.4E-01	PPRTV	ca
Imazalil	35554-44-0	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Imazaquin	81335-37-7	3.5E+00	IRIS_chr	nc	1.2E+00	IRIS_chr	nc
Iodine	7553-56-2	1.4E-01	MRL_chr	nc	4.7E-02	MRL_chr	nc
Iprodione	36734-19-7	5.6E-01	IRIS_chr	nc	1.9E-01	IRIS_chr	nc
Iron	7439-89-6	9.8E+00	PPRTV_sub	nc	3.3E+00	PPRTV_sub	nc
Isobutyl alcohol	78-83-1	4.2E+01	IRIS_sub	nc	1.4E+01	IRIS_sub	nc
Isophorone	78-59-1	2.8E+01	IRIS_sub	nc	9.3E+00	IRIS_sub	nc
Isopropalin	33820-53-0	2.1E+00	IRIS_sub	nc	7.0E-01	IRIS_sub	nc
Isopropyl methyl phosphonic acid	1832-54-8	1.4E+01	IRIS_sub	nc	4.7E+00	IRIS_sub	nc
Isoxaben	82558-50-7	7.0E-01	IRIS_chr	nc	2.3E-01	IRIS_chr	nc
Lactofen	77501-63-4	2.8E-02	IRIS_chr	nc	9.3E-03	IRIS_chr	nc
Lewisite oxide	3088-37-7	4.2E-03	Munro	nc	1.4E-03	Munro	nc
Lindane	58-89-9	4.2E-02	IRIS_sub	nc	1.4E-02	IRIS_sub	nc
Linuron	330-55-2	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Lithium	7439-93-2	2.8E-02	PPRTV_sub	nc	9.3E-03	PPRTV_sub	nc
Londax	83055-99-6	2.8E+00	IRIS_chr	nc	9.3E-01	IRIS_chr	nc
Lutetium	7439-94-3	7.0E+00	PPRTV_sub	nc	2.3E+00	PPRTV_sub	nc
Malathion	121-75-5	2.8E-01	MRL_inter	nc	9.3E-02	MRL_inter	nc
Maleic anhydride	108-31-6	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Maleic hydrazide	123-33-1	7.0E+00	HEAST_sub	nc	2.3E+00	HEAST_sub	nc
Malononitrile	109-77-3	1.4E-02	PPRTV_sub	nc	4.7E-03	PPRTV_sub	nc
Mancozeb	8018-01-7	4.2E-01	HEAST_sub	nc	1.4E-01	HEAST_sub	nc
Maneb	12427-38-2	7.0E-01	IRIS_sub	nc	2.3E-01	IRIS_sub	nc
Manganese	7439-96-5	2.0E+00	HEAST_sub	nc	6.5E-01	HEAST_sub	nc
MCPA	94-74-6	7.0E-03	HEAST_sub	nc	2.3E-03	HEAST_sub	nc
MCPB	94-81-5	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
MCPP	93-65-2	1.4E-01	IRIS_sub	nc	4.7E-02	IRIS_sub	nc
Mephosfolan	950-10-7	1.3E-02	HEAST_sub	nc	4.2E-03	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Mepiquat chloride	24307-26-4	4.2E+00	IRIS_sub	nc	1.4E+00	IRIS_sub	nc
Mercuric chloride	7487-94-7	4.2E-02	IRIS_sub	nc	1.4E-02	IRIS_sub	nc
Mercuric sulfide	1344-48-5	4.2E-03	PPRTV_chr	nc	1.4E-03	PPRTV_chr	nc
Merphos	150-50-5	4.2E-03	IRIS_sub	nc	1.4E-03	IRIS_sub	nc
Merphos oxide	78-48-8	4.2E-03	IRIS_sub	nc	1.4E-03	IRIS_sub	nc
Metalaxyl	57837-19-1	8.4E-01	IRIS_chr	nc	2.8E-01	IRIS_chr	nc
Methacrylonitrile	126-98-7	1.4E-02	IRIS_sub	nc	4.7E-03	IRIS_sub	nc
Methamidophos	10265-92-6	7.0E-04	IRIS_chr	nc	2.3E-04	IRIS_chr	nc
Methanol	67-56-1	7.0E+01	IRIS_sub	nc	2.3E+01	IRIS_sub	nc
Methidathion	950-37-8	1.4E-02	IRIS_chr	nc	4.7E-03	IRIS_chr	nc
Methomyl	16752-77-5	3.5E-01	HEAST_sub	nc	1.2E-01	HEAST_sub	nc
Methoxy-5-nitroaniline, 2-	99-59-2	2.1E+00	HEAST	ca	7.1E-01	HEAST	ca
Methoxychlor	72-43-5	7.0E-02	MRL_inter	nc	4.0E-02	MCL*	
Methoxyethanol, 2-	109-86-4	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Methoxyethyl acetate, 2-	110-49-6	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Methyl acetate	79-20-9	1.4E+02	HEAST_sub	nc	4.7E+01	HEAST_sub	nc
Methyl acrylate	96-33-3	4.2E-01	HEAST_sub	nc	1.4E-01	HEAST_sub	nc
Methyl bromide	74-83-9	7.0E-02	PPRTV_sub	nc	2.3E-02	PPRTV_sub	nc
Methyl chloride	74-87-3	7.5E+00	HEAST	ca	2.5E+00	HEAST	ca
Methyl ethyl ketone	78-93-3	2.8E+01	HEAST_sub	nc	9.3E+00	HEAST_sub	nc
Methyl isobutyl ketone	108-10-1	1.1E+01	HEAST_sub	nc	3.7E+00	HEAST_sub	nc
Methyl methacrylate	80-62-6	1.1E+00	HEAST_sub	nc	3.7E-01	HEAST_sub	nc
Methyl parathion	298-00-0	9.8E-03	MRL_inter	nc	3.3E-03	MRL_inter	nc
Methyl tertiary butyl ether	1634-04-4	4.2E+00	MRL_inter	nc	1.4E+00	MRL_inter	nc
Methyl-5-nitroaniline, 2-	99-55-8	3.0E+00	HEAST	ca	9.9E-01	HEAST	ca
Methylaniline hydrochloride, 2-	636-21-5	5.4E-01	HEAST	ca	1.8E-01	HEAST	ca
Methylaniline, 2-	95-53-4	4.1E-01	HEAST	ca	1.4E-01	HEAST	ca
Methylcyclopentane	96-37-7	5.6E+00	PPRTV_sub	nc	1.9E+00	PPRTV_sub	nc
Methylene chloride	75-09-2	8.4E-01	HEAST_sub	nc	2.8E-01	HEAST_sub	nc
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	2.8E-02	PPRTV_sub	nc	9.3E-03	PPRTV_sub	nc
Methylenebis(N,N'-dimethyl)aniline, 4,4'-	101-61-1	2.1E+00	IRIS	ca	7.1E-01	IRIS	ca

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Methylenedianiline, 4,4'-	101-77-9	1.1E+00	MRL_inter	nc	3.7E-01	MRL_inter	nc
Methylmercury	22967-92-6	1.4E-03	HEAST_sub	nc	4.7E-04	HEAST_sub	nc
Methylnaphthalene, 1-	90-12-0	9.8E-01	MRL_chr	nc	3.3E-01	MRL_chr	nc
Methylnapthalene, 2-	91-57-6	5.6E-02	PPRTV_sub	nc	1.9E-02	PPRTV_sub	nc
Methylstyrene, alpha-	98-83-9	9.8E+00	HEAST_sub	nc	3.3E+00	HEAST_sub	nc
Metolachlor	51218-45-2	2.1E+00	HEAST_sub	nc	7.0E-01	HEAST_sub	nc
Metribuzin	21087-64-9	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
Mineral oil, white	8042-47-5	4.2E+02	PPRTV_sub	nc	1.4E+02	PPRTV_sub	nc
Mirex	2385-85-5	2.8E-03	HEAST_sub	nc	9.3E-04	HEAST_sub	nc
Molinate	2212-67-1	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Molybdenum	7439-98-7	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Monochloramine	10599-90-3	4.0E+00	MCL*		4.0E+00	MCL*	
Naled	300-76-5	2.8E-02	IRIS_chr	nc	9.3E-03	IRIS_chr	nc
Naphthalene	91-20-3	2.8E+00	IRIS_sub	nc	9.3E-01	IRIS_sub	nc
Napropamide	15299-99-7	1.4E+00	IRIS_chr	nc	4.7E-01	IRIS_chr	nc
Nickel, soluble salts	Ni sol salts	2.8E-01	HEAST_sub	nc	1.0E-01	BW Std*	
Nitrobenzene	98-95-3	8.4E-02	IRIS_sub	nc	2.8E-02	IRIS_sub	nc
Nitrocellulose	9004-70-0	4.2E+04	PPRTV_sub	nc	1.4E+04	PPRTV_sub	nc
Nitrofurantoin	67-20-9	9.8E+00	HEAST_sub	nc	3.3E+00	HEAST_sub	nc
Nitrofurazone	59-87-0	6.5E-02	HEAST	ca	2.2E-02	HEAST	ca
Nitroglycerin	55-63-0	1.4E-03	PPRTV_sub	nc	4.7E-04	PPRTV_sub	nc
Nitroguanidine	556-88-7	1.4E+00	PPRTV_sub	nc	4.7E-01	PPRTV_sub	nc
Nitrosodiethanolamine, N-	1116-54-7	3.5E-02	IRIS	ca	1.2E-02	IRIS	ca
Nitrosodiethylamine, N-	55-18-5	6.5E-04	IRIS	ca	2.2E-04	IRIS	ca
Nitrosodimethylamine, N-	62-75-9	1.1E-04	PPRTV_sub	nc	3.7E-05	PPRTV_sub	nc
Nitroso-di-n-butylamine, N-	924-16-3	1.8E-02	IRIS	ca	6.0E-03	IRIS	ca
Nitrosodiphenylamine, N-	86-30-6	2.0E+01	IRIS	ca	6.7E+00	IRIS	ca
Nitrosodipropylamine, N-	621-64-7	1.4E-02	IRIS	ca	4.7E-03	IRIS	ca
Nitroso-N-ethylurea, N-	759-73-9	7.0E-04	HEAST	ca	2.3E-04	HEAST	ca
Nitroso-N-methylethylamine, N-	10595-95-6	4.5E-03	IRIS	ca	1.5E-03	IRIS	ca
Nitrosopyrrolidine, N-	930-55-2	4.7E-02	IRIS	ca	1.6E-02	IRIS	ca

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Nitrotoluene, m-	99-08-1	1.4E-02	PPRTV_sub	nc	4.7E-03	PPRTV_sub	nc
Nitrotoluene, o-	88-72-2	1.4E-01	PPRTV_sub	nc	4.7E-02	PPRTV_sub	nc
Nitrotoluene, p-	99-99-0	5.6E-02	PPRTV_sub	nc	1.9E-02	PPRTV_sub	nc
Nonane	111-84-2	4.2E-02	PPRTV_sub	nc	1.4E-02	PPRTV_sub	nc
Norflurazon	27314-13-2	5.6E-01	IRIS_chr	nc	1.9E-01	IRIS_chr	nc
NuStar	85509-19-9	9.8E-03	IRIS_chr	nc	3.3E-03	IRIS_chr	nc
Octabromodiphenyl ether	32536-52-0	4.2E-01	IRIS_sub	nc	1.4E-01	IRIS_sub	nc
Octamethylpyrophosphoramide	152-16-9	2.8E-02	HEAST_sub	nc	9.3E-03	HEAST_sub	nc
Oryzalin	19044-88-3	7.0E-01	IRIS_chr	nc	2.3E-01	IRIS_chr	nc
Oxadiazon	19666-30-9	7.0E-02	IRIS_chr	nc	2.3E-02	IRIS_chr	nc
Oxamyl	23135-22-0	3.5E-01	IRIS_chr	nc	2.0E-01	MCL*	
Oxyfluorfen	42874-03-3	4.2E-02	IRIS_chr	nc	1.4E-02	IRIS_chr	nc
Paclobutrazol	76738-62-0	1.8E+00	IRIS_sub	nc	6.1E-01	IRIS_sub	nc
Paraquat dichloride	1910-42-5	6.3E-02	IRIS_chr	nc	2.1E-02	IRIS_chr	nc
Parathion	56-38-2	8.4E-02	HEAST_sub	nc	2.8E-02	HEAST_sub	nc
Pebulate	1114-71-2	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Pendimethalin	40487-42-1	5.6E-01	HEAST_sub	nc	1.9E-01	HEAST_sub	nc
Pentabromo-6-chlorocyclohexane, 1,2,3,4,5-	87-84-3	4.3E+00	HEAST	ca	1.4E+00	HEAST	ca
Pentabromodiphenyl ether	32534-81-9	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Pentachlorobenzene	608-93-5	1.1E-01	IRIS_sub	nc	3.7E-02	IRIS_sub	nc
Pentachloroethane	76-01-7	1.1E+00	PPRTV	ca	3.6E-01	PPRTV	ca
Pentachloronitrobenzene	82-68-8	4.2E-02	HEAST_sub	nc	1.4E-02	HEAST_sub	nc
Pentachlorophenol	87-86-5	1.4E-02	MRL_inter	nc	4.7E-03	MRL_inter	nc
Perchloroethylene	127-18-4	1.4E+00	IRIS_sub	nc	4.7E-01	IRIS_sub	nc
Permethrin	52645-53-1	2.8E+00	MRL_inter	nc	9.3E-01	MRL_inter	nc
Phenmedipham	13684-63-4	3.5E+00	IRIS_chr	nc	1.2E+00	IRIS_chr	nc
Phenol	108-95-2	8.4E+00	HEAST_sub	nc	2.8E+00	HEAST_sub	nc
Phenyl isothiocyanate	103-72-0	2.8E-02	PPRTV_sub	nc	9.3E-03	PPRTV_sub	nc
Phenylenediamine, m-	108-45-2	8.4E-01	IRIS_sub	nc	2.8E-01	IRIS_sub	nc
Phenylenediamine, o-	95-54-5	2.1E+00	HEAST	ca	7.0E-01	HEAST	ca
Phenylenediamine, p-	106-50-3	2.7E+00	HEAST_chr	nc	8.9E-01	HEAST_chr	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Phenylmercuric acetate	62-38-4	1.1E-03	HEAST_sub	nc	3.7E-04	HEAST_sub	nc
Phenylphenol, 2-	90-43-7	5.1E+01	HEAST	ca	1.7E+01	HEAST	ca
Phorate	298-02-2	2.8E-03	HEAST_sub	nc	9.3E-04	HEAST_sub	nc
Phosmet	732-11-6	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Phosphine	7803-51-2	4.2E-03	HEAST_sub	nc	1.4E-03	HEAST_sub	nc
Phosphorus, white	12185-10-3	2.8E-03	MRL_inter	nc	9.3E-04	MRL_inter	nc
Phthalic anhydride	85-44-9	2.8E+01	HEAST_sub	nc	9.3E+00	HEAST_sub	nc
Picloram	1918-02-1	9.8E-01	IRIS_chr	nc	5.0E-01	MCL*	
Pirimiphos-methyl	29232-93-7	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc
Polybrominated biphenyl	36355-01-8	9.8E-04	HEAST_sub	nc	3.3E-04	HEAST_sub	nc
Polychlorinated biphenyl (Aroclor 1016/1242): (Chl	z-0042	2.9E-03	IRIS_sub	nc	9.8E-04	IRIS_sub	nc
Polychlorinated biphenyls	1336-36-3	8.4E-04	IRIS_sub*		5.0E-04	MCL*	
Potassium cyanide	151-50-8	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Potassium perchlorate	7778-74-7	9.8E-03	MRL_chr	nc	3.3E-03	MRL_chr	nc
Potassium silver cyanide	506-61-6	2.8E+00	HEAST_sub	nc	9.3E-01	HEAST_sub	nc
Praseodymium chloride, stable, nonradioactive	10361-79-2	1.1E+01	PPRTV_sub	nc	3.7E+00	PPRTV_sub	nc
Prochloraz	67747-09-5	1.3E-01	IRIS_chr	nc	4.2E-02	IRIS_chr	nc
Profluralin	26399-36-0	8.4E-02	HEAST_sub	nc	2.8E-02	HEAST_sub	nc
Prometon	1610-18-0	2.1E+00	IRIS_sub	nc	7.0E-01	IRIS_sub	nc
Prometryn	7287-19-6	5.6E-02	IRIS_chr	nc	1.9E-02	IRIS_chr	nc
Pronamide	23950-58-5	1.1E+00	HEAST_sub	nc	3.5E-01	HEAST_sub	nc
Propachlor	1918-16-7	1.8E+00	IRIS_sub	nc	6.1E-01	IRIS_sub	nc
Propanil	709-98-8	7.0E-02	IRIS_chr	nc	2.3E-02	IRIS_chr	nc
Propargite	2312-35-8	2.8E-01	IRIS_chr	nc	9.3E-02	IRIS_chr	nc
Propargyl alcohol	107-19-7	2.8E-01	IRIS_sub	nc	9.3E-02	IRIS_sub	nc
Propazine	139-40-2	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Propham	122-42-9	2.8E+00	IRIS_sub	nc	9.3E-01	IRIS_sub	nc
Propiconazole	60207-90-1	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Propylene glycol	57-55-6	2.8E+02	PPRTV_sub	nc	9.3E+01	PPRTV_sub	nc
Propylene glycol monoethyl ether	1569-02-4	9.8E+01	HEAST_sub	nc	3.3E+01	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Propylene glycol monomethyl ether	107-98-2	9.8E+01	HEAST_sub	nc	3.3E+01	HEAST_sub	nc
Propylene oxide	75-56-9	4.1E-01	IRIS	ca	1.4E-01	IRIS	ca
Pursuit	81335-77-5	3.5E+00	IRIS_chr	nc	1.2E+00	IRIS_chr	nc
Pydrin	51630-58-1	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
Pyrene	129-00-0	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Pyridine	110-86-1	1.4E-01	IRIS_sub	nc	4.7E-02	IRIS_sub	nc
Quinalphos	13593-03-8	7.0E-03	IRIS_chr	nc	2.3E-03	IRIS_chr	nc
Quinoline	91-22-5	3.3E-02	IRIS	ca	1.1E-02	IRIS	ca
RDX	121-82-4	4.2E-01	MRL_inter	nc	1.4E-01	MRL_inter	nc
Resmethrin	10453-86-8	4.2E-01	IRIS_chr	nc	1.4E-01	IRIS_chr	nc
Ronnel	299-84-3	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Rotenone	83-79-4	5.6E-02	IRIS_chr	nc	1.9E-02	IRIS_chr	nc
Samarium chloride, stable, nonradioactive	10361-82-7	1.3E+01	PPRTV_sub	nc	4.2E+00	PPRTV_sub	nc
Savey	78587-05-0	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
Selenious acid	7783-00-8	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Selenium	7782-49-2	7.0E-02	HEAST_sub	nc	5.0E-02	MCL*	
Selenourea	630-10-4	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Sethoxydim	74051-80-2	1.3E+00	IRIS_chr	nc	4.2E-01	IRIS_chr	nc
Silver	7440-22-4	1.0E-01	BW Std*		1.0E-01	BW Std*	
Silver cyanide	506-64-9	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Silvex	93-72-1	1.1E-01	HEAST_sub	nc	5.0E-02	MCL*	
Simazine	122-34-9	7.0E-02	HEAST_sub	nc	2.3E-02	HEAST_sub	nc
Sodium azide	26628-22-8	5.6E-01	IRIS_sub	nc	1.9E-01	IRIS_sub	nc
Sodium cyanide	143-33-9	7.0E-01	MRL_inter	nc	2.3E-01	MRL_inter	nc
Sodium diethydithiocarbamate	148-18-5	3.6E-01	HEAST	ca	1.2E-01	HEAST	ca
Sodium fluoroacetate	62-74-8	2.8E-03	IRIS_sub	nc	9.3E-04	IRIS_sub	nc
Sodium metavanadate	13718-26-8	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Sodium perchlorate	7601-89-0	9.8E-03	MRL_chr	nc	3.3E-03	MRL_chr	nc
Strontium, stable	7440-24-6	2.8E+01	MRL_inter	nc	9.3E+00	MRL_inter	nc
Strychnine	57-24-9	4.2E-02	IRIS_sub	nc	1.4E-02	IRIS_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Sulfonylbis(4-chlorobenzene),1,1'-	80-07-9	5.6E-02	PPRTV_sub	nc	1.9E-02	PPRTV_sub	nc
Systhane	88671-89-0	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
TCDD, 2,3,7,8-	1746-01-6	2.8E-07	MRL_inter	nc	9.3E-08	MRL_inter	nc
Tebuthiuron	34014-18-1	9.8E-01	IRIS_chr	nc	3.3E-01	IRIS_chr	nc
Temephos	3383-96-8	2.8E+00	HEAST_sub	nc	9.3E-01	HEAST_sub	nc
Terbacil	5902-51-2	1.8E-01	IRIS_chr	nc	6.1E-02	IRIS_chr	nc
Terbufos	13071-79-9	3.5E-04	HEAST_sub	nc	1.2E-04	HEAST_sub	nc
Terbutryn	886-50-0	1.4E-02	IRIS_chr	nc	4.7E-03	IRIS_chr	nc
Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.8E-02	PPRTV_sub	nc	9.3E-03	PPRTV_sub	nc
Tetrachloroethane, 1,1,1,2-	630-20-6	1.3E+00	PPRTV_sub	nc	4.2E-01	PPRTV_sub	nc
Tetrachloroethane, 1,1,2,2-	79-34-5	1.4E-01	PPRTV_sub	nc	4.7E-02	PPRTV_sub	nc
Tetrachlorophenol, 2,3,4,6-	58-90-2	4.2E+00	IRIS_sub	nc	1.4E+00	IRIS_sub	nc
Tetrachlorotoluene, para, alpha, alpha, alpha-	5216-25-1	4.9E-03	HEAST	ca	1.6E-03	HEAST	ca
Tetrachlorovinphos	961-11-5	4.2E-01	HEAST_sub	nc	1.4E-01	HEAST_sub	nc
Tetraethyl dithiopyrophosphate	3689-24-5	7.0E-02	IRIS_sub	nc	2.3E-02	IRIS_sub	nc
Tetraethyl lead	78-00-2	1.4E-05	IRIS_sub	nc	4.7E-06	IRIS_sub	nc
Tetramethylcyclohexane	30501-43-0	4.2E+01	PPRTV_sub	nc	1.4E+01	PPRTV_sub	nc
Thallium (I) acetate	563-68-8	1.3E-02	HEAST_sub	nc	4.2E-03	HEAST_sub	nc
Thallium (I) carbonate	6533-73-9	1.1E-02	HEAST_sub	nc	3.7E-03	HEAST_sub	nc
Thallium (I) chloride	7791-12-0	1.1E-02	HEAST_sub	nc	3.7E-03	HEAST_sub	nc
Thallium (I) sulfate	7446-18-6	1.1E-02	HEAST_sub	nc	3.7E-03	HEAST_sub	nc
Thiobencarb	28249-77-6	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc
Thiocyanates	463-56-9	8.4E-03	PPRTV_sub	nc	2.8E-03	PPRTV_sub	nc
Thiodiglycol	111-48-8	7.0E+00	Munro	nc	2.3E+00	Munro	nc
Thiofanox	39196-18-4	4.2E-03	HEAST_sub	nc	1.4E-03	HEAST_sub	nc
Thiophanate-methyl	23564-05-8	1.1E+00	IRIS_chr	nc	3.7E-01	IRIS_chr	nc
Thiram	137-26-8	8.4E-02	HEAST_sub	nc	2.8E-02	HEAST_sub	nc
Tin, inorganic	7440-31-5	4.2E+00	MRL_inter	nc	1.4E+00	MRL_inter	nc
Toluene	108-88-3	1.1E+01	PPRTV_sub	nc	3.7E+00	PPRTV_sub	nc
Toluene-2,4-diamine	95-80-7	3.1E-02	HEAST	ca	1.0E-02	HEAST	ca
Toluene-2,5-diamine	95-70-5	8.4E+00	HEAST_sub	nc	2.8E+00	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	CASRN	WMEG_1y5 (mg/L)	Basis & Endpoint		WMEG_1y15 (mg/L)	Basis & Endpoint	
Toluene-2,6-diamine	823-40-5	8.4E-01	PPRTV_sub	nc	2.8E-01	PPRTV_sub	nc
Toluidine, p-	106-49-0	5.2E-01	HEAST	ca	1.7E-01	HEAST	ca
Toxaphene	8001-35-2	1.4E-02	MRL_inter	nc	4.7E-03	MRL_inter	nc
Tralomethrin	66841-25-6	1.1E-01	IRIS_chr	nc	3.5E-02	IRIS_chr	nc
Tri(2-butoxyethyl) phosphate	78-51-3	2.8E+00	MRL_inter	nc	9.3E-01	MRL_inter	nc
Triallate	2303-17-5	1.8E-01	HEAST_sub	nc	6.1E-02	HEAST_sub	nc
Triasulfuron	82097-50-5	1.4E-01	IRIS_chr	nc	4.7E-02	IRIS_chr	nc
Tribromobenzene, 1,2,4-	615-54-3	7.0E-01	IRIS_sub	nc	2.3E-01	IRIS_sub	nc
Tributyl phosphate	126-73-8	2.8E-01	MRL_inter	nc	9.3E-02	MRL_inter	nc
Tributyltin compounds	z-303	4.2E-03	PPRTV_sub	nc	1.4E-03	PPRTV_sub	nc
Tributyltin oxide	56-35-9	4.2E-03	MRL_inter	nc	1.4E-03	MRL_inter	nc
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	4.2E+01	HEAST_sub	nc	1.4E+01	HEAST_sub	nc
Trichloroaniline hydrochloride, 2,4,6-	33663-50-2	3.4E+00	HEAST	ca	1.1E+00	HEAST	ca
Trichloroaniline, 2,4,6-	634-93-5	2.9E+00	HEAST	ca	9.6E-01	HEAST	ca
Trichlorobenzene, 1,2,3-	87-61-6	1.1E-01	PPRTV_sub	nc	3.7E-02	PPRTV_sub	nc
Trichlorobenzene, 1,2,4-	120-82-1	7.0E-02	MCL*		7.0E-02	MCL*	
Trichloroethane, 1,1,1-	71-55-6	8.4E+01	IRIS_sub	nc	2.8E+01	IRIS_sub	nc
Trichloroethane, 1,1,2-	79-00-5	5.5E-02	PPRTV_sub	nc	1.8E-02	PPRTV_sub	nc
Trichlorofluoromethane	75-69-4	9.8E+00	HEAST_sub	nc	3.3E+00	HEAST_sub	nc
Trichlorophenol, 2,4,5-	95-95-4	4.2E+00	PPRTV_sub	nc	1.4E+00	PPRTV_sub	nc
Trichlorophenol, 2,4,6-	88-06-2	1.4E-02	PPRTV_chr	nc	4.7E-03	PPRTV_chr	nc
Trichlorophenoxyacetic acid	93-76-5	1.4E+00	HEAST_sub	nc	4.7E-01	HEAST_sub	nc
Trichloropropane, 1,1,2-	598-77-6	7.0E-01	IRIS_sub	nc	2.3E-01	IRIS_sub	nc
Trichloropropane, 1,2,3-	96-18-4	3.3E-03	IRIS	ca	1.1E-03	IRIS	ca
Trichloropropene, 1,2,3-	96-19-5	4.2E-01	PPRTV_sub	nc	1.4E-01	PPRTV_sub	nc
Trichlorotoluene, 2,3,6-	2077-46-5	7.0E-04	HEAST_sub	nc	2.3E-04	HEAST_sub	nc
Trichlorotoluene, alpha, 2,6-	2014-83-7	7.0E-04	HEAST_sub	nc	2.3E-04	HEAST_sub	nc
Triclosan	3380-34-5	5.6E+01	HEAST_sub	nc	1.9E+01	HEAST_sub	nc
Tridiphane	58138-08-2	4.2E-02	IRIS_chr	nc	1.4E-02	IRIS_chr	nc
Trifluralin	1582-09-8	1.1E-01	HEAST_sub	nc	3.5E-02	HEAST_sub	nc
Trimethyl phosphate	512-56-1	2.6E+00	HEAST	ca	8.8E-01	HEAST	ca

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	*CASRN*	*WMEG_1y5 (mg/L)*	*Basis & Endpoint*		*WMEG_1y15 (mg/L)*	*Basis & Endpoint*	
Trinitrobenzene, 1,3,5-	99-35-4	7.0E-03	HEAST_sub	nc	2.3E-03	HEAST_sub	nc
Trinitrophenylmethylnitramine	479-45-8	1.4E-01	PPRTV_sub	nc	4.7E-02	PPRTV_sub	nc
Trinitrotoluene, 2,4,6-	118-96-7	2.1E-02	IRIS_sub	nc	7.0E-03	IRIS_sub	nc
Triphenylphosphine oxide	791-28-6	2.8E-01	PPRTV_sub	nc	9.3E-02	PPRTV_sub	nc
Tris(1,3-dichloro-2-propyl) phophate (TDCP)	13674-87-8	7.0E-01	MRL_inter	nc	2.3E-01	MRL_inter	nc
Tris(2-chloroethyl)phosphate	115-96-8	2.8E-01	PPRTV_sub	nc	9.3E-02	PPRTV_sub	nc
Tris(2-ethylhexyl)phosphate	78-42-2	1.4E+00	PPRTV_chr	nc	4.7E-01	PPRTV_chr	nc
Uranium, highly soluble salts	HZ1800-90-T	3.0E-02	MCL*		3.0E-02	MCL*	
Vanadium	7440-62-2	9.8E-02	HEAST_sub	nc	3.3E-02	HEAST_sub	nc
Vanadium and soluble, inorganic compounds (other than Vanadium Pentoxide)	z-365	9.8E-03	PPRTV_sub	nc	3.3E-03	PPRTV_sub	nc
Vanadium pentoxide	1314-62-1	1.3E-01	HEAST_sub	nc	4.2E-02	HEAST_sub	nc
Vanadium sulfate	16785-81-2	2.8E-01	HEAST_sub	nc	9.3E-02	HEAST_sub	nc
Vernam	1929-77-7	1.4E-01	HEAST_sub	nc	4.7E-02	HEAST_sub	nc
Vinclozolin	50471-44-8	3.5E-01	IRIS_chr	nc	1.2E-01	IRIS_chr	nc
Vinyl acetate	108-05-4	1.4E+01	HEAST_sub	nc	4.7E+00	HEAST_sub	nc
Vinyl chloride	75-01-4	4.2E-02	IRIS_chr	nc	1.4E-02	IRIS_chr	nc
Vinyl toluene	25013-15-4	8.4E-02	HEAST_sub	nc	2.8E-02	HEAST_sub	nc
Warfarin	81-81-2	4.2E-03	HEAST_sub	nc	1.4E-03	HEAST_sub	nc
Xylene, m-	108-38-3	2.8E+01	HEAST_chr	nc	9.3E+00	HEAST_chr	nc
Xylene, o-	95-47-6	2.8E+01	HEAST_chr	nc	9.3E+00	HEAST_chr	nc
Xylenes, total	1330-20-7	5.6E+00	PPRTV_sub	nc	1.9E+00	PPRTV_sub	nc
Zinc cyanide	557-21-1	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc
Zinc phosphide	1314-84-7	4.2E-02	IRIS_sub	nc	1.4E-02	IRIS_sub	nc
Zinc, metallic	7440-66-6	5.0E+00	BW Std*		5.0E+00	BW Std*	
Zineb	12122-67-7	7.0E-01	HEAST_sub	nc	2.3E-01	HEAST_sub	nc

Table E-2: Basis for the Long-Term Water MEGs

Chemical Name	*CASRN*	*WMEG_1y5 (mg/L)*	*Basis & Endpoint*	*WMEG_1y15 (mg/L)*	*Basis & Endpoint*

Units:
f/L = asbestos fibers per liter
mg/L = milligrams per liter

Notes:
All Water Military Exposure Guidelines (WMEGs) are provided in mg/L with the exception of asbestos which is in f/L (fibers per liter).
CASRN = Chemical Abstract Service Registry Number
WMEG_1y5 = 1-year WMEG for ingestion rate of 5 L/day
WMEG_1y15 = 1-year WMEG for ingestion rate of 15 L/day
Endpoint = type of health endpoint for which the WMEG is based
nc = non-cancer
ca = cancer
sub = subchronic
chr = chronic
inter = intermediate
LT5 = long-term TSFWS based on ingestion rate of 5 L/day
LT15 = long-term TSFWS based on ingestion rate of 15 L/day

Sources:

BWStd = U.S. Food and Drug Administration (FDA) bottled water standard (BWstd) (FDA 2006)
HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MCL = U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) (EPA 2006)
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
Munro = Munro et al 1999
PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
EPA_Reg6 = EPA Region 6 Human Health Medium-Specific Screening Values (Tox Values from NCEA) (EPA Region 6 2008)
TSFWS = Tri-Service Field Water Standard (HQDA 2005)

‡All TSFWS values are based on 2005 edition due of TBMED 577. The new TBMED577 short term potability standards are a subset of the previous 2005 TBMED577 standards.

* IRIS only provides chronic values. Subchronic values noted from IRIS were obtained by adjusting the chronic values for the purposes of developing the MEGs. These adjustments were not made by the EPA, nor were subchronic values published in IRIS. Section 3.5.2 further describes adjustments made to IRIS values.

Table E-3. Original Long-Term Water MEGs Compared to Federal Drinking Water Standards

Chemical	*CASRN*	*FDA BWStd (mg/L)*	*EPA MCL (mg/L)*	*WMEG_1y5 (mg/L)*	*WMEG_1y15 (mg/L)*	*Fedstd/ 15LWMEG*	*15LWMEG/ Fedstd*
Alachlor	15972-60-8	2.0E-03	2.0E-03	1.4E-01	4.7E-02	0.0	23.3
Aluminum, elemental	7429-90-5	2.0E-01					
Antimony, elemental	7440-36-0	6.0E-03	6.0E-03	5.6E-03	1.9E-03	3.2	0.3
Arsenic, elemental	7440-38-2	1.0E-02	1.0E-02	4.2E-03	1.4E-03	7.1	0.1
Asbestos	1332-21-4		7.0E+06				
Atrazine	1912-24-9	3.0E-03	3.0E-03	4.2E-02	1.4E-02	0.2	4.7
Barium, elemental	7440-39-3	2.0E+00	2.0E+00	9.8E-01	3.3E-01	6.1	0.2
Benzene	71-43-2	5.0E-03	5.0E-03	1.4E-01	4.7E-02	0.1	9.3
Benzo[a]pyrene	50-32-8	2.0E-04	2.0E-04	1.3E-02	4.5E-03	0.0	22.4
Beryllium, elemental	7440-41-7		4.0E-03	7.0E-02	2.3E-02	0.2	5.8
Bis(2-ethylhexyl) phthalate	117-81-7		6.0E-03	2.8E+00	9.3E-01	0.0	155.6
Bromate	15541-45-4	1.0E-02	1.0E-02	5.6E-02	1.9E-02	0.5	1.9
Cadmium, elemental	7440-43-9	5.0E-03	5.0E-03	7.0E-03	2.3E-03	2.1	0.5
Carbofuran	1563-66-2	4.0E-02	4.0E-02	7.0E-02	2.3E-02	1.7	0.6
Carbon tetrachloride	56-23-5	5.0E-03	5.0E-03	1.7E-01	5.6E-02	0.1	11.2
Chloramines (as Cl2)	10599-90-3		4.0E+00	1.4E+00	4.7E-01	8.6	0.1
Chlordane	57-74-9	2.0E-03	2.0E-03	8.4E-03	2.8E-03	0.7	1.4
Chloride	16887-00-6	2.5E+02					
Chlorine (as Cl2)	7782-50-5		4.0E+00	1.4E+00	4.7E-01	8.6	0.1
Chlorine Dioxide	10049-04-4		8.0E-01				
Chlorite	7758-19-2	1.0E+00	1.0E+00	1.4E+00	4.7E-01	2.1	0.5
Chlorobenzene	108-90-7	1.0E-01	1.0E-01	9.8E-01	3.3E-01	0.3	3.3
Chromium, elemental	7440-47-3	1.0E-01	1.0E-01				
Copper, elemental	7440-50-8	1.0E+00					
Dalapon	75-99-0	2.0E-01	2.0E-01	4.2E-01	1.4E-01	1.4	0.7
Di(2-ethylhexyl)adipate	103-23-1	4.0E-01	4.0E-01	8.4E+00	2.8E+00	0.1	7.0
Dibromo-3-chloropropane, 1,2-	96-12-8	2.0E-04	2.0E-04	2.8E-02	9.3E-03	0.0	46.7
Dibromoethane, 1,2-	106-93-4	5.0E-05	5.0E-05	4.9E-02	1.6E-02	0.0	326.7
Dichlorobenzene, 1,2-	95-50-1	6.0E-01	6.0E-01	8.4E+00	2.8E+00	0.2	4.7

Table E-3. Original Long-Term Water MEGs Compared to Federal Drinking Water Standards

Chemical	*CASRN*	*FDA BWStd (mg/L)*	*EPA MCL (mg/L)*	*WMEG_1y5 (mg/L)*	*WMEG_1y15 (mg/L)*	*Fedstd/ 15LWMEG*	*15LWMEG/ Fedstd*
Dichlorobenzene, 1,4-	106-46-7	7.5E-02	7.5E-02	9.8E-01	3.3E-01	0.2	4.4
Dichloroethane, 1,2-	107-06-2		5.0E-03	1.1E+00	3.6E-01	0.0	71.8
Dichloroethylene, 1,1-	75-35-4	7.0E-03	7.0E-03	1.3E-01	4.2E-02	0.2	6.0
Dichloroethylene, cis-1,2-	156-59-2	7.0E-02	7.0E-02	1.4E+00	4.7E-01	0.2	6.7
Dichloroethylene, trans-	156-60-5	1.0E-01	1.0E-01	2.8E+00	9.3E-01	0.1	9.3
Dichlorophenoxy acetic acid, 2,4-	94-75-7	7.0E-02	7.0E-02	1.4E-01	4.7E-02	1.5	0.7
Dichloropropane, 1,2-	78-87-5	5.0E-03	5.0E-03	9.8E-01	3.3E-01	0.0	65.3
Dinoseb	88-85-7	7.0E-03	7.0E-03	1.4E-02	4.7E-03	1.5	0.7
Diquat	85-00-7	2.0E-02	2.0E-02	3.1E-02	1.0E-02	1.9	0.5
Endothall	145-73-3	1.0E-01	1.0E-01	2.8E-01	9.3E-02	1.1	0.9
Endrin	72-20-8	2.0E-03	2.0E-03	2.8E-02	9.3E-03	0.2	4.7
Ethylbenzene	100-41-4	7.0E-01	7.0E-01	7.0E+00	2.3E+00	0.3	3.3
Fluorine (soluble fluoride)	7782-41-4		4.0E+00	8.4E-01	2.8E-01	14.3	0.1
Glyphosate	1071-83-6	7.0E-01	7.0E-01	1.4E+00	4.7E-01	1.5	0.7
Haloacetic acids, five	HAA5	6.0E-02	6.0E-02				
Heptachlor	76-44-8	4.0E-04	4.0E-04	1.4E-03	4.7E-04	0.9	1.2
Heptachlor epoxide	1024-57-3	2.0E-04	2.0E-04	1.8E-04	6.1E-05	3.3	0.3
Hexachlorobenzene	118-74-1	1.0E-03	1.0E-03	1.4E-03	4.7E-04	2.1	0.5
Hexachlorocyclopentadiene	77-47-4	5.0E-02	5.0E-02	2.5E-01	8.4E-02	0.6	1.7
Iron	7439-89-6	3.0E-01		9.8E+00	3.3E+00	0.1	10.9
Lead and compounds (inorganic)	7439-92-1	5.0E-03					
Lindane	58-89-9	2.0E-04	2.0E-04	4.2E-02	1.4E-02	0.0	70.0
Manganese	7439-96-5	5.0E-02		2.0E+00	6.5E-01	0.1	13.1
Mercuric chloride	7487-94-7	2.0E-03	2.0E-03	4.2E-02	1.4E-02	0.1	7.0
Methoxychlor	72-43-5	4.0E-02	4.0E-02	7.0E-02	2.3E-02	1.7	0.6
Methylene chloride	75-09-2	5.0E-03	5.0E-03	8.4E-01	2.8E-01	0.0	56.0
Nickel, soluble salts	Ni sol salts	1.0E-01		2.8E-01	9.3E-02	1.1	0.9
Nitrate	14797-55-8	1.0E+01	1.0E+01	2.2E+01	7.5E+00	1.3	0.7
Nitrite	14797-65-0	1.0E+00	1.0E+00	1.4E+00	4.7E-01	2.1	0.5

Table E-3. Original Long-Term Water MEGs Compared to Federal Drinking Water Standards

Chemical	*CASRN*	*FDA BWStd (mg/L)*	*EPA MCL (mg/L)*	*WMEG_1y5 (mg/L)*	*WMEG_1y15 (mg/L)*	*Fedstd/ 15LWMEG*	*15LWMEG/ Fedstd*
Oxamyl	23135-22-0	2.0E-01	2.0E-01	3.5E-01	1.2E-01	1.7	0.6
Pentachlorophenol	87-86-5	1.0E-03	1.0E-03	1.4E-02	4.7E-03	0.2	4.7
Perchloroethylene	127-18-4	5.0E-03	5.0E-03	1.4E+00	4.7E-01	0.0	93.3
Phenol	108-95-2	1.0E-03		8.4E+00	2.8E+00	0.0	2800.0
Picloram	1918-02-1	5.0E-01	5.0E-01	9.8E-01	3.3E-01	1.5	0.7
Polychlorinated biphenyls	1336-36-3	5.0E-04	5.0E-04	4.9E-02	1.6E-02	0.0	32.7
Selenium	7782-49-2	5.0E-02	5.0E-02	7.0E-02	2.3E-02	2.1	0.5
Silver	7440-22-4	1.0E-01		7.0E-02	2.3E-02	4.3	0.2
Silvex	93-72-1	5.0E-02	5.0E-02	1.1E-01	3.7E-02	1.3	0.7
Simazine	122-34-9	4.0E-03	4.0E-03	7.0E-02	2.3E-02	0.2	5.8
Sodium cyanide	143-33-9	2.0E-01	2.0E-01	7.0E-01	2.3E-01	0.9	1.2
Styrene	100-42-5	1.0E-01	1.0E-01				
Sulfate	14808-79-8	2.5E+02					
TCDD, 2,3,7,8-	1746-01-6	3.0E-08	3.0E-08	2.8E-07	9.3E-08	0.3	3.1
Thallium	7440-28-0	2.0E-03	2.0E-03				
Toluene	108-88-3	1.0E+00	1.0E+00	1.1E+01	3.7E+00	0.3	3.7
Total Trihalomethanes	TTHMs		8.0E-02				
Toxaphene	8001-35-2	3.0E-03	3.0E-03	1.4E-02	4.7E-03	0.6	1.6
Trichlorobenzene, 1,2,4-	120-82-1	7.0E-02	7.0E-02	1.3E+00	4.2E-01	0.2	6.0
Trichloroethane, 1,1,1-	71-55-6	2.0E-01	2.0E-01	8.4E+01	2.8E+01	0.0	140.0
Trichloroethane, 1,1,2-	79-00-5	5.0E-03	5.0E-03	5.5E-02	1.8E-02	0.3	3.6
Trichloroethylene	79-01-6	5.0E-03	5.0E-03				
Uranium, highly soluble salts	HZ1800-90-T	3.0E-02	3.0E-02	2.8E-02	9.3E-03	3.2	0.3
Vinyl chloride	75-01-4	2.0E-03	2.0E-03	4.2E-02	1.4E-02	0.1	7.0
Xylenes, total	1330-20-7	1.0E+01	1.0E+01	5.6E+00	1.9E+00	5.4	0.2
Zinc, metallic	7440-66-6	5.0E+00		4.2E+00	1.4E+00	3.6	0.3

Table E-3. Original Long-Term Water MEGs Compared to Federal Drinking Water Standards

Chemical	*CASRN*	*FDA BWStd (mg/L)*	*EPA MCL (mg/L)*	*WMEG_1y5 (mg/L)*	*WMEG_1y15 (mg/L)*	*Fedstd/ 15LWMEG*	*15LWMEG/ Fedstd*

Units:
f/L = asbestos fibers per liter
mg/L = milligrams per liter

Key:
All water values are provided in units of mg/L with the exception of asbestos which is in f/L (fibers per liter)
MEGs = Military Exposure Guidelines. The MEGs provided in this table are the original values calculated using the standards methodology and hierarchy of sources presented in RD 230. Many of these MEGs were changed after evaluating with federal water standards. The final 1-year water MEGs are provided in Table E-2.
CASRN = Chemical Abstract Service Registry Number
FDA BWStd = U.S. Food and Drug Administration (FDA) bottled water standard (BWstd)
EPA MCL = U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL)
WMEG_1y5 or 5LWMEG = 1 year water MEG for ingestion rate of 5 L/day
WMEG_1y15 or 15LWMEG = 1 year water MEG for ingestion rate of 15 L/day
Fedstd = U.S. federal drinking water standard. Either the BWStd or the MCL.
Fedstd/15LWMEG = ratio of Fedstd to lowest water MEG. This was used to identify Fedstd values that were greater than the water MEGs. Anything >1 was evaluated in this version of RD230.
15LWMEG/Fedstd = ratio of the lowest water MEG to the Fedstd. This was used to identify Fedstd values that were less than the water MEGs.

Notes:
The federal standards for mercuric chloride are listed as "Mercury" by EPA and FDA.
Uranium, highly soluble salts does not have an official CASRN. The CASRN presented was obtained from the ATSDR MRL listing.

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Antimony, elemental	*7440-36-0*	*3.2*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for both 5 and 15 L/day 1-yr MEGs because higher than both. Both sets of data have large UFs (MEGs = 300 and FDA std = 1000) and use similar tox values. Ratio therefore an insignificant difference (6.4).* ***References:*** July 17, 1992 (57FR31776), IRIS online with last revision Feb 1, 1991, PPRTV Jul 26, 1999
	Reason(s) different than MEG: Lower ingestion rate Different toxicity value Use of RSC			
Arsenic, elemental	*7440-38-2*	*7.1*		***References:***
Asbestos	*1332-21-4*		*Adopt Fed std as MEG(s)*	*Adopt MCL as 1-year MEGs because no other oral data is currently available.* ***References:*** http://www.epa.gov/ogwdw000/dwh/c-ioc/asbestos.html

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Barium, elemental	*7440-39-3*	*6.1*		*Adopt Fed std for 15 L/day MEG. New IRIS tox value available (Jul 05) used to update MEGs in place of older value from HEAST. Difference between values even less than before (ratio = 2.1). Total UF with IRIS value is 300 and dev using chronic study. Therefore, differences in 15 L/day MEG vs Fed std seen as insignificant and Fed std used for 15 L/day MEG.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			
Cadmium, elemental	*7440-43-9*	*2.1*	*Adopt Fed std as MEG(s)*	*Adopted Fed std for 15 L/day MEG only since 5 L/day value slightly greater than Fed std. The differences between the 15 L MEG and Fed std considered insignificant (ratio = 2.1) given that the critical effect is not directly an adverse effect and will not cause mission impact (proteinuira). The dose corresponding to deployment exposures of 15 L/day using the Fed std is less than the NOAEL identified in human studies and is still protective for long-term deployments.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), May 22, 1989 (54FR22062), ATSDR Tox Profile July 1999, IRIS online with last revision Feb 1, 1994
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Carbofuran	*1563-66-2*	*1.7*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L /dayMEG greater than Fed std). Critical effect in animal study used are blood and testicular effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.7 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).* ***References:*** Jan 30, 1991 (56FR3526), IRIS online with last revision Sep 30, 1987
	Reason(s) different than MEG: Lower ingestion rate Use of RSC			
Chloramines (as Cl2)	*10599-90-3*	*8.6*	*Adopt Fed std as MEG(s)*	*The Federal standard for chloramines is a MRDL set at 4 mg/L measured as chlorine. The discussion for chlorine above is relevant here. Because the upcoming revision to TB MED 577 will use the MRDL of 4 mg/L as the long-term potability (LTP) standard. Both long-term Negligible MEGs were adjusted upward to match the LTP standard.* ***References:***
Chloride	*16887-00-6*		*Adopt Fed std as MEG(s)*	*Adopt BW Std as 1-year MEGs because no other oral data is currently available.* ***References:***

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Chlorine (as Cl2)	*7782-50-5*	*8.6*	*Adopt Fed std as MEG(s)*	*The Federal standard for chlorine is a Maximum Residual Disinfectant Level (MRDL) set at 4 mg/L, which is designed to balance the risk reduction achieved against microbial pathogens with the chemical toxicity risks associated with chlorine and chlorine residual byproducts formed in the water. The preliminary long-term Negligible MEGs were 1.4 and 0.47 mg/L (for 5 and 15 L/d consumption rates) and were based on an IRIS reference dose using a NOAEL from a chronic rat drinking water study. No LOAEL was identified in the IRIS critical study. Other studies identified in the IRIS assessment identified a LOAEL over 6 times higher with a critical effect of decreased body weight due potentially to poor water palatability leading to dehydration. Therefore, it is unclear if the IRIS study is the most relevant for setting long-term Negligible MEGs. Target chlorination levels for water supplies in deployment settings range from 2 to 4 mg/L, so setting Negligible MEGs less than the MRDL poses conflicting risk management recommendations. There are some concerns about palatability of chlorinated water in when water temperatures are relatively high; however, the upcoming revision to TB MED 577 will use the MRDL of 4 mg/L as the long-term potability (LTP) standard. Both long-term Negligible MEGs were adjusted upward to match the LTP standard. A reassessment of the MEG and the LTP standard is needed; especially with regard to high temperature water and palatability concerns.* ***References:***

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Chlorine Dioxide	*10049-04-4*		*Adopt Fed std as MEG(s)*	*The Federal standard for chlorine dioxide is a Maximum Residual Disinfectant Level (MRDL) set at 0.8 mg/L. The preliminary long-term Negligible MEGs were 0.42 and 0.14 mg/L (for 5 and 15 L/d consumption rates) and were based on an IRIS reference dose from a study of sodium chlorite in a two generation chronic drinking water study in rats where both a NOAEL and LOAEL were identified. The critical effect was neurodevelopmental effects and the LOAEL was double the NOAEL. While chlorine dioxide rapidly degrades to chlorite, chlorate, and chloride in drinking water, the IRIS study was based on sodium chlorite. Due to the length of this study (two generations) and the health endpoint, it is unclear if this study is the most relevant for setting long-term Negligible MEGs. Therefore, both long-term Negligible MEGs were adjusted upward to match the LTP standard.* ***References:***
Chlorite	*7758-19-2*	*2.1*	*Adopt Fed std as MEG(s)* *Reason(s) different than MEG:* Based on treatment feasibility	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is neurodevelopmental delays. The Fed std was adopted as the 15 L/day MEG because it is only 2.1 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).* ***References:*** Dec 16, 1998 (63FR69390), ATSDR Tox Profile Sep 2004, IRIS Tox Review EPA/635/R-00/007 Sep 2000

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Chromium, elemental	*7440-47-3*		*Adopt Fed std as MEG(s)*	*Adopted Fed std for 15 L/day MEG only since 5 L/day value slightly greater than Fed std. The differences between the 15 L/day MEG and Fed std considered insignificant (ratio = 2.4) given that the tox value used is based on the more toxic Cr VI and total UF of 100 (MEG) and 500 (Fed std).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Nov 13, 1985 (50FR46975), Jan 30, 1991 (56FR3526), IRIS Tox Review Aug 1998
	Use of RSC			
	Different toxicity value			
Copper, elemental	*7440-50-8*		*Recommend use of MEGs*	*The bottled water standard is based on the SMCL from 1979 which was based on taste considerations and staining. More recent (ATSDR 2003) toxicity data shows that doses at the FDA standard level may result in GI effects; particularly considering the higher ingestion rate of deployed personnel. Therefore a MEG at the FDA level would not be adequately protective for deployment exposures. Only oral MRL values are available (no other tox data),however, the study data is very suited for developing MEGs: based on healthy adult human exposure via drinking water for subchronic exposure duration, low UF (total = 3), NOAEL and higher effects levels provided along with specific symptom data. Keep current MEGs based on MRLs. Recommend using 15L/d MEG for potability decisions.*
	Reason(s) different than MEG:			***References:***
	Based on aesthetics			July 19, 1979 (44FR42198), Oct 5, 1983 (48FR45502), EPA 570/9-76-009, ATSDR Tox Profile Sep 2004

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Dalapon	*75-99-0*	*1.4*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is increased kidney weights. The Fed std was adopted as the 15 L/day MEG because it is only 1.4 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 300).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Jun 1, 1989
	Use of RSC			
Dichlorophenoxy acetic acid, 2,4-	*94-75-7*	*1.5*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used are liver, kidney, and blood effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), IRIS online with last revision May 5, 1988
	Use of RSC			
Dinoseb	*88-85-7*	*1.5*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is developmental effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 1000).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Aug 1, 1989
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Diquat	*85-00-7*	*1.9*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is lens opacity/cataracts in eyes. The Fed std was adopted as the 15 L/day MEG because it is only 1.9 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Jan 1, 1995
	Use of RSC			
Endothall	*145-73-3*	*1.1*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used are increased stomach and small intestine weight. The Fed std was adopted as the 15 L/day MEG because it is only 1.1 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Mar 1, 1991
	Use of RSC			
Ethylbenzene	*100-41-4*	*0.3*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used are kidney and liver effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 1000).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), IRIS online with last revision Jun 1, 1991
	Different toxicity value			
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Fluorine (soluble fluoride)	*7782-41-4*	*14.3*	*Revise MEGs and recommend use of MEGs*	*Fluorides are naturally occurring compounds. Low levels of fluorides can help prevent dental cavities. At high levels, fluorides can result in tooth and bone damage. The EPA has set a maximum amount of fluoride allowable in drinking water of 4 mg/L. For the prevention of dental decay, the Public Health Service (PHS) has, since 1962, recommended that public water supplies contain between 0.7 and 1.2 mg/L (ATSDR 2003). These values conflict with potential 1-year water MEGs of 2 mg/L (for 5 L/d consumption) and 0.6 mg/L (for 15 L/d consumption), respectively) based on the IRIS recommendation that an RfD for the critical health endpoint of skeletal fluorosis in adults might be 0.12 mg/kg-d. (The) The primary reason these values conflict is due to the different water consumption rate assumptions, though the EPA standards are based on the main IRIS RfD for protection against dental fluorosis in children. However, the federal standards are based on the presumption of chronic lifelong exposure, whereas the MEGs need to address subchronic exposures. Studies of the subchronic exposure effects are unavailable, prohibiting the calculation more appropriate MEGs. The health effects of concern for more longer term exposures are based on studies of fluoride exposures that are 10 or more years in duration (IOM 1997). In summary, the originally calculated MEGs are considered to be overly protective for the deployed military population. Therefore, the 1-year Negligible water MEGs were adjusted to be equal to 4 mg/L (for the 5 L/d consumption rate) and 2 mg/L (for the 15 L/d consumption rate)*

Reason(s) different than MEG:

Lower ingestion rate

References:

May 14, 1985 (50FR20164), No 14, 1985 (50FR47142 and 50FR47156), IRIS online with last revision Jun 1, 1989

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Glyphosate	*1071-83-6*	*1.5*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is developmental kidney effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).* ***References:*** July 17, 1992 (57FR31776), IRIS online with last revision Sep 1, 1990
	Reason(s) different than MEG: Lower ingestion rate Use of RSC			
Haloacetic acids, five	*HAA5*		*Adopt Fed std as MEG(s)*	*Adopt MCL as 1-year MEGs because no other oral data is currently available for HAA5 as a group of chemicals.* ***References:*** Dec 16, 1998 (63FR69390), July 29, 1994 (59FR38668)
Heptachlor epoxide	*1024-57-3*	*3.3*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for both 5 and 15 L/day MEGs because value is same as 5 L/day when rounded to one sig fig. MEGs were based on nc endpoint with high uncertainty in tox value (UF total = 1000). Adopting the Fed std is still protective for ca endpoints and the ratio is considered insignificant given the high level of uncertainty with the MEG value.* ***References:*** Jan 30, 1991 (56FR3526), IRIS online with last revision Mar 1, 1991
	Reason(s) different than MEG: Based on analytical feasibility			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Hexachlorobenzene	*118-74-1*	*2.1*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is ovarian effects. The Fed std was adopted as the 15 L/day MEG because it is only 2.1 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Based on analytical feasibility			July 17, 1992 (57FR31776), ATSDR Tox Profile Sep 2002
Lead and compounds (inorganic)	*7439-92-1*		*See RD 230 Section 5.5.1*	
				References:
Methoxychlor	*72-43-5*	*1.7*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is reproductive effects (loss of litters/abortions). The Fed std was adopted as the 15 L/day MEG because it is only 1.7 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 1000).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate Use of RSC			Jan 30, 1991 (56FR3526), IRIS online with last revision Aug 1, 1991, ATSDR Tox Profile Sep 2002

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Nickel, soluble salts	*Ni sol salts*	*1.1*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used are decreased organ and body weight gain. The Fed std was adopted as the 15 L/day MEG because it is only 1.1 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 300).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Dec 1, 1996
	Use of RSC			
Nitrate	*14797-55-8*	*1.3*	*Do not develop MEGs*	*Critical effect not impacting deployed population (infants). Older children and adults are not at risk for methemoglobinemia as infants are and nitrate is a normal component of the human diet. For these reasons, nitrate is not identified as a hazard for deployed personnel.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), May 22, 1989 (54FR22062), IRIS online with last revision Oct 1, 1991
	Use of RSC			
Nitrite	*14797-65-0*	*2.1*	*Do not develop MEGs*	*Critical effect not impacting deployed population (infants). Data indicates that even older children (1-8 years) are not impacted by elevated nitrite levels in water. Data for other exposure groups was not available from EPA. Therefore, nitrite is not considered to be a potential hazard.*
	Reason(s) different than MEG:			***References:***
	Different toxicity value			July 17, 1992 (57FR31776), May 22, 1989 (54FR22062), IRIS online with last revision Sep 1, 1997
	Lower ingestion rate			
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Oxamyl	*23135-22-0*	*1.7*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is decreased body weight gain. No clinical signs of toxicity were observed at the highest dose. The Fed std was adopted as the 15 L/day MEG because it is only 1.7 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100)-.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Mar 1, 1991
	Use of RSC			
Picloram	*1918-02-1*	*1.5*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used are reduced food consumption and body weight and liver effects. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision May 1, 1992
	Use of RSC			
Polychlorinated biphenyls	*1336-36-3*	*0.0*	*Recommend VETCOM use MEG*	*The Fed std used an out-dated cancer potency factor but was based on analytical capabilities. The MCL of 0.0005 mg/L actually falls within the 5L and 15L MEGs, but the MCL is based on technology not health risk, while the MEGs are based on noncancer risks, driven by the high ingestion rate.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), IRIS online with last revision Jun 1, 1997
	Different toxicity value			
	Based on analytical feasibility			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Selenium	*7782-49-2*	*2.1*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Doses for ingestion of 15 L/day at Fed std concentration did not result in health effects in studies referenced in ATSDR tox profile and correspond to the NOAEL. Even though an UF of 3 is applied, deployment exposures at the Fed std level are still considered protective for the deployment population.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), May 22, 1989 (54FR22062), ATSDR Tox Profile Sep 2003, IRIS online with last revision Sep 1, 1991
	Different toxicity value			
	Use of RSC			
Silver	*7440-22-4*	*4.3*	*Adopt Fed std as MEG(s)*	*Tox values for silver are based on cosmetic effect (argyria - skin discoloration) and not adverse health impact. Levels 5x NOEL did not result in adverse effects for other subjects. Adopted FDA std because the critical effect is not one that would not have an operational impact.*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), IRIS online with last revision Dec 1, 1996
	Different toxicity value			
	Based on aesthetics			
Silvex	*93-72-1*	*1.3*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is liver changes. The Fed std was adopted as the 15 L/day MEG because it is only 1.3 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 100).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			Jan 30, 1991 (56FR3526), IRIS online with last revision Sep 7, 1988
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*
Sulfate	*14808-79-8*		*Adopt Fed std as MEG(s)*	*Use BW stds for 1y MEGs due to lack of other tox data for this chemical.*
	Reason(s) different than MEG:			***References:***
	Based on aesthetics			July 19, 1979 (44FR421498), Oct 5, 1983 (48FR45502), EPA 570/9-76-009, TB MED 577 Dec 2005
Thallium	*7440-28-0*		*Develop MEGs using MCL data*	*MEGs were developed using the oral reference dose used to develop the MCL with an adjustment to the uncertainty factor. The MCL oral reference dose was multiplied by 10 to remove the uncertainty factor applied for the duration extrapolation. Since deployment scenarios represent a subchronic, rather than chronic exposure, the additional uncertainty factor of 10 was unneccessary. The MCL toxicity data was used because no other oral toxicity data was available using the TG 230 hierarchy of sources. This resulted in MEGs that were slightly greater than the MCL.*
	Reason(s) different than MEG:			***References:***
	Based on analytical feasibility			July 25, 1990 (55FR30383), July 17, 1992 (57FR3527)
	Different toxicity value			
Trichlorobenzene, 1,2,4-	*120-82-1*	*0.2*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is increased adrenal gland weight. The Fed std was adopted as the 15 L/day MEG because it is only 1.5 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF = 1000).*
	Reason(s) different than MEG:			***References:***
	Lower ingestion rate			July 17, 1992 (57FR31776), IRIS online with last revision Nov 1, 1996
	Use of RSC			

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Trichloroethylene	*79-01-6*		*Adopt Fed std as MEG(s)*	*The MEGs were developed based on an NCEA oral RfD of 0.003 mg/kg-day with a total UF of 3,000. MEGs based on ca endpoint would be 0.25 and 0.082 mg/L (5 and 15 L/day respectively). Because of the high level of uncertainty associated with use of the nc value, a ratio of 3.6 is seen as insignificant. Therefore the Fed stds are determined protective for deployment exposures and adopted as the 5 and 15 L/day 1-yr MEGs.*
	Reason(s) different than MEG:			***References:***
	Based on analytical feasibility			July 8, 1987 (52FR25690), EPA (NCEA) TCE Health Risk Assessment EPA/600/P-01/002A External Review Draft Aug 2001
Uranium, highly soluble salts	*HZ1800-90-*	*3.2*	*Adopt Fed std as MEG(s)*	*Fed std same as 5 L/day MEG when rounded to one sig fig. FDA std adopted as 15 L/day MEG based on uncertainty associated with the MRL on which the MEG was based (UF total = 30). Given this level of uncertainty and the conservative nature of the MRLs, a ratio of 3.2 was considered insignificant. The MRL was based on the most sensitive mammalian species (rabbit) which are considered even more sensitive than humans.*
	Reason(s) different than MEG:			***References:***
	Based on treatment feasibility			Dec 7, 2000 (65FR76708), ATSDR Tox Profile Sep 1999

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	CASRN	Fedstd/15LWMEG	Action taken	Rationale
Xylenes, total	*1330-20-7*	*5.4*	*Adopt Fed std as MEG(s)*	*Adopt Fed std for 15 L/day MEG (5 L/day MEG greater than Fed std). Critical effect in animal study used is hyperactivity/neurotoxicity. The Fed std was adopted as the 15 L/day MEG because it is only 2.1 times greater which is not considered a significant difference given the uncertainty associated with the toxicity data (total UF/MF = 300).*
	Reason(s) different than MEG:			***References:***
	Different toxicity value			Jan 30, 1991 (56FR3526), May 22, 1989 (54FR22062), ATSDR Tox Profile Sep 2005
	Lower ingestion rate			
	Use of RSC			
Zinc, metallic	*7440-66-6*	*3.6*	*Adopt Fed std as MEG(s)*	*FDA std adopted for both 1-yr MEGs because although based on SMCL, it is still considered protective for deployment exposures. The available tox data (ATSDR and EPA) are based on healthy adult exposures with a total UF of 3. However, zinc is an essential nutrient and the dose corresponding to the FDA std if applied to deployments (1 mg/kg-day) did not result in adverse effects that would have a mission impact.*
	Reason(s) different than MEG:			***References:***
	Based on aesthetics			Oct 5, 1983 (48FR45502), EPA 570/9-76-009, IRIS Tox Review EPA/635/R-05/002 July 2005, ATSDR Tox Profile Aug 2005

Table E-4. Actions Taken to Resolve Differences When Federal Water Standards Were Greater Than the Water MEGs or When MEGs Were Not Available

Chemical Name	*CASRN*	*Fedstd/15LWMEG*	*Action taken*	*Rationale*

Key:
MEGs = Military Exposure Guidelines
CASRN = Chemical Abstract Service Registry Number
Fedstd = U.S. federeral drinking water standard. Either U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) or U.S. Food and Drug Administration (FDA) bottled water standard (BWstd).
SMCL = secondary maximum contaminant level
UF = uncertatinty factor
IRIS = EPA Integrated Risk Information System. References to IRIS are available at their website: http://www.epa.gov/iriswebp/iris/
HEAST = EPA Health Effects Assessment Summary Tables
MRL = Agency for Toxic Substance and Disease Registry (ATSDR) Minimal Risk Level. ATSDR Tox Profiles are available at their website: http://www.atsdr.cdc.gov/toxpro2.html. Appendix A provides details on the MRLs.
NCEA = National Center for Environmental Assessment
RfD = Reference Dose
RSC = relative source contribution
NOAEL = no observed adverse effect level
NOEL = no observed effect level
MF = modifying factor
ca = cancer
nc = non cancer
TSFWS = TriService Field Water Standard. These standards are available in the TB MED 577 Dec 2005.
FR = U.S. Federal Register. References are available at the following website: http://www.gpoaccess.gov/fr/index.html
All Water Military Exposure Guidelines (MEGs) are provided in mg/L with the exception of asbestos which is in MFL (million fibers per liter).

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Aldrin	309-00-2					5.6E-04 PPRTV_sub	1.9E-04 PPRTV_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values and were lower than WMEG_1y based on recent PPRTV_sub.						
Antimony, elemental	7440-36-0	1.4E-02 HA1d_adj	6.0E-03 MCL*	1.4E-02 HA10d_adj	6.0E-03 MCL*	6.0E-03 MCL*	6.0E-03 MCL*	Alt method-water, Hier order-water
	MEGs Impacted:	WMEG_7d15, WMEG_14d15, WMEG_1y5, and WMEG_1y15 raised						
	Rationale:	Matched to Fed water std since values not significantly different.						
Arsenic, elemental	7440-38-2	3.0E-01 TSFWS_ST5‡	1.0E-01 TSFWS_ST15‡	6.0E-02 TSFWS_LT5‡	2.0E-02 TSFWS_LT15‡	6.0E-02 TSFWS_LT5‡*	2.0E-02 TSFWS_LT15‡*	Hier order-water
	MEGs Impacted:	WMEG_1y lowered						
	Rationale:	WMEG_1y values were lowered slightly (by 0.5 and 0.2 mg/L) to match TSFWS to avoid conflicting with military standards.						
Asbestos	1332-21-4					7.0E+06 MCL	7.0E+06 MCL	Units; Alt method-water
	MEGs Impacted:	Values added for WMEG_1y5 and WMEG_1y15						
	Rationale:	Adopted MCL for long-term MEGs since no other toxicity data available.						
Barium, elemental	7440-39-3					2.0E+00 MCL*	2.0E+00 MCL*	Alt method-water, Hier order-water
	MEGs Impacted:	WMEG_1y5 and WMEG_1y15 raised. Short-term MEGs deleted.						
	Rationale:	Matched long-term MEGs to Fed water std and deleted short-term MEGs because they were lower than Fed std and based on old HA without any supporting data.						
Baygon	114-26-1					5.6E-02 IRIS_chr	1.9E-02 IRIS_chr	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on HA values were seen as too conservative because they were slightly lower than WMEG_1y based on IRIS_chr.						
Bentazon	25057-89-0					4.2E-01 IRIS_chr	1.4E-01 IRIS_chr	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS_chr.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Boron	7440-42-8	5.6E+00 HA1d_adj*	1.9E+00 HA1d_adj*	2.8E+00 IRIS_sub*	9.3E-01 IRIS_sub*	2.8E+00 IRIS_chr	9.3E-01 IRIS_sub*	Alt method
		MEGs Impacted: WMEG_14d and WMEG 1y Rationale: The 7d values are based on the standard hierarchy and are fine; however, the 14d and 1yr values are deviations from the standard hierarchy. The basis is that the originally calculated 14d and 1yr values were based on ATSDR's 1992 intermediate oral MRL of 0.01 mg/kg-d, which is actually less than the current EPA IRIS RfD of 0.2 mg/kg-d and the proposed ATSDR intermediate oral MRL of 0.2 mg/kg-d. The 14d and 1yr values were calculated using the IRIS RfD.						
Bromoform	75-25-2	7.0E+00 HA1d_adj	2.3E+00 HA1d_adj			4.2E-01 PPRTV_sub	1.4E-01 PPRTV_sub	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on IRIS_sub.						
Cadmium, elemental	7440-43-9	5.6E-02 HA1d_adj	1.9E-02 HA1d_adj	5.6E-02 HA10d_adj	1.9E-02 HA10d_adj	7.0E-03 IRIS_chr	5.0E-03 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y15 raised Rationale: Matched 15L/day 1y value to Fed water std since values not significantly different.						
Carbon disulfide	75-15-0					1.4E+00 HEAST_sub	4.7E-01 HEAST_sub	Hier order-air and water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on acute MRLs were seen as too conservative because they were lower than WMEG_1y based on HEAST_sub.						
Chlorine	7782-50-5	4.2E+00 HA1d_adj	4.0E+00 MRDL*	4.2E+00 HA10d_adj	4.0E+00 MRDL*	4.0E+00 MRDL*	4.0E+00 MRDL*	Alt method
		MEGs Impacted: WMEG 1y values raised Rationale: Raised 1y 5L/day and all 15L/d to match TSFW LTP Standards. See RD-230 Table E-4 for reasoning.						
Chlorite	14998-27-7			1.4E+00 MRL_inter_nc*	1.0E+00 MCL*	1.4E+00 MRL_inter	1.0E+00 MCL*	Hier order-water, Alt method-water
		MEGs Impacted: WMEG_1y15 raised. 14d MEGS Rationale: Matched long-term MEG to Fed water std and deleted 7d MEGs because they were lower than Fed std and based on old HA without any supporting data. 14d MEGS were set equal to the 1y MEGs						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Chlorotoluene, p-	106-43-4					9.8E+00 PPRTV_sub	3.3E+00 PPRTV_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values and were lower than WMEG_1y based on recent PPRTV_sub.						
Cyanogen chloride	506-77-4					7.0E-01 HEAST_sub	2.3E-01 HEAST_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on HEAST_sub.						
Dalapon	75-99-0	4.2E+00 HA1d_adj	1.4E+00 HA1d_adj	4.2E+00 HA10d_adj	1.4E+00 HA10d_adj	4.2E-01 HEAST_sub	2.0E-01 MCL*	Alt method-water
	MEGs Impacted:	WMEG_1y15 raised						
	Rationale:	Matched to Fed water std since values not significantly different.						
Dibromochloromethane	124-48-1					9.8E-01 PPRTV_sub	3.3E-01 PPRTV_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values and were lower than WMEG_1y based on PPRTV_sub_nc endpoint.						
Dibromoethane, 1,2-	106-93-4					4.9E-02 IRIS	1.6E-02 IRIS	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values and were lower than WMEG_1y based on IRIS ca endpoint.						
Dibutyl phthalate	84-74-2					1.4E+01 IRIS_sub	4.7E+00 IRIS_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on acute MRLs were seen as too conservative because they were lower than WMEG_1y based on IRIS_sub.						
Dichloroethane, 1,2-	107-06-2					1.1E+00 IRIS	3.6E-01 IRIS	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS ca endpoint.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Dichloroethylene, trans-	156-60-5	2.8E+01 HA1d_adj	9.3E+00 HA1d_adj			2.8E+00 IRIS_sub	9.3E-01 IRIS_sub	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on IRIS_sub.						
Dichlorophenol, 2,4-	120-83-2					2.8E-01 PPRTV_sub	9.3E-02 PPRTV_sub	Hier order-water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values and were lower than WMEG_1y based on recent PPRTV_sub. And because no documentation available on these HA values.						
Dichlorophenoxy acetic acid, 2,4-	94-75-7	1.4E+00 HA1d_adj	4.7E-01 HA1d_adj	4.2E-01 HA10d_adj	1.4E-01 HA10d_adj	1.4E-01 HEAST_sub	7.0E-02 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.						
Dichloropropane, 1,2-	78-87-5	1.4E+00 MRLoA_adj	4.7E-01 MRLoA_adj			9.8E-01 MRL_inter	3.3E-01 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on MRL_inter.						
Dichloropropene, 1,3-	542-75-6					5.6E-01 MRL_inter	1.9E-01 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on more current IRIS ca endpoint.						
Dieldrin	60-57-1					1.4E-03 MRL_inter	4.7E-04 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on more recent MRL_inter.						
Diethyl phthalate	84-66-2					1.1E+02 IRIS_sub	3.7E+01 IRIS_sub	Hier order-water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on acute MRLs were seen as too conservative because they were lower than WMEG_1y based on IRIS_sub.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Diisopropyl methylphosphonate	1445-75-6					1.1E+01 IRIS_sub	3.7E+00 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old chronic-based HA values were lower than WMEG_1y based on more recent IRIS_sub.							
Dinitrophenol, 2,4-	51-28-5					2.8E-01 PPRTV_sub	9.3E-02 PPRTV_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on acute MRLs were seen as too conservative because they were lower than WMEG_1y based on IRIS_sub.							
Dinoseb	88-85-7	4.2E-01 HA1d_adj	1.4E-01 HA1d_adj	4.2E-01 HA10d_adj	1.4E-01 HA10d_adj	1.4E-02 HEAST_sub	7.0E-03 MCL*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.							
Dioxane, 1,4-	123-91-1					8.4E+00 MRL_inter	2.8E+00 MRL_inter	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on more recent MRL_inter.							
Diquat	85-00-7					3.1E-02 IRIS_chr	2.0E-02 MCL*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.							
Dithiane, 1,4-	505-29-3					1.4E+00 IRIS_sub	4.7E-01 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old chronic-based HA values were lower than WMEG_1y based on IRIS_sub.							
Endothall	145-73-3	1.1E+00 HA1d_adj	3.7E-01 HA1d_adj	1.1E+00 HA10d_adj	3.7E-01 HA10d_adj	2.8E-01 HEAST_sub	1.0E-01 MCL*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.							

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Endrin	72-20-8	2.8E-02 HA1d_adj	9.3E-03 HA1d_adj			2.8E-02 MRL_inter	9.3E-03 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on MRL_inter.						
Ethylbenzene	100-41-4					7.0E+00 MRL_inter	7.0E-01 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.						
Ethylene glycol	107-21-1	2.8E+01 HA1d_adj	9.3E+00 HA1d_adj			1.1E+01 MRL_inter	3.7E+00 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on HEAST_sub.						
Fluoride	16984-48-8					4.0E+00 IRIS_chr*	2.0E+00 IRIS_chr*	Alt method-water
		MEGs Impacted: WMEG_1y5 and WMEG_1y15 added Rationale: Added MEGs for flouride based on section 5.5.2.1 in RD-230(v17). See sodium flouride.						
Glyphosate	1071-83-6	2.8E+01 HA1d_adj	9.3E+00 HA1d_adj	2.8E+01 HA10d_adj	9.3E+00 HA10d_adj	1.4E+00 IRIS_chr	7.0E-01 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.						
HD	505-60-2	1.4E-01 TSFWS_ST5‡	4.7E-02 TSFWS_ST15‡	1.4E-01 TSFWS_ST5‡*	4.7E-02 TSFWS_ST5‡*	9.8E-04 MRL_inter	3.3E-04 MRL_inter	Alt method
		MEGs Impacted: WMEG_14d Rationale: Changed 14d standards that were based on MRL's to more closely match TBMED 579						
Heptachlor epoxide	1024-57-3	1.4E-02 HA1d_adj	4.7E-03 HA1d_adj			2.0E-04 MCL*	2.0E-04 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y5 and WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	67562-39-4							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	55673-89-7							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	35822-46-9							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hexachlorobenzene	118-74-1	7.0E-02 HA1d_adj	2.3E-02 HA1d_adj	7.0E-02 HA10d_adj	2.3E-02 HA10d_adj	1.4E-03 MRL_inter	1.0E-03 MCL*	Alt method-water
	MEGs Impacted:	WMEG_1y15 raised						
	Rationale:	Matched to Fed water std since values not significantly different.						
Hexachlorodibenzodioxin, 1,2,3,4,7,8-	39227-28-6							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hexachlorodibenzofuran, 1,2,3,4,7,8-	70648-26-9							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Hexachlorodibenzofuran, 1,2,3,6,7,8-	57117-44-9							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hexachlorodibenzofuran, 1,2,3,7,8,9-	72918-21-9							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hexachlorodibenzofuran, 2,3,4,6,7,8-	60851-34-5							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	57653-85-7							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Hydrogen cyanide	74-90-8	6.0E-03 TSFWS_ST5‡	2.0E-03 TSFWS_ST15‡	6.0E-03 TSFWS_LT5‡	2.0E-03 TSFWS_LT15‡			Hier order-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Deleted WMEG_1y based on IRIS_chr because significantly greater than short-term values that are TSFWS. Changed to avoid conflicting with military standards. Will update MEGs as TSFWS are updated.						
Isophorone	78-59-1					2.8E+01 IRIS_sub	9.3E+00 IRIS_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS_sub.						
Manganese	7439-96-5					2.0E+00 HEAST_sub	6.5E-01 HEAST_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on HEAST_sub.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Mercuric chloride	7487-94-7					4.2E-02 IRIS_sub	1.4E-02 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS_sub. Also checked use of acute MRLo for ST MEGs but would also be lower than WMEG_1y so did not develop.							
Methoxychlor	72-43-5	7.0E-02 HA1d_adj	4.0E-02 MCL*	7.0E-02 HA10d_adj	4.0E-02 MCL*	7.0E-02 MRL_inter	4.0E-02 MCL*	Alt method-water
	MEGs Impacted: 15L/day values raised Rationale: Matched to Fed water std since values not significantly different.							
Methyl chloride	74-87-3	1.3E+01 HA1d_adj	4.2E+00 HA1d_adj			7.5E+00 HEAST	2.5E+00 HEAST	Hier order-water
	MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on HEAST cancer endpoint.							
Methyl ethyl ketone	78-93-3	1.1E+02 HA1d_adj	3.5E+01 HA1d_adj			2.8E+01 HEAST_sub	9.3E+00 HEAST_sub	Hier order-water
	MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on HEAST_sub.							
Monochloramine	10599-90-3					4.0E+00 MCL*	4.0E+00 MCL*	Alt method
	MEGs Impacted: WMEG 1y values Rationale: Raised 1y values to match TBMED 577 and MCL's. See RD-230 Table E-4 for reasoning.							
Naphthalene	91-20-3					2.8E+00 IRIS_sub	9.3E-01 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS_sub.							
Nickel, soluble salts	Ni sol salts					2.8E-01 HEAST_sub	1.0E-01 BW Std*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to bottled water std since values not significantly different.							

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Nitrate	14797-55-8							Hier order-water, Alt method-water
	MEGs Impacted:	All MEGs (6) deleted						
	Rationale:	Not a deployment hazard because adverse health effects impact infants only.						
Nitrite	14797-65-0							Alt method-water
	MEGs Impacted:	All MEGs (6) deleted						
	Rationale:	Not a deployment hazard because adverse health effects impact infants only.						
Octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-	3268-87-9							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Octachlorodibenzofuran, 1,2,3,4,6,7,8,9-	39001-02-0							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Oxamyl	23135-22-0			3.5E-01 IRIS_chr*	2.0E-01 MCL*	3.5E-01 IRIS_chr	2.0E-01 MCL*	Alt method-water
	MEGs Impacted:	WMEG_1y15 14d raised 7d deleted						
	Rationale:	Matched to Fed water std since values not significantly different. Matched 14d to 1y values, and deleted 7d values because based on HA and less than Fed STD.						
Pentachlordibenzofuran, 2,3,4,7,8-	57117-31-4							Alt method-water
	MEGs Impacted:	All MEGs deleted (previously had values for all)						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Pentachlorodibenzofuran, 1,2,3,7,8-	57117-41-6							Alt method-water
	MEGs Impacted:	WMEG_1y deleted						
	Rationale:	Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	40321-76-4							Alt method-water
	MEGs Impacted: WMEG_1y deleted Rationale: Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.							
Picloram	1918-02-1	2.8E+01 HA1d_adj	9.3E+00 HA1d_adj	2.8E+01 HA10d_adj	9.3E+00 HA10d_adj	9.8E-01 IRIS_chr	5.0E-01 MCL*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.							
Polychlorinated biphenyls	1336-36-3					8.4E-04 IRIS_sub*	5.0E-04 MCL*	Alt method
	MEGs Impacted: WMEG 1y 15L/d values raised Rationale: Raised 1y 15L/d value from 0.00028 to MCL of 0.0005 see RD-230 Table E-4 for reasoning.							
Prometon	1610-18-0					2.1E+00 IRIS_sub	7.0E-01 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old chronic-based HA values were lower than WMEG_1y based on IRIS_sub.							
Propachlor	1918-16-7					1.8E+00 IRIS_sub	6.1E-01 IRIS_sub	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values were lower than WMEG_1y based on IRIS_sub.							
RDX	121-82-4					4.2E-01 MRL_inter	1.4E-01 MRL_inter	Hier order-water
	MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values and were lower than WMEG_1y based on recent MRL_inter.							
Selenium	7782-49-2					7.0E-02 HEAST_sub	5.0E-02 MCL*	Alt method-water
	MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.							

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Silver	7440-22-4	2.8E-01 HA1d_adj	1.0E-01 BW Std*	2.8E-01 HA10d_adj	1.0E-01 BW Std*	1.0E-01 BW Std*	1.0E-01 BW Std*	Alt method-water
		MEGs Impacted: WMEG_1y5 raised and WMEG_1y15 raised Rationale: Matched 1y and all 15L/day values to bottled water std since HEAST endpoint based on a cosmetic effect, and no adverse effect seen at 5 times the NOAEL in other studies.						
Silvex	93-72-1	2.8E-01 HA1d_adj	9.3E-02 HA1d_adj	2.8E-01 HA10d_adj	9.3E-02 HA10d_adj	1.1E-01 HEAST_sub	5.0E-02 MCL*	Alt method-water
		MEGs Impacted: WMEG_1y15 raised Rationale: Matched to Fed water std since values not significantly different.						
Sodium cyanide	143-33-9					7.0E-01 MRL_inter	2.3E-01 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_7d and WMEG_14d deleted Rationale: Short-term WMEGs based on old HA values and were higher than WMEG_1y based on recent MRL_inter.						
Sulfate	14808-79-8	3.0E+02 TSFWS_ST5‡	2.5E+02 TSFWS‡*	3.0E+02 TSFWS_LT5‡	2.5E+02 TSFWS‡*			Alt method
		MEGs Impacted: WMEG 1y Rationale: Used BW standards because no other oral tox data available. No MCL's available. Used 2009 version of TSFWS and BW std for ST MEGs						
TCDD, 2,3,7,8-	1746-01-6	1.4E-06 HA1d_adj	4.7E-07 HA1d_adj			2.8E-07 MRL_inter	9.3E-08 MRL_inter	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on MRL_inter.						
Tetrachlorodibenzofuran, 2,3,7,8-	51207-31-9							Alt method-water
		MEGs Impacted: WMEG_1y deleted Rationale: Dioxins now assessed using WMEG for TCDD, 2,3,7,8- (1746-01-6). See TG 230 and RD230 for methodology.						
Toluene	108-88-3	2.8E+01 HA1d_adj	9.3E+00 HA1d_adj			1.1E+01 PPRTV_sub	3.7E+00 PPRTV_sub	Hier order-water
		MEGs Impacted: WMEG_14d deleted Rationale: HA10d_adj for WMEG_14d considered too conservative since lower than WMEG_1y based on IRIS_sub.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	CASRN	WMEG_7d5L and Basis	WMEG_7d15L and Basis	WMEG_14d5L and Basis	WMEG_14d15L and Basis	WMEG_1y5L and Basis	WMEG_1y15L and Basis	Reason Unique
Toxaphene	8001-35-2					1.4E-02 MRL_inter	4.7E-03 MRL_inter	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on more recent MRL_inter.						
Trichlorobenzene, 1,2,4-	120-82-1			7.0E-02 MCL*	7.0E-02 MCL*	7.0E-02 MCL*	7.0E-02 MCL*	Hier order-water
	MEGs Impacted:	1y values lowered, 14d values, 7d deleted						
	Rationale:	Matched to Fed water std since 1yr values based on PPRTV higher than ST values based on HA. 14d changed to match Fed STD, 7d deleted						
Trichloroethane, 1,1,1-	71-55-6	1.4E+02 HA1d_adj	4.7E+01 HA1d_adj	8.4E+01 IRIS_sub_nc*	2.8E+01 IRIS_sub_nc*	8.4E+01 IRIS_sub	2.8E+01 IRIS_sub	Hier order-air
	MEGs Impacted:	14d values						
	Rationale:	set 14 day values equla to 1 year values to solve hierarchy problems and because 1y based on more reliable sources						
Trichlorophenoxyacetic acid	93-76-5					1.4E+00 HEAST_sub	4.7E-01 HEAST_sub	Hier order-water
	MEGs Impacted:	WMEG_7d and WMEG_14d deleted						
	Rationale:	Short-term WMEGs based on old HA values were lower than WMEG_1y based on HEAST_sub.						
Uranium, highly soluble salts	HZ1800-90-					3.0E-02 MCL*	3.0E-02 MCL*	Alt method-water
	MEGs Impacted:	WMEG_1y5 and WMEG_1y15 raised						
	Rationale:	Matched to Fed water std since values not significantly different.						
Zinc, metallic	7440-66-6	8.4E+00 HA1d_adj	5.0E+00 BW Std*	8.4E+00 HA10d_adj	5.0E+00 BW Std*	5.0E+00 BW Std*	5.0E+00 BW Std*	Alt method-water
	MEGs Impacted:	WMEG_7d15, WMEG_14d15, WMEG_1y5, and WMEG_1y15 raised						
	Rationale:	Matched to bottled water std since values not significantly different.						

Table E-5: Basis for Water MEGs Derived Using Unique Methods

Chemical Name	*CASRN*	*WMEG_7d5L and Basis*	*WMEG_7d15L and Basis*	*WMEG_14d5L and Basis*	*WMEG_14d15L and Basis*	*WMEG_1y5L and Basis*	*WMEG_1y15L and Basis*	*Reason Unique*

Units:
MFL = million asbestos fibers per liter
mg/L = milligrams per liter

Notes:
All Water Military Exposure Guidelines (MEGs) are provided in mg/L with the exception of asbestos which is in MFL (million fibers per liter).
CASRN = Chemical Abstract Service Registry Number
WMEG = water military exposure guideline (mg/L or MFL)
adj = adjusted
sub = subchronic
chr = chronic
inter = intermediate
ST5 = short-term TSFWS based on ingestion rate of 5 L/day (HQDA 2005)
ST15 = short-term TSFWS based on ingestion rate of 15 L/day (HQDA 2005)
LT5 = long-term TSFWS based on ingestion rate of 5 L/day (HQDA 2005)
LT15 = long-term TSFWS based on ingestion rate of 15 L/day (HQDA 2005)

Sources:
BWStd = U.S. Food and Drug Administration (FDA) bottled water standard (BWstd) (FDA 2006)
HA = EPA Drinking Water Health Advisories (EPA 2004c)
HEAST = EPA Health Effects Assessment Summary Table (EPA 2005c)
IRIS = EPA Integrated Risk Information System (EPA 2005a)*
MCL = U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) (EPA 2006)
MRL = ATSDR Minimal Risk Level (ATSDR 2004)
PPRTV = Provisional Peer-Reviewed Toxicity Values for Superfund (EPA 2005d)
SMCL = Secondary Maximum Contaminant Level
TSFWS = Tri-Service Field Water Standard (HQDA 2005)

‡All TSFWS values are based on 2005 edition due of TBMED 577. The new TBMED577 short term potability standards are a subset of the previous 2005 TBMED577 standards.

APPENDIX F
DEVELOPMENT OF THE SOIL MILITARY EXPOSURE GUIDELINES

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Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Acenaphthene	83-32-9	154.21	☐	☐	☐	☑	☐	☐	☑	0.13	4.7E-07	4.2E-02	7.7E-06	1.6E-04	6.4E-03	2.9E+01	4.2E+00	1.3E+02	3.7E+04
Acephate	30560-19-1	183.16	☐	☐	☐	☐	☐	☐	☐					5.0E-13	2.1E-11				
Acetaldehyde	75-07-0	44.05	☐	☐	☐	☐	☐	☐	☑		1.0E-04	1.2E-01	1.4E-05	7.9E-05	3.2E-03	1.1E-01	1.0E+06	2.1E+05	2.6E+03
Acetochlor	34256-82-1	269.80	☐	☐	☐	☐	☐	☐	☐										
Acetone	67-64-1	58.05	☐	☐	☐	☐	☐	☐	☑		1.0E-04	1.2E-01	1.1E-05	3.9E-05	1.6E-03	3.4E-03	1.0E+06	1.0E+05	2.6E+03
Acetone cyanohydrin	75-86-5	85.10	☐	☐	☐	☐	☐	☐	☐					9.0E-08	3.7E-06				
Acetonitrile	75-05-8	41.05	☐	☐	☐	☐	☐	☐	☑		2.9E-05	1.3E-01	1.7E-05	2.0E-05	8.2E-04	9.4E-02	1.0E+06	1.9E+05	4.8E+03
Acetophenone	98-86-2	120.15	☐	☐	☐	☐	☐	☐	☑		1.5E-01	6.0E-02	8.7E-06	1.0E-05	4.2E-04	2.7E-01	6.1E+03	2.3E+03	6.6E+01
Acifluorfen-sodium	62476-59-9	383.60	☐	☐	☐	☐	☐	☐	☐										
Acrolein	107-02-8	56.06	☐	☐	☐	☐	☐	☐	☑		1.2E-04	1.1E-01	1.2E-05	1.2E-04	4.9E-03	1.3E-01	2.1E+05	4.8E+04	2.4E+03
Acrylamide	79-06-1	71.08	☐	☐	☐	☐	☐	☑	☐	0.1				1.0E-09	4.1E-08				
Acrylic acid	79-10-7	72.06	☐	☐	☐	☐	☐	☑	☐	0.1				1.2E-07	4.8E-06		1.0E+06		
Acrylonitrile	107-13-1	53.06	☐	☐	☐	☐	☐	☐	☑		1.9E-04	1.1E-01	1.3E-05	8.8E-05	3.6E-03	5.1E-03	7.9E+04	8.4E+03	1.8E+03
Adipic acid	124-04-9	146.14	☐	☐	☐	☐	☐	☐	☐										
Adiponitrile	111-69-3	108.10	☐	☐	☐	☐	☐	☐	☐										
Alachlor	15972-60-8	269.77	☐	☐	☐	☐	☐	☐	☐					3.2E-08	1.3E-06				
Alar	1596-84-5	160.17	☐	☐	☐	☐	☐	☐	☐										
Aldicarb	116-06-3	190.27	☐	☐	☐	☐	☐	☐	☐										
Aldicarb sulfone	1646-88-4	222.26	☐	☐	☐	☐	☐	☐	☐										
Aldrin	309-00-2	364.93	☐	☐	☐	☐	☐	☑	☐	0.1				1.7E-04	7.0E-03				
Ally	74223-64-6	381.36	☐	☐	☐	☐	☐	☐	☐										
Allyl alcohol	107-18-6	58.08	☐	☐	☐	☐	☐	☐	☐										
Allyl chloride	107-05-1	76.50	☐	☐	☐	☐	☐	☐	☑		2.8E-01	1.2E-01	1.1E-05	1.1E-02	4.4E-01	1.9E-01	3.4E+03	1.3E+03	4.9E+01
Aluminum phosphide	20859-73-8	57.96	☐	☐	☐	☐	☐	☐	☐										
Aluminum, elemental	7429-90-5	26.98	☐	☐	☐	☐	☐	☐	☐										
Amdro	67485-29-4	494.48	☐	☐	☐	☐	☐	☐	☐										
Ametryn	834-12-8	227.33	☐	☐	☐	☐	☐	☐	☐										
Aminodinitrotoluenes	1321-12-6	137.14	☐	☐	☐	☐	☐	☐	☐										
Aminophenol, 3-	591-27-5	109.13	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Aminophenol, 4-	123-30-8	109.13	☐	☐	☐	☐	☐	☐	☐										
Aminopyridine, 4-	504-24-5	94.12	☐	☐	☐	☐	☐	☐	☐										
Amitraz	33089-61-1	293.45	☐	☐	☐	☐	☐	☐	☐										
Ammonia	7664-41-7	17.03	☐	☐	☐	☐	☐	☐	☐			2.6E-01	6.9E-05	1.6E-05	6.6E-04				
Ammonium perchlorate	7790-98-9	117.49	☐	☐	☐	☐	☐	☐	☐										
Ammonium sulfamate	7773-06-0	114.13	☐	☐	☐	☐	☐	☐	☐										
Aniline	62-53-3	93.12	☐	☐	☐	☐	☐	☑	☐	0.1				1.9E-06	7.8E-05				
Anthracene	120-12-7	178.23	☐	☐	☐	☑	☐	☐	☑	0.13	3.2E-08	3.2E-02	7.7E-06	6.5E-05	2.7E-03	1.4E+02	4.3E-02	6.1E+00	1.4E+05
Antimony pentoxide	1314-60-9	647.03	☐	☐	☐	☐	☐	☐	☐										
Antimony potassium tartrate	28300-74-5	667.86	☐	☐	☐	☐	☐	☐	☐										
Antimony tetroxide	1332-81-6		☐	☐	☐	☐	☐	☐	☐										
Antimony trioxide	1309-64-4	291.52	☐	☐	☐	☐	☐	☐	☐										
Antimony, elemental	7440-36-0	121.76	☐	☐	☐	☐	☐	☐	☐										
Apollo	74115-24-5	303.15	☐	☐	☐	☐	☐	☐	☐										
Aramite	140-57-8	334.87	☐	☐	☐	☐	☐	☐	☐										
Aroclor 1016	12674-11-2		☐	☐	☐	☐	☑	☐	☐	0.14									
Aroclor 1254	11097-69-1	328.40	☐	☐	☐	☐	☑	☐	☐	0.14				2.8E-04	1.2E-02				
Arsenic, elemental	7440-38-2	74.92	☐	☐	☐	☐	☐	☐	☐	0.03									
Arsine	7784-42-1	77.95	☐	☐	☐	☐	☐	☐	☐								2.8E+01		
Asbestos	1332-21-4		☐	☐	☐	☐	☐	☐	☐										
Assure	76578-14-8	372.80	☐	☐	☐	☐	☐	☐	☐										
Asulam	3337-71-1	230.24	☐	☐	☐	☐	☐	☐	☐										
Atrazine	1912-24-9	216.06	☐	☐	☐	☐	☐	☐	☐					3.0E-09	1.2E-07				
Avermectin B1	65195-55-3		☐	☐	☐	☐	☐	☐	☐										
Azinphos methyl	86-50-0	317.34	☐	☐	☐	☐	☐	☐	☐										
Azobenzene	103-33-3	182.22	☐	☐	☐	☐	☐	☐	☑					1.3E-05	5.5E-04		6.4E+00		
Barium, elemental	7440-39-3	137.30	☐	☐	☐	☐	☐	☐	☐										
Baygon	114-26-1	209.24	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Bayleton	43121-43-3	293.75	☐	☐	☐	☐	☐	☐	☐										
Baythroid	68359-37-5	434.29	☐	☐	☐	☐	☐	☐	☐										
Benefin	1861-40-1	335.32	☐	☐	☐	☐	☐	☐	☐										
Benomyl	17804-35-2	290.32	☐	☐	☐	☐	☐	☐	☐										
Bentazon	25057-89-0	240.30	☐	☐	☐	☐	☐	☐	☐										
Benzaldehyde	100-52-7	106.12	☐	☐	☐	☐	☐	☐	☑		1.5E-01	7.1E-02	9.5E-06	4.2E-05	1.7E-03	2.0E-01	3.3E+03	9.9E+02	6.6E+01
Benzene	71-43-2	78.11	☐	☐	☐	☐	☐	☐	☑		2.1E-03	8.8E-02	9.8E-06	5.6E-03	2.3E-01	3.5E-01	1.8E+03	8.7E+02	5.6E+02
Benzenethiol	108-98-5	110.18	☐	☐	☐	☐	☐	☐	☐										
Benzidine	92-87-5	184.23	☐	☐	☐	☐	☐	☑	☐	0.1				3.9E-11	1.6E-09		3.2E+02		
Benzo(a)anthracene	56-55-3	228.30	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	2.5E-02	6.2E-06	3.6E-06	1.5E-04	2.6E+03	1.3E-02		
Benzo(a)pyrene	50-32-8	252.30	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	2.2E-02	5.8E-06	1.1E-06	4.6E-05	9.7E+03	1.9E-03		
Benzo(b)fluoranthene	205-99-2	252.30	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	2.3E-02	5.5E-06	6.2E-06	2.5E-04	8.4E+03	4.3E-03		
Benzo(k)fluoranthene	207-08-9	252.32	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	2.3E-02	5.5E-06	4.2E-07	1.7E-05	8.3E+03	8.0E-04		
Benzoic acid	65-85-0	122.12	☐	☐	☐	☐	☐	☐	☐		1.5E-01	5.4E-02	8.8E-06	2.9E-06	1.2E-04	5.5E-03	3.1E+03		
Benzotrichloride	98-07-7	195.50	☐	☐	☐	☐	☐	☐	☑					2.8E-04	1.2E-02		5.3E+01		
Benzyl alcohol	100-51-6	108.14	☐	☐	☐	☐	☐	☐	☐		1.5E-01	6.9E-02	9.4E-06	3.8E-07	1.5E-05	1.0E-01	4.0E+04		
Benzyl chloride	100-44-7	126.58	☐	☐	☐	☐	☐	☐	☑		1.8E-05	6.7E-02	7.8E-06	5.1E-05	2.1E-03	3.0E-01	3.3E+03	1.3E+03	6.0E+03
Beryllium, elemental	7440-41-7	9.01	☐	☐	☐	☐	☐	☐	☐										
Bidrin	141-66-2	237.21	☐	☐	☐	☐	☐	☐	☐										
Bifenox	42576-02-3		☐	☐	☐	☐	☐	☐	☐										
Biphenthrin	82657-04-3	422.87	☐	☐	☐	☐	☐	☐	☐										
Biphenyl, 1,1-	92-52-4	154.20	☐	☐	☐	☐	☐	☐	☑		5.5E-07	4.0E-02	8.2E-06	3.0E-04	1.2E-02	4.7E+01	7.5E+00	3.5E+02	3.4E+04
Bis(2-chloro-1-methylethyl) ether	108-60-1	171.07	☐	☐	☐	☐	☐	☐	☑		3.3E-05	6.3E-02	6.4E-06	1.1E-04	4.6E-03	3.7E-01	1.7E+03	7.9E+02	4.5E+03
Bis(2-chloroethoxy)methane	111-91-1	173.05	☐	☐	☐	☐	☐	☐	☐			4.4E-02	8.5E-06						
Bis(2-chloroethyl) ether	111-44-4	143.02	☐	☐	☐	☐	☐	☐	☑		4.9E-06	6.9E-02	7.5E-06	1.8E-05	7.4E-04	4.6E-01	1.7E+04	9.6E+03	1.2E+04
Bis(2-chloroisopropyl) ether	39638-32-9	171.07	☐	☐	☐	☐	☐	☐	☑		3.3E-05	6.3E-02	6.4E-06	1.1E-04	4.6E-03	3.7E-01	1.7E+03	7.9E+02	4.5E+03

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Bis(2-ethylhexyl) phthalate	117-81-7	390.56	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	1.3E-02	4.2E-06	1.0E-07	4.2E-06	1.1E+03	4.0E-01		
Bis(chloromethyl) ether	542-88-1	114.96	☐	☐	☐	☐	☐	☐	☑		3.5E-04	8.9E-02	9.4E-06	2.0E-04	8.2E-03	7.2E-03	2.2E+04	2.4E+03	1.4E+03
Bisphenol A	80-05-7	228.28	☐	☐	☐	☐	☐	☐	☐										
Boron	7440-42-8	10.81	☐	☐	☐	☐	☐	☐	☐										
Boron trifluoride	7637-07-2	67.82	☐	☐	☐	☐	☐	☐	☐										
Bromate	15541-45-4	127.90	☐	☐	☐	☐	☐	☐	☐										
Bromobenzene	108-86-1	157.02	☐	☐	☐	☐	☐	☐	☑		3.9E-04	7.3E-02	8.7E-06	3.7E-03	1.5E-01	1.3E+00	4.7E+02	6.9E+02	1.3E+03
Bromodichloromethane	75-27-4	163.83	☐	☐	☐	☐	☐	☐	☑		2.3E-04	3.0E-02	1.1E-05	1.6E-03	6.6E-02	3.3E-01	6.7E+03	3.0E+03	1.7E+03
Bromoethene	593-60-2	106.96	☐	☐	☐	☐	☐	☐	☑		1.5E-03	1.0E-01	1.2E-05	6.2E-03	2.6E-01	7.6E-01	1.8E+04	1.6E+04	6.7E+02
Bromoform	75-25-2	252.80	☐	☐	☐	☐	☐	☑	☐	0.1	########	1.4E-02	1.0E-05	6.5E+00	2.7E+02	1.3E+00	3.2E+03		
Bromophos	2104-96-3	365.98	☐	☐	☐	☐	☐	☐	☐										
Bromoxynil	1689-84-5	276.91	☐	☐	☐	☐	☐	☐	☐										
Bromoxynil octanoate	1689-99-2	403.11	☐	☐	☐	☐	☐	☐	☐										
Busan	21564-17-0	238.34	☐	☐	☐	☐	☐	☐	☐										
Butadiene, 1,3-	106-99-0	54.09	☐	☐	☐	☐	☐	☐	☑		1.7E-02	9.8E-02	1.1E-05	1.8E-01	7.3E+00	7.2E-01	7.4E+02	1.6E+03	2.0E+02
Butanol, 1-	71-36-3	74.12	☐	☐	☐	☐	☐	☑	☐	0.1				8.8E-06	3.6E-04				
Butyl benzyl phthalate	85-68-7	312.39	☐	☐	☐	☐	☐	☐	☐		1.5E-01	1.7E-02	5.2E-06	1.9E-06	7.8E-05	1.4E+02	2.6E+00		
Butyl glycolyl butyl phthalate	85-70-1	336.42	☐	☐	☐	☐	☐	☐	☐										
Butylate	2008-41-5	217.41	☐	☐	☐	☐	☐	☐	☐										
Butylbenzene, n-	104-51-8	134.22	☐	☐	☐	☐	☐	☐	☑		1.2E-04	7.5E-02	7.8E-06	1.3E-02	5.4E-01	1.7E+01	1.4E+01	2.4E+02	2.3E+03
Butylbenzene, sec-	135-98-8	134.22	☐	☐	☐	☐	☐	☐	☑		2.3E-04	7.5E-02	7.8E-06	1.9E-02	7.7E-01	1.3E+01	1.7E+01	2.2E+02	1.7E+03
Butylbenzene, tert-	98-06-6	134.22	☐	☐	☐	☐	☐	☐	☑		1.5E-04	7.5E-02	7.8E-06	1.3E-02	5.2E-01	1.3E+01	3.0E+01	3.9E+02	2.1E+03
Cacodylic acid	75-60-5	138.00	☐	☐	☐	☐	☐	☐	☐										
Cadmium, elemental	7440-43-9	112.40	☐	☐	☐	☐	☐	☐	☐	0.001									
Calcium cyanide	592-01-8	66.10	☐	☐	☐	☐	☐	☐	☐										
Caprolactam	105-60-2	113.16	☐	☐	☐	☐	☐	☐	☐										
Captafol	2425-06-1	349.06	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Captan	133-06-2	300.60	☐	☐	☐	☐	☐	☐	☐					7.2E-06	2.9E-04				
Carbaryl	63-25-2	201.20	☐	☐	☐	☐	☐	☐	☐										
Carbazole	86-74-8	167.20	☐	☐	☐	☑	☐	☐	☐	0.13				8.7E-08	3.5E-06				
Carbofuran	1563-66-2	221.30	☐	☐	☐	☐	☐	☐	☐										
Carbon disulfide	75-15-0	76.14	☐	☐	☐	☐	☐	☐	☑		1.1E-02	1.0E-01	1.0E-05	3.0E-02	1.2E+00	2.7E-01	1.2E+03	7.2E+02	2.4E+02
Carbon tetrachloride	56-23-5	153.84	☐	☐	☐	☐	☐	☐	☑		3.7E-03	7.8E-02	8.8E-06	3.0E-02	1.2E+00	1.0E+00	7.9E+02	1.1E+03	4.2E+02
Carbosulfan	55285-14-8	380.54	☐	☐	☐	☐	☐	☐	☐										
Carboxin	5234-68-4	235.30	☐	☐	☐	☐	☐	☐	☐										
Cerium	7440-45-1	140.12	☐	☐	☐	☐	☐	☐	☐										
Chloral	75-87-6	147.39	☐	☐	☐	☐	☐	☐	☐										
Chloral hydrate	302-17-0	165.40	☐	☐	☐	☐	☐	☐	☐										
Chloramben	133-90-4	206.03	☐	☐	☐	☐	☐	☐	☐										
Chloranil	118-75-2	245.88	☐	☐	☐	☐	☐	☐	☐										
Chlordane	57-74-9	409.80	☐	☐	☐	☐	☐	☐	☐	0.04				4.9E-05	2.0E-03				
Chlordecone	143-50-0	490.64	☐	☐	☐	☐	☐	☐	☐					2.5E-08	1.0E-06				
Chlorfenvinphos	470-90-6	359.57	☐	☐	☐	☐	☐	☐	☐										
Chlorimuron-ethyl	90982-32-4	414.82	☐	☐	☐	☐	☐	☐	☐										
Chlorine	7782-50-5	70.91	☐	☐	☐	☐	☐	☐	☐										
Chlorine dioxide	10049-04-4	67.46	☐	☐	☐	☐	☐	☐	☐										
Chlorite (sodium chlorite)	7758-19-2	90.44	☐	☐	☐	☐	☐	☐	☐										
Chloro-1,3-butadiene	126-99-8	88.54	☐	☐	☐	☐	☐	☐	☑		1.2E-02	1.1E-01	1.1E-05	3.2E-02	1.3E+00	3.0E-01	7.4E+02	4.8E+02	2.4E+02
Chloro-2-methylaniline hydrochloride, 4-	3165-93-3	178.06	☐	☐	☐	☐	☐	☐	☐										
Chloro-2-methylaniline, 4-	95-69-2	141.60	☐	☐	☐	☐	☐	☐	☐										
Chloroacetic acid	79-11-8	94.50	☐	☐	☐	☐	☐	☐	☐										
Chloroacetophenone, 2-	532-27-4	154.59	☐	☐	☐	☐	☐	☐	☑		2.4E-03	7.2E-02	6.8E-06	3.7E-02	1.5E+00	2.0E+00	4.7E+02	1.1E+03	5.2E+02
Chloroaniline, 4-	106-47-8	127.57	☐	☐	☐	☐	☐	☐	☐		1.5E-01	4.8E-02	1.0E-05	1.2E-06	4.8E-05	3.9E-01	3.4E+03		
Chlorobenzene	108-90-7	112.56	☐	☐	☐	☐	☐	☐	☑		4.0E-04	7.3E-02	8.7E-06	3.7E-03	1.5E-01	1.3E+00	4.7E+02	6.8E+02	1.3E+03

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Chlorobenzilate	510-15-6	325.19	☐	☐	☐	☐	☐	☑	☐	0.1				7.2E-08	3.0E-06				
Chlorobenzoic acid, p-	74-11-3	156.57	☐	☐	☐	☐	☐	☐	☐										
Chlorobenzotrifluoride, 4-	98-56-6	180.56	☐	☐	☐	☐	☐	☐	☐										
Chlorobutane, 1-	109-69-3	92.57	☐	☐	☐	☐	☐	☐	☑		1.2E-02	1.1E-01	1.1E-05	3.2E-02	1.3E+00	3.0E-01	7.4E+02	4.8E+02	2.4E+02
Chlorodifluoromethane	75-45-6	86.47	☐	☐	☐	☐	☐	☐	☑		1.4E-02	8.0E-02	1.0E-05	1.0E-01	4.1E+00	3.5E-01	2.8E+02	3.4E+02	2.2E+02
Chloroform	67-66-3	119.38	☐	☐	☐	☐	☐	☐	☑		2.2E-03	1.0E-01	1.0E-05	3.7E-03	1.5E-01	2.4E-01	7.9E+03	2.9E+03	5.4E+02
Chloro-m-cresol, p-	59-50-7	142.58	☐	☐	☐	☐	☐	☐	☐		1.5E-01	7.0E-02	8.1E-06	4.0E-07	1.6E-05	3.7E+00	3.9E+03		
Chloronaphthalene, beta-	91-58-7	162.62	☐	☐	☐	☐	☐	☐	☑		2.4E-06	3.5E-02	8.8E-06	3.1E-04	1.3E-02	9.3E+00	1.2E+01	1.1E+02	1.6E+04
Chloronitrobenzene, o-	88-73-3	157.56	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Chloronitrobenzene, p-	100-00-5	157.56	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Chlorophenol, 2-	95-57-8	128.56	☐	☐	☐	☐	☐	☐	☑		1.7E-04	5.0E-01	9.5E-06	3.9E-04	1.6E-02	2.4E+00	2.2E+04	5.5E+04	2.0E+03
Chloropropane, 2-	75-29-6	78.54	☐	☐	☐	☐	☐	☐	☑		9.3E-04	8.0E-02	1.0E-05	2.3E-03	9.4E-02	3.1E-01	2.7E+03	1.1E+03	8.4E+02
Chlorothalonil	1897-45-6	235.91	☐	☐	☐	☐	☐	☑	☐	0.1				2.7E-07	1.1E-05				
Chlorotoluene, o-	95-49-8	126.59	☐	☐	☐	☐	☐	☐	☑		4.9E-04	7.2E-02	8.7E-06	3.5E-03	1.4E-01	9.6E-01	4.7E+02	5.1E+02	1.2E+03
Chlorotoluene, p-	106-43-4	126.59	☐	☐	☐	☐	☐	☐	☐										
Chlorpropham	101-21-3	213.67	☐	☐	☐	☐	☐	☐	☐										
Chlorpyrifos	2921-88-2	350.57	☐	☐	☐	☐	☐	☐	☐					2.9E-06	1.2E-04				
Chlorpyrifos methyl	5598-13-0	322.53	☐	☐	☐	☐	☐	☐	☐										
Chlorsulfuron	64902-72-3	357.77	☐	☐	☐	☐	☐	☐	☐										
Chlorthiophos	60238-56-4	361.24	☐	☐	☐	☐	☐	☐	☐										
Chromic acid	7738-94-5	100.00	☐	☐	☐	☐	☐	☐	☐										
Chromium (III)	16065-83-1	52.00	☐	☐	☐	☐	☐	☐	☐										
Chromium (VI)	18540-29-9	52.00	☐	☐	☐	☐	☐	☐	☐			1.4E-01	1.6E-05			1.9E+01			
Chrysene	218-01-9	228.30	☐	☐	☐	☑	☐	☐	☐	0.13	2.1E-09	2.5E-02	6.2E-06	9.5E-05	3.9E-03	2.4E+03	1.6E-03		
Cobalt	7440-48-4	58.93	☐	☐	☐	☐	☐	☐	☐							2.1E-02			
Coke oven emissions	8007-45-2		☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Copper cyanide	544-92-3	89.56	☐	☐	☐	☐	☐	☐	☐										
Copper, elemental	7440-50-8	63.55	☐	☐	☐	☐	☐	☐	☐										
Cresol, m-	108-39-4	108.14	☐	☐	☐	☐	☐	☐	☐										
Cresol, o-	95-48-7	108.14	☐	☐	☐	☐	☐	☐	☐		1.5E-01	6.9E-02	9.4E-06	1.6E-06	6.6E-05	5.3E-01	2.8E+04		
Cresol, p-	106-44-5	108.14	☐	☐	☐	☐	☐	☐	☐		1.5E-01	6.9E-02	9.3E-06	8.0E-07	3.3E-05	4.6E-01	2.3E+04		
Crotonaldehyde, trans-	123-73-9	70.09	☐	☐	☐	☐	☐	☐	☑					2.0E-05	8.0E-04		1.5E+05		
Cumene	98-82-8	120.19	☐	☐	☐	☐	☐	☐	☑		1.2E-03	7.5E-02	7.1E-06	1.2E-02	4.7E-01	1.3E+00	6.1E+01	9.2E+01	7.3E+02
Cyanazine	21725-46-2	240.69	☐	☐	☐	☐	☐	☐	☐					2.6E-10	1.1E-08				
Cyanide	57-12-5	26.02	☐	☐	☐	☐	☐	☐	☐			5.5E-01	2.1E-05						
Cyanogen	460-19-5	52.04	☐	☐	☐	☐	☐	☐	☑		3.5E-03	9.6E-02	1.0E-05	5.0E-03	2.1E-01	1.6E-01	8.5E+03	2.5E+03	4.4E+02
Cyanogen bromide	506-68-3	105.92	☐	☐	☐	☐	☐	☐	☑		3.5E-03	9.6E-02	1.0E-05	5.0E-03	2.1E-01	1.6E-01	8.5E+03	2.5E+03	4.4E+02
Cyanogen chloride	506-77-4	61.48	☐	☐	☐	☐	☐	☐	☑		3.5E-03	9.6E-02	1.0E-05	5.0E-03	2.1E-01	1.6E-01	8.5E+03	2.5E+03	4.4E+02
Cyclohexane	110-82-7	84.16	☐	☐	☐	☐	☐	☐	☑		1.3E-02	8.0E-02	9.0E-06	2.0E-01	8.2E+00	9.6E-01	5.5E+01	1.4E+02	2.2E+02
Cyclohexanone	108-94-1	94.14	☐	☐	☐	☐	☐	☐	☐										
Cyclohexylamine	108-91-8	99.17	☐	☐	☐	☐	☐	☐	☐										
Cyclopentadiene	542-92-7	66.10	☐	☐	☐	☐	☐	☐	☑					2.1E-02	8.7E-01		1.8E+03		
Cyhalothrin	68085-85-8	449.86	☐	☐	☐	☐	☐	☐	☐										
Cypermethrin	52315-07-8	416.30	☐	☐	☐	☐	☐	☐	☐										
Cyromazine	66215-27-8	166.19	☐	☐	☐	☐	☐	☐	☐										
Dacthal	1861-32-1	331.97	☐	☐	☐	☐	☐	☐	☐										
Dalapon	75-99-0	142.97	☐	☐	☐	☐	☐	☐	☐										
Danitol	39515-41-8	349.43	☐	☐	☐	☐	☐	☐	☐										
DDD	72-54-8	320.05	☐	☐	☐	☐	☐	☑	☐	0.1				4.0E-06	1.6E-04				
DDE	72-55-9	318.03	☐	☐	☐	☐	☐	☑	☐	0.1				2.1E-05	8.6E-04				
DDT	50-29-3	354.50	☐	☐	☐	☐	☐	☐	☐	0.03				8.1E-06	3.3E-04				
Decabromodiphenyl ether	1163-19-5	959.17	☐	☐	☐	☐	☐	☐	☐										
Demeton	8065-48-3	258.34	☐	☐	☐	☐	☐	☐	☐										
Di(2-ethylhexyl)adipate	103-23-1	370.57	☐	☐	☐	☐	☐	☑	☐	0.1				2.1E-05	8.7E-04				

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Diallate	2303-16-4	270.22	☐	☐	☐	☐	☐	☑	☐	0.1				3.8E-06	1.6E-04				
Diazinon	333-41-5	304.36	☐	☐	☐	☐	☐	☐	☐					1.2E-07	4.8E-06				
Dibenz(a,h)anthracene	53-70-3	278.35	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	1.8E-02	6.0E-06	1.1E-08	4.6E-07	1.8E+04	6.7E-04		
Dibenzofuran	132-64-9	168.19	☐	☐	☐	☑	☐	☐	☑	0.13	3.7E-08	6.0E-02	1.0E-05	1.3E-05	5.3E-04	4.7E+01	3.1E+00	1.4E+02	1.3E+05
Dibromo-3-chloropropane, 1,2-	96-12-8	236.33	☐	☐	☐	☐	☐	☑	☐	0.1	7.6E-06	2.1E-02	7.0E-06	1.5E-04	6.0E-03	7.8E-01	1.2E+03		
Dibromobenzene, 1,4-	106-37-6	235.90	☐	☐	☐	☐	☐	☐	☐										
Dibromochloromethane	124-48-1	208.28	☐	☐	☐	☐	☐	☑	☐	0.1	6.0E-05	9.6E-02	1.0E-05	8.5E-04	3.5E-02	2.8E+00	4.4E+03		
Dibromoethane, 1,2-	106-93-4	187.88	☐	☐	☐	☐	☐	☐	☑		1.8E-04	7.3E-02	8.1E-06	3.2E-04	1.3E-02	2.6E-01	3.4E+03	1.2E+03	1.9E+03
Dibromomethane	74-95-3	173.83	☐	☐	☐	☐	☐	☐	☑		7.2E-04	9.6E-02	1.0E-05	9.0E-04	3.7E-02	1.5E-01	1.2E+04	3.0E+03	9.6E+02
Dibutyl phthalate	84-74-2	278.34	☐	☐	☐	☐	☐	☐	☐		1.5E-01	4.4E-02	7.9E-06	1.4E-06	5.9E-05	1.6E+01	1.1E+01		
Dibutyl tin dichloride	683-18-1	303.83	☐	☐	☐	☐	☐	☐	☐										
Dicamba	1918-00-9	221.04	☐	☐	☐	☐	☐	☐	☐										
Dichloro-2-butene, 1,4-	764-41-0	124.99	☐	☐	☐	☐	☐	☐	☑		1.0E-04	7.2E-02	8.1E-06	2.6E-04	1.1E-02	2.9E-01	2.8E+03	1.1E+03	2.5E+03
Dichloroacetic acid	79-43-6	128.94	☐	☐	☐	☐	☐	☐	☐										
Dichlorobenzene, 1,2-	95-50-1	147.01	☐	☐	☐	☐	☐	☐	☑		7.3E-05	6.9E-02	7.9E-06	1.9E-03	7.8E-02	3.7E+00	1.6E+02	6.0E+02	3.0E+03
Dichlorobenzene, 1,3-	541-73-1	147.01	☐	☐	☐	☐	☐	☐	☑		7.3E-05	6.9E-02	7.9E-06	1.9E-03	7.8E-02	3.7E+00	1.6E+02	6.0E+02	3.0E+03
Dichlorobenzene, 1,4-	106-46-7	147.01	☐	☐	☐	☐	☐	☐	☑		9.4E-05	6.9E-02	7.9E-06	2.4E-03	1.0E-01	3.7E+00	7.4E+01	2.8E+02	2.7E+03
Dichlorobenzidine, 3,3'-	91-94-1	253.13	☐	☐	☐	☐	☐	☑	☐	0.1				4.0E-09	1.6E-07				
Dichlorobenzophenone, 4,4'-	90-98-2	251.11	☐	☐	☐	☐	☐	☐	☐										
Dichlorodifluoromethane	75-71-8	120.91	☐	☐	☐	☐	☐	☐	☑		1.4E-02	8.0E-02	1.0E-05	1.0E-01	4.1E+00	3.5E-01	2.8E+02	3.4E+02	2.2E+02
Dichloroethane, 1,1-	75-34-3	98.97	☐	☐	☐	☐	☐	☐	☑		2.7E-03	7.4E-02	1.0E-05	5.6E-03	2.3E-01	1.9E-01	5.1E+03	1.7E+03	5.0E+02
Dichloroethane, 1,2-	107-06-2	98.96	☐	☐	☐	☐	☐	☐	☑		1.0E-03	1.0E-01	9.9E-06	9.8E-04	4.0E-02	1.0E-01	8.5E+03	1.8E+03	8.0E+02
Dichloroethylene, 1,1-	75-35-4	96.95	☐	☐	☐	☐	☐	☐	☑		7.7E-03	9.0E-02	1.0E-05	2.6E-02	1.1E+00	3.5E-01	2.3E+03	1.5E+03	2.9E+02
Dichloroethylene, 1,2-	540-59-0	96.95	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Dichloroethylene, cis-1,2-	156-59-2	96.95	☐	☐	☐	☐	☐	☐	☑		1.9E-03	7.4E-02	1.1E-05	4.1E-03	1.7E-01	2.1E-01	3.5E+03	1.2E+03	5.9E+02
Dichloroethylene, trans-	156-60-5	96.95	☐	☐	☐	☐	☐	☐	☑		2.9E-03	7.1E-02	1.2E-05	9.4E-03	3.8E-01	3.2E-01	6.3E+03	3.1E+03	4.8E+02
Dichlorophenol, 2,4-	120-83-2	163.00	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	2.7E-02	7.8E-06	3.2E-06	1.3E-04	1.4E+00	4.9E+03		
Dichlorophenoxy acetic acid, 2,4-	94-75-7	221.04	☐	☐	☐	☐	☐	☐	☐	0.05									
Dichlorophenoxybutyric acid, 2,4-	94-82-6	249.09	☐	☐	☐	☐	☐	☐	☐										
Dichloropropane, 1,2-	78-87-5	112.99	☐	☐	☐	☐	☐	☐	☑		1.2E-03	7.8E-02	8.7E-06	2.8E-03	1.1E-01	2.6E-01	2.8E+03	1.1E+03	7.4E+02
Dichloropropane, 1,3-	142-28-9	112.99	☐	☐	☐	☐	☐	☐	☑		1.2E-03	7.8E-02	8.7E-06	2.8E-03	1.1E-01	2.6E-01	2.8E+03	1.1E+03	7.4E+02
Dichloropropanol, 2,3-	616-23-9	128.99	☐	☐	☐	☐	☐	☐	☐										
Dichloropropene, 1,3-	542-75-6	110.98	☐	☐	☐	☐	☐	☐	☑		4.6E-03	6.3E-02	1.0E-05	1.8E-02	7.3E-01	2.7E-01	2.8E+03	1.4E+03	3.8E+02
Dichlorvos	62-73-7	220.98	☐	☐	☐	☐	☐	☐	☐					1.5E-03	6.3E-02				
Dicyclopentadiene	77-73-6	132.21	☐	☐	☐	☐	☐	☐	☑		4.2E-04	6.7E-02	1.0E-05	1.1E-02	4.4E-01	3.4E+00	1.8E+03	6.5E+03	1.2E+03
Dieldrin	60-57-1	380.93	☐	☐	☐	☐	☐	☑	☐	0.1				1.5E-05	6.2E-04				
Diesel engine exhaust	Diesel		☐	☐	☐	☐	☐	☐	☐										
Diethyl phthalate	84-66-2	222.23	☐	☐	☐	☐	☐	☐	☐		1.5E-01	2.6E-02	6.4E-06	4.5E-07	1.8E-05	8.2E-01	8.8E+02		
Diethylene glycol monobutyl ether	112-34-5	162.23	☐	☐	☐	☐	☐	☐	☐					5.3E-06	2.2E-04		1.0E+06		
Diethylene glycol monoethyl ether	111-90-0	134.17	☐	☐	☐	☐	☐	☑	☐	0.1				8.6E-10	3.5E-08				
Diethylformamide	617-84-5	101.15	☐	☐	☐	☐	☐	☐	☐										
Diethylstilbestrol	56-53-1	268.35	☐	☐	☐	☐	☐	☑	☐	0.1				5.8E-12	2.4E-10				
Difenzoquat	43222-48-6	360.43	☐	☐	☐	☐	☐	☐	☐										
Diflubenzuron	35367-38-5	310.69	☐	☐	☐	☐	☐	☐	☐										
Difluoroethane, 1,1-	75-37-6	66.05	☐	☐	☐	☐	☐	☐	☑					2.0E-02	8.2E-01		1.8E+04		
Diisononyl phthalate	28553-12-0	418.62	☐	☐	☐	☐	☐	☐	☐										
Diisopropyl ether	108-20-3	102.17	☐	☐	☐	☐	☐	☐	☑					2.3E-03	9.4E-02		8.8E+03		
Diisopropyl methylphosphonate	1445-75-6	180.18	☑	☐	☐	☐	☐	☐	☑					4.4E-05	1.8E-03		1.5E+03		
Dimethipin	55290-64-7	210.26	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Dimethoate	60-51-5	229.25	☐	☐	☐	☐	☐	☐	☐										
Dimethoxybenzidine, 3,3'-	119-90-4	244.29	☐	☐	☐	☐	☐	☑	☐	0.1				1.8E-13	7.4E-12				
Dimethyl methylphosphonate	756-79-6	124.08	☐	☐	☐	☐	☐	☐	☐										
Dimethyl terephthalate	120-61-6	194.19	☐	☐	☐	☐	☐	☐	☐										
Dimethylaniline hydrochloride, 2,4-	21436-96-4	157.64	☐	☐	☐	☐	☐	☐	☐										
Dimethylaniline, 2,4-	95-68-1	121.18	☐	☐	☐	☐	☐	☐	☐										
Dimethylaniline, N,N-	121-69-7	121.18	☐	☐	☐	☐	☐	☐	☐										
Dimethylbenzidine, 3,3'-	119-93-7	212.29	☐	☐	☐	☐	☐	☑	☐	0.1				6.3E-11	2.6E-09				
Dimethylformamide	68-12-2	73.09	☐	☐	☐	☐	☐	☐	☐					7.4E-08	3.0E-06				
Dimethylhydrazine, 1,1-	57-14-7	60.12	☐	☐	☐	☐	☐	☐	☐					6.9E-08	2.8E-06				
Dimethylhydrazine, 1,2-	540-73-8	60.10	☐	☐	☐	☐	☐	☐	☐					6.9E-08	2.8E-06				
Dimethylphenethylamine	122-09-8	149.24	☐	☐	☐	☐	☐	☐	☐			6.8E-02	7.8E-06						
Dimethylphenol, 2,4-	105-67-9	122.17	☐	☐	☐	☐	☐	☐	☐		1.5E-01	5.8E-02	8.7E-06	3.2E-06	1.3E-04	1.3E+00	6.3E+03		
Dimethylphenol, 2,6-	576-26-1	122.17	☐	☐	☐	☐	☐	☐	☐										
Dimethylphenol, 3,4-	95-65-8	122.17	☐	☐	☐	☐	☐	☐	☐										
Dinitrobenzene, 1,2-	528-29-0	168.11	☐	☐	☐	☐	☐	☐	☐										
Dinitrobenzene, 1,3-	99-65-0	168.11	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	3.2E-02	9.2E-06	2.3E-07	9.5E-06	2.1E-01	5.4E+02		
Dinitrobenzene, 1,4-	100-25-4	168.11	☐	☐	☐	☐	☐	☐	☐										
Dinitro-o-cresol, 4,6-	534-52-1	198.13	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	2.8E-02	6.9E-06	4.3E-07	1.8E-05	6.5E-01			
Dinitro-o-cyclohexyl phenol, 4,6-	131-89-5	266.25	☐	☐	☐	☐	☐	☐	☐										
Dinitrophenol, 2,4-	51-28-5	184.11	☐	☐	☐	☐	☐	☐	☐		1.5E-01	2.7E-02	9.1E-06	4.8E-09	2.0E-07	1.0E-04	5.8E+03		
Dinitrotoluene	25321-14-6	182.15	☐	☐	☐	☐	☐	☐	☐								2.7E+02		
Dinitrotoluene, 2,4-	121-14-2	182.14	☐	☐	☐	☐	☐	☑	☐	0.102	1.5E-01	3.1E-02	7.9E-06	9.3E-08	3.8E-06	5.1E-01	2.9E+02		
Dinitrotoluene, 2,6-	606-20-2	182.14	☐	☐	☐	☐	☐	☑	☐	0.099	1.5E-01	3.1E-02	7.8E-06	7.5E-07	3.1E-05	4.2E-01	1.1E+03		
Di-n-octyl phthalate	117-84-0	390.56	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	1.3E-02	4.2E-06	6.7E-05	2.7E-03	9.0E+06	3.0E+00		

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Dinoseb	88-85-7	240.22	☐	☐	☐	☐	☐	☐	☐										
Dioxane, 1,4-	123-91-1	88.10	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	9.2E-02	1.0E-05	4.8E-06	2.0E-04	8.8E-03	9.0E+05		
Diphenamid	957-51-7	239.32	☐	☐	☐	☐	☐	☐	☐										
Diphenyl sulfone	127-63-9	218.27	☐	☐	☐	☐	☐	☐	☐										
Diphenyl-1,4-benzenediamine, N,N'-	74-31-7	260.34	☐	☐	☐	☐	☐	☐	☐										
Diphenylamine	122-39-4	169.24	☐	☐	☐	☐	☐	☐	☐			5.8E-02	6.3E-06	3.2E-06	1.3E-04		3.0E+02		
Diphenylhydrazine, 1,2-	122-66-7	184.24	☐	☐	☐	☐	☐	☑	☐	0.1				1.5E-06	6.3E-05		2.2E+02		
Diquat	85-00-7	344.07	☐	☐	☐	☐	☐	☐	☐										
Direct black 38	1937-37-7	781.73	☐	☐	☐	☐	☐	☐	☐										
Direct blue 6	2602-46-2	932.74	☐	☐	☐	☐	☐	☐	☐										
Direct brown 95	16071-86-6	760.10	☐	☐	☐	☐	☐	☐	☐										
Disulfoton	298-04-4	274.38	☐	☐	☐	☐	☐	☑	☐	0.1				4.0E-06	1.6E-04				
Dithiane, 1,4-	505-29-3	120.23	☐	☐	☐	☐	☐	☐	☐										
Diuron	330-54-1	233.10	☐	☐	☐	☐	☐	☐	☐										
Dodine	2439-10-3	287.44	☐	☐	☐	☐	☐	☐	☐										
Dysprosium	7429-91-6	162.50	☐	☐	☐	☐	☐	☐	☐										
EA 2192	73207-98-4		☑	☐	☐	☐	☐	☐	☐										
EMPA	1832-53-7		☑	☐	☐	☐	☐	☐	☐								1.8E+05		
Endosulfan	115-29-7	406.95	☐	☐	☐	☐	☐	☐	☐					1.1E-05	4.6E-04				
Endothall	145-73-3	186.16	☐	☐	☐	☐	☐	☐	☐										
Endrin	72-20-8	380.93	☐	☐	☐	☐	☐	☐	☐					7.5E-06	3.1E-04				
Epichlorohydrin	106-89-8	92.53	☐	☐	☐	☐	☐	☐	☑		5.0E-05	8.8E-02	9.8E-06	3.2E-05	1.3E-03	2.1E-02	6.0E+04	7.3E+03	3.6E+03
Epoxybutane, 1,2-	106-88-7	72.11	☐	☐	☐	☐	☐	☐	☑					1.8E-04	7.4E-03		9.5E+04		
EPTC	759-94-4	189.32	☐	☐	☐	☐	☐	☐	☐										
Ethephon	16672-87-0	144.49	☐	☐	☐	☐	☐	☐	☐										
Ethion	563-12-2	384.48	☐	☐	☐	☐	☐	☐	☐										
Ethoxyethanol, 2-	110-80-5	90.12	☐	☐	☐	☐	☐	☑	☐	0.1				1.2E-07	5.0E-06				

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Ethoxyethyl acetate, 2-	111-15-9	132.16	☐	☐	☐	☐	☐	☐	☐					1.8E-06	7.4E-05		2.3E+05		
Ethyl acetate	141-78-6	88.10	☐	☐	☐	☐	☐	☐	☑		4.8E-05	7.3E-02	9.7E-06	1.4E-04	5.7E-03	3.6E-01	8.0E+04	3.7E+04	3.7E+03
Ethyl acrylate	140-88-5	100.11	☐	☐	☐	☐	☐	☐	☑		6.7E-03	9.1E-02	8.6E-06	2.4E-01	9.8E+00	5.0E+00	2.0E+01	1.4E+02	3.1E+02
Ethyl chloride	75-00-3	64.52	☐	☐	☐	☐	☐	☐	☑		9.0E-03	1.0E-01	1.2E-05	1.1E-02	4.5E-01	8.8E-02	5.7E+03	1.6E+03	2.7E+02
Ethyl ether	60-29-7	74.12	☐	☐	☐	☐	☐	☐	☑		1.1E-05	7.0E-02	9.3E-06	1.3E-05	5.3E-04	8.4E-02	1.0E+04	1.8E+03	7.8E+03
Ethyl methacrylate	97-63-2	114.14	☐	☐	☐	☐	☐	☐	☑		6.8E-03	9.1E-02	8.6E-06	2.4E-01	1.0E+01	5.0E+00	2.0E+01	1.4E+02	3.1E+02
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	323.31	☐	☐	☐	☐	☐	☐	☐										
Ethylbenzene	100-41-4	106.16	☐	☐	☐	☐	☐	☐	☑		5.4E-04	7.5E-02	7.8E-06	7.9E-03	3.2E-01	2.2E+00	1.7E+02	4.0E+02	1.1E+03
Ethylene cyanohydrin	109-78-4	71.08	☐	☐	☐	☐	☐	☐	☐										
Ethylene diamine	107-15-3	60.10	☐	☐	☐	☐	☐	☐	☐										
Ethylene glycol	107-21-1	62.07	☐	☐	☐	☐	☐	☑	☐	0.1				6.0E-08	2.5E-06				
Ethylene glycol monobutyl ether	111-76-2	118.17	☐	☐	☐	☐	☐	☑	☐	0.1				2.1E-07	8.5E-06				
Ethylene oxide	75-21-8	44.05	☐	☐	☐	☐	☐	☐	☑		1.8E-04	1.3E-01	1.5E-05	7.6E-05	3.1E-03	1.3E-02	1.0E+06	1.1E+05	1.9E+03
Ethylene thiourea	96-45-7	102.15	☐	☐	☐	☐	☐	☑	☐	0.1				3.1E-10	1.3E-08				
Ethylphthalyl ethyl glycolate	84-72-0	280.28	☐	☐	☐	☐	☐	☐	☐										
Express	101200-48-0	395.39	☐	☐	☐	☐	☐	☐	☐										
Fenamiphos	22224-92-6	303.40	☐	☐	☐	☐	☐	☐	☐										
Fluometuron	2164-17-2	232.20	☐	☐	☐	☐	☐	☐	☐										
Fluoranthene	206-44-0	202.26	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	2.8E-02	7.2E-06	1.6E-05	6.6E-04	4.9E+02	2.3E-01		
Fluorene	86-73-7	166.22	☐	☐	☐	☑	☐	☐	☑	0.13	1.2E-07	6.1E-02	7.9E-06	7.7E-05	3.2E-03	8.3E+01	1.9E+00	1.6E+02	7.4E+04
Fluoride, sodium	7681-49-4	41.99	☐	☐	☐	☐	☐	☐	☐								4.3E-02		
Fluorine	7782-41-4	38.00	☐	☐	☐	☐	☐	☐	☐										
Fluridone	59756-60-4	329.32	☐	☐	☐	☐	☐	☐	☐										
Flurprimidol	56425-91-3	312.29	☐	☐	☐	☐	☐	☐	☐										
Flutolanil	66332-96-5	323.31	☐	☐	☐	☐	☐	☐	☐										
Fluvalinate	69409-94-5	502.92	☐	☐	☐	☐	☐	☐	☐										
Folpet	133-07-3	296.56	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Fomesafen	72178-02-0	438.86	☐	☐	☐	☐	☐	☐	☐										
Fonofos	944-22-9	246.32	☐	☐	☐	☐	☐	☐	☐										
Formaldehyde	50-00-0	30.03	☐	☐	☐	☐	☐	☐	☐		1.5E-01	5.0E-01	1.7E-05	3.4E-07	1.4E-05	2.6E-02	5.5E+05		
Formic acid	64-18-6	46.03	☐	☐	☐	☐	☐	☑	☐	0.1				1.7E-07	6.8E-06				
Fosetyl-aluminum	39148-24-8	354.11	☐	☐	☐	☐	☐	☐	☐										
Furan	110-00-9	68.08	☐	☐	☐	☐	☐	☐	☑		5.6E-03	1.0E-01	1.2E-05	5.4E-03	2.2E-01	7.4E-02	1.0E+04	2.2E+03	3.4E+02
Furazolidone	67-45-8	225.16	☐	☐	☐	☐	☐	☐	☐										
Furfural	98-01-1	96.08	☐	☐	☐	☐	☐	☐	☐					3.7E-06	1.5E-04		8.3E+04		
Furium	531-82-8	253.23	☐	☐	☐	☐	☐	☐	☐										
Furmecyclox	60568-05-0	251.32	☐	☐	☐	☐	☐	☐	☐										
GA	77-81-6	162.13	☐	☑	☐	☐	☐	☐	☐	0.062	2.4E-07	9.2E-02	7.5E-06	1.5E-07	6.2E-06	2.3E-01	9.8E+04		
GB	107-44-8	140.09	☐	☑	☐	☐	☐	☐	☐	0.084	5.4E-07	1.0E-01	8.2E-06	5.3E-07	2.2E-05	2.1E-01			
GD	96-64-0	182.18	☐	☑	☐	☐	☐	☐	☐	0.19	5.6E-07	8.2E-02	6.8E-06	4.6E-06	1.9E-04	1.4E+00	2.1E+04		
GF	329-99-7	180.16	☐	☑	☐	☐	☐	☐	☐										
Glufosinate ammonium	77182-82-2	198.16	☐	☐	☐	☐	☐	☐	☐										
Glycidaldehyde	765-34-4	72.06	☐	☐	☐	☐	☐	☑	☐	0.1				3.1E-07	1.3E-05				
Glyphosate	1071-83-6	169.07	☐	☐	☐	☐	☐	☐	☐										
Haloxyfop-methyl	69806-40-2	375.73	☐	☐	☐	☐	☐	☐	☐										
Harmony	79277-27-3	387.38	☐	☐	☐	☐	☐	☐	☐										
HCFC-142b	75-68-3	100.50	☐	☐	☐	☐	☐	☐	☑		1.4E-02	8.0E-02	1.0E-05	1.0E-01	4.1E+00	3.5E-01	2.8E+02	3.4E+02	2.2E+02
HD	505-60-2	159.08	☐	☑	☐	☐	☐	☐	☑	0.17	5.0E-06	9.9E-02	8.4E-06	2.1E-05	8.6E-04	8.0E-01	9.2E+02	8.3E+02	1.2E+04
Heptachlor	76-44-8	373.32	☐	☐	☐	☐	☐	☑	☐	0.1				1.5E+00	6.1E+01				
Heptachlor epoxide	1024-57-3	389.40	☐	☐	☐	☐	☐	☐	☐					9.5E-06	3.9E-04				
Hexabromobenzene	87-82-1	551.49	☐	☐	☐	☐	☐	☐	☐										
Hexachlorobenzene	118-74-1	284.78	☐	☐	☐	☐	☐	☑	☐	0.1	1.7E-01	1.4E-02	7.8E-06	1.3E-03	5.4E-02	8.0E+02	8.6E-03		
Hexachlorobutadiene	87-68-3	260.76	☐	☐	☐	☐	☐	☐	☐		2.4E-01	1.7E-02	7.3E-06	8.1E-03	3.3E-01	6.9E+01	2.5E+00		
Hexachlorocyclohexane, alpha-	319-84-6	290.83	☐	☐	☐	☐	☐	☑	☐	0.1				1.1E-05	4.3E-04				
Hexachlorocyclohexane, beta-	319-85-7	290.83	☐	☐	☐	☐	☐	☐	☐					7.4E-07	3.0E-05				

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Hexachlorocyclohexane, technical	608-73-1	290.73	☐	☐	☐	☐	☐	☐	☐										
Hexachlorocyclopentadiene	77-47-4	272.75	☐	☐	☐	☐	☐	☑	☐	0.1	4.6E-01	1.6E-02	7.2E-06	2.7E-02	1.1E+00	9.5E+01	1.5E+00		
Hexachloroethane	67-72-1	236.74	☐	☐	☐	☐	☐	☑	☐	0.1	2.0E-01	1.8E-02	8.9E-06	3.9E-03	1.6E-01	1.8E+01	4.1E+01		
Hexachlorophene	70-30-4	406.91	☐	☐	☐	☐	☐	☐	☐										
Hexamethylene diisocyanate	822-06-0	168.22	☐	☐	☐	☐	☐	☐	☐										
Hexane, commercial	110-54-3	86.18	☐	☐	☐	☐	☐	☐	☑		8.2E-03	2.0E-01	7.8E-06	1.2E-01	5.0E+00	5.3E+00	1.8E+01	1.1E+02	2.8E+02
Hexazinone	51235-04-2	252.32	☐	☐	☐	☐	☐	☐	☐										
HFC-134A	811-97-2	102.03	☐	☐	☐	☐	☐	☐	☑					1.5E+00	6.3E+01		6.7E+01		
HMX	2691-41-0	296.16	☐	☐	☐	☐	☐	☐	☐	0.006									
Hydrazine	302-01-2	32.05	☐	☐	☐	☐	☐	☐	☐					6.1E-07	2.5E-05				
Hydrazine sulfate	10034-93-2	130.12	☐	☐	☐	☐	☐	☐	☐										
Hydrogen chloride	7647-01-0	36.47	☐	☐	☐	☐	☐	☐	☐			1.7E-01	2.0E-05						
Hydrogen cyanide	74-90-8	27.03	☐	☐	☐	☐	☐	☐	☑		2.4E-04	1.8E-01	1.8E-05	1.3E-04	5.3E-03	1.0E-01	1.0E+06	2.1E+05	1.7E+03
Hydrogen sulfide	7783-06-4	34.08	☐	☐	☐	☐	☐	☐	☐								4.0E+03		
Hydroquinone	123-31-9	110.11	☐	☐	☐	☐	☐	☐	☐										
Imazalil	35554-44-0	297.18	☐	☐	☐	☐	☐	☐	☐										
Imazaquin	81335-37-7	311.34	☐	☐	☐	☐	☐	☐	☐										
Indeno(1,2,3-cd)pyrene	193-39-5	276.34	☐	☐	☐	☑	☐	☐	☐	0.13	1.5E-01	1.9E-02	5.7E-06	4.9E-09	2.0E-07	4.1E+04	1.1E-02		
Iodine	7553-56-2	253.81	☐	☐	☐	☐	☐	☐	☐										
Iprodione	36734-19-7	330.17	☐	☐	☐	☐	☐	☐	☐										
Iron	7439-89-6	55.85	☐	☐	☐	☐	☐	☐	☐			1.3E-01	1.5E-05			1.0E-03			
Isobutyl alcohol	78-83-1	74.12	☐	☐	☐	☐	☐	☐	☑		4.8E-06	8.6E-02	9.3E-06	1.2E-05	4.9E-04	3.7E-01	8.5E+04	4.0E+04	1.2E+04
Isophorone	78-59-1	138.21	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	5.2E-02	7.5E-06	6.6E-06	2.7E-04	3.0E-01	1.2E+04		
Isopropalin	33820-53-0	309.36	☐	☐	☐	☐	☐	☐	☐										
Isopropyl methyl phosphonic acid	1832-54-8	138.10	☑	☐	☐	☐	☐	☐	☐								4.8E+04		
Isoxaben	82558-50-7	332.40	☐	☐	☐	☐	☐	☐	☐										
JP-4 jet fuel	50815-00-4		☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
JP-5/JP-8 jet fuel	94114-58-6		☐	☐	☐	☐	☐	☐	☐										
JP-7 jet fuel	JP-7		☐	☐	☐	☐	☐	☐	☐										
Kerosene	8008-20-6		☐	☐	☐	☐	☐	☐	☐										
Lactofen	77501-63-4	461.78	☐	☐	☐	☐	☐	☐	☐										
Lewisite	541-25-3	207.32	☐	☑	☐	☐	☐	☐	☐			9.9E-02	9.0E-06	3.2E-04	1.3E-02		5.0E+02		
Lewisite oxide	3088-37-7		☑	☐	☐	☐	☐	☐	☐										
Lindane	58-89-9	290.85	☐	☐	☐	☐	☐	☐	☐	0.04				1.4E-05	5.7E-04				
Linuron	330-55-2	249.10	☐	☐	☐	☐	☐	☐	☐										
Lithium	7439-93-2	6.94	☐	☐	☐	☐	☐	☐	☐										
Lithium perchlorate	7791-03-9	106.39	☐	☐	☐	☐	☐	☐	☐										
Londax	83055-99-6	410.40	☐	☐	☐	☐	☐	☐	☐										
Lutetium	7439-94-3		☐	☐	☐	☐	☐	☐	☐										
Malathion	121-75-5	330.36	☐	☐	☐	☐	☐	☑	☐	0.1				4.9E-09	2.0E-07				
Maleic anhydride	108-31-6	98.06	☐	☐	☐	☐	☐	☐	☐										
Maleic hydrazide	123-33-1	112.09	☐	☐	☐	☐	☐	☐	☑		3.2E-03	9.0E-02	1.1E-05	6.6E-03	2.7E-01	2.5E-01	6.0E+03	2.4E+03	4.6E+02
Malononitrile	109-77-3	66.06	☐	☐	☐	☐	☐	☐	☐										
Mancozeb	8018-01-7	265.28	☐	☐	☐	☐	☐	☐	☐										
Maneb	12427-38-2	265.28	☐	☐	☐	☐	☐	☐	☐										
Manganese	7439-96-5	54.94	☐	☐	☐	☐	☐	☐	☐										
MCPA	94-74-6	200.62	☐	☐	☐	☐	☐	☐	☐										
MCPB	94-81-5	228.67	☐	☐	☐	☐	☐	☐	☐										
MCPP	93-65-2	214.65	☐	☐	☐	☐	☐	☐	☐										
Mephosfolan	950-10-7	269.31	☐	☐	☐	☐	☐	☐	☐										
Mepiquat chloride	24307-26-4	149.66	☐	☐	☐	☐	☐	☐	☐										
Mercaptobenzothiazole, 2-	149-30-4	167.24	☐	☐	☐	☐	☐	☐	☐										
Mercuric chloride	7487-94-7	271.50	☐	☐	☐	☐	☐	☐	☐		1.5E-01	4.5E-02	5.2E-06	7.1E-10	2.9E-08	5.8E+04	6.9E+04		
Mercury, elemental	7439-97-6	200.59	☐	☐	☐	☐	☐	☐	☐		2.3E-01	1.1E-02	3.0E-05	7.1E-03	2.9E-01	1.0E+03	5.6E-02		
Merphos	150-50-5	298.50	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Merphos oxide	78-48-8	314.50	☐	☐	☐	☐	☐	☐	☐										
Metalaxyl	57837-19-1	279.34	☐	☐	☐	☐	☐	☐	☐										
Methacrylonitrile	126-98-7	67.09	☐	☐	☐	☐	☐	☐	☑		2.0E-04	1.1E-01	1.3E-05	8.8E-05	3.6E-03	5.1E-03	7.9E+04	8.4E+03	1.8E+03
Methamidophos	10265-92-6	141.13	☐	☐	☐	☐	☐	☐	☐										
Methanol	67-56-1	32.04	☐	☐	☐	☐	☐	☐	☐										
Methidathion	950-37-8	302.32	☐	☐	☐	☐	☐	☐	☐										
Methomyl	16752-77-5	162.20	☐	☐	☐	☐	☐	☐	☑		1.2E-02	6.9E-02	1.0E-05	3.8E-02	1.6E+00	8.9E-02	1.7E+05	8.2E+04	2.4E+02
Methoxy-5-nitroaniline, 2-	99-59-2	168.15	☐	☐	☐	☐	☐	☐	☐					1.2E-08	5.1E-07		1.2E+02		
Methoxychlor	72-43-5	345.65	☐	☐	☐	☐	☐	☑	☐	0.1				1.6E-05	6.5E-04				
Methoxyethanol, 2-	109-86-4	76.09	☐	☐	☐	☐	☐	☑	☐	0.1				8.1E-08	3.3E-06				
Methoxyethyl acetate, 2-	110-49-6	118.13	☐	☐	☐	☐	☐	☐	☐										
Methyl acetate	79-20-9	74.08	☐	☐	☐	☐	☐	☐	☑		4.1E-05	1.0E-01	1.0E-05	2.1E-05	8.4E-04	1.3E-02	1.0E+06	1.1E+05	4.0E+03
Methyl acrylate	96-33-3	86.09	☐	☐	☐	☐	☐	☐	☑		6.7E-03	9.1E-02	8.6E-06	2.4E-01	9.8E+00	5.0E+00	6.0E+01	4.2E+02	3.1E+02
Methyl aniline, N-	100-61-8	107.15	☐	☐	☐	☐	☐	☐	☐										
Methyl bromide	74-83-9	94.94	☐	☐	☐	☐	☐	☐	☑		4.8E-03	7.3E-02	1.2E-05	6.2E-03	2.6E-01	5.4E-02	1.5E+04	3.1E+03	3.7E+02
Methyl chloride	74-87-3	50.49	☐	☐	☐	☐	☐	☐	☑		1.1E-02	1.1E-01	6.5E-06	2.4E-02	9.8E-01	2.1E-01	8.2E+03	4.0E+03	2.4E+02
Methyl ethyl ketone	78-93-3	72.10	☐	☐	☐	☐	☐	☐	☑		4.2E-05	9.0E-02	9.8E-06	2.7E-05	1.1E-03	2.7E-02	2.7E+05	3.4E+04	4.0E+03
Methyl hydrazine	60-34-4	46.07	☐	☐	☐	☐	☐	☐	☐					3.0E-06	1.2E-04				
Methyl isobutyl ketone	108-10-1	100.16	☐	☐	☐	☐	☐	☐	☑		2.5E-05	7.5E-02	7.8E-06	1.4E-04	5.7E-03	8.0E-01	1.9E+04	1.7E+04	5.2E+03
Methyl mercaptan	74-93-1	48.11	☐	☐	☐	☐	☐	☐	☑					3.1E-03	1.3E-01		1.5E+04		
Methyl methacrylate	80-62-6	100.13	☐	☐	☐	☐	☐	☐	☑		3.1E-04	7.7E-02	8.6E-06	3.4E-04	1.4E-02	7.9E-02	1.5E+04	2.7E+03	1.5E+03
Methyl parathion	298-00-0	263.23	☐	☐	☐	☐	☐	☑	☐	0.1				1.0E-07	4.1E-06				
Methyl tertiary butyl ether	1634-04-4	88.17	☐	☐	☐	☐	☐	☐	☑		7.1E-04	8.0E-02	1.0E-05	5.9E-04	2.4E-02	3.6E-02	1.5E+05	2.1E+04	9.6E+02
Methyl-5-nitroaniline, 2-	99-55-8	152.15	☐	☐	☐	☐	☐	☐	☐										
Methylaniline hydrochloride, 2-	636-21-5	143.62	☐	☐	☐	☐	☐	☑	☐	0.1									
Methylaniline, 2-	95-53-4	107.15	☐	☐	☐	☐	☐	☑	☐	0.1				2.7E-06	1.1E-04		1.7E+04		

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Methylene chloride	75-09-2	84.93	☐	☐	☐	☐	☐	☐	☑		2.5E-03	1.0E-01	1.2E-05	2.2E-03	9.0E-02	7.0E-02	1.3E+04	2.5E+03	5.1E+02
Methylene diphenyl diisocyanate	101-68-8	250.26	☐	☐	☐	☐	☐	☑	☐	0.1									
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	267.17	☐	☐	☐	☐	☐	☑	☐	0.1				4.1E-11	1.7E-09				
Methylenebis(N,N'-dimethyl)aniline, 4,4'-	101-61-1	254.37	☐	☐	☐	☐	☐	☑	☐	0.1				1.1E-09	4.4E-08				
Methylenedianiline, 4,4'-	101-77-9	198.26	☐	☐	☐	☐	☐	☑	☐	0.1				5.6E-11	2.3E-09				
Methylmercury	22967-92-6	215.62	☐	☐	☐	☐	☐	☐	☐		1.5E-01	5.3E-02	6.1E-06	4.7E-07	1.9E-05	7.0E+03			
Methylnaphthalene, 1-	90-12-0	142.20	☐	☐	☐	☐	☐	☐	☑					5.1E-04	2.1E-02		2.6E+01		
Methylnapthalene, 2-	91-57-6	142.20	☐	☐	☐	☑	☐	☐	☑	0.13	1.6E-01	5.2E-02	7.8E-06	5.2E-04	2.1E-02	1.5E+01	2.5E+01	3.7E+02	6.5E+01
Methylphosphonic acid	993-13-5	96.02	☑	☐	☐	☐	☐	☐	☐										
Methylstyrene, alpha-	98-83-9	118.18	☐	☐	☐	☐	☐	☐	☑		1.5E-04	7.1E-02	8.0E-06	2.3E-03	9.4E-02	2.2E+00	3.0E+02	6.8E+02	2.1E+03
Metolachlor	51218-45-2	283.80	☐	☐	☐	☐	☐	☐	☐										
Metribuzin	21087-64-9	214.28	☐	☐	☐	☐	☐	☐	☐										
Mirex	2385-85-5	545.55	☐	☐	☐	☐	☐	☐	☐										
Molinate	2212-67-1	187.30	☐	☐	☐	☐	☐	☐	☐										
Molybdenum	7439-98-7	95.95	☐	☐	☐	☐	☐	☐	☐										
Monochloramine	10599-90-3	51.48	☐	☐	☐	☐	☐	☐	☐										
Naled	300-76-5	380.79	☐	☐	☐	☐	☐	☐	☐										
Naphthalene	91-20-3	128.19	☐	☐	☐	☑	☐	☐	☑	0.13	8.4E-06	5.9E-02	7.5E-06	4.8E-04	2.0E-02	7.1E+00	3.1E+01	2.2E+02	8.9E+03
Napropamide	15299-99-7	271.36	☐	☐	☐	☐	☐	☐	☐										
Nickel	7440-02-0	58.69	☐	☐	☐	☐	☐	☐	☐										
Nickel refinery dust	Ni ref dust		☐	☐	☐	☐	☐	☐	☐										
Nickel subsulfide	12035-72-2	240.19	☐	☐	☐	☐	☐	☐	☐										
Nickel, soluble salts	Ni sol salts		☐	☐	☐	☐	☐	☐	☐										
Nitrate	14797-55-8	62.00	☐	☐	☐	☐	☐	☐	☐										
Nitrite	14797-65-0	46.01	☐	☐	☐	☐	☐	☐	☐										
Nitroaniline, 2-	88-74-4	138.13	☐	☐	☐	☐	☐	☐	☐		1.5E-01	4.3E-02	9.8E-06	1.1E-07	4.5E-06	3.9E-01	1.3E+03		

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Nitroaniline, 3-	99-09-2	138.12	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	7.1E-02	8.2E-06	1.4E-07	5.9E-06	1.7E-01	8.9E+02		
Nitroaniline, 4-	100-01-6	138.12	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	4.3E-02	9.7E-06	2.1E-09	8.5E-08	1.7E-01	1.1E-05		
Nitrobenzene	98-95-3	123.11	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Nitrofurantoin	67-20-9	238.16	☐	☐	☐	☐	☐	☐	☐										
Nitrofurazone	59-87-0	198.14	☐	☐	☐	☐	☐	☐	☐										
Nitroglycerin	55-63-0	227.09	☐	☐	☐	☐	☐	☐	☐		1.5E-01	5.1E-02	5.9E-06	3.2E-05	1.3E-03	2.5E-01	1.4E+03		
Nitroguanidine	556-88-7	104.07	☐	☐	☐	☐	☐	☐	☐			8.6E-02	9.9E-06						
Nitromethane	75-52-5	61.04	☐	☐	☐	☐	☐	☐	☑			1.2E-01	1.4E-05	2.6E-05	1.1E-03		1.1E+05		
Nitrophenol, 2-	88-75-5	139.11	☐	☐	☐	☐	☐	☐	☑		1.5E-01	4.4E-02	9.2E-06	1.5E-05	6.0E-04	3.5E-01	2.5E+03	1.1E+03	6.6E+01
Nitrophenol, 4-	100-02-7	139.11	☐	☐	☐	☐	☐	☐	☐		1.5E-01	4.3E-02	9.6E-06	7.3E-09	3.0E-07	4.4E-01	2.5E+04		
Nitropropane, 2-	79-46-9	89.09	☐	☐	☐	☐	☐	☐	☑					1.2E-04	5.0E-03		1.7E+04		
Nitrosodiethanolamine, N-	1116-54-7	134.13	☐	☐	☐	☐	☐	☑	☐	0.1				2.4E-10	1.0E-08				
Nitrosodiethylamine, N-	55-18-5	102.14	☐	☐	☐	☐	☐	☑	☐	0.1		8.7E-02	1.0E-05	3.6E-06	1.5E-04		2.0E+05		
Nitrosodimethylamine, N-	62-75-9	74.08	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	1.0E-01	1.0E-05	1.2E-06	4.9E-05	5.1E-03	1.0E+06		
Nitroso-di-n-butylamine, N-	924-16-3	158.24	☐	☐	☐	☐	☐	☐	☑		2.4E-05	5.8E-02	9.7E-06	3.2E-04	1.3E-02	1.5E+00	1.3E+03	2.1E+03	5.2E+03
Nitrosodiphenylamine, N-	86-30-6	198.22	☐	☐	☐	☐	☐	☐	☐		1.5E-01	3.1E-02	6.4E-06	5.0E-06	2.1E-04	3.3E+00	3.7E+01		
Nitrosodipropylamine, N-	621-64-7	130.19	☐	☐	☐	☐	☐	☑	☐	0.1	1.5E-01	5.7E-02	7.8E-06	2.3E-06	9.2E-05	1.7E-01	1.5E+04		
Nitroso-N-ethylurea, N-	759-73-9	117.11	☐	☐	☐	☐	☐	☐	☐										
Nitroso-N-methylethylamine, N-	10595-95-6	88.11	☐	☐	☐	☐	☐	☐	☐										
Nitrosopyrrolidine, N-	930-55-2	100.12	☐	☐	☐	☐	☐	☑	☐	0.1				1.2E-08	4.9E-07				
Nitrotoluene, m-	99-08-1	137.13	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Nitrotoluene, o-	88-72-2	137.13	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Nitrotoluene, p-	99-99-0	137.13	☐	☐	☐	☐	☐	☐	☑		8.1E-06	7.6E-02	8.6E-06	2.4E-05	9.8E-04	3.9E-01	2.1E+03	1.0E+03	9.0E+03
Norflurazon	27314-13-2	303.67	☐	☐	☐	☐	☐	☐	☐										
NuStar	85509-19-9	315.40	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Octabromodiphenyl ether	32536-52-0	801.38	☐	☐	☐	☐	☐	☐	☐										
Octamethylpyrophosphoramide	152-16-9	286.25	☐	☐	☐	☐	☐	☐	☐										
Oryzalin	19044-88-3	346.36	☐	☐	☐	☐	☐	☐	☐										
Oxadiazon	19666-30-9	345.22	☐	☐	☐	☐	☐	☐	☐										
Oxamyl	23135-22-0	219.26	☐	☐	☐	☐	☐	☐	☐										
Oxyfluorfen	42874-03-3	361.70	☐	☐	☐	☐	☐	☐	☐										
Paclobutrazol	76738-62-0	293.80	☐	☐	☐	☐	☐	☐	☐										
Paraquat dichloride	1910-42-5	257.16	☐	☐	☐	☐	☐	☐	☐										
Parathion	56-38-2	291.27	☐	☐	☐	☐	☐	☐	☐										
Pebulate	1114-71-2	203.34	☐	☐	☐	☐	☐	☐	☐										
Pendimethalin	40487-42-1	281.31	☐	☐	☐	☐	☐	☐	☐										
Pentabromo-6-chlorocyclohexane, 1,2,3,4,5-	87-84-3	513.09	☐	☐	☐	☐	☐	☐	☐										
Pentabromodiphenyl ether	32534-81-9	564.69	☐	☐	☐	☐	☐	☐	☐										
Pentachlorobenzene	608-93-5	250.34	☐	☐	☐	☐	☐	☐	☐										
Pentachloroethane	76-01-7	202.29	☐	☐	☐	☐	☐	☐	☐										
Pentachloronitrobenzene	82-68-8	295.36	☐	☐	☐	☐	☐	☐	☐					3.8E-04	1.6E-02				
Pentachlorophenol	87-86-5	266.35	☐	☐	☐	☐	☐	☐	☐	0.25	1.5E-01	1.6E-02	8.0E-06	2.4E-08	1.0E-06	5.0E+00	1.3E+01		
Perchlorate ion	14797-73-0	99.45	☐	☐	☐	☐	☐	☐	☐										
Perchloric acid	7601-90-3	100.46	☐	☐	☐	☐	☐	☐	☐										
Perchloroethylene	127-18-4	165.80	☐	☐	☐	☐	☐	☐	☑		2.4E-03	7.2E-02	8.2E-06	1.8E-02	7.5E-01	9.3E-01	2.0E+02	2.3E+02	5.2E+02
Permethrin	52645-53-1	391.29	☐	☐	☐	☐	☐	☐	☐										
Phenmedipham	13684-63-4	300.31	☐	☐	☐	☐	☐	☐	☐										
Phenol	108-95-2	94.11	☐	☐	☐	☐	☐	☐	☐		1.5E-01	8.3E-02	1.0E-05	6.0E-07	2.4E-05	2.2E-01	9.1E+04		
Phenothiazine	92-84-2	199.26	☐	☐	☐	☐	☐	☐	☐										
Phenylenediamine, m-	108-45-2	108.05	☐	☐	☐	☐	☐	☐	☐										
Phenylenediamine, o-	95-54-5	108.05	☐	☐	☐	☐	☐	☑	☐	0.1				7.7E-08	3.2E-06				

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Phenylenediamine, p-	106-50-3	108.05	☐	☐	☐	☐	☐	☐	☐										
Phenylmercuric acetate	62-38-4	336.74	☐	☐	☐	☐	☐	☐	☐										
Phenylphenol, 2-	90-43-7	170.21	☐	☐	☐	☐	☐	☑	☐	0.1				1.0E-06	4.3E-05				
Phorate	298-02-2	260.40	☐	☐	☐	☐	☐	☐	☐										
Phosgene	75-44-5	98.92	☐	☐	☐	☐	☐	☐	☐										
Phosmet	732-11-6	317.31	☐	☐	☐	☐	☐	☐	☐										
Phosphine	7803-51-2	34.00	☐	☐	☐	☐	☐	☐	☐										
Phosphoric acid	7664-38-2	98.00	☐	☐	☐	☐	☐	☐	☐			7.7E-02	9.6E-06						
Phosphorus	7723-14-0	30.97	☐	☐	☐	☐	☐	☐	☐										
Phosphorus, white	12185-10-3	123.92	☐	☐	☐	☐	☐	☐	☐										
Phthalic acid, p-	100-21-0	166.13	☐	☐	☐	☐	☐	☐	☐										
Phthalic anhydride	85-44-9	148.11	☐	☐	☐	☐	☐	☐	☐					1.6E-08	6.7E-07				
Picloram	1918-02-1	241.46	☐	☐	☐	☐	☐	☐	☐										
Picramic acid	96-91-3	199.12	☐	☐	☐	☐	☐	☐	☐										
Pirimiphos-methyl	29232-93-7	305.33	☐	☐	☐	☐	☐	☐	☐										
Polybrominated biphenyl	36355-01-8	627.59	☐	☐	☐	☐	☐	☐	☐										
Polychlorinated biphenyls	1336-36-3		☐	☐	☐	☐	☑	☐	☐	0.14									
Polychlorinated terphenyls	61788-33-8		☐	☐	☐	☐	☐	☐	☐										
Polymeric MDI	9016-87-9		☐	☐	☐	☐	☐	☐	☐										
Potassium cyanide	151-50-8	65.12	☐	☐	☐	☐	☐	☐	☐										
Potassium perchlorate	7778-74-7	138.54	☐	☐	☐	☐	☐	☐	☐										
Potassium silver cyanide	506-61-6	198.99	☐	☐	☐	☐	☐	☐	☐										
Prochloraz	67747-09-5	376.67	☐	☐	☐	☐	☐	☐	☐										
Profluralin	26399-36-0	347.29	☐	☐	☐	☐	☐	☐	☐										
Prometon	1610-18-0	225.29	☐	☐	☐	☐	☐	☐	☐										
Prometryn	7287-19-6	241.35	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Pronamide	23950-58-5	256.13	☐	☐	☐	☐	☐	☐	☐										
Propachlor	1918-16-7	211.69	☐	☐	☐	☐	☐	☐	☐										
Propanil	709-98-8	218.08	☐	☐	☐	☐	☐	☐	☐										
Propargite	2312-35-8	350.47	☐	☐	☐	☐	☐	☐	☐										
Propargyl alcohol	107-19-7	56.06	☐	☐	☐	☐	☐	☐	☐										
Propazine	139-40-2	229.71	☐	☐	☐	☐	☐	☐	☐										
Propham	122-42-9	179.22	☐	☐	☐	☐	☐	☐	☐										
Propiconazole	60207-90-1	342.22	☐	☐	☐	☐	☐	☐	☐										
Propylbenzene, n-	103-65-1	120.19	☐	☐	☐	☐	☐	☐	☑		1.2E-04	7.5E-02	7.8E-06	1.3E-02	5.4E-01	1.7E+01	1.4E+01	2.4E+02	2.3E+03
Propylene glycol	57-55-6	76.10	☐	☐	☐	☐	☐	☐	☐					1.3E-08	5.3E-07				
Propylene glycol dinitrate	6423-43-4	166.09	☐	☐	☐	☐	☐	☐	☐					9.4E-07	3.9E-05				
Propylene glycol monoethyl ether	1569-02-4	104.15	☐	☐	☐	☐	☐	☐	☐										
Propylene glycol monomethyl ether	107-98-2	90.12	☐	☐	☐	☐	☐	☑	☐	0.1				1.8E-08	7.4E-07				
Propylene oxide	75-56-9	58.08	☐	☐	☐	☐	☐	☐	☑		8.7E-05	1.2E-01	1.3E-05	8.5E-05	3.5E-03	1.5E-01	4.8E+05	1.2E+05	2.7E+03
Pursuit	81335-77-5	289.33	☐	☐	☐	☐	☐	☐	☐										
Pydrin	51630-58-1	419.91	☐	☐	☐	☐	☐	☐	☐										
Pyrene	129-00-0	202.26	☐	☐	☐	☑	☐	☐	☐	0.13	1.1E-09	2.7E-02	7.2E-06	1.1E-05	4.5E-04	6.3E+02	1.4E-01		
Pyridine	110-86-1	70.10	☐	☐	☐	☐	☐	☐	☐										
Quinalphos	13593-03-8	298.30	☐	☐	☐	☐	☐	☐	☐										
Quinoline	91-22-5	129.16	☐	☐	☐	☐	☐	☑	☐	0.1				2.7E-06	1.1E-04		6.1E+03		
RDX	121-82-4	222.26	☐	☐	☐	☐	☐	☐	☐	0.015	1.5E-01	5.2E-02	6.0E-06	2.0E-11	8.2E-10	6.8E-02	6.0E+01		
Refractory ceramic fibers	ref ceramic fi		☐	☐	☐	☐	☐	☐	☐										
Resmethrin	10453-86-8	338.45	☐	☐	☐	☐	☐	☐	☐										
Ronnel	299-84-3	321.57	☐	☐	☐	☐	☐	☐	☐										
Rotenone	83-79-4	391.41	☐	☐	☐	☐	☐	☐	☐										
Savey	78587-05-0	352.88	☐	☐	☐	☐	☐	☐	☐										
Selenious acid	7783-00-8	128.97	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Selenium	7782-49-2	78.96	☐	☐	☐	☐	☐	☐	☐										
Selenourea	630-10-4	123.02	☐	☐	☐	☐	☐	☐	☐										
Sethoxydim	74051-80-2	327.48	☐	☐	☐	☐	☐	☐	☐										
Silver	7440-22-4	107.87	☐	☐	☐	☐	☐	☐	☐										
Silver cyanide	506-64-9	133.89	☐	☐	☐	☐	☐	☐	☐										
Silvex	93-72-1	269.51	☐	☐	☐	☐	☐	☐	☐										
Simazine	122-34-9	201.66	☐	☐	☐	☐	☐	☐	☐										
Sodium azide	26628-22-8	65.02	☐	☐	☐	☐	☐	☐	☐										
Sodium cyanide	143-33-9	49.01	☐	☐	☐	☐	☐	☐	☐										
Sodium diethydithiocarbamate	148-18-5	171.25	☐	☐	☐	☐	☐	☐	☐										
Sodium fluoroacetate	62-74-8	100.02	☐	☐	☐	☐	☐	☐	☐										
Sodium metavanadate	13718-26-8	121.93	☐	☐	☐	☐	☐	☐	☐										
Sodium perchlorate	7601-89-0	122.44	☐	☐	☐	☐	☐	☐	☐										
Strontium, stable	7440-24-6	87.62	☐	☐	☐	☐	☐	☐	☐							2.1E-02			
Strychnine	57-24-9	334.42	☐	☐	☐	☐	☐	☐	☐										
Styrene	100-42-5	104.16	☐	☐	☐	☐	☐	☐	☑		8.7E-05	7.1E-02	8.0E-06	2.7E-03	1.1E-01	4.7E+00	3.1E+02	1.5E+03	2.7E+03
Sulfonylbis(4-chlorobenzene),1,1'-	80-07-9	287.16	☐	☐	☐	☐	☐	☐	☐										
Systhane	88671-89-0	288.78	☐	☐	☐	☐	☐	☐	☐										
TCDD, 2,3,7,8-	1746-01-6	321.97	☐	☐	☑	☐	☐	☐	☐	0.03	1.5E-01	1.0E-01	5.6E-06	7.9E-05	3.2E-03	2.7E+04	1.9E-05		
Tebuthiuron	34014-18-1	228.31	☐	☐	☐	☐	☐	☐	☐										
Temephos	3383-96-8	466.46	☐	☐	☐	☐	☐	☐	☐										
Terbacil	5902-51-2	216.67	☐	☐	☐	☐	☐	☐	☐										
Terbufos	13071-79-9	288.45	☐	☐	☐	☐	☐	☐	☐										
Terbutryn	886-50-0	241.35	☐	☐	☐	☐	☐	☐	☐										
Tetrachlorobenzene, 1,2,4,5-	95-94-3	215.89	☐	☐	☐	☐	☐	☐	☐										
Tetrachloroethane, 1,1,1,2-	630-20-6	167.85	☐	☐	☐	☐	☐	☐	☑		7.9E-05	7.1E-02	7.9E-06	3.4E-04	1.4E-02	5.6E-01	3.0E+03	2.0E+03	2.9E+03

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Tetrachloroethane, 1,1,2,2-	79-34-5	167.86	☐	☐	☐	☐	☐	☐	☑		7.9E-05	7.1E-02	7.9E-06	3.4E-04	1.4E-02	5.6E-01	3.0E+03	2.0E+03	2.9E+03
Tetrachlorophenol, 2,3,4,6-	58-90-2	231.89	☐	☐	☐	☐	☐	☐	☐										
Tetrachlorotoluene, para, alpha, alpha, alpha-	5216-25-1	229.92	☐	☐	☐	☐	☐	☐	☐										
Tetrachlorovinphos	961-11-5	365.96	☐	☐	☐	☐	☐	☐	☐					1.8E-09	7.5E-08				
Tetraethyl dithiopyrophosphate	3689-24-5	322.32	☐	☐	☐	☐	☐	☐	☐										
Tetraethyl lead	78-00-2	323.45	☐	☐	☐	☐	☐	☐	☐										
Tetrahydrofuran	109-99-9	72.10	☐	☐	☐	☐	☐	☐	☑		1.4E-04	9.8E-02	1.1E-05	7.0E-05	2.9E-03	5.7E-03	1.0E+06	1.1E+05	2.2E+03
Thallium (I) acetate	563-68-8	263.43	☐	☐	☐	☐	☐	☐	☐										
Thallium (I) carbonate	6533-73-9	468.78	☐	☐	☐	☐	☐	☐	☐										
Thallium (I) chloride	7791-12-0	239.84	☐	☐	☐	☐	☐	☐	☐										
Thallium (I) nitrate	10102-45-1	266.39	☐	☐	☐	☐	☐	☐	☐										
Thallium (I) sulfate	7446-18-6	504.82	☐	☐	☐	☐	☐	☐	☐										
Thiobencarb	28249-77-6	257.78	☐	☐	☐	☐	☐	☐	☐										
Thiocyanates	463-56-9	59.09	☐	☐	☐	☐	☐	☐	☐										
Thiodiglycol	111-48-8	122.18	☑	☐	☐	☐	☐	☐	☐	0.0075									
Thiofanox	39196-18-4	218.31	☐	☐	☐	☐	☐	☐	☐										
Thiophanate-methyl	23564-05-8	342.39	☐	☐	☐	☐	☐	☐	☐										
Thiram	137-26-8	240.44	☐	☐	☐	☐	☐	☐	☐										
Tin, inorganic	7440-31-5	118.69	☐	☐	☐	☐	☐	☐	☐										
Tin, tributyl	56-36-9		☐	☐	☐	☐	☐	☐	☐										
Titanium	7440-32-6	47.87	☐	☐	☐	☐	☐	☐	☐			1.4E-01	1.7E-05						
Titanium dioxide	13463-67-7	79.90	☐	☐	☐	☐	☐	☐	☐										
Titanium tetrachloride	7550-45-0	189.68	☐	☐	☐	☐	☐	☐	☐										
Toluene	108-88-3	92.13	☐	☐	☐	☐	☐	☐	☑		9.9E-04	8.7E-02	8.6E-06	6.6E-03	2.7E-01	1.1E+00	5.3E+02	6.5E+02	8.2E+02
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5	174.15	☐	☐	☐	☐	☐	☐	☐										
Toluene-2,4-diamine	95-80-7	122.17	☐	☐	☐	☐	☐	☑	☐	0.1				7.5E-10	3.1E-08		7.7E+03		

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Toluene-2,5-diamine	95-70-5	122.17	☐	☐	☐	☐	☐	☐	☐										
Toluene-2,6-diamine	823-40-5	122.17	☐	☐	☐	☐	☐	☐	☐										
Toluidine, p-	106-49-0	107.15	☐	☐	☐	☐	☐	☐	☐					2.0E-06	8.3E-05				
Toxaphene	8001-35-2	414.00	☐	☐	☐	☐	☐	☐	☐					6.0E-06	2.5E-04				
Tralomethrin	66841-25-6	665.01	☐	☐	☐	☐	☐	☐	☐										
Triallate	2303-17-5	304.66	☐	☐	☐	☐	☐	☐	☐										
Triasulfuron	82097-50-5	401.82	☐	☐	☐	☐	☐	☐	☐										
Tribromobenzene, 1,2,4-	615-54-3	314.80	☐	☐	☐	☐	☐	☐	☐										
Tributyl phosphate	126-73-8	266.32	☐	☐	☐	☐	☐	☐	☐										
Tributyltin oxide	56-35-9	596.07	☐	☐	☐	☐	☐	☐	☐										
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	187.40	☐	☐	☐	☐	☐	☐	☑		6.3E-03	2.9E-02	8.1E-06	5.2E-01	2.1E+01	9.6E-01	1.1E+03	5.6E+03	3.2E+02
Trichloroaniline hydrochloride, 2,4,6-	33663-50-2	232.92	☐	☐	☐	☐	☐	☐	☐										
Trichloroaniline, 2,4,6-	634-93-5	196.46	☐	☐	☐	☐	☐	☐	☐					1.3E-06	5.5E-05		4.0E+01		
Trichlorobenzene, 1,2,4-	120-82-1	181.46	☐	☐	☐	☐	☐	☐	☑		8.4E-06	3.0E-02	8.2E-06	1.4E-03	5.8E-02	1.1E+01	3.0E+02	3.2E+03	8.8E+03
Trichloroethane, 1,1,1-	71-55-6	133.42	☐	☐	☐	☐	☐	☐	☑		3.2E-03	7.8E-02	8.8E-06	1.7E-02	7.1E-01	6.6E-01	1.3E+03	1.2E+03	4.5E+02
Trichloroethane, 1,1,2-	79-00-5	133.41	☐	☐	☐	☐	☐	☐	☑		3.7E-04	7.8E-02	8.8E-06	9.1E-04	3.7E-02	3.0E-01	4.4E+03	1.8E+03	1.3E+03
Trichloroethylene	79-01-6	131.40	☐	☐	☐	☐	☐	☐	☑		1.5E-03	7.9E-02	9.1E-06	1.0E-02	4.2E-01	1.0E+00	1.1E+03	1.3E+03	6.7E+02
Trichlorofluoromethane	75-69-4	137.38	☐	☐	☐	☐	☐	☐	☑		1.0E-02	8.7E-02	1.3E-05	9.7E-02	4.0E+00	9.6E-01	1.1E+03	2.0E+03	2.6E+02
Trichlorophenol, 2,4,5-	95-95-4	197.45	☐	☐	☐	☐	☐	☐	☐		1.5E-01	2.9E-02	7.0E-06	5.6E-06	2.3E-04	1.1E+01	7.5E+02		
Trichlorophenol, 2,4,6-	88-06-2	197.45	☐	☐	☐	☐	☐	☐	☐		1.5E-01	2.6E-02	8.1E-06	7.8E-06	3.2E-04	2.3E+00	7.5E+02		
Trichlorophenoxyacetic acid	93-76-5	255.49	☐	☐	☐	☐	☐	☐	☐										
Trichloropropane, 1,1,2-	598-77-6	147.43	☐	☐	☐	☐	☐	☐	☑		1.3E-04	7.1E-02	7.9E-06	3.4E-04	1.4E-02	3.1E-01	2.7E+03	1.1E+03	2.3E+03
Trichloropropane, 1,2,3-	96-18-4	147.43	☐	☐	☐	☐	☐	☐	☑		1.3E-04	7.1E-02	7.9E-06	3.4E-04	1.4E-02	3.1E-01	2.7E+03	1.1E+03	2.3E+03

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Trichloropropene, 1,2,3-	96-19-5	145.42	☐	☐	☐	☐	☐	☐	☑		1.3E-04	7.1E-02	7.9E-06	3.4E-04	1.4E-02	3.1E-01	2.7E+03	1.1E+03	2.3E+03
Trichlorotoluene, 2,3,6-	2077-46-5	195.48	☐	☐	☐	☐	☐	☐	☐										
Trichlorotoluene, alpha, 2,6-	2014-83-7	195.48	☐	☐	☐	☐	☐	☐	☐										
Triclosan	3380-34-5	289.55	☐	☐	☐	☐	☐	☐	☐										
Tricresol	1319-77-3	108.14	☐	☐	☐	☐	☐	☐	☐										
Tridiphane	58138-08-2	320.43	☐	☐	☐	☐	☐	☐	☐										
Triethylamine	121-44-8	101.19	☐	☐	☐	☐	☐	☐	☑		2.0E-04	1.2E-01	1.3E-05	9.0E-05	3.7E-03	1.3E-02	1.0E+06	1.1E+05	1.8E+03
Trifluralin	1582-09-8	335.28	☑	☐	☐	☐	☐	☑	☐	0.1				2.6E-05	1.1E-03				
Trimellitic anhydride	552-30-7	192.12	☐	☐	☐	☐	☐	☐	☐										
Trimethyl phosphate	512-56-1	140.08	☐	☐	☐	☐	☐	☐	☐					7.2E-09	3.0E-07				
Trimethylbenzene, 1,2,4-	95-63-6	120.19	☐	☐	☐	☐	☐	☐	☑		4.1E-05	7.5E-02	7.1E-06	5.7E-03	2.3E-01	2.2E+01	5.7E+01	1.3E+03	4.0E+03
Trimethylbenzene, 1,3,5-	108-67-8	120.19	☐	☐	☐	☐	☐	☐	☑		2.4E-04	7.5E-02	7.1E-06	7.7E-03	3.2E-01	4.9E+00	4.8E+01	2.4E+02	1.6E+03
Trinitrobenzene, 1,3,5-	99-35-4	213.11	☐	☐	☐	☐	☐	☐	☐	0.019	1.5E-01	2.8E-02	6.1E-06	8.7E-08	3.6E-06	1.2E-01	3.2E+02		
Trinitrophenylmethyln itramine	479-45-8	287.15	☐	☐	☐	☐	☐	☐	☐	######		2.1E-02	5.1E-06						
Trinitrotoluene, 2,4,6-	118-96-7	227.13	☐	☐	☐	☐	☐	☑	☐	0.032	1.5E-01	2.6E-02	5.8E-06	4.9E-09	2.0E-07	2.5E-01	1.3E+02		
Triphenylphosphine oxide	791-28-6	278.29	☐	☐	☐	☐	☐	☐	☐										
Tris(2-chloroethyl)phosphat e	115-96-8	285.49	☐	☐	☐	☐	☐	☐	☐										
Tris(2-ethylhexyl)phosphate	78-42-2	434.64	☐	☐	☐	☐	☐	☐	☐										
Uranium	7440-61-1	238.03	☐	☐	☐	☐	☐	☐	☐										
Uranium, highly soluble salts	HZ1800-90-T		☐	☐	☐	☐	☐	☐	☐										
Vanadium	7440-62-2	50.94	☐	☐	☐	☐	☐	☐	☐										
Vanadium pentoxide	1314-62-1	181.90	☐	☐	☐	☐	☐	☐	☐										
Vanadium sulfate	16785-81-2		☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	CASRN	MW	ADP	CWA	Dioxin	PAH	PCB	SVOC	VOC	ABS	DA	Di	Dw	H	H'	Kd	S	SAT	VF
Vanadium sulfate	36907-42-3		☐	☐	☐	☐	☐	☐	☐										
Vernam	1929-77-7	203.34	☐	☐	☐	☐	☐	☐	☐										
Vinclozolin	50471-44-8	286.11	☐	☐	☐	☐	☐	☐	☐										
Vinyl acetate	108-05-4	86.09	☐	☐	☐	☐	☐	☐	☑		6.8E-04	8.5E-02	9.2E-06	5.1E-04	2.1E-02	3.2E-02	2.0E+04	2.7E+03	9.8E+02
Vinyl chloride	75-01-4	62.50	☐	☐	☐	☐	☐	☐	☑		1.5E-02	1.1E-01	1.2E-06	2.7E-02	1.1E+00	1.1E-01	2.8E+03	1.2E+03	2.1E+02
Vinyl toluene	25013-15-4	118.18	☐	☐	☐	☐	☐	☐	☑		1.5E-04	7.1E-02	8.0E-06	2.3E-03	9.4E-02	2.2E+00	3.0E+02	6.8E+02	2.1E+03
VX	50782-69-9	267.37	☐	☑	☐	☐	☐	☐	☐	0.065	1.7E-08	6.2E-02	5.3E-06	3.5E-09	1.4E-07	2.0E+00	3.0E+04		
Warfarin	81-81-2	308.32	☐	☐	☐	☐	☐	☐	☐										
Xylene, m-	108-38-3	106.16	☐	☐	☐	☐	☐	☐	☑					7.3E-03	3.0E-01				
Xylene, o-	95-47-6	106.16	☐	☐	☐	☐	☐	☐	☑		2.2E-01	8.7E-02	1.0E-05	6.0E-03	2.5E-01	2.4E+00	1.9E+02	4.8E+02	5.5E+01
Xylenes, total	1330-20-7	106.16	☐	☐	☐	☐	☐	☐	☑		4.2E-04	7.0E-02	7.8E-06	7.3E-03	3.0E-01	2.4E+00	1.6E+02	4.2E+02	1.2E+03
Zinc cyanide	557-21-1	117.43	☐	☐	☐	☐	☐	☐	☐										
Zinc phosphide	1314-84-7	258.12	☐	☐	☐	☐	☐	☐	☐										
Zinc, metallic	7440-66-6	65.39	☐	☐	☐	☐	☐	☐	☐										
Zineb	12122-67-7	275.73	☐	☐	☐	☐	☐	☐	☐										

Table F-1: Physical and Chemical Data for Soil MEG Chemicals

Chemical Name	*CASRN*	*MW*	*ADP*	*CWA*	*Dioxin*	*PAH*	*PCB*	*SVOC*	*VOC*	*ABS*	*DA*	*Di*	*Dw*	*H*	*H'*	*Kd*	*S*	*SAT*	*VF*

Units:
atm = atmospheres
m = meter
mol = mole
g = grams
cm = centimeters
mg = milligrams
kg = kilograms
sec = second

Notes:
CASRN = Chemical Abstract Service Registry Number
MW = molecular weight (g/mol)
ADP = Agent Degradation Product
CWA = Chemical Warfare Agent
Dioxin = dioxin/furan chemicals
PAH = Polynuclear Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
SVOC = Semi-Volatile Organic Compound
VOC = Volatile Organic Compound
ABS = dermal absorption fraction (unitless)
DA = apparent diffusivity (cm^2/sec)
Di = diffusivity in air (cm^2/sec)
Dw = diffusivity in water (cm^2/sec)
H = Henry's law constant ($atm\text{-}m^3/mole$)
H' = dimensionless Henry's law constant (unitless)
Kd = soil-water partition coefficient ($cm^3/gram$)
S = water solubility (mg/L)
SAT = soil saturation concentration (mg/kg)
VF = soil-to-air volatilization factor (m^3/kg)

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Acenaphthene	83-32-9	1.6E-04	154.21	☑	4.7E-07	3.73E+04	0.13	6.0E-01		1.3E+05		4.9E+05	1.0E+05
Acephate	30560-19-1	5.0E-13	183.16	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Acetaldehyde	75-07-0	7.9E-05	44.05	☑	1.0E-04	2.56E+03			2.6E-02		1.6E+02		1.6E+02
Acetochlor	34256-82-1		269.80	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Acetone	67-64-1	3.9E-05	58.05	☑	1.0E-04	2.57E+03		2.7E+00	8.8E+00	5.7E+05	5.4E+04		5.0E+04
Acetone cyanohydrin	75-86-5	9.0E-08	85.10	☐		1.36E+09		3.0E-02	1.7E-02	6.4E+03	5.6E+07		6.4E+03
Acetonitrile	75-05-8	2.0E-05	41.05	☑	2.9E-05	4.79E+03		6.0E-02	1.7E-02	1.3E+04	2.0E+02		1.9E+02
Acetophenone	98-86-2	1.0E-05	120.15	☑	1.5E-01	6.62E+01		1.0E+00		2.1E+05			2.1E+05
Acifluorfen-sodium	62476-59-9		383.60	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Acrolein	107-02-8	1.2E-04	56.06	☑	1.2E-04	2.36E+03		4.0E-03	5.7E-05	8.5E+02	3.2E-01		3.2E-01
Acrylamide	79-06-1	1.0E-09	71.08	☐		1.36E+09	0.1	2.0E-03	1.7E-03	4.2E+02	5.6E+06	2.1E+03	3.5E+02
Acrylic acid	79-10-7	1.2E-07	72.06	☐		1.36E+09	0.1	5.0E-01	8.6E-04	1.1E+05	2.8E+06	5.3E+05	8.6E+04
Acrylonitrile	107-13-1	8.8E-05	53.06	☑	1.9E-04	1.84E+03		1.0E-02	1.4E-01	2.1E+03	6.3E+02		4.9E+02
Adipic acid	124-04-9		146.14	☐		1.36E+09		2.0E+00		4.2E+05			4.2E+05
Adiponitrile	111-69-3		108.10	☐		1.36E+09			1.7E-02		5.6E+07		5.6E+07
Alachlor	15972-60-8	3.2E-08	269.77	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Alar	1596-84-5		160.17	☐		1.36E+09		1.5E-01		3.2E+04			3.2E+04
Aldicarb	116-06-3		190.27	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Aldicarb sulfone	1646-88-4		222.26	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Aldrin	309-00-2	1.7E-04	364.93	☐		1.36E+09	0.1	4.0E-05		8.5E+00		4.2E+01	7.1E+00
Ally	74223-64-6		381.36	☐		1.36E+09		2.5E-01		5.3E+04			5.3E+04
Allyl alcohol	107-18-6		58.08	☐		1.36E+09		4.0E-03	2.9E-04	8.5E+02	9.3E+05		8.5E+02
Allyl chloride	107-05-1	1.1E-02	76.50	☑	2.8E-01	4.89E+01			2.9E-03		3.3E-01		3.3E-01
Aluminum phosphide	20859-73-8		57.96	☐		1.36E+09		4.0E-04		8.5E+01			8.5E+01
Aluminum, elemental	7429-90-5		26.98	☐		1.36E+09			1.4E-03		4.7E+06		4.7E+06
Amdro	67485-29-4		494.48	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Ametryn	834-12-8		227.33	☐		1.36E+09		9.0E-02		1.9E+04			1.9E+04
Aminophenol, 3-	591-27-5		109.13	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Aminophenol, 4-	123-30-8		109.13	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Aminopyridine, 4-	504-24-5		94.12	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01
Amitraz	33089-61-1		293.45	☐		1.36E+09		2.5E-03		5.3E+02			5.3E+02
Ammonia	7664-41-7	1.6E-05	17.03	☐		1.36E+09			2.9E-02		9.3E+07		9.3E+07
Ammonium perchlorate	7790-98-9		117.49	☐		1.36E+09		7.0E-04		1.5E+02			1.5E+02
Ammonium sulfamate	7773-06-0		114.13	☐		1.36E+09		2.0E+00		4.2E+05			4.2E+05
Aniline	62-53-3	1.9E-06	93.12	☐		1.36E+09	0.1		2.9E-03		9.3E+06		9.3E+06
Anthracene	120-12-7	6.5E-05	178.23	☑	3.2E-08	1.43E+05	0.13	1.0E+00		2.1E+05		8.2E+05	1.7E+05
Antimony pentoxide	1314-60-9		647.03	☐		1.36E+09		5.0E-04		1.1E+02			1.1E+02
Antimony potassium tartrate	28300-74-5		667.86	☐		1.36E+09		9.0E-04		1.9E+02			1.9E+02
Antimony tetroxide	1332-81-6			☐		1.36E+09		4.0E-04		8.5E+01			8.5E+01
Antimony trioxide	1309-64-4		291.52	☐		1.36E+09		5.0E-01	5.7E-05	1.1E+05	1.9E+05		6.8E+04
Antimony, elemental	7440-36-0		121.76	☐		1.36E+09		4.0E-04		8.5E+01			8.5E+01
Apollo	74115-24-5		303.15	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Aramite	140-57-8		334.87	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Aroclor 1016	12674-11-2			☐		1.36E+09	0.14	2.1E-04		4.5E+01		1.6E+02	3.5E+01
Aroclor 1254	11097-69-1	2.8E-04	328.40	☐		1.36E+09	0.14	6.0E-05		1.3E+01		4.5E+01	9.9E+00
Arsenic, elemental	7440-38-2		74.92	☐		1.36E+09	0.03	3.0E-04		6.4E+01		1.1E+03	6.0E+01
Arsine	7784-42-1		77.95	☐		1.36E+09			1.4E-05		4.7E+04		4.7E+04
Assure	76578-14-8		372.80	☐		1.36E+09		9.0E-03		1.9E+03			1.9E+03
Asulam	3337-71-1		230.24	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Atrazine	1912-24-9	3.0E-09	216.06	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Avermectin B1	65195-55-3			☐		1.36E+09		4.0E-04		8.5E+01			8.5E+01
Azinphos methyl	86-50-0		317.34	☐		1.36E+09		3.0E-03	2.9E-03	6.4E+02	9.3E+06		6.4E+02
Barium, elemental	7440-39-3		137.30	☐		1.36E+09		7.0E-02	1.4E-03	1.5E+04	4.7E+06		1.5E+04
Baygon	114-26-1		209.24	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Bayleton	43121-43-3		293.75	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Baythroid	68359-37-5		434.29	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Benefin	1861-40-1		335.32	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Benomyl	17804-35-2		290.32	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Bentazon	25057-89-0		240.30	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Benzene	71-43-2	5.6E-03	78.11	☑	2.1E-03	5.60E+02		1.0E-02	2.3E-02	2.1E+03	3.1E+01		3.0E+01
Benzenethiol	108-98-5		110.18	☐		1.36E+09		1.0E-04		2.1E+01			2.1E+01
Benzidine	92-87-5	3.9E-11	184.23	☐		1.36E+09	0.1	3.0E-03		6.4E+02		3.2E+03	5.3E+02
Benzoic acid	65-85-0	2.9E-06	122.12	☐	1.5E-01	1.36E+09		4.0E+00	5.7E-04	8.5E+05	1.9E+06		5.8E+05
Beryllium, elemental	7440-41-7		9.01	☐		1.36E+09		5.0E-03	5.7E-06	1.1E+03	1.9E+04		1.0E+03
Bidrin	141-66-2		237.21	☐		1.36E+09		1.0E-04		2.1E+01			2.1E+01
Bifenox	42576-02-3			☐		1.36E+09		1.0E+00		2.1E+05			2.1E+05
Biphenthrin	82657-04-3		422.87	☐		1.36E+09		1.5E-02		3.2E+03			3.2E+03
Biphenyl, 1,1-	92-52-4	3.0E-04	154.20	☑	5.5E-07	3.44E+04		5.0E-02		1.1E+04			1.1E+04
Bis(2-chloro-1-methylethyl) ether	108-60-1	1.1E-04	171.07	☑	3.3E-05	4.49E+03		4.0E-02		8.5E+03			8.5E+03
Bis(2-chloroethoxy)methane	111-91-1		173.05	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Bis(2-chloroethyl) ether	111-44-4	1.8E-05	143.02	☑	4.9E-06	1.16E+04			3.3E-02		9.3E+02		9.3E+02
Bis(2-chloroisopropyl) ether	39638-32-9	1.1E-04	171.07	☑	3.3E-05	4.49E+03		4.0E-02		8.5E+03			8.5E+03
Bis(2-ethylhexyl) phthalate	117-81-7	1.0E-07	390.56	☐	1.5E-01	1.36E+09	0.1	2.0E-01		4.2E+04		2.1E+05	3.5E+04
Bis(chloromethyl) ether	542-88-1	2.0E-04	114.96	☑	3.5E-04	1.37E+03			4.0E-04		1.3E+00		1.3E+00
Bisphenol A	80-05-7		228.28	☐		1.36E+09		5.0E-01		1.1E+05			1.1E+05
Boron	7440-42-8		10.81	☐		1.36E+09		2.0E-01	5.7E-03	4.2E+04	1.9E+07		4.2E+04
Boron trifluoride	7637-07-2		67.82	☐		1.36E+09			2.0E-03		6.5E+06		6.5E+06
Bromate	15541-45-4		127.90	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Bromobenzene	108-86-1	3.7E-03	157.02	☑	3.9E-04	1.30E+03		2.0E-02	5.7E-02	4.2E+03	1.8E+02		1.7E+02

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Bromodichloromethane	75-27-4	1.6E-03	163.83	☑	2.3E-04	1.69E+03		8.0E-03	5.7E-03	1.7E+03	2.3E+01		2.3E+01
Bromoethene	593-60-2	6.2E-03	106.96	☑	1.5E-03	6.69E+02			8.6E-04		1.4E+00		1.4E+00
Bromoform	75-25-2	6.5E+00	252.80	☐	7.6E+01	1.36E+09	0.1	3.0E-02		6.4E+03		3.2E+04	5.3E+03
Bromophos	2104-96-3		365.98	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Bromoxynil	1689-84-5		276.91	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Bromoxynil octanoate	1689-99-2		403.11	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Busan	21564-17-0		238.34	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Butadiene, 1,3-	106-99-0	1.8E-01	54.09	☑	1.7E-02	1.97E+02			5.7E-04		2.7E-01		2.7E-01
Butanol, 1-	71-36-3	8.8E-06	74.12	☐		1.36E+09	0.1	1.0E+00		2.1E+05		1.1E+06	1.8E+05
Butyl benzyl phthalate	85-68-7	1.9E-06	312.39	☐	1.5E-01	1.36E+09		2.0E+00		4.2E+05			4.2E+05
Butyl glycolyl butyl phthalate	85-70-1		336.42	☐		1.36E+09		1.0E+00		2.1E+05			2.1E+05
Butylate	2008-41-5		217.41	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Cacodylic acid	75-60-5		138.00	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Cadmium, elemental	7440-43-9		112.40	☐		1.36E+09	0.001	5.0E-04	2.9E-06	1.1E+02	9.3E+03	5.3E+04	1.0E+02
Calcium cyanide	592-01-8		66.10	☐		1.36E+09		4.0E-02		8.5E+03			8.5E+03
Caprolactam	105-60-2		113.16	☐		1.36E+09		5.0E-01		1.1E+05			1.1E+05
Captafol	2425-06-1		349.06	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Captan	133-06-2	7.2E-06	300.60	☐		1.36E+09		1.3E-01		2.8E+04			2.8E+04
Carbaryl	63-25-2		201.20	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Carbofuran	1563-66-2		221.30	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Carbon disulfide	75-15-0	3.0E-02	76.14	☑	1.1E-02	2.44E+02		1.0E-01	2.0E-01	2.1E+04	1.2E+02		1.2E+02
Carbon tetrachloride	56-23-5	3.0E-02	153.84	☑	3.7E-03	4.23E+02		1.2E-02	5.4E-02	2.5E+03	5.5E+01		5.4E+01
Carbosulfan	55285-14-8		380.54	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Carboxin	5234-68-4		235.30	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Chloral	75-87-6		147.39	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Chloral hydrate	302-17-0		165.40	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Chloramben	133-90-4		206.03	☐		1.36E+09		1.5E-02		3.2E+03			3.2E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Chlordane	57-74-9	4.9E-05	409.80	☐		1.36E+09	0.04	6.0E-04	5.7E-05	1.3E+02	1.9E+05	1.6E+03	1.2E+02
Chlordecone	143-50-0	2.5E-08	490.64	☐		1.36E+09		5.0E-04		1.1E+02			1.1E+02
Chlorfenvinphos	470-90-6		359.57	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Chlorimuron-ethyl	90982-32-4		414.82	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Chlorine	7782-50-5		70.91	☐		1.36E+09		1.0E-01	1.7E-03	2.1E+04	5.4E+06		2.1E+04
Chlorite (sodium chlorite)	7758-19-2		90.44	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Chloro-1,3-butadiene	126-99-8	3.2E-02	88.54	☑	1.2E-02	2.38E+02		2.0E-02	2.0E-02	4.2E+03	1.1E+01		1.1E+01
Chloroacetic acid	79-11-8		94.50	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Chloroacetophenone, 2-	532-27-4	3.7E-02	154.59	☑	2.4E-03	5.23E+02			8.6E-06		1.1E-02		1.1E-02
Chloroaniline, 4-	106-47-8	1.2E-06	127.57	☐	1.5E-01	1.36E+09		5.0E-04		1.1E+02			1.1E+02
Chlorobenzene	108-90-7	3.7E-03	112.56	☑	4.0E-04	1.28E+03		7.0E-02	1.4E-01	1.5E+04	4.4E+02		4.3E+02
Chlorobenzilate	510-15-6	7.2E-08	325.19	☐		1.36E+09	0.1	2.0E-02		4.2E+03		2.1E+04	3.5E+03
Chlorobenzotrifluoride, 4-	98-56-6		180.56	☐		1.36E+09		3.0E-02	8.6E-01	6.4E+03	2.8E+09		6.4E+03
Chlorobutane, 1-	109-69-3	3.2E-02	92.57	☑	1.2E-02	2.38E+02		7.0E-02		1.5E+04			1.5E+04
Chlorodifluoromethane	75-45-6	1.0E-01	86.47	☑	1.4E-02	2.16E+02			1.4E+01		7.4E+03		7.4E+03
Chloroform	67-66-3	3.7E-03	119.38	☑	2.2E-03	5.45E+02		1.0E-01	7.0E-02	2.1E+04	9.1E+01		9.1E+01
Chloronaphthalene, beta-	91-58-7	3.1E-04	162.62	☑	2.4E-06	1.64E+04		2.0E-01		4.2E+04			4.2E+04
Chloronitrobenzene, o-	88-73-3	2.4E-05	157.56	☑	8.1E-06	9.04E+03		2.0E-02	2.9E-05	4.2E+03	6.2E-01		6.2E-01
Chlorophenol, 2-	95-57-8	3.9E-04	128.56	☑	1.7E-04	1.98E+03		8.0E-03		1.7E+03			1.7E+03
Chloropropane, 2-	75-29-6	2.3E-03	78.54	☑	9.3E-04	8.43E+02			2.9E-01		5.8E+02		5.8E+02
Chlorothalonil	1897-45-6	2.7E-07	235.91	☐		1.36E+09	0.1	1.5E-02		3.2E+03		1.6E+04	2.7E+03
Chlorotoluene, o-	95-49-8	3.5E-03	126.59	☑	4.9E-04	1.15E+03		2.0E-01		4.2E+04			4.2E+04
Chlorotoluene, p-	106-43-4		126.59	☐		1.36E+09		7.0E-01		1.5E+05			1.5E+05
Chlorpropham	101-21-3		213.67	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Chlorpyrifos	2921-88-2	2.9E-06	350.57	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Chlorpyrifos methyl	5598-13-0		322.53	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Chlorsulfuron	64902-72-3		357.77	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Chlorthiophos	60238-56-4		361.24	☐		1.36E+09		8.0E-04		1.7E+02			1.7E+02
Chromium (III)	16065-83-1		52.00	☐		1.36E+09		1.5E+00	1.4E-03	3.2E+05	4.7E+06		3.0E+05
Chromium (VI)	18540-29-9		52.00	☐		1.36E+09		9.0E-03	2.9E-04	1.9E+03	9.3E+05		1.9E+03
Cobalt	7440-48-4		58.93	☐		1.36E+09		3.0E-03	5.7E-06	6.4E+02	1.9E+04		6.2E+02
Copper cyanide	544-92-3		89.56	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Cresol, m-	108-39-4		108.14	☐		1.36E+09		5.0E-01		1.1E+05			1.1E+05
Cresol, o-	95-48-7	1.6E-06	108.14	☐	1.5E-01	1.36E+09		5.0E-01		1.1E+05			1.1E+05
Cresol, p-	106-44-5	8.0E-07	108.14	☐	1.5E-01	1.36E+09		5.0E-03		1.1E+03			1.1E+03
Cumene	98-82-8	1.2E-02	120.19	☑	1.2E-03	7.35E+02		3.0E-01	1.1E+00	6.4E+04	2.0E+03		2.0E+03
Cyanazine	21725-46-2	2.6E-10	240.69	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Cyanide	57-12-5		26.02	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Cyanogen	460-19-5	5.0E-03	52.04	☑	3.5E-03	4.35E+02		4.0E-02		8.5E+03			8.5E+03
Cyanogen bromide	506-68-3	5.0E-03	105.92	☑	3.5E-03	4.35E+02		9.0E-02		1.9E+04			1.9E+04
Cyanogen chloride	506-77-4	5.0E-03	61.48	☑	3.5E-03	4.35E+02		5.0E-02		1.1E+04			1.1E+04
Cyclohexane	110-82-7	2.0E-01	84.16	☑	1.3E-02	2.24E+02			1.7E+00		9.2E+02		9.2E+02
Cyclohexanone	108-94-1		94.14	☐		1.36E+09		5.0E+00		1.1E+06			1.1E+06
Cyclohexylamine	108-91-8		99.17	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Cyclopentadiene	542-92-7	2.1E-02	66.10	☑		1.36E+09			8.6E-01		2.8E+09		2.8E+09
Cyhalothrin	68085-85-8		449.86	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Cypermethrin	52315-07-8		416.30	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Cyromazine	66215-27-8		166.19	☐		1.36E+09		7.5E-03		1.6E+03			1.6E+03
Dacthal	1861-32-1		331.97	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Dalapon	75-99-0		142.97	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Danitol	39515-41-8		349.43	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
DDT	50-29-3	8.1E-06	354.50	☐		1.36E+09	0.03	5.0E-04		1.1E+02		1.8E+03	1.0E+02
Decabromodiphenyl ether	1163-19-5		959.17	☐		1.36E+09		2.1E-02		4.5E+03			4.5E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Demeton	8065-48-3		258.34	☐		1.36E+09		4.0E-05		8.5E+00			8.5E+00
Di(2-ethylhexyl)adipate	103-23-1	2.1E-05	370.57	☐		1.36E+09	0.1	6.0E-01		1.3E+05		6.4E+05	1.1E+05
Diazinon	333-41-5	1.2E-07	304.36	☐		1.36E+09		2.0E-03	2.9E-03	4.2E+02	9.3E+06		4.2E+02
Dibenzofuran	132-64-9	1.3E-05	168.19	☑	3.7E-08	1.33E+05	0.13	4.0E-03		8.5E+02		3.3E+03	6.7E+02
Dibromo-3-chloropropane, 1,2-	96-12-8	1.5E-04	236.33	☐	7.6E-06	1.36E+09	0.1	2.0E-03	5.7E-04	4.2E+02	1.9E+06	2.1E+03	3.5E+02
Dibromobenzene, 1,4-	106-37-6		235.90	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Dibromochloromethane	124-48-1	8.5E-04	208.28	☐	6.0E-05	1.36E+09	0.1	7.0E-02		1.5E+04		7.4E+04	1.2E+04
Dibromoethane, 1,2-	106-93-4	3.2E-04	187.88	☑	1.8E-04	1.89E+03		9.0E-03	5.7E-04	1.9E+03	2.6E+00		2.6E+00
Dibromomethane	74-95-3	9.0E-04	173.83	☑	7.2E-04	9.58E+02		9.0E-03		1.9E+03			1.9E+03
Dibutyl phthalate	84-74-2	1.4E-06	278.34	☐	1.5E-01	1.36E+09		1.0E+00		2.1E+05			2.1E+05
Dibutyl tin dichloride	683-18-1		303.83	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Dicamba	1918-00-9		221.04	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Dichloroacetic acid	79-43-6		128.94	☐		1.36E+09		1.2E-02		2.5E+03			2.5E+03
Dichlorobenzene, 1,2-	95-50-1	1.9E-03	147.01	☑	7.3E-05	3.00E+03		6.0E-01	5.7E-01	1.3E+05	4.1E+03		4.0E+03
Dichlorobenzene, 1,3-	541-73-1	1.9E-03	147.01	☑	7.3E-05	3.00E+03		2.0E-02	2.3E-03	4.2E+03	1.6E+01		1.6E+01
Dichlorobenzene, 1,4-	106-46-7	2.4E-03	147.01	☑	9.4E-05	2.65E+03		7.0E-02	6.9E-01	1.5E+04	4.4E+03		3.4E+03
Dichlorodifluoromethane	75-71-8	1.0E-01	120.91	☑	1.4E-02	2.16E+02		9.0E-01	5.7E-01	1.9E+05	3.0E+02		3.0E+02
Dichloroethane, 1,1-	75-34-3	5.6E-03	98.97	☑	2.7E-03	4.96E+02		2.0E+00		4.2E+05			4.2E+05
Dichloroethane, 1,2-	107-06-2	9.8E-04	98.96	☑	1.0E-03	8.02E+02		2.0E-01	1.4E-03	4.2E+04	2.7E+00		2.7E+00
Dichloroethylene, 1,1-	75-35-4	2.6E-02	96.95	☑	7.7E-03	2.93E+02		9.0E-03	2.3E-02	1.9E+03	1.6E+01		1.6E+01
Dichloroethylene, 1,2-	540-59-0		96.95	☐		1.36E+09		9.0E-03		1.9E+03			1.9E+03
Dichloroethylene, cis-1,2-	156-59-2	4.1E-03	96.95	☑	1.9E-03	5.95E+02		1.0E-01		2.1E+04			2.1E+04
Dichloroethylene, trans-	156-60-5	9.4E-03	96.95	☑	2.9E-03	4.76E+02		2.0E-01	2.3E-01	4.2E+04	2.6E+02		2.6E+02
Dichlorophenol, 2,4-	120-83-2	3.2E-06	163.00	☐	1.5E-01	1.36E+09	0.1	2.0E-02		4.2E+03		2.1E+04	3.5E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Dichlorophenoxy acetic acid, 2,4-	94-75-7		221.04	☐		1.36E+09	0.05	1.0E-02		2.1E+03		2.1E+04	1.9E+03
Dichlorophenoxybutyric acid, 2,4-	94-82-6		249.09	☐		1.36E+09		8.0E-02		1.7E+04			1.7E+04
Dichloropropane, 1,2-	78-87-5	2.8E-03	112.99	☑	1.2E-03	7.35E+02		7.0E-02	3.4E-03	1.5E+04	6.0E+00		6.0E+00
Dichloropropane, 1,3-	142-28-9	2.8E-03	112.99	☑	1.2E-03	7.35E+02		2.0E-01		4.2E+04			4.2E+04
Dichloropropanol, 2,3-	616-23-9		128.99	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Dichloropropene, 1,3-	542-75-6	1.8E-02	110.98	☑	4.6E-03	3.77E+02		4.0E-02	1.0E-02	8.5E+03	9.4E+00		9.4E+00
Dichlorvos	62-73-7	1.5E-03	220.98	☐		1.36E+09		3.0E-03	7.7E-04	6.4E+02	2.5E+06		6.4E+02
Dicyclopentadiene	77-73-6	1.1E-02	132.21	☑	4.2E-04	1.25E+03		8.0E-02	5.7E-03	1.7E+04	1.7E+01		1.7E+01
Dieldrin	60-57-1	1.5E-05	380.93	☐		1.36E+09	0.1	1.0E-04		2.1E+01		1.1E+02	1.8E+01
Diesel engine exhaust	Diesel			☐		1.36E+09			1.4E-03		4.7E+06		4.7E+06
Diethyl phthalate	84-66-2	4.5E-07	222.23	☐	1.5E-01	1.36E+09		8.0E+00		1.7E+06			1.7E+06
Diethylene glycol monobutyl ether	112-34-5	5.3E-06	162.23	☐		1.36E+09		3.0E-01	2.9E-04	6.4E+04	9.3E+05		6.0E+04
Diethylene glycol monoethyl ether	111-90-0	8.6E-10	134.17	☐		1.36E+09	0.1	6.0E-01	8.6E-04	1.3E+05	2.8E+06	6.4E+05	1.0E+05
Diethylformamide	617-84-5		101.15	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Difenzoquat	43222-48-6		360.43	☐		1.36E+09		8.0E-02		1.7E+04			1.7E+04
Diflubenzuron	35367-38-5		310.69	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Difluoroethane, 1,1-	75-37-6	2.0E-02	66.05	☑		1.36E+09			1.1E+01		3.7E+10		3.7E+10
Diisopropyl ether	108-20-3	2.3E-03	102.17	☑		1.36E+09			1.1E+00		3.7E+09		3.7E+09
Diisopropyl methylphosphonate	1445-75-6	4.4E-05	180.18	☑		1.36E+09		8.0E-01		1.7E+05			1.7E+05
Dimethipin	55290-64-7		210.26	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Dimethoate	60-51-5		229.25	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01
Dimethyl methylphosphonate	756-79-6		124.08	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Dimethyl terephthalate	120-61-6		194.19	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Dimethylaniline, N,N-	121-69-7		121.18	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Dimethylformamide	68-12-2	7.4E-08	73.09	☐		1.36E+09		3.0E-01	2.0E-02	6.4E+04	6.5E+07		6.4E+04
Dimethylhydrazine, 1,1-	57-14-7	6.9E-08	60.12	☐		1.36E+09			2.3E-06		7.5E+03		7.5E+03
Dimethylhydrazine, 1,2-	540-73-8	6.9E-08	60.10	☐		1.36E+09		8.0E-04		1.7E+02			1.7E+02
Dimethylphenol, 2,4-	105-67-9	3.2E-06	122.17	☐	1.5E-01	1.36E+09		5.0E-02		1.1E+04			1.1E+04
Dimethylphenol, 2,6-	576-26-1		122.17	☐		1.36E+09		6.0E-03		1.3E+03			1.3E+03
Dimethylphenol, 3,4-	95-65-8		122.17	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Dinitrobenzene, 1,2-	528-29-0		168.11	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Dinitrobenzene, 1,3-	99-65-0	2.3E-07	168.11	☐	1.5E-01	1.36E+09	0.1	1.0E-03		2.1E+02		1.1E+03	1.8E+02
Dinitro-o-cresol, 4,6-	534-52-1	4.3E-07	198.13	☐	1.5E-01	1.36E+09	0.1	4.0E-03		8.5E+02		4.2E+03	7.1E+02
Dinitro-o-cyclohexyl phenol, 4,6-	131-89-5		266.25	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Dinitrophenol, 2,4-	51-28-5	4.8E-09	184.11	☐	1.5E-01	1.36E+09		2.0E-02		4.2E+03			4.2E+03
Dinitrotoluene, 2,4-	121-14-2	9.3E-08	182.14	☐	1.5E-01	1.36E+09	0.102	2.0E-03		4.2E+02		2.1E+03	3.5E+02
Dinitrotoluene, 2,6-	606-20-2	7.5E-07	182.14	☐	1.5E-01	1.36E+09	0.099	1.0E-02		2.1E+03		1.1E+04	1.8E+03
Di-n-octyl phthalate	117-84-0	6.7E-05	390.56	☐	1.5E-01	1.36E+09	0.1	4.0E-01		8.5E+04		4.2E+05	7.1E+04
Dinoseb	88-85-7		240.22	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Dioxane, 1,4-	123-91-1	4.8E-06	88.10	☐	1.5E-01	1.36E+09	0.1	6.0E-01	1.0E+00	1.3E+05	3.4E+09	6.4E+05	1.1E+05
Diphenamid	957-51-7		239.32	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Diphenylamine	122-39-4	3.2E-06	169.24	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Diquat	85-00-7		344.07	☐		1.36E+09		2.2E-03		4.7E+02			4.7E+02
Disulfoton	298-04-4	4.0E-06	274.38	☐		1.36E+09	0.1	9.0E-05	5.7E-05	1.9E+01	1.9E+05	9.5E+01	1.6E+01
Dithiane, 1,4-	505-29-3		120.23	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Diuron	330-54-1		233.10	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Dodine	2439-10-3		287.44	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
EA 2192	73207-98-4			☐		1.36E+09		6.0E-07		1.3E-01			1.3E-01
EMPA	1832-53-7			☐		1.36E+09		2.5E-02	8.6E-03	5.3E+03	2.8E+07		5.3E+03
Endosulfan	115-29-7	1.1E-05	406.95	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Endothall	145-73-3		186.16	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Endrin	72-20-8	7.5E-06	380.93	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Epichlorohydrin	106-89-8	3.2E-05	92.53	☑	5.0E-05	3.64E+03		6.0E-03	2.9E-03	1.3E+03	2.5E+01		2.4E+01
Epoxybutane, 1,2-	106-88-7	1.8E-04	72.11	☑		1.36E+09			5.7E-03		1.9E+07		1.9E+07
EPTC	759-94-4		189.32	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Ethephon	16672-87-0		144.49	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Ethion	563-12-2		384.48	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Ethoxyethanol, 2-	110-80-5	1.2E-07	90.12	☐		1.36E+09	0.1	5.0E-01	5.7E-01	1.1E+05	1.9E+09	5.3E+05	8.8E+04
Ethoxyethyl acetate, 2-	111-15-9	1.8E-06	132.16	☐		1.36E+09			8.6E-02		2.8E+08		2.8E+08
Ethyl acetate	141-78-6	1.4E-04	88.10	☑	4.8E-05	3.71E+03		9.0E+00		1.9E+06			1.9E+06
Ethyl chloride	75-00-3	1.1E-02	64.52	☑	9.0E-03	2.71E+02		1.0E-01	1.1E+00	2.1E+04	7.4E+02		7.2E+02
Ethyl ether	60-29-7	1.3E-05	74.12	☑	1.1E-05	7.78E+03		5.0E-01	8.6E-01	1.1E+05	1.6E+04		1.4E+04
Ethyl methacrylate	97-63-2	2.4E-01	114.14	☑	6.8E-03	3.12E+02		9.0E-02		1.9E+04			1.9E+04
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5		323.31	☐		1.36E+09		1.0E-04		2.1E+01			2.1E+01
Ethylbenzene	100-41-4	7.9E-03	106.16	☑	5.4E-04	1.11E+03		5.0E-01	8.7E-01	1.1E+05	2.3E+03		2.3E+03
Ethylene cyanohydrin	109-78-4		71.08	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Ethylene diamine	107-15-3		60.10	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Ethylene glycol	107-21-1	6.0E-08	62.07	☐		1.36E+09	0.1	8.0E-01		1.7E+05		8.5E+05	1.4E+05
Ethylene glycol monobutyl ether	111-76-2	2.1E-07	118.17	☐		1.36E+09	0.1	7.0E-02	4.1E+00	1.5E+04	1.4E+10	7.4E+04	1.2E+04
Ethylene oxide	75-21-8	7.6E-05	44.05	☑	1.8E-04	1.92E+03			4.6E-02		2.1E+02		2.1E+02
Ethylene thiourea	96-45-7	3.1E-10	102.15	☐		1.36E+09	0.1	8.0E-05		1.7E+01		8.5E+01	1.4E+01
Ethylphthalyl ethyl glycolate	84-72-0		280.28	☐		1.36E+09		3.0E+00		6.4E+05			6.4E+05
Express	101200-48-		395.39	☐		1.36E+09		8.0E-03		1.7E+03			1.7E+03
Fenamiphos	22224-92-6		303.40	☐		1.36E+09		2.5E-04		5.3E+01			5.3E+01
Fluometuron	2164-17-2		232.20	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Fluoranthene	206-44-0	1.6E-05	202.26	☐	1.5E-01	1.36E+09	0.13	4.0E-01		8.5E+04		3.3E+05	6.7E+04

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Fluorene	86-73-7	7.7E-05	166.22	☑	1.2E-07	7.37E+04	0.13	4.0E-01		8.5E+04		3.3E+05	6.7E+04
Fluorine	7782-41-4		38.00	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Fluridone	59756-60-4		329.32	☐		1.36E+09		8.0E-02		1.7E+04			1.7E+04
Flurprimidol	56425-91-3		312.29	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Flutolanil	66332-96-5		323.31	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Fluvalinate	69409-94-5		502.92	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Folpet	133-07-3		296.56	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Fonofos	944-22-9		246.32	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Formaldehyde	50-00-0	3.4E-07	30.03	☐	1.5E-01	1.36E+09		3.0E-01	1.1E-02	6.4E+04	3.4E+07		6.4E+04
Fosetyl-aluminum	39148-24-8		354.11	☐		1.36E+09		3.0E+00		6.4E+05			6.4E+05
Furan	110-00-9	5.4E-03	68.08	☑	5.6E-03	3.44E+02		1.0E-02		2.1E+03			2.1E+03
Furfural	98-01-1	3.7E-06	96.08	☐		1.36E+09		3.0E-02	1.4E-01	6.4E+03	4.7E+08		6.4E+03
Glufosinate ammonium	77182-82-2		198.16	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Glycidaldehyde	765-34-4	3.1E-07	72.06	☐		1.36E+09	0.1	4.0E-03	2.9E-03	8.5E+02	9.3E+06	4.2E+03	7.1E+02
Glyphosate	1071-83-6		169.07	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Haloxyfop-methyl	69806-40-2		375.73	☐		1.36E+09		5.0E-05		1.1E+01			1.1E+01
Harmony	79277-27-3		387.38	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
HCFC-142b	75-68-3	1.0E-01	100.50	☑	1.4E-02	2.16E+02			1.4E+01		7.4E+03		7.4E+03
HD	505-60-2	2.1E-05	159.08	☑	5.0E-06	1.15E+04	0.17	7.0E-05	5.7E-06	1.5E+01	1.6E-01	4.4E+01	1.6E-01
Heptachlor	76-44-8	1.5E+00	373.32	☐		1.36E+09	0.1	1.0E-04		2.1E+01		1.1E+02	1.8E+01
Heptachlor epoxide	1024-57-3	9.5E-06	389.40	☐		1.36E+09		1.3E-05		2.8E+00			2.8E+00
Hexabromobenzene	87-82-1		551.49	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Hexachlorobenzene	118-74-1	1.3E-03	284.78	☐	1.7E-01	1.36E+09	0.1	1.0E-04		2.1E+01		1.1E+02	1.8E+01
Hexachlorobutadiene	87-68-3	8.1E-03	260.76	☐	2.4E-01	1.36E+09		1.0E-03		2.1E+02			2.1E+02
Hexachlorocyclohexane, alpha-	319-84-6	1.1E-05	290.83	☐		1.36E+09	0.1	8.0E-03		1.7E+03		8.5E+03	1.4E+03
Hexachlorocyclohexane, beta-	319-85-7	7.4E-07	290.83	☐		1.36E+09		6.0E-04		1.3E+02			1.3E+02

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Hexachlorocyclopentadiene	77-47-4	2.7E-02	272.75	☐	4.6E-01	1.36E+09	0.1	1.8E-02	3.2E-02	3.8E+03	1.0E+08	1.9E+04	3.2E+03
Hexachloroethane	67-72-1	3.9E-03	236.74	☐	2.0E-01	1.36E+09	0.1	1.0E-02	1.7E+01	2.1E+03	5.4E+10	1.1E+04	1.8E+03
Hexachlorophene	70-30-4		406.91	☐		1.36E+09		9.0E-04		1.9E+02			1.9E+02
Hexamethylene diisocyanate	822-06-0		168.22	☐		1.36E+09			5.9E-05		1.9E+05		1.9E+05
Hexane, commercial	110-54-3	1.2E-01	86.18	☑	8.2E-03	2.84E+02		3.0E-01	5.7E-01	6.4E+04	3.9E+02		3.9E+02
Hexazinone	51235-04-2		252.32	☐		1.36E+09		3.3E-02		7.0E+03			7.0E+03
HFC-134A	811-97-2	1.5E+00	102.03	☑		1.36E+09			2.3E+01		7.5E+10		7.5E+10
HMX	2691-41-0		296.16	☐		1.36E+09	0.006	5.0E-01		1.1E+05		8.8E+06	1.0E+05
Hydrazine	302-01-2	6.1E-07	32.05	☐		1.36E+09			2.6E-05		8.4E+04		8.4E+04
Hydrogen chloride	7647-01-0		36.47	☐		1.36E+09			5.7E-03		1.9E+07		1.9E+07
Hydrogen cyanide	74-90-8	1.3E-04	27.03	☑	2.4E-04	1.66E+03		2.0E-02	2.6E-03	4.2E+03	1.0E+01		1.0E+01
Hydrogen sulfide	7783-06-4		34.08	☐		1.36E+09		3.0E-02	5.7E-03	6.4E+03	1.9E+07		6.4E+03
Hydroquinone	123-31-9		110.11	☐		1.36E+09		4.0E-01		8.5E+04			8.5E+04
Imazalil	35554-44-0		297.18	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Imazaquin	81335-37-7		311.34	☐		1.36E+09		2.5E-01		5.3E+04			5.3E+04
Iodine	7553-56-2		253.81	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Iprodione	36734-19-7		330.17	☐		1.36E+09		4.0E-02		8.5E+03			8.5E+03
Iron	7439-89-6		55.85	☐		1.36E+09		7.0E-01		1.5E+05			1.5E+05
Isobutyl alcohol	78-83-1	1.2E-05	74.12	☑	4.8E-06	1.17E+04		3.0E+00		6.4E+05			6.4E+05
Isophorone	78-59-1	6.6E-06	138.21	☐	1.5E-01	1.36E+09	0.1	2.0E+00		4.2E+05		2.1E+06	3.5E+05
Isopropalin	33820-53-0		309.36	☐		1.36E+09		1.5E-01		3.2E+04			3.2E+04
Isopropyl methyl phosphonic acid	1832-54-8		138.10	☐		1.36E+09		1.0E+00		2.1E+05			2.1E+05
Isoxaben	82558-50-7		332.40	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
JP-4 jet fuel	50815-00-4			☐		1.36E+09			2.6E+00		8.4E+09		8.4E+09
Kerosene	8008-20-6			☐		1.36E+09			2.9E-03		9.3E+06		9.3E+06
Lactofen	77501-63-4		461.78	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Lewisite oxide	3088-37-7			☐		1.36E+09		3.0E-04	1.4E-01	6.4E+01	4.7E+08		6.4E+01
Lindane	58-89-9	1.4E-05	290.85	☐		1.36E+09	0.04	3.0E-03		6.4E+02		8.0E+03	5.9E+02
Linuron	330-55-2		249.10	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Lithium	7439-93-2		6.94	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Londax	83055-99-6		410.40	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Lutetium	7439-94-3			☐		1.36E+09		5.0E-01		1.1E+05			1.1E+05
Malathion	121-75-5	4.9E-09	330.36	☐		1.36E+09	0.1	2.0E-02	5.7E-03	4.2E+03	1.9E+07	2.1E+04	3.5E+03
Maleic anhydride	108-31-6		98.06	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Maleic hydrazide	123-33-1	6.6E-03	112.09	☑	3.2E-03	4.56E+02		5.0E-01		1.1E+05			1.1E+05
Malononitrile	109-77-3		66.06	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Mancozeb	8018-01-7		265.28	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Maneb	12427-38-2		265.28	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Manganese	7439-96-5		54.94	☐		1.36E+09		1.4E-01	1.4E-05	3.0E+04	4.7E+04		1.8E+04
MCPA	94-74-6		200.62	☐		1.36E+09		5.0E-04		1.1E+02			1.1E+02
MCPB	94-81-5		228.67	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
MCPP	93-65-2		214.65	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Mephosfolan	950-10-7		269.31	☐		1.36E+09		9.0E-04		1.9E+02			1.9E+02
Mepiquat chloride	24307-26-4		149.66	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Mercuric chloride	7487-94-7	7.1E-10	271.50	☐	1.5E-01	1.36E+09		3.0E-03		6.4E+02			6.4E+02
Mercury, elemental	7439-97-6	7.1E-03	200.59	☐	2.3E-01	1.36E+09			3.0E-04		9.8E+05		9.8E+05
Merphos	150-50-5		298.50	☐		1.36E+09		3.0E-04		6.4E+01			6.4E+01
Merphos oxide	78-48-8		314.50	☐		1.36E+09		3.0E-04		6.4E+01			6.4E+01
Metalaxyl	57837-19-1		279.34	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Methacrylonitrile	126-98-7	8.8E-05	67.09	☑	2.0E-04	1.83E+03		1.0E-03	2.0E-03	2.1E+02	8.8E+00		8.4E+00
Methamidophos	10265-92-6		141.13	☐		1.36E+09		5.0E-05		1.1E+01			1.1E+01
Methanol	67-56-1		32.04	☐		1.36E+09		5.0E+00		1.1E+06			1.1E+06
Methidathion	950-37-8		302.32	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Methomyl	16752-77-5	3.8E-02	162.20	☑	1.2E-02	2.37E+02		2.5E-02		5.3E+03			5.3E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Methoxychlor	72-43-5	1.6E-05	345.65	☐		1.36E+09	0.1	5.0E-03		1.1E+03		5.3E+03	8.8E+02
Methoxyethanol, 2-	109-86-4	8.1E-08	76.09	☐		1.36E+09	0.1	1.0E-02	5.7E-02	2.1E+03	1.9E+08	1.1E+04	1.8E+03
Methoxyethyl acetate, 2-	110-49-6		118.13	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Methyl acetate	79-20-9	2.1E-05	74.08	☑	4.1E-05	4.03E+03		1.0E+01		2.1E+06			2.1E+06
Methyl acrylate	96-33-3	2.4E-01	86.09	☑	6.7E-03	3.13E+02		3.0E-02		6.4E+03			6.4E+03
Methyl bromide	74-83-9	6.2E-03	94.94	☑	4.8E-03	3.70E+02		5.0E-03	2.9E-02	1.1E+03	2.5E+01		2.5E+01
Methyl chloride	74-87-3	2.4E-02	50.49	☑	1.1E-02	2.42E+02			2.6E-01		1.5E+02		1.5E+02
Methyl ethyl ketone	78-93-3	2.7E-05	72.10	☑	4.2E-05	3.98E+03		2.0E+00	2.9E-01	4.2E+05	2.7E+03		2.7E+03
Methyl isobutyl ketone	108-10-1	1.4E-04	100.16	☑	2.5E-05	5.15E+03		8.0E-01	2.3E-01	1.7E+05	2.8E+03		2.8E+03
Methyl mercaptan	74-93-1	3.1E-03	48.11	☑		1.36E+09			5.7E-04		1.9E+06		1.9E+06
Methyl methacrylate	80-62-6	3.4E-04	100.13	☑	3.1E-04	1.46E+03		8.0E-02	2.0E-01	1.7E+04	7.0E+02		6.7E+02
Methyl parathion	298-00-0	1.0E-07	263.23	☐		1.36E+09	0.1	7.0E-04		1.5E+02		7.4E+02	1.2E+02
Methyl tertiary butyl ether	1634-04-4	5.9E-04	88.17	☑	7.1E-04	9.61E+02		3.0E-01	7.2E-01	6.4E+04	1.7E+03		1.6E+03
Methylene chloride	75-09-2	2.2E-03	84.93	☑	2.5E-03	5.11E+02		6.0E-02	3.0E-01	1.3E+04	3.6E+02		3.5E+02
Methylene diphenyl diisocyanate	101-68-8		250.26	☐		1.36E+09	0.1		2.0E-05		6.5E+04		6.5E+04
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	4.1E-11	267.17	☐		1.36E+09	0.1	2.0E-03		4.2E+02		2.1E+03	3.5E+02
Methylenedianiline, 4,4'-	101-77-9	5.6E-11	198.26	☐		1.36E+09	0.1	8.0E-02		1.7E+04		8.5E+04	1.4E+04
Methylmercury	22967-92-6	4.7E-07	215.62	☐	1.5E-01	1.36E+09		1.0E-04		2.1E+01			2.1E+01
Methylnaphthalene, 1-	90-12-0	5.1E-04	142.20	☑		1.36E+09		7.0E-02		1.5E+04			1.5E+04
Methylnapthalene, 2-	91-57-6	5.2E-04	142.20	☑	1.6E-01	6.50E+01	0.13	4.0E-03		8.5E+02		3.3E+03	6.7E+02
Methylphosphonic acid	993-13-5		96.02	☐		1.36E+09			6.9E-03		2.2E+07		2.2E+07
Methylstyrene, alpha-	98-83-9	2.3E-03	118.18	☑	1.5E-04	2.07E+03		7.0E-01		1.5E+05			1.5E+05
Metolachlor	51218-45-2		283.80	☐		1.36E+09		1.5E-01		3.2E+04			3.2E+04
Metribuzin	21087-64-9		214.28	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Mirex	2385-85-5		545.55	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Molinate	2212-67-1		187.30	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Molybdenum	7439-98-7		95.95	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Monochloramine	10599-90-3		51.48	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Naled	300-76-5		380.79	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Naphthalene	91-20-3	4.8E-04	128.19	☑	8.4E-06	8.86E+03	0.13	2.0E-01	8.6E-04	4.2E+04	1.8E+01	1.6E+05	1.8E+01
Napropamide	15299-99-7		271.36	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Nickel, soluble salts	Ni sol salts			☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Nitrate	14797-55-8		62.00	☐		1.36E+09		1.6E+00		3.4E+05			3.4E+05
Nitrite	14797-65-0		46.01	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Nitroaniline, 2-	88-74-4	1.1E-07	138.13	☐	1.5E-01	1.36E+09			1.1E-04		3.7E+05		3.7E+05
Nitrobenzene	98-95-3	2.4E-05	123.11	☑	8.1E-06	9.04E+03		6.0E-03	5.7E-03	1.3E+03	1.2E+02		1.1E+02
Nitrofurantoin	67-20-9		238.16	☐		1.36E+09		7.0E-01		1.5E+05			1.5E+05
Nitroglycerin	55-63-0	3.2E-05	227.09	☐	1.5E-01	1.36E+09		1.0E-04		2.1E+01			2.1E+01
Nitroguanidine	556-88-7		104.07	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Nitromethane	75-52-5	2.6E-05	61.04	☑		1.36E+09			1.7E-02		5.6E+07		5.6E+07
Nitrophenol, 2-	88-75-5	1.5E-05	139.11	☑	1.5E-01	6.62E+01			1.4E-04		2.3E-02		2.3E-02
Nitropropane, 2-	79-46-9	1.2E-04	89.09	☑		1.36E+09			5.7E-03		1.9E+07		1.9E+07
Nitrosodimethylamine, N-	62-75-9	1.2E-06	74.08	☐	1.5E-01	1.36E+09	0.1	8.0E-06		1.7E+00		8.5E+00	1.4E+00
Nitrotoluene, m-	99-08-1	2.4E-05	137.13	☑	8.1E-06	9.04E+03		1.0E-03		2.1E+02			2.1E+02
Nitrotoluene, o-	88-72-2	2.4E-05	137.13	☑	8.1E-06	9.04E+03		1.0E-02		2.1E+03			2.1E+03
Nitrotoluene, p-	99-99-0	2.4E-05	137.13	☑	8.1E-06	9.04E+03		4.0E-03		8.5E+02			8.5E+02
Norflurazon	27314-13-2		303.67	☐		1.36E+09		4.0E-02		8.5E+03			8.5E+03
NuStar	85509-19-9		315.40	☐		1.36E+09		7.0E-04		1.5E+02			1.5E+02
Octabromodiphenyl ether	32536-52-0		801.38	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Octamethylpyrophosphoramide	152-16-9		286.25	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Oryzalin	19044-88-3		346.36	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Oxadiazon	19666-30-9		345.22	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Oxamyl	23135-22-0		219.26	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Oxyfluorfen	42874-03-3		361.70	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Paclobutrazol	76738-62-0		293.80	☐		1.36E+09		1.3E-01		2.8E+04			2.8E+04
Paraquat dichloride	1910-42-5		257.16	☐		1.36E+09		4.5E-03		9.5E+02			9.5E+02
Parathion	56-38-2		291.27	☐		1.36E+09		6.0E-03		1.3E+03			1.3E+03
Pebulate	1114-71-2		203.34	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Pendimethalin	40487-42-1		281.31	☐		1.36E+09		4.0E-02		8.5E+03			8.5E+03
Pentabromodiphenyl ether	32534-81-9		564.69	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Pentachlorobenzene	608-93-5		250.34	☐		1.36E+09		8.0E-03		1.7E+03			1.7E+03
Pentachloronitrobenzene	82-68-8	3.8E-04	295.36	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Pentachlorophenol	87-86-5	2.4E-08	266.35	☐	1.5E-01	1.36E+09	0.25	1.0E-03		2.1E+02		4.2E+02	1.4E+02
Perchloroethylene	127-18-4	1.8E-02	165.80	☑	2.4E-03	5.22E+02		1.0E-01	7.7E-02	2.1E+04	9.7E+01		9.7E+01
Permethrin	52645-53-1		391.29	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Phenmedipham	13684-63-4		300.31	☐		1.36E+09		2.5E-01		5.3E+04			5.3E+04
Phenol	108-95-2	6.0E-07	94.11	☐	1.5E-01	1.36E+09		6.0E-01		1.3E+05			1.3E+05
Phenylenediamine, m-	108-45-2		108.05	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Phenylenediamine, p-	106-50-3		108.05	☐		1.36E+09		1.9E-01		4.0E+04			4.0E+04
Phenylmercuric acetate	62-38-4		336.74	☐		1.36E+09		8.0E-05		1.7E+01			1.7E+01
Phorate	298-02-2		260.40	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01
Phosgene	75-44-5		98.92	☐		1.36E+09			2.6E-04		8.4E+05		8.4E+05
Phosmet	732-11-6		317.31	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Phosphine	7803-51-2		34.00	☐		1.36E+09		3.0E-04	8.6E-04	6.4E+01	2.8E+06		6.4E+01
Phosphoric acid	7664-38-2		98.00	☐		1.36E+09			2.9E-02		9.3E+07		9.3E+07
Phosphorus, white	12185-10-3		123.92	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01
Phthalic anhydride	85-44-9	1.6E-08	148.11	☐		1.36E+09		2.0E+00	3.4E-02	4.2E+05	1.1E+08		4.2E+05

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Picloram	1918-02-1		241.46	☐		1.36E+09		7.0E-02		1.5E+04			1.5E+04
Pirimiphos-methyl	29232-93-7		305.33	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Polybrominated biphenyl	36355-01-8		627.59	☐		1.36E+09		7.0E-05		1.5E+01			1.5E+01
Potassium cyanide	151-50-8		65.12	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Potassium perchlorate	7778-74-7		138.54	☐		1.36E+09		7.0E-04		1.5E+02			1.5E+02
Potassium silver cyanide	506-61-6		198.99	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Prochloraz	67747-09-5		376.67	☐		1.36E+09		9.0E-03		1.9E+03			1.9E+03
Profluralin	26399-36-0		347.29	☐		1.36E+09		6.0E-03		1.3E+03			1.3E+03
Prometon	1610-18-0		225.29	☐		1.36E+09		1.5E-01		3.2E+04			3.2E+04
Prometryn	7287-19-6		241.35	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Pronamide	23950-58-5		256.13	☐		1.36E+09		7.5E-02		1.6E+04			1.6E+04
Propachlor	1918-16-7		211.69	☐		1.36E+09		1.3E-01		2.8E+04			2.8E+04
Propanil	709-98-8		218.08	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Propargite	2312-35-8		350.47	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Propargyl alcohol	107-19-7		56.06	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Propazine	139-40-2		229.71	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Propham	122-42-9		179.22	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Propiconazole	60207-90-1		342.22	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Propylene glycol	57-55-6	1.3E-08	76.10	☐		1.36E+09		2.0E+01	8.0E-03	4.2E+06	2.6E+07		3.6E+06
Propylene glycol dinitrate	6423-43-4	9.4E-07	166.09	☐		1.36E+09			7.8E-05		2.5E+05		2.5E+05
Propylene glycol monoethyl ether	1569-02-4		104.15	☐		1.36E+09		7.0E+00		1.5E+06			1.5E+06
Propylene glycol monomethyl ether	107-98-2	1.8E-08	90.12	☐		1.36E+09	0.1	7.0E+00	5.7E+00	1.5E+06	1.9E+10	7.4E+06	1.2E+06
Propylene oxide	75-56-9	8.5E-05	58.08	☑	8.7E-05	2.74E+03			8.6E-03		5.6E+01		5.6E+01
Pursuit	81335-77-5		289.33	☐		1.36E+09		2.5E-01		5.3E+04			5.3E+04
Pydrin	51630-58-1		419.91	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Pyrene	129-00-0	1.1E-05	202.26	☐	1.1E-09	1.36E+09	0.13	3.0E-01		6.4E+04		2.4E+05	5.1E+04
Pyridine	110-86-1		70.10	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Quinalphos	13593-03-8		298.30	☐		1.36E+09		5.0E-04		1.1E+02			1.1E+02
RDX	121-82-4	2.0E-11	222.26	☐	1.5E-01	1.36E+09	0.015	3.0E-02		6.4E+03		2.1E+05	6.2E+03
Refractory ceramic fibers	ref ceramic			☐		1.36E+09			3.0E-02		9.8E+07		9.8E+07
Resmethrin	10453-86-8		338.45	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Ronnel	299-84-3		321.57	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Rotenone	83-79-4		391.41	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Savey	78587-05-0		352.88	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Selenious acid	7783-00-8		128.97	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Selenium	7782-49-2		78.96	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Selenourea	630-10-4		123.02	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Sethoxydim	74051-80-2		327.48	☐		1.36E+09		9.0E-02		1.9E+04			1.9E+04
Silver	7440-22-4		107.87	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Silver cyanide	506-64-9		133.89	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Silvex	93-72-1		269.51	☐		1.36E+09		8.0E-03		1.7E+03			1.7E+03
Simazine	122-34-9		201.66	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Sodium azide	26628-22-8		65.02	☐		1.36E+09		4.0E-02		8.5E+03			8.5E+03
Sodium cyanide	143-33-9		49.01	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Sodium diethydithiocarbamate	148-18-5		171.25	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Sodium fluoroacetate	62-74-8		100.02	☐		1.36E+09		2.0E-04		4.2E+01			4.2E+01
Sodium metavanadate	13718-26-8		121.93	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Sodium perchlorate	7601-89-0		122.44	☐		1.36E+09		7.0E-04		1.5E+02			1.5E+02
Strontium, stable	7440-24-6		87.62	☐		1.36E+09		2.0E+00		4.2E+05			4.2E+05
Strychnine	57-24-9		334.42	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Styrene	100-42-5	2.7E-03	104.16	☑	8.7E-05	2.75E+03			2.4E-01		1.6E+03		1.6E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Sulfonylbis(4-chlorobenzene),1,1'-	80-07-9		287.16	☐		1.36E+09		4.0E-03		8.5E+02			8.5E+02
Systhane	88671-89-0		288.78	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
TCDD, 2,3,7,8-	1746-01-6	7.9E-05	321.97	☐	1.5E-01	1.36E+09	0.03	2.0E-08		4.2E-03		7.1E-02	4.0E-03
Tebuthiuron	34014-18-1		228.31	☐		1.36E+09		7.0E-02		1.5E+04			1.5E+04
Temephos	3383-96-8		466.46	☐		1.36E+09		2.0E-01		4.2E+04			4.2E+04
Terbacil	5902-51-2		216.67	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Terbufos	13071-79-9		288.45	☐		1.36E+09		2.5E-05		5.3E+00			5.3E+00
Terbutryn	886-50-0		241.35	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Tetrachlorobenzene, 1,2,4,5-	95-94-3		215.89	☐		1.36E+09		2.0E-03		4.2E+02			4.2E+02
Tetrachloroethane, 1,1,1,2-	630-20-6	3.4E-04	167.85	☑	7.9E-05	2.89E+03		9.0E-02		1.9E+04			1.9E+04
Tetrachloroethane, 1,1,2,2-	79-34-5	3.4E-04	167.86	☑	7.9E-05	2.89E+03		1.0E-02		2.1E+03			2.1E+03
Tetrachlorophenol, 2,3,4,6-	58-90-2		231.89	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Tetrachlorovinphos	961-11-5	1.8E-09	365.96	☐		1.36E+09		3.0E-02		6.4E+03			6.4E+03
Tetraethyl dithiopyrophosphate	3689-24-5		322.32	☐		1.36E+09		5.0E-03		1.1E+03			1.1E+03
Tetraethyl lead	78-00-2		323.45	☐		1.36E+09		1.0E-06		2.1E-01			2.1E-01
Tetrahydrofuran	109-99-9	7.0E-05	72.10	☑	1.4E-04	2.18E+03			8.6E-02		4.5E+02		4.5E+02
Thallium (I) acetate	563-68-8		263.43	☐		1.36E+09		9.0E-04		1.9E+02			1.9E+02
Thallium (I) carbonate	6533-73-9		468.78	☐		1.36E+09		8.0E-04		1.7E+02			1.7E+02
Thallium (I) chloride	7791-12-0		239.84	☐		1.36E+09		8.0E-04		1.7E+02			1.7E+02
Thallium (I) sulfate	7446-18-6		504.82	☐		1.36E+09		8.0E-04		1.7E+02			1.7E+02
Thiobencarb	28249-77-6		257.78	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Thiocyanates	463-56-9		59.09	☐		1.36E+09		6.0E-04		1.3E+02			1.3E+02
Thiodiglycol	111-48-8		122.18	☐		1.36E+09	'#####	5.0E-01		1.1E+05		7.1E+06	1.0E+05
Thiofanox	39196-18-4		218.31	☐		1.36E+09		3.0E-04		6.4E+01			6.4E+01

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Thiophanate-methyl	23564-05-8		342.39	☐		1.36E+09		8.0E-02		1.7E+04			1.7E+04
Thiram	137-26-8		240.44	☐		1.36E+09		6.0E-03		1.3E+03			1.3E+03
Tin, inorganic	7440-31-5		118.69	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Titanium tetrachloride	7550-45-0		189.68	☐		1.36E+09			2.9E-03		9.3E+06		9.3E+06
Toluene	108-88-3	6.6E-03	92.13	☑	9.9E-04	8.15E+02		8.0E-01	1.4E+00	1.7E+05	2.8E+03		2.7E+03
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5		174.15	☐		1.36E+09			2.0E-05		6.5E+04		6.5E+04
Toluene-2,5-diamine	95-70-5		122.17	☐		1.36E+09		6.0E-01		1.3E+05			1.3E+05
Toluene-2,6-diamine	823-40-5		122.17	☐		1.36E+09		6.0E-02		1.3E+04			1.3E+04
Toxaphene	8001-35-2	6.0E-06	414.00	☐		1.36E+09		1.0E-03		2.1E+02			2.1E+02
Tralomethrin	66841-25-6		665.01	☐		1.36E+09		7.5E-03		1.6E+03			1.6E+03
Triallate	2303-17-5		304.66	☐		1.36E+09		1.3E-02		2.8E+03			2.8E+03
Triasulfuron	82097-50-5		401.82	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Tribromobenzene, 1,2,4-	615-54-3		314.80	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Tributyl phosphate	126-73-8		266.32	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Tributyltin oxide	56-35-9		596.07	☐		1.36E+09		3.0E-04		6.4E+01			6.4E+01
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	5.2E-01	187.40	☑	6.3E-03	3.22E+02		3.0E+00	8.6E+00	6.4E+05	6.6E+03		6.6E+03
Trichlorobenzene, 1,2,4-	120-82-1	1.4E-03	181.46	☑	8.4E-06	8.84E+03		9.0E-02	5.7E-03	1.9E+04	1.2E+02		1.2E+02
Trichloroethane, 1,1,1-	71-55-6	1.7E-02	133.42	☑	3.2E-03	4.53E+02		6.0E+00	1.1E+00	1.3E+06	1.2E+03		1.2E+03
Trichloroethane, 1,1,2-	79-00-5	9.1E-04	133.41	☑	3.7E-04	1.33E+03		3.9E-03		8.3E+02			8.3E+02
Trichloroethylene	79-01-6	1.0E-02	131.40	☑	1.5E-03	6.68E+02			1.5E-01		2.5E+02		2.5E+02
Trichlorofluoromethane	75-69-4	9.7E-02	137.38	☑	1.0E-02	2.57E+02		7.0E-01	2.9E-01	1.5E+05	1.8E+02		1.8E+02
Trichlorophenol, 2,4,5-	95-95-4	5.6E-06	197.45	☐	1.5E-01	1.36E+09		3.0E-01		6.4E+04			6.4E+04
Trichlorophenol, 2,4,6-	88-06-2	7.8E-06	197.45	☐	1.5E-01	1.36E+09		1.0E-03		2.1E+02			2.1E+02
Trichlorophenoxyacetic acid	93-76-5		255.49	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Trichloropropane, 1,1,2-	598-77-6	3.4E-04	147.43	☑	1.3E-04	2.25E+03		5.0E-02		1.1E+04			1.1E+04
Trichloropropane, 1,2,3-	96-18-4	3.4E-04	147.43	☑	1.3E-04	2.25E+03		6.0E-02	8.6E-04	1.3E+04	4.6E+00		4.6E+00
Trichloropropene, 1,2,3-	96-19-5	3.4E-04	145.42	☑	1.3E-04	2.25E+03		3.0E-02	8.6E-04	6.4E+03	4.6E+00		4.6E+00
Trichlorotoluene, 2,3,6-	2077-46-5		195.48	☐		1.36E+09		5.0E-05		1.1E+01			1.1E+01
Trichlorotoluene, alpha, 2,6-	2014-83-7		195.48	☐		1.36E+09		5.0E-05		1.1E+01			1.1E+01
Triclosan	3380-34-5		289.55	☐		1.36E+09		4.0E+00		8.5E+05			8.5E+05
Tridiphane	58138-08-2		320.43	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Triethylamine	121-44-8	9.0E-05	101.19	☑	2.0E-04	1.80E+03			2.0E-02		8.6E+01		8.6E+01
Trifluralin	1582-09-8	2.6E-05	335.28	☐		1.36E+09	0.1	7.5E-03		1.6E+03		8.0E+03	1.3E+03
Trimethylbenzene, 1,2,4-	95-63-6	5.7E-03	120.19	☑	4.1E-05	4.03E+03			2.0E-02		1.9E+02		1.9E+02
Trimethylbenzene, 1,3,5-	108-67-8	7.7E-03	120.19	☑	2.4E-04	1.65E+03			2.9E-03		1.1E+01		1.1E+01
Trinitrobenzene, 1,3,5-	99-35-4	8.7E-08	213.11	☐	1.5E-01	1.36E+09	0.019	5.0E-04		1.1E+02		2.8E+03	1.0E+02
Trinitrophenylmethylnitramine	479-45-8		287.15	☐		1.36E+09	'#####	1.0E-02		2.1E+03		1.6E+06	2.1E+03
Trinitrotoluene, 2,4,6-	118-96-7	4.9E-09	227.13	☐	1.5E-01	1.36E+09	0.032	1.5E-03		3.2E+02		5.0E+03	3.0E+02
Triphenylphosphine oxide	791-28-6		278.29	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Tris(2-chloroethyl)phosphate	115-96-8		285.49	☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03
Tris(2-ethylhexyl)phosphate	78-42-2		434.64	☐		1.36E+09		1.0E-01		2.1E+04			2.1E+04
Uranium, highly soluble salts	HZ1800-90-			☐		1.36E+09		2.0E-03	1.1E-04	4.2E+02	3.7E+05		4.2E+02
Vanadium	7440-62-2		50.94	☐		1.36E+09		7.0E-03	2.9E-05	1.5E+03	9.3E+04		1.5E+03
Vanadium pentoxide	1314-62-1		181.90	☐		1.36E+09		9.0E-03	2.9E-05	1.9E+03	9.3E+04		1.9E+03
Vanadium sulfate	16785-81-2			☐		1.36E+09		2.0E-02		4.2E+03			4.2E+03

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	RfDo	RfDi	Ingestion	Inhalation	Dermal	SMEGnc
Vernam	1929-77-7		203.34	☐		1.36E+09		1.0E-02		2.1E+03			2.1E+03
Vinclozolin	50471-44-8		286.11	☐		1.36E+09		2.5E-02		5.3E+03			5.3E+03
Vinyl acetate	108-05-4	5.1E-04	86.09	☑	6.8E-04	9.81E+02		1.0E+00	1.0E-02	2.1E+05	2.4E+01		2.4E+01
Vinyl chloride	75-01-4	2.7E-02	62.50	☑	1.5E-02	2.12E+02		3.0E-03	2.2E-02	6.4E+02	1.1E+01		1.1E+01
Vinyl toluene	25013-15-4	2.3E-03	118.18	☑	1.5E-04	2.07E+03		6.0E-03	1.1E-02	1.3E+03	5.7E+01		5.4E+01
Warfarin	81-81-2		308.32	☐		1.36E+09		3.0E-04		6.4E+01			6.4E+01
Xylene, m-	108-38-3	7.3E-03	106.16	☑		1.36E+09		2.0E+00		4.2E+05			4.2E+05
Xylene, o-	95-47-6	6.0E-03	106.16	☑	2.2E-01	5.46E+01		2.0E+00		4.2E+05			4.2E+05
Xylenes, total	1330-20-7	7.3E-03	106.16	☑	4.2E-04	1.25E+03		4.0E-01	1.1E-01	8.5E+04	3.4E+02		3.4E+02
Zinc cyanide	557-21-1		117.43	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04
Zinc phosphide	1314-84-7		258.12	☐		1.36E+09		3.0E-03		6.4E+02			6.4E+02
Zinc, metallic	7440-66-6		65.39	☐		1.36E+09		3.0E-01		6.4E+04			6.4E+04
Zineb	12122-67-7		275.73	☐		1.36E+09		5.0E-02		1.1E+04			1.1E+04

Table F-2: Soil Concentration Estimates for Non-Carcinogenic Chemicals

Chemical Name	*CASRN*	*H*	*MW*	*VOC*	*DA*	*VF or PEF*	*ABS*	*RfDo*	*RfDi*	*Ingestion*	*Inhalation*	*Dermal*	*SMEGnc*

Units:
atm = atmospheres
m = meter
mol = mole
g = grams
cm = centimeters
mg = milligrams
kg = kilograms
sec = second

Notes:
CASRN = Chemical Abstract Service Registry Number
H = Henry's law constant (atm-m^3/mol)
MW = molecular weight (g/mol)
VOC = Volatile Organic Compound
DA = apparent diffusivity (cm^2/sec)
VF = soil-to-air volatilization factor (m^3/kg)
PEF = particulate emission factor (m^3/kg)
ABS = dermal absorption fraction (unitless)
RfDo = oral reference dose (mg/kg-day)
RfDi = inhalation reference dose (mg/kg-day)
SMEGnc = soil military exposure guideline based on non-cancer endpoint (mg/kg)
Note that dermal contribution was calculated using the RfDo because dermal RfD values are not available for these chemicals
Note that the Ingestion, Inhalation and Dermal columns all have units of mg/kg
Please see Table 3-6 for health criteria used to derive the soil concentrations for chemical warfare agents

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Acephate	30560-19-1	5.0E-13	183.16	☐		1.36E+09		8.7E-03		1.7E+05			1.7E+05
Acetaldehyde	75-07-0	7.9E-05	44.05	☑	1.0E-04	2.56E+03			7.7E-03		5.6E+03		5.6E+03
Acrylamide	79-06-1	1.0E-09	71.08	☐		1.36E+09	0.1	5.0E-01	3.5E-01	3.0E+03	6.5E+07	1.5E+04	2.5E+03
Acrylonitrile	107-13-1	8.8E-05	53.06	☑	1.9E-04	1.84E+03		5.4E-01	2.4E-01	2.7E+03	1.3E+02		1.2E+02
Alachlor	15972-60-8	3.2E-08	269.77	☐		1.36E+09		8.0E-02		1.9E+04			1.9E+04
Aldrin	309-00-2	1.7E-04	364.93	☐		1.36E+09	0.1	1.7E+01	1.7E+01	8.7E+01	1.3E+06	4.4E+02	7.3E+01
Aniline	62-53-3	1.9E-06	93.12	☐		1.36E+09	0.1	5.7E-03		2.6E+05		1.3E+06	2.2E+05
Aramite	140-57-8		334.87	☐		1.36E+09		2.5E-02	2.5E-02	5.9E+04	9.2E+08		5.9E+04
Arsenic, elemental	7440-38-2		74.92	☐		1.36E+09	0.03	1.5E+00	1.5E+01	9.9E+02	1.5E+06	1.6E+04	9.3E+02
Atrazine	1912-24-9	3.0E-09	216.06	☐		1.36E+09		2.2E-01		6.7E+03			6.7E+03
Azobenzene	103-33-3	1.3E-05	182.22	☑		1.36E+09		1.1E-01	1.1E-01	1.3E+04	2.1E+08		1.3E+04
Benzene	71-43-2	5.6E-03	78.11	☑	2.1E-03	5.60E+02		5.5E-02	2.7E-02	2.7E+04	3.4E+02		3.4E+02
Benzidine	92-87-5	3.9E-11	184.23	☐		1.36E+09	0.1	2.3E+02	2.3E+02	6.5E+00	9.8E+04	3.2E+01	5.4E+00
Benzo(a)anthracene	56-55-3	3.6E-06	228.30	☐	1.5E-01	1.36E+09	0.13		3.1E-01		7.4E+07		7.4E+07
Benzo(a)pyrene	50-32-8	1.1E-06	252.30	☐	1.5E-01	1.36E+09	0.13	7.3E+00	3.1E+00	2.0E+02	7.4E+06	7.8E+02	1.6E+02
Benzo(b)fluoranthene	205-99-2	6.2E-06	252.30	☐	1.5E-01	1.36E+09	0.13		3.1E-01		7.4E+07		7.4E+07
Benzo(k)fluoranthene	207-08-9	4.2E-07	252.32	☐	1.5E-01	1.36E+09	0.13		3.1E-02		7.4E+08		7.4E+08
Benzotrichloride	98-07-7	2.8E-04	195.50	☑		1.36E+09		1.3E+01		1.1E+02			1.1E+02
Beryllium, elemental	7440-41-7		9.01	☐		1.36E+09			8.4E+00		2.7E+06		2.7E+06
Bis(2-chloro-1-methylethyl) ether	108-60-1	1.1E-04	171.07	☑	3.3E-05	4.49E+03		7.0E-02	3.5E-02	2.1E+04	2.2E+03		2.0E+03
Bis(2-chloroethyl) ether	111-44-4	1.8E-05	143.02	☑	4.9E-06	1.16E+04		1.1E+00	1.2E+00	1.3E+03	1.7E+02		1.5E+02
Bis(2-ethylhexyl) phthalate	117-81-7	1.0E-07	390.56	☐	1.5E-01	1.36E+09	0.1	1.4E-02		1.1E+05		5.3E+05	8.8E+04
Bis(chloromethyl) ether	542-88-1	2.0E-04	114.96	☑	3.5E-04	1.37E+03		2.2E+02	2.2E+02	6.7E+00	1.1E-01		1.0E-01
Bromate	15541-45-4		127.90	☐		1.36E+09		7.0E-01		2.1E+03			2.1E+03
Bromodichloromethane	75-27-4	1.6E-03	163.83	☑	2.3E-04	1.69E+03		6.2E-02		2.4E+04			2.4E+04

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Bromoethene	593-60-2	6.2E-03	106.96	☑	1.5E-03	6.69E+02			1.1E-01		1.0E+02		1.0E+02
Bromoform	75-25-2	6.5E+00	252.80	☐	7.6E+01	1.36E+09	0.1	7.9E-03	3.9E-03	1.9E+05	5.9E+09	9.4E+05	1.6E+05
Butadiene, 1,3-	106-99-0	1.8E-01	54.09	☑	1.7E-02	1.97E+02			1.1E-01		3.1E+01		3.1E+01
Butyl benzyl phthalate	85-68-7	1.9E-06	312.39	☐	1.5E-01	1.36E+09		1.9E-03		7.8E+05			7.8E+05
Cadmium, elemental	7440-43-9		112.40	☐		1.36E+09	0.001		6.3E+00		3.6E+06		3.6E+06
Captafol	2425-06-1		349.06	☐		1.36E+09		8.6E-03		1.7E+05			1.7E+05
Captan	133-06-2	7.2E-06	300.60	☐		1.36E+09		3.5E-03		4.2E+05			4.2E+05
Carbazole	86-74-8	8.7E-08	167.20	☐		1.36E+09	0.13	2.0E-02		7.4E+04		2.9E+05	5.9E+04
Carbon tetrachloride	56-23-5	3.0E-02	153.84	☑	3.7E-03	4.23E+02		7.0E-02	2.1E-02	2.1E+04	3.4E+02		3.3E+02
Chloranil	118-75-2		245.88	☐		1.36E+09		4.0E-01		3.7E+03			3.7E+03
Chlordane	57-74-9	4.9E-05	409.80	☐		1.36E+09	0.04		1.3E+00		1.8E+07		1.8E+07
Chlordecone	143-50-0	2.5E-08	490.64	☐		1.36E+09		1.0E+01		1.5E+02			1.5E+02
Chloro-2-methylaniline hydrochloride, 4-	3165-93-3		178.06	☐		1.36E+09		4.6E-01		3.2E+03			3.2E+03
Chloro-2-methylaniline, 4-	95-69-2		141.60	☐		1.36E+09		5.8E-01		2.6E+03			2.6E+03
Chloroaniline, 4-	106-47-8	1.2E-06	127.57	☐	1.5E-01	1.36E+09		2.0E-01		7.4E+03			7.4E+03
Chlorobenzilate	510-15-6	7.2E-08	325.19	☐		1.36E+09	0.1	2.7E-01	2.7E-01	5.5E+03	8.4E+07	2.7E+04	4.6E+03
Chloroform	67-66-3	3.7E-03	119.38	☑	2.2E-03	5.45E+02			8.1E-02		1.1E+02		1.1E+02
Chloronitrobenzene, o-	88-73-3	2.4E-05	157.56	☑	8.1E-06	9.04E+03		3.0E-01		4.9E+03			4.9E+03
Chlorothalonil	1897-45-6	2.7E-07	235.91	☐		1.36E+09	0.1	1.1E-02		1.3E+05		6.7E+05	1.1E+05
Chromium (VI)	18540-29-9		52.00	☐		1.36E+09			4.2E+01		5.4E+05		5.4E+05
Chrysene	218-01-9	9.5E-05	228.30	☐	2.1E-09	1.36E+09	0.13		3.1E-03		7.4E+09		7.4E+09
Cobalt	7440-48-4		58.93	☐		1.36E+09			3.2E+01		7.2E+05		7.2E+05
Coke oven emissions	8007-45-2			☐		1.36E+09			2.2E+00		1.1E+07		1.1E+07
Crotonaldehyde, trans-	123-73-9	2.0E-05	70.09	☑		1.36E+09		1.9E+00		7.8E+02			7.8E+02
Cyanazine	21725-46-2	2.6E-10	240.69	☐		1.36E+09		8.4E-01		1.8E+03			1.8E+03
DDD	72-54-8	4.0E-06	320.05	☐		1.36E+09	0.1	2.4E-01		6.2E+03		3.1E+04	5.2E+03

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
DDE	72-55-9	2.1E-05	318.03	☐		1.36E+09	0.1	3.4E-01		4.4E+03		2.2E+04	3.6E+03
DDT	50-29-3	8.1E-06	354.50	☐		1.36E+09	0.03	3.4E-01	3.4E-01	4.4E+03	6.7E+07	7.3E+04	4.1E+03
Decabromodiphenyl ether	1163-19-5		959.17	☐		1.36E+09		7.0E-04		2.1E+06			2.1E+06
Di(2-ethylhexyl)adipate	103-23-1	2.1E-05	370.57	☐		1.36E+09	0.1	1.2E-03		1.2E+06		6.2E+06	1.0E+06
Diallate	2303-16-4	3.8E-06	270.22	☐		1.36E+09	0.1	6.1E-02		2.4E+04		1.2E+05	2.0E+04
Dibenz(a,h)anthracene	53-70-3	1.1E-08	278.35	☐	1.5E-01	1.36E+09	0.13		3.1E+00		7.4E+06		7.4E+06
Dibromo-3-chloropropane, 1,2-	96-12-8	1.5E-04	236.33	☐	7.6E-06	1.36E+09	0.1	8.0E-01	2.1E+01	1.9E+03	1.1E+06	9.3E+03	1.5E+03
Dibromochloromethane	124-48-1	8.5E-04	208.28	☐	6.0E-05	1.36E+09	0.1	8.4E-02		1.8E+04		8.8E+04	1.5E+04
Dibromoethane, 1,2-	106-93-4	3.2E-04	187.88	☑	1.8E-04	1.89E+03		2.0E+00	2.1E+00	7.4E+02	1.5E+01		1.5E+01
Dichloro-2-butene, 1,4-	764-41-0	2.6E-04	124.99	☑	1.0E-04	2.53E+03			1.5E+01		2.9E+00		2.9E+00
Dichloroacetic acid	79-43-6		128.94	☐		1.36E+09		5.0E-02		3.0E+04			3.0E+04
Dichlorobenzene, 1,4-	106-46-7	2.4E-03	147.01	☑	9.4E-05	2.65E+03		2.4E-02		6.2E+04			6.2E+04
Dichlorobenzidine, 3,3'-	91-94-1	4.0E-09	253.13	☐		1.36E+09	0.1	4.5E-01		3.3E+03		1.6E+04	2.7E+03
Dichloroethane, 1,2-	107-06-2	9.8E-04	98.96	☑	1.0E-03	8.02E+02		9.1E-02	9.1E-02	1.6E+04	1.5E+02		1.5E+02
Dichloroethylene, 1,1-	75-35-4	2.6E-02	96.95	☑	7.7E-03	2.93E+02			1.2E+00		4.1E+00		4.1E+00
Dichloropropane, 1,2-	78-87-5	2.8E-03	112.99	☑	1.2E-03	7.35E+02		6.8E-02		2.2E+04			2.2E+04
Dichloropropene, 1,3-	542-75-6	1.8E-02	110.98	☑	4.6E-03	3.77E+02		1.0E-01	1.4E-02	1.5E+04	4.5E+02		4.4E+02
Dichlorvos	62-73-7	1.5E-03	220.98	☐		1.36E+09		2.9E-01		5.1E+03			5.1E+03
Dieldrin	60-57-1	1.5E-05	380.93	☐		1.36E+09	0.1	1.6E+01	1.6E+01	9.3E+01	1.4E+06	4.6E+02	7.7E+01
Diethylstilbestrol	56-53-1	5.8E-12	268.35	☐		1.36E+09	0.1	4.7E-03		3.2E+05		1.6E+06	2.6E+05
Dimethoxybenzidine, 3,3'-	119-90-4	1.8E-13	244.29	☐		1.36E+09	0.1	1.4E-02		1.1E+05		5.3E+05	8.8E+04
Dimethyl methylphosphonate	756-79-6		124.08	☐		1.36E+09		1.7E-03		8.7E+05			8.7E+05
Dimethylaniline hydrochloride, 2,4-	21436-96-4		157.64	☐		1.36E+09		5.8E-01		2.6E+03			2.6E+03
Dimethylaniline, 2,4-	95-68-1		121.18	☐		1.36E+09		7.5E-01		2.0E+03			2.0E+03

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Dimethylbenzidine, 3,3'-	119-93-7	6.3E-11	212.29	☐		1.36E+09	0.1	1.1E+01		1.3E+02		6.7E+02	1.1E+02
Dinitrotoluene	25321-14-6		182.15	☐		1.36E+09		6.8E-01		2.2E+03			2.2E+03
Dioxane, 1,4-	123-91-1	4.8E-06	88.10	☐	1.5E-01	1.36E+09	0.1	1.1E-02		1.3E+05		6.7E+05	1.1E+05
Diphenylhydrazine, 1,2-	122-66-7	1.5E-06	184.24	☐		1.36E+09	0.1	8.0E-01	7.7E-01	1.9E+03	3.0E+07	9.3E+03	1.5E+03
Direct black 38	1937-37-7		781.73	☐		1.36E+09		8.6E+00		1.7E+02			1.7E+02
Direct blue 6	2602-46-2		932.74	☐		1.36E+09		8.1E+00		1.8E+02			1.8E+02
Direct brown 95	16071-86-6		760.10	☐		1.36E+09		9.3E+00		1.6E+02			1.6E+02
Epichlorohydrin	106-89-8	3.2E-05	92.53	☑	5.0E-05	3.64E+03		9.9E-03	4.2E-03	1.5E+05	1.5E+04		1.3E+04
Ethyl acrylate	140-88-5	2.4E-01	100.11	☑	6.7E-03	3.13E+02		4.8E-02		3.1E+04			3.1E+04
Ethylene oxide	75-21-8	7.6E-05	44.05	☑	1.8E-04	1.92E+03		1.0E+00	3.5E-01	1.5E+03	9.2E+01		8.7E+01
Ethylene thiourea	96-45-7	3.1E-10	102.15	☐		1.36E+09	0.1	1.1E-01		1.3E+04		6.7E+04	1.1E+04
Folpet	133-07-3		296.56	☐		1.36E+09		3.5E-03		4.2E+05			4.2E+05
Fomesafen	72178-02-0		438.86	☐		1.36E+09		1.9E-01		7.8E+03			7.8E+03
Formaldehyde	50-00-0	3.4E-07	30.03	☐	1.5E-01	1.36E+09			4.5E-02		5.0E+08		5.0E+08
Furazolidone	67-45-8		225.16	☐		1.36E+09		3.8E+00		3.9E+02			3.9E+02
Furium	531-82-8		253.23	☐		1.36E+09		5.0E+01		3.0E+01			3.0E+01
Furmecyclox	60568-05-0		251.32	☐		1.36E+09		3.0E-02		4.9E+04			4.9E+04
Heptachlor	76-44-8	1.5E+00	373.32	☐		1.36E+09	0.1	4.5E+00	4.5E+00	3.3E+02	5.0E+06	1.6E+03	2.7E+02
Heptachlor epoxide	1024-57-3	9.5E-06	389.40	☐		1.36E+09		9.1E+00	9.1E+00	1.6E+02	2.5E+06		1.6E+02
Hexachlorobenzene	118-74-1	1.3E-03	284.78	☐	1.7E-01	1.36E+09	0.1	1.6E+00	1.6E+00	9.3E+02	1.4E+07	4.6E+03	7.7E+02
Hexachlorobutadiene	87-68-3	8.1E-03	260.76	☐	2.4E-01	1.36E+09		7.8E-02	7.7E-02	1.9E+04	3.0E+08		1.9E+04
Hexachlorocyclohexane, alpha-	319-84-6	1.1E-05	290.83	☐		1.36E+09	0.1	6.3E+00	6.3E+00	2.4E+02	3.6E+06	1.2E+03	2.0E+02
Hexachlorocyclohexane, beta-	319-85-7	7.4E-07	290.83	☐		1.36E+09		1.8E+00	1.9E+00	8.2E+02	1.2E+07		8.2E+02
Hexachlorocyclohexane, technical	608-73-1		290.73	☐		1.36E+09		1.8E+00	1.8E+00	8.2E+02	1.3E+07		8.2E+02
Hexachloroethane	67-72-1	3.9E-03	236.74	☐	2.0E-01	1.36E+09	0.1	1.4E-02	1.4E-02	1.1E+05	1.6E+09	5.3E+05	8.8E+04

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Hydrazine	302-01-2	6.1E-07	32.05	☐		1.36E+09		3.0E+00	1.7E+01	4.9E+02	1.3E+06		4.9E+02
Hydroquinone	123-31-9		110.11	☐		1.36E+09		6.0E-02		2.5E+04			2.5E+04
Indeno(1,2,3-cd)pyrene	193-39-5	4.9E-09	276.34	☐	1.5E-01	1.36E+09	0.13		3.1E-01		7.4E+07		7.4E+07
Isophorone	78-59-1	6.6E-06	138.21	☐	1.5E-01	1.36E+09	0.1	9.5E-04		1.6E+06		7.8E+06	1.3E+06
Lindane	58-89-9	1.4E-05	290.85	☐		1.36E+09	0.04	1.3E+00		1.1E+03		1.4E+04	1.1E+03
Methoxy-5-nitroaniline, 2-	99-59-2	1.2E-08	168.15	☐		1.36E+09		4.6E-02		3.2E+04			3.2E+04
Methyl chloride	74-87-3	2.4E-02	50.49	☑	1.1E-02	2.42E+02		1.3E-02	6.3E-03	1.1E+05	6.4E+02		6.4E+02
Methyl-5-nitroaniline, 2-	99-55-8		152.15	☐		1.36E+09		3.3E-02		4.5E+04			4.5E+04
Methylaniline hydrochloride, 2-	636-21-5		143.62	☐		1.36E+09	0.1	1.8E-01		8.2E+03		4.1E+04	6.9E+03
Methylaniline, 2-	95-53-4	2.7E-06	107.15	☐		1.36E+09	0.1	2.4E-01		6.2E+03		3.1E+04	5.2E+03
Methylene chloride	75-09-2	2.2E-03	84.93	☑	2.5E-03	5.11E+02		7.5E-03	1.6E-03	2.0E+05	5.2E+03		5.1E+03
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	4.1E-11	267.17	☐		1.36E+09	0.1	1.0E-01	1.3E-01	1.5E+04	1.8E+08	7.4E+04	1.2E+04
Methylenebis(N,N'-dimethyl)aniline, 4,4'-	101-61-1	1.1E-09	254.37	☐		1.36E+09	0.1	4.6E-02		3.2E+04		1.6E+05	2.7E+04
Methylnaphthalene, 1-	90-12-0	5.1E-04	142.20	☑		1.36E+09		2.9E-02		5.1E+04			5.1E+04
Nickel refinery dust	Ni ref dust			☐		1.36E+09			8.4E-01		2.7E+07		2.7E+07
Nickel subsulfide	12035-72-2		240.19	☐		1.36E+09			1.7E+00		1.4E+07		1.4E+07
Nitrobenzene	98-95-3	2.4E-05	123.11	☑	8.1E-06	9.04E+03			1.4E-01		1.1E+03		1.1E+03
Nitrofurazone	59-87-0		198.14	☐		1.36E+09		1.5E+00		9.9E+02			9.9E+02
Nitroglycerin	55-63-0	3.2E-05	227.09	☐	1.5E-01	1.36E+09		1.7E-02		8.7E+04			8.7E+04
Nitromethane	75-52-5	2.6E-05	61.04	☑		1.36E+09			3.2E-02		7.2E+08		7.2E+08
Nitropropane, 2-	79-46-9	1.2E-04	89.09	☑		1.36E+09			9.4E+00		2.4E+06		2.4E+06
Nitrosodiethanolamine, N-	1116-54-7	2.4E-10	134.13	☐		1.36E+09	0.1	2.8E+00		5.3E+02		2.7E+03	4.4E+02
Nitrosodiethylamine, N-	55-18-5	3.6E-06	102.14	☐		1.36E+09	0.1	1.5E+02	1.5E+02	9.9E+00	1.5E+05	4.9E+01	8.2E+00

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Nitrosodimethylamine, N-	62-75-9	1.2E-06	74.08	☐	1.5E-01	1.36E+09	0.1	5.1E+01	4.9E+01	2.9E+01	4.7E+05	1.5E+02	2.4E+01
Nitroso-di-n-butylamine, N-	924-16-3	3.2E-04	158.24	☑	2.4E-05	5.23E+03		5.4E+00	5.6E+00	2.7E+02	1.6E+01		1.5E+01
Nitrosodiphenylamine, N-	86-30-6	5.0E-06	198.22	☐	1.5E-01	1.36E+09		4.9E-03		3.0E+05			3.0E+05
Nitrosodipropylamine, N-	621-64-7	2.3E-06	130.19	☐	1.5E-01	1.36E+09	0.1	7.0E+00		2.1E+02		1.1E+03	1.8E+02
Nitroso-N-ethylurea, N-	759-73-9		117.11	☐		1.36E+09		1.4E+02		1.1E+01			1.1E+01
Nitroso-N-methylethylamine, N-	10595-95-6		88.11	☐		1.36E+09		2.2E+01		6.7E+01			6.7E+01
Nitrosopyrrolidine, N-	930-55-2	1.2E-08	100.12	☐		1.36E+09	0.1	2.1E+00	2.1E+00	7.1E+02	1.1E+07	3.5E+03	5.9E+02
Nitrotoluene, o-	88-72-2	2.4E-05	137.13	☑	8.1E-06	9.04E+03		2.2E-01		6.7E+03			6.7E+03
Nitrotoluene, p-	99-99-0	2.4E-05	137.13	☑	8.1E-06	9.04E+03		1.6E-02		9.3E+04			9.3E+04
Pentabromo-6-chlorocyclohexane, 1,2,3,4,5-	87-84-3		513.09	☐		1.36E+09		2.3E-02		6.5E+04			6.5E+04
Pentachloroethane	76-01-7		202.29	☐		1.36E+09		9.0E-02		1.6E+04			1.6E+04
Pentachloronitrobenzene	82-68-8	3.8E-04	295.36	☐		1.36E+09		2.6E-01		5.7E+03			5.7E+03
Pentachlorophenol	87-86-5	2.4E-08	266.35	☐	1.5E-01	1.36E+09	0.25	1.2E-01		1.2E+04		2.5E+04	8.2E+03
Phenylenediamine, o-	95-54-5	7.7E-08	108.05	☐		1.36E+09	0.1	4.7E-02		3.2E+04		1.6E+05	2.6E+04
Phenylphenol, 2-	90-43-7	1.0E-06	170.21	☐		1.36E+09	0.1	1.9E-03		7.7E+05		3.8E+06	6.4E+05
Polybrominated biphenyl	36355-01-8		627.59	☐		1.36E+09		8.9E+00		1.7E+02			1.7E+02
Polychlorinated biphenyls	1336-36-3			☐		1.36E+09	0.14	2.0E+00	3.8E-01	7.4E+02	6.1E+07	2.7E+03	5.8E+02
Prochloraz	67747-09-5		376.67	☐		1.36E+09		1.5E-01		9.9E+03			9.9E+03
Propylene oxide	75-56-9	8.5E-05	58.08	☑	8.7E-05	2.74E+03		2.4E-01	1.3E-02	6.2E+03	3.6E+03		2.3E+03
Quinoline	91-22-5	2.7E-06	129.16	☐		1.36E+09	0.1	3.0E+00		4.9E+02		2.5E+03	4.1E+02
RDX	121-82-4	2.0E-11	222.26	☐	1.5E-01	1.36E+09	0.015	1.1E-01		1.3E+04		4.5E+05	1.3E+04
Simazine	122-34-9		201.66	☐		1.36E+09		1.2E-01		1.2E+04			1.2E+04

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	CASRN	H	MW	VOC	DA	VF or PEF	ABS	CSFo	CSFi	Ingestion	Inhalation	Dermal	SMEGca
Sodium diethydithiocarbamate	148-18-5		171.25	☐		1.36E+09		2.7E-01		5.5E+03			5.5E+03
TCDD, 2,3,7,8-	1746-01-6	7.9E-05	321.97	☐	1.5E-01	1.36E+09	0.03	1.5E+05	7.5E+04	9.9E-03	3.0E+02	1.6E-01	9.3E-03
Tetrachloroethane, 1,1,1,2-	630-20-6	3.4E-04	167.85	☑	7.9E-05	2.89E+03		2.6E-02	2.6E-02	5.7E+04	1.9E+03		1.8E+03
Tetrachloroethane, 1,1,2,2-	79-34-5	3.4E-04	167.86	☑	7.9E-05	2.89E+03		2.0E-01	2.0E-01	7.4E+03	2.4E+02		2.3E+02
Tetrachlorotoluene, para, alpha, alpha, alpha-	5216-25-1		229.92	☐		1.36E+09		2.0E+01		7.4E+01			7.4E+01
Tetrachlorovinphos	961-11-5	1.8E-09	365.96	☐		1.36E+09		2.4E-02		6.2E+04			6.2E+04
Tetrahydrofuran	109-99-9	7.0E-05	72.10	☑	1.4E-04	2.18E+03			6.8E-03		5.4E+03		5.4E+03
Toluene-2,4-diamine	95-80-7	7.5E-10	122.17	☐		1.36E+09	0.1	3.2E+00		4.6E+02		2.3E+03	3.9E+02
Toluidine, p-	106-49-0	2.0E-06	107.15	☐		1.36E+09		1.9E-01		7.8E+03			7.8E+03
Toxaphene	8001-35-2	6.0E-06	414.00	☐		1.36E+09		1.1E+00	1.1E+00	1.3E+03	2.0E+07		1.3E+03
Tributyl phosphate	126-73-8		266.32	☐		1.36E+09		9.2E-03		1.6E+05			1.6E+05
Trichloroaniline hydrochloride, 2,4,6-	33663-50-2		232.92	☐		1.36E+09		2.9E-02		5.1E+04			5.1E+04
Trichloroaniline, 2,4,6-	634-93-5	1.3E-06	196.46	☐		1.36E+09		3.4E-02		4.4E+04			4.4E+04
Trichlorobenzene, 1,2,4-	120-82-1	1.4E-03	181.46	☑	8.4E-06	8.84E+03		2.9E-02		5.1E+04			5.1E+04
Trichloroethane, 1,1,2-	79-00-5	9.1E-04	133.41	☑	3.7E-04	1.33E+03		5.7E-02	5.6E-02	2.6E+04	4.0E+02		3.9E+02
Trichloroethylene	79-01-6	1.0E-02	131.40	☑	1.5E-03	6.68E+02			4.0E-01		2.8E+01		2.8E+01
Trichlorophenol, 2,4,6-	88-06-2	7.8E-06	197.45	☐	1.5E-01	1.36E+09		1.1E-02	1.1E-02	1.3E+05	2.1E+09		1.3E+05
Trichloropropane, 1,2,3-	96-18-4	3.4E-04	147.43	☑	1.3E-04	2.25E+03		3.0E+01		4.9E+01			4.9E+01
Trifluralin	1582-09-8	2.6E-05	335.28	☐		1.36E+09	0.1	7.7E-03		1.9E+05		9.6E+05	1.6E+05
Trimethyl phosphate	512-56-1	7.2E-09	140.08	☐		1.36E+09		3.7E-02		4.0E+04			4.0E+04
Trinitrotoluene, 2,4,6-	118-96-7	4.9E-09	227.13	☐	1.5E-01	1.36E+09	0.032	3.0E-02		4.9E+04		7.7E+05	4.7E+04
Tris(2-chloroethyl)phosphate	115-96-8		285.49	☐		1.36E+09		2.0E-02		7.4E+04			7.4E+04

Table F-3: Soil Concentration Estimates for Carcinogenic Chemicals

Chemical Name	*CASRN*	*H*	*MW*	*VOC*	*DA*	*VF or PEF*	*ABS*	*CSFo*	*CSFi*	*Ingestion*	*Inhalation*	*Dermal*	*SMEGca*
Tris(2-ethylhexyl)phosphate	78-42-2		434.64	☐		1.36E+09		3.2E-03		4.6E+05			4.6E+05
Vanadium pentoxide	1314-62-1		181.90	☐		1.36E+09			2.9E+01		7.9E+05		7.9E+05
Vinyl chloride	75-01-4	2.7E-02	62.50	☑	1.5E-02	2.12E+02		7.2E-01	1.5E-02	2.1E+03	2.3E+02		2.1E+02

Units:
atm = atmospheres
m = meter
mol = mole
g = grams
cm = centimeters
mg = milligrams
kg = kilograms
sec = second

Notes:
CASRN = Chemical Abstract Service Registry Number
H = Henry's law constant (atm-m^3/mole)
MW = molecular weight (g/mol)
VOC = volatile organic compound
DA = apparent diffusivity (cm^2/sec)
VF = soil-to-air volatilization factor (m^3/kg)
PEF = particulate emission factor (m^3/kg)
ABS = dermal absorption fraction (unitless)
CSFo = oral cancer slope factor (mg/kg-day)-1
CSFi = inhalation cancer slope factor (mg/kg-day)-1
SMEGca = soil military exposure guideline based on cancer endpoint (mg/kg)
Note that dermal contribution was calculated using the CSFo because dermal CSF values are not available for these chemicals
Note that the Ingestion, Inhalation and Dermal columns all have units of mg/kg

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Acenaphthene	83-32-9	☑	1.3E+02	1.0E+05		1.0E+05	nc
Acephate	30560-19-1	☐		8.5E+02	1.7E+05	8.5E+02	nc
Acetaldehyde	75-07-0	☑	2.1E+05	1.6E+02	5.6E+03	1.6E+02	nc
Acetochlor	34256-82-1	☐		4.2E+03		4.2E+03	nc
Acetone	67-64-1	☑	1.0E+05	5.0E+04		5.0E+04	nc
Acetone cyanohydrin	75-86-5	☐		6.4E+03		6.4E+03	nc
Acetonitrile	75-05-8	☑	1.9E+05	1.9E+02		1.9E+02	nc
Acetophenone	98-86-2	☑	2.3E+03	2.1E+05		2.1E+05	nc
Acifluorfen-sodium	62476-59-9	☐		2.8E+03		2.8E+03	nc
Acrolein	107-02-8	☑	4.8E+04	3.2E-01		3.2E-01	nc
Acrylamide	79-06-1	☐		3.5E+02	2.5E+03	3.5E+02	nc
Acrylic acid	79-10-7	☐		8.6E+04		8.6E+04	nc
Acrylonitrile	107-13-1	☑	8.4E+03	4.9E+02	1.2E+02	1.2E+02	ca
Adipic acid	124-04-9	☐		4.2E+05		4.2E+05	nc
Adiponitrile	111-69-3	☐		5.6E+07		5.6E+07	nc
Alachlor	15972-60-8	☐		2.1E+03	1.9E+04	2.1E+03	nc
Alar	1596-84-5	☐		3.2E+04		3.2E+04	nc
Aldicarb	116-06-3	☐		2.1E+02		2.1E+02	nc
Aldicarb sulfone	1646-88-4	☐		2.1E+02		2.1E+02	nc
Aldrin	309-00-2	☐		7.1E+00	7.3E+01	7.1E+00	nc
Ally	74223-64-6	☐		5.3E+04		5.3E+04	nc
Allyl alcohol	107-18-6	☐		8.5E+02		8.5E+02	nc
Allyl chloride	107-05-1	☑	1.3E+03	3.3E-01		3.3E-01	nc
Aluminum phosphide	20859-73-8	☐		8.5E+01		8.5E+01	nc
Aluminum, elemental	7429-90-5	☐		4.7E+06		4.7E+06	nc
Amdro	67485-29-4	☐		6.4E+02		6.4E+02	nc
Ametryn	834-12-8	☐		1.9E+04		1.9E+04	nc
Aminophenol, 3-	591-27-5	☐		6.4E+04		6.4E+04	nc
Aminophenol, 4-	123-30-8	☐		4.2E+04		4.2E+04	nc
Aminopyridine, 4-	504-24-5	☐		4.2E+01		4.2E+01	nc
Amitraz	33089-61-1	☐		5.3E+02		5.3E+02	nc
Ammonia	7664-41-7	☐		9.3E+07		9.3E+07	nc
Ammonium perchlorate	7790-98-9	☐		1.5E+02		1.5E+02	nc
Ammonium sulfamate	7773-06-0	☐		4.2E+05		4.2E+05	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Aniline	62-53-3	☐		9.3E+06	2.2E+05	2.2E+05	ca
Anthracene	120-12-7	☑	6.1E+00	1.7E+05		1.7E+05	nc
Antimony pentoxide	1314-60-9	☐		1.1E+02		1.1E+02	nc
Antimony potassium tartrate	28300-74-5	☐		1.9E+02		1.9E+02	nc
Antimony tetroxide	1332-81-6	☐		8.5E+01		8.5E+01	nc
Antimony trioxide	1309-64-4	☐		6.8E+04		6.8E+04	nc
Antimony, elemental	7440-36-0	☐		8.5E+01		8.5E+01	nc
Apollo	74115-24-5	☐		2.8E+03		2.8E+03	nc
Aramite	140-57-8	☐		2.1E+04	5.9E+04	2.1E+04	nc
Aroclor 1016	12674-11-2	☐		3.5E+01		3.5E+01	nc
Aroclor 1254	11097-69-1	☐		9.9E+00		9.9E+00	nc
Arsenic, elemental	7440-38-2	☐		6.0E+01	9.3E+02	6.0E+01	nc
Arsine	7784-42-1	☐		4.7E+04		4.7E+04	nc
Assure	76578-14-8	☐		1.9E+03		1.9E+03	nc
Asulam	3337-71-1	☐		1.1E+04		1.1E+04	nc
Atrazine	1912-24-9	☐		6.4E+02	6.7E+03	6.4E+02	nc
Avermectin B1	65195-55-3	☐		8.5E+01		8.5E+01	nc
Azinphos methyl	86-50-0	☐		6.4E+02		6.4E+02	nc
Azobenzene	103-33-3	☑			1.3E+04	1.3E+04	ca
Barium, elemental	7440-39-3	☐		1.5E+04		1.5E+04	nc
Baygon	114-26-1	☐		8.5E+02		8.5E+02	nc
Bayleton	43121-43-3	☐		6.4E+03		6.4E+03	nc
Baythroid	68359-37-5	☐		5.3E+03		5.3E+03	nc
Benefin	1861-40-1	☐		6.4E+04		6.4E+04	nc
Benomyl	17804-35-2	☐		1.1E+04		1.1E+04	nc
Bentazon	25057-89-0	☐		6.4E+03		6.4E+03	nc
Benzene	71-43-2	☑	8.7E+02	3.0E+01	3.4E+02	3.0E+01	nc
Benzenethiol	108-98-5	☐		2.1E+01		2.1E+01	nc
Benzidine	92-87-5	☐		5.3E+02	5.4E+00	5.4E+00	ca
Benzo(a)anthracene	56-55-3	☐			7.4E+07	7.4E+07	ca
Benzo(a)pyrene	50-32-8	☐			1.6E+02	1.6E+02	ca
Benzo(b)fluoranthene	205-99-2	☐			7.4E+07	7.4E+07	ca
Benzo(k)fluoranthene	207-08-9	☐			7.4E+08	7.4E+08	ca

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Benzoic acid	65-85-0	☐		5.8E+05		5.8E+05	nc
Benzotrichloride	98-07-7	☑			1.1E+02	1.1E+02	ca
Beryllium, elemental	7440-41-7	☐		1.0E+03	2.7E+06	1.0E+03	nc
Bidrin	141-66-2	☐		2.1E+01		2.1E+01	nc
Bifenox	42576-02-3	☐		2.1E+05		2.1E+05	nc
Biphenthrin	82657-04-3	☐		3.2E+03		3.2E+03	nc
Biphenyl, 1,1-	92-52-4	☑	3.5E+02	1.1E+04		1.1E+04	nc
Bis(2-chloro-1-methylethyl) ether	108-60-1	☑	7.9E+02	8.5E+03	2.0E+03	2.0E+03	ca
Bis(2-chloroethoxy)methane	111-91-1	☐		6.4E+03		6.4E+03	nc
Bis(2-chloroethyl) ether	111-44-4	☑	9.6E+03	9.3E+02	1.5E+02	1.5E+02	ca
Bis(2-chloroisopropyl) ether	39638-32-9	☑	7.9E+02	8.5E+03		8.5E+03	nc
Bis(2-ethylhexyl) phthalate	117-81-7	☐		3.5E+04	8.8E+04	3.5E+04	nc
Bis(chloromethyl) ether	542-88-1	☑	2.4E+03	1.3E+00	1.0E-01	1.0E-01	ca
Bisphenol A	80-05-7	☐		1.1E+05		1.1E+05	nc
Boron	7440-42-8	☐		4.2E+04		4.2E+04	nc
Boron trifluoride	7637-07-2	☐		6.5E+06		6.5E+06	nc
Bromate	15541-45-4	☐		8.5E+02	2.1E+03	8.5E+02	nc
Bromobenzene	108-86-1	☑	6.9E+02	1.7E+02		1.7E+02	nc
Bromodichloromethane	75-27-4	☑	3.0E+03	2.3E+01	2.4E+04	2.3E+01	nc
Bromoethene	593-60-2	☑	1.6E+04	1.4E+00	1.0E+02	1.4E+00	nc
Bromoform	75-25-2	☐		5.3E+03	1.6E+05	5.3E+03	nc
Bromophos	2104-96-3	☐		1.1E+04		1.1E+04	nc
Bromoxynil	1689-84-5	☐		4.2E+03		4.2E+03	nc
Bromoxynil octanoate	1689-99-2	☐		4.2E+03		4.2E+03	nc
Busan	21564-17-0	☐		6.4E+04		6.4E+04	nc
Butadiene, 1,3-	106-99-0	☑	1.6E+03	2.7E-01	3.1E+01	2.7E-01	nc
Butanol, 1-	71-36-3	☐		1.8E+05		1.8E+05	nc
Butyl benzyl phthalate	85-68-7	☐		4.2E+05	7.8E+05	4.2E+05	nc
Butyl glycolyl butyl phthalate	85-70-1	☐		2.1E+05		2.1E+05	nc
Butylate	2008-41-5	☐		1.1E+04		1.1E+04	nc
Cacodylic acid	75-60-5	☐		4.2E+03		4.2E+03	nc
Cadmium, elemental	7440-43-9	☐		1.0E+02	3.6E+06	1.0E+02	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Calcium cyanide	592-01-8	☐		8.5E+03		8.5E+03	nc
Caprolactam	105-60-2	☐		1.1E+05		1.1E+05	nc
Captafol	2425-06-1	☐		4.2E+02	1.7E+05	4.2E+02	nc
Captan	133-06-2	☐		2.8E+04	4.2E+05	2.8E+04	nc
Carbaryl	63-25-2	☐		2.1E+04		2.1E+04	nc
Carbazole	86-74-8	☐			5.9E+04	5.9E+04	ca
Carbofuran	1563-66-2	☐		1.1E+03		1.1E+03	nc
Carbon disulfide	75-15-0	☑	7.2E+02	1.2E+02		1.2E+02	nc
Carbon tetrachloride	56-23-5	☑	1.1E+03	5.4E+01	3.3E+02	5.4E+01	nc
Carbosulfan	55285-14-8	☐		2.1E+03		2.1E+03	nc
Carboxin	5234-68-4	☐		2.1E+04		2.1E+04	nc
Chloral	75-87-6	☐		4.2E+03		4.2E+03	nc
Chloral hydrate	302-17-0	☐		2.1E+04		2.1E+04	nc
Chloramben	133-90-4	☐		3.2E+03		3.2E+03	nc
Chloranil	118-75-2	☐			3.7E+03	3.7E+03	ca
Chlordane	57-74-9	☐		1.2E+02	1.8E+07	1.2E+02	nc
Chlordecone	143-50-0	☐		1.1E+02	1.5E+02	1.1E+02	nc
Chlorfenvinphos	470-90-6	☐		4.2E+02		4.2E+02	nc
Chlorimuron-ethyl	90982-32-4	☐		4.2E+03		4.2E+03	nc
Chlorine	7782-50-5	☐		2.1E+04		2.1E+04	nc
Chlorite (sodium chlorite)	7758-19-2	☐		2.1E+04		2.1E+04	nc
Chloro-1,3-butadiene	126-99-8	☑	4.8E+02	1.1E+01		1.1E+01	nc
Chloro-2-methylaniline hydrochloride, 4-	3165-93-3	☐			3.2E+03	3.2E+03	ca
Chloro-2-methylaniline, 4-	95-69-2	☐			2.6E+03	2.6E+03	ca
Chloroacetic acid	79-11-8	☐		4.2E+03		4.2E+03	nc
Chloroacetophenone, 2-	532-27-4	☑	1.1E+03	1.1E-02		1.1E-02	nc
Chloroaniline, 4-	106-47-8	☐		1.1E+02	7.4E+03	1.1E+02	nc
Chlorobenzene	108-90-7	☑	6.8E+02	4.3E+02		4.3E+02	nc
Chlorobenzilate	510-15-6	☐		3.5E+03	4.6E+03	3.5E+03	nc
Chlorobenzotrifluoride, 4-	98-56-6	☐		6.4E+03		6.4E+03	nc
Chlorobutane, 1-	109-69-3	☑	4.8E+02	1.5E+04		1.5E+04	nc
Chlorodifluoromethane	75-45-6	☑	3.4E+02	7.4E+03		7.4E+03	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Chloroform	67-66-3	☑	2.9E+03	9.1E+01	1.1E+02	9.1E+01	nc
Chloronaphthalene, beta-	91-58-7	☑	1.1E+02	4.2E+04		4.2E+04	nc
Chloronitrobenzene, o-	88-73-3	☑	1.0E+03	6.2E-01	4.9E+03	6.2E-01	nc
Chlorophenol, 2-	95-57-8	☑	5.5E+04	1.7E+03		1.7E+03	nc
Chloropropane, 2-	75-29-6	☑	1.1E+03	5.8E+02		5.8E+02	nc
Chlorothalonil	1897-45-6	☐		2.7E+03	1.1E+05	2.7E+03	nc
Chlorotoluene, o-	95-49-8	☑	5.1E+02	4.2E+04		4.2E+04	nc
Chlorotoluene, p-	106-43-4	☐		1.5E+05		1.5E+05	nc
Chlorpropham	101-21-3	☐		4.2E+04		4.2E+04	nc
Chlorpyrifos	2921-88-2	☐		6.4E+02		6.4E+02	nc
Chlorpyrifos methyl	5598-13-0	☐		2.1E+03		2.1E+03	nc
Chlorsulfuron	64902-72-3	☐		1.1E+04		1.1E+04	nc
Chlorthiophos	60238-56-4	☐		1.7E+02		1.7E+02	nc
Chromium (III)	16065-83-1	☐		3.0E+05		3.0E+05	nc
Chromium (VI)	18540-29-9	☐		1.9E+03	5.4E+05	1.9E+03	nc
Chrysene	218-01-9	☐			7.4E+09	7.4E+09	ca
Cobalt	7440-48-4	☐		6.2E+02	7.2E+05	6.2E+02	nc
Coke oven emissions	8007-45-2	☐			1.1E+07	1.1E+07	ca
Copper cyanide	544-92-3	☐		1.1E+04		1.1E+04	nc
Cresol, m-	108-39-4	☐		1.1E+05		1.1E+05	nc
Cresol, o-	95-48-7	☐		1.1E+05		1.1E+05	nc
Cresol, p-	106-44-5	☐		1.1E+03		1.1E+03	nc
Crotonaldehyde, trans-	123-73-9	☑			7.8E+02	7.8E+02	ca
Cumene	98-82-8	☑	9.2E+01	2.0E+03		2.0E+03	nc
Cyanazine	21725-46-2	☐		4.2E+02	1.8E+03	4.2E+02	nc
Cyanide	57-12-5	☐		4.2E+03		4.2E+03	nc
Cyanogen	460-19-5	☑	2.5E+03	8.5E+03		8.5E+03	nc
Cyanogen bromide	506-68-3	☑	2.5E+03	1.9E+04		1.9E+04	nc
Cyanogen chloride	506-77-4	☑	2.5E+03	1.1E+04		1.1E+04	nc
Cyclohexane	110-82-7	☑	1.4E+02	9.2E+02		9.2E+02	nc
Cyclohexanone	108-94-1	☐		1.1E+06		1.1E+06	nc
Cyclohexylamine	108-91-8	☐		6.4E+04		6.4E+04	nc
Cyclopentadiene	542-92-7	☑		2.8E+09		2.8E+09	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Cyhalothrin	68085-85-8	☐		2.1E+03		2.1E+03	nc
Cypermethrin	52315-07-8	☐		2.1E+03		2.1E+03	nc
Cyromazine	66215-27-8	☐		1.6E+03		1.6E+03	nc
Dacthal	1861-32-1	☐		2.1E+03		2.1E+03	nc
Dalapon	75-99-0	☐		6.4E+03		6.4E+03	nc
Danitol	39515-41-8	☐		5.3E+03		5.3E+03	nc
DDD	72-54-8	☐			5.2E+03	5.2E+03	ca
DDE	72-55-9	☐			3.6E+03	3.6E+03	ca
DDT	50-29-3	☐		1.0E+02	4.1E+03	1.0E+02	nc
Decabromodiphenyl ether	1163-19-5	☐		4.5E+03	2.1E+06	4.5E+03	nc
Demeton	8065-48-3	☐		8.5E+00		8.5E+00	nc
Di(2-ethylhexyl)adipate	103-23-1	☐		1.1E+05	1.0E+06	1.1E+05	nc
Diallate	2303-16-4	☐			2.0E+04	2.0E+04	ca
Diazinon	333-41-5	☐		4.2E+02		4.2E+02	nc
Dibenz(a,h)anthracene	53-70-3	☐			7.4E+06	7.4E+06	ca
Dibenzofuran	132-64-9	☑	1.4E+02	6.7E+02		6.7E+02	nc
Dibromo-3-chloropropane, 1,2-	96-12-8	☐		3.5E+02	1.5E+03	3.5E+02	nc
Dibromobenzene, 1,4-	106-37-6	☐		2.1E+04		2.1E+04	nc
Dibromochloromethane	124-48-1	☐		1.2E+04	1.5E+04	1.2E+04	nc
Dibromoethane, 1,2-	106-93-4	☑	1.2E+03	2.6E+00	1.5E+01	2.6E+00	nc
Dibromomethane	74-95-3	☑	3.0E+03	1.9E+03		1.9E+03	nc
Dibutyl phthalate	84-74-2	☐		2.1E+05		2.1E+05	nc
Dibutyl tin dichloride	683-18-1	☐		1.1E+03		1.1E+03	nc
Dicamba	1918-00-9	☐		6.4E+03		6.4E+03	nc
Dichloro-2-butene, 1,4-	764-41-0	☑	1.1E+03		2.9E+00	2.9E+00	ca
Dichloroacetic acid	79-43-6	☐		2.5E+03	3.0E+04	2.5E+03	nc
Dichlorobenzene, 1,2-	95-50-1	☑	6.0E+02	4.0E+03		4.0E+03	nc
Dichlorobenzene, 1,3-	541-73-1	☑	6.0E+02	1.6E+01		1.6E+01	nc
Dichlorobenzene, 1,4-	106-46-7	☑	2.8E+02	3.4E+03	6.2E+04	3.4E+03	nc
Dichlorobenzidine, 3,3'-	91-94-1	☐			2.7E+03	2.7E+03	ca
Dichlorodifluoromethane	75-71-8	☑	3.4E+02	3.0E+02		3.0E+02	nc
Dichloroethane, 1,1-	75-34-3	☑	1.7E+03	4.2E+05		4.2E+05	nc
Dichloroethane, 1,2-	107-06-2	☑	1.8E+03	2.7E+00	1.5E+02	2.7E+00	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Dichloroethylene, 1,1-	75-35-4	☑	1.5E+03	1.6E+01	4.1E+00	4.1E+00	ca
Dichloroethylene, 1,2-	540-59-0	☐		1.9E+03		1.9E+03	nc
Dichloroethylene, cis-1,2-	156-59-2	☑	1.2E+03	2.1E+04		2.1E+04	nc
Dichloroethylene, trans-	156-60-5	☑	3.1E+03	2.6E+02		2.6E+02	nc
Dichlorophenol, 2,4-	120-83-2	☐		3.5E+03		3.5E+03	nc
Dichlorophenoxy acetic acid, 2,4-	94-75-7	☐		1.9E+03		1.9E+03	nc
Dichlorophenoxybutyric acid, 2,4-	94-82-6	☐		1.7E+04		1.7E+04	nc
Dichloropropane, 1,2-	78-87-5	☑	1.1E+03	6.0E+00	2.2E+04	6.0E+00	nc
Dichloropropane, 1,3-	142-28-9	☑	1.1E+03	4.2E+04		4.2E+04	nc
Dichloropropanol, 2,3-	616-23-9	☐		6.4E+02		6.4E+02	nc
Dichloropropene, 1,3-	542-75-6	☑	1.4E+03	9.4E+00	4.4E+02	9.4E+00	nc
Dichlorvos	62-73-7	☐		6.4E+02	5.1E+03	6.4E+02	nc
Dicyclopentadiene	77-73-6	☑	6.5E+03	1.7E+01		1.7E+01	nc
Dieldrin	60-57-1	☐		1.8E+01	7.7E+01	1.8E+01	nc
Diesel engine exhaust	Diesel	☐		4.7E+06		4.7E+06	nc
Diethyl phthalate	84-66-2	☐		1.7E+06		1.7E+06	nc
Diethylene glycol monobutyl ether	112-34-5	☐		6.0E+04		6.0E+04	nc
Diethylene glycol monoethyl ether	111-90-0	☐		1.0E+05		1.0E+05	nc
Diethylformamide	617-84-5	☐		2.1E+02		2.1E+02	nc
Diethylstilbestrol	56-53-1	☐			2.6E+05	2.6E+05	ca
Difenzoquat	43222-48-6	☐		1.7E+04		1.7E+04	nc
Diflubenzuron	35367-38-5	☐		4.2E+03		4.2E+03	nc
Difluoroethane, 1,1-	75-37-6	☑		3.7E+10		3.7E+10	nc
Diisopropyl ether	108-20-3	☑		3.7E+09		3.7E+09	nc
Diisopropyl methylphosphonate	1445-75-6	☑		1.7E+05		1.7E+05	nc
Dimethipin	55290-64-7	☐		4.2E+03		4.2E+03	nc
Dimethoate	60-51-5	☐		4.2E+01		4.2E+01	nc
Dimethoxybenzidine, 3,3'-	119-90-4	☐			8.8E+04	8.8E+04	ca
Dimethyl methylphosphonate	756-79-6	☐		1.3E+04	8.7E+05	1.3E+04	nc
Dimethyl terephthalate	120-61-6	☐		2.1E+04		2.1E+04	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Dimethylaniline hydrochloride, 2,4-	21436-96-4	☐			2.6E+03	2.6E+03	ca
Dimethylaniline, 2,4-	95-68-1	☐			2.0E+03	2.0E+03	ca
Dimethylaniline, N,N-	121-69-7	☐		4.2E+03		4.2E+03	nc
Dimethylbenzidine, 3,3'-	119-93-7	☐			1.1E+02	1.1E+02	ca
Dimethylformamide	68-12-2	☐		6.4E+04		6.4E+04	nc
Dimethylhydrazine, 1,1-	57-14-7	☐		7.5E+03		7.5E+03	nc
Dimethylhydrazine, 1,2-	540-73-8	☐		1.7E+02		1.7E+02	nc
Dimethylphenol, 2,4-	105-67-9	☐		1.1E+04		1.1E+04	nc
Dimethylphenol, 2,6-	576-26-1	☐		1.3E+03		1.3E+03	nc
Dimethylphenol, 3,4-	95-65-8	☐		2.1E+03		2.1E+03	nc
Dinitrobenzene, 1,2-	528-29-0	☐		2.1E+02		2.1E+02	nc
Dinitrobenzene, 1,3-	99-65-0	☐		1.8E+02		1.8E+02	nc
Dinitro-o-cresol, 4,6-	534-52-1	☐		7.1E+02		7.1E+02	nc
Dinitro-o-cyclohexyl phenol, 4,6-	131-89-5	☐		4.2E+03		4.2E+03	nc
Dinitrophenol, 2,4-	51-28-5	☐		4.2E+03		4.2E+03	nc
Dinitrotoluene	25321-14-6	☐			2.2E+03	2.2E+03	ca
Dinitrotoluene, 2,4-	121-14-2	☐		3.5E+02		3.5E+02	nc
Dinitrotoluene, 2,6-	606-20-2	☐		1.8E+03		1.8E+03	nc
Di-n-octyl phthalate	117-84-0	☐		7.1E+04		7.1E+04	nc
Dinoseb	88-85-7	☐		2.1E+02		2.1E+02	nc
Dioxane, 1,4-	123-91-1	☐		1.1E+05	1.1E+05	1.1E+05	nc
Diphenamid	957-51-7	☐		6.4E+03		6.4E+03	nc
Diphenylamine	122-39-4	☐		5.3E+03		5.3E+03	nc
Diphenylhydrazine, 1,2-	122-66-7	☐			1.5E+03	1.5E+03	ca
Diquat	85-00-7	☐		4.7E+02		4.7E+02	nc
Direct black 38	1937-37-7	☐			1.7E+02	1.7E+02	ca
Direct blue 6	2602-46-2	☐			1.8E+02	1.8E+02	ca
Direct brown 95	16071-86-6	☐			1.6E+02	1.6E+02	ca
Disulfoton	298-04-4	☐		1.6E+01		1.6E+01	nc
Dithiane, 1,4-	505-29-3	☐		2.1E+04		2.1E+04	nc
Diuron	330-54-1	☐		4.2E+02		4.2E+02	nc
Dodine	2439-10-3	☐		8.5E+02		8.5E+02	nc
EA 2192	73207-98-4	☐		1.3E-01		1.3E-01	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
EMPA	1832-53-7	☐		5.3E+03		5.3E+03	nc
Endosulfan	115-29-7	☐		1.1E+03		1.1E+03	nc
Endothall	145-73-3	☐		4.2E+03		4.2E+03	nc
Endrin	72-20-8	☐		4.2E+02		4.2E+02	nc
Epichlorohydrin	106-89-8	☑	7.3E+03	2.4E+01	1.3E+04	2.4E+01	nc
Epoxybutane, 1,2-	106-88-7	☑		1.9E+07		1.9E+07	nc
EPTC	759-94-4	☐		5.3E+03		5.3E+03	nc
Ethephon	16672-87-0	☐		1.1E+03		1.1E+03	nc
Ethion	563-12-2	☐		4.2E+02		4.2E+02	nc
Ethoxyethanol, 2-	110-80-5	☐		8.8E+04		8.8E+04	nc
Ethoxyethyl acetate, 2-	111-15-9	☐		2.8E+08		2.8E+08	nc
Ethyl acetate	141-78-6	☑	3.7E+04	1.9E+06		1.9E+06	nc
Ethyl acrylate	140-88-5	☑	1.4E+02		3.1E+04	3.1E+04	ca
Ethyl chloride	75-00-3	☑	1.6E+03	7.2E+02		7.2E+02	nc
Ethyl ether	60-29-7	☑	1.8E+03	1.4E+04		1.4E+04	nc
Ethyl methacrylate	97-63-2	☑	1.4E+02	1.9E+04		1.9E+04	nc
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	☐		2.1E+01		2.1E+01	nc
Ethylbenzene	100-41-4	☑	4.0E+02	2.3E+03		2.3E+03	nc
Ethylene cyanohydrin	109-78-4	☐		2.1E+04		2.1E+04	nc
Ethylene diamine	107-15-3	☐		4.2E+04		4.2E+04	nc
Ethylene glycol	107-21-1	☐		1.4E+05		1.4E+05	nc
Ethylene glycol monobutyl ether	111-76-2	☐		1.2E+04		1.2E+04	nc
Ethylene oxide	75-21-8	☑	1.1E+05	2.1E+02	8.7E+01	8.7E+01	ca
Ethylene thiourea	96-45-7	☐		1.4E+01	1.1E+04	1.4E+01	nc
Ethylphthalyl ethyl glycolate	84-72-0	☐		6.4E+05		6.4E+05	nc
Express	101200-48-0	☐		1.7E+03		1.7E+03	nc
Fenamiphos	22224-92-6	☐		5.3E+01		5.3E+01	nc
Fluometuron	2164-17-2	☐		2.8E+03		2.8E+03	nc
Fluoranthene	206-44-0	☐		6.7E+04		6.7E+04	nc
Fluorene	86-73-7	☑	1.6E+02	6.7E+04		6.7E+04	nc
Fluorine	7782-41-4	☐		1.3E+04		1.3E+04	nc
Fluridone	59756-60-4	☐		1.7E+04		1.7E+04	nc
Flurprimidol	56425-91-3	☐		4.2E+03		4.2E+03	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Flutolanil	66332-96-5	☐		1.3E+04		1.3E+04	nc
Fluvalinate	69409-94-5	☐		2.1E+03		2.1E+03	nc
Folpet	133-07-3	☐		2.1E+04	4.2E+05	2.1E+04	nc
Fomesafen	72178-02-0	☐			7.8E+03	7.8E+03	ca
Fonofos	944-22-9	☐		4.2E+02		4.2E+02	nc
Formaldehyde	50-00-0	☐		6.4E+04	5.0E+08	6.4E+04	nc
Fosetyl-aluminum	39148-24-8	☐		6.4E+05		6.4E+05	nc
Furan	110-00-9	☑	2.2E+03	2.1E+03		2.1E+03	nc
Furazolidone	67-45-8	☐			3.9E+02	3.9E+02	ca
Furfural	98-01-1	☐		6.4E+03		6.4E+03	nc
Furium	531-82-8	☐			3.0E+01	3.0E+01	ca
Furmecyclox	60568-05-0	☐			4.9E+04	4.9E+04	ca
Glufosinate ammonium	77182-82-2	☐		8.5E+02		8.5E+02	nc
Glycidaldehyde	765-34-4	☐		7.1E+02		7.1E+02	nc
Glyphosate	1071-83-6	☐		2.1E+04		2.1E+04	nc
Haloxyfop-methyl	69806-40-2	☐		1.1E+01		1.1E+01	nc
Harmony	79277-27-3	☐		2.8E+03		2.8E+03	nc
HCFC-142b	75-68-3	☑	3.4E+02	7.4E+03		7.4E+03	nc
HD	505-60-2	☑	8.3E+02	1.6E-01	1.4E+02	1.6E-01	nc
Heptachlor	76-44-8	☐		1.8E+01	2.7E+02	1.8E+01	nc
Heptachlor epoxide	1024-57-3	☐		2.8E+00	1.6E+02	2.8E+00	nc
Hexabromobenzene	87-82-1	☐		4.2E+03		4.2E+03	nc
Hexachlorobenzene	118-74-1	☐		1.8E+01	7.7E+02	1.8E+01	nc
Hexachlorobutadiene	87-68-3	☐		2.1E+02	1.9E+04	2.1E+02	nc
Hexachlorocyclohexane, alpha-	319-84-6	☐		1.4E+03	2.0E+02	2.0E+02	ca
Hexachlorocyclohexane, beta-	319-85-7	☐		1.3E+02	8.2E+02	1.3E+02	nc
Hexachlorocyclohexane, technical	608-73-1	☐			8.2E+02	8.2E+02	ca
Hexachlorocyclopentadiene	77-47-4	☐		3.2E+03		3.2E+03	nc
Hexachloroethane	67-72-1	☐		1.8E+03	8.8E+04	1.8E+03	nc
Hexachlorophene	70-30-4	☐		1.9E+02		1.9E+02	nc
Hexamethylene diisocyanate	822-06-0	☐		1.9E+05		1.9E+05	nc
Hexane, commercial	110-54-3	☑	1.1E+02	3.9E+02		3.9E+02	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Hexazinone	51235-04-2	☐		7.0E+03		7.0E+03	nc
HFC-134A	811-97-2	☑		7.5E+10		7.5E+10	nc
HMX	2691-41-0	☐		1.0E+05		1.0E+05	nc
Hydrazine	302-01-2	☐		8.4E+04	4.9E+02	4.9E+02	ca
Hydrogen chloride	7647-01-0	☐		1.9E+07		1.9E+07	nc
Hydrogen cyanide	74-90-8	☑	2.1E+05	1.0E+01		1.0E+01	nc
Hydrogen sulfide	7783-06-4	☐		6.4E+03		6.4E+03	nc
Hydroquinone	123-31-9	☐		8.5E+04	2.5E+04	2.5E+04	ca
Imazalil	35554-44-0	☐		2.8E+03		2.8E+03	nc
Imazaquin	81335-37-7	☐		5.3E+04		5.3E+04	nc
Indeno(1,2,3-cd)pyrene	193-39-5	☐			7.4E+07	7.4E+07	ca
Iodine	7553-56-2	☐		2.1E+03		2.1E+03	nc
Iprodione	36734-19-7	☐		8.5E+03		8.5E+03	nc
Iron	7439-89-6	☐		1.5E+05		1.5E+05	nc
Isobutyl alcohol	78-83-1	☑	4.0E+04	6.4E+05		6.4E+05	nc
Isophorone	78-59-1	☐		3.5E+05	1.3E+06	3.5E+05	nc
Isopropalin	33820-53-0	☐		3.2E+04		3.2E+04	nc
Isopropyl methyl phosphonic acid	1832-54-8	☐		2.1E+05		2.1E+05	nc
Isoxaben	82558-50-7	☐		1.1E+04		1.1E+04	nc
JP-4 jet fuel	50815-00-4	☐		8.4E+09		8.4E+09	nc
Kerosene	8008-20-6	☐		9.3E+06		9.3E+06	nc
Lactofen	77501-63-4	☐		4.2E+02		4.2E+02	nc
Lewisite oxide	3088-37-7	☐		6.4E+01		6.4E+01	nc
Lindane	58-89-9	☐		5.9E+02	1.1E+03	5.9E+02	nc
Linuron	330-55-2	☐		4.2E+02		4.2E+02	nc
Lithium	7439-93-2	☐		4.2E+02		4.2E+02	nc
Londax	83055-99-6	☐		4.2E+04		4.2E+04	nc
Lutetium	7439-94-3	☐		1.1E+05		1.1E+05	nc
Malathion	121-75-5	☐		3.5E+03		3.5E+03	nc
Maleic anhydride	108-31-6	☐		2.1E+04		2.1E+04	nc
Maleic hydrazide	123-33-1	☑	2.4E+03	1.1E+05		1.1E+05	nc
Malononitrile	109-77-3	☐		2.1E+02		2.1E+02	nc
Mancozeb	8018-01-7	☐		6.4E+03		6.4E+03	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Maneb	12427-38-2	☐		1.1E+04		1.1E+04	nc
Manganese	7439-96-5	☐		1.8E+04		1.8E+04	nc
MCPA	94-74-6	☐		1.1E+02		1.1E+02	nc
MCPB	94-81-5	☐		2.1E+04		2.1E+04	nc
MCPP	93-65-2	☐		2.1E+03		2.1E+03	nc
Mephosfolan	950-10-7	☐		1.9E+02		1.9E+02	nc
Mepiquat chloride	24307-26-4	☐		6.4E+04		6.4E+04	nc
Mercuric chloride	7487-94-7	☐		6.4E+02		6.4E+02	nc
Mercury, elemental	7439-97-6	☐		9.8E+05		9.8E+05	nc
Merphos	150-50-5	☐		6.4E+01		6.4E+01	nc
Merphos oxide	78-48-8	☐		6.4E+01		6.4E+01	nc
Metalaxyl	57837-19-1	☐		1.3E+04		1.3E+04	nc
Methacrylonitrile	126-98-7	☑	8.4E+03	8.4E+00		8.4E+00	nc
Methamidophos	10265-92-6	☐		1.1E+01		1.1E+01	nc
Methanol	67-56-1	☐		1.1E+06		1.1E+06	nc
Methidathion	950-37-8	☐		2.1E+02		2.1E+02	nc
Methomyl	16752-77-5	☑	8.2E+04	5.3E+03		5.3E+03	nc
Methoxy-5-nitroaniline, 2-	99-59-2	☐			3.2E+04	3.2E+04	ca
Methoxychlor	72-43-5	☐		8.8E+02		8.8E+02	nc
Methoxyethanol, 2-	109-86-4	☐		1.8E+03		1.8E+03	nc
Methoxyethyl acetate, 2-	110-49-6	☐		4.2E+03		4.2E+03	nc
Methyl acetate	79-20-9	☑	1.1E+05	2.1E+06		2.1E+06	nc
Methyl acrylate	96-33-3	☑	4.2E+02	6.4E+03		6.4E+03	nc
Methyl bromide	74-83-9	☑	3.1E+03	2.5E+01		2.5E+01	nc
Methyl chloride	74-87-3	☑	4.0E+03	1.5E+02	6.4E+02	1.5E+02	nc
Methyl ethyl ketone	78-93-3	☑	3.4E+04	2.7E+03		2.7E+03	nc
Methyl isobutyl ketone	108-10-1	☑	1.7E+04	2.8E+03		2.8E+03	nc
Methyl mercaptan	74-93-1	☑		1.9E+06		1.9E+06	nc
Methyl methacrylate	80-62-6	☑	2.7E+03	6.7E+02		6.7E+02	nc
Methyl parathion	298-00-0	☐		1.2E+02		1.2E+02	nc
Methyl tertiary butyl ether	1634-04-4	☑	2.1E+04	1.6E+03		1.6E+03	nc
Methyl-5-nitroaniline, 2-	99-55-8	☐			4.5E+04	4.5E+04	ca
Methylaniline hydrochloride, 2-	636-21-5	☐			6.9E+03	6.9E+03	ca

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Methylaniline, 2-	95-53-4	☐			5.2E+03	5.2E+03	ca
Methylene chloride	75-09-2	☑	2.5E+03	3.5E+02	5.1E+03	3.5E+02	nc
Methylene diphenyl diisocyanate	101-68-8	☐		6.5E+04		6.5E+04	nc
Methylene-bis(2-chroloaniline), 4,4'-	101-14-4	☐		3.5E+02	1.2E+04	3.5E+02	nc
Methylenebis(N,N'-dimethyl)aniline, 4,4'-	101-61-1	☐			2.7E+04	2.7E+04	ca
Methylenedianiline, 4,4'-	101-77-9	☐		1.4E+04		1.4E+04	nc
Methylmercury	22967-92-6	☐		2.1E+01		2.1E+01	nc
Methylnaphthalene, 1-	90-12-0	☑		1.5E+04	5.1E+04	1.5E+04	nc
Methylnapthalene, 2-	91-57-6	☑	3.7E+02	6.7E+02		6.7E+02	nc
Methylphosphonic acid	993-13-5	☐		2.2E+07		2.2E+07	nc
Methylstyrene, alpha-	98-83-9	☑	6.8E+02	1.5E+05		1.5E+05	nc
Metolachlor	51218-45-2	☐		3.2E+04		3.2E+04	nc
Metribuzin	21087-64-9	☐		5.3E+03		5.3E+03	nc
Mirex	2385-85-5	☐		4.2E+01		4.2E+01	nc
Molinate	2212-67-1	☐		4.2E+02		4.2E+02	nc
Molybdenum	7439-98-7	☐		1.1E+03		1.1E+03	nc
Monochloramine	10599-90-3	☐		2.1E+04		2.1E+04	nc
Naled	300-76-5	☐		4.2E+02		4.2E+02	nc
Naphthalene	91-20-3	☑	2.2E+02	1.8E+01		1.8E+01	nc
Napropamide	15299-99-7	☐		2.1E+04		2.1E+04	nc
Nickel refinery dust	Ni ref dust	☐			2.7E+07	2.7E+07	ca
Nickel subsulfide	12035-72-2	☐			1.4E+07	1.4E+07	ca
Nickel, soluble salts	Ni sol salts	☐		4.2E+03		4.2E+03	nc
Nitrate	14797-55-8	☐		3.4E+05		3.4E+05	nc
Nitrite	14797-65-0	☐		2.1E+04		2.1E+04	nc
Nitroaniline, 2-	88-74-4	☐		3.7E+05		3.7E+05	nc
Nitrobenzene	98-95-3	☑	1.0E+03	1.1E+02	1.1E+03	1.1E+02	nc
Nitrofurantoin	67-20-9	☐		1.5E+05		1.5E+05	nc
Nitrofurazone	59-87-0	☐			9.9E+02	9.9E+02	ca
Nitroglycerin	55-63-0	☐		2.1E+01	8.7E+04	2.1E+01	nc
Nitroguanidine	556-88-7	☐		2.1E+04		2.1E+04	nc
Nitromethane	75-52-5	☑		5.6E+07	7.2E+08	5.6E+07	nc
Nitrophenol, 2-	88-75-5	☑	1.1E+03	2.3E-02		2.3E-02	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Nitropropane, 2-	79-46-9	☑		1.9E+07	2.4E+06	2.4E+06	ca
Nitrosodiethanolamine, N-	1116-54-7	☐			4.4E+02	4.4E+02	ca
Nitrosodiethylamine, N-	55-18-5	☐			8.2E+00	8.2E+00	ca
Nitrosodimethylamine, N-	62-75-9	☐		1.4E+00	2.4E+01	1.4E+00	nc
Nitroso-di-n-butylamine, N-	924-16-3	☑	2.1E+03		1.5E+01	1.5E+01	ca
Nitrosodiphenylamine, N-	86-30-6	☐			3.0E+05	3.0E+05	ca
Nitrosodipropylamine, N-	621-64-7	☐			1.8E+02	1.8E+02	ca
Nitroso-N-ethylurea, N-	759-73-9	☐			1.1E+01	1.1E+01	ca
Nitroso-N-methylethylamine, N-	10595-95-6	☐			6.7E+01	6.7E+01	ca
Nitrosopyrrolidine, N-	930-55-2	☐			5.9E+02	5.9E+02	ca
Nitrotoluene, m-	99-08-1	☑	1.0E+03	2.1E+02		2.1E+02	nc
Nitrotoluene, o-	88-72-2	☑	1.0E+03	2.1E+03	6.7E+03	2.1E+03	nc
Nitrotoluene, p-	99-99-0	☑	1.0E+03	8.5E+02	9.3E+04	8.5E+02	nc
Norflurazon	27314-13-2	☐		8.5E+03		8.5E+03	nc
NuStar	85509-19-9	☐		1.5E+02		1.5E+02	nc
Octabromodiphenyl ether	32536-52-0	☐		6.4E+03		6.4E+03	nc
Octamethylpyrophosphoramide	152-16-9	☐		4.2E+02		4.2E+02	nc
Oryzalin	19044-88-3	☐		1.1E+04		1.1E+04	nc
Oxadiazon	19666-30-9	☐		1.1E+03		1.1E+03	nc
Oxamyl	23135-22-0	☐		5.3E+03		5.3E+03	nc
Oxyfluorfen	42874-03-3	☐		6.4E+02		6.4E+02	nc
Paclobutrazol	76738-62-0	☐		2.8E+04		2.8E+04	nc
Paraquat dichloride	1910-42-5	☐		9.5E+02		9.5E+02	nc
Parathion	56-38-2	☐		1.3E+03		1.3E+03	nc
Pebulate	1114-71-2	☐		1.1E+04		1.1E+04	nc
Pendimethalin	40487-42-1	☐		8.5E+03		8.5E+03	nc
Pentabromo-6-chlorocyclohexane, 1,2,3,4,5-	87-84-3	☐			6.5E+04	6.5E+04	ca
Pentabromodiphenyl ether	32534-81-9	☐		4.2E+03		4.2E+03	nc
Pentachlorobenzene	608-93-5	☐		1.7E+03		1.7E+03	nc
Pentachloroethane	76-01-7	☐			1.6E+04	1.6E+04	ca

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Pentachloronitrobenzene	82-68-8	☐		6.4E+02	5.7E+03	6.4E+02	nc
Pentachlorophenol	87-86-5	☐		1.4E+02	8.2E+03	1.4E+02	nc
Perchloroethylene	127-18-4	☑	2.3E+02	9.7E+01		9.7E+01	nc
Permethrin	52645-53-1	☐		4.2E+04		4.2E+04	nc
Phenmedipham	13684-63-4	☐		5.3E+04		5.3E+04	nc
Phenol	108-95-2	☐		1.3E+05		1.3E+05	nc
Phenylenediamine, m-	108-45-2	☐		1.3E+04		1.3E+04	nc
Phenylenediamine, o-	95-54-5	☐			2.6E+04	2.6E+04	ca
Phenylenediamine, p-	106-50-3	☐		4.0E+04		4.0E+04	nc
Phenylmercuric acetate	62-38-4	☐		1.7E+01		1.7E+01	nc
Phenylphenol, 2-	90-43-7	☐			6.4E+05	6.4E+05	ca
Phorate	298-02-2	☐		4.2E+01		4.2E+01	nc
Phosgene	75-44-5	☐		8.4E+05		8.4E+05	nc
Phosmet	732-11-6	☐		4.2E+03		4.2E+03	nc
Phosphine	7803-51-2	☐		6.4E+01		6.4E+01	nc
Phosphoric acid	7664-38-2	☐		9.3E+07		9.3E+07	nc
Phosphorus, white	12185-10-3	☐		4.2E+01		4.2E+01	nc
Phthalic anhydride	85-44-9	☐		4.2E+05		4.2E+05	nc
Picloram	1918-02-1	☐		1.5E+04		1.5E+04	nc
Pirimiphos-methyl	29232-93-7	☐		2.1E+03		2.1E+03	nc
Polybrominated biphenyl	36355-01-8	☐		1.5E+01	1.7E+02	1.5E+01	nc
Polychlorinated biphenyls	1336-36-3	☐			5.8E+02	5.8E+02	ca
Potassium cyanide	151-50-8	☐		1.1E+04		1.1E+04	nc
Potassium perchlorate	7778-74-7	☐		1.5E+02		1.5E+02	nc
Potassium silver cyanide	506-61-6	☐		4.2E+04		4.2E+04	nc
Prochloraz	67747-09-5	☐		1.9E+03	9.9E+03	1.9E+03	nc
Profluralin	26399-36-0	☐		1.3E+03		1.3E+03	nc
Prometon	1610-18-0	☐		3.2E+04		3.2E+04	nc
Prometryn	7287-19-6	☐		8.5E+02		8.5E+02	nc
Pronamide	23950-58-5	☐		1.6E+04		1.6E+04	nc
Propachlor	1918-16-7	☐		2.8E+04		2.8E+04	nc
Propanil	709-98-8	☐		1.1E+03		1.1E+03	nc
Propargite	2312-35-8	☐		4.2E+03		4.2E+03	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Propargyl alcohol	107-19-7	☐		4.2E+03		4.2E+03	nc
Propazine	139-40-2	☐		4.2E+03		4.2E+03	nc
Propham	122-42-9	☐		4.2E+04		4.2E+04	nc
Propiconazole	60207-90-1	☐		2.8E+03		2.8E+03	nc
Propylene glycol	57-55-6	☐		3.6E+06		3.6E+06	nc
Propylene glycol dinitrate	6423-43-4	☐		2.5E+05		2.5E+05	nc
Propylene glycol monoethyl ether	1569-02-4	☐		1.5E+06		1.5E+06	nc
Propylene glycol monomethyl ether	107-98-2	☐		1.2E+06		1.2E+06	nc
Propylene oxide	75-56-9	☑	1.2E+05	5.6E+01	2.3E+03	5.6E+01	nc
Pursuit	81335-77-5	☐		5.3E+04		5.3E+04	nc
Pydrin	51630-58-1	☐		5.3E+03		5.3E+03	nc
Pyrene	129-00-0	☐		5.1E+04		5.1E+04	nc
Pyridine	110-86-1	☐		2.1E+03		2.1E+03	nc
Quinalphos	13593-03-8	☐		1.1E+02		1.1E+02	nc
Quinoline	91-22-5	☐			4.1E+02	4.1E+02	ca
RDX	121-82-4	☐		6.2E+03	1.3E+04	6.2E+03	nc
Refractory ceramic fibers	ref ceramic fiber	☐		9.8E+07		9.8E+07	nc
Resmethrin	10453-86-8	☐		6.4E+03		6.4E+03	nc
Ronnel	299-84-3	☐		1.1E+04		1.1E+04	nc
Rotenone	83-79-4	☐		8.5E+02		8.5E+02	nc
Savey	78587-05-0	☐		5.3E+03		5.3E+03	nc
Selenious acid	7783-00-8	☐		1.1E+03		1.1E+03	nc
Selenium	7782-49-2	☐		1.1E+03		1.1E+03	nc
Selenourea	630-10-4	☐		1.1E+03		1.1E+03	nc
Sethoxydim	74051-80-2	☐		1.9E+04		1.9E+04	nc
Silver	7440-22-4	☐		1.1E+03		1.1E+03	nc
Silver cyanide	506-64-9	☐		2.1E+04		2.1E+04	nc
Silvex	93-72-1	☐		1.7E+03		1.7E+03	nc
Simazine	122-34-9	☐		1.1E+03	1.2E+04	1.1E+03	nc
Sodium azide	26628-22-8	☐		8.5E+03		8.5E+03	nc
Sodium cyanide	143-33-9	☐		1.1E+04		1.1E+04	nc
Sodium diethydithiocarbamate	148-18-5	☐		6.4E+04	5.5E+03	5.5E+03	ca

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Sodium fluoroacetate	62-74-8	☐		4.2E+01		4.2E+01	nc
Sodium metavanadate	13718-26-8	☐		2.1E+03		2.1E+03	nc
Sodium perchlorate	7601-89-0	☐		1.5E+02		1.5E+02	nc
Strontium, stable	7440-24-6	☐		4.2E+05		4.2E+05	nc
Strychnine	57-24-9	☐		6.4E+02		6.4E+02	nc
Styrene	100-42-5	☑	1.5E+03	1.6E+03		1.6E+03	nc
Sulfonylbis(4-chlorobenzene),1,1'-	80-07-9	☐		8.5E+02		8.5E+02	nc
Systhane	88671-89-0	☐		5.3E+03		5.3E+03	nc
TCDD, 2,3,7,8-	1746-01-6	☐		4.0E-03	9.3E-03	4.0E-03	nc
Tebuthiuron	34014-18-1	☐		1.5E+04		1.5E+04	nc
Temephos	3383-96-8	☐		4.2E+04		4.2E+04	nc
Terbacil	5902-51-2	☐		2.8E+03		2.8E+03	nc
Terbufos	13071-79-9	☐		5.3E+00		5.3E+00	nc
Terbutryn	886-50-0	☐		2.1E+02		2.1E+02	nc
Tetrachlorobenzene, 1,2,4,5-	95-94-3	☐		4.2E+02		4.2E+02	nc
Tetrachloroethane, 1,1,1,2-	630-20-6	☑	2.0E+03	1.9E+04	1.8E+03	1.8E+03	ca
Tetrachloroethane, 1,1,2,2-	79-34-5	☑	2.0E+03	2.1E+03	2.3E+02	2.3E+02	ca
Tetrachlorophenol, 2,3,4,6-	58-90-2	☐		6.4E+04		6.4E+04	nc
Tetrachlorotoluene, para, alpha, alpha, alpha-	5216-25-1	☐			7.4E+01	7.4E+01	ca
Tetrachlorovinphos	961-11-5	☐		6.4E+03	6.2E+04	6.4E+03	nc
Tetraethyl dithiopyrophosphate	3689-24-5	☐		1.1E+03		1.1E+03	nc
Tetraethyl lead	78-00-2	☐		2.1E-01		2.1E-01	nc
Tetrahydrofuran	109-99-9	☑	1.1E+05	4.5E+02	5.4E+03	4.5E+02	nc
Thallium (I) acetate	563-68-8	☐		1.9E+02		1.9E+02	nc
Thallium (I) carbonate	6533-73-9	☐		1.7E+02		1.7E+02	nc
Thallium (I) chloride	7791-12-0	☐		1.7E+02		1.7E+02	nc
Thallium (I) sulfate	7446-18-6	☐		1.7E+02		1.7E+02	nc
Thiobencarb	28249-77-6	☐		2.1E+03		2.1E+03	nc
Thiocyanates	463-56-9	☐		1.3E+02		1.3E+02	nc
Thiodiglycol	111-48-8	☐		1.0E+05		1.0E+05	nc
Thiofanox	39196-18-4	☐		6.4E+01		6.4E+01	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Thiophanate-methyl	23564-05-8	☐		1.7E+04		1.7E+04	nc
Thiram	137-26-8	☐		1.3E+03		1.3E+03	nc
Tin, inorganic	7440-31-5	☐		6.4E+04		6.4E+04	nc
Titanium tetrachloride	7550-45-0	☐		9.3E+06		9.3E+06	nc
Toluene	108-88-3	☑	6.5E+02	2.7E+03		2.7E+03	nc
Toluene diisocyanate mixture, 2,4-/2,6-	26471-62-5	☐		6.5E+04		6.5E+04	nc
Toluene-2,4-diamine	95-80-7	☐			3.9E+02	3.9E+02	ca
Toluene-2,5-diamine	95-70-5	☐		1.3E+05		1.3E+05	nc
Toluene-2,6-diamine	823-40-5	☐		1.3E+04		1.3E+04	nc
Toluidine, p-	106-49-0	☐			7.8E+03	7.8E+03	ca
Toxaphene	8001-35-2	☐		2.1E+02	1.3E+03	2.1E+02	nc
Tralomethrin	66841-25-6	☐		1.6E+03		1.6E+03	nc
Triallate	2303-17-5	☐		2.8E+03		2.8E+03	nc
Triasulfuron	82097-50-5	☐		2.1E+03		2.1E+03	nc
Tribromobenzene, 1,2,4-	615-54-3	☐		1.1E+04		1.1E+04	nc
Tributyl phosphate	126-73-8	☐		4.2E+03	1.6E+05	4.2E+03	nc
Tributyltin oxide	56-35-9	☐		6.4E+01		6.4E+01	nc
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	☑	5.6E+03	6.6E+03		6.6E+03	nc
Trichloroaniline hydrochloride, 2,4,6-	33663-50-2	☐			5.1E+04	5.1E+04	ca
Trichloroaniline, 2,4,6-	634-93-5	☐			4.4E+04	4.4E+04	ca
Trichlorobenzene, 1,2,4-	120-82-1	☑	3.2E+03	1.2E+02	5.1E+04	1.2E+02	nc
Trichloroethane, 1,1,1-	71-55-6	☑	1.2E+03	1.2E+03		1.2E+03	nc
Trichloroethane, 1,1,2-	79-00-5	☑	1.8E+03	8.3E+02	3.9E+02	3.9E+02	ca
Trichloroethylene	79-01-6	☑	1.3E+03	2.5E+02	2.8E+01	2.8E+01	ca
Trichlorofluoromethane	75-69-4	☑	2.0E+03	1.8E+02		1.8E+02	nc
Trichlorophenol, 2,4,5-	95-95-4	☐		6.4E+04		6.4E+04	nc
Trichlorophenol, 2,4,6-	88-06-2	☐		2.1E+02	1.3E+05	2.1E+02	nc
Trichlorophenoxyacetic acid	93-76-5	☐		2.1E+04		2.1E+04	nc
Trichloropropane, 1,1,2-	598-77-6	☑	1.1E+03	1.1E+04		1.1E+04	nc
Trichloropropane, 1,2,3-	96-18-4	☑	1.1E+03	4.6E+00	4.9E+01	4.6E+00	nc
Trichloropropene, 1,2,3-	96-19-5	☑	1.1E+03	4.6E+00		4.6E+00	nc
Trichlorotoluene, 2,3,6-	2077-46-5	☐		1.1E+01		1.1E+01	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*
Trichlorotoluene, alpha, 2,6-	2014-83-7	☐		1.1E+01		1.1E+01	nc
Triclosan	3380-34-5	☐		8.5E+05		8.5E+05	nc
Tridiphane	58138-08-2	☐		6.4E+02		6.4E+02	nc
Triethylamine	121-44-8	☑	1.1E+05	8.6E+01		8.6E+01	nc
Trifluralin	1582-09-8	☐		1.3E+03	1.6E+05	1.3E+03	nc
Trimethyl phosphate	512-56-1	☐			4.0E+04	4.0E+04	ca
Trimethylbenzene, 1,2,4-	95-63-6	☑	1.3E+03	1.9E+02		1.9E+02	nc
Trimethylbenzene, 1,3,5-	108-67-8	☑	2.4E+02	1.1E+01		1.1E+01	nc
Trinitrobenzene, 1,3,5-	99-35-4	☐		1.0E+02		1.0E+02	nc
Trinitrophenylmethylnitramine	479-45-8	☐		2.1E+03		2.1E+03	nc
Trinitrotoluene, 2,4,6-	118-96-7	☐		3.0E+02	4.7E+04	3.0E+02	nc
Triphenylphosphine oxide	791-28-6	☐		4.2E+03		4.2E+03	nc
Tris(2-chloroethyl)phosphate	115-96-8	☐		4.2E+03	7.4E+04	4.2E+03	nc
Tris(2-ethylhexyl)phosphate	78-42-2	☐		2.1E+04	4.6E+05	2.1E+04	nc
Uranium, highly soluble salts	HZ1800-90-T	☐		4.2E+02		4.2E+02	nc
Vanadium	7440-62-2	☐		1.5E+03		1.5E+03	nc
Vanadium pentoxide	1314-62-1	☐		1.9E+03	7.9E+05	1.9E+03	nc
Vanadium sulfate	16785-81-2	☐		4.2E+03		4.2E+03	nc
Vernam	1929-77-7	☐		2.1E+03		2.1E+03	nc
Vinclozolin	50471-44-8	☐		5.3E+03		5.3E+03	nc
Vinyl acetate	108-05-4	☑	2.7E+03	2.4E+01		2.4E+01	nc
Vinyl chloride	75-01-4	☑	1.2E+03	1.1E+01	2.1E+02	1.1E+01	nc
Vinyl toluene	25013-15-4	☑	6.8E+02	5.4E+01		5.4E+01	nc
Warfarin	81-81-2	☐		6.4E+01		6.4E+01	nc
Xylene, m-	108-38-3	☑		4.2E+05		4.2E+05	nc
Xylene, o-	95-47-6	☑	4.8E+02	4.2E+05		4.2E+05	nc
Xylenes, total	1330-20-7	☑	4.2E+02	3.4E+02		3.4E+02	nc
Zinc cyanide	557-21-1	☐		1.1E+04		1.1E+04	nc
Zinc phosphide	1314-84-7	☐		6.4E+02		6.4E+02	nc
Zinc, metallic	7440-66-6	☐		6.4E+04		6.4E+04	nc
Zineb	12122-67-7	☐		1.1E+04		1.1E+04	nc

Table F-4: Basis for Soil Military Exposure Guidelines

Chemical Name	*CASRN*	*VOC*	*SAT*	*SMEGnc*	*SMEGca*	*SMEG*	*Basis*

Units:
mg = milligrams
kg = kilograms

Notes:
nc = non-cancer
ca = cancer
CASRN = Chemical Abstract Service Registry Number
VOC = volatile organic compound
SAT = soil saturation concentration (mg/kg)
SMEGca = soil military exposure guideline based on cancer endpoint (mg/kg)
SMEGnc = soil military exposure guideline based on non-cancer endpoint (mg/kg)
SMEG = general soil military exposure guideline (mg/kg)
For basis of the soil MEG for lead compounds, please see Section 6.\

Approved for public release; Distribution unlimited

June 2010 Revision

Reference Document 230

Methodology for Developing Chemical Exposure Guidelines for Deployed Military Personnel

U.S. Army Public Health Command (Provisional)