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Evaluation of Military Field-Water Quality

Volume 2. Constituents of Military Concern from Natural and Anthropogenic Sources

Part 1. Organic Chemical Contaminants

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January 1988

Lawrence Livermore National Laboratory

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In this part of Volume 2 we focus on the identification and analysis of organic water contaminants that could degrade the performance of military personnel that drink field water. To identify the contaminants of concern, we developed a screening methodology for comparing measured concentrations of organic solutes in U.S. and foreign surface and ground waters against estimated threshold concentrations for toxic and organoleptic effects. If the measured concentration of a substance in water was higher than the concentration used as an effects threshold for toxic or organoleptic responses, we then closely examined the substance's occurrence and toxicity to decide on recommending development of a water standard to protect military personnel from adverse health effects. After comparing the measured concentrations with the threshold concentrations for toxic or organoleptic effects, we concluded that there was only a small probability that troops would experience performance-degrading effects as a result of drinking field water containing organic solutes.

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However, we identified several organic solutes that could cause taste and odor problems. These compounds include trichloromethane, ethylbenzene, toluene, tetrachloroethene, and chlorinated phenols. Additionally, geosmin and 2-methylisoborneol, which are two metabolites of blue-green algae (cyanobacteria) and associated gram-negative filamentous bacteria (actinomycetes), can produce taste and odor problems and are of particular concern, especially when algal blooms are present. Oil and grease could also impair the potability of water supplies, and by fouling reverse-osmosis (RO) membranes, oil and grease could impair the performance of reverse osmosis water purification units (ROWPUs).

This report is the first part of the second volume of a nine-volume study entitled Evaluation of Military Field-Water Quality. The second and third parts of this volume address pesticides and inorganic chemicals, respectively. Titles of the other volumes are as follows: Vol. 1, Executive Summary; Vol. 3, Opportunity Poisons; Vol. 4, Health Criteria and Recommendations for Standards; Vol. 5, Infectious Organisms of Military Concern Associated with Consumption: Assessment of Health Risks, and Recommendations for Establishing Related Standards; Vol. 6, Infectious Organisms of Military Concern Associated with Nonconsumptive Exposure: Assessment of Health Risks, and Recommendations for Establishing Related Standards; Vol. 7, Performance Evaluation of the 600-GPH Reverse Osmosis Water Purification Unit (ROWPU): Reverse Osmosis (RO) Components; Vol. 8, Performance of Mobile Water Purification Unit (MWPU) and Pretreatment Components of the 600-GPH Reverse Osmosis Water Purification Unit (ROWPU) and Consideration of Reverse Osmosis (RO) Bypass, Potable-Water Disinfection, and Water-Quality Analysis Techniques; and Vol. 9, Data for Assessing Health Risks in Potential Theaters of Operation for U.S. Military Forces.

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FOREWORD

This report is the first part of the second volume of a nine-volume study entitled Evaluation of Military Field-Water Quality. The second and third parts of this volume address pesticides and inorganic chemicals, respectively. Titles of the other volumes are as follows: Vol. 1, Executive Summary; Vol. 3, Opportunity Poisons; Vol. 4, Health Criteria and Recommendations for Standards; Vol. 5, Infectious Organisms of Military Concern Associated with Consumption: Assessment of Health Risks, and Recommendations for Establishing Related Standards; Vol. 6, Infectious Organisms of Military Concern Associated with Nonconsumptive Exposure: Assessment of Health Risks, and Recommendations for Establishing Related Standards; Vol. 7, Performance Evaluation of the 600-GPH Reverse Osmosis Water Purification Unit (ROWPU): Reverse Osmosis (RO) Components; Vol. 8, Performance of Mobile Water Purification Unit (MWPU) and Pretreatment Components of the 600-GPH Reverse Osmosis Water Purification Unit (ROWPU) and Consideration of Reverse Osmosis (RO) Bypass, Potable-Water Disinfection, and Water-Quality Analysis Techniques; and Vol. 9, Data for Assessing Health Risks in Potential Theaters of Operation for U.S. Military Forces.

As indicated by the titles listed above, the nine volumes of this study contain a comprehensive assessment of the chemical, radiological, and biological constituents of field-water supplies that could pose health risks to military personnel as well as a detailed evaluation of the field-water-treatment capability of the U.S. Armed Forces. The scientific expertise for performing the analyses in this study came from the University of California Lawrence Livermore National Laboratory (LLNL) in Livermore, CA; the University of California campuses located in Berkeley (UCB) and Davis (UCD), CA; the University of Illinois campus in Champaign-Urbana, IL; and the consulting firms of IWG Corporation in San Diego, CA, and V.J. Ciccone & Associates (VJCA), Inc., in Woodbridge, VA. Additionally a Department of Defense (DoD) Multiservice Steering Group (MSG), consisting of both military and civilian representatives from the Armed Forces of the United States (Army, Navy, Air Force, and Marines), as well as representatives from the U.S. Department of Defense, and the U.S. Environmental Protection Agency provided guidance, and critical reviews to the researchers. The reports addressing chemical, radiological, and biological constituents of field-water supplies were also reviewed by scientists at Oak Ridge National Laboratory in Oak Ridge, TN, at the request of the U.S. Army. Furthermore, personnel at several research laboratories, military installations, and agencies of the U.S. Army and the other Armed Forces provided technical assistance and information to the researchers on topics related to field water and the U.S. military community.

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VOLUME 2. CONSTITUENTS OF MILITARY CONCERN FROM NATURAL AND ANTHROPOGENIC SOURCES

Part 1. Organic Chemical Contaminants

PREFACE

Water that may be used by military personnel in the field can contain many different organic and inorganic chemical constituents. These chemicals may exist in a dissolved or colloidal state or on suspended material, and they are present as a consequence of either natural geochemical and hydrological processes or the industrial, domestic, or agricultural activities of man.

The health risk to military personnel from a chemical constituent of field water is largely a function of the frequency with which it occurs at concentrations that are high enough to produce a toxic or organoleptic (e.g., detectable taste or odor) effect that leads directly or indirectly to the diminished ability of exposed military forces to perform assigned tasks. To minimize performance-related effects in military personnel using field-water supplies, the high-risk chemical constituents must be identified and analyzed. The potential health risks of the contaminants can then be managed by adopting and meeting field-water quality standards. The health effects that could occur when standards are exceeded can be addressed on a case-by-case basis.

The objective of Volume 2 of Evaluation of Military Field-Water Quality is to indicate the chemical constituents of field water that are of possible military concern and to describe the screening methodology and supporting data that we used to identify them. Briefly, the screening methodology is separated into two phases. In both phases the general approach consists of comparing (1) the maximum likely concentration in field water of each possible chemical constituent with (2) a corresponding concentration we estimate to be the threshold above which toxic effects, including impaired performance, could occur. Our analyses are based on 70-kg military personnel consuming field water at a maximum rate of 15 L/d. Maximum likely concentrations in field water for each chemical are derived from our compilation of available U.S. and worldwide water-quality monitoring data. However, in the first phase of screening we make conservative assumptions to extrapolate the threshold concentration above which toxic effects could occur in military forces from either oral-mammalian LD50 (lethal dose to 50% of a population) data or Acceptable Daily Intake (ADI) values for humans. The result of this screening procedure is to exclude from further consideration those chemical constituents that are not expected to be of military concern. Although the conservative assumptions incorporated into the initial screening exercise minimize the omission of substances that may actually be of concern, some substances may be identified incorrectly as high-risk. Therefore, to refine the results of the initial screening effort, we reexamine the available monitoring data and review the published human-toxicity data more carefully for each chemical indicated to be of possible military concern. Next, we use any more appropriate human-toxicity data (e.g., dose-response information from reported accidental poisonings, occupational exposures, or therapeutic administrations) that we find and apply it in the second phase of screening. Then, as in the initial screening procedure, any ratio greater than unity between the maximum likely concentration for a chemical in field water and the concentration above which it could produce toxic or organoleptic effects in 70-kg military personnel consuming field water at a maximum rate of 15 L/d indicates that the chemical really could be of military concern. Because impaired performance can occur as a result of indirect health effects, especially from heat illnesses caused by dehydration resulting from reduced consumption of poor-tasting water, we also screen the initial list of chemicals by comparing maximum likely concentration data for each one with available data corresponding to the concentration of the substance that represents the taste- or odor-detection threshold in water.

To facilitate data acquisition, analysis, and review, as well as application of the screening methodology, we separated the potential chemical constituents of field water into three categories and divided Volume 2 into three corresponding parts. Part 1 covers organic solutes (except pesticides), Part 2 addresses pesticides, and Part 3 focuses on inorganic chemicals.

ABSTRACT

In this part of Volume 2 we focus on the identification and analysis of organic water contaminants that could degrade the performance of military personnel that drink field water. To identify the contaminants of concern, we developed a screening methodology for comparing measured concentrations of organic solutes in U.S. and foreign surface and ground waters against estimated threshold concentrations for toxic and organoleptic effects. If the measured concentration of a substance in water was higher than the concentration used as an effects threshold for toxic or organoleptic responses, we then closely examined the substance's occurrence and toxicity to decide on recommending development of a water standard to protect military personnel from adverse health effects. After comparing the measured concentrations with the threshold concentrations for toxic or organoleptic effects, we concluded that there was only a small probability that troops would experience performance-degrading effects as a result of drinking field water containing organic solutes. However, we identified several organic solutes that could cause taste and odor problems. These compounds include trichloromethane, ethylbenzene, toluene, tetrachloroethene, and chlorinated phenols. Additionally, geosmin and 2-methylisoborneol, which are two metabolites of blue-green algae (cyanobacteria) and associated gram-negative filamentous bacteria (actinomycetes), can produce taste and odor problems and are of particular concern, especially when algal blooms are present. Oil and grease could also impair the potability of water supplies, and by fouling reverse-osmosis (RO) membranes, oil and grease could impair the performance of reverse osmosis water purification units (ROWPUs).

INTRODUCTION

The objective of Volume 2 of Evaluation of Military Field-Water Quality is to identify those water contaminants that have potential for impairing troop performance. Key considerations in identifying hazardous contaminants are their occurrence in foreign water supplies, the concentrations measured, and importantly, their toxicity. Volume 2 is divided into three parts: Part 1 covers organic solutes (except pesticides); Part 2 deals exclusively with pesticides; and Part 3 addresses inorganic solutes.

Of particular concern are health effects that would directly affect an individual's ability to conduct a military mission. Indirect effects, such as heat illnesses caused by dehydration resulting from the reduced consumption of poor-tasting water, are also important. The health risk of an organic contaminant in drinking water is a function of its occurrence, expected concentrations, toxicity, and organoleptic properties. As an illustration, a substance that is toxic at low concentrations in water but is found rarely in surface and ground waters would not be considered a high-risk substance. Accordingly, a basic requirement of a screening methodology for field-water contaminants is that it include those factors that directly influence risk. For example, this methodology must consider occurrence in different water sources, measured or predicted concentrations in water, and finally, concentrations that could cause adverse health responses. Another requirement is that the screening procedure should minimize omission of organic solutes that are actually of concern. This means that the methodology should be based on conservative assumptions, even if some substances are incorrectly identified as high-risk during the initial phases of screening. In the following sections we review the basic methodology for screening organic solutes, the data and procedures used to represent contaminant concentrations, and the data and procedures used to estimate threshold-effect concentrations.

OVERVIEW OF THE SCREENING METHODOLOGY

The basic procedure for screening an organic solute, as shown schematically in Fig. 1, is to compare its measured or predicted concentration in water with a screening concentration which represents a no-effect level; that is, the screening concentration has a low probability of degrading performance or causing an organoleptic response. Figure 2 depicts the various comparisons that can result. If the solute concentration is below the screening concentration for toxic effects and the organoleptic concentration (comparison A), then the substance does not constitute a potential health risk. However, if the concentration is above either of these screening concentrations (i.e., comparisons B to E), then the substance is considered a potential high-risk contaminant. The highest potential health risk occurs when the odor or taste threshold is above the no-effect threshold, because there is no organoleptic warning of possible danger (comparison E). The second phase of the screening methodology is a more detailed analysis of the toxicity and occurrence of these high-risk solutes to ensure that they are identified correctly.

The presence of organic solutes in natural waters is a complex function of usage, pollution controls, environmental chemistry (e.g., solubility, volatility, decomposition rates, etc.), and transport (i.e., dilution and diffusion) in surface and ground waters. Measured concentrations of a solute reflect all of the above factors. If we knew all of the relevant parameters for different organic compounds, as well as site-specific hydrologic characteristics, we could conceivably predict concentrations in various water supplies. Unfortunately these data are incomplete for most chemicals. Therefore, in order to estimate the probable occurrence of organic chemicals in field-water supplies, we have relied principally on measured concentrations in treated and untreated waters in foreign countries and the U.S. To augment the measured concentration values, we have used a methodology to predict levels of organic contaminants in the surface waters of foreign countries receiving industrial waste waters.

One of the more difficult components of the screening methodology is the calculation of threshold solute concentrations, above which there would be a high probability of toxic effects in humans. Acquisition and analysis of toxicological data on each substance to define these thresholds is an expensive proposition. An alternative is to estimate the thresholds from the more widely available data on mammalian species. The most frequently reported parameter in this regard is the lethal dose (expressed in mg of chemical per kg of body weight) to 50% of a population of laboratory animals (i.e., an LD50). To estimate human threshold concentrations from mammalian data, we use the LD50 of the species most sensitive to the substance of concern. This value is multiplied by a fraction derived from a statistical analysis of the ratios of no-effect dose rates [in mg/(kg•d)] to LD50's for a set of chemicals. After the applicable dose is calculated, an equivalent concentration in water is calculated, based on a 70-kg man consuming 15 L of water per day. The calculated threshold concentrations are then compared with observed or predicted concentrations in water (see Fig. 1). Those substances that meet the high-risk screening criteria are then scrutinized further to determine whether they are indeed compounds that pose adverse health risks to soldiers that drink field water.

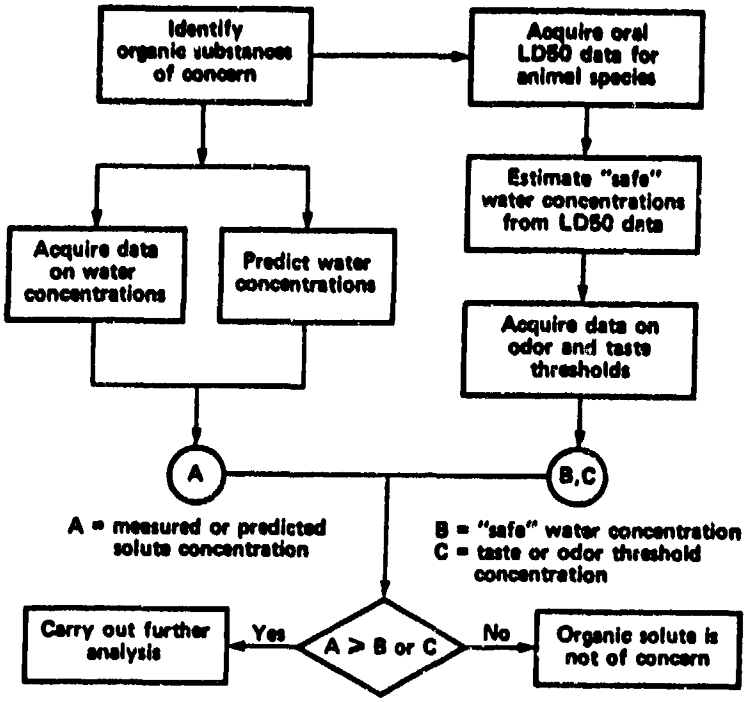

Figure 1. Diagram of the methodology for identifying organic solutes that could pose health risks to military personnel consuming field waters. The basic procedure for screening a chemical is to compare measured or predicted concentrations in water with concentrations that represent a no-effect level. Solutes whose concentrations in water are above toxic or organoleptic thresholds are potentially high-risk compounds.

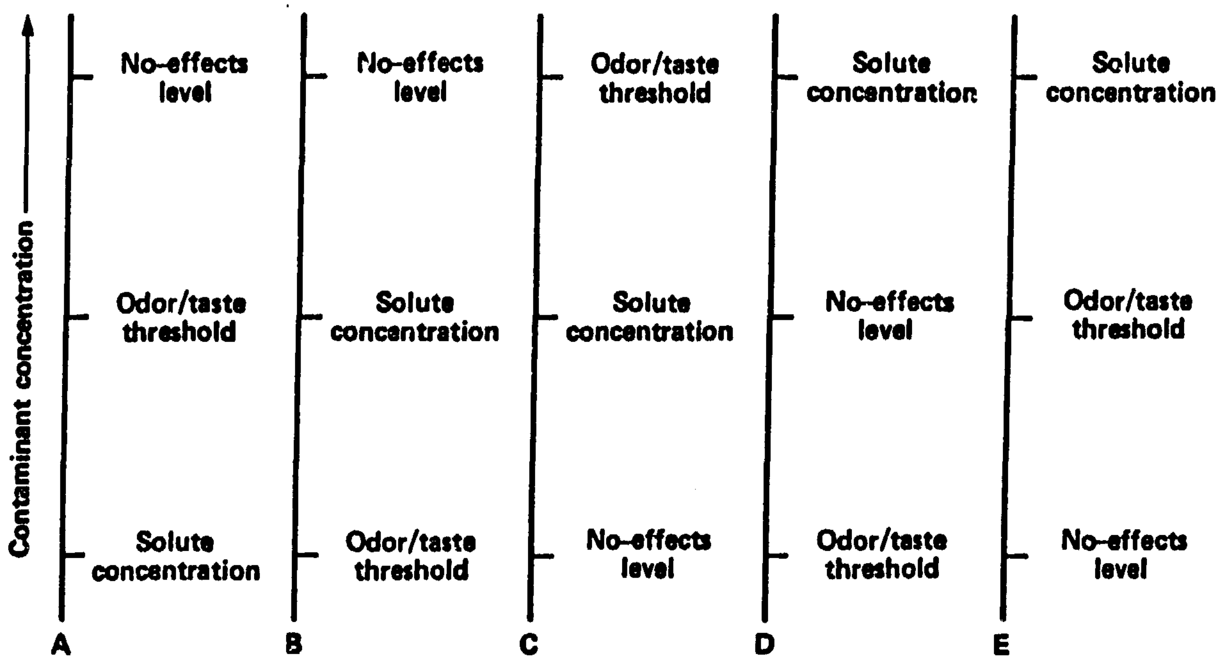

Figure 2. Possible comparisons between water concentrations and threshold concentrations for toxic and organoleptic responses.

IDENTIFICATION OF ORGANIC CONTAMINANTS

It would be impossible to complete screening analyses on all organic compounds that are potential water contaminants. Accordingly, the goal of our data-gathering efforts was to focus on those substances that might actually constitute a health threat to troops drinking treated or untreated field water. The substances identified for screening analyses included organic substances for which health standards had been established by domestic or foreign governments or scientific organizations and substances that appeared on hazardous material lists. Our premise was that such standards and lists reflect objective and subjective evaluations of the health risks of various organic solutes in water supplies worldwide. We supplemented this set of compounds with substances that were reported in foreign water supplies and substances that were measured frequently in U.S. water supplies. The primary emphasis, though, was on measured concentrations of organic solutes in foreign water resources because these supplies are the most likely sources of field drinking waters. The final screening list consisted of over 200 potentially hazardous substances (see Appendix A).

SCREENING CONCENTRATIONS FOR TOXIC AND ORGANOLEPTIC RESPONSES

In this section we describe the methodology we used to derive the minimum concentrations of organic solutes in field water that could produce toxic effects in military personnel consuming up to 15 L of water per day. These minimum concentrations represent the screening concentrations for toxic effects. We also discuss the data used to identify contaminants that could cause organoleptic responses in exposed individuals.

TOXIC EFFECTS

A major challenge in developing a methodology for identifying organic solutes that could pose adverse health risks to soldiers is the quantification of a screening concentration for toxic effects. Ideally, we would calculate the equivalent screening concentration for toxicity as follows:

$$C_s = \frac{NOEL}{SF} \bullet \frac{W}{I}, \text{ where} \qquad (1)$$

C_s = screening concentration for human toxicity, mg/L;
NOEL = maximum no-observed-effect level in rats, mg/(kg•d);

SF = safety factor for adjusting the animal data to compensate for intra- and interspecies variation, dimensionless;

W = reference body weight of a soldier, kg; and

I = maximum daily intake of water, L/d.

Unfortunately, the no-observed-effect levels (NOEL's) derived from animal studies are available for only a relatively small number of substances. The data that best meet the criteria for availability are the oral LD50 data for mammalian species. The LD50, however, is not particularly useful for developing a screening dose or concentration because there is no direct way to relate this acute measure of animal toxicity (i.e., lethality) to an effects threshold in humans. To relate LD50 data to screening concentration thresholds, we adopted a statistical approach in which an LD50 is used to define a lower-bound limit of toxic effects, based on a statistical analysis of the relationship between LD50 values and subchronic (90-d) NOEL's. McNamara,[1] in a study of the relationship between chronic and acute toxicities, computed the ratios of subchronic NOEL's [mg/(kg•d)] to LD50's (oral administrations to rats, mg/kg) for 33 substances. The geometric mean of the log normally distributed ratios was 0.03 d^{-1} with a geometric standard deviation of 4.8. A conservative NOEL (i.e., a NOEL that has a high probability of being below a toxic threshold) can then be calculated from an LD50 by multiplying the median lethal dose by a ratio that corresponds to a suitable cumulative percentile on the lognormal distribution. For the purposes of this screening exercise, we chose the ratio corresponding to the 10th cumulative percentile of the lognormal distribution, or 0.004 d^{-1} (i.e., $0.03/4.8^{1.3}$).

The 90-d exposure period used for the NOEL is similar to a human exposure period of nearly ten years, based on the assumption that the ratios of the two periods to the lifespans of the respective species are approximately the same (i.e., 90 d/730 d = 9 y/75 y). By comparison, the assumed exposure period for consuming field-water supplies is one year, and so there is an implicit margin of safety in using the derived subchronic NOEL. A safety factor of 100 was selected to adjust the NOEL because this factor has been widely used by regulators for standards setting, and it is supported by data on inter- and intraspecies variations (see Dourson and Stara[2]). The reference body weight of a soldier is 70 kg, and the maximum intake of drinking water is 15 L/d. In addition, we assume that the military population is predominately male; age ranges from 18 to 50 y; and the troops are in good health. We use these assumptions to calculate the screening concentration, in mg/L, from an animal LD50 (mg/kg) as:

$$C_s = \frac{LD50 \cdot 0.004}{100} \cdot \frac{70}{15} \cdot \qquad (2)$$

To simplify the computation of the screening concentrations, we multiplied the LD50 values by 10^{-4} to obtain a C_s value. In addition, we used the oral LD50 value of the most sensitive mammalian species; most of these LD50's were for rats. When oral LD50's (or intraperitoneal LD50's in some instances) were not listed in the Registry of Toxic Effects of Chemical Substances,[3] we used the lowest lethal doses for oral administrations. Appendix B contains the animal LD50 data used to calculate screening concentrations.

ORGANOLEPTIC RESPONSES

Organic substances dissolved in water can impart undesirable tastes and odors. However, data on the organoleptic properties of organic solutes rarely deal with the objectionability of the tastes and odors. Instead, data are presented on the concentrations at which the odor or taste of a chemical is detected by an individual or panel of testers. Threshold concentrations are reported as individual values, ranges, means, medians, or minima, making it almost impossible to accurately compare the organoleptic properties of chemicals. Moreover, because researchers have not used the same techniques to measure organoleptic responses, the resulting odor and taste thresholds can show large variability -- even for the same compound.[4] With these difficulties in mind, our approach is to screen the organic chemicals that are potential contaminants of field water, based on their organoleptic properties, by comparing the lowest odor or taste threshold recorded in the literature with the measured or predicted solute concentrations for the chemicals in natural waters (see Appendix C for a listing of the organoleptic data). Substances whose concentration in water is above the measured odor or taste threshold are identified as potential high-risk compounds from an aesthetic standpoint. Once identified, these compounds must be analyzed further to determine whether their tastes or odors are likely to cause adverse responses. In such cases we reviewed the applicable literature on the particular compound.

SCREENING BASED ON MEASURED AND PREDICTED CONCENTRATIONS OF ORGANIC SOLUTES

The screening methodology employs a comparison between our estimated toxic/organoleptic concentration and predicted and measured concentrations of organic substances in water resources located in various parts of the world. Most of our effort was directed toward the acquisition of data on organic solutes in foreign water supplies. Unfortunately, such data were difficult to locate and obtain. One reason for the absence of data on organic solutes is the lack of the appropriate analytical equipment and water-sampling programs in developing countries, and even industrialized ones. Because of this, we were forced to supplement the foreign data with U.S. data. Whether U.S. data are reasonable surrogates for foreign water supplies is debatable. Nevertheless, the large number of organic substances entering U.S. surface and ground waters from industrial and domestic sources would seem to bracket the kinds of compounds that might be encountered elsewhere; however, less-developed countries are likely to have different industrial mixes (and therefore different waste effluents) and less stringent water pollution controls, which would result in higher solute concentrations. To ensure that the monitoring data we were able to obtain provided a reasonable picture of water contamination expected in foreign water supplies, we also calculated concentrations of organic solutes in surface waters of five countries that receive waste waters from a mix of different industries.

MEASURED SOLUTE CONCENTRATIONS

In order to characterize the concentrations of organic solutes that are apt to occur in foreign field-water supplies, we collected concentration data for many different countries. Table 1 summarizes the measured concentrations for 150 organic substances in major geographic regions of the world. Most of our efforts were directed toward the acquisition of water-quality data for water supplies outside of North America, but we have also included a significant number of samples from the U.S. and Canada to supplement the foreign data. We encoded the appropriate water-quality data for entry into our computerized data base. After the entries were made, we checked the values in the data base against the original values in the source documents. We also analyzed the concentration data statistically to identify unusually high or unusually low values. Whenever such concentrations were identified, we examined the source document to determine their validity. If the validity of the reported concentrations could not be established, we removed the values from the data base. Appendix D contains the concentration data that we were able to obtain from the open literature. Figure 3 is a log probability plot of the maximum concentrations for each of the solutes measured in different studies. This plot clearly shows that nearly all organic solute concentrations are below 1 mg/L.

Table 1. Summary of the organic solute concentration measurements for 150 organic substances in water supplies located in major geographic regions around the world.

Geographic location	Number of concentration values selected for screening
pe	364
North America	235
Southeast Asia	96
Africa	77
Middle East	35
Asia	34
South America	20
Central America	8
Total	869

Screening for Systemic Toxicants

The objective of the first phase of the screening analysis was to identify compounds that could pose health risks by virtue of their frequency of occurrence, measured concentrations, and toxicity. In Table 2 we present the ratios of the maximum measured concentration of each organic solute to the screening concentration we estimated as the threshold for toxicity. The compounds of greatest concern are those with ratios greater than unity (to be conservative, we also examined substances with ratios greater than 0.1). To ensure that the maximum concentration values for compounds with a screening ratio greater than 1 were valid, we compared these values with those independently recorded for the same chemicals in a separate data base named WaterDROP. This data base was prepared under the sponsorship of the U.S. Environmental Protection Agency (EPA). It contains data on over 20,000 occurrences of nearly 1000 organic solutes in different kinds of waters (e.g., industrial effluents, process streams, surface and ground waters, etc.).[5] We used WaterDROP only as an auxiliary check of our concentration data because we were unable to verify the accuracy of the reported data as waterDROP is no longer supported as a sponsored project of EPA. In Table 3 we show those compounds that had maximum concentrations in WaterDROP greater than the ones we reported and also those compounds with values less than our maximum values.

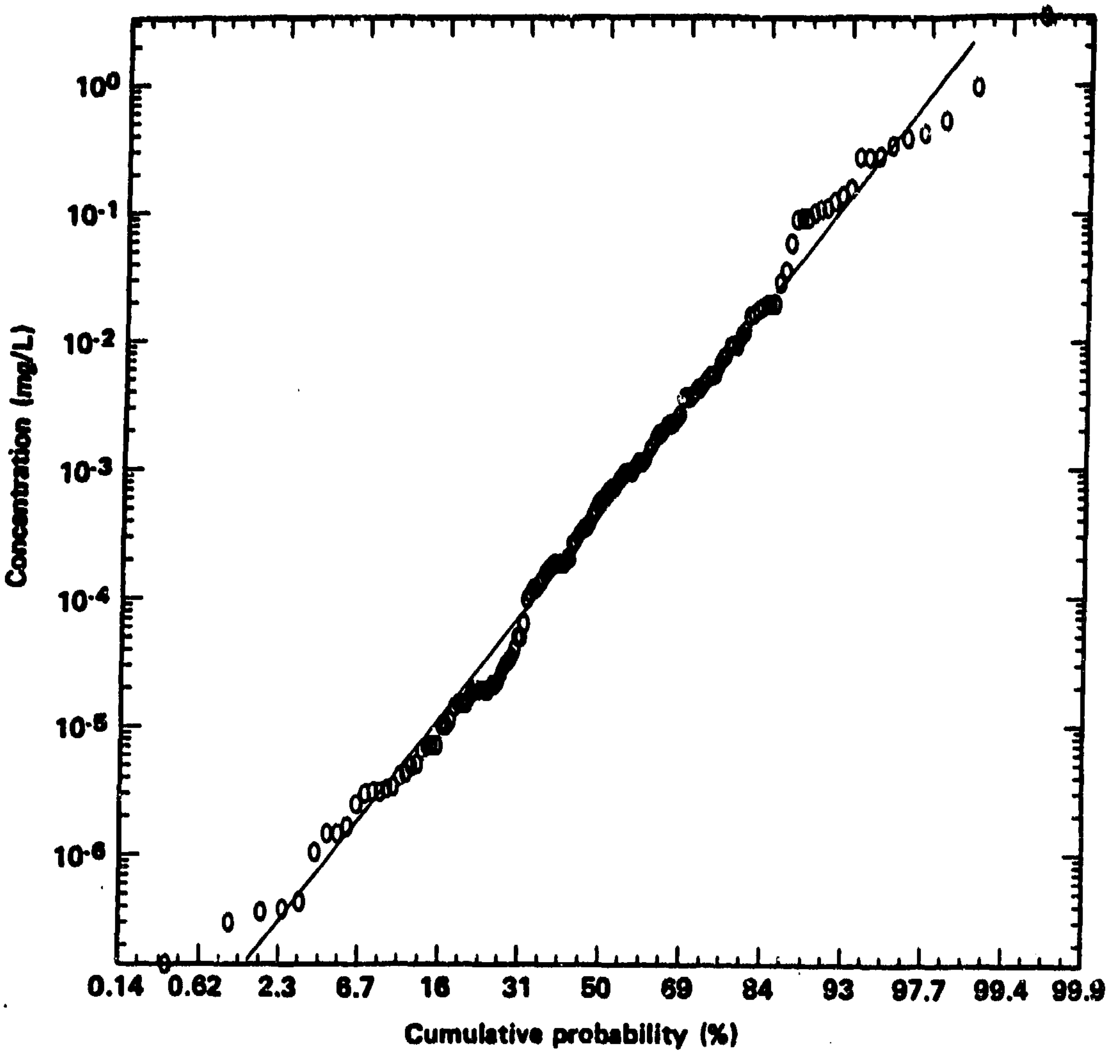

Figure 3. Log probability plot of the maximum concentration for each organic solute that was reported in one or more studies. The geometric mean concentration was 0.0005 mg/L, with a geometric standard deviation of 40. The total number of data points (n) equals 150.

The high concentrations of compounds in surface waters reported in WaterDROP were all in conjunction with immediate (e.g., adjacent to discharge points) industrial pollution. For example, phenol and xylene were both found in surface waters directly receiving effluent from a petrochemical plant. Dilution would diminish these concentrations.

The compound with the highest ratio is trisodium nitrilotriacetate (NTA). Data on the concentrations of NTA were obtained from a study by Woodiwiss et al.,[6] who sampled several Canadian streams receiving sewage effluents from cities in the province of Ontario. The NTA was present in detergents as a replacement for phosphates. The

Table 2. Ratios of maximum observed concentrations (C_{max}) to screening concentrations (C_s) calculated from oral LD50's for mammalian animal species. The reference code is an abbreviation for the reference containing the concentration data (see Appendix D).

Substance	Water type[a]	C_{max} (mg/L)	C_s[b] (mg/L)	Ratio C_{max}/C_s	Ref.
Phenol, m-chloro-	SW	6.00E-03	5.70E-02	1.05E-01	WEGM79
Phthalate, butylbenzyl	GW	3.80E-02	3.16E-01[c]	1.20E-01	EPA811
Phenol, 4-chloro-	SW	3.90E-03	2.61E-02	1.49E-01	WEGM79
Aniline, 2-chloro-	SW	3.90E-03	2.56E-02	1.52E-01	WEGM81
Ethane, trichlorotrifluoro-	GW	1.35E-01	8.60E-01[c]	1.57E-01	EPA811
Ethene, chloro- (vinyl chloride)	FDW	8.40E-03	5.00E-02	1.68E-01	WEST84
Ether, bis(2-chloroisopropyl)	SW	4.60E-03	2.40E-02	1.92E-01	MEIJ76
Benzene, 1,2-dichloro-	SW	1.00E-02	5.00E-02	2.00E-01	PIET80
Ethane, 1,2-dichloro-	FDW	9.80E-03	4.89E-02	2.00E-01	WEST84
Propane, 1,2-dichloro-	FDW	2.10E-02	8.60E-02	2.44E-01	WEST84
Cyclopentadiene, hexachloro-	SW	2.90E-03	1.13E-02	2.57E-01	COTR83
Benzene	GW	1.00E-01	3.80E-01	2.63E-01	DUIJ81
Benzene, 1,4-dichloro-	GW	1.76E-02	5.00E-02	3.52E-01	PAGE82
Phthalate, di-n-butyl	GW	4.70E-01	1.20E+00	3.92E-01	EPA81
Ethene, tetrachloro-	GW	3.75E-01	8.10E-01	4.63E-01	EPA81
Toluene	GW	3.00E-01	5.00E-01	6.00E-01	DUIJ81
Aniline	SW	1.20E-02	1.95E-02	6.15E-01	WEGM81
Methane, dibromochloro-	FDW	6.30E-02	8.00E-02	7.88E-01	WEST84
Benzene, ethyl-	GW	3.00E-01	3.50E-01	8.57E-01	DUIJ81
Phenol	SW	7.90E-03	8.00E-03[c]	9.88E-01	SCHO81
Methane, dichloro-	SW	1.70E-02	1.67E-02	1.02E+00	COTR83
Methane, tribromo-	SW	1.17E-01	1.15E-01	1.02E+00	PELE81
Xylene	GW	6.00E-01	4.30E-01	1.40E+00	DUIJ81
Ethene, 1,2-dichloro-	FDW	1.20E-01	7.70E-02	1.56E+00	WEST84
Phenol, pentachloro-	SW	1.00E-02	5.00E-03	2.00E+00	WEGM79
Ethene, trichloro-	GW	1.10E+00	4.92E-01	2.24E+00	ZOET78
Methane, bromodichloro-	FDW	1.10E-01	4.50E-02	2.44E+00	WEST84

Table 2. (Continued)

Substance	Water type[a]	C_{max} (mg/L)	C_s [b] (mg/L)	Ratio C_{max}/C_s	Ref.
Carbon disulfide	SW	3.90E-03	1.40E-03	2.79E+00	KAI83
Ethane, 1,1,1-trichloro-	GW	3.10E-01	7.50E-02	4.13E+00	EPA81
Ethene, 1,1,-dichloro-	GW	9.62E-02	2.00E-02	4.81E+00	PAGE82
Methane, trichloro-	FDW	4.30E-01	8.00E-02	5.38E+00	WEST84
Trisodium nitrilotriacetate	SW	3.36E+00	6.81E-02	4.93E+01	WOOD79

[a] SW = surface water, GW = ground water, FDW = finished (i.e., treated) drinking water.

[b] The screening concentration is equal to the LD50 multiplied by 0.0001.

[c] If oral LD50's were not available, then an LD50 resulting from intraperitoneal administration was used; and, if neither oral nor intraperitoneal LD50's were available, the oral LDLo was used.

concentration producing the ratio greater than 1 was obtained by sampling receiving waters below a sewage outfall. We do not believe that this substance poses a high risk for troops for the following reasons: first, the maximum concentration measured was considerably higher than the other values reported in the study (see Appendix D); second, we did not find any concentration data reported for other countries, suggesting that this material is probably not widely used; and finally, the available toxicity data suggest that it is not particularly toxic. Nixon[7] completed a toxicity evaluation of NTA and found that a no-observed-effect level during a 90-d exposure to rats was about 200 mg/(kg•d). If we assume an animal-to-man extrapolation (safety) factor of 100 and apply Eq. 1, the equivalent drinking-water concentration representing a toxicity threshold for a 70-kg soldier consuming 15 L/d is

$$\frac{200\ \text{mg}}{\text{kg} \cdot \text{d}} \cdot \frac{70\ \text{kg}}{1} \cdot \frac{\text{d}}{15\ \text{L}} \cdot \frac{1}{100} = 9\ \text{mg/L}\,. \tag{3}$$

Because this value is higher than the maximum measured concentration, there is a strong possibility that even in worst-case exposure conditions, troops would not be affected.

It is also difficult to make a strong case that any of the other compounds with ratios greater than 1 pose a significant health risk to troops. For example, trichloromethane (i.e., chloroform), the compound with the second highest screening ratio, is found in many drinking waters as a product of chlorination, but it rarely reaches concentrations as high as 0.4 mg/L. Moreover, the human toxicity data indicate that dose rates of well

Table 3. Comparison of maximum concentration values in the WaterDROP data base with those used in the present study for substances with screening ratios greater than or approximately equal to unity in Table 2.

	WaterDROP [a]			Our Survey	
Compound	Water type[b]	Maximum concentration (mg/L)		Maximum concentration (mg/L)	Water type[b]
Phenol	SW	60	>	0.006	SW
Methane, dichloro-	SW	0.03	>	0.017	SW
Phenol, pentachloro-	SW	0.4	>	0.01	SW
Xylene	SW	8.0	>	0.60	GW
Ethene, trichloro-	SW	0.1	<	1.1	GW
Ethane, 1,1,1-trichloro-	SW	0.003	<	0.3	GW
Ethene, 1,1-dichloro-	SW	0.004[a]	<	0.096	GW
Ethene, 1,2-dichloro-	SW	0.003	<	0.12	FDW
Methane, tribromo-	SW	0.002	<	0.12	SW
Methane, bromodichloro-	FDW	0.021	<	0.11	FDW
Methane, trichloro-	FDW	0.152	<	0.43	FDW

[a] WaterDROP does not list concentration data for carbon disulfide and trisodium nitrilotriacetate, nor does WaterDROP contain concentration data for Ethene, 1,1-dichloro- specifically (i.e., reported concentration is for unspecified species of dichloroethylene).

[b] FDW = finished drinking water, OW = ocean water, SW = surface water, GW = ground water.

over 1 mg/(kg•d) do not produce debilitating effects.[8] The equivalent drinking-water concentration for toxicity for the reference exposure case (i.e., a 70-kg person consuming 15 L/d) is about 5 mg/L, well above the maximum concentration of 0.4 mg/L, and therefore it is unlikely that this substance presents an unacceptable human-health risk.

As a way of checking our screening concentrations for the chlorinated methanes, ethanes, and ethenes, we compared them with toxic concentrations for water calculated from air-concentration threshold limit values (TLV's) for each of these chemicals. A TLV is an air concentration standard that is set to protect worker health for 8-h exposures to toxic substances during a 5-d work week. We converted the TLV's to an equivalent water concentration by adjusting for continuous exposures (i.e., a 7-d, 24-h exposure instead of a 5-d, 8-h exposure) and by using an inhalation volume of 10 m^3 for a 70-kg man working 8 h. We also assumed that the substances were completely absorbed after inhalation and ingestion. As an example, the TLV of chloroform is 10 parts per million by volume (ppmv or 10 $m^3/10^6$ m^3), and it is equivalent to a concentration of 25.8 mg/L in water for our reference exposure case.

$$\text{Conc} = \frac{10\ m^3}{10^6\ m^3} \bullet \frac{10\ m^3}{d} \bullet \frac{\text{mole}}{0.022\ m^3} \bullet \frac{119.4\ g}{\text{mole}} \bullet \frac{1000\ mg}{g} \bullet \frac{5\ d}{wk} \bullet \frac{wk}{7\ d} \bullet \frac{d}{15\ L} = 25.8\ \frac{mg}{L}$$

This value is more than a factor of five higher than the concentration we derived from oral exposures (i.e., 5 mg/L). The TLV and equivalent concentration in water for 1,1-dichloroethene are 5 ppmv and 10.5 mg/L, respectively. By comparison, the screening concentration calculated from LD50 data is 0.02 mg/L (see Table 2). In a similar fashion, the TLV and equivalent concentration in water for 1,1,1-trichloroethane, trichloroethene, 1,2-dichloroethene, and dichloromethane, are 350 ppmv and 1008 mg/L, 50 ppmv and 142 mg/L, 200 ppmv and 419 mg/L, and 100 ppmv and 184 mg/L, respectively. All of these equivalent concentrations are far above the screening concentrations we used. Our evaluation of the other compounds with screening ratios greater than 1 indicates that the screening concentrations are reasonable for those compounds as well.

We also used acceptable daily intake (ADI) values to check our screening concentrations. The ADI for pentachlorophenol, for example, was estimated in an EPA document[9] to be approximately 2 mg, which translates to a drinking-water concentration of 0.1 mg/L--a factor of 20 higher than the value we used (see Table 2). The ADIs for toluene and phenol (assuming a 70-kg man) have been estimated to be 29.5 and 7 mg, respectively.[10,11] The equivalent drinking-water concentrations are 2 and 0.5 mg/L. The value for toluene is only a factor of 4 greater than the estimated screening concentration we used; however, the maximum concentration was only 0.3 mg/L.

Data on the toxicities of the bromomethanes (i.e., dibromochloromethane, tribromomethane, and bromodichloromethane) are meager, and it is not possible to derive equivalent concentrations in water for the purpose of verifying our screening concentrations. (See the National Research Council report[12] for brief toxicity reviews of these substances.) However, we note that the bromomethanes have low water solubilities, and therefore it is conceivable that they will not reach concentrations that would be harmful.

The remaining substances with screening ratios greater than 1 (i.e., aniline, ethylbenzene, xylene, and carbon disulfide) have screening concentrations that are below concentrations calculated from the TLV's of those substances. Moreover, the screening concentrations in Table 2 for aniline (0.02 mg/L), ethylbenzene (0.35 mg/L), and xylene (0.43 mg/L) are close to the standards appearing in Table A-1 of Appendix A, that is, 0.1, 1.4, and 2 mg/L, respectively.

Screening for Organoleptic Effects

Organic compounds that impart tastes and odors to field drinking-water supplies are of concern for two basic reasons: troops are apt to become dehydrated as they reduce consumption of the aesthetically poor water, or they may seek out and consume unauthorized water supplies that are more potable, but contain toxic substances or disease-causing organisms. The process of identifying compounds that could induce these types of behavior is difficult because most of the data on odor and/or taste thresholds are based on detection thresholds rather than behavioral responses like "I could not drink this water" (see Fig. 2, Columns D and E). For screening purposes, we assume that the taste/odor thresholds are indicative of a potentially negative response. In addition, we used the minimum threshold concentration measured in water for comparisons (threshold values calculated from air data were used when threshold concentrations in water were unavailable). In Table 4 we present the screening ratios of the maximum concentrations in water (from Appendix D) to taste or odor thresholds in water (from Appendix C). Eighteen compounds had ratios greater than 1, and in Table 5 we list all of the concentration data for those compounds, arranged in alphabetical order.

From these two tables the following information about the observed concentrations can be drawn:

Benzene, 1,4-dichloro-	Only two studies reported concentrations above or equal to the organoleptic limit. The highest concentration was from a survey of New Jersey wells.
Benzene, ethyl-	Occurrence is worldwide, but the only concentration above the taste/odor threshold in Table 5 was for a landfill leachate in the Netherlands.
Biphenyl	The only concentration above the organoleptic threshold was associated with an industrial-sewage outfall into a Norwegian river. The reported concentration near this outfall was two orders of magnitude higher than the next highest reported value (see Table 5).
Carbon disulfide	Of the two concentrations in the data base, only one was above the screening concentration.

Table 4. Comparison between maximum concentrations and the minimum concentrations for taste- or odor-detection thresholds.

CASID	SUBSTANCE	MAXIMUM CONCENTRATION	TASTE/ODOR THRESHOLD	TYPE	RATIO MAXCONC/TASTEODOR
110827	CYCLOHEXANE	2.05E-05	2.00E+02	OMW	1.03E-07
85018	PHENANTHRENE	6.40E-05	1.00E+00	OMW	6.40E-05
62533	ANILINE	1.20E-02	7.01E+01	OMW	1.71E-04
91203	NAPHTHALENE	1.00E-04	5.00E-01	OMW	2.00E-04
107062	ETHANE, 1,2-DICHLORO-	9.80E-03	2.90E+01	OMW	3.38E-04
933755	PHENOL, 2,3,6-TRICHLORO-	1.10E-04	3.00E-01	OMW	3.67E-04
100527	BENZALDEHYDE	1.54E-05	3.50E-02	OMW	4.39E-04
118741	BENZENE, HEXACHLORO-	1.50E-03	3.00E+00	OMW	5.00E-04
75014	ETHENE, CHLORO- (VINYLCHLORIDE	8.40E-03	3.40E+00	OAWC	2.47E-03
540590	ETHENE, 1,2- DICHLORO-	1.20E-01	2.60E+01	OAWC	4.62E-03
87683	BUTADIENE, HEXACHLORO-	3.00E-05	6.00E-03	OMW	5.00E-03
108601	ETHER, BIS(2-CHLOROISOPROPYL)-	4.60E-03	2.00E-01	OMW	2.30E-02
108907	BENZENE, CHLORO-	2.70E-03	1.00E-01	OMW	2.70E-02
98953	BENZENE, NITRO-	5.40E-03	2.00E-01	OMW	2.70E-02
56235	METHANE, TETRACHLORO-	2.10E-02	5.20E-01	OAWC	4.04E-02
71432	BENZENE	1.00E-01	2.00E+00	OMW	5.00E-02
75354	ETHENE, 1,1-DICHLORO-	9.62E-02	1.50E+00	OAWC	6.42E-02
79016	ETHENE, TRICHLORO-	1.10E+00	7.30E+00	OMW	1.51E-01
75092	METHANE, DICHLORO-	1.70E-02	1.00E-01	OAWC	1.70E-01
87865	PHENOL, PENTACHLORO-	1.00E-02	3.00E-02	TMW	3.33E-01
75252	METHANE, TRIBROMO-	1.17E-01	3.00E-01	OMW	3.90E-01
58902	PHENOL, 2,3,4,6-TETRACHLORO-	5.60E-04	1.00E-03	TMW	5.60E-01
95954	PHENOL, 2,4,5-TRICHLORO-	6.60E-04	1.00E-03	TMW	6.60E-01
95501	BENZENE, 1,2-DICHLORO-	1.00E-02	1.00E-02	OMW	1.00E+00
95772	PHENOL, 3,4-DICHLORO-	3.20E-04	3.00E-04	TMW	1.07E+00
92524	BIPHENYL	6.00E-04	5.00E-04	OMW	1.20E+00
127184	ETHENE, TETRACHLORO-	3.75E-01	3.00E-01	OMW	1.25E+00
88062	PHENOL, 2,4,6-TRICHLORO-	2.50E-03	2.00E-03	TMW	1.25E+00
583788	PHENOL, 2,5-DICHLORO-	2.90E-04	2.00E-04	TMW	1.45E+00
75150	CARBON DISULFIDE	3.90E-03	2.60E-03	OMW	1.50E+00
120832	PHENOL, 2,4-DICHLORO-	5.90E-04	3.00E-04	TMW	1.97E+00
87650	PHENOL, 2,6-DICHLORO-	4.50E-04	2.00E-04	TMW	2.25E+00
108883	TOLUENE	3.00E-01	1.20E-01	TMW	2.50E+00
77474	CYCLOPENTADIENE, HEXACHLORO-	2.90E-03	1.00E-03	OMW	2.90E+00
108952	PHENOL	8.95E-01	3.00E-01	TMW	2.98E+00
100414	BENZENE, ETHYL-	3.00E-01	1.00E-01	TMW	3.00E+00
67663	METHANE, TRICHLORO-	4.30E-01	1.00E-01	OAW	4.30E+00
95578	PHENOL, 2-CHLORO-	2.30E-03	3.30E-04	OMW	6.97E+00
78875	PROPANE, 1,2-DICHLORO-	2.10E-02	1.40E-03	OMW	1.50E+01
106489	PHENOL, 4-CHLORO-	3.90E-03	1.00E-04	TMW	3.90E+01
106467	BENZENE, 1,4-DICHLORO-	1.76E-02	3.00E-04	OMW	5.86E+01
108430	PHENOL, M-CHLORO-	6.00E-03	1.00E-04	OMW	6.00E+01

* O = ODOR
T = TASTE
M = MINIMUM
A = AVERAGE
W = WATER
C = CALCULATED.

Table 5. Comparison between screening concentrations based on LD50 values and all concentration data reported for those organic chemicals that appear in Table 4 and have a maximum concentration to taste- or odor-detection threshold ratio greater than unity.

CASID	SUBSTANCE	TYPE*	REPORTED	SCREENING	# SAMP	REFERENCE	PLACE
			CONCENTRATIONS MG/L				
106467	BENZENE, 1,4-DICHLORO-	SW	8.00E-06	5.00E-01	1	SCHW79	SWITZERLAND
		SW	9.00E-06		3	SCHW79	SWITZERLAND
		SW	1.00E-05		2	SCHW79	SWITZERLAND
		SW	1.00E-05		1	SCHW79	SWITZERLAND
		SW	1.10E-05		3	SCHW79	SWITZERLAND
		SW	3.00E-04		7	PIET80	NETHERLANDS
		FDW	6.80E-04		280	WEST84	UNITED STATES
		FDW	9.00E-04		321	WEST84	UNITED STATES
		FDW	1.30E-03		186	WEST84	UNITED STATES
		GW	3.00E-03			ZOET80	NETHERLANDS
		GW	1.76E-02			PAGE82	NEW JERSEY
100414	BENZENE, ETHYL-	OW	4.00E-07	3.50E+00	1	SAUE78	GULF OF MEXICO
		OW	6.00E-07		1	SAUE78	GULF OF MEXICO
		OW	8.00E-07		1	SAUE78	GULF OF MEXICO
		OW	1.03E-06		1	SAUE81	GULF OF MEXICO
		OW	1.10E-06		1	SAUE78	GULF OF MEXICO
		OW	1.50E-06		1	SAUE78	GULF OF MEXICO
		OW	1.80E-06		1	SAUE78	GULF OF MEXICO
		OW	4.40E-06		1	SAUE78	GULF OF MEXICO
		OW	4.50E-06		1	SAUE78	GULF OF MEXICO
		OW	5.13E-06		3	SAUE81	GULF OF MEXICO
		OW	5.13E-06			SAUE81	GULF OF MEXICO
		OW	7.18E-06		1	SAUE81	GULF OF MEXICO
		SW	1.00E-05		1	TRUS80	NICARAGUA
		SW	1.00E-05		1	TRUS80	AUSTRALIA
		OW	1.54E-05			SAUE81	GULF OF MEXICO
		SW	2.00E-05		1	TRUS80	EGYPT
		SW	2.00E-04		1	TRUS80	PHILIPPINES
		GW	3.00E-04		1	VAND81	NETHERLANDS
		FDW	7.40E-04		186	WEST84	UNITED STATES
		FDW	9.50E-04		321	WEST84	UNITED STATES
		FDW	1.10E-03		280	WEST84	UNITED STATES
		GW	3.00E-02		1	VAND81	NETHERLANDS
		GW	4.00E-02			EPA81	NEW YORK
		GW	1.00E-01		1	VAND81	NETHERLANDS
		GW	3.00E-01		1	VAND81	NETHERLANDS
92524	BIPHENYL	FDW	1.00E-07	2.40E+00		BENO79	CANADA, EASTERN ONTARIO
		FDW	2.00E-07			BENO79	CANADA, EASTERN
		FDW	2.60E-07		1	KVES82	NORWAY
		FDW	3.00E-07			BENO79	CANADA, EASTERN
		FDW	4.00E-07			BENO79	CANADA
		FDW	5.00E-07			BENO79	CANADA, EASTERN
		FDW	5.00E-07			BENO79	CANADA
		FDW	6.00E-07			BENO79	CANADA
		FDW	6.00E-07			BENO79	CANADA, EASTERN
		FDW	7.00E-07			BENO79	CANADA, EASTERN
		FDW	7.80E-07		1	KVES82	SWEDEN
		FDW	1.70E-06			BENO79	CANADA
		FDW	2.20E-06		1	KVES82	DENMARK

Table 5. (Continued)

CASID	SUBSTANCE	TYPE*	REPORTED	SCREENING	# SAMP	REFERENCE	PLACE
			CONCENTRATIONS MG/L				
		FDW	4.80E-06		1	KVES82	FINLAND
		SW	6.00E-04		1	SCHO81	NORWAY
75150	CARBON DISULFIDE	SW	2.50E-05	1.40E-02	17	KAIS83	NEW YORK
		SW	3.90E-03		98	KAIS83	CANADA, ONTARIO
77474	CYCLOPENTADIENE, HEXACHLORO-	SW	2.90E-03	1.13E-01		COTR83	UNITED STATES
127184	ETHENE, TETRACHLORO-	SW	3.00E-05	8.10E+00	2	SCHW79	SWITZERLAND
		SW	3.10E-05		3	SCHW79	SWITZERLAND
		OW	4.10E-05			SAUE81	GULF OF MEXICO
		SW	4.20E-05		3	SCHW79	SWITZERLAND
		SW	4.60E-05		1	SCHW79	SWITZERLAND
		SW	4.90E-05		3	SCHW79	SWITZERLAND
		SW	5.10E-05		1	SCHW79	SWITZERLAND
		SW	1.00E-04		1	TRUS80	AUSTRALIA
		SW	1.34E-04		17	KAIS83	NEW YORK
		SW	1.60E-04		1	CORR77	NETHERLANDS
		SW	2.00E-04		1	CORR77	DENMARK
		SW	2.00E-04		1	TRUS80	CHINA
		SW	3.00E-04		1	TRUS80	EGYPT
		SW	3.00E-04		1	VANR82	SOUTH AFRICA
		SW	3.00E-04		1	CORR77	NETHERLANDS
		SW	3.50E-04		1	VANR82	SOUTH AFRICA
		SW	4.80E-04		1	VANR82	SOUTH AFRICA
		SW	5.00E-04		1	VANR82	SOUTH AFRICA
		SW	5.30E-04		1	VANR82	SOUTH AFRICA
		SW	5.80E-04		1	VANR82	SOUTH AFRICA
		SW	5.90E-04		98	KAIS83	CANADA, ONTARIO
		SW	6.20E-04		1	VANR82	SOUTH AFRICA
		SW	6.60E-04		1	VANR82	SOUTH AFRICA
		SW	9.50E-04		1	VANR82	SOUTH AFRICA
		SW	1.00E-03		1	CORR77	DENMARK
		SW	1.20E-03		1	VANR82	SOUTH AFRICA
		SW	1.40E-03		1	CORR77	NETHERLANDS
		SW	1.40E-03		1	CORR77	NETHERLANDS
		SW	1.50E-03		1	CORR77	DENMARK
		SW	1.70E-03		1	CORR77	NETHERLANDS
		SW	1.75E-03		1	CORR77	DENMARK
		SW	1.90E-03		1	CORR77	DENMARK
		SW	2.50E-03		1	CORR77	DENMARK
		SW	2.50E-03		1	CORR77	DENMARK
		GW	2.60E-03		1	CORR77	ENGLAND
		OW	2.60E-03			PEAR75	ENGLAND, THAMES
		SW	2.80E-03		1	CORR77	DENMARK
		FDW	5.90E-03		186	WEST84	UNITED STATES
		SW	6.60E-03		1	CORR77	NETHERLANDS
		SW	7.00E-03		1	PELE81	ISRAEL
		SW	7.00E-03		1	PELE81	ISRAEL
		SW	1.05E-02		1	PELE81	ISRAEL
		GW	1.65E-02			PAGE82	NEW JERSEY
		SW	1.96E-02		1	CORR77	DENMARK
		FDW	2.10E-02		321	WEST84	UNITED STATES
		GW	2.20E-02			ZOET80	NETHERLANDS
		FDW	2.30E-02		280	WEST84	UNITED STATES
		SW	4.60E-02		1	CORR77	FINLAND
		FDW	6.90E-02		158	WEST84	UNITED STATES
		GW	3.75E-01			EPA81	UNITED STATES, NEW YORK

Table 5. (Continued)

CASID	SUBSTANCE	TYPE*	REPORTED	SCREENING	# SAMP	REFERENCE	PLACE
			CONCENTRATIONS MG/L				
67663	METHANE, TRICHLORO-	GW	4.10E-05	8.00E-01	1	SAUE81	GULF OF MEXICO
		GW	5.00E-05		1	TRUS80	TAIWAN
		SW	1.10E-04		17	KAIS83	NEW YORK
		OW	2.05E-04			SAUE81	GULF OF MEXICO
		SW	6.00E-04		1	TRUS80	NICARAGUA
		SW	8.30E-04		98	KAIS83	CANADA, ONTARIO
		SW	1.33E-02			EISE81	ISRAEL
		OW	1.00E-03			PEAR75	ENGLAND, THAMES RIVER
		FDW	1.10E-03		34	CHAM83	FRANCE
		SW	1.40E-03		1	PELE81	ISRAEL
		SW	1.80E-03		1	TRUS80	PHILIPPINES
		SW	2.70E-03		1	VANR82	SOUTH AFRICA
		SW	3.40E-03		1	TRUS80	CHINA
		SW	3.60E-03		1	PELE81	ISRAEL
		SW	4.90E-03		1	TRUS80	PHILIPPINES
		GW	5.00E-03			ZOET80	NETHERLANDS
		SW	5.80E-03		1	TRUS80	ENGLAND
		SW	6.40E-03		1	TRUS80	PERU
		SW	6.80E-03		1	TRUS80	THAILAND
		SW	7.90E-03			COTR83	UNITED STATES
		GW	1.04E-02			PAGE82	NEW JERSEY
		SW	1.10E-02		1	TRUS80	AUSTRALIA
		SW	1.26E-02			KOOL81	NETHERLANDS
		SW	1.30E-02		1	VANR82	SOUTH AFRICA
		SW	1.40E-02		1	VANR82	SOUTH AFRICA
		SW	1.70E-02		1	TRUS80	BRAZIL
		SW	1.90E-02		1	VANR82	SOUTH AFRICA
		SW	2.00E-02		1	VANR82	SOUTH AFRICA
		SW	2.10E-02		1	VANR82	SOUTH AFRICA
		SW	2.30E-02		1	VANR82	SOUTH AFRICA
		SW	2.50E-02		1	VANR82	SOUTH AFRICA
		SW	2.70E-02		18	CHAM83	FRANCE
		SW	3.00E-02		9	CHAM83	FRANCE
		SW	3.20E-02		1	VANR82	SOUTH AFRICA
		SW	3.40E-02		1	VANR82	SOUTH AFRICA
		SW	4.00E-02		18	CHAM83	FRANCE
		SW	4.29E-02		1	DEFE84	BRAZIL
		SW	5.70E-02		1	TRUS80	VENEZUELA
		SW	5.77E-02		1	DEFE84	BRAZIL
		FDW	6.00E-02		20	ZOET80	NETHERLANDS
		GW	6.70E-02			EPA81	UNITED STATES, NEW YO
		SW	7.59E-02		1	DEFE84	BRAZIL
		SW	9.78E-02		1	DEFE84	BRAZIL
		FDW	1.00E-01		321	WEST84	UNITED STATES
		FDW	1.40E-01		280	WEST84	UNITED STATES
		GW	1.76E-01		86	SCHR81	NEW YORK
		SW	2.66E-01		32	SCHR81	NEW YORK
		FDW	3.00E-01		186	WEST84	UNITED STATES
		SW	3.49E-01		35	SCHR81	NEW YORK
		FDW	4.30E-01		158	WEST84	UNITED STATES
		SW	4.30E-01		58	SCHR81	NEW YORK

Table 5. (Continued)

CASID	SUBSTANCE	TYPE*	REPORTED	SCREENING	# SAMP	REFERENCE	PLACE
			CONCENTRATIONS MG/L				
88062	PHENOL, 2,4,6-TRICHLORO-	SW	4.00E-05	8.20E-01		WEGM79	NETHERLANDS
		SW	5.00E-05			WEGM79	NETHERLANDS
		SW	1.20E-04			WEGM79	NETHERLANDS
		SW	2.60E-04			WEGM79	NETHERLANDS
		SW	2.70E-04			WEGM79	NETHERLANDS
		SW	3.50E-04			WEGM79	NETHERLANDS
		SW	3.70E-04			WEGM79	NETHERLANDS
		SW	3.70E-04			WEGM79	NETHERLANDS
		SW	5.10E-04			WEGM79	NETHERLANDS
		SW	2.50E-03			WEGM79	NETHERLANDS
120832	PHENOL, 2,4-DICHLORO-	SW	3.50E-04	5.80E-01		WEGM79	NETHERLANDS
		SW	5.90E-04			WEGM79	NETHERLANDS
583788	PHENOL, 2,5-DICHLORO-	SW	2.60E-04	NO VALUE		WEGM79	NETHERLANDS
		SW	2.90E-04			WEGM79	NETHERLANDS
87650	PHENOL, 2,6-DICHLORO-	SW	6.00E-05	2.94E+00		WEGM79	NETHERLANDS
		SW	6.00E-05			WEGM79	NETHERLANDS
		SW	1.90E-04			WEGM79	NETHERLANDS
		SW	2.50E-04			WEGM79	NETHERLANDS
		SW	2.50E-04			WEGM79	NETHERLANDS
		SW	2.50E-04			WEGM79	NETHERLANDS
		SW	3.30E-04			WEGM79	NETHERLANDS
		SW	4.30E-04			WEGM79	NETHERLANDS
		SW	4.50E-04			WEGM79	NETHERLANDS
95578	PHENOL, 2-CHLORO-	SW	2.30E-03	4.40E-01		WEGM79	NETHERLANDS
95772	PHENOL, 3,4-DICHLORO-	SW	2.30E-04	NO VALUE		WEGM79	NETHERLANDS
		SW	3.20E-04			WEGM79	NETHERLANDS
106489	PHENOL, 4-CHLORO-	SW	3.90E-03	2.61E-01		WEGM79	NETHERLANDS
		SW	3.90E-03		1	WEGM79	NETHERLANDS
108430	PHENOL, 3-CHLORO-	SW	6.00E-03	5.70E-01		WEGM79	NETHERLANDS
78875	PROPANE, 1,2-DICHLORO-	SW	5.50E-05	8.60E-01	17	KAIS83	NEW YORK
		SW	4.40E-04		98	KAIS83	CANADA, ONTARIO
		FDW	7.50E-04		280	WEST84	UNITED STATES
		FDW	1.40E-03		321	WEST84	UNITED STATES
		FDW	1.80E-02		158	WEST84	UNITED STATES
		FDW	2.10E-02		186	WEST84	UNITED STATES
108883	TOLUENE	OW	4.50E-06	5.00E+00	1	SAUE78	GULF OF MEXICO
		OW	5.90E-06		1	SAUE78	GULF OF MEXICO
		OW	1.03E-05		1	SAUE81	GULF OF MEXICO
		OW	1.03E-05		3	SAUE81	GULF OF MEXICO
		OW	1.03E-05			SAUE81	GULF OF MEXICO
		OW	1.24E-05		1	SAUE78	GULF OF MEXICO
		OW	1.36E-05		1	SAUE78	GULF OF MEXICO
		OW	2.00E-05		1	SAUE78	GULF OF MEXICO
		OW	2.39E-05		1	SAUE78	GULF OF MEXICO
		OW	3.07E-05		1	SAUE81	GULF OF MEXICO
		OW	3.47E-05		1	SAUE78	GULF OF MEXICO
		OW	6.15E-05			SAUE81	GULF OF MEXICO
		SW	3.00E-04		1	TRUS80	ENGLAND
		FDW	3.00E-04		20	ZOET80	NETHERLANDS
		OW	3.76E-04		1	SAUE78	GULF OF MEXICO
		SW	5.00E-04		1	TRUS80	PHILIPPINES
		SW	6.00E-04		1	TRUS80	AUSTRALIA
		GW	7.00E-04		1	TRUS80	TAIWAN

Table 5. (Continued)

CASID	SUBSTANCE	TYPE*	REPORTED	SCREENING	# SAMP	REFERENCE	PLACE
			CONCENTRATIONS MG/L				
		SW	7.00E-04		1	TRUS80	PERU
		SW	7.00E-04		1	TRUS80	CHINA
		FDW	7.90E-04		321	WEST84	UNITED STATES
		FDW	8.50E-04		280	WEST84	UNITED STATES
		SW	9.00E-04		1	TRUS80	VENEZUELA
		GW	1.00E-03		1	VAND81	NETHERLANDS
		SW	1.10E-03		1	TRUS80	EGYPT
		SW	1.20E-03		1	TRUS80	BRAZIL
		SW	1.40E-03		1	TRUS80	THAILAND
		SW	1.50E-03		1	TRUS80	PHILIPPINES
		FDW	1.50E-03		158	WEST84	UNITED STATES
		SW	2.30E-03		1	TRUS80	NICARAGUA
		FDW	2.90E-03		186	WEST84	UNITED STATES
		GW	3.00E-03		1	VAND81	NETHERLANDS
		GW	1.00E-02			EPA81	NEW YORK
		SW	3.10E-02			COTR83	UNITED STATES
		GW	1.00E-01		1	VAND81	NETHERLANDS
		GW	3.00E-01		1	VAND81	NETHERLANDS

Note: Screening concentration is based on LD50 data.

*
FDW = finished drinking water.
GW = ground water.
SW = surface water.
OW = ocean water.

Cyclopentadiene, hexachloro-	The only concentration value we were able to obtain was above the organoleptic threshold.
Ethene, tetrachloro-	Its occurrence is worldwide. The highest concentration was for a U.S. surface water. The other values were below the screening concentration.
Methane, trichloro-	The highest concentration values are from the U.S., but worldwide values are not significantly lower.
Phenol	All but one of the values listed in our basic source data, Table D-1, Appendix D, are from Norway. Organoleptic response would be zero at these concentrations; however, we did find higher values in the WaterDROP data base for waters in the U.S. The highest was 60 mg/L at the outlet of an industrial discharge. This value would definitely be above the taste/odor threshold. (WaterDROP data, as explained previously, were used for comparison.)
Phenols, chloro- (mono-, di-, trichloro-)	Most of the values were from a study of the Rhine River in the Netherlands.
Phenol, pentachloro-	All surface-water monitoring data we surveyed were from the Netherlands or Japan. The largest concentration in WaterDROP is an order of magnitude higher than our survey data.
Propane, 1,2-dichloro-	All values are for tap waters in North America.
Toluene	It is found worldwide, but the problem concentration was for a landfill leachate in the Netherlands.

We can place most of the compounds with ratios less than 0.1 in Table 4 into two classes: phenols and their chlorinated homologs and chlorinated hydrocarbons. The compounds with ratios of 0.1 to 1.0 are also primarily chlorinated hydrocarbons and phenols. Tetrachloroethene, 1,2-dichloropropane, trichloroethene, dichloromethane, and dibromomethane are found in many of the same studies. Toluene (i.e., methylbenzene) and ethylbenzene are found in the same studies. Likewise, all chlorinated phenols are found together. We would expect the total olfactory contributions of these combinations to be greater than the single contributions.

The compounds with the greatest worldwide distributions (see Table 5) are ethylbenzene, tetrachloroethene, trichloromethane, and toluene. Of these four substances, the one with the highest screening ratio was trichloromethane, with a ratio of 4.3. It was followed by ethylbenzene (3.0), toluene (2.5), and tetrachloroethene (1.25). None of the measured concentrations is greatly above the detection thresholds, and therefore these substances may not actually cause adverse organoleptic responses. Our data on the chlorinated phenols were derived from a single study of the Rhine River; however, phenolic compounds can be expected in other similar rivers receiving industrial discharges (we will discuss the phenolic compounds again in a later section).

An important source of uncertainty in the screening for potential organoleptic effects has been the lack of adequate psychometric data on the kinds of responses expected at the contaminant concentrations presented. If the threshold concentrations we have used for screening are far below levels that would actually cause a soldier to refuse water, then none of these substances truly represents a problem. To rectify this situation, we recommend that taste panels comprised of soldiers be used to quantify the behavioral responses to varying concentrations of the organic solutes noted above.

PREDICTED ORGANIC-SOLUTE CONCENTRATION MAXIMA IN THE SURFACE WATERS OF REPRESENTATIVE FOREIGN COUNTRIES

We recognize the fact that measurement bias may play a role in the screening comparisons we performed using observed-maximum concentrations. Therefore, to compensate for such possible bias, we augmented our initial screening process with one that uses predicted concentrations of the following organic substances:

- Acenaphthene,
- Acrolein,
- Acrylonitrile,
- Chloromethane,
- Cyanide,

- 2,4-Dinitrophenol,
- Oil and grease,
- Pentachlorophenol,
- Phenol, and
- Phenol (4AAP)[a].

These are major contaminants that are likely to be present in the waste waters from 13 major industrial sources in foreign countries. The industrial sources include: (1) aluminum forming, (2) coal mining, (3) copper forming, (4) foundries, (5) iron and steel mills, (6) leather tanning, (7) metal finishing, (8) nonferrous metal production, (9) ore mining, (10) organic chemical/plastic production, (11) petroleum refining, (12) pulp and paper production, and (13) textile manufacturing.

To predict the maximum concentrations in surface water of the organic substances listed above, we used a model that combines data for (1) the annual release of each of the organic chemicals into wastestreams by the U.S. industries that are in the previously mentioned 13 industrial categories, with data for (2) the annual production of the manufactured/mined material from each of the 13 industrial categories in five representative foreign countries and in the U.S., and (3) country-specific hydrologic data. Comparison between these predicted maximum concentrations in surface water and the corresponding estimates of threshold concentrations for toxic effects (based on 70-kg military personnel consuming water at a rate up to 15 L/d) or organoleptic responses will augment the screening for the set of organic compounds that could pose a human health risk to military personnel consuming field water in foreign countries.

Our approach for estimating the concentration of an arbitrary chemical in the surface water of a given country is based on the influence diagram shown in Fig. 4. This figure is based in part on the concepts described by Mackay.[13] For our purposes, for example, the concentration of an organic compound in a river, lake, or estuary is related to (1) the amount of the compound in industrial effluents (both direct and indirect), (2) the advection (e.g., horizontal transport) properties for receiving waters, and (3) the attenuation of the organic compound's concentration in water by means of biogeochemical processes. The contribution of industrial effluents to organic-chemical pollution of surface waters is estimated by considering (1) the types of industries that release the compound into wastestreams, (2) the most prominent organic chemicals released into the wastestreams (per unit of production) by each industry, and (3) the level of output of

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[a] The designation 4AAP refers to the method of detection, which involves the reaction of phenolic compounds with 4-aminoantipyrine (i.e., 4AAP).

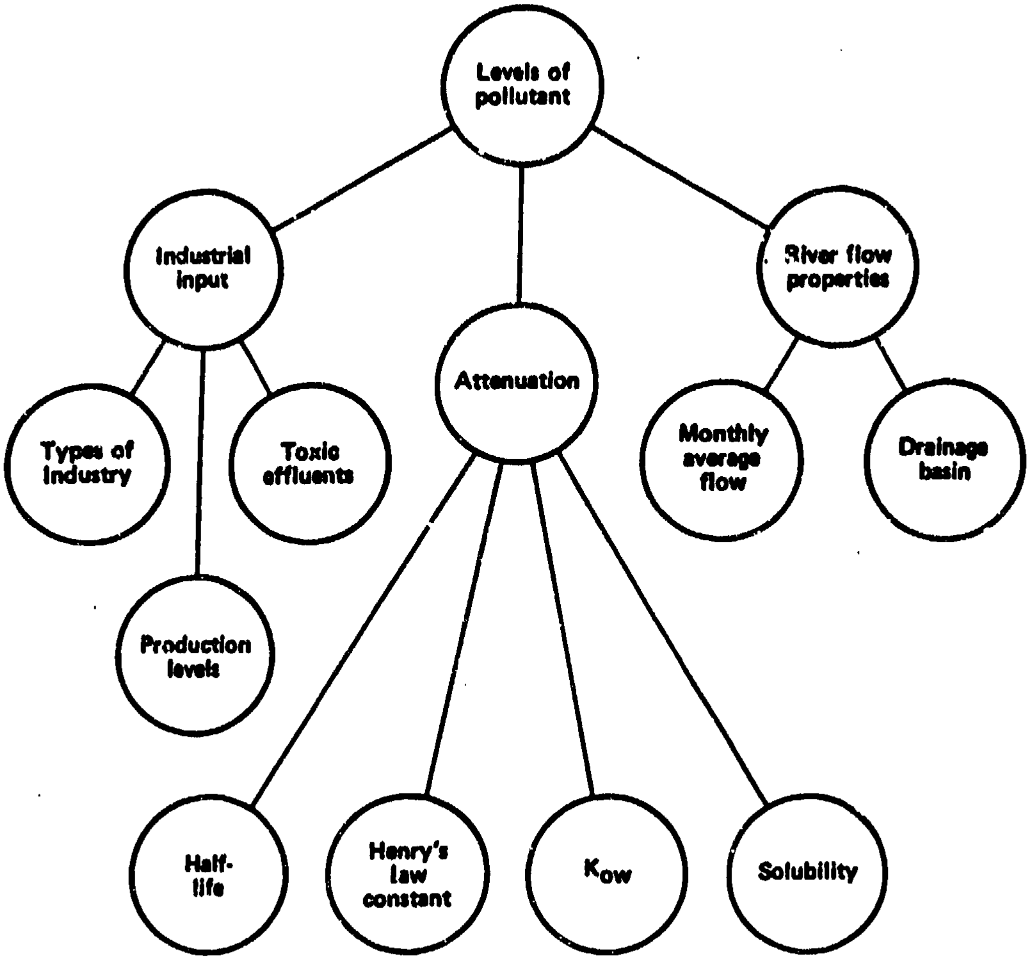

Figure 4. Influence diagram for processes that affect the concentratic a of organic solutes in surface waters.

manufactured/mined material each industry produces. The volume of surface water available for diluting the released organic chemicals is determined using river-flow properties (e.g., average-flow volume monthly). The physicochemical properties of the organic compounds released provide information on the potential attenuation of concentration by chemical decay (biodegradation, photolysis, hydrolysis, oxidation, and volatilization), sorption by sediments, and uptake by biomass. However, in order to simplify our calculation and provide a conservative upper bound for our concentration estimate, attenuation as a result of these chemical processes was excluded from our model. Dilution by advection within the water system, however, was included in the model. Figure 5 provides an illustration of a national water system as it is viewed for the purposes of this model.

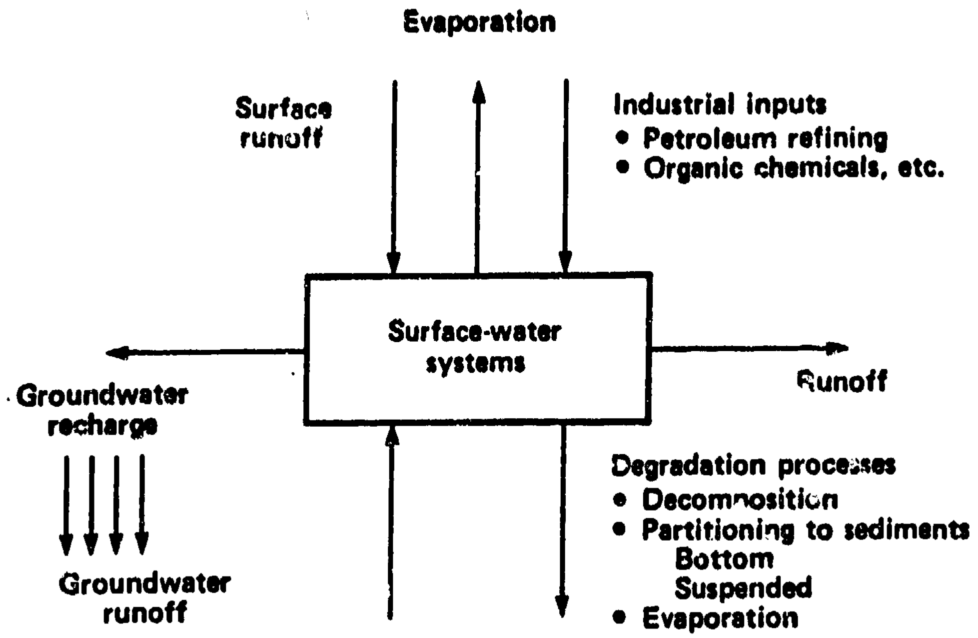

Figure 5. A schematic view of a national water system for use in screening organic solutes likely to be at potentially toxic levels.

The screening methodology was applied to each of the five representative countries according to the following mathematical expression:

$$C_{i,m} = \frac{1}{R_m} \sum_{j=1}^{n} F_{i,j} \cdot P_{j,m},$$

where

$C_{i,m}$ = the concentration of chemical compound, i (g/L), in the surface waters of country, m;

R_m = the discharge of the major rivers (L/y) in country, m, that are likely to be receiving industrial wastestreams;

$F_{i,j}$ = the amount of chemical, i (g/y), contained in the raw-effluent wastestream generated annually by industry, j, in the U.S. (The choice of raw-effluent wastestream instead of treated-effluent wastestream tends to provide added conservatism to this figure; this assumption also is realistic for most developing countries); and

$P_{j,m}$ = the ratio between the annual manufacturing output produced nationally for industry, j, in country, m, and the same production-output value for industry, j, in the U.S. We define this ratio as the production-output factor (dimensionless) for industry, j, in country, m.

Statistics compiled by the United Nations[14] concerning the annual manufacturing output produced nationally in a particular country by a specific industrial category were used to derive the production-output factor ($P_{j,m}$). Data on the amounts of the organic chemicals of interest contained in the raw-effluent wastestreams generated annually by an industry category in the U.S. (i.e., $F_{i,j}$) were obtained from a U.S. EPA-sponsored study concerning the discharges of 86 organic contaminants released from 24 industries in the U.S.[15] The surface-water volume available in each country (R_m) for dilution of the organic chemicals contained in the raw-effluent wastestreams generated annually by the combination of all 13 industrial categories was obtained from a reference work edited by van der Leeden[16]; these figures correspond to the volumes of major surface-water systems in each country that are likely to receive industrial wastestreams, and therefore they are not necessarily equal to the total surface runoff in each country.

Once the estimated concentration of a specific organic chemical is calculated for a particular representative country ($C_{i,m}$), based on the industrial mix and the receiving-water flow, the chemicals are ranked for each country, using the screening-criteria formula:

$$S_{i,m} = \frac{C_{i,m}}{T_i} \quad ,$$

where

$S_{i,m}$ = screening-criteria ratio (dimensionless) for chemical, i, in country, m,

$C_{i,m}$ = concentration of chemical compound, i (mg/L), in the surface waters of country, m, and

T_i = an estimate of the threshold concentration (mg/L) in water of chemical, i, for toxicity or organoleptic effects, based on 70-kg military personnel consuming water at a consumption rate of up to 15 L/d.

Table 6. Production-output factors[a] for estimating source terms from the 13 industrial/mining categories that we consider to be major sources of organic-chemical pollution in foreign countries.

	Country				
Industry	Egypt	Iran	Israel	Thailand	Turkey
	Production factors				
Aluminum forming	2.00E-03	1.60E-03	0	0	8.30E-03
Coal mining	0	1.60E-03	0	9.80E-04	7.50E-03
Copper forming	0	0	0	0	1.10E-02
Foundries	7.20E-03	8.13E-05	8.10E-04	2.60E-03	1.50E-02
Iron and steel	7.50E-03	0	9.90E-04	3.20E-03	1.70E-02
Leather tanning	0	4.50E-02	0	0	1.10E-01
Metal finishing	1.80E-02	3.80E-02	3.90E-03	2.80E-03	2.60E-02
Nonferrous metals	0	0	0	0	4.30E-03
Ore mining	1.40E-02	7.20E-03	1.60E-05	1.30E-03	4.50E-02
Organics/plastics	4.90E-04	4.70E-05	1.30E-03	3.90E-06	5.80E-03
Petroleum refining	1.80E-02	3.40E-02	1.40E-02	1.10E-02	2.00E-02
Pulp and paper	1.20E-03	7.80E-04	1.10E-03	4.60E-03	6.80E-03
Textiles	0	2.60E-02	0	1.50E-01	4.00E-02

[a] Production-output factors are calculated by dividing the annual manufacturing or mining output from an industrial/mining category for a foreign country by the same value for the equivalent industrial/mining category in the U.S. The amount of organic-chemical pollutant contained in the raw-effluent wastestreams for all 13 industrial/mining categories in a foreign country is then the sum of the product of the production-output factor and the amount of organic-chemical pollutant in the raw-effluent wastestreams generated by each industrial/mining category in the U.S.

Application of the Model to Five Representative Countries

The model described above was applied to the following countries: Egypt, Iran, Israel, Thailand, and Turkey. These countries were selected because they possess the wide range of industrial and climatic conditions that are most likely to be encountered in foreign countries. Table 6 lists the production-output factors for the thirteen industrial categories that we used to scale the level of organic-chemical pollutant contained in the raw-effluent wastestreams generated by these industries in the five foreign countries just mentioned. Table 7 lists the amounts of the pollutants contained in the raw-effluent wastestreams generated annually in the U.S. by each of the 13 industrial categories. Table 8 presents the average and low-dilution volumes provided annually by major rivers

Table 7. U.S. production of organic by-products in g/y for each industrial category.

Industry	Organic Substances									
	Acenaphthene	Acrolein	Acrylonitrile	Chloromethane	Cyanide	2,4-Dinitrophenol	Oil and grease	Pentachlorophenol	Phenol	Phenol (4AAP)[a]
Aluminum forming					1.16E+06		8.58E+08		8.65E+05	
Coal mining					2.66E+06					8.87E+07
Copper forming					2.80E+06		4.59E+11			2.13E+08
Foundries	1.43E+07					1.10E+06	3.13E+10	1.14E+07	2.55E+09	3.44E+09
Iron and steel			5.46E+07				2.93E+11	6.00E+06	1.80E+10	1.39E+10
Leather tanning	7.43E+05				2.39E+06		1.98E+10	6.01E+06	1.60E+08	
Metal finishing					1.43E+10		1.42E+11			
Nonferrous metals	2.25E+07				1.21E+08		1.17E+09		2.51E+08	2.52E+08
Ore mining					6.67E+07					5.66E+06
Organics/plastics	5.24E+09	1.04E+10	6.89E+09	1.87E+08	1.79E+09	5.45E+07		7.85E+06	1.77E+10	
Petroleum refining	8.14E+07	3.02E+05			8.41E+07	4.60E+08	6.49E+10	9.48E+05	5.90E+08	9.70E+09
Pulp and paper								4.87E+07	2.12E+08	
Textiles			1.85E+07		1.37E+07		3.73E+10	1.26E+07	2.01E+07	

[a] The designation 4AAP refers to the method of detection, which involves the reaction of phenolic compounds with 4-aminoantipyrine (i.e., 4AAP).

Table 8. Annual average and low dilution volumes provided by major rivers in each of the candidate countries.

Country	Dilution volume[a] (L/y) Low	Average
Egypt	2.21E+13	8.20E+13
Iran	3.15E+11	9.46E+12
Israel	9.10E+10	1.96E+12
Thailand	5.20E+13	2.90E+14
Turkey	1.40E+13	4.00E+13

[a] The low dilution volume was calculated by multiplying the lowest monthly flow by 12.

Table 9. Annual mass discharges of the major organic contaminants released into the raw-effluent wastestreams of all 13 industrial/mining categories in each of five representative countries.

	Country				
Contaminant	Egypt	Iran	Israel	Thailand	Turkey
	Mass discharged, kg/y				
Acenaphthene	4.13E+06	3.05E+06	7.96E+06	9.53E+05	3.24E+07
Acrolein	5.08E+06	4.97E+05	1.35E+07	4.37E+04	6.01E+07
Acrylonitrile	3.79E+06	8.06E+05	9.02E+06	2.98E+06	4.16E+07
Chloromethane	9.14E+04	8.77E+03	2.43E+05	7.28E+02	1.08E+06
Cyanide	2.61E+08	5.47E+08	5.92E+07	4.31E+07	3.88E+08
2,4-Dinitrophenol	8.32E+06	1.57E+07	6.52E+06	5.07E+06	9.54E+06
Oil and grease	6.15E+09	9.48E+09	1.78E+09	7.73E+09	1.92E+10
Pentachlorophenol	2.07E+05	6.68E+05	9.22E+04	2.17E+06	1.83E+06
Phenol	1.72E+08	2.90E+07	5.13E+07	7.46E+07	4.79E+08
Phenol (4AAP)[a]	3.04E+08	3.30E+08	1.52E+08	1.60E+08	4.86E+08

[a] Phenol (4AAP) includes soluble phenolic compounds.

in each of the five representative countries. Table 9 contains the estimated total amount of each of the organic-chemical pollutants generated in each country from the combination of all 13 industrial categories. An estimate of the maximum and mean concentrations for each of the pollutants of interest in the surface waters of each of the five representative countries are presented in Table 10. Finally, Table 11 contains the values representing toxicity or organoleptic threshold concentrations (T_i) and screening-criteria ratios ($S_{i,m}$) for each of the organic chemicals of interest.

According to the screening-criteria ratios presented in Table 11, dissolved oil and grease is of potential concern in virtually all foreign countries. The screening-criteria value for oil and grease was computed using the Soviet taste/odor standard of 0.1 mg/L for crude oil (high sulfur) and kerosene reported by Bedding *et al.*[18] The importance of oil and grease is not surprising because oil and grease are major components of many industrial effluents prior to wastewater treatment. We were able to obtain some water-quality data that corroborate this prediction from our screening. For example, Moursy[19] measured concentrations of oil and grease in the Nile River that were typically between 1 and 30 mg/L. The highest of these concentrations were recorded near the major industrialized areas along the river. In another study Cordero *et al.*[20] sampled water from the Bermudez River in Costa Rica at three separate locations and measured oil and grease levels ranging from approximately 30 to 50 mg/L. This river also received effluents from various industrial sources.

In addition to oil and grease posing potential problems for military personnel from an organoleptic standpoint, these hydrocarbons can interfere with the operation of the Reverse Osmosis Water Purification Unit (ROWPU). Specifically, oil and grease can create a film on the reverse osmosis membrane and thus decrease its ability to desalinate water.

The other organic chemicals of potentially greatest concern to U.S. military personnel in foreign countries are the phenolic compounds detected by their reaction with 4-aminoantipyrine (i.e., 4AAP). The screening-criteria values are all greater than one for this class of organic compounds for each of the five representative countries. These phenolic compounds are not a problem in drinking water from a toxicological standpoint because the WHO limit for 2,4,6-trichlorophenol is an organoleptic limit.

Generally, Israel is the country predicted to have the highest concentrations in their surface waters (see Table 10) of the organic chemicals of interest. However, the predicted concentrations that appear in Table 10 are very conservative because we have assumed that there is no pretreatment (e.g., chlorination) of raw-effluent wastestreams, and we have used the low-dilution volumes for receiving waters.

Table 10. The estimated maximum[a] and mean concentrations of each of the major organic chemicals in the surface waters of each of five representative countries.

	Country									
	Egypt		Iran		Israel		Thailand		Turkey	
	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean
Contaminant	Concentration (mg/L)									
Acenaphthene	1.87E-04	5.04E-05	9.67E-03	3.22E-04	8.76E-02	4.06E-03	1.83E-05	3.29E-06	2.31E-03	8.10E-04
Acrolein	2.30E-04	6.19E-05	1.58E-03	5.25E-05	1.48E-01	6.87E-03	8.40E-07	1.51E-07	4.29E-03	1.50E-03
Acrylonitrile	1.71E-04	4.62E-05	2.55E-03	8.52E-05	9.93E-02	4.60E-03	5.73E-05	1.03E-05	2.97E-03	1.04E-03
Chloromethane	4.14E-06	1.11E-06	2.78E-05	9.27E-07	2.67E-03	1.24E-04	1.40E-08	2.51E-09	7.73E-05	2.70E-05
Cyanide	1.18E-02	3.18E-03	1.73E+00	5.78E-02	6.52E-01	3.02E-02	8.29E-04	1.49E-04	2.77E-02	9.70E-03
2,4-Dinitrophenol	3.77E-04	1.01E-04	4.96E-02	1.66E-03	7.18E-02	3.33E-03	9.75E-05	1.75E-05	6.82E-04	2.39E-04
Oil and grease	2.78E-01	7.50E-02	3.00E+01	1.00E+00	1.96E+01	9.07E-01	1.49E-01	2.66E-02	1.37E+00	4.79E-01
Pentachlorophenol	9.35E-06	2.52E-06	2.12E-03	7.06E-05	1.02E-03	4.71E-05	4.17E-05	7.47E-06	1.31E-04	4.58E-05
Phenol	7.81E-03	2.10E-03	9.18E-02	3.06E-03	5.65E-01	2.62E-02	1.43E-03	2.57E-04	3.42E-02	1.20E-02
Phenol (4AAP)[b]	1.37E-02	3.70E-03	1.05E+00	3.49E-02	1.68E+00	7.77E-02	3.08E-03	5.52E-04	3.47E-02	1.21E-02

[a] The maximum concentration is calculated from a dilution volume by multiplying the lowest monthly flow volume by 12. The mean is calculated from annual average flows.

[b] Phenol (4AAP) includes soluble phenolic compounds.

Table 11. Toxicity- or organoleptic-threshold concentrations in water (T_i, based on 70-kg military personnel consuming up to 15 L/d of drinking water) and screening-criteria ratios ($S_{i,m}$, calculated by dividing the estimated maximum concentration in the water of a particular country, $C_{i,m}$, by T_i) for each of the major organic chemicals (i) in each of five representative countries (m).

Contaminant	Screening concentration (mg/L)	Country				
		Egypt	Iran	Israel	Thailand	Turkey
		Concentration ratios				
Acenaphthene	2.00E-02[a]	9.35E-03	4.83E-01	4.38E+00	9.17E-04	1.16E-01
Acrolein	3.20E-01[a]	7.18E-04	4.92E-03	4.63E-01	2.63E-06	1.34E-02
Acrylonitrile	2.00E+00[a]	8.57E-05	1.28E-03	4.96E-02	2.87E-05	1.49E-03
Chloromethane	2.00E-03[a]	2.07E-03	1.39E-02	1.34E+00	7.00E-06	3.86E-02
Cyanide	2.00E+00[b]	5.90E-03	8.65E-01	3.26E-01	4.14E-04	1.38E-02
2,4-Dinitrophenol	3.00E-02[a]	1.26E-02	1.65E+00	2.39E+00	3.25E-03	2.27E-02
Oil and grease	1.00E-01[c]	2.78E+00	3.00E+02	1.96E+02	1.49E+00	1.37E+01
Pentachlorophenol	5.00E-03[d]	1.87E-03	4.24E-01	2.04E-01	8.34E-03	2.62E-02
Phenol	3.50E+00[a]	2.23E-03	3.62E-02	1.61E-01	4.10E-04	9.77E-03
Phenol (4AAP)[e]	1.00E-04[f]	1.38E+02	1.04E+04	1.68E+04	3.08E+01	3.47E+02

[a] Lowest health standard or guideline (see Appendix A).

[b] Interim value recommended by Scofield *et al.* for field-water supplies.[17]

[c] Taste/odor standards of USSR for oil and kerosene.[18]

[d] Value calculated from oral LD50 (see Table 2).

[e] Phenol (4AAP) includes soluble phenolic compounds.

[f] WHO limit for 2,4,6-trichlorophenol (see Appendix A).

BIOCHEMICAL COMPOUNDS RELEASED BY ALGAE AND ASSOCIATED MICROORGANISMS

The ubiquitous aquatic microorganisms, cyanobacteria (blue-green algae) and actinomycetes (Gram-positive filamentous bacteria that grow in close association with cyanobacteria), have been identified as the source of taste- and odor-producing biochemical compounds in surface waters, particularly drinking-water reservoirs (Krasner *et al.*, 1981).[21] Furthermore, there is even circumstantial evidence suggesting that a causal relationship exists between otherwise unexplainable outbreaks of adverse health effects in human populations and the presence of toxic biochemicals released by cyanobacteria into public drinking-water supplies.[22-27] Therefore, in addition to the organic chemicals previously discussed, we also assessed the significance of these natural organic compounds from the perspective of military field-water quality.

Our assessment revealed that there are two taste- and odor-causing metabolites of cyanobacteria and actinomycetes--geosmin and 2-methylisoborneol (MIB)--that can be of military concern in field water, especially when algal blooms are present. There are two reasons that justify this conclusion. First, these metabolites can occur in field water at concentrations above organoleptic thresholds. For example, according to a survey cited by Zoeteman (1981)[28] comparing the maximum concentration measured in drinking water of taste-impairing substances with their odor-threshold concentration (defined as the concentration at which 50% of the subjects can detect the odor of the substance), the ratios of maximum concentration to odor-threshold concentration were among the greatest for geosmin and MIB (i.e., 1.5 = 0.03 µg/L of water/0.02 µg/L of water). Second, these biologically released substances resist oxidation and therefore are difficult to remove by standard water-treatment processes such as chlorination (Krasner et al., 1981).[21] Consequently, military personnel exposed to field water containing maximum concentrations of geosmin and MIB may refuse to consume such water based on objectionable organoletpic properties (i.e., taste and odor) and therefore can become susceptible to the performance-degrading health effects associated with dehydration. Moreover, chlorination, which is the water-treatment technique most commonly available in the field, normally is ineffective in destroying these compounds.

Another group of biochemicals that may be of military concern are the alkaloid, lipopolysaccharide, and polypeptide metabolites that are released by cyanobacteria. These natural organic substances have been associated with the death of animals, especially cattle, and are implicated as being toxic to man (Carmichael, 1981).[29] Consequently, the potential for performance-degrading effects from human exposure to these substances should be evaluated further.

SUMMARY AND RECOMMENDATIONS

Our screening effort has addressed substances that could potentially cause toxic or organoleptic effects in troops that drink field water. To minimize the omission of substances that might adversely affect troops, we made conservative assumptions for screening for those organic chemicals that could be present in field water at concentrations that could produce organoleptic effects or toxicity in military personnel forced to consume up to 15 L/d of field water. Moreover, we assumed that no treatment would occur prior to water consumption. From our comparison between reported maximum-observed concentrations and threshold concentrations for toxicity (based on a 15-L/d consumption rate for a 70-kg individual), we conclude that there is a very low probability that organic solutes in field water will cause direct, debilitating effects in troops. However, this assumes that troops follow existing doctrine regarding the placement of water-supply points. Siting a water point directly below a sewage outfall on a stream or river, for example, greatly enhances the risk of health effects. Likewise, the use of a well that is in the immediate vicinity of actual or possible surface industrial contamination poses an increased health risk. Avoiding these obvious situations is a key precaution in the management of health risks from all contaminants of field water.

We have identified several compounds that have the potential for causing organoleptic effects (e.g., objectionable taste or odor). Among the most important compounds in this group are trichloromethane, ethylbenzene, toluene, and tetrachloroethene because they have the greatest worldwide distribution. In addition, chlorinated phenols, as well as oil and grease, could impair the potability of field water. Our screening for organoleptic effects, however, utilized concentrations for taste- and odor-detection thresholds instead of concentrations related to a behavioral response, such as refusal to drink poor-tasting water. We therefore recommend that taste panels comprised of groups of soldiers be used to quantify the relationship between the concentrations of these substances, an organoleptic property, and various behavioral responses (see, for example, Daniels and Layton, 1988[30]). This research could provide a data base that would support a more definitive analysis for determining the organic chemicals likely to impair the potability of field water. An important issue that has emerged is the effect that oil and grease could have on the operation of a ROWPU. Studies are needed to determine the concentrations of oil and grease that could impair the efficiency of reverse osmosis membranes.

Finally, we indicate that compounds released into water by the aquatic microorganisms, cyanobacteria and actinomycetes, can also be of particular military concern. These substances fall into two categories: (1) those that impair the taste and odor of drinking water and (2) those that could produce toxic health effects following ingestion or nonconsumptive exposure. Geosmin and MIB fall into the first category and alkaloid, lipopolysaccharide, and polypeptide toxins belong to the second one. Because of the potential for algal blooms in surface waters, we recommend that available data on the organoleptic and toxic properties of these metabolites be evaluated carefully so that consideration can be given to developing criteria and recommendations for their standards in field water.

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APPENDIX A

HEALTH STANDARDS AND GUIDELINES FOR ORGANIC WATER CONTAMINANTS

As a starting point for our screening analyses of organic contaminants that could pose health problems, we compiled relevant health standards and guidelines developed by domestic as well as foreign organizations. Table A-1 summarizes the results of our regulatory review. Included in the table are short-term (approximately 10 d or less) and long-term (chronic exposure) standards. For example, a 7-d standard is expressed as 7d, followed by a slash and the standard in mg/L (e.g., 7d/0.03). We have also listed substances that have been identified as hazardous by different organizations. For a number of substances we calculated an equivalent drinking-water concentration from Acceptable Daily Intakes (ADIs).

Table A-1. Regulatory status of organic compounds (excluding pesticides).

CASID	Substance	Formula	EPA PP	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	WQS tox	Other
				mg/l						
83329	acenaphthene	$C_{12}H_{10}$	x						0.02	
208968	acenaphthylene	$C_{12}H_8$	x							
141786	acetic acid, ethyl ester	$C_4H_8O_2$				0.04375				
79209	acetic acid, methyl ester	$C_3H_6O_2$						0.1		
108054	acetic acid, vinyl ester	$C_4H_6O_2$						0.2		
98862	acetophenone	C_8H_8O						0.1		
107028	acrolein	C_3H_4O	x						0.32	
79061	acrylamide	C_3H_5NO						0.1		
79107	acrylic acid	$C_3H_4O_2$						0.5		
107131	acrylonitrile	C_3H_3N	x					2.0		car
111693	adiponitrile	$C_6H_8N_2$						0.1		
62533	aniline	C_6H_7N						0.1		
108429	aniline, m-chloro-	C_6H_6ClN						0.2		
99092	aniline, m-nitro-	$C_6H_6N_2O_2$								haz
88744	aniline, o-nitro-	$C_6H_6N_2O_2$								haz
106478	aniline, p-chloro-	C_6H_6ClN						0.2		haz
100016	aniline, p-nitro-	$C_6H_6N_2O_2$								haz
100663	anisole	C_7H_8O						0.05		
71432	benzene	C_6H_6	x	10d/0.23	7d/12.6		0.01	0.5		
108907	benzene, chloro-	C_6H_5Cl	x				0.003	0.02	0.02	
100414	benzene, ethyl-	C_8H_{10}	x						1.4	
118741	benzene, hexachloro-	C_6Cl_6	x			0.035	0.00001	0.05		car
98953	benzene, nitro-	$C_6H_5NO_2$	x						0.03	
577559	benzene, o-diisopropyl-	$C_{12}H_{18}$						0.05		
608935	benzene, pentachloro-	C_6HCl_5							0.074	
121733	benzene, 1-chloro-3-nitro-	$C_6H_4ClNO_2$						0.05		
100005	benzene, 1-chloro-4-nitro-	$C_6H_4ClNO_2$						0.05		
95501	benzene, 1,2-dichloro-	$C_6H_4Cl_2$	x				0.0003		0.4	
95943	benzene, 1,2,4,5-tetrachloro-	$C_6H_2Cl_4$						0.01	0.038	
541731	benzene, 1,3-dichloro-	$C_6H_4Cl_2$	x						0.4	
106467	benzene, 1,4-dichloro-	$C_6H_4Cl_2$	x			0.47	0.0001		0.14	
92875	benzidine	$C_{12}H_{12}N_2$	x							car
91941	benzidine, 3,3'-dichloro-	$C_{12}H_{10}Cl_2N_2$	x							
56553	benzo[a]anthracene	$C_{18}H_{12}$	x							
50328	benzo[a]pyrene	$C_{22}H_{12}$	x	10d/0.025			0.00001			car
205992	benzo[b]fluoranthene	$C_{20}H_{12}$	x							
191242	benzo[ghi]perylene	$C_{22}H_{12}$	x							
207089	benzo[k]fluoranthene	$C_{20}H_{12}$	x							
92524	biphenyl	$C_{12}H_{10}$				2.1			15.	
23184669	butachlor	$C_{17}H_{26}ClNO_2$				0.35				
87683	butadiene, hexachloro-	C_4Cl_6	x							car
78933	butan-2-one	C_4H_8O		1d/7.5						haz

Table A-1. (Continued).

CASID	Substance	Formula	EPA pp	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	WQS tox	Other
				mg/l						
218019	chrysene	C18H12	x							
59507	cresol-m, p-chloro-	C7H7C10	x						3.	
7	cresol-m, 6-chloro-	C7H7C10							0.02	
6	cresol-o, 4-chloro-	C7H7C10							1.8	
1321104	cresol, chloro-	C7H7C10							0.02	
534521	cresol, 4,6-dinitro-	C7H6N205	x						0.0134	
21	crotonitrile	C4H5N						0.1		
98828	cumene	C9H12						0.5		
110827	cyclohexane	C6H12						0.1		
37	cyclohexane, nitro-	C6H5N02						0.1		
108930	cyclohexanol	C6H120						0.5		
100641	cyclohexanone oxime	C6H11NO						0.1		
110838	cyclohexene	C6H10						0.02		
77474	cyclopentadiene, hexachloro-	C5HC16	x						0.001	
621647	di-n-propylnitrosamine	C6H14N20	x							
132649	dibenzofuran	C12H80								haz
53703	dibenzo[a,h]anthracene	C22H14	x							
77587	dibutyl tin dilaurate	C32H6404Sn						0.1		
34	dichlorohydrin	C3H6C12						0 .01		
31	diethyl ether maleate							1.		
32	diethyl tin dicaprylate	C16H320						0.01		
109897	diethylamine	C4H11N						2.0		
55185	diethylamine, N-nitroso-	C4H10N20							0.0000008	car
111466	diethylene glycol	C4H1003						1.		
108189	diisopropylamine	C6H15N						0.5		
33	dimethyl phenyl carbinol	C9H120						0.05		
124403	dimethylamine	C2H7N						0.1		
62759	dimethylnitrosamine	C26.20	x						0.0000014	car
25136554	dioxane, dimethyl-	C6H1202						0.005		
1746016	dioxin	C12H4C1402	x							
86306	diphenylamine, N-nitroso-	C12H10N20								car
86306	diphenylnitrosamine	C6H10N20	x						0.0049	
75003	ethane, chloro-	C2H5C1	x				0.003			
67721	ethane, hexachloro-	C2C16	x							car
75343	ethane, 1,1-dichloro-	C2H4C12	x							
71556	ethane, 1,1,1-trichloro-	C2H3C13	x	c/1.0	1d/0.49 10d/0.07				18.4	
79005	ethane, 1,1,2-trichloro-	C2H3C13	x							car
79345	ethane, 1,1,2,2-tetrachloro-	C2H2C14	x							car
107062	ethane, 1,2-dichloro-	C2H4C12	x				0.01			car
75014	ethene, chloro- (vinyl chloride)	C2H3C1	x							
127184	ethene, tetrachloro-	C2C14	x	1d/2.3 10d/0.175 c/0.02	1d/.172 7d/0.024		0.01			car

Table A-1. (Continued).

CASID	Substance	Formula	EPA PP	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	wqs tox	Other
				mg/l						
79016	ethene, trichloro-	C2HC13	x	1d/2. 10d/0.2 c/0.075	1d/0.105 7d/0.015		0.03			car
75354	ethene, 1,1-dichloro-	C2H2C12	x	1d/1.0 c/0.07			0.0003			car
540590	ethene, 1,1-dichloro- (trans)	C2H2C12	x	1d/2.7 10d/0.27						
542881	ether, bis(chloromethyl)-	C2H4C12O	x							
111444	ether, bis(2-chloroethyl)-	C4H8C12O	x							car
108601	ether, bis(2-chloroisopropyl)-	C6H12C12O	x						0.0347	car
101553	ether, 4-bromophenyl phenyl-	C12H12BrO	x							
7005723	ether, 4-chlorophenyl phenyl-	C12H12C1O	x							
107211	ethylene glycol	C2H6O2			1d/19. c/5.					
206440	fluoranthene	C16H10	x						0.04	
86737	fluorene	C13H10	x							
50000	formaldehyde	CH2O		1d/0.03				0.5		
68247961	fuel oil #2	C7H7		1d/0.1 10d/0.1						
110009	furan	C4H4O						0.2		
543497	heptan-2-ol	C7H16O						0.005		
111706	heptyl alcohol	C7H16O						0.005		
319868	hexachlorocyclohexane, delta-	C6H6C16	x							
319846	hexachlorocyclohexane, alpha-	C6H6C16	x							car
319857	hexachlorocyclohexane, beta-	C6H6C16	x							car
70304	hexachlorophene	C13H6C16O2				0.035				
124094	hexamethylenediamine	C6H16N2						0.01		
100970	hexamethylenetetramine	C6H12N4						0.5		
519786	hexan-2-one	C7H14O								
25056706	hexanate	C10H6C16O3						5.0		haz
110543	hexane	C6H14		1d/13.						
302012	hydrazine	H4N2						0.01		
100630	hydrazine, phenyl-	C6H8N2						0.01		
122667	hydrazine, 1,2-diphenyl-	C12H12N2	x							
193395	indeno[1,2,3-cd]pyrene	C22H12	x							
35	isocrotonitrile	C4H5N						0.1		
78591	isophorone	C9H14O	x						5.2	
75310	isopropylamine	C3H9N						2.0		
143500	kepone	C10C110O				3.5				
8008206	kerosene	C10-C16 HCS		1d/0.1 10d/0.1						

Table A-1. (Continued).

CASID	Substance	Formula	EPA pp	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	wqs tox	Other
				mg/l						
75865	lactonitrile, 2-methyl-	C4H7NO						0.001		
107277	mercury, chloroethyl-	C2H5ClHg						0.0001		
627441	mercury, diethyl-	C4H10Hg						0.0001		
80626	methacrylic acid, methyl ester	C5H8O2				3.5				
111911	methane, bis(2-chloroethoxy)-	C5H10Cl2O2	x							
74839	methane, bromo-	CH3Br	x						0.002	
75274	methane, bromodichloro-	CHBrCl2	x							car
74873	methane, chloro-	CH3Cl	x						0.002	car
124481	methane, dibromochloro-	CHBr2Cl	x		1d/18.					car
75092	methane, dichloro-	CH2Cl2	x	1d/13	1d/35. 10d/1.3 c/0.15	7d/5.				car
75718	methane, dichlorodifluoro-	CCl2F2	x	1d/13.	1d/350. 7d/5.6				3.	car
56235	methane, tetrachloro-	CCl4	x	1d/0.2 10d/0.02	1d/14. 7d/2.		0.003	0.3		car
75252	methane, tribromo-	CHBr3	x							
67663	methane, trichloro-	CHCl3	x		1d/22.		0.03			car
75694	methane, trichlorofluoro-	CCl3F	x		1d/80. 7d/8.				3.2	car
74895	methylamine	CH5N						1.		
36	methylol m-acrylamide							0.1		
90153	naphth-1-ol	C10H8O						0.01		
135193	naphth-2-ol	C10H8O						0.4		
91203	naphthalene	C10H8	x						0.143	
1335871	naphthalene, hexachloro-	C10H2Cl6							0.00015	
2234131	naphthalene, octachloro-	C8Cl8							0.00008	
1321648	naphthalene, pentachloro-	C10H3Cl5							0.0039	
42	naphthalene, tetrachloro-	C10H4Cl4							0.0015	
1321659	naphthalene, trichloro-	C10H5Cl3							0.0039	
91587	naphthalene, 2-chloro-	C10H7Cl	x							
91576	naphthalene, 2-methyl-	C11H10								haz
117806	naphtho-1,4-quinone, 2,3-dichlo	C10H4Cl2O2						0.25		
924613	nitrosodi-n-butylamine	C8H18N2O							0.000006	car
143088	nonyl alcohol	C9H20O						0.01		
789026	op'-ddt	C14H9Cl5	x							
105113	p-benzoquinone dioxime	C6H6N2O2						0.1		
123911	p-dioxane	C4H8O2		1d/5.7 10d/0.57						
106503	p-phenylenediamine	C6H8N2						0.1		
11097691	pcb (aroclor 1254)	C12H5Cl5 (?)	x							
11104282	pcb (aroclor 1221)	C12H9Cl (?)	x							
11141165	pcb (aroclor 1232)	C12H7Cl3 (?)	x							
53469219	pcb (aroclor 1242)	C12H7Cl3 (?)	x							
12672296	pcb (aroclor 1248)	C12H6Cl4 (?)	x							
11096825	pcb (aroclor 1260)	C12H4Cl6 (?)	x							

Table A-1. (Continued).

CASID	Substance	Formula	EPA pp	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	wqs tox	Other
				mg/l						
136254	pentanate	C11H9Cl5O3						2.5		
050108	phenanthrene	C14H10	x							
108952	phenol	C6H6O	x						3.5	
108430	phenol, m-chloro-	C6H5ClO						0.06	0.0001	
554847	phenol, m-nitro-	C6H5NO3						0.06		
100027	phenol, p-nitro-	C6H5NO3	x					0.02		
87865	phenol, pentachloro-	C6HCl5O	x							
95578	phenol, 2-chloro-	C6H5ClO	x						0.0001	
95487	phenol, 2-methyl-	C7H8O								haz
88755	phenol, 2-nitro	C6H5NO3	x					0.06		
4	phenol, 2,3-dichloro-	C6H4Cl2O							0.00004	
58902	phenol, 2,3,4,6-tetrachloro-	C6H2Cl4O							1.6	
120832	phenol, 2,4-dichloro-	C6H4Cl2O	x						0.0003	
105679	phenol, 2,4-dimethyl-	C8H10O	x						0.004	
51285	phenol, 2,4-dinitro-	C6H4N2O5	x					0.03	0.07	
95954	phenol, 2,4,5-trichloro-	C6H3Cl3O							0.01	haz
88062	phenol, 2,4,6-trichloro-	C6H3Cl3O	x				0.0001		0.1	car
3	phenol, 2,5-dichloro-	C6H4Cl2O							0.0005	
87656	phenol, 2,6-dichloro-	C6H4Cl2O							0.0002	
2	phenol, 3,4-dichloro-	C6H4Cl2O							0.0003	
106489	phenol, 4-chloro-	C6H5ClO							0.0001	
117817	phthalate, bis (2-ethylhexyl)	C24H4O4	x			21.			15.	
85687	phthalate, butyl benzyl	C18H2O04	x							
84742	phthalate, di-n-butyl	C19H21O4	x						34.	
117840	phthalate, di-n-octyl	C24H4O4	x							
84662	phthalate, diethyl	C12H14O4	x						350.	
131113	phthalate, dimethyl	C10H10O4	x						313.	
109068	picol-2-ine	C6H7N						0.05		
88891	picric acid	C6H3N3O7							0.01	
1336363	polychlorinated biphenyls	C12H?Cl?	x	1d/0.125 10d/0.025	1d/0.35 7d/0.05					
25267156	polychloropinene	C10H10Cl8						0.2		
40	propane, chlorotrifluoro-	C3H4ClF3						0.1		
106898	propane, 1-chloro-2,3-epoxy-	C3H5ClO			1d/0.84 7d/0.53					
78875	propane, 1,2-dichloro-	C3H6Cl2	x						0.2	
542756	propene, 1,3-dichloro-	C3H4Cl2							0.087	

Table A-1. (Continued).

CASID	Substance	Formula	EPA pp	EPA advis*	NAS snarl*	NAS adi	WHO std	Soviet std	wqs tox	Other
				mg/l						
129000	pyrene	C16H10	x							
110861	pyridine	C5H5N						0.2		
17	pyridine, 2,5-dimethyl-	C7H9N						0.05		
120809	pyrocatechol	C6H6O2			1d/2.2					
121824	rdx (hexogen or cyclonite)	C3H6N6O6						0.1		
108463	resorcinol	C6H6O2			1d/11.7 7d/0.5					
39	sodium adipate	C6H8O4Na2						1.		
683181	stannane, dibutyldichloro-	C8H18Cl2Sn						0.002		
597648	stannane, tetraethyl-	C8H20Sn						0.0002		
100425	styrene	C8H8				4.66				
108883	toluene	C7H8	x	1d/21.5 10d/2.2 c/0.34					14.3	
99990	toluene, p-nitro-	C7H7NO2				0.044				
121142	toluene, 2,4-dinitro-	C7H6N2O4	x							car
606202	toluene, 2,6-dinitro-	C7H6N2O4	x							
5103719	trans-chlordane	C10H6Cl8	x							
121448	triethylamine	C6H15N						2.		
1330207	xylene	C8H10		1d/12. 10d/1.4 c/0.6	1d/21. 7d/11.2					
95476	o-xylene	C8H10		1d/5.7 10d/0.57						

*Duration is shown as number of days (d) or as chronic (c).

EPA pp	= Environmental Protection Agency, priority pollutant
EPA advis	= EPA health advisory
NAS snarl	= National Academy of Sciences, safe no adverse response level
NAS adi	= National Academy of Sciences, acceptable daily intake
WHO std	= World Health Organization standards
Soviet std	= Russian standards
wqs tox	= water quality standards for toxicity (EPA)
car	= carcinogen
haz	= hazardous compound not designated as a priority pollutant

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FOR
APPENDIX A

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APPENDIX B

LETHAL DOSES USED IN THE CALCULATION OF SCREENING CONCENTRATIONS FOR TOXICITY

The screening concentrations for toxicity are calculated as the product of an oral LD50 for a mammalian species (median lethal dose to 50% of a population of laboratory animals), a risk factor for establishing a threshold concentration for systemic toxicity in humans, body weight of the average soldier, and drinking-water consumption (see section entitled "Screening Concentrations for Toxic and Organoleptic Responses" for a discussion of this procedure). The LD50 data in Table B-1 were obtained from a computer tape of the Registry of Toxic Effects of Chemical Substances (RTECS).[1] For each substance we selected the lowest oral LD50 for a mammalian species. If an oral LD50 was unavailable, we used an LD50 resulting from an intraperitoneal administration. If neither oral nor intraperitoneal doses were available, we used the lethal dose low (LDLo), which is defined as "the lowest dose (other than LD50) of a substance introduced by any route, other than inhalation, over any given period of time in one or more divided portions and reported to have caused death in humans or animals."[1] We restricted our use of the LDLo to those resulting from oral doses to animals. Table B-1 also contains the cited reference in the CODEN abbreviation form reported in the RTECS. All of the CODEN abbreviations are found in Vol. 2 of the 1980 RTECS report.[2] In Table B-2 we have defined the various acronyms for species and exposure mode used in Table B-1.

Table B-1. Oral LD50's for organic water contaminants. Each LD50 is for the most sensitive mammalian species.

CASID	SUBSTANCE	LETHAL DOSE*	MODE	SPECIES	ORIGINAL REFERENCE**
141786	ACETIC ACID, ETHYL ESTER	4.94E+03	ORL	RBT	IMSUAI 41,31,72
79209	ACETIC ACID, METHYL ESTER	3.71E+03	ORL	RBT	IMSUAI 41,31,72
108054	ACETIC ACID, VINYL ESTER	2.92E+03	ORL	RAT	UCDS** 4/25/58
67641	ACETONE	3.00E+03	ORL	MUS	PCJOAU 14,162,80
75058	ACETONITRILE	1.77E+02	ORL	GPG	JOCMA7 1,634,59
140294	ACETONITRILE, PHENYL-	7.80E+01	ORL	MUS	HYSAAV 32,176,67
98862	ACETOPHENONE	9.00E+02	ORL	RAT	JIHTAB 30,63,48
107028	ACROLEIN	7.00E+00	ORL	RBT	PCOC** -,1,66
79061	ACRYLAMIDE	1.07E+02	ORL	MUS	ARTODN 47,179,81
79107	ACRYLIC ACID	3.40E+02	ORL	RAT	TXAPA9 28,313,74
107131	ACRYLONITRILE	2.70E+01	ORL	MUS	JHEMA2 3,106,59
141286	ADIPIC ACID, DIETHYL ESTER	2.19E+03	IPR	MUS	TXAPA9 32,566,75
111693	ADIPONITRILE	5.00E+02	ORL	RAT	WQCHM* 3,-,74
62533	ANILINE	1.95E+02	ORL	DOG	NTIS** PB214-270
554007	ANILINE, 2,4-DICHLORO-	1.13E+02*	ORL	CAT	AEXPBL 72,241,13
95761	ANILINE, 3,4-DICHLORO-	6.48E+02	ORL	RAT	28ZPAK -,96,72
106490	ANILINE, 4-METHYL-	6.56E+02	ORL	RAT	BIOFX* 31-4/73
108429	ANILINE, M-CHLORO-	3.34E+02	ORL	MUS	GTPZAB 13(5),29,69
99092	ANILINE, M-NITRO-	3.08E+02	ORL	MUS	AMRL** TR-72-62,72
91667	ANILINE, N,N-DIETHYL-	7.82E+02	ORL	RAT	MARJV* 29MAR77
103695	ANILINE, N-ETHYL-	3.34E+02	ORL	RAT	MARJV* 29MAR77
88744	ANILINE, O-NITRO-	1.25E+03	ORL	MUS	VKMGA7 6,89,66
106478	ANILINE, P-CHLORO-	1.00E+02	ORL	MUS	NCILB* NIH-NCI-E-C-72-32
100016	ANILINE, P-NITRO-	4.50E+02	ORL	GPG	VKMGA7 6,89,66
95512	ANILINE,2-CHLORO-	2.56E+02	ORL	MUS	GTPZAB 13(5),29,69
100663	ANISOLE	2.80E+03	ORL	MUS	JPETAB 88,400,46
1825214	ANISOLE, 2,3,4,5,6-PENTACHLORO-	5.00E+02*	ORL	RAT	JPETAB 90,260,47
100527	BENZALDEHYDE	1.00E+03	ORL	GPG	FCTXAV 2,327,64
71432	BENZENE	3.80E+03	ORL	RAT	TXAPA9 19,699,71
95943	BENZENE, 1,2,4,5-TETRACHLORO-	1.03E+03	ORL	MUS	HYSAAV 30,8,65
95501	BENZENE, 1,2-DICHLORO-	5.00E+02	ORL	RBT	85ARAE 3,32,76
106467	BENZENE, 1,4-DICHLORO-	5.00E+02	ORL	RAT	WRPCA2 9,119,70
121733	BENZENE, 1-CHLORO-3-NITRO-	3.90E+02	ORL	MUS	FATOAO 29,619,66
100005	BENZENE, 1-CHLORO-4-NITRO-	4.20E+02	ORL	RAT	AGGHAR 17,217,59
108861	BENZENE, BROMO-	2.70E+03	ORL	RAT	GTPZAB 19(9),36,75
108907	BENZENE, CHLORO-	2.83E+03	ORL	RBT	14CYAT 2,1394,63
100414	BENZENE, ETHYL-	3.50E+03	ORL	RAT	AMIHAB 14,387,56
462066	BENZENE, FLUORO-	4.40E+03	ORL	RAT	GTPZAB 19(9),36,75
118741	BENZENE, HEXACHLORO-	1.00E+04	ORL	RAT	85DPAN -,-,71/76
98953	BENZENE, NITRO-	6.40E+02	ORL	RAT	5DCAI 2,73,70
577559	BENZENE, O-DIISOPROPYL-	5.00E+03*	ORL	RAT	28ZRAQ -,57,60
608935	BENZENE, PENTACHLORO-	1.08E+03	ORL	RAT	JEPTDQ 4(5-6),183,80
103651	BENZENE, PROPYL-	4.83E+03*	ORL	RAT	FCTXAV 2,327,64
92875	BENZIDINE	2.14E+02	ORL	MUS	NTIS** PB214-270
91941	BENZIDINE, 3,3'-DICHLORO-	4.74E+03*	ORL	RAT	28ZPAK -,98,72
98168	BENZOAMINOTRIFLUORIDE	2.20E+02	ORL	MUS	TPKVAL 10,131,68
69727	BENZOIC ACID, O-HYDROXY-	4.00E+02	ORL	CAT	HBTXAC 5,148,59
99967	BENZOIC ACID, P-HYDROXY-	2.20E+03	ORL	MUS	DRSTAT 20,89,52
536505	BENZYL ALCOHOL, 2,2-DIMETHYL-	2.80E+00	ORL	MUS	ARZNAD 12,347,62
103297	BIBENZYL	2.50E+03	IPR	MUS	ARZNAD 19,617,69
92524	BIPHENYL	2.40E+03	ORL	RBT	NASDA6 28,983,77

Table B-1. (Continued).

CASID	SUBSTANCE	LETHAL DOSE*	MODE	SPECIES	ORIGINAL REFERENCE**
80057	BISPHENOL A	2.50E+03	ORL	MUS	AIHAAP 28,301,67
87683	BUTADIENE, HEXACHLORO-	9.00E+01	ORL	GPG	GISAAA 28,9,63
78933	BUTAN-2-ONE	3.40E+00	ORL	RAT	TXAPA9 19,699,71
71363	BUTANOL	7.90E+02	ORL	RAT	SAMJAF 43,795,69
75150	CARBON DISULFIDE	1.40E+01	ORL	HMN	32ZWAA 8,225,74
534521	CRESOL, 4,6-DINITRO-	1.00E+01	ORL	RAT	85ARAE 3,54,76
108394	CRESOL, M-	2.42E+02	ORL	RAT	BIOFX* 3-5/69
59507	CRESOL-M, P-CHLORO-	5.00E+02*	ORL	RAT	JPETAB 90,260,47
1319773	CRESOLS	8.61E+02	ORL	MUS	NTIS** PB214-270
98828	CUMENE	1.40E+03	ORL	RAT	AMIHAB 14,387,56
110827	CYCLOHEXANE	1.30E+03	ORL	MUS	SCCUR* -,3,61
108872	CYCLOHEXANE, METHYL-	4.00E+03*	ORL	RBT	JIHTAB 25,199,43
108930	CYCLOHEXANOL	2.06E+03	ORL	RAT	MDZEAK 8,244,67
77474	CYCLOPENTADIENE, HEXACHLORO-	1.13E+02	ORL	RAT	28ZPAK -,30,72
112312	DECANAL	3.73E+03	ORL	RAT	FCTXAV 11,477,73
621647	DI-N-PROPYLNITROSAMINE	4.80E+02	ORL	RAT	ZEKBAI 69,103,67
77587	DIBUTYL TIN DILAURATE	1.75E+02	ORL	RAT	ARZNAD 10,44,60
109897	DIETHYLAMINE	5.40E+02	ORL	RAT	AEHLAU 1,343,60
55185	DIETHYLAMINE, N-NITROSO-	2.50E+02	ORL	GPG	ZEKBAI 69,103,67
111466	DIETHYLENE GLYCOL	7.80E+03	ORL	GPG	FEPRA7 4,142,45
108189	DIISOPROPYLAMINE	7.70E+02	ORL	RAT	AEHLAU 1,343,60
124403	DIMETHYLAMINE	2.40E+02	ORL	RBT	HYSAAV 32,329,67
62759	DIMETHYLNITROSAMINE	2.60E+01	ORL	RAT	BJIMAG 11,167,54
25136554	DIOXANE, DIMETHYL-	3.00E+03	ORL	RAT	JIHTAB 30,63,48
1746016	DIOXIN	6.00E-04	ORL	GPG	ADCSAJ 120,55,73
86306	DIPHENYLAMINE, N-NITROSO-	1.65E+03	ORL	RAT	28ZPAK -,134,72
60004	EDTA	2.50E+02	IPR	MUS	NTIS** AD691-490
71556	ETHANE, 1,1,1-TRICHLORO-	7.50E+02	ORL	DOG	FMCHA2 -,D317,80
79345	ETHANE, 1,1,2,2-TETRACHLORO-	3.00E+02*	ORL	DOG	AJHYA2 16,325,32
79005	ETHANE, 1,1,2-TRICHLORO-	1.14E+03	ORL	RAT	UCDS** 6/28/72
75343	ETHANE, 1,1-DICHLORO-	7.25E+02	ORL	RAT	HYSAAV 32,349,67
106934	ETHANE, 1,2-DIBROMO-	5.50E+01	ORL	RBT	AMIHBC 6,158,52
107062	ETHANE, 1,2-DICHLORO-	4.89E+02	ORL	MUS	TOXID9 1,26,81
67721	ETHANE, HEXACHLORO-	4.97E+03	ORL	GPG	AIHAAP 40,187,79
26523648	ETHANE, TRICHLOROTRIFLUORO-	8.60E+03	IPR	MUS	JETOAS 7(4),247,74
64175	ETHANOL	5.56E+03	ORL	GPG	JIHTAB 23,259,41
112345	ETHANOL, 2-(2-BUTOXYETHOXY)-	2.00E+03	ORL	GPG	JIHTAB 23,259,41
111762	ETHANOL, 2-BUTOXY-	3.20E+02	ORL	RBT	AMIHAB 14,114,56
110805	ETHANOL, 2-ETHOXY-	1.20E+03*	IPR	RAT	JPPMAB 11,150,59
75354	ETHENE, 1,1-DICHLORO-	2.00E+02	ORL	RAT	DCTODJ 1,63,77
540590	ETHENE, 1,2- DICHLORO-	7.70E+02	ORL	RAT	ARSIM* 20,10,66
156605	ETHENE, 1,2-DICHLORO- (TRANS)	7.54E+03	IPR	RAT	TXCYAC 7(2),141,77
75014	ETHENE, CHLORO- (VINYL CHLORIDE)	5.00E+02	ORL	RAT	DOWCC*
127184	ETHENE, TETRACHLORO-	8.10E+03	ORL	MUS	NTIS** PB257-185
79016	ETHENE, TRICHLORO-	4.92E+03	ORL	RAT	AIHAAP 30,470,69
110758	ETHER, 2-CHLOROETHYL VINYL	2.50E+02	ORL	RAT	JIHTAB 31,60,49
111444	ETHER, BIS(2-CHLOROETHYL)	7.50E+01	ORL	RAT	JIHTAB 30,63,48
108601	ETHER, BIS(2-CHLOROISOPROPYL)	2.40E+02	ORL	RAT	AMIHBC 4,119,51
542881	ETHER, BIS(CHLOROMETHYL)	2.10E+02	ORL	RAT	AIHAAP 30,470,69
142961	ETHER, DI-N-BUTYL	1.10E+04	ORL	RAT	UCDS** 7/8/71
60297	ETHER, DIETHYL	1.70E+03	ORL	RAT	TXAPA9 19,699,71
108203	ETHER, DIISOPROPYL	8.47E+03	ORL	RAT	UCDS** 4/10/68
101848	ETHER, DIPHENYL	3.37E+03	ORL	RAT	FCTXAV 12,703,74
107211	ETHYLENE GLYCOL	6.61E+03	ORL	GPG	JIHTAB 23,259,41

Table B-1. (Continued).

CASID	SUBSTANCE	LETHAL DOSE*	MODE	SPECIES	ORIGINAL REFERENCE**
206440	FLUORANTHRENE	2.00E+03	ORL	RAT	AIHAAP 23,95,62
50000	FORMALDEHYDE	2.60E+02	ORL	GPG	JIHTAB 23,259,41
110009	FURAN	5.20E+00	IPR	RAT	AIHAAP 40,310,79
109999	FURAN, TETRAHYDRO-	3.00E+03*	ORL	RAT	TPKVAL 5,21,63
543497	HEPTAN-2-OL	2.58E+03	ORL	RAT	AMIHBC 10,61,54
111717	HEPTANAL	1.40E+04	ORL	RAT	FDRLI* 123,-,76
111706	HEPTYL ALCOHOL	7.50E+02	ORL	RBT	HYSAAV 31,310,66
70304	HEXACHLOROPHENE	3.00E+01	ORL	DOM	ANYAA9 320,426,78
124094	HEXAMETHYLENEDIAMINE	7.50E+02	ORL	RAT	TXAPA9 42,417,77
100970	HEXAMETHYLENETETRAMINE	5.12E+02*	ORL	MUS	NTIS** AD-A066-307
66251	HEXANAL	4.89E+03	ORL	RAT	AMIHBC 10,61,54
25056706	HEXANATE	1.20E+03	ORL	MUS	HYSAAV 34,174,69
110543	HEXANE	2.87E+01	ORL	RAT	TXAPA9 19,699,71
104767	HEXANOL-1, 2-ETHYL-	2.46E+03	ORL	RAT	FCTXAV 17(SUPPL.),695,79
302012	HYDRAZINE	7.60E+01	IPR	RAT	HINEL* AF33(657)-117
122667	HYDRAZINE, 1,2-DIPHENYL-	3.01E+02	ORL	RAT	NCIMR* NIH-71-E-2144
100630	HYDRAZINE, PHENYL-	8.00E+01	ORL	RBT	HYSAAV 30,191,65
96457	IMID-2-AZOLIDINETHIONE	1.83E+03	ORL	RAT	TXAPA9 42(1),85,77
78591	ISOPHORONE	2.33E+03	ORL	RAT	TXAPA9 17,498,70
75310	ISOPROPYLAMINE	8.20E+02	ORL	RAT	UCDS** 11/15/71
143500	KEPONE	6.50E+01	ORL	RBT	PCOC** -,642,66
8008206	KEROSENE	2.00E+04	ORL	GPG	AIMEAS 21,803,44
75865	LACTONITRILE, 2-METHYL-	9.00E+00	ORL	GPG	NTIS** PB214-270
138863	LIMONENE	5.00E+03	ORL	RAT	FCTXAV 13,681,75
107277	MERCURY, CHLOROETHYL-	4.00E+01	ORL	RAT	TAGTBR 9,25,74
79414	METHACRYLIC ACID	4.80E+01	IPR	MUS	JPMSAE 62,778,73
80626	METHACRYLIC ACID, METHYL ESTER	6.30E+03	ORL	GPG	INMEAF 14,292,45
111911	METHANE, BIS(2-CHLOROETHOXY)-	6.50E+01	ORL	RAT	JIHTAB 30,63,48
74975	METHANE, BROMOCHLORO-	4.30E+03	ORL	MUS	JIHTAB 29,382,47
75274	METHANE, BROMODICHLORO-	4.50E+02	ORL	MUS	TXAPA9 44,213,78
75627	METHANE, BROMOTRICHLORO-	1.00E+02	ORL	RAT	IJMDAI 10,301,74
124481	METHANE, DIBROMOCHLORO-	8.00E+02	ORL	MUS	TXAPA9 44,213,78
75092	METHANE, DICHLORO-	1.67E+02	ORL	RAT	DOWSD* 1/26/76
74884	METHANE, IODO-	1.50E+02*	ORL	RAT	BJIMAG 7,122,50
56235	METHANE, TETRACHLORO-	2.80E+03	ORL	RAT	TXAPA9 17,498,70
75252	METHANE, TRIBROMO-	1.15E+03	ORL	RAT	TXAPA9 52,351,80
67663	METHANE, TRICHLORO-	8.00E+02	ORL	RAT	TXAPA9 19,699,71
75694	METHANE, TRICHLOROFLUORO-	1.74E+03	IPR	MUS	TOIZAG 18(2),363,71
76062	METHANE, TRICHLORONITRO-	2.50E+02	ORL	RAT	DOWCC* -,-,72
121697	N,N-DIMETHYLANILINE	1.41E+03*	ORL	RAT	AIHAAP 23,95,62
123864	N-BUTYL ACETATE	7.10E+03	ORL	MUS	FCTXAV 17,509,79
90153	NAPHTH-1-OL	2.59E+03	ORL	RAT	UCDS** 11/10/64
135193	NAPHTH-2-OL	2.42E+03	ORL	RAT	BIOFX* 26-4/73
91203	NAPHTHALENE	1.00E+03	ORL	MAM	FMCHA2 -,D213,80
119642	NAPHTHALENE, 1,2,3,4-TETRAHYDRO-	2.86E+03	ORL	RAT	AMIHBC 4,119,51
90120	NAPHTHALENE, 1-METHYL-	5.00E+03*	ORL	RAT	28ZRAQ -,55,60
91587	NAPHTHALENE, 2-CHLORO-	8.86E+02	ORL	MUS	NTIS** PB214-270
91576	NAPHTHALENE, 2-METHYL-	5.00E+03*	ORL	RAT	28ZRAQ -,55,60
1335871	NAPHTHALENE, HEXACHLORO-	1.10E+01*	ORL	CTL	AVSCB8 13,101,69
117806	NAPHTHO-1,4-QUINONE, 2,3-DICHLORO-	1.30E+03	ORL	RAT	RREVAH 10,97,65
143088	NONYL ALCOHOL	1.40E+03*	ORL	RAT	14CYAT 2,1466,63
95534	O-TOLUIDINE	9.00E+02	ORL	RAT	TXAPA9 22,153,72
95476	O-XYLENE	5.00E+03*	ORL	RAT	AMIHAB 19,403,59
105113	P-BENZOQUINONE DIOXIME	4.64E+02	ORL	RAT	NCILB* NIH-NCI-E-C-72-32
123911	P-DIOXANE	2.00E+03	ORL	CAT	JIHTAB 21,173,39
106503	P-PHENYLENEDIAMINE	8.00E+01	ORL	RAT	JTEHD6 2,657,77

Table B-1. (Continued).

CASID	SUBSTANCE	LETHAL DOSE#	MODE	SPECIES	ORIGINAL REFERENCE**
11097691	PCB (AROCLOR:1254)	1.30E+03	ORL	RAT	FCTXAV 12,63,74
11104282	PCB (AROCLOR 1221)	3.98E+03	ORL	RAT	ARVPAX 14,139,74
11141165	PCB (AROCLOR 1232)	4.47E+03	ORL	RAT	ARVPAX 14,139,74
53469219	PCB (AROCLOR 1242)	4.25E+03	ORL	RAT	TXAPA9 24,434,73
12672296	PCB (AROCLOR 1248)	1.10E+04	ORL	RAT	ARVPAX 14,139,74
11096825	PCB (AROCLOR 1260)	1.32E+03	ORL	RAT	FCTXAV 12,63,74
108101	PENTAN-2-ONE, 4-METHYL-	2.08E+03	ORL	RAT	UCDS** 4/25/58
136254	PENTANATE	9.12E+02	ORL	MUS	HYSAAV 34,174,69
85018	PHENANTHRENE	7.00E+02	ORL	MUS	HYSAAV 29,19,64
108952	PHENOL	8.00E+01*	ORL	CAT	RMSRA6 15,561,1895
4901513	PHENOL, 2,3,4,5-TETRACHLORO-	4.00E+02	ORL	MUS	ARTODN 40,63,78
58902	PHENOL, 2,3,4,6-TETRACHLORO-	1.40E+02	ORL	RAT	IMSUAI 39,56,70
935955	PHENOL, 2,3,5,6-TETRACHLORO-	1.09E+02	ORL	MUS	ARTODN 40,63,78
933755	PHENOL, 2,3,6-TRICHLORO-	3.08E+02	IPR	RAT	BJPCAL 13,20,58
95954	PHENOL, 2,4,5-TRICHLORO-	8.20E+02	ORL	RAT	FEPRA7 2,76,43
88062	PHENOL, 2,4,6-TRICHLORO-	8.20E+02	ORL	RAT	PCOC** -,1176,66
120832	PHENOL, 2,4-DICHLORO-	5.80E+02	ORL	RAT	FEPRA7 2,76,43
105679	PHENOL, 2,4-DIMETHYL-	8.09E+02	ORL	MUS	GTPZAB 18,58,74
51285	PHENOL, 2,4-DINITRO-	3.00E+01	ORL	RAT	TXAPA9 21,315,72
128370	PHENOL, 2,6-DI-TERT-BUTYL-4-METHYL-	8.90E+02	ORL	RAT	NEOLA4 24,253,77
87650	PHENOL, 2,6-DICHLORO-	2.94E+03	ORL	RAT	28ZPAK -,79,72
95578	PHENOL, 2-CHLORO-	4.40E+02	ORL	MAM	TIVSAI 33,258,69
78831	PHENOL, 2-METHYL-	2.46E+03	ORL	RAT	AMIHBC 10,61,54
95487	PHENOL, 2-METHYL-	1.21E+02	ORL	RAT	BIOFX* 4-5/69
88755	PHENOL, 2-NITRO-	1.30E+03	ORL	MUS	TXAPA9 42,417,77
609198	PHENOL, 3,4,5-TRICHLORO-	3.72E+02	IPR	RAT	BJPCAL 13,20,58
106489	PHENOL, 4-CHLORO-	2.61E+02	ORL	RAT	28ZPAK -,78,72
108430	PHENOL, M-CHLORO-	5.70E+02	ORL	RAT	FEPRA7 2,76,43
554847	PHENOL, M-NITRO-	4.47E+02	ORL	RAT	28ZPAK -,107,72
100027	PHENOL, P-NITRO-	3.50E+02	ORL	RAT	MONS**
87865	PHENOL, PENTACHLORO-	5.00E+01	ORL	RAT	FMCHA2 -,D233,80
103822	PHENYLACETIC ACID	2.25E+03	ORL	MUS	VPITAR 33(5),48,74
117817	PHTHALATE, BIS (2-ETHYLHEXYL)	3.00E+04	ORL	MUS	TJADAB 14,259,76
85687	PHTHALATE, BUTYLBENZYL	3.16E+03	IPR	MUS	EVHPAZ 4,3,73
88993	PHTHALIC ACID	7.90E+03	ORL	RAT	JIHTAB 27,130,45
84742	PHTHLATE, DI-N-BUTYL	1.20E+04	ORL	RAT	SPEADM 74-1,-,74
84662	PHTHLATE, DIETHYL	6.17E+03	ORL	MUS	GTPZAB 17(10),51,73
131113	PHTHLATE, DIMETHYL	2.40E+03	ORL	GPG	JPETAB 93,26,48
109068	PICOL-2-INE	6.74E+02	ORL	MUS	HYSAAV 33,341,68
88891	PICRIC ACID	1.00E+02*	ORL	GPG	HBAMAK 4,1289,35
78002	PLUMBANE, TETRAETHYL-	1.70E+01*	ORL	RAT	AEHLAU 8,277,64
25267156	POLYCHLOROPINENE	4.60E+02	ORL	RAT	HYSAAV 31,18,66
78875	PROPANE, 1,2-DICHLORO-	8.60E+02	ORL	MUS	12VXA5 8,876,68
106898	PROPANE, 1-CHLORO-2,3-EPOXY-	9.00E+01	ORL	RAT	JIHTAB 30,63,48
542756	PROPENE, 1,3-DICHLORO-	2.50E+02	ORL	RAT	GUCHAZ 6,192,73
110861	PYRIDINE	8.91E+02	ORL	RAT	BIOFX* 14-4/70
120809	PYROCATECHOL	2.40E+02	ORL	MAM	TPKVAL 15,136,79
121824	RDX (HEXOGON OR CYCLONITE)	1.00E+02	ORL	RAT	TXAPA9 39,531,77
108463	RESORCINOL	3.01E+02	ORL	RAT	BIOFX* 11-4/70
683181	STANNANE, DIBUTYLDICHLORO-	1.00E+02	ORL	RAT	ARZNAD 10,44,60
597648	STANNANE, TETRAETHYL-	7.00E+00	ORL	RBT	HYSAAV 32,11,67
100425	STYRENE	3.16E+02	ORL	MUS	NCILB* NIH-NCI-E-C-72-32
25013154	STYRENE, METHYL-	3.16E+03	ORL	MUS	HYSAAV 34,334,69
99865	TERPINENES	1.68E+03	ORL	RAT	FCTXAV 14,659,76
108883	TOLUENE	5.00E+03	ORL	RAT	AMIHAB 19,403,59
121142	TOLUENE, 2,4-DINITRO-	2.68E+02	ORL	RAT	NTIS** PB214-270

Table B-1. (Continued).

CASID	SUBSTANCE	LETHAL DOSE*	MODE	SPECIES	ORIGINAL REFERENCE**
606202	TOLUENE, 2,6-DINITRO-	1.77E+02	ORL	RAT	NTIS** PB214-270
99081	TOLUENE, M-NITRO-	3.30E+02	ORL	MUS	CHABA8 73,91015E,70
99990	TOLUENE, P-NITRO-	1.23E+03	ORL	MUS	NTIS** PB214-270
121448	TRIETHYLAMINE	4.60E+02	ORL	RAT	AMIHBC 4,119,51
5064313	TRISODIUM NITRILOTRIACETATE	6.81E+02	ORL	MUS	NCILB* NIH-NCI-E-C-72-3252
57136	UREA	5.11E+02*	ORL	DOM	AJPHAP 153(1),41,48
121346	VANILLIC ACID	5.02E+03	IPR	RAT	COREAF 243,609,56
1330207	XYLENE	4.30E+03	ORL	RAT	AMIHAB 14,387,56

* LDLo.

** Original reference CODEN from Registry of Toxic Effects of Chemical Substances (RTECS).[2]

Note: For each substance we selected the lowest LD50 for a mammalian species. If an oral LD50 was unavailable, we used an LD50 resulting from an intraperitoneal administration. If neither oral nor intraperitoneal doses were reported, we used the lethal dose low (LDLo).

Table B-2. Abbreviations used in Table B-1 for exposure mode and species.

Abbreviations	Definition
ORL	Oral administration
IPR	Intraperitoneal administration
RBT	Rabbit
MUS	Mouse
GPG	Guinea pig
DOM	Domestic animal
CTL	Cattle
MAM	Mammalian species

REFERENCES
FOR
APPENDIX B

1. Department of Health and Human Services, Registry of Toxic Effects of Chemical Substances Computer Tape, 1981 Edition, National Technical Information Service, Springfield, VA, PB82-169988 (1982).

2. Lewis, R. J., Sr., and R. L. Tatken, Eds., Registry of Toxic Effects of Chemical Substances, 1980 Edition -- Volume Two (U. S. Department of Health and Human Services, Washington, DC, 1982).

APPENDIX C

TASTE AND ODOR THRESHOLDS

Table C-1 contains the taste- and odor-threshold data that we acquired on organic substances that are potential contaminants in field-water supplies. The data were gathered from a number of different sources, and consequently the threshold values between substances are not strictly comparable because of different methods for determining thresholds. Another artifact of the taste/odor studies is the statistic used for reporting the organoleptic data. In some studies a minimum value is reported; in others an average value. Under the column entitled "TYPE" we have designated whether the concentrations were a minimum (M) or average (A); taste (T) or odor (O) value, based on our review of the reference. Some threshold concentrations in water were calculated from odor thresholds in air using Henry's law constant; these calculated values are indentified by a "C" in the column entitled "TYPE."

Table C-1. Reported taste- and odor-detection threshold concentrations (mg/L) for organic chemicals for which we compiled water-quality monitoring data.

CASID	SUBSTANCE	TASTE/ODOR THRESHOLD	TYPE*	REFERENCE**
67641	ACETONE	5.00E+00	OM	VANG77
		2.00E+01	OAC	AMOO83
		4.00E+01	OM	VANG77
		4.09E+01	OM	VANG77
		2.40E+02	OM	VANG77
		2.65E+02	OM	VANG77
98862	ACETOPHENONE	6.50E-02	OM	VANG77
		1.70E-01	OM	VANG77
107028	ACROLEIN	1.10E-05	OM	FAZZ78
		1.10E-01	OAC	AMOO83
		4.00E+01	TM	FAZZ78
79061	ACRYLAMIDE	3.10E-01	OAC	AMOO83
107131	ACRYLONITRILE	9.10E+00	OAC	AMOO83
		1.86E+01	OM	FAZZ78
		1.86E+01	OM	VANG77
62533	ANILINE	6.50E+01	OAC	AMOO83
		7.01E+01	OM	VANG77
		3.00E+03	OM	VANG77
100527	BENZALDEHYDE	3.50E-02	OM	VANG77
71432	BENZENE	1.70E-01	OAC	AMOO83
		2.00E+00	OM	VANG77
		1.00E+01	OM	VANG77
		3.12E+01	OM	VANG77
		3.13E+01	OM	FAZZ78
120821	BENZENE, 1,2,4-TRICHLORO-	5.00E-03	OM	VANG77
95501	BENZENE, 1,2-DICHLORO-	1.00E-02	OM	VANG77
		2.40E-02	OAC	AMOO83
106467	BENZENE, 1,4-DICHLORO-	3.00E-04	OM	VANG77
		3.00E-02	OM	VANG77
		7.60E-02	OA	PUNT83
		1.10E+01	OAC	AMOO83
108907	BENZENE, CHLORO-	5.20E-02	OAC	AMOO83
		1.00E-01	OM	VANG77
		1.00E-01	OM	VANG77
100414	BENZENE, ETHYL-	2.90E-02	OAC	AMOO83
		1.00E-01	TM	FAZZ78
		1.00E-01	M	VANG77
		1.40E-01	M	VANG77
		2.00E-01	M	VANG77
		1.40E+02	OM	FAZZ78
118741	BENZENE, HEXACHLORO-	3.00E+00	OM	VANG77
		3.00E+00	OM	LILL75
98953	BENZENE, NITRO-	2.00E-01	OM	VANG77
		1.10E+01	OAC	AMOO83
92524	BIPHENYL	5.00E-04	OM	VANG77
		5.00E-04	OAC	AMOO83
87683	BUTADIENE, HEXACHLORO-	6.00E-03	OM	VANG77
75150	CARBON DISULFIDE	3.90E-04	OAC	AMOO83
		2.60E-03	OM	VERS83
7	CRESOL-M, 6-CHLORO-	2.00E-02	OM	EPA80S
59507	CRESOL-M, P-CHLORO-	3.00E+00	OM	EPA80S

Table C-1. (Continued)

CASID	SUBSTANCE	TASTE/ODOR THRESHOLD	TYPE*	REFERENCE**
6	CRESOL-O, 4-CHLORO-	1.80E+00	OM	EPA80S
98828	CUMENE	8.00E-04	OAC	AMOO83
		1.00E-01	OM	VANG77
110827	CYCLOHEXANE	1.10E-02	OAC	AMOO83
		2.00E+02	OM	VANG77
108930	CYCLOHEXANOL	4.00E-01	OM	VANG77
		2.80E+00	OAC	AMOO83
		3.50E+00	OM	VANG77
77474	CYCLOPENTADIENE, HEXACHLORO-	1.00E-03	OM	LILL75
		7.70E-03	OAC	AMOO83
109897	DIETHYLAMINE	4.70E+01	OAC	AMOO83
108189	DIISOPROPYLAMINE	2.39E+01	OM	VANG77
124403	DIMETHYLAMINE	2.90E+01	OAC	AMOO83
79345	ETHANE, 1,1,2,2-TETRACHLORO-	5.00E-01	OM	FAZZ78
107062	ETHANE, 1,2-DICHLORO-	2.90E+01	OM	VANG77
75003	ETHANE, CHLORO-	1.90E+01	OAC	AMOO83
67721	ETHANE, HEXACHLORO-	1.00E-02	OM	VANG77
		1.00E-02	OM	FAZZ78
		1.00E+00	OAC	AMOO83
64175	ETHANOL	1.00E+02	OM	VANG77
		1.00E+02	OM	VANG77
		7.40E+02	OM	VANG77
		7.60E+02	OAC	AMOO83
		8.00E+02	OM	VANG77
75354	ETHENE, 1,1-DICHLORO-	1.50E+00	OAC	AMOO83
540590	ETHENE, 1,2- DICHLORO-	2.60E+01	OAC	AMOO83
75014	ETHENE, CHLORO- (VINYL CHLORIDE)	3.40E+00	OAC	AMOO83
127184	ETHENE, TETRACHLORO-	1.70E-01	OAC	AMOO83
		3.00E-01	OM	VANG77
79016	ETHENE, TRICHLORO-	7.30E+00	OM	FAZZ78
111444	ETHER, BIS(2-CHLOROETHYL)	3.60E-01	OM	VANG77
		3.60E+01	OAC	AMOO83
		3.60E+02	OM	FAZZ78
108601	ETHER, BIS(2-CHLOROISOPROPYL)	2.00E-01	OM	VANG77
		3.00E-01	OM	VANG77
		3.20E-01	OM	VANG77
50000	FORMALDEHYDE	4.99E+01	OM	VANG77
110009	FURAN	6.00E+00	OM	VANG77
111706	HEPTYL ALCOHOL	1.30E+00	OM	VANG77
75310	ISOPROPYLAMINE	9.00E-01	OAC	AMOO83
		5.00E+00	OM	VANG77
75092	METHANE, DICHLORO-	1.00E-01	OAC	AMOO83
56235	METHANE, TETRACHLORO-	5.20E-01	OAC	AMOO83
75252	METHANE, TRIBROMO-	3.00E-01	OM	VANG77
67663	METHANE, TRICHLORO-	1.00E-01	OA	ZOET80
		2.40E+00	OAC	AMOO83
		1.20E+01	TM	ALEX82
74895	METHYLAMINE	4.00E-01	OAC	AMOO83
135193	NAPHTH-2-OL	1.29E+00	OM	VANG77
91203	NAPHTHALENE	5.00E-03	OM	VANG77
		5.00E-01	OM	VANG77
		6.80E+00	OM	VANG77
		6.80E+00	OM	FAZZ78
		2.10E+01	OAC	AMOO83
85018	PHENANTHRENE	1.00E+00	OM	VANG77

Table C-1. (Continued)

CASID	SUBSTANCE	TASTE/ODOR THRESHOLD	TYPE*	REFERENCE**
108952	PHENOL	3.00E-01	TM	EPA80S
		1.00E+00	OM	VANG77
		4.20E+00	OM	VANG77
		5.90E+00	OM	VANG77
		5.90E+00	OM	FAZZ78
		7.90E+00	OAC	AMOO83
		2.50E+01	TM	FAZZ78
58902	PHENOL, 2,3,4,6-TETRACHLORO-	1.00E-03	TM	EPA80K
		6.00E-01	OM	EPA80K
933755	PHENOL, 2,3,6-TRICHLORO-	3.00E-01	OM	EPA80K
95954	PHENOL, 2,4,5-TRICHLORO-	1.00E-03	TM	EPA80K
		1.10E-02	OM	EPA80K
88062	PHENOL, 2,4,6-TRICHLORO-	2.00E-03	TM	VERS83
		2.00E-03	TM	EPA80K
		1.00E-01	OM	VERS83
		1.00E-01	OM	EPA80K
		1.00E+00	TM	VERS83
120832	PHENOL, 2,4-DICHLORO-	3.00E-04	TM	EPA80L
		6.50E-04	OM	EPA80L
		2.00E-03	OM	VANG77
		2.10E-01	OM	VANG77
		2.10E-01	OM	FAZZ78
583788	PHENOL, 2,5-DICHLORO-	2.00E-04	TM	EPA80K
		3.30E-03	OM	EPA80K
87650	PHENOL, 2,6-DICHLORO-	2.00E-04	TM	EPA80K
		3.00E-03	OM	EPA80K
95578	PHENOL, 2-CHLORO-	3.30E-04	OM	EPA80K
		9.00E-01	TM	FAZZ78
		1.24E+00	OM	FAZZ78
88755	PHENOL, 2-NITRO-	1.00E+01	OM	VANG77
95772	PHENOL, 3,4-DICHLORO-	3.00E-04	TM	EPA80K
		1.00E-01	OM	EPA80K
106489	PHENOL, 4-CHLORO-	1.00E-04	TM	EPA80K
		3.30E-02	OM	EPA80K
108430	PHENOL, M-CHLORO-	1.00E-04	OM	EPA80K
87865	PHENOL, PENTACHLORO-	3.00E-02	TM	EPA80Q
		8.57E-01	OM	EPA80Q
78875	PROPANE, 1,2-DICHLORO-	1.40E-03	OM	VANG77
110861	PYRIDINE	9.50E-01	OAC	AMOO83
108883	TOLUENE	4.20E-02	OAC	AMOO83
		1.20E-01	TM	ALEX82
		1.00E+00	OM	VANG77
121448	TRIETHYLAMINE	4.20E-01	OAC	AMOO83

* O = odor, T = taste, M = minimum concentration detectable by individuals with sensitive sensory ability, A = average concentration detectable by individuals with average sensory ability, and C = calculated from odor thresholds in air using Henry's law constant.

** References appear as CODEN abbreviations; the CODEN abbreviations correspond to those listed alphabetically in the reference section for Appendix C.

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APPENDIX C

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APPENDIX D

DATA ON THE CONCENTRATIONS OF ORGANIC SOLUTES IN FRESH AND SALT WATERS

The data on the concentrations of organic solutes in natural waters are presented in two tables: Table D-1 contains concentration data for fresh waters, including surface and ground waters, and Table D-2 contains data for salt waters. Each table contains the type of water measured; the statistical value reported; the number of samples, if available; the reference identifier; and the geographic location. The acronyms for the water types are as follows: DW = drinking water, FDW = finished drinking water, SW = surface water, GW = ground water, and SALT = salt water. The complete literature citation for each of the reference identifiers is located in the reference section of this appendix. Two types of quality control were used to ensure that the values reported in the computerized data base were correct. First, we compared the values in the data base with those in the original reference to see if they agreed; second, we statistically analyzed the values in the data base to identify values that were very high or very low. Once these outliers were found, we reviewed the source articles to determine whether the reported concentrations were valid.

Table D-1. Fresh-water concentration data for organic substances other than pesticides.

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
ACENAPHTHENE	FDW	1.00E-06				BENO79	CANADA
	FDW	7.00E-07				BENO79	CANADA
	FDW	2.00E-06				BENO79	CANADA
	FDW	5.00E-07				BENO79	CANADA
	FDW	1.40E-05			1	KVES82	DENMARK
	FDW	7.40E-06			1	KVES82	FINLAND
	FDW	1.30E-06				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-06				BENO79	CANADA, E ONTARIO
	FDW	1.30E-06				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
ACENAPHTHYLENE	FDW	4.00E-07			1	KVES82	DENMARK
	FDW	1.60E-06			1	KVES82	FINLAND
ANILINE	SW	2.60E-03	2.40E-03	5.80E-03		HEGM81	NETHERLANDS
	SW	2.00E-03	1.20E-03	5.50E-03		HEGM81	NETHERLANDS
	SW	7.70E-04	5.60E-04	2.40E-03		HEGM81	NETHERLANDS
	SW	6.20E-04	5.50E-04	1.60E-03		HEGM81	NETHERLANDS
	SW	2.97E-03	1.70E-03	1.20E-02		HEGM81	NETHERLANDS
ANILINE, 2,3-DICHLORO-	SW	5.00E-05		3.20E-04		HEGM81	NETHERLANDS
	SW	4.00E-05		4.00E-04		HEGM81	NETHERLANDS
	SW	1.00E-05		7.00E-05		HEGM81	NETHERLANDS
	SW	4.00E-05		3.90E-04		HEGM81	NETHERLANDS
ANILINE, 2,4-DICHLORO-	SW	2.00E-05		1.50E-04		HEGM81	NETHERLANDS
	SW	2.00E-05		8.00E-05		HEGM81	NETHERLANDS
	SW	3.00E-05		3.20E-04		HEGM81	NETHERLANDS
	SW	2.00E-05		7.60E-04		HEGM81	NETHERLANDS
ANILINE, 3,4-DICHLORO-	SW	3.30E-04	3.50E-04	4.70E-04		HEGM81	NETHERLANDS
	SW	3.00E-04	1.90E-04	6.90E-04		HEGM81	NETHERLANDS
	SW	2.90E-04	7.00E-05	2.10E-03		HEGM81	NETHERLANDS
	SW	3.90E-04	3.60E-04	1.20E-03		HEGM81	NETHERLANDS
ANILINE, 3,5-DICHLORO-	SW	1.00E-05		8.00E-05		HEGM81	NETHERLANDS
	SW	2.00E-05		1.80E-04		HEGM81	NETHERLANDS
	SW	2.00E-05		1.90E-04		HEGM81	NETHERLANDS
ANILINE, 4-METHYL-	SW	7.00E-05		3.50E-04		HEGM81	NETHERLANDS
	SW	1.70E-04	1.10E-04	1.00E-03		HEGM81	NETHERLANDS
ANILINE, M-CHLORO-	SK	7.00E-05	5.00E-05	2.10E-04		HEGM81	NETHERLANDS
	SW	9.00E-05	1.20E-03	4.50E-04		HEGM81	NETHERLANDS
	SW	1.00E-05		6.00E-05		HEGM81	NETHERLANDS
	SW	2.00E-05	2.00E-05	9.00E-05		HEGM81	NETHERLANDS
	SW	1.40E-04	2.00E-04	1.80E-03		HEGM81	NETHERLANDS
ANILINE, N,N-DIETHYL-	SW	6.00E-04				MEIJ76	NETHERLANDS
	SW	9.00E-04				MEIJ76	NETHERLANDS
	SW	1.30E-03				MEIJ76	NETHERLANDS
ANILINE, N-ETHYL-	SW	9.00E-04				MEIJ76	NETHERLANDS
	SW	6.00E-04				MEIJ76	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
ANILINE, P-CHLORO-	SW	1.40E-04	1.20E-04	2.40E-04		WEGM81	NETHERLANDS
	SW	1.30E-04	1.10E-04	2.90E-04		WEGM81	NETHERLANDS
	SW	8.00E-05		3.90E-04		WEGM81	NETHERLANDS
	SW	2.00E-05		8.00E-05		WEGM81	NETHERLANDS
	SW	3.00E-05	1.00E-05	1.20E-04		WEGM81	NETHERLANDS
	SW	2.20E-04	1.90E-04	7.40E-04		WEGM81	NETHERLANDS
ANILINE,2-CHLORO-	SW	4.50E-04	4.20E-04	1.30E-03		WEGM81	NETHERLANDS
	SW	4.50E-04	2.10E-04	1.70E-03		WEGM81	NETHERLANDS
	SW	1.50E-04		8.60E-04		WEGM81	NETHERLANDS
	SW	6.00E-05	2.00E-05	2.30E-04		WEGM81	NETHERLANDS
	SW	5.40E-04	2.00E-04	3.90E-03		WEGM81	NETHERLANDS
ANTHRACENE	FDW	1.60E-07			1	KVES82	DENMARK
	FDW	5.40E-06			1	KVES82	DENMARK
	FDW	9.70E-06			1	KVES82	FINLAND
	FDW	3.90E-07			1	KVES82	NORWAY
	GW	2.10E-02				EPA81	UNITED STATES, NY
ANTHRACENE, 2-METHYL	FDW	2.00E-08			1	KVES82	DENMARK
	FDW	1.40E-06			1	KVES82	DENMARK
	FDW	6.00E-07			1	KVES82	FINLAND
	FDW	1.00E-07			1	KVES82	NORWAY
ANTHRACHINON, 1,5-CHLOR-		1.29E-05		2.60E-05	1	WEBE83	GERMANY
ANTHRACHINON, 1-CHLOR-		1.30E-05		2.25E-05	1	WEBE83	GERMANY
		4.50E-06		8.00E-06	1	WEBE83	GERMANY
ANTHRACHINON, 2-DICHLOR-		1.90E-06		4.00E-06	1	WEBE83	GERMANY
AROCLOR 1254	SW	2.00E-02			1	GREI77	SOUTH AFRICA
BENZ(1,2)FLUORENE	FDW	4.00E-08			1	KVES82	DENMARK
	FDW	4.70E-07			1	KVES82	FINLAND
	SW	3.00E-05			1	MATS77	JAPAN
	SW	1.00E-05			1	MATS77	JAPAN
	SW	2.00E-05			1	MATS77	JAPAN
	SW	1.80E-05			1	OGUR75	JAPAN
	SW	1.20E-05			1	OGUR75	JAPAN
BENZENE	SW	6.80E-03				COTR83	UNITED STATES
	SW	6.80E-03			1	TRUS80	ENGLAND
	SW	4.00E-05			1	TRUS80	BRAZIL
	SW	7.00E-04			1	TRUS80	NICARAGUA
	SW	1.20E-04			1	TRUS80	PHILIPPINES
	SW	2.00E-05			1	TRUS80	VENEZUELA
	FDW		1.60E-03	1.20E-02	321	WEST84	UNITED STATES
	FDW		2.70E-03	1.20E-02	158	WEST84	UNITED STATES
	FDW		6.10E-04	6.10E-04	280	WEST84	UNITED STATES
	FDW		9.00E-03	1.50E-02	186	WEST84	UNITED STATES
	GW	3.00E-04			1	VAND81	NETHERLANDS
	GW	1.00E-01			1	VAND81	NETHERLANDS
	GW	1.00E-02			1	VAND81	NETHERLANDS
	GW	9.60E-03				EPA81	UNITED STATES, NY
BENZENE, 1,2,4-TRICHLORO-	GW	3.37E-02				PAGE82	NEW JERSEY
	GW			1.20E-03		ZOET80	NETHERLANDS
BENZENE, 1,2-DICHLORO-	SW	1.00E-04				MEIJ76	NETHERLANDS
	SW	9.00E-04				MEIJ76	NETHERLANDS
	SW	6.60E-03				MEIJ76	NETHERLANDS
	SW	4.30E-03				MEIJ76	NETHERLANDS
	SW	2.10E-03				MEIJ76	NETHERLANDS
	SW	3.30E-03				MEIJ76	NETHERLANDS
	SW			1.00E-02	48	PIET80	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	1.10E-03			7	PIET80	NETHERLANDS
	FDW		2.20E-03	2.20E-03	321	WEST84	UNITED STATES
	FDW		2.70E-03	2.70E-03	158	WEST84	UNITED STATES
BENZENE, 1,4-DICHLORO-	GW	1.76E-02				PAGE82	NEW JERSEY
	SW	3.00E-04			7	PIET80	NETHERLANDS
	SW	1.10E-05			3	SCHW79	SWITZERLAND
	SW	9.00E-06			3	SCHW79	SWITZERLAND
	SW	1.00E-05			1	SCHW79	SWITZERLAND
	SW	9.00E-06			3	SCHW79	SWITZERLAND
	SW	1.00E-05			2	SCHW79	SWITZERLAND
	SW	8.00E-06			1	SCHW79	SWITZERLAND
TOLUENE, O-CHLORO-	FDW		7.40E-04	9.00E-04	321	WEST84	UNITED STATES
	FDW				158	WEST84	UNITED STATES
	FDW		6.00E-04	6.80E-04	280	WEST84	UNITED STATES
	FDW		6.60E-04	1.30E-03	186	WEST84	UNITED STATES
	GW			3.00E-03		ZOET80	NETHERLANDS
BENZENE, BROMO-	FDW		9.70E-04	1.20E-03	321	WEST84	UNITED STATES
	FDW				158	WEST84	UNITED STATES
	FDW		1.90E-03	5.80E-03	280	WEST84	UNITED STATES
	FDW		1.70E-03	1.70E-03	186	WEST84	UNITED STATES
BENZENE, CHLORO-	FDW		2.70E-03	2.70E-03	321	WEST84	UNITED STATES
	FDW				158	WEST84	UNITED STATES
	FDW				280	WEST84	UNITED STATES
	FDW				186	WEST84	UNITED STATES
BENZENE, CHLORONITRO-	SW	2.00E-04				MEIJ76	NETHERLANDS
	SW	5.00E-05				MEIJ76	NETHERLANDS
	SW	1.20E-03				MEIJ76	NETHERLANDS
	SW	7.00E-04				MEIJ76	NETHERLANDS
	SW	8.00E-04				MEIJ76	NETHERLANDS
BENZENE, ETHYL-	SW	1.00E-05			1	TRUS80	AUSTRALIA
	SW	2.00E-05			1	TRUS80	EGYPT
	SW	1.00E-05			1	TRUS80	NICARAGUA
	SW	2.00E-04			1	TRUS80	PHILIPPINES
	FDW		8.70E-04	9.50E-04	321	WEST84	UNITED STATES
	FDW				158	WEST84	UNITED STATES
	FDW		9.40E-04	1.10E-03	280	WEST84	UNITED STATES
	FDW		7.40E-04	7.40E-04	186	WEST84	UNITED STATES
	GW	1.00E-01			1	VAND81	NETHERLANDS
	GW	3.00E-01			1	VAND81	NETHERLANDS
	GW	3.00E-02			1	VAND81	NETHERLANDS
	GW	3.00E-04			1	VAND81	NETHERLANDS
	GW	4.00E-02				EPA81	UNITED STATES, NY
BENZENE, HEXACHLORO-	SW	1.50E-03				COTR83	UNITED STATES
BENZENE, NITRO-	SW	1.00E-04				MEIJ76	NETHERLANDS
	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	5.40E-03				MEIJ76	NETHERLANDS
	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	1.00E-04				MEIJ76	NETHERLANDS
	SW	1.00E-03				MEIJ76	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
BENZENE, PROPYL-	FDW		9.80E-04	9.80E-04	321	WEST84	UNITED STATES
BENZOAMINOTRIFLUORIDE	SW	7.00E-04				MEIJ76	NETHERLANDS
	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	1.00E-04				MEIJ76	NETHERLANDS
BENZOIC ACID, O-HYDROXY-	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
BENZOIC ACID, P-HYDROXY-	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN
BENZOIC ACID,M-HYDROXY-	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
BENZO[A]ANTHRACENE	FDW	2.00E-07				BENO79	CANADA
	FDW	2.00E-07				BENO79	CANADA
	FDW	4.00E-07				BENO79	CANADA
	SW	4.00E-05			1	FURU83	JAPAN
	SW	1.00E-05			1	FURU83	JAPAN
	SW	1.00E-05			1	FURU83	JAPAN
	FDW	1.50E-06			1	KVES82	DENMARK
	FDW	7.60E-07			1	KVES82	FINLAND
	FDW	2.40E-07			1	KVES82	NORWAY
	FDW	1.20E-07			1	KVES82	SWEDEN
	SW	3.00E-05			1	MATS77	JAPAN
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.60E-06				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
BENZO[A]FLUORENE	FDW	5.00E-08			1	KVES82	DENMARK
	FDW	4.20E-06			1	KVES82	DENMARK
	FDW	7.80E-07			1	KVES82	FINLAND
BENZO[A]PYRENE	SW	3.00E-05			1	FURU83	JAPAN
	SW	1.00E-05			1	FURU83	JAPAN
	SW	2.00E-05			1	FURU83	JAPAN
	FDW	2.90E-07			1	KVES82	NORWAY
	SW	1.80E-05			1	OGUR75	JAPAN
	SW	9.00E-06			1	OGUR75	JAPAN
	SW	1.60E-04				HARR75	ENGLAND, THAMES R
	SW	1.30E-04				HARR75	ENGLAND, THAMES R
	SW	3.50E-04				HARR75	ENGLAND, THAMES R
BENZO[B]FLUORANTHENE	FDW	2.90E-07			1	KVES82	DENMARK
	FDW	1.70E-07			1	KVES82	FINLAND
	FDW	3.40E-07			1	KVES82	NORWAY
	FDW	5.00E-08			1	KVES82	SWEDEN
BENZO[C]PHENANTHRENE	FDW	2.80E-07			1	KVES82	FINLAND
BENZO[E]PYRENE	FDW	4.10E-07			1	KVES82	NORWAY
BENZO[GHI]FLUORANTHENE	FDW	3.60E-07			1	KVES82	FINLAND
BENZO[GHI]PERYLENE	SW	1.00E-08			1	FURU83	JAPAN
	SW	2.00E-05			1	MATS77	JAPAN
	SW	1.00E-05			1	MATS77	JAPAN
	SW	1.40E-05			1	OGUR75	JAPAN

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	9.00E-06			1	OGUR75	JAPAN
	SW	1.10E-04				HARR75	ENGLAND, THAMES R
	SW	6.00E-05				HARR75	ENGLAND, THAMES R
	SW	1.60E-04				HARR75	ENGLAND, THAMES R
BENZO[J]FLUORANTHENE	FDW	1.40E-07			1	KVES82	DENMARK
	FDW	9.00E-08			1	KVES82	FINLAND
	FDW	3.00E-08			1	KVES82	SWEDEN
BENZO[K]FLUORANTHENE	SW	4.00E-05				HARR75	ENGLAND, THAMES R
	SW	8.00E-05				HARR75	ENGLAND, THAMES R
	SW	1.20E-04				HARR75	ENGLAND, THAMES R
	FDW	1.00E-07			1	KVES82	DENMARK
	FDW	9.00E-08			1	KVES82	FINLAND
	FDW	1.00E-07			1	KVES82	NORWAY
	FDW	2.00E-08			1	KVES82	SWEDEN
BIBENZYL	FDW	1.00E-06				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	8.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA
	FDW	2.00E-07				BENO79	CANADA
	FDW	6.00E-07				BENO79	CANADA
	FDW	7.00E-07				BENO79	CANADA
BIPHENYL	FDW	4.00E-07				BENO79	CANADA
	FDW	5.00E-07				BENO79	CANADA
	FDW	1.70E-06				BENO79	CANADA
	FDW	6.00E-07				BENO79	CANADA
	FDW	2.20E-06			1	KVES82	DENMARK
	FDW	4.80E-06			1	KVES82	FINLAND
	FDW	2.60E-07			1	KVES82	NORWAY
	FDW	7.80E-07			1	KVES82	SWEDEN
	SW	6.00E-04			1	SCHO81	NORWAY
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	6.00E-07				BENO79	CANADA, E ONTARIO
	FDW	7.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
BISPHENOL A	SW	1.90E-05				MATS77	JAPAN
CARBON DISULFIDE	SW			3.90E-03	98	KAIS83	CANADA, ONTARIO
	SW			2.50E-05	17	KAIS83	UNITED STATES, NY
CHRYSENE	SW	5.00E-05			1	FURU83	JAPAN
	SW	1.00E-05			1	FURU83	JAPAN
	SW	1.00E-05			1	FURU83	JAPAN
	SW	3.00E-05			1	FURU83	JAPAN
	FDW	6.70E-06			1	KVES82	DENMARK
	FDW	1.80E-06			1	KVES82	FINLAND

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW	1.00E-06			1	KVES82	NORWAY
	FDW	4.70E-07			1	KVES82	SWEDEN
	SW	3.20E-05			1	OGUR75	JAPAN
	SW	1.50E-05			1	OGUR75	JAPAN
COUMARIC ACID (PARA)	SW	1.90E-05				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
CRESOLS	SW	1.00E-04			1	SCHO81	NORWAY
	SW	1.00E-03			1	SCHO81	NORWAY
CYCLOPENTADIENE, HEXACHLORO-	SW	2.90E-03				COTR83	UNITED STATES
DIBENZOFURAN	FDW	1.80E-07			1	KVES82	DENMARK
	FDW	1.50E-05			1	KVES82	FINLAND
	FDW	4.30E-07			1	KVES82	NORWAY
DIBENZOTHIOPHENE	FDW	1.10E-05			1	KVES82	DENMARK
	FDW	6.50E-06			1	KVES82	FINLAND
DIBENZO[A,H]ANTHRACENE	SW	1.00E-05			1	FURU83	JAPAN
	SW	8.00E-06			1	OGUR75	JAPAN
	SW	5.91E-01		1.20E+00	9	HAGG77	ENGLAND
ETHANE, 1,1,1-TRICHLORO-				2.00E-04	1	CORR77	NETHERLANDS
				1.00E-04	1	CORR77	NETHERLANDS
				3.00E-04	1	CORR77	NETHERLANDS
				3.00E-04	1	CORR77	NETHERLANDS
	SW	6.90E-03				COTR83	UNITED STATES
	GW	2.59E-02				PAGE82	NEW JERSEY
	FDW		1.20E-03	8.20E-03	321	WEST84	UNITED STATES
	FDW		9.30E-04	2.10E-02	158	WEST84	UNITED STATES
	FDW		3.20E-04	1.80E-02	280	WEST84	UNITED STATES
	FDW		1.00E-03	3.10E-03	186	WEST84	UNITED STATES
	SW			1.80E-04	98	KAIS83	CANADA, ONTARIO
	GW			1.00E-04		ZOET80	NETHERLANDS
	GW	3.10E-01				EPA81	UNITED STATES, NY
	SW	7.00E-06		1.70E-05	17	KAIS83	UNITED STATES, NY
ETHANE, 1,1,2-TRICHLORO-	GW	7.10E-03				PAGE82	NEW JERSEY
ETHANE, 1,1-DICHLORO-	FDW		6.20E-04	1.20E-03	321	WEST84	UNITED STATES
	FDW		8.70E-04	4.20E-03	158	WEST84	UNITED STATES
	FDW		5.10E-04	3.20E-03	280	WEST84	UNITED STATES
	FDW		5.40E-04	1.20E-03	186	WEST84	UNITED STATES
ETHANE, 1,2-DICHLORO-	FDW		2.90E-03	3.40E-03	321	WEST84	UNITED STATES
	FDW		1.80E-03	9.80E-03	158	WEST84	UNITED STATES
	FDW		5.70E-04	9.50E-04	186	WEST84	UNITED STATES
ETHANE, TRICHLOROTRIFLUORO-	GW	1.35E-01				EPA81	UNITED STATES, NY
ETHENE, 1,1-DICHLORO-	GW	9.62E-02				PAGE82	NEW JERSEY
	SW			3.50E-03	98	KAIS83	CANADA, ONTARIO
ETHENE, 1,2- DICHLORO-	GW	7.32E-02				PAGE82	NEW JERSEY
	FDW		1.30E-03	1.70E-02	321	WEST84	UNITED STATES
	FDW		2.70E-03	1.20E-01	158	WEST84	UNITED STATES

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW		2.30E-04	1.70E-03	280	WEST84	UNITED STATES
	FDW		1.10E-03	2.00E-03	186	WEST84	UNITED STATES
ETHENE, 1,2-DICHLORO- (TRANS)	SW	5.00E-04			1	TRUS80	EGYPT
ETHENE, CHLORO- (VINYLCHLORID	FDW				321	WEST84	UNITED STATES
	FDW		2.70E-03	8.40E-03	158	WEST84	UNITED STATES
	FDW		1.10E-03	1.10E-03	186	WEST84	UNITED STATES
ETHENE, TETRACHLORO-	SW			5.90E-04	98	KAIS83	CANADA, ONTARIO
	GW			2.20E-02		ZOET80	NETHERLANDS
	GW	3.75E-01				EPA81	UNITED STATES, NY
	SW			2.80E-03	1	CORR77	DENMARK
	SW			2.00E-04	1	CORR77	DENMARK
	SW			2.50E-03	1	CORR77	DENMARK
	SW			1.50E-03	1	CORR77	DENMARK
	SW			2.50E-03	1	CORR77	DENMARK
	SW			1.90E-03	1	CORR77	DENMARK
	SW			1.00E-03	1	CORR77	DENMARK
	SW			1.96E-02	1	CORR77	DENMARK
	SW			1.75E-03	1	CORR77	DENMARK
	SW			4.60E-02	1	CORR77	FINLAND
	SW			3.00E-04	1	CORR77	NETHERLANDS
				1.60E-04	1	CORR77	NETHERLANDS
				1.40E-03	1	CORR77	NETHERLANDS
				1.40E-03	1	CORR77	NETHERLANDS
				1.70E-03	1	CORR77	NETHERLANDS
				6.60E-03	1	CORR77	NETHERLANDS
	GW	1.65E-02				PAGE82	NEW JERSEY
	SW	1.05E-02			1	PELE81	ISRAEL
	SW	7.00E-03			1	PELE81	ISRAEL
	SW	7.00E-03			1	PELE81	ISRAEL
	SW	4.90E-05		1.00E-06	3	SCHW79	SWITZERLAND
	SW	4.20E-05			3	SCHW79	SWITZERLAND
	SW	4.60E-05			1	SCHW79	SWITZERLAND
	SW	3.10E-05			3	SCHW79	SWITZERLAND
	SW	3.00E-05			2	SCHW79	SWITZERLAND
	SW	5.10E-05			1	SCHW79	SWITZERLAND
	SW	1.00E-04			1	TRUS80	AUSTRALIA
	SW	2.00E-04			1	TRUS80	CHINA
	SW	3.00E-04			1	TRUS80	EGYPT
	SW	1.20E-03			1	VANR82	SOUTH AFRICA
	SW	5.00E-04			1	VANR82	SOUTH AFRICA
	SW	3.50E-04			1	VANR82	SOUTH AFRICA
	SW	3.00E-04			1	VANR82	SOUTH AFRICA
	SW	6.60E-04			1	VANR82	SOUTH AFRICA
	SW	4.80E-04			1	VANR82	SOUTH AFRICA
	SW	9.50E-04			1	VANR82	SOUTH AFRICA
	SW	5.80E-04			1	VANR82	SOUTH AFRICA
	SW	5.30E-04			1	VANR82	SOUTH AFRICA
	SW	6.20E-04			1	VANR82	SOUTH AFRICA
	FDW		7.90E-04	2.10E-02	321	WEST84	UNITED STATES
	FDW		6.60E-04	6.90E-02	158	WEST84	UNITED STATES
	FDW		3.50E-04	2.30E-02	280	WEST84	UNITED STATES
	FDW		5.20E-04	5.90E-03	186	WEST84	UNITED STATES
	SW	3.60E-05		1.34E-04	17	KAIS83	UNITED STATES, NY
ETHENE, TRIBROMO-	GW			1.00E-01		ZOET80	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
ETHENE, TRICHLORO-	SW			8.50E-03	1	CORR77	DENMARK
	SW			1.50E-04	1	CORR77	DENMARK
	SW			3.20E-03	1	CORR77	DENMARK
	SW			1.50E-03	1	CORR77	DENMARK
	SW			2.50E-03	1	CORR77	DENMARK
	SW			2.10E-03	1	CORR77	DENMARK
	SW			7.39E-02	1	CORR77	DENMARK
	SW			2.00E-03	1	CORR77	DENMARK
	SW			2.50E-02	1	CORR77	FINLAND
	SW			2.60E-04	1	CORR77	NETHERLANDS
				1.10E-04	1	CORR77	NETHERLANDS
				7.00E-04	1	CORR77	NETHERLANDS
				2.00E-04	1	CORR77	NETHERLANDS
				7.50E-03	1	CORR77	NETHERLANDS
	SW	3.70E-03			1	PELE81	ISRAEL
	SW	1.40E-03			1	PELE81	ISRAEL
	SW	8.00E-04			1	PELE81	ISRAEL
	SW	4.00E-04			1	TRUS80	ENGLAND
	SW	1.20E-03			1	TRUS80	EGYPT
	SW	5.00E-05			1	TRUS80	NICARAGUA
	SW	3.00E-05			1	TRUS80	PHILIPPINES
	SW	1.00E-05			1	TRUS80	PHILIPPINES
	FDW		1.20E-03	2.90E-02	321	WEST84	UNITED STATES
	FDW		1.50E-03	1.30E-01	158	WEST84	UNITED STATES
	FDW		8.80E-04	4.00E-02	280	WEST84	UNITED STATES
	FDW		1.13E-02	7.80E-02	186	WEST84	UNITED STATES
	SW			9.00E-03	1	ZOET80	FINLAND
	SW			3.30E-05	98	KAIS83	CANADA, ONTARIO
	GW	1.90E-02				EPA81	UNITED STATES, NY
	GW	3.00E-01				EPA81	UNITED STATES, NY
	SW	5.00E-06		1.10E-05	17	KAIS83	UNITED STATES, NY
	GW			1.10E+00		ZOET80	NETHERLANDS
ETHER, BIS(2-CHLOROISOPROPYL)	SW	3.00E-05				MEIJ76	NETHERLANDS
	SW	1.30E-03				MEIJ76	NETHERLANDS
	SW	2.40E-03				MEIJ76	NETHERLANDS
	SW	4.60E-03				MEIJ76	NETHERLANDS
	SW	3.10E-03				MEIJ76	NETHERLANDS
	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	2.90E-03			7	PIET80	NETHERLANDS
		4.22E-05		9.70E-05	1	WEBE83	GERMANY
ETHER, DIPHENYL	SW	3.00E-06				ADDI77	CANADA, N. SCOTIA
ETHER, TETRACHLOROISOPROPYL	SW	7.00E-04				MEIJ76	NETHERLANDS
	SW	1.20E-03				MEIJ76	NETHERLANDS
	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	9.00E-04				MEIJ76	NETHERLANDS
	SW	1.00E-03				MEIJ76	NETHERLANDS
	SW	8.00E-04				MEIJ76	NETHERLANDS
FERULIC ACID	SW	1.90E-05				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
FLUORANTHENE	FDW	6.00E-07				BENO79	CANADA
	FDW	9.00E-07				BENO79	CANADA
	FDW	8.00E-07				BENO79	CANADA
	FDW	5.00E-07				BENO79	CANADA
	SW	4.00E-05			1	FURU83	JAPAN
	SW	1.30E-04			1	FURU83	JAPAN

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW	1.50E-05			1	KVES82	DENMARK
	FDW	2.40E-05			1	KVES82	FINLAND
	FDW	1.80E-06			1	KVES82	NORWAY
	SW	1.80E-04			1	MATS77	JAPAN
	SW	2.00E-05			1	MATS77	JAPAN
	SW	5.80E-05			1	OGUR75	JAPAN
	SW	3.70E-05			1	OGUR75	JAPAN
	FDW	7.00E-07				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.60E-06				BENO79	CANADA, E ONTARIO
	FDW	1.40E-06				BENO79	CANADA, E ONTARIO
	FDW	3.90E-06				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.30E-06				BENO79	CANADA, E ONTARIO
	FDW	7.00E-07				BENO79	CANADA, E ONTARIO
	SW	2.00E-04				HARR75	ENGLAND, THAMES R
	SW	1.40E-04				HARR75	ENGLAND, THAMES R
	SW	3.60E-04				HARR75	ENGLAND, THAMES R
FLUORENE	FDW	1.80E-06				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.10E-06				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	7.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-06				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA
	FDW	6.00E-08				BENO79	CANADA
	FDW	5.00E-07				BENO79	CANADA
	FDW	3.00E-07				BENO79	CANADA
	FDW	2.10E-05			1	KVES82	DENMARK
	FDW	2.00E-05			1	KVES82	FINLAND
	FDW	5.10E-07			1	KVES82	NORWAY
HYDROCARBONS	SW	1.10E-03			64	BROW78	CANADA, ONTARIO
INDENO[1,2,3-CD]PYRENE	SW	1.10E-04				HARR75	ENGLAND, THAMES R
	SW	5.00E-05				HARR75	ENGLAND, THAMES R
	SW	2.10E-04				HARR75	ENGLAND, THAMES R
ISOBUTANOATE, METHYL	FDW			1.00E-03	20	ZOET80	NETHERLANDS
METHANE, BROMOCHLORO-	SW			1.00E-05	98	KAIS83	CANADA, ONTARIO
METHANE, BROMODICHLORO-	SW	2.08E-02				KOOL87	NETHERLANDS
	SW	2.00E-03				EISE81	ISRAEL
	SW	2.00E-03				EISE81	ISRAEL
	SW	2.00E-03				EISE81	ISRAEL
	SW	1.50E-03				EISE81	ISRAEL
	SW	1.00E-03				EISE81	ISRAEL
	SW	1.00E-03				EISE81	ISRAEL
	SW	1.76E-02			1	DEFE84	BRAZIL
	SW	2.78E-02			1	DEFE84	BRAZIL
	SW	1.15E-02			1	DEFE84	BRAZIL
	SW	1.72E-02			1	DEFE84	BRAZIL
	GW	1.45E-03				PAGE82	NEW JERSEY

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	6.40E-03			1	TRUS80	ENGLAND
	SW	4.10E-03			1	TRUS80	AUSTRALIA
	SW	4.40E-03			1	TRUS80	BRAZIL
	SW	7.60E-03			1	TRUS80	CHINA
	SW	5.70E-03			1	TRUS80	PERU
	SW	2.30E-03			1	TRUS80	PHILIPPINES
	SW	1.70E-03			1	TRUS80	PHILIPPINES
	SW	3.00E-03			1	TRUS80	THAILAND
	SW	1.00E-02			1	TRUS80	VENEZUELA
	SW	8.90E-03			1	VANR82	SOUTH AFRICA
	SW	3.10E-02			1	VANR82	SOUTH AFRICA
	SW	2.60E-02			1	VANR82	SOUTH AFRICA
	SW	2.10E-02			1	VANR82	SOUTH AFRICA
	SW	2.90E-02			1	VANR82	SOUTH AFRICA
	SW	3.00E-02			1	VANR82	SOUTH AFRICA
	SW	3.00E-04			1	VANR82	SOUTH AFRICA
	SW	3.30E-04			1	VANR82	SOUTH AFRICA
	SW	3.10E-02			1	VANR82	SOUTH AFRICA
	SW	2.50E-02			1	VANR82	SOUTH AFRICA
	FDW		2.00E-03	4.90E-02	321	WEST84	UNITED STATES
	FDW		2.20E-03	1.10E-01	158	WEST84	UNITED STATES
	FDW		1.90E-03	6.00E-02	280	WEST84	UNITED STATES
	FDW		1.80E-03	7.10E-02	186	WEST84	UNITED STATES
	SW			2.00E-05	98	KAIS83	CANADA, ONTARIO
	GW	1.18E-02		4.40E-02	86	SCHR81	UNITED STATES, NY
	SW	9.00E-03		2.80E-02	58	SCHR81	UNITED STATES, NY
	SW	8.70E-03		2.70E-02	35	SCHR81	UNITED STATES, NY
	SW	9.00E-04		5.00E-03	35	SCHR81	UNITED STATES, NY
	SW	1.40E-02		6.00E-02	32	SCHR81	UNITED STATES, NY
	SW	6.00E-06		2.50E-05	17	KAIS83	UNITED STATES, NY
METHANE, BROMOTRICHLORO-	SW			7.00E-06	98	KAIS83	CANADA, ONTARIO
	SW			7.00E-06	17	KAIS83	UNITED STATES, NY
METHANE, DIBROMO-	SW			7.00E-06	98	KAIS83	CANADA, ONTARIO
	SW			5.00E-06	17	KAIS83	UNITED STATES, NY
METHANE, DIBROMOCHLORO-	SW	1.86E-02				KOOL81	NETHERLANDS
	SW	7.00E-03				EISE81	ISRAEL
	SW	1.00E-03				EISE81	ISRAEL
	SW	5.00E-04				EISE81	ISRAEL
	SW	3.50E-03				EISE81	ISRAEL
	SW	4.00E-03				EISE81	ISRAEL
	SW	3.00E-03				EISE81	ISRAEL
	SW	4.90E-03			1	DEFE84	BRAZIL
	SW	8.00E-03			1	DEFE84	BRAZIL
	SW	2.20E-03			1	DEFE84	BRAZIL
	SW	4.80E-03			1	DEFE84	BRAZIL
	GW	1.50E-03				PAGE82	NEW JERSEY
	SW	2.30E-03			1	TRUS80	ENGLAND
	SW	1.30E-02			1	TRUS80	CHINA
	SW	1.10E-03			1	TRUS80	NICARAGUA
	SW	2.70E-03			1	TRUS80	PERU
	SW	1.20E-03			1	TRUS80	PHILIPPINES
	SW	1.50E-03			1	TRUS80	PHILIPPINES
	SW	7.00E-04			1	TRUS80	THAILAND
	SW	1.20E-03			1	VANR82	SOUTH AFRICA
	SW	1.90E-02			1	VANR82	SOUTH AFRICA

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	1.20E-02			1	VANR82	SOUTH AFRICA
	SW	1.30E-02			1	VANR82	SOUTH AFRICA
	SW	1.70E-02			1	VANR82	SOUTH AFRICA
	SW	1.90E-04			1	VANR82	SOUTH AFRICA
	SW	2.00E-04			1	VANR82	SOUTH AFRICA
	SW	2.00E-02			1	VANR82	SOUTH AFRICA
	SW	2.00E-02			1	VANR82	SOUTH AFRICA
	SW	1.50E-02			1	VANR82	SOUTH AFRICA
	FDW		3.50E-03	6.30E-02	321	WEST84	UNITED STATES
	FDW		4.60E-03	5.10E-02	158	WEST84	UNITED STATES
	FDW		2.10E-03	5.20E-02	280	WEST84	UNITED STATES
	FDW		2.90E-03	5.90E-02	186	WEST84	UNITED STATES
	SW			6.30E-04	98	KAIS83	CANADA, ONTARIO
	GW	4.20E-03		5.10E-02	86	SCHR81	UNITED STATES, NY
	SW	1.80E-03		1.00E-02	58	SCHR81	UNITED STATES, NY
	SW	4.70E-03		3.20E-02	32	SCHR81	UNITED STATES, NY
	SW	4.00E-06		1.50E-05	17	KAIS83	UNITED STATES, NY
METHANE, DICHLORO-	SW	2.80E-03				KOOL81	NETHERLANDS
	SW	1.70E-02				COTR83	UNITED STATES
	SW	1.10E-03			1	TRUS80	ENGLAND
	SW	5.00E-04			1	TRUS80	BRAZIL
	SW	1.60E-03			1	TRUS80	EGYPT
	SW	1.00E-03			1	TRUS80	NICARAGUA
	SW	2.50E-03			1	TRUS80	PERU
	GW	4.40E-03			1	TRUS80	TAIWAN
	SW			4.60E-03	98	KAIS83	CANADA, ONTARIO
	SW			4.50E-05	17	KAIS83	UNITED STATES, NY
METHANE, TETRACHLORO-	SW	1.40E-02				COTR83	UNITED STATES
	GW	1.94E-03				PAGE82	NEW JERSEY
	SW	1.10E-03			1	TRUS80	NICARAGUA
	SW	1.00E-04			1	VANR82	SOUTH AFRICA
	SW	2.30E-04			1	VANR82	SOUTH AFRICA
	SW	1.40E-04			1	VANR82	SOUTH AFRICA
	SW	1.90E-04			1	VANR82	SOUTH AFRICA
	SW	2.60E-04			1	VANR82	SOUTH AFRICA
	SW	2.20E-04			1	VANR82	SOUTH AFRICA
	SW	1.60E-04			1	VANR82	SOUTH AFRICA
	SW	4.20E-04			1	VANR82	SOUTH AFRICA
	SW	1.50E-04			1	VANR82	SOUTH AFRICA
	SW	2.00E-04			1	VANR82	SOUTH AFRICA
	FDW		4.40E-04	1.50E-02	321	WEST84	UNITED STATES
	FDW		7.00E-04	9.40E-03	158	WEST84	UNITED STATES
	FDW		3.70E-04	1.60E-02	280	WEST84	UNITED STATES
	FDW		3.20E-04	2.80E-03	186	WEST84	UNITED STATES
	FDW			7.00E-04	20	ZOET80	NETHERLANDS
	SW			2.50E-05	98	KAIS83	CANADA, ONTARIO
	GW			5.40E-03		ZOET80	NETHERLANDS
	GW	2.10E-02				EPA81	UNITED STATES, NY
	SW	2.90E-06		1.80E-05	17	KAIS83	UNITED STATES, NY
METHANE, TRIBROMO-	SW	3.40E-03				KOOL81	NETHERLANDS
	SW	3.00E-03				EISE81	ISRAEL
	SW	4.00E-02				EISE81	ISRAEL
	SW	1.65E-02				EISE81	ISRAEL
	SW	2.30E-02				EISE81	ISRAEL
	SW	2.90E-02				EISE81	ISRAEL

Table D-I. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	2.80E-02				EISE81	ISRAEL
	GW	3.61E-03				PAGE82	NEW JERSEY
	SW	1.17E-01			1	PELE81	ISRAEL
	SW	3.80E-02			1	PELE81	ISRAEL
	SW	4.00E-03			1	PELE81	ISRAEL
	SW	6.30E-03			1	TRUS80	CHINA
	SW	1.30E-03			1	VANR82	SOUTH AFRICA
	SW	3.40E-03			1	VANR82	SOUTH AFRICA
	SW	1.80E-03			1	VANR82	SOUTH AFRICA
	SW	2.80E-03			1	VANR82	SOUTH AFRICA
	SW	3.00E-03			1	VANR82	SOUTH AFRICA
	SW	3.30E-03			1	VANR82	SOUTH AFRICA
	SW	3.10E-03			1	VANR82	SOUTH AFRICA
	SW	3.00E-03			1	VANR82	SOUTH AFRICA
	SW	3.60E-03			1	VANR82	SOUTH AFRICA
	SW	2.30E-03			1	VANR82	SOUTH AFRICA
	FDW		3.70E-03	1.10E-01	321	WEST84	UNITED STATES
	FDW		5.10E-03	6.80E-02	158	WEST84	UNITED STATES
	FDW		2.40E-03	5.40E-02	280	WEST84	UNITED STATES
	FDW		3.80E-03	5.00E-02	186	WEST84	UNITED STATES
	SW			7.00E-06	98	KAIS83	CANADA, ONTARIO
	GW	8.00E-04		3.80E-02	86	SCHR81	UNITED STATES, NY
	SW			6.00E-06	17	KAIS83	UNITED STATES, NY
METHANE, TRICHLORO-	SW	7.50E-03		3.00E-02	9	CHAM83	FRANCE
	FDW	1.10E-03			34	CHAM83	FRANCE
	SW	2.70E-02			18	CHAM83	FRANCE
	SW	6.40E-03		4.00E-02	18	CHAM83	FRANCE
	SW	1.26E-02				KOOL81	NETHERLANDS
	SW	7.90E-03				COTR83	UNITED STATES
	SW	1.00E-03				EISE81	ISRAEL
	SW	1.00E-03				EISE81	ISRAEL
	SW	1.00E-03				EISE81	ISRAEL
	SW	5.00E-04				EISE81	ISRAEL
	SW	5.00E-04				EISE81	ISRAEL
	SW	3.00E-03				EISE81	ISRAEL
	SW	7.59E-02			1	DEFE84	BRAZIL
	SW	9.78E-02			1	DEFE84	BRAZIL
	SW	5.77E-02			1	DEFE84	BRAZIL
	SW	4.29E-02			1	DEFE84	BRAZIL
	GW	1.04E-02				PAGE82	NEW JERSEY
	SW	1.40E-03			1	PELE81	ISRAEL
	SW	3.60E-03			1	PELE81	ISRAEL
	SW	5.80E-03			1	TRUS80	ENGLAND
	SW	1.10E-02			1	TRUS80	AUSTRALIA
	SW	1.70E-02			1	TRUS80	BRAZIL
	SW	3.40E-03			1	TRUS80	CHINA
	SW	6.00E-04			1	TRUS80	NICARAGUA
	SW	6.40E-03			1	TRUS80	PERU
	SW	4.90E-03			1	TRUS80	PHILIPPINES
	SW	1.80E-03			1	TRUS80	PHILIPPINES
	GW	5.00E-05			1	TRUS80	TAIWAN
	SW	6.80E-03			1	TRUS80	THAILAND
	SW	5.70E-02			1	TRUS80	VENEZUELA
	SW	2.70E-03			1	VANR82	SOUTH AFRICA
	SW	2.00E-02			1	VANR82	SOUTH AFRICA

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	1.40E-02			1	VANR82	SOUTH AFRICA
	SW	1.30E-02			1	VANR82	SOUTH AFRICA
	SW	3.40E-02			1	VANR82	SOUTH AFRICA
	SW	1.90E-02			1	VANR82	SOUTH AFRICA
	SW	3.20E-02			1	VANR82	SOUTH AFRICA
	SW	2.30E-02			1	VANR82	SOUTH AFRICA
	SW	2.10E-02			1	VANR82	SOUTH AFRICA
	SW	2.50E-02			1	VANR82	SOUTH AFRICA
	FDW		1.60E-03	1.00E-01	321	WEST84	UNITED STATES
	FDW		2.10E-03	4.30E-01	158	WEST84	UNITED STATES
	FDW		1.40E-03	1.40E-01	280	WEST84	UNITED STATES
	FDW		1.60E-03	3.00E-01	186	WEST84	UNITED STATES
	FDW			6.00E-02	20	ZOET80	NETHERLANDS
	SW			8.30E-04	98	KAIS83	CANADA, ONTARIO
	GW			5.00E-03		ZOET80	NETHERLANDS
	GW	5.47E-02		1.76E-01	86	SCHR81	UNITED STATES, NY
	SW	6.40E-02		4.30E-01	58	SCHR81	UNITED STATES, NY
	SW	9.81E-02		3.49E-01	35	SCHR81	UNITED STATES, NY
	SW	7.91E-02		2.66E-01	32	SCHR81	UNITED STATES, NY
	GW	6.70E-02				EPA81	UNITED STATES, NY
	SW	2.20E-05		1.10E-04	17	KAIS83	UNITED STATES, NY
METHANE, TRICHLOROFLUORO-	SW	3.00E-04			1	TRUS80	EGYPT
	SW			6.10E-03	98	KAIS83	CANADA, ONTARIO
	GW	1.30E-02				EPA81	UNITED STATES, NY
	SW	1.10E-05		2.70E-05	17	KAIS83	UNITED STATES, NY
MUSK KETONE	SW	9.70E-06			9	YAMA83	JAPAN
	SW	7.50E-06			1	YAMA83	JAPAN
	SW	2.70E-04			3	YAMA83	JAPAN
	SW	7.80E-06			1	YAMA83	JAPAN
	SW	1.30E-05			1	YAMA83	JAPAN
	SW	1.90E-05			1	YAMA83	JAPAN
	SW	9.10E-06			1	YAMA83	JAPAN
	SW	1.26E-05	4.20E-06		9	YAMA83	JAPAN
	SW	9.50E-06			1	YAMA83	JAPAN
	SW	1.68E-05			4	YAMA83	JAPAN
MUSK XYLENE	SW	1.39E-05			9	YAMA83	JAPAN
	SW	6.00E-06			1	YAMA83	JAPAN
	SW	3.20E-05			3	YAMA83	JAPAN
	SW	5.60E-06			1	YAMA83	JAPAN
	SW	3.40E-06			1	YAMA83	JAPAN
	SW	3.90E-06			1	YAMA83	JAPAN
	SW	5.60E-06			1	YAMA83	JAPAN
	SW	2.90E-06			9	YAMA83	JAPAN
	SW	7.20E-06			1	YAMA83	JAPAN
	SW	7.90E-06			1	YAMA83	JAPAN
	SW	5.00E-06			1	YAMA83	JAPAN
	SW	2.00E-06			1	YAMA83	JAPAN
	SW	1.75E-05			4	YAMA83	JAPAN
N,N-DIMETHYLANILINE	SW	2.00E-03				MEIJ76	NETHERLANDS
	SW	8.00E-04				MEIJ76	NETHERLANDS
	SW	8.00E-04				MEIJ76	NETHERLANDS
NAPHTHALENE	FDW	6.20E-06				BENO79	CANADA, E ONTARIO
	FDW	3.30E-06				BENO79	CANADA, E ONTARIO
	FDW	6.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-06				BENO79	CANADA, E ONTARIO

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW	2.10E-06				BENO79	CANADA, E ONTARIO
	FDW	2.40E-06				BENO79	CANADA, E ONTARIO
	FDW	6.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.10E-06				BENO79	CANADA, E ONTARIO
	FDW	2.90E-06				BENO79	CANADA, E ONTARIO
	FDW	1.10E-06				BENO79	CANADA, E ONTARIO
	FDW	4.10E-06				BENO79	CANADA
	FDW	7.50E-06				BENO79	CANADA
	FDW	3.80E-06				BENO79	CANADA
	FDW	2.70E-06				BENO79	CANADA
	FDW	5.50E-06			1	KVES82	DENMARK
	FDW	8.80E-06			1	KVES82	FINLAND
	FDW	1.20E-06			1	KVES82	NORWAY
	SW			1.00E-04		WILS83	ARIZONA
NAPHTHALENE, 1,2/4,3-DIMETHYL	FDW	1.10E-06			1	KVES82	DENMARK
	FDW	1.40E-06			1	KVES82	FINLAND
NAPHTHALENE, 1,4-DIMETHYL-	FDW	1.70E-06			1	KVES82	DENMARK
	FDW	3.30E-06			1	KVES82	FINLAND
NAPHTHALENE, 1-METHYL-	FDW	5.50E-06				BENO79	CANADA
	FDW	6.10E-06				BENO79	CANADA
	FDW	6.40E-06				BENO79	CANADA
	FDW	1.80E-06				BENO79	CANADA
	FDW	2.30E-06			1	KVES82	DENMARK
	FDW	5.10E-06			1	KVES82	FINLAND
	FDW	4.00E-07			1	KVES82	NORWAY
	FDW	6.20E-06				BENO79	CANADA, E ONTARIO
	FDW	4.10E-06				BENO79	CANADA, E ONTARIO
	FDW	6.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.70E-06				BENO79	CANADA, E ONTARIO
	FDW	1.70E-06				BENO79	CANADA, E ONTARIO
	FDW	1.20E-06				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.70E-06				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
NAPHTHALENE, 2-METHYL-	FDW	2.50E-06			1	KVES82	DENMARK
	FDW	6.90E-06			1	KVES82	FINLAND
	FDW	6.30E-07			1	KVES82	NORWAY
NAPHTHALENE, DIMETHYL-	FDW	2.40E-06				BENO79	CANADA
	FDW	3.40E-06				BENO79	CANADA
	FDW	5.20E-06				BENO79	CANADA
	FDW	1.80E-06				BENO79	CANADA
	FDW	2.30E-06				BENO79	CANADA, E ONTARIO
	FDW	1.30E-06				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.90E-06				BENO79	CANADA, E ONTARIO
	FDW	2.20E-06				BENO79	CANADA, E ONTARIO
	FDW	1.60E-06				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	7.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.50E-06				BENO79	CANADA, E ONTARIO
	FDW	1.73E-05				BENO79	CANADA, E ONTARIO
NITROTOLUENE	SW	3.00E-04				MEIJ76	NETHERLANDS
	SW	3.90E-03				MEIJ76	NETHERLANDS
	SW	4.30E-03				MEIJ76	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SW	5.80E-03				MEIJ76	NETHERLANDS
	SW	4.00E-03				MEIJ76	NETHERLANDS
O-TOLUIDINE	SW	1.30E-03				MEIJ76	NETHERLANDS
	SW	6.00E-04				MEIJ76	NETHERLANDS
	SW	4.00E-04				MEIJ76	NETHERLANDS
	SW	7.00E-05		8.00E-04		WEGM81	NETHERLANDS
	SW	2.00E-05		2.40E-03		WEGM81	NETHERLANDS
	SW	3.00E-05		1.80E-03		WEGM81	NETHERLANDS
PCB (AROCLOR 1260)	SW			5.00E-05		SHAW80	AUSTRALIA
PERYLENE	SW	4.00E-06			1	OGUR75	JAPAN
	SW	7.00E-05				HARR75	ENGLAND, THAMES R
	SW	4.00E-05				HARR75	ENGLAND, THAMES R
	SW	1.30E-04				HARR75	ENGLAND, THAMES R
PETROLEUM HYDROCARBONS	SW	1.60E-03			6	STAR76	CANADA, ONTARIO
PHENANTHRENE, ETHYLMETHYLENE-	FDW	8.00E-08			1	KVES82	DENMARK
	FDW	5.00E-06			1	KVES82	DENMARK
	FDW	1.50E-06			1	KVES82	FINLAND
PHENANTHRENE	FDW	4.80E-06				BENO79	CANADA, E ONTARIO
	FDW	9.80E-06				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.10E-06				BENO79	CANADA, E ONTARIO
	FDW	1.80E-06				BENO79	CANADA, E ONTARIO
	FDW	5.30E-06				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.80E-06				BENO79	CANADA, E ONTARIO
	FDW	9.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-06				BENO79	CANADA
	FDW	1.40E-06				BENO79	CANADA
	FDW	6.00E-07				BENO79	CANADA
	FDW	1.00E-06				BENO79	CANADA
	FDW	2.80E-05			1	KVES82	DENMARK
	FDW	6.40E-05			1	KVES82	FINLAND
	FDW	1.60E-06			1	KVES82	NORWAY
PHENANTHRENE, 1-METHYL-	FDW	9.00E-07				BENO79	CANADA
	FDW	5.10E-06				BENO79	CANADA
	FDW	1.50E-06				BENO79	CANADA
	FDW	6.00E-07				BENO79	CANADA
	FDW	1.30E-05			1	KVES82	DENMARK
	FDW	2.90E-06			1	KVES82	FINLAND
	FDW	1.40E-07			1	KVES82	NORWAY
	FDW	1.30E-06				BENO79	CANADA, E ONTARIO
	FDW	1.10E-06				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	4.50E-06				BENO79	CANADA, E ONTARIO
	FDW	1.10E-06				BENO79	CANADA, E ONTARIO
	FDW	2.40E-06				BENO79	CANADA, E ONTARIO
	FDW	3.44E-05				BENO79	CANADA, E ONTARIO
PHENANTHRENE, 2-METHYL-	FDW	4.00E-08			1	KVES82	DENMARK
	FDW	1.50E-05			1	KVES82	DENMARK
	FDW	3.90E-06			1	KVES82	FINLAND
	FDW	1.80E-07			1	KVES82	NORWAY
PHENANTHRENE, 3-METHYL-	FDW	4.00E-08			1	KVES82	DENMARK
	FDW	1.50E-05			1	KVES82	DENMARK
	FDW	4.50E-06			1	KVES82	FINLAND

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW	1.60E-07			1	KVES82	NORWAY
PHENANTHRENE, 4,5-METHYLENE-	FDW	5.00E-08			1	KVES82	DENMARK
	FDW	1.30E-06			1	KVES82	DENMARK
	FDW	2.90E-06			1	KVES82	FINLAND
	FDW	1.30E-07			1	KVES82	NORWAY
PHENANTHRENE, 4-METHYL-	FDW	5.00E-08			1	KVES82	DENMARK
	FDW	2.10E-05			1	KVES82	DENMARK
	FDW	2.10E-06			1	KVES82	FINLAND
	FDW	9.00E-08			1	KVES82	NORWAY
PHENOL	SW	7.00E-05			1	SCHO81	NORWAY
	SW	2.00E-05			1	SCHO81	NORWAY
	SW	3.00E-05			1	SCHO81	NORWAY
	SW	7.90E-03			1	SCHO81	NORWAY
	SW	2.00E-05			1	SCHO81	NORWAY
	SW	1.00E-05			1	SCHO81	NORWAY
	SW			9.50E-02		WILS83	ARIZONA
PHENOL, 2,3,4,5-TETRACHLORO-	SW			1.40E-04		WEGM79	NETHERLANDS
PHENOL, 2,3,4,6-TETRACHLORO-	SW	6.00E-05		1.60E-04		WEGM79	NETHERLANDS
	SW		5.00E-05	2.30E-04		WEGM79	NETHERLANDS
	SW		7.00E-05	3.30E-04		WEGM79	NETHERLANDS
	SW		7.00E-05	2.80E-04		WEGM79	NETHERLANDS
	SW		1.10E-04	3.30E-04		WEGM79	NETHERLANDS
	SW		5.00E-05	2.40E-04		WEGM79	NETHERLANDS
	SW			1.10E-04		WEGM79	NETHERLANDS
	SW		6.00E-05	2.30E-04		WEGM79	NETHERLANDS
	SW		1.40E-04	3.80E-04		WEGM79	NETHERLANDS
	SW		8.00E-05	5.60E-04		WEGM79	NETHERLANDS
	SW		4.00E-05	9.00E-05		WEGM79	NETHERLANDS
PHENOL, 2,3,4-TRICHLORO-	SW			2.10E-04		WEGM79	NETHERLANDS
PHENOL, 2,3,5,6-TETRACHLORO-	SW			6.00E-05		WEGM79	NETHERLANDS
	SW			3.00E-05		WEGM79	NETHERLANDS
	SW		3.00E-05	1.00E-04		WEGM79	NETHERLANDS
	SW			3.00E-05		WEGM79	NETHERLANDS
	SW		2.00E-05	1.10E-04		WEGM79	NETHERLANDS
	SW			4.00E-05		WEGM79	NETHERLANDS
	SW		2.00E-05	1.00E-04		WEGM79	NETHERLANDS
	SW			6.00E-05		WEGM79	NETHERLANDS
	SW		3.00E-05	1.70E-04		WEGM79	NETHERLANDS
	SW			4.00E-05		WEGM79	NETHERLANDS
PHENOL, 2,3,5-TRICHLORO-	SW			1.80E-04		WEGM79	NETHERLANDS
PHENOL, 2,3,6-TRICHLORO-	SW			5.00E-05		WEGM79	NETHERLANDS
	SW			1.10E-04		WEGM79	NETHERLANDS
PHENOL, 2,3-DICHLORO-	SW			8.60E-04		WEGM79	NETHERLANDS
	SW			7.20E-04	1	WEGM79	NETHERLANDS
PHENOL, 2,4,5-TRICHLORO-	SW			8.00E-05		WEGM79	NETHERLANDS
	SW			2.80E-04		WEGM79	NETHERLANDS
	SW		9.00E-05	5.10E-04		WEGM79	NETHERLANDS
	SW			2.20E-04		WEGM79	NETHERLANDS
	SW		1.50E-04	6.40E-04		WEGM79	NETHERLANDS
	SW			7.00E-05		WEGM79	NETHERLANDS
	SW			9.00E-05		WEGM79	NETHERLANDS
	SW			4.00E-05		WEGM79	NETHERLANDS
	SW		1.50E-04	6.10E-04		WEGM79	NETHERLANDS
	SW			6.60E-04		WEGM79	NETHERLANDS
	SW			5.00E-05		WEGM79	NETHERLANDS

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
PHENOL, 2,4,6-TRICHLORO-	SW			5.00E-05		WEGM79	NETHERLANDS
	SW			5.00E-05		WEGM79	NETHERLANDS
	SW		1.20E-04	2.70E-04		WEGM79	NETHERLANDS
	SW		1.50E-04	3.70E-04		WEGM79	NETHERLANDS
	SW		1.80E-04	3.50E-04		WEGM79	NETHERLANDS
	SW		1.60E-04	3.70E-04		WEGM79	NETHERLANDS
	SW			1.20E-04		WEGM79	NETHERLANDS
	SW			4.00E-05		WEGM79	NETHERLANDS
	SW		1.90E-04	2.50E-03		WEGM79	NETHERLANDS
	SW		1.80E-04	5.10E-04		WEGM79	NETHERLANDS
	SW		3.00E-05	2.60E-04		WEGM79	NETHERLANDS
PHENOL, 2,4-DICHLORO-	SW			5.90E-04		WEGM79	NETHERLANDS
	SW			3.50E-04		WEGM79	NETHERLANDS
PHENOL, 2,5-DICHLORO-	SW			2.90E-04		WEGM79	NETHERLANDS
	SW			2.60E-04		WEGM79	NETHERLANDS
PHENOL, 2,6-DICHLORO-	SW			1.90E-04		WEGM79	NETHERLANDS
	SW			6.00E-05		WEGM79	NETHERLANDS
	SW		3.00E-05	2.50E-04		WEGM79	NETHERLANDS
	SW			2.50E-04		WEGM79	NETHERLANDS
	SW		1.20E-04	3.30E-04		WEGM79	NETHERLANDS
	SW			6.00E-05		WEGM79	NETHERLANDS
	SW		1.50E-04	4.50E-04		WEGM79	NETHERLANDS
	SW		1.00E-04	4.30E-04		WEGM79	NETHERLANDS
	SW			2.50E-04		WEGM79	NETHERLANDS
PHENOL, 2-CHLORO-	SW			2.30E-03		WEGM79	NETHERLANDS
PHENOL, 3,4,5-TRICHLORO-	SW			7.00E-05		WEGM79	NETHERLANDS
	SW			3.70E-04		WEGM79	NETHERLANDS
PHENOL, 3,4-DICHLORO-	SW			3.20E-04		WEGM79	NETHERLANDS
	SW			2.30E-04		WEGM79	NETHERLANDS
PHENOL, 3,5-DICHLORO-	SW			5.20E-04		WEGM79	NETHERLANDS
	SW			7.70E-04		WEGM79	NETHERLANDS
PHENOL, 4-CHLORO-	SW			3.90E-03		WEGM79	NETHERLANDS
	SW			3.90E-03	1	WEGM79	NETHERLANDS
PHENOL, M-CHLORO-	SW			6.00E-03		WEGM79	NETHERLANDS
PHENOL, PENTACHLORO-	SW	1.90E-03				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN
	SW		3.80E-04	3.90E-03		WEGM79	NETHERLANDS
	SW		7.90E-04	8.90E-03		WEGM79	NETHERLANDS
	SW		4.90E-04	2.60E-03		WEGM79	NETHERLANDS
	SW		1.00E-03	9.60E-03		WEGM79	NETHERLANDS
	SW		5.50E-04	2.00E-03		WEGM79	NETHERLANDS
	SW		1.00E-03	1.00E-02		WEGM79	NETHERLANDS
	SW		3.20E-04	1.40E-03		WEGM79	NETHERLANDS
	SW		7.80E-04	1.00E-04		WEGM79	NETHERLANDS
	SW		7.30E-04	2.40E-03		WEGM79	NETHERLANDS
	SW		6.80E-04	1.00E-03		WEGM79	NETHERLANDS
PHTHALATE, BIS (2-ETHYLHEXYL)	SW	1.20E-02				COTR83	UNITED STATES
	SW			1.00E-01		WILS83	ARIZONA
	GW	1.70E-01				EPA81	UNITED STATES, NY
PHTHALATE, BUTYLBENZYL	GW	3.80E-02				EPA81	UNITED STATES, NY
PHTHALIC ACID	SW	1.90E-02				MATS77	JAPAN
	SW	1.90E-03				MATS77	JAPAN
PHTHALATE, DI-N-BUTYL	SW	1.00E-03				COTR83	UNITED STATES
	GW	4.70E-01				EPA81	UNITED STATES, NY

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
PHTHLATE, DIETHYL	GW	4.60E-03				EPA81	UNITED STATES, NY
POLYCHLORINATED BIPHENYLS	SW	4.20E-05			1	GALA81	ITALY, RIVER
	SW			7.70E-07	16	AHNO75	GOTA RIVER
	SW	2.25E-06			1	BURN82	FRANCE
	SW	2.55E-06			1	BURN82	FRANCE
	SW	1.38E-06			1	BURN82	FRANCE
	SW	8.00E-07			1	BURN82	FRANCE
	SW	6.60E-07			1	BURN82	FRANCE
	SW	4.00E-07			1	BURN82	FRANCE
	SW	1.00E-06			1	BURN82	FRANCE
	GW	1.00E-05			1	ELZA83	EGYPT
	GW	2.00E-05			1	ELZA83	EGYPT
	GW	8.00E-05			1	ELZA83	EGYPT
	GW	2.00E-05			1	ELZA83	EGYPT
	GW	2.00E-05			1	ELZA83	EGYPT
	GW	1.00E-05			1	ELZA83	EGYPT
	GW	2.00E-05			1	ELZA83	EGYPT
	GW	1.00E-05			1	ELZA83	EGYPT
	SW		1.35E-04	3.80E-04	20	PUCC80	ITALY
	SW	5.00E-03			1	SCHO81	NORWAY
	SW	1.80E-03			1	SCHO81	NORWAY
	SW	3.10E-03			1	SCHO81	NORWAY
	SW	4.40E-03			1	SCHO81	NORWAY
	SW	2.90E-03			1	SCHO81	NORWAY
	SW	4.60E-03			1	SCHO81	NORWAY
	SW	5.00E-08			1	TANA83	ANTARCTICA
PROPANE, 1,2-DICHLORO-	FDW		1.20E-03	1.40E-03	321	WEST84	UNITED STATES
	FDW		7.00E-04	1.80E-02	158	WEST84	UNITED STATES
	FDW		7.50E-04	7.50E-04	280	WEST84	UNITED STATES
	FDW		9.60E-04	2.10E-02	186	WEST84	UNITED STATES
	SW			4.40E-04	98	KAIS83	CANADA, ONTARIO
	SW			5.50E-05	17	KAIS83	UNITED STATES, NY
PYRENE	FDW	3.00E-07				BENO79	CANADA
	FDW	4.00E-07				BENO79	CANADA
	FDW	4.00E-07				BENO79	CANADA
	FDW	4.00E-07				BENO79	CANADA
	FDW	3.10E-07			1	KVES82	DENMARK
	FDW	8.50E-06			1	KVES82	DENMARK
	FDW	1.20E-05			1	KVES82	FINLAND
	FDW	7.20E-07			1	KVES82	NORWAY
	SW	1.20E-04			1	MATS77	JAPAN
	SW	2.00E-05			1	MATS77	JAPAN
	SW	4.00E-05			1	MATS77	JAPAN
	SW	9.00E-05			1	MATS77	JAPAN
	SW	5.40E-05			1	OGUR75	JAPAN
	SW	3.20E-05			1	OGUR75	JAPAN
	FDW	1.80E-06				BENO79	CANADA, E ONTARIO
	FDW	1.70E-06				BENO79	CANADA, E ONTARIO
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-06				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO
	FDW	2.00E-07				BENO79	CANADA, E ONTARIO
	FDW	1.00E-07				BENO79	CANADA, E ONTARIO
	FDW	5.00E-07				BENO79	CANADA, E ONTARIO

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	FDW	3.00E-07				BENO79	CANADA, E ONTARIO
PYRENE, 1-METHYL-	FDW	2.40E-06			1	KVES82	DENMARK
	FDW	1.90E-07			1	KVES82	FINLAND
	FDW	4.00E-08			1	KVES82	SWEDEN
PYRENE, 2-METHYL-	FDW	4.80E-06			1	KVES82	DENMARK
	FDW	2.40E-07			1	KVES82	FINLAND
	FDW	1.00E-07			1	KVES82	SWEDEN
PYRENE, 4-METHYL-	FDW	3.20E-06			1	KVES82	DENMARK
	FDW	3.10E-07			1	KVES82	FINLAND
SYRINGIC ACID	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN
	SW	1.90E-05				MATS77	JAPAN
TOLUENE	SW	3.10E-02				COTR83	UNITED STATES
	SW	3.00E-04			1	TRUS80	ENGLAND
	SW	6.00E-04			1	TRUS80	AUSTRALIA
	SW	1.20E-03			1	TRUS80	BRAZIL
	SW	7.00E-04			1	TRUS80	CHINA
	SW	1.10E-03			1	TRUS80	EGYPT
	SW	2.30E-03			1	TRUS80	NICARAGUA
	SW	7.00E-04			1	TRUS80	PERU
	SW	1.50E-03			1	TRUS80	PHILIPPINES
	SW	5.00E-04			1	TRUS80	PHILIPPINES
	GW	7.00E-04			1	TRUS80	TAIWAN
	SW	1.40E-03			1	TRUS80	THAILAND
	SW	9.00E-04			1	TRUS80	VENEZUELA
	FDW		6.70E-04	7.90E-04	321	WEST84	UNITED STATES
	FDW		1.50E-03	1.50E-03	158	WEST84	UNITED STATES
	FDW		6.20E-04	8.50E-04	280	WEST84	UNITED STATES
	FDW		2.60E-03	2.90E-03	186	WEST84	UNITED STATES
	FDW			3.00E-04	20	ZOET80	NETHERLANDS
	GW	3.00E-03			1	VAND81	NETHERLANDS
	GW	3.00E-01			1	VAND81	NETHERLANDS
	GW	1.00E-03			1	VAND81	NETHERLANDS
	GW	1.00E-01			1	VAND81	NETHERLANDS
	GW	1.00E-02				EPA81	UNITED STATES, NY
TOLUENE, O-CHLORO-	FDW		2.40E-03	2.40E-03	158	WEST84	UNITED STATES
TOLUIDINE, CHLORO-	SW	7.00E-04				MEIJ76	NETHERLANDS
	SW	2.00E-03				MEIJ76	NETHERLANDS
	SW	5.00E-04				MEIJ76	NETHERLANDS
TOLUIDINES, ETHYL-	SW	5.27E+03				MEIJ76	NETHERLANDS
	SW	5.26E+03				MEIJ76	NETHERLANDS
	SW	1.30E-03				MEIJ76	NETHERLANDS
TOTAL THM	SW	2.50E-02			1	ROOK82	NETHERLANDS
	SW	3.10E-02			1	ROOK82	NETHERLANDS
	SW	2.00E-02			1	ROOK82	NETHERLANDS
	SW	9.00E-03			1	ROOK82	NETHERLANDS
TRIMESIC ACID	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN

Table D-I. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
TRISODIUM NITRILOTRIACETATE	SW	2.80E-02		5.10E-02		WOOD79	CANADA
	SW	3.80E-02		1.75E-01		WOOD79	CANADA
	SW	3.10E-02		5.90E-02		WOOD79	CANADA
	SW	3.30E-02		1.18E-01		WOOD79	CANADA
	SW	1.90E-02		5.50E-02		WOOD79	CANADA
	SW	2.20E-02		2.83E-01		WOOD79	CANADA
	SW	1.90E-02		6.20E-02		WOOD79	CANADA
	SW	3.70E-02		1.24E-01		WOOD79	CANADA
	SW	3.00E-03		3.10E-02		WOOD79	CANADA
	SW	1.00E-03		2.00E-02		WOOD79	CANADA
	SW	3.00E-03		3.10E-02		WOOD79	CANADA
	SW	1.00E-03		2.60E-02		WOOD79	CANADA
	SW	5.00E-03		8.80E-02		WOOD79	CANADA
	SW	2.00E-03		1.90E-02		WOOD79	CANADA
	SW	3.10E-02		1.39E-01		WOOD79	CANADA
	SW	5.40E-02		4.04E-01		WOOD79	CANADA
	SW	5.00E-03		3.60E-02		WOOD79	CANADA
	SW	7.00E-03		5.90E-02		WOOD79	CANADA
	SW	5.00E-03		2.00E-02		WOOD79	CANADA
	SW	1.30E-02		4.40E-02		WOOD79	CANADA
	SW	1.00E-03		2.69E-01		WOOD79	CANADA
	SW	8.00E-03		9.20E-02		WOOD79	CANADA
	SW	3.00E-02		1.01E+00		WOOD79	CANADA
	SW	3.00E-03		2.40E-02		WOOD79	CANADA
	SW	3.00E-03		3.00E-02		WOOD79	CANADA
	SW	5.00E-04		1.60E-02		WOOD79	CANADA
	SW	4.00E-03		2.60E-02		WOOD79	CANADA
	SW	3.00E-03		5.90E-02		WOOD79	CANADA
	SW	2.00E-03		3.40E-02		WOOD79	CANADA
	SW	1.70E-02		8.30E-02		WOOD79	CANADA
	SW	2.20E-02		8.70E-02		WOOD79	CANADA
	SW	4.00E-03		5.00E-02		WOOD79	CANADA
	SW	4.00E-03		4.70E-02		WOOD79	CANADA
	SW	6.10E-02		3.40E-01		WOOD79	CANADA
	SW	6.40E-02		9.42E-01		WOOD79	CANADA
	SW	9.00E-03		3.20E-02		WOOD79	CANADA
	SW	1.60E-02		3.20E-02		WOOD79	CANADA
	SW	3.00E-02		1.41E-01		WOOD79	CANADA
	SW	1.23E-01		7.06E-01		WOOD79	CANADA
	SW	4.00E-03		1.90E-01		WOOD79	CANADA
	SW	4.00E-03		3.10E-02		WOOD79	CANADA
	SW	1.50E-02		2.90E-01		WOOD79	CANADA
	SW	1.03E-01		2.56E-01		WOOD79	CANADA
	SW	4.00E-03		4.70E-02		WOOD79	CANADA
	SW	8.00E-03		1.20E-01		WOOD79	CANADA
	SW	3.00E-03		1.01E-01		WOOD79	CANADA
	SW	2.80E-02		1.80E-01		WOOD79	CANADA
	SW	6.30E-02		3.09E-01		WOOD79	CANADA
	SW	1.20E-02		2.56E-01		WOOD79	CANADA
	SW	9.12E-01		3.36E+00		WOOD79	CANADA
	SW	5.00E-03		1.10E-01		WOOD79	CANADA
	SW	3.00E-03		2.00E-02		WOOD79	CANADA
UREA	SW			1.50E-01	22	BERM74	ISRAEL
VANILLIC ACID	SW	1.90E-06				MATS77	JAPAN
	SW	1.90E-04				MATS77	JAPAN

Table D-1. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	NO. SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
XYLENE	SW	1.90E-05				MATS77	JAPAN
	FDW		4.40E-04	2.50E-03	321	WEST84	UNITED STATES
	FDW		3.40E-04	5.90E-04	280	WEST84	UNITED STATES
	FDW		5.90E-04	9.10E-04	186	WEST84	UNITED STATES
	GW	1.00E-03			1	VAND81	NETHERLANDS
	GW	1.00E-01			1	VAND81	NETHERLANDS
	GW	6.00E-01			1	VAND81	NETHERLANDS
	GW	4.00E-01			1	VAND81	NETHERLANDS

Table D-2. Salt-water concentration data for organic substances other than pesticides.

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
AROCLOR 1254	SALT	9.40E-06			1	SCUR75	NE PACIFIC
	SALT	6.10E-06			1	SCUR75	NE PACIFIC
	SALT	4.20E-06			1	SCUR75	NE PACIFIC
	SALT	1.03E-05			1	SCUR75	NE PACIFIC
	SALT	2.90E-06			1	SCUR75	NE PACIFIC
	SALT	2.30E-06			1	SCUR75	NE PACIFIC
	SALT	3.00E-06			1	SCUR75	NE PACIFIC
	SALT	9.60E-06			1	SCUR75	NE PACIFIC
	SALT	7.50E-06			1	SCUR75	NE PACIFIC
	SALT	7.20E-06			1	SCUR75	NE PACIFIC
	SALT	7.70E-06			1	SCUR75	NE PACIFIC
	SALT	9.50E-06			1	SCUR75	NE PACIFIC
	SALT	1.40E-05			1	SCUR75	NE PACIFIC
	SALT	3.56E-05			1	SCUR75	NE PACIFIC
BENZALDEHYDE	SALT			1.03E-05		SAUE81	GULF OF MEXICO
	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT	3.08E-06			1	SAUE81	GULF OF MEXICO
	SALT			1.54E-05		SAUE81	GULF OF MEXICO
	SALT			1.03E-05	3	SAUE81	GULF OF MEXICO
BENZENE	SALT	1.58E-05			1	SAUE78	GULF OF MEXICO
	SALT	1.53E-05			1	SAUE78	GULF OF MEXICO
	SALT	1.01E-04			1	SAUE78	GULF OF MEXICO
	SALT	1.74E-05			1	SAUE78	GULF OF MEXICO
	SALT	9.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.25E-05			1	SAUE78	GULF OF MEXICO
	SALT	5.00E-05			1	SAUE78	GULF OF MEXICO
	SALT	3.11E-05			1	SAUE78	GULF OF MEXICO
	SALT			1.54E-05		SAUE81	GULF OF MEXICO
	SALT	6.15E-06			1	SAUE81	GULF OF MEXICO
	SALT	5.13E-05			1	SAUE81	GULF OF MEXICO
	SALT			1.79E-04		SAUE81	GULF OF MEXICO
	SALT			1.54E-05	3	SAUE81	GULF OF MEXICO
BENZENE, 1,2-DICHLORO-	SALT	2.05E-06			1	SAUE81	GULF OF MEXICO
	SALT			1.03E-05		SAUE81	GULF OF MEXICO
BENZENE, ETHYL-	SALT	6.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.80E-06			1	SAUE78	GULF OF MEXICO
	SALT	8.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	4.40E-06			1	SAUE78	GULF OF MEXICO
	SALT	4.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	4.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.10E-06			1	SAUE78	GULF OF MEXICO
	SALT			5.13E-06		SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
	SALT	7.18E-06			1	SAUE81	GULF OF MEXICO
	SALT			1.54E-05		SAUE81	GULF OF MEXICO
	SALT			5.13E-06	3	SAUE81	GULF OF MEXICO
BUTADIENE, HEXACHLORO-	SALT	3.08E-06			1	SAUE81	GULF OF MEXICO
	SALT			1.54E-05		SAUE81	GULF OF MEXICO
	SALT			3.00E-05		PEAR75	THAMES RIVER

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
CYCLOHEXANE	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT			2.05E-05		SAUE81	GULF OF MEXICO
CYCLOHEXANE, ETHYL-	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT			1.03E-05		SAUE81	GULF OF MEXICO
	SALT			5.13E-06	3	SAUE81	GULF OF MEXICO
CYCLOHEXANE, METHYL-	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT			2.56E-05		SAUE81	GULF OF MEXICO
	SALT			2.05E-06	3	SAUE81	GULF OF MEXICO
DECANAL	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
DECANE	SALT	9.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.00E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.40E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.60E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.30E-06			1	SAUE78	GULF OF MEXICO
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
	SALT	2.05E-06			1	SAUE81	GULF OF MEXICO
DODECANE	SALT	5.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.20E-06			1	SAUE78	GULF OF MEXICO
	SALT	5.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	3.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	8.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	9.80E-06			1	SAUE78	GULF OF MEXICO
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT			5.13E-06		SAUE81	GULF OF MEXICO
ETHANE	SALT	3.00E-07			1	SAUE80	CARIBBEAN SEA
ETHANE, 1,1,1-TRICHLORO-	SALT	2.50E-04		3.30E-03		PEAR75	THAMES RIVER
ETHANE, 1,2-DICHLORO-	SALT	5.13E-05			1	SAUE81	GULF OF MEXICO
	SALT			2.15E-04		SAUE81	GULF OF MEXICO
ETHENE	SALT	3.70E-06			1	SAUE80	CARIBBEAN SEA
	SALT	4.40E-06			1	SAUE80	CARIBBEAN SEA
	SALT	4.70E-06			1	SAUE80	CARIBBEAN SEA
	SALT	4.40E-06			1	SAUE80	CARIBBEAN SEA
ETHENE, TETRACHLORO-	SALT	1.20E-04		2.60E-03		PEAR75	THAMES RIVER
	SALT			2.60E-03	1	CORR77	NORTH SEA
	SALT			4.10E-05		SAUE81	GULF OF MEXICO
ETHENE, TRICHLORO-	SALT			3.60E-03	1	CORR77	NORTH SEA
	SALT	1.03E-05			1	SAUE81	GULF OF MEXICO
	SALT			5.13E-05		SAUE81	GULF OF MEXICO
	SALT	3.00E-04		3.60E-03		PEAR75	THAMES RIVER
ETHER, DIPHENYL	SALT	9.00E-06				ADDI77	ATLANTIC OCEAN
	SALT	5.40E-05				ADDI77	ATLANTIC OCEAN
	SALT	1.50E-05				ADDI77	ATLANTIC OCEAN
	SALT	3.20E-05				ADDI77	ATLANTIC OCEAN
	SALT	1.79E-04				ADDI77	ATLANTIC OCEAN
	SALT	2.60E-05				ADDI77	ATLANTIC OCEAN
	SALT	1.03E-04				ADDI77	ATLANTIC OCEAN
	SALT	2.40E-05				ADDI77	ATLANTIC OCEAN
HEPTANAL	SALT	7.18E-06			1	GSCH80	PACIFIC OCEAN
	SALT	1.13E-05			1	GSCH80	PACIFIC OCEAN
	SALT	4.10E-06			1	GSCH80	PACIFIC OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	1.54E-05			1	GSCH80	PACIFIC OCEAN
	SALT	1.23E-05			1	GSCH80	PACIFIC OCEAN
	SALT	1.95E-05			1	GSCH80	PACIFIC OCEAN
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
HEPTANE	SALT	4.10E-06			1	SAUE78	GULF OF MEXICO
	SALT	4.00E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.40E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.20E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.30E-06			1	SAUE78	GULF OF MEXICO
	SALT			5.13E-06		SAUE81	GULF OF MEXICO
HEXANAL	SALT			2.05E-06		SAUE81	GULF OF MEXICO
HEXANE	SALT	5.10E-06			1	SAUE78	GULF OF MEXICO
	SALT	6.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.40E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	7.80E-06			1	SAUE78	GULF OF MEXICO
HYDROCARBONS	SALT	3.40E-02			1	LAW83	BALTIC SEA
	SALT	1.30E-01			1	LAW83	BALTIC SEA
	SALT	2.00E-03			1	LAW83	BALTIC SEA
LIMONENE	SALT	4.10E-05			1	SAUE81	GULF OF MEXICO
	SALT	7.18E-06			1	SAUE81	GULF OF MEXICO
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
METHANE	SALT	4.35E-05			1	SAUE80	CARIBBEAN SEA
	SALT	6.64E-05			1	SAUE80	CARIBBEAN SEA
	SALT	5.08E-05			1	SAUE80	CARIBBEAN SEA
	SALT	3.94E-05			1	SAUE80	CARIBBEAN SEA
METHANE, TETRACHLORO-	SALT	2.50E-04		2.40E-03		PEAR75	THAMES RIVER
METHANE, TRICHLORO-	SALT	4.10E-05			1	SAUE81	GULF OF MEXICO
	SALT			2.05E-04		SAUE81	GULF OF MEXICO
	SALT			1.00E-03		PEAR75	THAMES RIVER
NAPHTHALENE	SALT	2.05E-06			1	SAUE81	GULF OF MEXICO
	SALT	3.08E-06			1	SAUE81	GULF OF MEXICO
	SALT			5.13E-06		SAUE81	GULF OF MEXICO
NONANE	SALT	2.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	9.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	2.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	8.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	2.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	9.00E-07			1	SAUE78	GULF OF MEXICO
	SALT			2.05E-06		SAUE81	GULF OF MEXICO
	SALT			3.08E-06		SAUE81	GULF OF MEXICO
	SALT			2.05E-06	3	SAUE81	GULF OF MEXICO
O-XYLENE	SALT	3.00E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.10E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.00E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.60E-06			1	SAUE78	GULF OF MEXICO
	SALT	6.00E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.01E-05			1	SAUE78	GULF OF MEXICO
	SALT	2.30E-06			1	SAUE78	GULF OF MEXICO
	SALT			1.03E-05		SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	1.54E-05			1	SAUE81	GULF OF MEXICO
	SALT			3.07E-05		SAUE81	GULF OF MEXICO
	SALT			1.03E-05	3	SAUE81	GULF OF MEXICO
OCTANE	SALT	6.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.90E-06			1	SAUE78	GULF OF MEXICO
	SALT	8.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	3.20E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.00E-07			1	SAUE78	GULF OF MEXICO
	SALT			3.08E-06	3	SAUE81	GULF OF MEXICO
PENTADECANE	SALT	2.36E-05			1	GSCH80	PACIFIC OCEAN
	SALT	1.13E-05			1	GSCH80	PACIFIC OCEAN
	SALT	5.13E-06			1	GSCH80	PACIFIC OCEAN
	SALT	2.56E-05			1	GSCH80	PACIFIC OCEAN
	SALT	1.84E-05			1	GSCH80	PACIFIC OCEAN
	SALT	5.84E-05			1	GSCH80	PACIFIC OCEAN
	SALT			1.13E-04		SAUE81	GULF OF MEXICO
	SALT	1.03E-04			1	SAUE81	GULF OF MEXICO
	SALT	2.05E-05			1	SAUE81	GULF OF MEXICO
	SALT			2.56E-05		SAUE81	GULF OF MEXICO
	SALT			1.13E-04	3	SAUE81	GULF OF MEXICO
PETROLEUM HYDROCARBONS	SALT	3.73E-03		3.52E-02	84	ABOU80	MEDITERRANEAN SEA
	SALT	2.80E-02			1	FOND80	ARABIAN SEA
	SALT	2.48E-02			1	FOND80	ARABIAN SEA
	SALT	3.65E-02			1	FOND80	ARABIAN SEA
	SALT	2.43E-02			1	FOND80	ARABIAN SEA
	SALT	2.88E-02			1	FOND80	ARABIAN SEA
	SALT	2.65E-02			1	FOND80	ARABIAN SEA
	SALT	2.28E-02			1	FOND80	ARABIAN SEA
	SALT	2.70E-02			1	FOND80	ARABIAN SEA
	SALT	2.70E-02			1	FOND80	ARABIAN SEA
	SALT	1.68E-02			1	FOND80	ARABIAN SEA
	SALT	2.15E-02			1	FOND80	ARABIAN SEA
	SALT	2.33E-02			1	FOND80	ARABIAN SEA
	SALT	2.55E-02			1	FOND80	ARABIAN SEA
	SALT	2.48E-02			1	FOND80	ARABIAN SEA
	SALT	2.60E-02			1	FOND80	ARABIAN SEA
	SALT	3.38E-02			1	FOND80	ARABIAN SEA
	SALT	4.15E-02			1	FOND80	ARABIAN SEA
	SALT	3.98E-02			1	FOND80	ARABIAN SEA
	SALT	4.20E-02			1	FOND80	ARABIAN SEA
	SALT	3.68E-02			1	FOND80	ARABIAN SEA
	SALT	4.28E-02			1	FOND80	ARABIAN SEA
	SALT	4.25E-02			1	FOND80	ARABIAN SEA
	SALT	3.83E-02			1	FOND80	ARABIAN SEA
	SALT	4.25E-02			1	FOND80	ARABIAN SEA
	SALT	3.00E-03			1	LAW81	NORTH SEA
	SALT	7.00E-03			1	LAW81	NORTH SEA
	SALT	2.60E-03			1	LAW81	NORTH SEA
	SALT	2.80E-03			1	LAW81	NORTH SEA
	SALT	2.10E-03			1	LAW81	NORTH SEA
	SALT	2.10E-03			1	LAW81	NORTH SEA
	SALT	2.70E-03			1	LAW81	NORTH SEA
	SALT	1.50E-03			1	LAW81	NORTH SEA
	SALT	1.50E-03			1	LAW81	NORTH SEA

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	1.30E-03			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	1.50E-03			1	LAW81	NORTH SEA
	SALT	1.50E-03			1	LAW81	NORTH SEA
	SALT	4.90E-03			1	LAW81	NORTH SEA
	SALT	7.70E-03			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	6.40E-03			1	LAW81	NORTH SEA
	SALT	2.60E-03			1	LAW81	NORTH SEA
	SALT	1.10E-03			1	LAW81	NORTH SEA
	SALT	1.30E-03			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	2.70E-03			1	LAW81	NORTH SEA
	SALT	2.50E-03			1	LAW81	NORTH SEA
	SALT	1.30E-02			1	LAW81	NORTH SEA
	SALT	3.10E-03			1	LAW81	NORTH SEA
	SALT	1.20E-02			1	LAW81	NORTH SEA
	SALT	3.50E-03			1	LAW81	NORTH SEA
	SALT	6.40E-03			1	LAW81	NORTH SEA
	SALT	7.40E-02			1	LAW81	NORTH SEA
	SALT	5.20E-03			1	LAW81	NORTH SEA
	SALT	2.70E-03			1	LAW81	NORTH SEA
	SALT	4.50E-03			1	LAW81	NORTH SEA
	SALT	2.10E-03			1	LAW81	NORTH SEA
	SALT	2.10E-03			1	LAW81	NORTH SEA
	SALT	4.90E-03			1	LAW81	NORTH SEA
	SALT	5.10E-03			1	LAW81	NORTH SEA
	SALT	1.00E-02			1	LAW81	NORTH SEA
	SALT	1.70E-03			1	LAW81	NORTH SEA
	SALT	1.20E-03			1	LAW81	NORTH SEA
	SALT	1.50E-03			1	LAW81	NORTH SEA
	SALT	3.08E-03		1.44E-02		MIMI80	MEDITERRANEAN SEA
	SALT	6.40E-01				SENG78	ARABIAN SEA
	SALT	5.84E+00				SENG78	ARABIAN SEA
	SALT	2.39E+00				SENG78	ARABIAN SEA
	SALT	1.04E+00				SENG78	ARABIAN SEA
	SALT	1.49E+00				SENG78	ARABIAN SEA
	SALT	2.44E+00				SENG78	ARABIAN SEA
	SALT	1.89E+00				SENG78	ARABIAN SEA
	SALT	1.59E+00				SENG78	ARABIAN SEA
	SALT	5.20E-01				SENG78	ARABIAN SEA
	SALT	1.84E+00				SENG78	ARABIAN SEA
	SALT	8.40E-01				SENG78	ARABIAN SEA
	SALT	2.80E-01				SENG78	ARABIAN SEA
	SALT	4.40E-01				SENG78	ARABIAN SEA
	SALT	1.20E-01				SENG78	ARABIAN SEA
	SALT	1.47E+00				SENG78	ARABIAN SEA
	SALT	1.01E+00				SENG78	ARABIAN SEA
	SALT	6.60E-01				SENG78	ARABIAN SEA
	SALT	7.60E-01				SENG78	ARABIAN SEA
	SALT	6.90E-01				SENG78	ARABIAN SEA
	SALT	3.90E-01				SENG78	ARABIAN SEA
	SALT	2.10E+00				SENG78	ARABIAN SEA

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	7.40E-01				SENG78	ARABIAN SEA
	SALT	1.44E+00				SENG78	ARABIAN SEA
	SALT	1.84E+00				SENG78	ARABIAN SEA
	SALT	1.44E+00				SENG78	ARABIAN SEA
	SALT	6.40E-01				SENG78	ARABIAN SEA
	SALT	5.90E-01				SENG78	ARABIAN SEA
	SALT	1.96E+00				SENG78	ARABIAN SEA
	SALT	5.20E-01				SENG78	ARABIAN SEA
	SALT	8.40E-01				SENG78	ARABIAN SEA
	SALT	8.10E-01				SENG78	ARABIAN SEA
	SALT	8.40E-01				SENG78	ARABIAN SEA
	SALT	4.09E+00				SENG78	ARABIAN SEA
	SALT	9.70E-01				SENG78	ARABIAN SEA
	SALT	2.17E-02		2.65E-02	9	SENG80	ARABIAN SEA
	SALT	2.05E-02		2.69E-02	9	SENG80	ARABIAN SEA
	SALT	8.60E-03		1.88E-02	13	SENG80	ARABIAN SEA
	SALT	1.25E-02		1.81E-02	13	SENG80	ARABIAN SEA
	SALT	2.30E-03		5.20E-03	14	SENG80	ARABIAN SEA
	SALT	1.10E-03		1.40E-03	14	SENG80	ARABIAN SEA
	SALT	3.50E-02			22	TOPG81	ANDAMAN SEA
	SALT	4.90E-02			22	TOPG81	ANDAMAN SEA
	SALT	7.50E-02			22	TOPG81	ANDAMAN SEA
	SALT	6.50E-02			22	TOPG81	ANDAMAN SEA
	SALT	6.10E-02			22	TOPG81	ANDAMAN SEA
	SALT	6.70E-02			22	TOPG81	ANDAMAN SEA
	SALT	8.30E-02			22	TOPG81	ANDAMAN SEA
	SALT	4.00E-02			22	TOPG81	ANDAMAN SEA
	SALT	4.80E-02			22	TOPG81	ANDAMAN SEA
	SALT	5.00E-02			22	TOPG81	ANDAMAN SEA
	SALT	2.80E-02				TOPG81	ANDAMAN SEA
	SALT	4.90E-02				TOPG81	ANDAMAN SEA
	SALT	4.80E-02				TOPG81	ANDAMAN SEA
	SALT	2.90E-02				TOPG81	ANDAMAN SEA
	SALT	4.70E-02				TOPG81	ANDAMAN SEA
	SALT	4.60E-02				TOPG81	ANDAMAN SEA
	SALT	6.90E-02				TOPG81	ANDAMAN SEA
	SALT	4.40E-02				TOPG81	ANDAMAN SEA
	SALT	5.00E-02			22	TOPG81	ANDAMAN SEA
	SALT	6.20E-02			22	TOPG81	ANDAMAN SEA
	SALT	6.40E-02				TOPG81	ANDAMAN SEA
	SALT	3.60E-02				TOPG81	ANDAMAN SEA
	SALT	2.58E-02			12	ZSOL79	ALBORAN SEA
	SALT	6.90E-03			13	ZSOL79	MEDITERRANEAN SEA
	SALT	2.05E-02			6	ZSOL79	MEDITERRANEAN SEA
	SALT	2.49E-02			13	ZSOL79	MEDITERRANEAN SEA
	SALT	1.49E-02			4	ZSOL79	MEDITERRANEAN SEA
	SALT	4.80E-03			7	ZSOL79	MEDITERRANEAN SEA
	SALT	2.50E-03			36	GORD78	BEDORD BASIN
	SALT	1.80E-03			36	GORD78	BEDORD BASIN
	SALT	6.83E-03				CHEU79	CHINA SEA
	SALT	8.68E-03				CHEU79	CHINA SEA
	SALT	1.20E-02				CHEU79	CHINA SEA
	SALT	3.67E-03				CHEU79	CHINA SEA
	SALT	1.16E-02				CHEU79	CHINA SEA
	SALT	3.28E-02			3	SENG81	INDIAN OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	5.10E-02			3	SENG81	INDIAN OCEAN
	SALT	3.45E-02				SENG81	INDIAN OCEAN
	SALT	4.10E-03			1	SENG81	INDIAN OCEAN
	SALT	1.84E-02			4	SENG81	INDIAN OCEAN
	SALT	4.67E-02			3	SENG81	INDIAN OCEAN
	SALT	7.46E-02			4	SENG81	INDIAN OCEAN
	SALT	2.59E-02			4	SENG81	INDIAN OCEAN
	SALT	2.97E-02			4	SENG81	INDIAN OCEAN
	SALT	2.96E-02			4	SENG81	INDIAN OCEAN
	SALT	2.76E-02			4	SENG81	INDIAN OCEAN
	SALT	1.03E-02			1	SENG81	INDIAN OCEAN
	SALT	4.10E-03			1	SENG81	INDIAN OCEAN
	SALT	9.74E-03			1	SENG81	INDIAN OCEAN
	SALT	9.33E-03			1	SENG81	INDIAN OCEAN
	SALT	4.61E-02			1	SENG81	INDIAN OCEAN
	SALT	7.85E-02			1	SENG81	INDIAN OCEAN
	SALT	6.11E-02				SENG81	INDIAN OCEAN
	SALT	3.77E-02			1	SENG81	INDIAN OCEAN
	SALT	4.87E-02			1	SENG81	INDIAN OCEAN
	SALT	1.97E-02			1	SENG81	INDIAN OCEAN
	SALT	7.48E-03			2	SENG81	INDIAN OCEAN
	SALT	8.00E-03			1	SENG81	INDIAN OCEAN
	SALT	5.13E-03			1	SENG81	INDIAN OCEAN
	SALT	1.04E-02			1	SENG81	INDIAN OCEAN
	SALT	9.33E-03			2	SENG81	INDIAN OCEAN
	SALT	5.84E-03			2	SENG81	INDIAN OCEAN
	SALT	6.54E-02			2	SENG81	INDIAN OCEAN
	SALT	2.95E-02			2	SENG81	INDIAN OCEAN
	SALT	1.49E-02			1	SENG81	INDIAN OCEAN
	SALT	9.49E-01			2	SENG81	INDIAN OCEAN
	SALT	8.51E-02			2	SENG81	INDIAN OCEAN
	SALT	1.69E-02			2	SENG81	INDIAN OCEAN
	SALT	1.08E+00			1	SENG81	INDIAN OCEAN
	SALT	1.24E+00			1	SENG81	INDIAN OCEAN
	SALT	2.10E-02			1	SENG81	INDIAN OCEAN
	SALT	3.59E-01			1	SENG81	INDIAN OCEAN
	SALT	2.15E-02			1	SENG81	INDIAN OCEAN
	SALT	5.74E-02			1	SENG81	INDIAN OCEAN
	SALT	4.99E-01			1	SENG81	INDIAN OCEAN
	SALT	1.28E-01			1	SENG81	INDIAN OCEAN
	SALT	4.51E-02			2	SENG81	INDIAN OCEAN
	SALT	5.74E-02			1	SENG81	INDIAN OCEAN
	SALT	4.13E-02			1	SENG81	INDIAN OCEAN
	SALT	6.66E-01			1	SENG81	INDIAN OCEAN
	SALT	7.55E-01			1	SENG81	INDIAN OCEAN
	SALT	2.98E-02			4	SENG81	INDIAN OCEAN
	SALT	2.90E-02			4	SENG81	INDIAN OCEAN
	SALT	4.45E-02			1	SENG81	INDIAN OCEAN
	SALT	3.11E-02			1	SENG81	INDIAN OCEAN
	SALT	2.54E+00			1	SENG81	INDIAN OCEAN
	SALT	2.23E+00			2	SENG81	INDIAN OCEAN
	SALT	5.69E-02			2	SENG81	INDIAN OCEAN
	SALT	2.77E-02			1	SENG81	INDIAN OCEAN
	SALT	2.73E-02			5	SENG81	INDIAN OCEAN
	SALT	3.67E-02			4	SENG81	INDIAN OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	7.69E-02			1	SENG81	INDIAN OCEAN
	SALT	1.03E-02			1	SENG81	INDIAN OCEAN
	SALT	5.13E-02			1	SENG81	INDIAN OCEAN
	SALT	1.85E+00			1	SENG81	INDIAN OCEAN
	SALT	3.06E-02			2	SENG81	INDIAN OCEAN
	SALT	1.85E+00			1	SENG81	INDIAN OCEAN
	SALT	2.36E+00			1	SENG81	INDIAN OCEAN
	SALT	1.33E+00			1	SENG81	INDIAN OCEAN
	SALT	2.02E+00			1	SENG81	INDIAN OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.30E-04				FOGE82	ARCTIC OCEAN
	SALT	1.20E-04				FOGE82	ARCTIC OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.00E-04				FOGE82	ARCTIC OCEAN
	SALT	1.90E-04				FOGE82	ARCTIC OCEAN
	SALT	1.80E-04				FOGE82	ARCTIC OCEAN
	SALT	3.70E-04				FOGE82	ARCTIC OCEAN
	SALT	3.40E-04				FOGE82	ARCTIC OCEAN
	SALT	3.90E-04				FOGE82	ARCTIC OCEAN
	SALT	1.80E-04				FOGE82	ARCTIC OCEAN
	SALT	1.10E-04				FOGE82	ARCTIC OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.00E-07				FOGE82	ARCTIC OCEAN
	SALT	1.30E-04				FOGE82	ARCTIC OCEAN
	SALT	1.50E-04				FOGE82	ARCTIC OCEAN
	SALT	4.00E-07				FOGE82	ARCTIC OCEAN
	SALT	3.00E-07				FOGE82	ARCTIC OCEAN
	SALT	2.00E-07				FOGE82	ARCTIC OCEAN
	SALT	3.00E-07				FOGE82	ARCTIC OCEAN
	SALT	1.00E-07				FOGE82	ARCTIC OCEAN
	SALT	2.00E-07				FOGE82	ARCTIC OCEAN
	SALT	1.00E-07				FOGE82	ARCTIC OCEAN
	SALT	2.00E-07				FOGE82	ARCTIC OCEAN
	SALT	7.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.80E-04				FOGE82	ARCTIC OCEAN
	SALT	3.90E-04				FOGE82	ARCTIC OCEAN
	SALT	5.00E-05				FOGE82	ARCTIC OCEAN
	SALT	6.80E-04				FOGE82	ARCTIC OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	5.00E-05				FOGE82	ARCTIC OCEAN
	SALT	4.40E-04				FOGE82	ARCTIC OCEAN
	SALT	1.10E-04				FOGE82	ARCTIC OCEAN
	SALT	1.10E-04				FOGE82	ARCTIC OCEAN
	SALT	1.40E-04				FOGE82	ARCTIC OCEAN
	SALT	1.20E-04				FOGE82	ARCTIC OCEAN
	SALT	1.00E-04				FOGE82	ARCTIC OCEAN
	SALT	2.60E-04				FOGE82	ARCTIC OCEAN
	SALT	7.00E-05				FOGE82	ARCTIC OCEAN
	SALT	2.90E-04				FOGE82	ARCTIC OCEAN
	SALT	3.30E-04				FOGE82	ARCTIC OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.20E-04				FOGE82	ARCTIC OCEAN
	SALT	1.60E-04				FOGE82	ARCTIC OCEAN
	SALT	1.20E-04				FOGE82	ARCTIC OCEAN
	SALT	1.60E-04				FOGE82	ARCTIC OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	4.50E-04				FOGE82	ARCTIC OCEAN
	SALT	8.00E-05				FOGE82	ARCTIC OCEAN
	SALT	1.50E-04				FOGE82	ARCTIC OCEAN
	SALT	2.70E-04				FOGE82	ARCTIC OCEAN
	SALT	1.50E-04				FOGE82	ARCTIC OCEAN
	SALT	1.80E-04				FOGE82	ARCTIC OCEAN
	SALT	2.60E-04				FOGE82	ARCTIC OCEAN
	SALT	6.00E-05				FOGE82	ARCTIC OCEAN
PHTHALATE, BIS (2-ETHYLHEXYL)	OW	1.30E-04		3.16E-04	10	GIAM78	GULF OF MEXICO
	SALT	8.00E-05		9.70E-05	7	GIAM78	GULF OF MEXICO
	SALT	4.90E-06		6.30E-06	10	GIAM78	US N ATLANTIC
	SALT	7.00E-05		2.25E-04	14	GIAM78	GULF OF MEXICO
PHTHLATE, DI-N-BUTYL	SALT	7.40E-05		2.65E-04	10	GIAM78	GULF OF MEXICO
	SALT	9.30E-05		1.33E-04	7	GIAM78	GULF OF MEXICO
	SALT	9.50E-05		4.71E-04	14	GIAM78	GULF OF MEXICO
POLYCHLORINATED BIPHENYLS	SALT	1.30E-05				WILL75	PACIFIC OCEAN
	SALT	1.20E-05				WILL75	PACIFIC OCEAN
	SALT			8.60E-06		EHRH81	BALTIC SEA
	SALT			6.60E-06		EHRH81	BALTIC SEA
	SALT			8.10E-06		EHRH81	BALTIC SEA
	SALT			4.00E-06		EHRH81	BALTIC SEA
	SALT			1.39E-04		EHRH81	BALTIC SEA
	SALT			5.50E-06		EHRH81	BALTIC SEA
	SALT			2.90E-06		EHRH81	BALTIC SEA
	SALT			3.00E-06		EHRH81	BALTIC SEA
	SALT			1.15E-05		EHRH81	BALTIC SEA
	SALT			9.00E-06		EHRH81	BALTIC SEA
	SALT			6.10E-06		EHRH81	BALTIC SEA
	SALT			1.89E-05		EHRH81	BALTIC SEA
	SALT			3.00E-07		EHRH81	BALTIC SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.50E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	8.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	8.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	9.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	8.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.20E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	5.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.50E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	2.50E-06			1	VILL80	MEDITERRANEAN SEA

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	5.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	4.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	3.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	2.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.00E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.20E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.90E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	4.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.30E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	1.90E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	9.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.20E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	4.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	4.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	5.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	8.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.40E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	6.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	9.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	1.10E-06			1	VILL80	MEDITERRANEAN SEA
	SALT	7.00E-07			1	VILL80	MEDITERRANEAN SEA
	SALT	9.00E-05				WILL75	GULF OF CALIFORNIA
	SALT	8.80E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	6.80E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.50E-04			1	HARV73	N ATLANTIC OCEAN
	SALT	4.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.70E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.90E-05			1	HARV73	N ATLANTIC OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	1.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	1.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	3.60E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	3.00E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	7.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	2.10E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.30E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	5.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	1.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	3.60E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.60E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.50E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	9.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	8.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	2.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.10E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	4.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	4.50E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	5.20E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	4.70E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	4.50E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	7.70E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.00E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	1.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	8.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	3.00E-06			1	HARV73	N ATLANTIC OCEAN
	SALT	9.70E-05			1	HARV73	N ATLANTIC OCEAN
	SALT	3.60E-06				WILL75	PACIFIC OCEAN
	SALT	3.30E-06				WILL75	PACIFIC OCEAN
	SALT	3.50E-06				WILL75	PACIFIC OCEAN
	SALT	5.00E-05				WILL75	PACIFIC OCEAN
	SALT	1.10E-05				WILL75	PACIFIC OCEAN
	SALT	4.90E-06				WILL75	PACIFIC OCEAN
	SALT	1.60E-06				WILL75	PACIFIC OCEAN
	SALT	1.40E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	3.00E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	1.90E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	6.70E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	5.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	2.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	6.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	3.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	3.90E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	4.10E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	1.10E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	7.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	4.00E-06			1	HARV73	S ATLANTIC OCEAN
	SALT	1.30E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	3.50E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	1.00E-05			1	HARV73	S ATLANTIC OCEAN
	SALT	2.40E-05				WILL75	PACIFIC OCEAN
	SALT	1.12E-05			1	BIDL74	SARGASSO SEA
	SALT	3.60E-06			1	BIDL74	SARGASSO SEA

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	4.90E-06			1	BIDL74	SARGASSO SEA
	SALT	8.30E-06			1	BIDL74	SARGASSO SEA
	SALT	1.00E-06			1	BIDL74	SARGASSO SEA
	SALT	1.93E-05			1	BIDL74	SARGASSO SEA
	SALT	3.80E-06			1	BIDL74	SARGASSO SEA
	SALT	1.60E-06			1	BIDL74	SARGASSO SEA
	SALT	5.60E-06			1	BIDL74	SARGASSO SEA
	SALT	1.80E-06			1	BIDL74	SARGASSO SEA
	SALT	5.00E-06			1	BIDL74	SARGASSO SEA
	SALT	8.40E-06			1	BIDL74	SARGASSO SEA
	SALT	1.30E-06		3.80E-05	11	ELDE76	MEDITERRANEAN SEA
	SALT	2.00E-06		8.60E-06	80	ELDE76	MEDITERRANEAN SEA
	SALT	1.60E-06		3.10E-06	10	GIAM78	GULF OF MEXICO
	SALT	1.40E-06		2.80E-06	7	GIAM78	GULF OF MEXICO
	SALT	1.60E-07		2.00E-07	10	GIAM78	US N ATLANTIC
	SALT	2.45E-06		3.30E-06	14	GIAM78	GULF OF MEXICO
	SALT	3.00E-06			1	OSTE77	BALTIC SEA
	SALT	3.00E-07			1	OSTE77	BALTIC SEA
	SALT	4.00E-07			1	OSTE77	BALTIC SEA
	SALT	1.00E-06			1	OSTE77	BALTIC SEA
	SALT	9.20E-07			1	OSTE77	BALTIC SEA
	SALT	7.60E-07			1	OSTE77	BALTIC SEA
	SALT	6.20E-07			1	OSTE77	BALTIC SEA
	SALT	6.50E-07			1	OSTE77	BALTIC SEA
	SALT	3.20E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.70E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	4.00E-07				TANA80	NW PACIFIC OCEAN
	SALT	4.40E-07				TANA80	NW PACIFIC OCEAN
	SALT	5.40E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	4.70E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.80E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	4.20E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.60E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	5.60E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.40E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	5.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.50E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	5.00E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	1.11E-06			1	TANA80	NW PACIFIC OCEAN
	SALT	6.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	7.70E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.40E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.20E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.90E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.40E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.30E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	5.90E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.90E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	2.90E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.70E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.50E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	3.80E-07			1	TANA80	NW PACIFIC OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
TETRADECANE	SALT	2.70E-07			1	TANA80	NW PACIFIC OCEAN
	SALT	5.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	4.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	7.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	7.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	4.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	5.00E-08			1	TANA83	ARCTIC OCEAN
	SALT	7.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	2.20E-06			1	SAUE78	GULF OF MEXICO
	SALT	6.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.70E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.51E-05			1	SAUE78	GULF OF MEXICO
	SALT	7.00E-07			1	SAUE78	GULF OF MEXICO
TOLUENE	SALT			8.20E-06		SAUE81	GULF OF MEXICO
	SALT	5.13E-06			1	SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
	SALT			3.08E-06		SAUE81	GULF OF MEXICO
	SALT			8.20E-06	3	SAUE81	GULF OF MEXICO
	SALT	4.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.24E-05			1	SAUE78	GULF OF MEXICO
	SALT	3.47E-05			1	SAUE78	GULF OF MEXICO
	SALT	2.39E-05			1	SAUE78	GULF OF MEXICO
	SALT	5.90E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.76E-04			1	SAUE78	GULF OF MEXICO
	SALT	2.00E-05			1	SAUE78	GULF OF MEXICO
	SALT	1.36E-05			1	SAUE78	GULF OF MEXICO
TRIDECANE	SALT			1.03E-05		SAUE81	GULF OF MEXICO
	SALT	1.03E-05			1	SAUE81	GULF OF MEXICO
	SALT	3.07E-05			1	SAUE81	GULF OF MEXICO
	SALT			6.15E-05		SAUE81	GULF OF MEXICO
	SALT			1.03E-05	3	SAUE81	GULF OF MEXICO
	SALT	6.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF CF MEXICO
	SALT	3.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	3.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.10E-06			1	SAUE78	GULF OF MEXICO
	SALT	7.40E-06			1	SAUE78	GULF OF MEXICO
UNDECANAL	SALT			2.05E-06		SAUE81	GULF OF MEXICO
	SALT	1.03E-06			1	SAUE81	GULF OF MEXICO
UNDECANE	SALT			1.03E-05		SAUE81	GULF OF MEXICO
	SALT	3.08E-06			1	SAUE81	GULF OF MEXICO
XYLENE	SALT			5.13E-06		SAUE81	GULF OF MEXICO
	SALT	6.00E-07			1	SAUE78	GULF OF MEXICO
	SALT	1.50E-06			1	SAUE78	GULF OF MEXICO
	SALT	3.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.90E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	8.30E-06			1	SAUE78	GULF OF MEXICO
	SALT	1.00E-06			1	SAUE78	GULF OF MEXICO
	SALT			3.08E-06		SAUE81	GULF OF MEXICO
	SALT	6.15E-06			1	GSCH80	PACIFIC OCEAN
	SALT	9.23E-06			1	GSCH80	PACIFIC OCEAN
	SALT	7.18E-06			1	GSCH80	PACIFIC OCEAN
	SALT	6.15E-06			1	GSCH80	PACIFIC OCEAN

Table D-2. (Continued)

SUBSTANCE	TYPE	AVERAGE	MEDIAN	MAXIMUM	# SAMP	REFERENCE	PLACE
		CONCENTRATIONS MG/L					
	SALT	4.10E-06			1	GSCH80	PACIFIC OCEAN
	SALT	6.15E-06			1	GSCH80	PACIFIC OCEAN
	SALT	1.02E-05			1	SAUE78	GULF OF MEXICO
	SALT	5.20E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.00E-05			1	SAUE78	GULF OF MEXICO
	SALT	2.10E-05			1	SAUE78	GULF OF MEXICO
	SALT	2.70E-06			1	SAUE78	GULF OF MEXICO
	SALT	2.44E-05			1	SAUE78	GULF OF MEXICO
	SALT	9.90E-06			1	SAUE78	GULF OF MEXICO
	SALT	9.10E-06			1	SAUE78	GULF OF MEXICO
	SALT			3.07E-05		SAUE81	GULF OF MEXICO
	SALT	9.22E-06			1	SAUE81	GULF OF MEXICO
	SALT	3.59E-05			1	SAUE81	GULF OF MEXICO
	SALT			7.18E-05		SAUE81	GULF OF MEXICO
	SALT			3.07E-05	3	SAUE81	GULF OF MEXICO

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