&EPA User's Manual for EPA's Risk-Screening Environmental Indicators Model: Version 1.02

[1988-1997 TRI Data, Air-Only Model]

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[1988-1997 TRI Data, Air-Only Model]

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ATTENTION USERS OF EPA'S RISK-SCREENING ENVIRONMENTAL INDICATORS CD-ROM!

The current version of the Indicators model is the air-only version, which permits full risk-related modeling for air releases only. All releases and transfers reported to TRI can be viewed from a hazard-based perspective, i.e., pounds can be weighted by toxicity. For releases to media other than air that can be modeled by the Indicators model, the user can view pounds weighted by toxicity and population as well. Although this User's Manual describes some functions that are not implemented in the air-only model, it also provides instruction specific to the use of the current version.

In addition to caveats listed throughout the User's Manual, there are several things to consider when running the current version of the model:

• When installing the Indicators model, please make sure that you sign off of your computer network (e.g., the Novell network), so that the model will be properly installed onto your computer's hard drive.

• Because the current version of the model is restricted to the air modeling results, the full risk-related model results are available only for on-site fugitive and stack air releases; full model results based on releases to other media (e.g., releases to surface water and groundwater) are not available. However, with this version of the model you will be able to look at TRI pounds, modeled pounds, hazard ranking, and subcomponents of the full risk-related model results, e.g., (pounds x toxicity) and (pounds x toxicity x population) for all media.

• If you have a computer with limited memory, please be aware that when running a new query (as described in Chapter 7), it may be difficult or impossible to use other computer applications at the same time. (Windows 95 operating system will allow multi-tasking.)

• We have prepared runs for your convenience. These are described in Chapter 10.

• This version of the model (version 1.02) uses TRI release and transfer information for the time period from 1988 to 1997.

• On-line Help Screens are available in the model, and present much of the information contained in this User's Manual.

• You may have difficulty viewing the results of extremely large queries using the current version of the model. For example, running a query to obtain Indicator scores for each chemical released by each facility and associated state in the database may result in a table that is too large to view or reload in the Indicators model (using the LOAD button), or to use and view within Excel. See section 7.1.4 for more general information about running large queries.

We would appreciate your comments and suggestions on how this User's Manual may be improved upon to aid you, the user. Thank You.

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**INSTALLATION INSTRUCTIONS FOR EPA'S RISK-SCREENING
ENVIRONMENTAL INDICATORS CD-ROM**

System Requirements and Model Run Times

Running the Indicators model directly from the CD requires 12 Mbytes of free hard disk space, Windows 95 or Windows 3.1, and 16 Mbytes of RAM; > 4x CDROM is recommended. All model functions are available using the CD, including 232 pre-run queries. However, when performing new queries, the model runs considerably faster when installed on the hard drive. With all files installed on the hard drive, a query takes between approximately 0.5 and 1.5 hours to run on a Pentium computer. Putting the model on the hard drive requires approximately 330 Mbytes of free hard disk space. To run the model off the CD, with a Pentium computer and Windows 95/98, new queries take 6.5 hours to 8 hours, and are significantly longer if you are using this model with Windows 3.1.

It is important to remove any previous versions of the Risk-Screening Environmental Indicators model from your hard drive before you install this version. Instructions on uninstalling the program are in the **Uninstall** section below.

These instructions assume you are using Windows 95 or 98. If you are using Windows 3.x and need assistance, contact your on-site technical specialist.

Installing the Indicators Model

This installation will allow you to view pre-run queries and browse the various databases that the model uses, including the facility and chemical databases.

Requires about 8 Mbytes of hard disk space.

Before beginning installation: be sure you are not logged on to a LAN and exit all applications.

1) Place the Indicators CD in the CD-ROM drive.

2) Click on the "Start" button and select "Run..." from the pop-up menu.

3) Type x:\oppteim\setup.exe in the "Open:" box, where x is the letter of your CD-ROM drive (usually D: or E:).

4) Follow the instructions indicated by the Install Wizard. The program will be installed in C:\Oppteim. The current version of the model (1.0x) *must* be located in this directory. Do not move it to a sub-directory. Also the contents of the sub-directories Database and User *must not* be moved or the program will not be able to find them. Another folder, C:\Idapi, will be created by the installation program if it did not previously exist.

5) At the end of installation, you can immediately launch the program and begin using the model, or you can exit the installer without launching the program.

Full Installation

If you plan on running queries yourself, you should complete this next step. Running new queries from the CD-ROM will require hours instead of the 20-40 minutes required to run a new query after the database files are copied to the hard drive.

First complete the installation as described above under the "Installing the Indicators Model"

To install the databases needed to run queries:

Requires an additional 305 Mbytes of disk space.

You must copy the contents of the CD's OPPTEIM/Database and OPPTEIM/User folders into the Oppteim/Database and Oppteim/User folders located on the hard drive. To do this follow steps 1 through 13 below. You must also change the IDAPI settings so the program knows where to look for the data files. This is explained in steps 14 through 20.

1) Put the Indicators CD in the CD-ROM drive.

2) Launch Windows Explorer (usually either Start->Windows Explorer or
    Start->Programs->Windows Explorer).

3) Referring to the window on the left side, open up the directory structure for the C: drive: The box to the left of "My Computer" should have a "-", showing all the drives on your computer. If the box has a "+", open the view by clicking on the "+" to change it to a "-", you should then see all the drives on your computer.

4) Right click on the C: drive and select "properties" from the bottom of the pop-up menu. Check the disk's free space. You need 310 MB (megabytes) of free space to complete this part of the installation.

5) The box to the left of C: drive should have a "-", showing all the folders on the c: drive. If the box has a "+", open up the view by clicking on the "+" to change it to a "-", you should then see all the folders on your hard drive.

6) Under your C: drive, find the folder called "Oppteim". The box to the left of it should have a "-", showing the sub-directories "Database" and "User". If the box has a "+", open up the view by clicking on the "+" to change it to a "-", you should then see the sub-directories in this folder.

7) Locate the CD-ROM drive (usually D: or E:). It should show a picture of a drive with a CD on top of it and say "Oppteim (D:)" or "Oppteim (E:)". Open the view of the CD-ROM to show the sub-directories Adobe and Oppteim. Again, do this by clicking on the "+" next to the picture of the drive to change it to a "-".

8) Open the view of Oppteim. You should now see the sub-directories "Database", "Manual", and "User".

9) Click on the "Database" folder. The window on the right should show you the contents of the CD's Oppteim\Database folder. The first few files are:

> BlockGroup.DB
> BlockGroup.PX
> BlockGroup.XGO
> etc...

If you see a different set of files, make sure you are looking at the Oppteim\Database on the CD, not the Oppteim\Database folder on the C: drive.

10) With the CD's Oppteim\Database folder's contents in view in the right-hand window, choose "Select All" from the "Edit" menu near the top left of the screen. All the files in the right-hand window should now be selected.

11) Click on and drag that group of files into the Oppteim\Database folder on the C: drive that you located in step 3) above. You may need to scroll the left-hand window up a bit so that you can see the C:\Oppteim\Database folder. It will take a couple of minutes to copy all the files. It is safe to click "Yes to All" when it asks if you want to replace any files since you are simply re-copying those files from the CD to the hard drive.

[Steps 12 and 13 are optional. If you frequently access the pre-run queries, you should complete these steps. The pre-run queries require about 10 Mbytes of disk space.]

12) Next click on the *CD*'s Oppteim\User folder. The window on the right should show you the file list starting with:
> 97a-c-m.aux
> 97a-c-m.db
> 97a-c-m.px
> 97a-s2-c.aux
> etc...
> If you see a different set of files, make sure you are looking at the Oppteim\User on the CD, not the Oppteim\User folder on the C: drive.

13) Choose "Select All" from the "Edit" menu then click and drag the file group to the Oppteim/User folder on the C: drive. Again, you can safely answer "Yes to All" when asked if you want to replace any files.

You have now completed loading the all the data files from the CD to the hard drive. You now must change the IDAPI settings so that the program knows where to look for the data files.

14) Using Windows Explorer, locate the Idapi folder on your hard drive. You should see it in the left-hand window a few folders above the Oppteim folder. Click on it to view its contents in the right-hand window.

15) Double click on Bdecfg.exe in the right-hand window to launch the BDE configuration utility.

16) At the bottom of the BDE Configuration Utility screen, look for the tab that says "Aliases" and click on it.

17) Under "Alias Names", click on the "EIMDATA" alias.

18) Under "Parameters", select the first letter of the "Path", it should be the same letter as your CD-ROM drive, probably D or E. Change this letter to a "C". The path should now read "C:\OPPTEIM\Database".

19) Save the change you have just made by choosing "Save" from the "File" menu.

20) Exit the BDE Configuration Utility by choosing "Exit" from the "File" menu.

You may now exit Windows Explorer (choose "Exit" from the "File" menu).

You are now set up to use all the capabilities of the Risk-Screening Environmental Indicators.

To launch the Indicators Model:

Click on Start->Programs->Oppteim->Oppteim

The Indicators program will start and automatically display the Help file. There is extensive help available in that file. The Help file is context-sensitive, so clicking on Help at any point in the program should assist you with the part of the program you are using at that time.

To Uninstall the Indicators Model:

This will remove the entire program, ancillary files (*.dll's), accompanying databases, and queries, including any queries that you have run yourself. It will *not* uninstall the IDAPI folder. You do not need the CD-ROM to do this.

1) Click on Start->Programs->Oppteim->Uninstall.

2) Manually delete the Oppteim folder. This is often necessary since using the Indicators model places new files in that folder or one of the sub-folder, so the uninstaller cannot complete the removal process. Do this by using Windows Explorer, open the view of the C: drive (refer to steps 3-6 above) and dragging the Oppteim folder into the Recycle Bin. The disk space will not be freed up until you empty the Recycle Bin.

3) Locate the IDAPI folder and launch BDEcfg.exe as described in steps 14 and 15 above.

4) Click on the "Aliases" tab at the bottom of the BDE Configuration Utility screen.

5) Click on "EIMCHEM" in the "Alias Names" box.

6) Click on "Delete Alias" and answer "Yes" when asked if you are sure you want to do this.

7) Also delete the "EIMDATA", "EIMUSER", and "EIMUSERC" aliases.

8) Save the changes you have just made by choosing "Save" from the "File" menu.

9) Exit the BDE Configuration Utility by choosing "Exit" from the "File" menu.

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1. INTRODUCTION TO EPA'S RISK-SCREENING ENVIRONMENTAL INDICATORS

Each year the Toxics Release Inventory (TRI) provides the public with detailed data on releases and transfers for a large set of chemicals emitted by manufacturing facilities in the United States. To track the potential risk-related impacts of these chemical releases and transfers, the Environmental Protection Agency's (EPA's) Office of Pollution Prevention and Toxics (OPPT) has developed Risk-Screening Environmental Indicators, a computer-based (Microsoft Windows) model that permits screening-level analyses. The Risk-Screening Environmental Indicators model supplements a quantity-based ("pounds only") view of releases by incorporating information and models that assess, at a screening-level, the risk-related trends that chemical releases may pose. The information and models enable the user to consider the toxicity of chemicals, the quantity to which people are exposed, and the size of the population exposed to those chemicals. It should be emphasized that the result is *not* a detailed or quantitative risk assessment, *but offers a screening-level, risk-related perspective for relative comparisons of chemical releases*.

Tracking changes in environmental health impacts over time using the Indicators model allows EPA to measure its progress in implementing environmental protection and pollution prevention programs. In addition, comparing risk-related impacts of particular chemicals, industries, and geographic regions through the Indicators model allows EPA and other users to establish priorities for improving future environmental health.

At this time, the Chronic Human Health Indicator (the "Indicator") has been developed, and addresses both chronic effects and chronic exposures. Chronic effects are those that generally persist over a long period of time whether or not they occur immediately after exposure or are delayed. Chronic exposure refers to multiple exposures occurring over an extended period of time, or a significant fraction of an individual's lifetime. A separate environmental indicator is being designed to address risk-related chronic ecological impacts and will be introduced in the future, eventually to be followed by an acute health indicator.

The following sections of this chapter (Chapter 1) describe the Indicator methodology and the types of questions that can be explored using the Indicators model. Chapters 2 through 8 describe the operations of the computer model, Chapter 9 presents the step-by-step processes for performing model operations, and Chapter 10 describes pre-run queries available with the model. The appendices present the following information: descriptions of various codes and abbreviations, physicochemical property data, detailed instructions on graphing capabilities, and a glossary of terms used in the model.

1.1   Model Description

The Indicators model calculates a number (referred to as the "Indicator Value") that reflects the risk-related impacts on chronic human health of modeled TRI releases and transfers for a given year or years. Indicator Values do not provide absolute measures of risk and can only be interpreted as relative measures to be compared with other Indicator Values (reflecting the direction and the general magnitude of changes at different points in time when analyzing trends, or identifying the relative contribution of variables in an analysis). In this way, the Indicators model is able to rank in a relative manner what are

termed the "risk-related impacts" on the general, non-worker population chronically exposed to any chemical that can be modeled.

The Indicator uses the reported quantities of TRI releases and transfers of chemicals to estimate the risk-related impacts associated with each type of release or transfer by every TRI facility in relationship to one another. The risk-related impacts potentially posed by a chemical are related to chemical toxicity, the fate and transport of the chemical in the environment after it is released, how people are exposed to the chemical, and how many people are exposed to it. The Indicator incorporates chemical-specific toxicity (for inhalation and oral exposure pathways), estimated exposures, and the size of the potentially exposed population[1]. These components are discussed further below.

The Indicator uses these components to derive a unique value corresponding to each combination of a facility, chemical, and release or transfer medium (i.e., a chemical-facility-medium-specific value is generated). This value is termed an "Indicator Element," a unitless value proportional to the potential risk-related impact of each specific release or transfer. The Indicator Value for the Chronic Human Health Indicator is simply the sum of all the applicable Indicator Elements for a given year. The Indicator incorporates each year of TRI reporting, beginning with 1988, the "base year." Year-by-year comparisons allow assessment of the trends in estimated risk-related impacts of TRI releases and transfers. The result is *not* a detailed or quantitative risk assessment, *but offers a screening-level, risk-related perspective for relative comparisons of chemical releases*.

For a detailed description of the Indicators model and components of the model, refer to *Toxic Release Inventory Relative Risk-Based Environmental Indicators Methodology* (U.S. EPA, 1997a), which represents the most recent full documentation of the model. Appendix A of the *Methodology* document also describes other systems for ranking chemicals, which can be compared with the Indicators model. Please note that there have been recent changes to the model that are not reflected in the *Methodology* document; a future version of the *Methodology* document will be developed to reflect these changes.

1.2   Components of the Indicators Model

The Indicators model relies on the ability to locate facilities geographically, and to attribute demographic data and physical characteristics, such as meteorology, to the facilities once they are located. To accomplish the location of facilities and the attribution of data to those facilities, the Indicators model describes the U.S. as a 1-km by 1-km grid system. For each cell in the grid, a location "address" in terms of (X,Y) coordinates is assigned based on latitude and longitude (lat/long).

The (X,Y) coordinates of the location address are the basis of the grid system. The origin of the system is at 96 degrees longitude and 37 degrees latitude in Montgomery County, Kansas. This point is at the center of the origin cell for the Indicators model (both X and Y equal zero at the center of the origin cell). Each (X,Y) pair defines the center point of one cell in the grid. The X value is the distance

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[1]The method is focused on general populations; individuals, particularly highly exposed individuals, are not the focus of the Chronic Human Health Indicator. Additional Indicators based upon highly exposed subpopulations may be developed in the future.

in kilometers in the east-west direction from the origin cell and the Y value is the distance in kilometers in the north-south direction from the origin cell. Using the (X,Y) pair, the boundary of each cell can be constructed with the four corner points: (X+0.5, Y+0.5) for the upper right corner, (X+0.5,Y-0.5) for the lower right corner, (X-0.5,Y-0.5) for the lower left corner, and (X-0.5,Y+0.5) for the upper left corner. The equations used to determine the (X,Y) coordinates defining the center of a given cell from lat/long data will be presented in the new *Methodology* document.

Once the grid system for the U.S. is established, facilities can be located in it. Each facility reporting to TRI is instructed in Form R to provide the lat/long coordinates of the facility, or, if the facility is large, the lat/long coordinates of a point central to the production activities of the facility. The ability of the Indicators model to accurately locate a facility therefore depends on the accuracy of the lat/long coordinates reported to TRI by the facility. The same equations that determine the (X,Y) coordinates of the grid cells are used to transform facility lat/long coordinates to (X,Y) coordinates. The facility can then be located in the grid system for further modeling.

Once facilities are located, four main components are used to compute risk-related impacts in the Indicators model. These components are:

- the quantity of chemicals released or transferred,
- adjustments for chemical-specific chronic human health toxicity,
- adjustments for pathway-specific exposure potential, and
- an adjustment to reflect size of the potentially exposed population.

These components and the method used to combine them are described in the following sections.

1.2.1 Chemical Releases and Transfers

The Indicators model uses information on chemical releases from manufacturing facilities and transfers from these facilities to off-site facilities (such as sewage treatment plants) to model risk-related impacts.[2] These releases are reported by facilities to the Toxics Release Inventory (as mandated by the Emergency Planning and Community Right-to-Know Act). As of the 1997 reporting year, there are 604 TRI chemicals listed.

1.2.2 Adjustments for Chronic Human Health Toxicity

The Chronic Human Health Indicator is based on current EPA methodologies for assessing toxicity. The Indicator will be continually updated to reflect any changes in these methodologies. The method OPPT has chosen for assigning toxicity weights to chemicals is clear and reproducible, based upon easily accessible and publicly available information, and utilizes expert EPA-wide judgments to the greatest extent possible. The Indicator weights the toxicities of chemicals relative to one another using

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[2] The Indicator is not restricted to the use of TRI chemical release information. Any chemical for which toxicity data, physicochemical properties, and facility latitude and longitude data are available can be modeled by the Indicator.

a proportional system of numerical scores. Scores (weights) for chemicals increase as the toxicological potential to cause chronic human health effects increases.

Values developed by EPA experts are used to differentiate the degrees and types of toxicity of chemicals and score them in a consistent manner. The values known as Oral Slope Factors and Inhalation Unit Risks[3] provide information pertaining to toxicity for chemicals that may cause cancer. The values known as Reference Doses (RfDs) and Reference Concentrations (RfCs) provide toxicity information related to noncancer effects.[4] The most preferred source of these values is EPA's database of Agency-evaluated toxicity values, the Integrated Risk Information System (IRIS).[5] Data contained in IRIS have been peer-reviewed and represent expert Agency-wide judgments. In the absence of IRIS data, the next preferred source of toxicity data is the publicly-available Health Effects Assessment Summary Tables (HEAST). These tables are constructed for use in both the Superfund program and in the Resource Conservation and Recovery Act (RCRA) program but do not represent Agency-wide expert judgments. Similarly, data from the Office of Pesticide Programs (OPP) Reference Dose Tracking Report may also be used. In certain cases where IRIS, HEAST or OPP data files do not have quantitative toxicity values, several other sources of secondary data available to EPA are used to assign toxicity weights. These data are reviewed by a group of OPPT expert health scientists who derive appropriate toxicity weightings when the available data on chronic human toxicity are sufficient for this purpose. A toxicity weighting summary is provided for each of these derived values. The OPPT scientists used a technical approach analogous to the Agency's method for deriving RfD values, RfC values, cancer risk estimates, and Weight of Evidence (WOE) determinations. *However, it must be emphasized that these derived values are not the equivalent of the more rigorous and resource-intensive IRIS process and are only useful for screening-level purposes.*

The Indicator toxicity scoring method separately evaluates certain exposure routes (breathing/inhalation and ingestion/oral) and classes of effects (cancer and noncancer). For each route, chemicals are scored based on their single, most sensitive adverse effect. Except for the cancer/noncancer distinction, the toxicity weighting methodology does not distinguish between chemicals based on type or target of effect (e.g., neurotoxicity *vs.* developmental toxicity), nor does it address multiple effects which may be exhibited by a chemical. When values are available for only one route of exposure, ordinarily the same toxicity weight is applied to reflect the potential for both inhalation and oral toxicity, provided there is no evidence the effects are route-specific or limited to the portal of entry into the body. In rare instances, toxicity studies are available to show a given chemical causes no health effects by one

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[3] The Oral Slope Factor represents the upper-bound estimate of the slope of the dose-response curve in the low-dose region for carcinogens. The units of the slope factor are usually expressed as (mg/kg-day)$^{-1}$. The Inhalation Unit Risk is the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 μg/m^3 in air.

[4]RfDs and RfCs are estimates (with uncertainty spanning perhaps an order of magnitude) of daily exposure [RfD], or continuous inhalation exposure [RfC], to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious noncancer effects during a lifetime.

[5] U.S. EPA. 1998. Integrated Risk Information System (IRIS). Online. National Center for Environmental Assessment, Washington, DC.

exposure pathway; in these instances, a toxicity weight is assigned only to the pathway that results in chronic human health effects.

In the Indicator methodology, the following algorithms are used to assign toxicity weights:

non-carcinogens: 0.5 / RfD (mg/kg-day) or 1.8 / RfC (mg/m^3)

carcinogens (WOE
categories A and B)[6]:   Oral Slope Factor (risk per mg/kg-day)/ 0.0005 or
                            Inhalation Unit Risk (risk per mg/m^3)/ 0.00014

carcinogens
(WOE category C)[6]:   Use the algorithm to estimate toxicity weights for A/B
                            carcinogens, but divide the weight by 10.

These constants maintain the equivalency between cancer and noncancer scores that was established in the Hazard Ranking System scoring methodology used in EPA's Superfund program. When combining cancer and noncancer endpoints, it is assumed that exposure at the level of the RfD is equivalent to a 2.5×10^{-4} cancer risk. The Indicator is designed in such a fashion that users can examine carcinogens and non-carcinogens separately or in combination. The distribution of toxicity values for TRI chemicals corresponds to a range of toxicity weights of approximately 0.1 to 1,000,000 for carcinogens and approximately 0.001 to 100,000 for non-carcinogens. Continuous toxicity weights are expressed as values with two significant figures.

There are 604 chemicals and chemical categories on the 1997 TRI Chemical List. Toxicity weights are available for 405 of these chemicals and chemical categories. The 405 chemicals with toxicity weights account for 98% of the reported pounds for all on-site releases in 1997.

A complete discussion of the methods used in these evaluations, as well as the chemical-by-chemical data summaries and score assignments, are provided in *Toxics Release Inventory Relative Risk-based Indicators: Interim Toxicity Weighting Summary Document* (U.S. EPA, 1997b) and amended by *EPA's Risk-Screening Environmental Indicators: Toxicity Weights for Toxics Release Inventory (TRI) Chemicals and Chemical Categories* (U.S. EPA, April 28, 1998).

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[6]Based on the quality and adequacy of data on carcinogenicity, a chemical is placed in one of the following five weight of evidence categories, as specified in 51 FR 33996:
     A   Carcinogenic to humans
     B   Probable carcinogen
          B1   Indicates limited human evidence
          B2   Indicates sufficient evidence in animals and inadequate or no evidence in
               humans
     C   Possible carcinogen
     D   Not classifiable
     E   Evidence of non-carcinogenicity

1.2.3   Adjustments for Exposure Potential

Both qualitative and quantitative elements are considered when weighting chronic exposure potential. Quantitatively, exposure potential is estimated using a "surrogate" dose. To estimate the surrogate dose, a separate exposure evaluation is conducted for each media-specific emissions pathway. The exposure evaluations use models that incorporate data on media-specific and pathway-specific chemical releases and transfers, physicochemical properties and, where available, site characteristics, to estimate the ambient chemical concentration in the medium into which the chemical is released or transferred. The ambient concentrations are then combined with standard human exposure assumptions to estimate the magnitude of the surrogate dose.

The qualitative element uses uncertainty categories that are defined so that, in general, surrogate dose estimates are placed in lower categories when they are developed using few data and generic models that require many assumptions and extrapolations. These assumptions and extrapolations tend to yield overestimates of exposure. Applying these uncertainty categories, the initial surrogate dose estimate may be reduced by a factor of five or ten. The three uncertainty categories and associated adjustment factors are as follows:

Category	Explanation	Adjustment Factor
A	Combines modeling with some generic and some reasonable site-specific data to generate exposure estimates.	1
B	Combines modeling with some generic and some site-specific data, but identification of appropriate site-specific data subject to error and will often be filled in with generic assumptions.	5
C	Extrapolates generic exposure estimates from actual data from other sites to exposure at TRI sites (e.g., groundwater modeling).	10

The algorithms for calculating surrogate doses rely on the ability to locate facilities geographically (including those to which off-site transfer is made) and to associate their locations with their demographic and physical characteristics. To accomplish this, the computer algorithm describes the U.S. as a 1-km by 1-km grid system. For each cell in the grid, the computer assigns a location "address" based on latitude and longitude. It then assigns information on the demographics and physical characteristics of that cell to that address.

While this methodology uses the EPA exposure assessment paradigm to evaluate exposure potential, the results should not be construed as an actual numerical estimate of dose resulting from TRI releases, because limited facility-specific data and the use of models that rely on default values for many parameters prevent the calculation of an actual dose. Instead, the purpose of the methodology is to generate as accurate a surrogate dose as possible without conducting an in-depth risk assessment. The

estimates of surrogate doses from releases of TRI chemicals are *relative to the surrogate doses resulting from other releases included in the Indicator*.

Pathway-specific Methods

Stack and Fugitive Air Releases

This method uses algorithms from the Industrial Source Complex Long Term (ISCLT3) model developed by the Office of Air Quality Planning and Standards (OAQPS). ISCLT3 is a steady-state Gaussian plume model used to estimate long-term pollutant concentrations downwind of a stack or area source. The concentration is a function of facility-specific parameters (such as stack height and exit gas velocity), meteorology, and chemical-specific, first-order air decay rates.

In the Indicators model, each facility is located in a 1-km by 1-km grid cell based on its reported lat/long. The facility may be located away from its reported location by up to 707 m within a grid cell so that it is in the center of the grid cell. (707 m is calculated as the hypotenuse of an isosceles triangle with both sides of length 500 m.)

The ISCLT3 model then estimates the air concentrations for the midpoint of each grid cell in a 21-km by 21-km area surrounding the grid cell containing the facility. For each of the 440 1-km by 1-km cells, an air concentration for a given chemical is calculated based on the radial distance of each grid cell's center from the source in the center cell, meteorological data, and chemical-specific data. For the center cell in which the facility is located, the Indicators model currently assigns the highest air concentration from the eight cells surrounding that cell. Surrogate doses estimated from the concentrations in each cell are then multiplied by the population in the cell and by the inhalation toxicity weight assigned to the chemical.

Stack height data were obtained from the AIRS Facility Subsystem (AFS) within the Aerometric Information Retrieval System (AIRS), the National Emission Trends Database, and databases from three individual states (California, New York, and Wisconsin). For each TRI facility that was identified in one of these data sources, the median height of all stacks at that facility is used in the Indicators model. For the TRI facilities for which stack height data were not available in these sources, a Standard Industrial Classification (SIC) code-based median stack height is used in the Indicators Model. The SIC code-based stack height is estimated from data in AFS and the Trends Database for facilities in a particular 3-digit SIC code or in the 2-digit SIC code if the 3-digit SIC code is invalid. If no valid 2-digit SIC code is available, the median of all stack heights in SIC codes 20 through 39 is used. Appendix A lists the industries associated with all 2-digit and 3-digit SIC codes. In the calculation of median stack height for facilities with a particular SIC code, statistical analyses were conducted to determine whether heights for stacks not emitting any TRI chemicals should be included. For some SIC codes, significant height differences did not exist between stacks emitting TRI chemicals and stacks not emitting TRI chemicals. Thus, in those cases, all stack heights for all facilities in that SIC code were used to estimate the median stack height for that SIC code. For other SIC codes, a significant height difference between the two groups of stacks did exist, and only those stacks emitting TRI chemicals were used in the calculation of a median stack height for that SIC code.

Similarly, the Indicators model uses either the median exit gas velocity of all stacks for TRI facilities with this information or an SIC code-based median exit gas velocity for facilities without stack exit gas velocity data. The latter is based on the median of exit gas velocities for facilities in a particular 3-digit SIC code or in the 2-digit SIC code if the 3-digit SIC code is invalid. If no valid 2-digit SIC code is available, the median of all stack exit gas velocities in SIC codes 20 through 39 is used. Exit gas velocity data were obtained from AFS within AIRS, the National Emission Trends Database, and databases from two individual states, New York and Wisconsin. The same statistical analyses as described above for stack heights were conducted before a median exit gas velocity was calculated for each SIC code.

Analyses have been conducted that show the concentrations predicted by the Indicators model using a combination of generic and site-specific data closely match concentrations estimated by using more complete site-specific data. Because a combination of site-specific data and generic inputs is used for the air release pathway, uncertainty category A is used to classify this pathway.

Direct Surface Water Releases

Chemicals released directly to surface waters are modeled using a simple first-order decay equation, along with estimates of river discharge and velocity. Chemical concentrations are estimated for distances up to 200 km downstream from the chemical release to take into account drinking water intakes up to 200 km downstream. The chemical-specific decay coefficient is predominantly based on either abiotic hydrolysis or microbial biodegradation; on occasion, it may be based on photooxidation.

This methodology considers two chronic human health exposure pathways from surface water releases. First, exposures from drinking water are calculated. As the chemical travels downstream, concentrations at public drinking water intakes are estimated. The population served at each drinking water intake is assumed to be the population exposed to that chemical concentration. If a cell contains no drinking water intake, the exposed population is zero. Uncertainty category B is used for the drinking water pathway because several factors may result in an overestimate of exposure.

A second potential exposure pathway is from consumption of contaminated fish. Each segment of the affected surface water reach may contain contaminated fish which could be caught and eaten by recreational fishers. As described above, the model tracks the concentration of the chemical as it travels downstream; in each U.S. Geological Survey-defined stream reach, the concentration in fish is derived by multiplying the chemical concentration in the water by a factor to account for bioconcentration of the chemical from water into fish. Because specific data on the number of people fishing in a reach are not available, the exposed population is modeled as a percentage of the drinking water population. State-specific population fractions of persons who eat fish were derived from state-specific fishing rates found in the U.S. Fish and Wildlife Service's *1991 National Survey of Fishing, Hunting, and Wildlife Associated Recreation* (U.S. DOI, FWS, 1993). Uncertainty category C is used for the fish consumption pathway because many factors may result in an overestimate of exposure.

On-site Land Releases

On-site land releases include releases to landfills, surface impoundments, land treatment units and underground injection wells. This section describes methods to evaluate exposure from these releases, except for underground injection.[7]

For on-site land releases, two major exposure pathways are considered because chemicals may volatilize to air or leach to groundwater. Volatilization of chemicals from on-site land releases is reported to TRI under the fugitive emission estimate for the facility, and is handled as a fugitive air release.

Groundwater contamination is also a concern for on-site land releases. The modeling of groundwater releases depends on the regulatory status of the unit in which the chemical is released. Chemicals could be deposited in an on-site RCRA-regulated, subtitle C hazardous waste unit, or in an on-site nonhazardous solid waste management unit. RCRA standards for hazardous waste units are, by regulation, designed to include technical controls to prevent release of contaminants into groundwater; if chemicals are placed in such regulated units, it is assumed that releases to groundwater are negligible. If chemicals are placed in nonhazardous land disposal units, we model the release of chemicals to groundwater. Because we lack data about how materials are disposed on-site, all on-site land disposal is assumed to occur in landfills.

The TRI forms do not provide site-specific information, such as hydrogeological data, to aid in the evaluation of groundwater transport. Unfortunately, these data are extremely site-specific and are not amenable to characterization by state or region of the country. Nonetheless, to maintain a concentration/exposure measure consistent with the approaches for direct air and water releases, we derive a surrogate dose using generic, conservative assumptions. This approach requires two steps: estimating leachate concentration (a measure of the amount of chemical that partitions from the waste to porewater) and estimating the dilution and attenuation of leachate that occurs between the disposal site and the drinking well location.

It should be noted that the chemical concentration in the leachate must be compatible with the chemical-specific solubility (i.e., leachate concentration cannot exceed water solubility); the smaller of the two values is used. Once leachate concentrations are estimated, the next step is to determine the magnitude of dilution and attenuation that occur as the contaminant travels from the source to the well. The diluted and attenuated concentrations are then used to calculate surrogate doses.

The population exposed to contaminated groundwater is calculated from the number of persons obtaining drinking water from groundwater within one kilometer of the facility. Uncertainty category C is used for this pathway because exposure is based on a conservative leachate concentration and a conservative dilution and attenuation factor.

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[7] Under well-managed conditions, underground injection wells are designed to pose minimal risks to human health or the environment. Only unweighted pounds of releases and transfers to underground injection wells are tracked in the Indicators model (these releases can be viewed from a hazard-based perspective).

Releases to POTWs

Modeling exposure from TRI discharges to Publicly Owned Treatment Works (POTWs) requires: (1) location of the POTW to which the chemicals are discharged, (2) consideration of overall removal efficiencies of POTWs and resulting effluent discharges from POTWs, and (3) consideration of residuals (sludge) management at POTWs.

The latitude and longitude of POTWs receiving TRI transfers are not included in the TRI database. However, the ZIP codes for the POTWs are available. For a given facility, the POTW is located on the grid based on the latitude and longitude of the ZIP code centroid.

Chemicals entering the POTW can biodegrade, volatilize, become sorbed to sewage sludge, or be discharged in the POTW's effluent. Chemicals in the POTW effluent discharged to surface water are modeled using the surface water evaluation methods described above. Chemicals that biodegrade are assumed to degrade to chemicals that do not pose risk. POTW volatilization releases are treated like area-source air releases. Currently, all POTW sludge is modeled as being landfilled at the POTW, a common method of sludge disposal. Landfilling of sludge is modeled using methods described for on-site land releases.

The population exposed to surface water effluent discharges is described in the section on direct surface water releases. The population exposed to air releases is the population within a 21-km by 21-km grid around the POTW. The population exposed to groundwater contaminated by the landfilling of sewage sludge is calculated from the number of persons obtaining drinking water from groundwater within one kilometer of the POTW.

The uncertainty categories used for direct water releases, air releases, and on-site land releases are applied to the appropriate sub-elements associated with POTW releases. The sub-elements are then combined (summed) to yield a single facility-chemical-POTW transfer Indicator Element.

Off-site Transfers

TRI reporters are required to supply the name and address of the facility that receives wastes for storage or disposal. From these data, we must determine if wastes are sent to a hazardous or nonhazardous waste management facility. As with underground injection wells, transfers to RCRA hazardous waste facilities are not included in the Chronic Human Health Indicator; if chemicals are placed in such regulated units, it is assumed that releases to groundwater are negligible. Therefore, only transfers to nonhazardous facilities are modeled.

As with transfers to POTWs, we must have information about the off-site facility location and some of its characteristics to assess the exposure potential associated with off-site transfers. After the off-site facility is located using the ZIP code centroid, the Indicators methodology requires information on the treatment and disposal technologies used by the facility.

If the treatment method is incineration, then destruction and removal efficiencies (DREs) are applied to the transfer amount, and the releases are modeled using ISCLT3, as described above.

For off-site landfills, two major exposure pathways are considered: groundwater and volatilization. For off-site transfers, the groundwater pathway is modeled in the same manner as for on-site land releases. Volatilization, however, is modeled differently. As noted earlier, for on-site releases, volatilization is included in reported fugitive emissions and thus exposure is modeled directly from these air releases. In contrast, volatilization emissions from off-site land disposal must be estimated before exposure can be modeled. The volatilization flux of chemicals (mass per area per time) is estimated from the concentration of the chemical in the landfill solids, using information on partitioning between solid, liquid, and vapor phases. The estimate of the volatilization flux is then multiplied by an estimate of the area of the landfill to obtain an estimate of total emissions (mass per time). These emissions are then combined with weather data and data on populations surrounding the off-site disposal facilities to obtain population-weighted concentrations, using the same algorithms as those used for direct air releases from TRI facilities. The population exposed to air releases is the population within a 21-km by 21-km grid around the off-site landfill. Uncertainty category C is used for this pathway because substantial assumptions and modeling are used to estimate exposure.

1.2.4   Adjustments for Potentially Exposed Populations

The populations modeled for each exposure pathway were described in the previous section; this section describes how census data are used to estimate population sizes. The Chronic Human Health Indicator uses two types of U.S. Census data to estimate the size of pathway-specific exposed populations. Population estimates are based on a combination of the following data: (1) block-level data from the major (decennial) U.S. Census information from 1990, and (2) county-specific population data for the years 1988 and 1996, which are used to estimate population changes and therefore the grid cell-level population for years other than 1990. Block-level data include race (White, Black, Native American, Asian/Pacific Islander, and Hispanic), the total population, the population younger than 18 years, and the population 65 years and older.

Census blocks are the smallest geographic area for which decennial census data are collected. Blocks are formed by streets, roads, railroads, streams and other bodies of water, other visible physical and cultural features, and the legal boundaries shown on Census Bureau maps. In 1990, the Census Bureau tabulated data for 7,020,924 census blocks.

One or more census blocks forms a block group, which is a subdivision of a census tract or block numbering area. A block group consists of all census blocks whose numbers begin with the same digit in a given census tract or block numbering area. The total number of block groups delineated for the 1990 decennial census was 229,466. Some demographic data, such as the population in more narrowly defined age groups or the population with an income level in a certain range, are available only for block groups. These block group data are not currently used in the Indicators model, but will be used in the next generation (32-bit) of the model.

The 1990 decennial Census data are the most recent and most complete set of population data available from the U.S. Census Bureau. However, the population numbers from the 1990 Census do not reflect differential growth rates in various parts of the country. Thus, to estimate populations in other years, the Indicators model uses U.S. Census data at the county level to estimate relative population

change across the U.S. To do this, the model incorporates data for every county for the years 1988 and 1996, in addition to the more complete 1990 Census data. Using the county-level population data, estimates of population change for non-decennial years are estimated by county based on interpolations between 1988 and 1990 and between 1990 and 1996, and extrapolations to 1997. For each 1-km by 1-km grid cell in the Indicators model, the county is determined, and then the interpolated or extrapolated estimates of population change are applied to the 1990 Census data attributed to that grid cell to estimate populations for the non-decennial years.

For each block, a block centroid is provided, based on the geometry of the block (i.e., the centroid is area-weighted, not population-weighted). Each block is then mapped to a grid cell by comparing its block centroid location to the grid cell location. The location of each grid cell is defined by its four corner points calculated from its (X,Y) coordinates. When a block centroid falls within a grid cell, its population data are attributed to that cell. If more than one block centroid is located within a grid cell, then the populations affiliated with the multiple blocks are summed.

1.3   Calculating the Indicator

The Indicator method combines each of the above components multiplicatively to obtain Indicator Elements and Indicator Values.

1.3.1   Indicator Elements

The toxicity, exposure potential, and population components are first combined multiplicatively to obtain a chemical-facility-medium-specific Indicator Element, as follows:

$$\text{Indicator Element}_{c,f,m} = \text{Toxicity Weight}_{c,m} * \text{Surrogate Dose}_{c,f,m} * \text{Exposed Population}_{f,m}$$

where:

c	=	subscript for chemical c,
f	=	subscript for facility f, and
m	=	subscript for medium m.

The result of the multiplication of the components is a chemical-facility-medium-specific "Indicator Element." This unitless element is *not* a physically meaningful measure of quantitative risk associated with the facility, but is an approximate measure that is comparable to approximate measures for other facilities (or chemicals, media, etc.) calculated using the same methods. Approximately 1.9 million Indicator Elements are calculated for all ten years of TRI reporting data (1988-1997). These are based on approximately 1.7 million distinct chemical releases and transfers reported to TRI.

1.3.2 Overall Indicator Value

The overall Indicator Value is calculated by summing all the relevant individual TRI chemical-facility-medium-specific Indicator Elements, as follows:

$$I = \sum\sum\sum IE_{c,f,m}$$

where:

I	=	Chronic Human Health Indicator, and
$IE_{c,f,m}$	=	chemical-facility-medium-specific Indicator Element.

The Indicator is recomputed for all years in the TRI database on an annual basis in order to incorporate revisions to the reporting data. In this method, each component score makes a contribution proportional to its size. The resulting value can be used in a number of ways, including tracking changes over time. For example, the base-year Indicator can be normalized to 100,000, and subsequent Indicators scaled to this value to evaluate changes over time. Indicators can also be calculated for various subsets of variables (e.g., chemical, facility, medium) that compose the Indicator Elements. *It must be reiterated that while changes in scores over the years would imply that there have been changes in risk-related environmental impacts, the actual magnitude of any specific risk or change in risk is unknown. Although the score itself may be useful in identifying facilities or counties with the highest potential for risk, the score does not quantify that risk or provide any indication whatsoever of the magnitude of individual risk associated with that facility or county. Furthermore, external factors such as the state of the economy may have an impact on the emissions of a facility irrespective of that facility's environmental management practices.*

1.4 Analyses That Can be Performed Using the Indicators Model

Users of the Indicators model can perform, in a matter of hours, a variety of screening-level analyses. Previously, days, weeks, or even months would have been required to organize the relevant information, evaluate that information, and perform the complex and sophisticated analyses that are necessary to provide a risk-related perspective. Indicator results can be used for screening-level ranking and prioritization for strategic planning purposes, risk-related targeting, and trends analyses. Considerable resources can be saved by conducting preliminary analyses with the Indicators model to identify risk-related situations of high potential concern, which warrant further evaluation.

As noted above, users can evaluate releases using a number of variables, such as chemical, medium, geographic area or industry. For instance, the following types of questions can be investigated: How do industry sectors compare to one another from a risk-related perspective? What is the relative contribution of chemicals within a given industry sector? What release pathway for a particular chemical poses the greatest risk-related impacts?

The Indicator also allows the user to investigate the relative influence of toxicity and population on the risk-related results, which also incorporate exposure modeling. In addition, users can consider cancer and noncancer health endpoints independently or in combination. Finally, the use of the Indicators

model is not limited to TRI chemicals; the adaptable methodology can model any chemical if toxicity characteristics, physicochemical properties, release levels, and release location are known or can be estimated.

A future version of the Indicators model will be made compatible with a Geographical Information System (GIS) format. The current version of the Indicators model available to the public has full modeling of only the air exposure pathway, but future versions will provide full modeling of all exposure pathways. Information regarding the Risk-Screening Environmental Indicators project will be available on the OPPT Homepage.[8]

1.5 Important Caveats Regarding the Chronic Human Health Indicator

The Chronic Human Health Indicator is a screening tool that provides a risk-related perspective in assessing the relative impacts of releases of toxic chemicals. This tool combines estimates of toxicity, exposure level, and the exposed population to provide risk-related comparisons. It does not provide a detailed or quantitative assessment of risk, and is not designed as a substitute for more comprehensive, site-specific risk assessments. There are a number of important considerations associated with each component of the Chronic Human Health Indicators model, as described in the following sections.

1.5.1 Toxicity Component

The following caveats should be considered regarding the toxicity component of the Indicators model:

- Toxicity weights are not designed to (and may not) correlate with statutory criteria used for listing and delisting chemicals in TRI. Indicators model results, which account for estimated exposures, also do not correlate with such listing/delisting decisions.

- The Indicators model only addresses chronic human toxicity (cancer and noncancer effects, e.g., developmental toxicity, reproductive toxicity, neurotoxicity, etc.) and does not address concerns for either acute human toxicity or environmental toxicity.

- Toxicity weights are based upon the single, most sensitive chronic health endpoint for inhalation or oral exposure pathways, and do not reflect severity of effects or multiple health effects.

- Estimated Reference Doses and Reference Concentrations for noncancer effects incorporate uncertainty factors which are therefore reflected in toxicity weights that are based upon these values.

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[8]For current information or inquiries regarding the Risk-Screening Environmental Indicators Project, please contact: Nicolaas W. Bouwes, Sr., Ph.D., (202) 260-1622, bouwes.nick@epa.gov, or Steven M. Hassur, Ph.D., (202) 260-1735, hassur.steven@epa.gov. Or, see www.epa.gov/opptintr/env_ind.

1.5.2 Exposure Component

The following caveats should be considered regarding the exposure component of the Indicators model:

- Like other exposure models, the Indicators model estimates exposure levels (it does not yield actual exposures).

- The model uses some generic assumptions, e.g., default median stack heights and exit gas velocities related to 2- or 3-digit SIC codes, or a nationwide median, where facility-specific median stack height and exit gas velocity data are unavailable.

- In the publicly available version of the current model, only air exposures are fully modeled.

1.5.3 Population Component

The following caveats should be considered regarding the population component of the Indicators model:

- Population values for non-decennial years are estimated based on interpolations between 1988 and 1990, and between 1990 and 1996, and extrapolations to 1997.   Both interpolations and extrapolations are based upon U.S. Census data.

- Drinking water populations are estimated by using the total drinking water populations associated with individual downstream drinking water intakes, while groundwater exposures are estimated by using the well water drinking population within one kilometer of the landfill site being evaluated. Estimated populations for the fish ingestion pathway are based upon U.S. Fish and Wildlife Service surveys.

- Because the Indicator reflects changing population size at the local level, a facility's relative contribution to the Indicator could increase or decrease even though no change in its releases occurs over time.   While the Indicator is designed to reflect the overall risk-related impacts on the local population, such population changes should be considered when examining a facility's environmental management practices.   The Indicator also has greater uncertainty when examining disaggregated results at the local or facility level.

1.6 Strengths and Limitations of the Chronic Human Health Indicator

1.6.1 Strengths

The following are strengths of the Indicators model:

•   The model provides an important risk-related perspective (incorporating toxicity characteristics, exposure and population) regarding the impacts of TRI releases.

•   Model results can help prioritize, and thereby conserve, resources for conducting more precise, site-specific risk evaluations.

•   This screening-level tool uses a sophisticated risk-related approach that is capable of quickly organizing and evaluating data in a complex manner.

•   The Indicator has been subjected to repeated expert peer review.

•   Complete and detailed documentation of the Indicators model is available.

•   The model can perform single- and multi-media analyses.

•   Users can consider cancer and noncancer health endpoints independently or in combination.

•   Custom-designed queries can be based upon a wide range of variables.

•   This adaptable methodology can model any chemical if toxicity characteristics, appropriate physicochemical properties, release levels and release location are known or can be estimated.

•   The air exposure model is combined with U.S. Census data to directly estimate the size of exposed populations and the magnitude of their exposure, rather than assuming that all individuals surrounding a facility are equally exposed.

1.6.2 Limitations

The following are limitations of the Indicators model:

•   Indicator results do not provide users with a quantitative risk estimate (e.g., excess cases of cancer).

•   The Indicator does not evaluate individual risk.

- The Indicators model does not account for all sources of TRI chemicals, only those sources that are required to report to TRI. It also does not provide scores for all TRI chemicals.

- The Indicators model assumes that air concentrations of TRI chemicals are the same for indoor and outdoor exposures, and that populations are continuously exposed.

- Dermal and food ingestion pathways (other than fish consumption), and some other indirect exposure pathways are not evaluated at the present time.

- Acute health effects associated with short-term, periodic exposures to higher levels of these same chemicals are not addressed; a separate indicator will be developed to address acute effects.

- A separate indicator will be developed to address ecological effects.

2. OPERATIONS AVAILABLE IN THE INDICATORS MODEL

The Indicators model is currently implemented in a Microsoft Windows-based, stand-alone, personal computer program. The program allows you to calculate the overall Indicator for one or more years of data and to present the results in various graphical and tabular formats, as well as save selected data to Microsoft Excel spreadsheets and dBase files. The computer program also allows you to create "Subindicators" based upon selected subsets of reported data. The program includes on-line help for all functions.

To begin running the model, click on the file named *oppteim.exe* in the OPPTEIM directory, which is created on your hard drive when the Indicators model is installed on your computer. The first screen that appears is an initial Help Screen; read this screen for an overview of the Indicators model and instructions on using the Help feature.

To view the initial Indicators model screen (entitled **EPA Risk-Screening Environmental Indicators**), close the initial Help Screen. The Indicators model screen that then appears is presented in Exhibit 2-1. This screen contains the buttons that begin the major operations of the Indicators model. Please note that the number of 'Releases Loaded' in the upper right of this screen represents the number of distinct chemical releases and transfers reported to TRI that have been loaded into the model. Approximately 1.9 million Indicator Elements have been generated from these releases and transfers (see Section 1.3, Calculating the Indicator, for details on how Indicator Elements are generated).

EXHIBIT 2-1
Indicators Model Screen
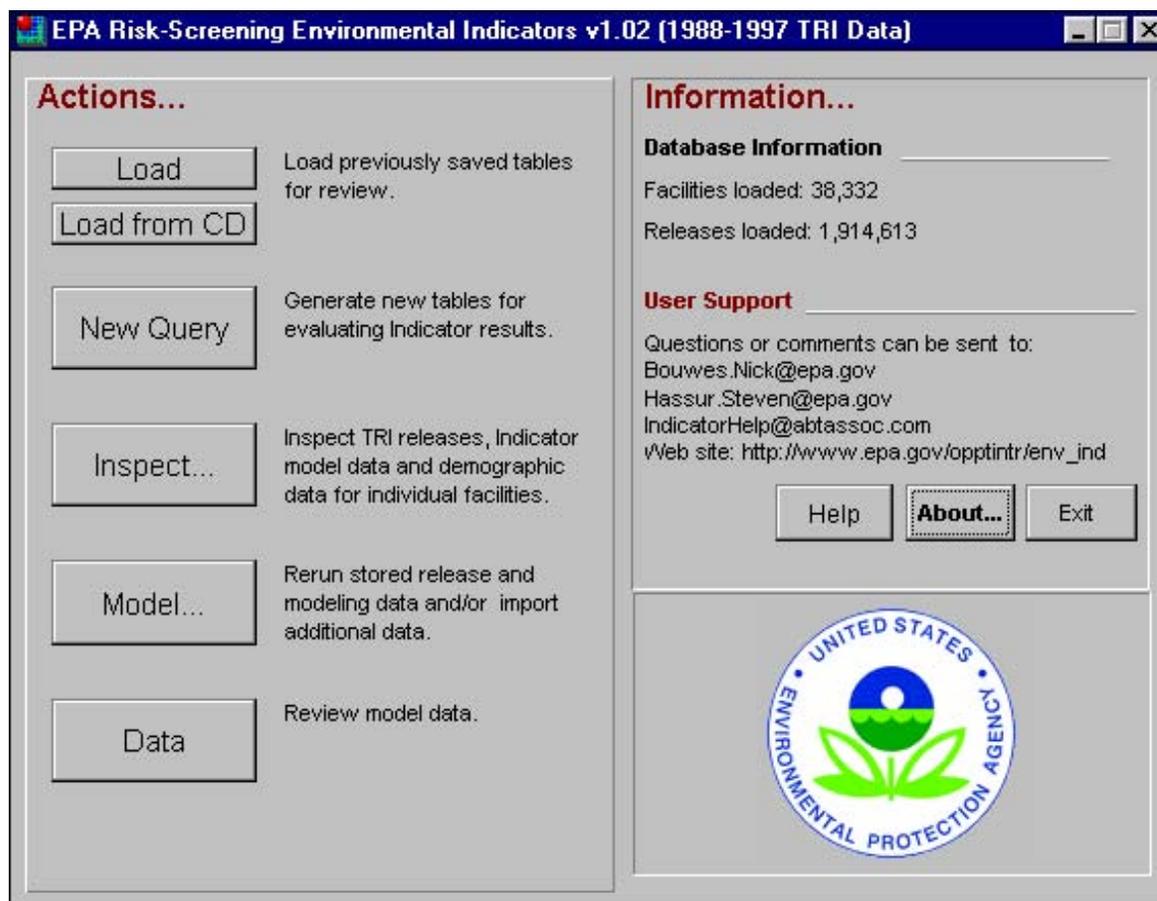
Chapters 3 through 8 describe the step-by-step processes used to run the major operations, which are started by clicking the indicated buttons. The following road map describes the contents of each of these chapters and lists the initial screen button(s) from Exhibit 2-1 that can be used to begin the operations discussed in each chapter. *If you wish to conduct queries of the data already contained in the Indicators model database, concentrate on Chapters 7 and 8. (Some of the other chapters discuss how to generate and edit data; although these types of operations may be available in future versions of the model, the options are restricted in the current public version of the model.)*

CHAPTER	CONTENTS	INITIAL BUTTON
Chapter 3	This chapter describes how to generate Indicator Elements from information on chemical releases. *[Not operational in this version.]*	Model...
Chapter 4	This chapter describes parameters and their values used in the Indicators model.	None
Chapter 5	This chapter describes how you can inspect individual facility data on chemical releases and the Indicator Element scores associated with these releases.	Inspect...
Chapter 6	This chapter describes how to view data in the model, such as the toxicity value for a chemical.	Data
Chapter 7	This chapter describes how to perform analyses and create tables of the results.	New Query / Load from CD / Load
Chapter 8	This chapter shows you how to make and format graphs of your results.	New Query / Load / Load from CD

Note: The [Load] button on the initial screen will load queries only from the c:\oppteim\user subdirectory on the user's hard drive. This subdirectory is created automatically when the model is installed, and is where the model will automatically save all queries that are run. To load pre-run queries from the CD, use the [Load from CD] button directly beneath the [Load] button on the initial screen. Note that sometimes when you click on [Load from CD], the available files will not be shown. In this case, click on CANCEL, then click on [Load from CD] again to view the files.
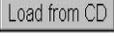
Each of these chapters also describes the series of additional screens and buttons that must be activated to perform the various operations. The discussion in each of the chapters assumes that the user is familiar with general methods of navigating in Windows-based programs (e.g., using a mouse, choosing options by clicking). However, any operations that may be slightly difficult are explained.

3. GENERATING INDICATOR ELEMENTS FROM CHEMICAL RELEASE DATA

Model...

[The Model... *button is not operational in the current version of the model, but may be operational in future versions.]*

Using Model... in the initial Indicators screen allows you to generate Indicator Elements from chemical release and transfer information. Because the database accompanying the Indicators model already contains Indicator Elements generated from chemical release and transfer data reported to the TRI for the years 1988 to 1997, the Model... operation is not essential for generating tables of Indicator scores based on chemical releases. However, if you wish to edit data in the model, change values used in the exposure models, or model new chemical releases, this option is necessary to regenerate Indicator Elements based on the new information.

Clicking on Model... will bring up the following screen:

EXHIBIT 3-1
Model Options
(Insert screen when model button becomes operational)
To Be Completed

The available options allow you to generate Indicator Elements from various types of data. Clicking on *Stored* will rerun Indicator scores for releases already stored in the database. As noted above, you may wish to rerun the scores if, for example, you want to edit the information required for generating Indicator Elements using the Data or Options operations. *(Changing information using* Options *is not operational in the current version of the model but will be operational in future versions*.)
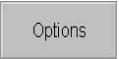
The *New* button will add facilities and chemicals from a file external to the system. This can be used, for example, to import new data from the latest reporting year of TRI releases or to import non-TRI chemical release information.

Both will add new releases and rerun stored release information.

The *Load* button will empty the release datafile and automatically load all years from the directory.

The 1,2,3,4 buttons run releases that are available with the model in 25% segments. Because the operation of generating Indicator Elements from release data may take a significant amount of time, this option allows you to divide the operation into manageable segments.

Click *Cancel* if you wish to end the operation at any time.

4. MODEL PARAMETERS

The Indicators model uses a combination of site-specific and default values in the exposure models used to generate the surrogate doses associated with the chemicals. Important site-specific parameters are shown in Exhibit 4-1; default parameters and their values are presented in Exhibit 4-2.

EXHIBIT 4-1
Site-Specific Parameters Used in Exposure Models

Parameter	Value	Definition
Stack height[1,2]	Varies based on the facility and the availability of information. If available, the median height of all stacks at the facility is used. Otherwise one of the following is used in order of preference: the median stack height of the facility's 3-digit SIC code, the facility's 2-digit SIC-code, or SIC codes 20 through 39.	Height of facility stack that is emitting the pollutant
Exit gas velocity[1,2]	Varies based on the facility and the availability of information. If available, the median exit gas velocity of all stacks at the facility is used. Otherwise one of the following is used, in order of preference: the median exit gas velocity of the facility's 3-digit SIC code, the facility's 2-digit SIC-code, or SIC codes 20 through 39.	Rate at which the pollutant exits the stack
Fishing rate[3]	Varies by state	Percent of population which fishes

[1] These parameters are used for chemicals directly emitted from the facility stacks; these emissions are modeled by the point source algorithm in ISCLT3.
[2] Values for these two parameters have two significant figures.
[3] These data are not listed separately in a data file, but are compiled with the program.

EXHIBIT 4-2
Default Parameters Used in Exposure Models

Parameter	Value
Drinking water ingestion rate	2 L/day
Fish ingestion rate	0.0065 kg/day
Air inhalation rate	20 m^3/day
Body weight	70 kg
Bulk density of soil	1400 kg/m^3
Exit gas temperature[1]	293 K
Stack diameter[1]	1 m
Area height[2,3]	3 m
Area length[2]	10 m

[1]These parameters are used for chemicals directly emitted from the facility stacks; these emissions are modeled by the point source algorithm in ISCLT3.

[2] These parameters are used for fugitive emissions and for pollutants volatilizing from either onsite or offsite disposal areas. These emissions are modeled by the area source algorithm in ISCLT3.

[3] Height of the on-site or off-site fugitive or area source from which a pollutant volatilizes.

5. INSPECTING DATA ON TRI FACILITIES

Inspect...

If you are interested in finding information about an individual facility, you can retrieve a variety of data contained in the Indicators model database. Retrievable information includes descriptions of each facility, the chemical releases, and the Indicator Elements calculated for the chemical releases. Facility information can be retrieved by clicking on the Inspect... button in the initial Indicators screen, which brings up the **Facility Browser** screen. The left-hand columns of data are shown separately from the right-hand columns in Exhibit 5-1.

EXHIBIT 5-1
Facility Browser Screen

Facility Browser - 1 records selected

Find... Links... Export Help Done

Facility   TRI Identification Number

EXAMPLE CORPORATION

STREET

CITY, STATE ZIP

Additional Facility Information

EPA Standard 2 Digit SIC Code: 28
NPDES Permit #:
Nearest REACH and distance (km): -1, 9999.0
Nearest Weather Station and distance (km): 11641, 125.8

Media Specific Releases and Scores

Year	CAS Number	Chemical	Media
1996	67-56-1	Methanol	792 Offsite Xfer to Broker (Recov.)
1995	67-56-1	Methanol	792 Offsite Xfer to Broker (Recov.)
1994	67-56-1	Methanol	792 Offsite Xfer to Broker (Recov.)
1993	67-56-1	Methanol	792 Offsite Xfer to Broker (Recov.)
1992	67-56-1	Methanol	756 Offsite Energy Recovery
1991	67-56-1	Methanol	756 Offsite Energy Recovery
1990	67-56-1	Methanol	750 Offsite Incineration
1990	67-56-1	Methanol	750 Offsite Incineration
1989	67-56-1	Methanol	750 Offsite Incineration
1988	67-56-1	Methanol	1 Fugitive Air
1988	67-56-1	Methanol	720 Offsite Recyc. (S/O Recovery)

Facility Browser - 1 records selected

Find... | Links... | Export | Help | Done

Facility TRI Identification Number

EXAMPLE CORPORATION
STREET
CITY, STATE ZIP

Additional Facility Information

EPA Standard 2 Digit SIC Code: 28
NPDES Permit #:
Nearest REACH and distance (km): -1, 9999.0
Nearest Weather Station and distance (km): 11641, 125.8

Media Specific Releases and Scores

Pounds Released	Tox Weight	Score Category	Score	Population	Max Onsite	Use
750	1	No/Unmodelled treatment code	0.000e+00		4	P
750	1	No/Unmodelled treatment code	0.000e+00		4	P
750	1	No/Unmodelled treatment code	0.000e+00		4	P
750	1	No/Unmodelled treatment code	0.000e+00		4	P
750	1	No/Unmodelled treatment code	0.000e+00		4	P
2,164	1	No/Unmodelled treatment code	0.000e+00		4	P
1,299	1	Offsite Incineration - Urban	0.000e+00	140,578	4	P
250	1	Offsite Incineration - Urban	0.000e+00	1,103,100	4	P
250	1	Offsite Incineration - Urban	0.000e+00	140,578	0	P
250	1	Direct Fugitive Air - Urban	1.499e-02	120,475	4	M/P
750	1	No/Unmodelled treatment code	0.000e+00		4	M/P

5.1 Finding a Facility

You can search the database by facility name (e.g., Evermore Systems Inc.), the TRI facility ID (e.g., 19152HYDRO8400F), ZIP code (e.g., 20814), state postal code (e.g., MA, NJ), or 4-digit SIC (Standard Industrial Classification) code (e.g., 3631). Click Find... and select the parameter you want to use to search for the data by clicking on the appropriate circle (see Exhibit 5-2). See Appendix A for industry descriptions associated with SIC codes; although 4-digit codes are not included in the Appendix, the first 3 digits of any 4-digit SIC code indicates a broader industrial classification that includes the 4-digit industrial classification. Appendix B lists the state postal codes and full state names associated with each code as well as EPA region numbers and the states within each region.

Facilities may report to TRI up to six 4-digit SIC codes; however, only the first four 4-digit SIC codes for each facility are reported in the database. It is important to note that the Find function only searches for the first SIC code listed for each facility, which is assumed to be the primary SIC code for that facility. In addition, over the years covered by the model, the U.S. Postal Service has deleted some ZIP codes, reassigned others, and added yet others. Historical files for currently reporting facilities are automatically corrected for ZIP code changes. However, ZIP codes alone are not good surrogates for

locational data, as they represent only mail delivery points. Thus, caution is advised when searching for facilities by SIC codes or ZIP codes.

EXHIBIT 5-2

```
Find Facility....                    _ □ ✕

  ┌─Search on──────────────┐   ┌────────┐
  │  ○ Facility Name        │   │   OK   │
  │  ⦿ Facility ID          │   └────────┘
  │  ○ Zip Code             │   ┌────────┐
  │  ○ State Postal Code    │   │ Cancel │
  │  ○ SIC Code             │   └────────┘
  └─────────────────────────┘   ┌────────┐
                                 │ Load...│
                                 └────────┘

  Search for:  │19152HYDRO8400F          │
```

Enter the search criterion in the box labeled **Search** and click [OK] to return to the **Facility Browser** screen to view the facility data. *NOTE: You must CAPITALIZE all letters when entering your selection.* The [Load...] button will be operational in a future version of the model.
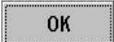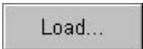
You can also scroll through the database by using the arrows in the upper right-hand corner of the screen. Use [►] to select the next facility in the database or click on [►|] to view the last record of the database. Similarly, use [◄] to select the preceding facility and [|◄] to return to the first record.

NOTE: **If your search criterion applies to more than 2,000 facilities (e.g., all facilities in SIC Code 28), the model will alert you that only the first 2,000 records were retrieved.   To avoid re-calling large search results, the model automatically clears results from its memory when the Facility Browser is closed.**

5.2   Viewing General Facility Information

You can view information on the name and location of the chosen facility directly below the [Find...] button in the **Facility Browser** screen. This information includes the facility identification number, name, and address. On the right side of the screen is a scroll down box with additional information. The additional information includes: the facility's X and Y coordinates in the grid as well as the facility's latitude and longitude, the county where the facility is located, the facility's FIPS code, EPA Region, Federal facility flag., stack parameters, public and technical contacts, the first of the first

four 4-digit SIC codes reported by the facility, the EPA standard two-digit SIC code (20 through 39, MU, and NA)[9], the NPDES (National Pollutant Discharge Elimination System) permit number, the number of the stream reach nearest to the facility and its distance from the facility, and the WBAN (Weather Bureau/Army/Navy) number of the weather station nearest to the facility and its distance from the facility. (If the facility has a NPDES number, it is allowed to discharge to surface waters.) The additional information also includes the Dun & Bradstreet number, parent company name, and parent company Dun & Bradstreet number. The Dun & Bradstreet number is the 9-digit number assigned by Dun and Bradstreet for financial purposes for the facility or each establishment within the facility. The parent company is defined as the highest level company, located in the United States, that directly owns at least 50 percent of the voting stock of the facility. If the facility is owned by a foreign entity, it will not be identified with a parent company. Note that county information is not available for facilities in American Samoa, Guam, Puerto Rico, and the Virgin Islands.

5.3   Viewing Chemical Release Information and Indicator Element Scores

To view all chemical releases for the facility, look under the section called *Media Specific Releases and Scores* on the **Facility Browser** screen. The number of pounds released is shown separately for each chemical, for each type of release or transfer to an offsite location (shown in the **Media** column), and each year of release. There are a variety of categories of releases; examples include releases directly to surface water (Direct Water) and emissions to air from the facility stack (Stack Air). Exhibit C-1 in Appendix C includes descriptions of each type of release. For each chemical, the Tox Weight column presents the appropriate toxicity weight (oral or inhalation) for the medium to which the chemical is released. There are also columns for the maximum amount of chemical stored onsite in any given calendar year and for the use of each chemical. Exhibit C-3 in Appendix C gives the number of pounds and the use category corresponding to these codes.

The Indicator Element scores for a given chemical and release media are also located in this section. The information in the Score Category column may indicate several things. It may show how the release was modeled (e.g., if the release was to air and whether the rural or urban mode of ISCLT3 was used). If the chemical was transferred offsite, this column indicates the type of offsite transfer, such as transfer to a landfill or incinerator. In addition, the Score Category also shows if and why a release cannot be modeled. For example, there may be no data on how a chemical may be removed from the discharge sent to a sewage treatment plant (Publicly Owned Treatment Works, POTW); this information would appear in Score Category as "No POTW Removal Data" for a POTW transfer. If the media code is one that is not modeled, the Score Category will read "No/Unmodelled Treatment Code." Exhibit A-2 presents a complete description of each score category. The Score column shows the Indicator Element for the release. The value is not normalized by any factor (i.e., the score is the product of the toxicity weight, the surrogate dose, and the exposed population). In this version of the model, all scores for releases other than fugitive and stack air releases are zero. A score of zero is also shown if the release

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[9]Two-digit SIC codes range from 01 to 99, and encompass all industries, including construction, mining, retail, and others. However, only manufacturing facilities (those with SIC codes within the range of 20 to 39) are required to report chemical releases to the TRI; therefore, this range of codes is referred to as the EPA SIC codes. The MU code means that there are multiple codes reported by a facility within the range of 20 to 39, and NA means that there are no codes reported by a facility within the 20-39 SIC code range.

cannot be modeled due to a lack of physicochemical properties or toxicity data. The Population column shows the total population exposed to the modeled release. The population may differ depending on the type of release. For example, an air pollutant may reach a different population than a pollutant which enters the groundwater and subsequently appears in drinking water.

If a facility shows no releases, then one of two things has occurred. Either the facility emits a chemical which used to be reported to TRI, but has since been delisted, or the facility uses a reported chemical, but emits amounts less than the TRI reporting threshold.

5.4   Exporting and Printing Data

If you wish to print facility-specific information contained in the **Facility Browser** screen, use `Export` to create an ASCII (DOS) text file (with a .prn extension). You can then import the *.prn file into Word Perfect. The file will include all of the relevant information from the **Facility Browser** for a given facility. Although the information will be easy to read within Word Perfect, you may wish to edit it further to create a more finished format to print. Once you have edited the information, you can simply print it using the "Print" option in Word Perfect.

5.5   Links Section

You can click on `Links...` in the **Facility Browser** to show data on populations, chemical concentrations modeled from air releases, and meteorological data (STability ARray, or STAR, data). After clicking on `Links...`, a screen appears with the following tabs at the bottom: **Population, Air Modeling Concentration,** and **STAR Data** (see Exhibit 5-3). Click on the appropriate tab to view the information you wish to see. Note that if a facility has never reported releases to air to TRI, the **Air Modeling Concentration** and **STAR Data** screens will be blank.

EXHIBIT 5-3
Population Modeling Screen
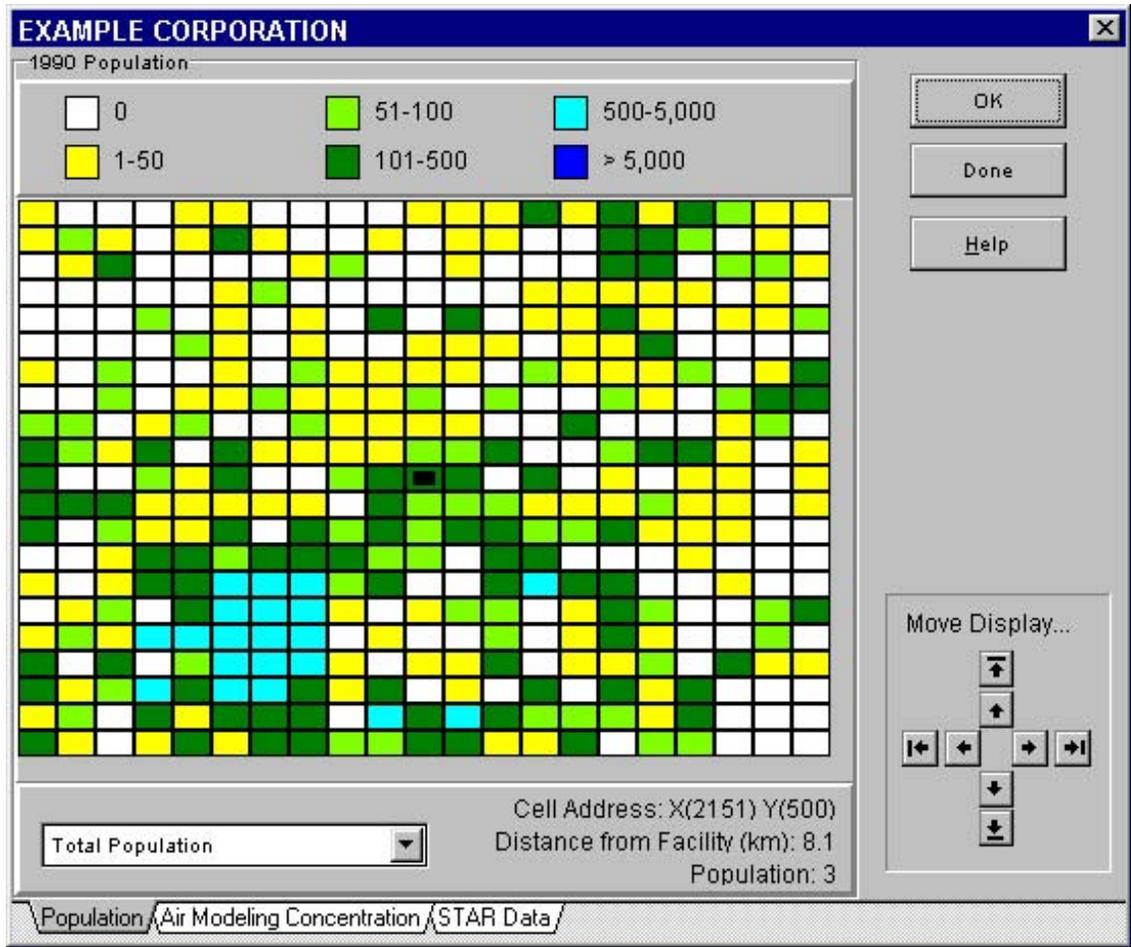
Click on the tab labeled **Population** to show the population in 1-km by 1-km cells surrounding a facility. When the screen first appears, the facility is shown as a black rectangle in the center of the grid and you can view population data out to 10 km from the facility in directions due north, due east, due south, and due west of the facility. The scale on the top of the chosen screen shows the population range associated with each color. You can customize the colors by clicking on the boxes next to the population range you wish to change and selecting an alternate color from the pop-up screen. (Note that you have to leave the screen to refresh the colors.) By moving the cursor to a given grid cell on the screen, you can view the cell address (i.e., the latitude and longitude), the distance from the facility (in km), and the population of the cell, as shown at the bottom right-hand side of the screen. Information on several subpopulations can be viewed by clicking on the following selections in the drop-down box: total population, black population, white population, Native American population, Asian/Pacific Islander population, Hispanic population, individuals less than 18 years old, and individuals 65 years and older.

In addition to viewing the population data within the distances specified above, you may also use the arrow keys in the **Move Display...** to view data for cells that are at distances much farther than 10 km from the facility. The arrows with lines will move the display 10 km at a time in the indicated direction, and the arrows without lines will move 1 km at a time in the indicated direction. Again, for any given cell, you can observe the distance from the facility.

Click on the tab labeled **Air Modeling Concentration** to see the chemical concentrations that would occur around the chosen facility for a non-decaying chemical released at a rate of 1 g/sec (see Exhibit 5-4). *The concentrations, in μg/m^3, are only presented as examples, and are based on the non-chemical-specific dispersion that would occur given the meteorological data specific to the area where the facility is located*. The scale on the top of the chosen screen shows the ranges of chemical concentrations associated with each color. By placing the cursor over a given cell, you can view the cell address and the distance from the facility for that cell; this information is listed at the bottom right-hand side of the screen. When you place the cursor over the center cell, the concentration shown at the bottom right-hand side of the screen will be the highest concentration of the eight cells surrounding the center cell.

If the population in the 21-km by 21-km grid surrounding a facility is less than 127,703 persons, ISCLT3 automatically calculates air concentrations in the rural mode. To view the concentration plume using the rural mode of the air model, check Rural Mode at the bottom of the screen. To see the concentration plume associated with the urban mode of the air model, make sure that Rural Mode is not checked. If the facility has no air releases reported to TRI, this screen will be blank.

NOTE: If you receive the error message "TRIdat.exe0010:2eb7" when viewing the Air Modeling Concentration Screen, you may need to close the screen and open it again to get rid of this message.

EXHIBIT 5-4
Air Modeling Concentration Screen
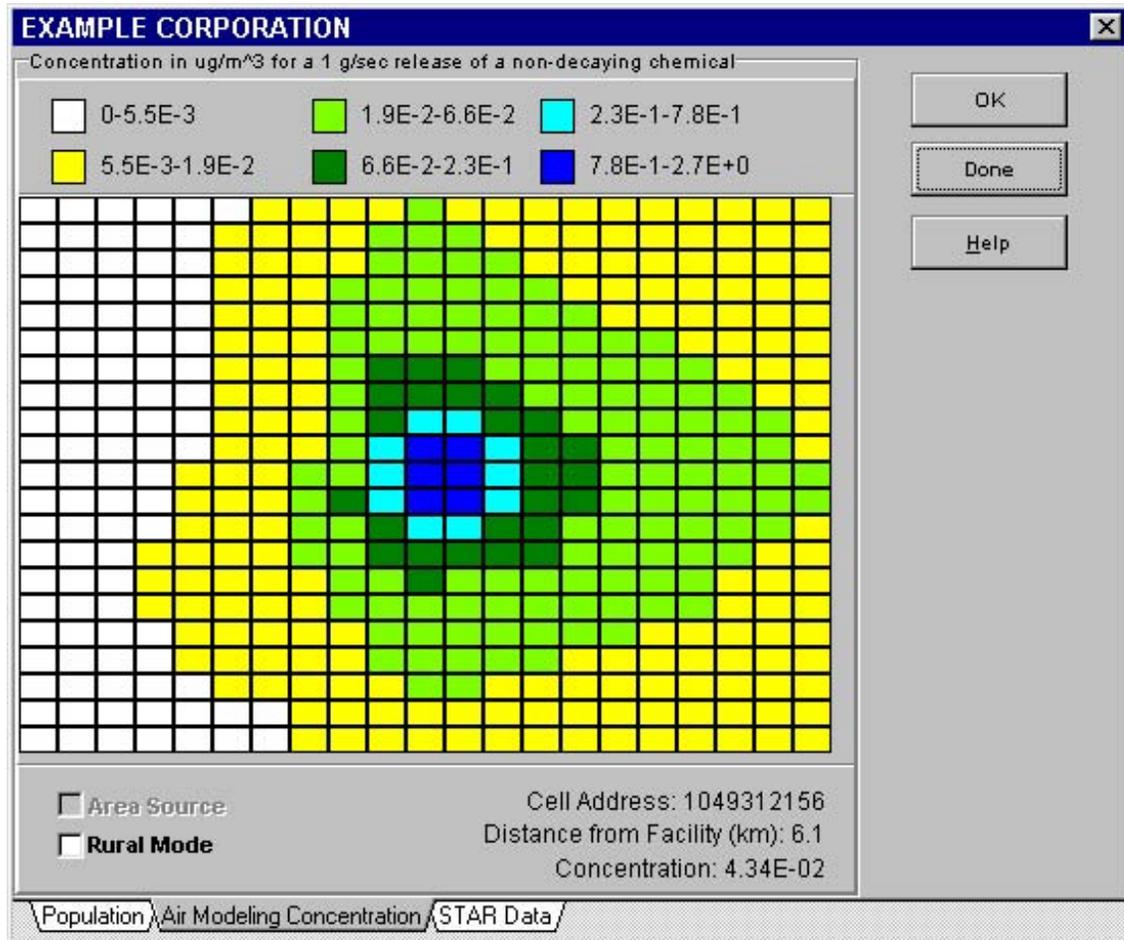
Click on the tab labeled **STAR Data** to show meteorological data that is used in the Industrial Source Complex Long Term (ISCLT3) model which is used to model the dispersion of air releases of chemicals (see Exhibit 5-5). At the bottom of the screen are shown two drop-down boxes, one for the six wind speed classes (in knots), and one for the six atmospheric stability categories A through F. The six wind speed classes are: 0-3 knots; 4-6 knots; 7-10 knots; 11-16 knots; 17-21 knots; and, greater than 21 knots. The conditions of windspeed, insolation, and cloudiness to which the six atmospheric stability categories correspond are summarized in Exhibit 5-6. For any given combination of atmospheric stability category and wind speed class, the frequency of wind from each of the sixteen wind direction categories is summarized in a wind rose (i.e., the Rose Chart). For example, if you click on a wind speed of 0-3 knots and stability category A, the wind rose shows that the majority of winds come from the southwest (as shown in Exhibit 5-5). These frequency distributions may be on a monthly, seasonal, or annual basis. The STAR data which are currently used in the Indicators model summarize approximately 20 years of meteorological data. If the facility has no air releases reported to TRI, this screen will be blank.

EXHIBIT 5-5
STAR Data Screen
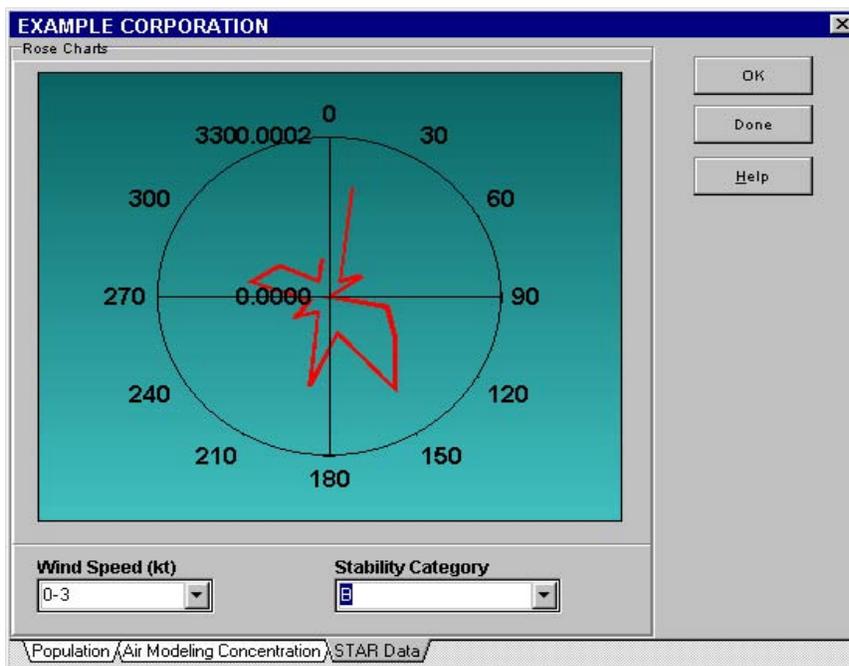
EXHIBIT 5-6
Atmospheric Stability Categories

Surface wind speed[3] (m/sec)	Surface wind speed[3] (knots)	Insolation[1]			Night[2]	
		strong	moderate	slight	thinly overcast or 4/8 low cloud	3/8 cloud
<2	<3.9	A	A-B	B	-	-
2-3	3.9-5.8	A-B	B	C	E	F
3-5	5.8-9.7	B	B-C	C	D	E
5-6	9.7-11.7	C	C-D	D	D	D
>6	>11.7	C	D	D	D	D
(for A-B, take the average of values for A and B, etc.)						

1. Strong insolation corresponds to sunny midday in midsummer in England; slight insolation to similar conditions in midwinter.
2. Night refers to the period from one hour before sunset to one hour after sunrise.
3. The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above. Source: Boubel et al., 1994.

6. VIEWING DATA IN THE MODEL

Data

By clicking on the | Data | button in the initial Indicators screen, you can view the data used in the model. *(The current version of the model does not allow the user to edit data. Future versions of the model may allow you to edit data as well as import and export files of data.)* A screen with four buttons (Chemical, Census, Weather, and Stream) appears.

6.1   Chemical-Specific Information

To view chemical-specific information, click on the | Chemical | button which brings up the following screen:
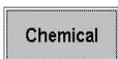
EXHIBIT 6-1
Chemical Information Screen

You can move throughout the database using the arrows on the top of the screen and the scroll bars on the bottom and right side of the screen. You can then click on the cell of the chemical you are interested in; the name and CAS (Chemical Abstracts Service) registry number of the selected chemical are listed at the top of the screen, as shown in Exhibit 6-1 for Urethane. For chemical categories, the identifications that show up in the CAS Number column begin with "N", followed by three digits.

Although chemical data in the model cannot be edited (see Section 6.1.2 below), the model contains five fields, User Tags 1 through 5, which can be used to supplement information regarding individual or groups of chemicals in which the user is particularly interested. Numbers or text up to 10 characters can be typed into each User Tag field in the Chemical Information Screen. The User Tag field can then be chosen as a row or column variable or as a subset parameter when running a new query. The field labels for the User Tags cannot be edited; therefore, the user must remember what chemicals each tag represents when subsetting or choosing variables. However, when the query has been performed, the characters entered by the user will show up in the Sorted Table, thereby conveying the content of the User Tag.

6.1.1   Sorting the Data

You can sort the chemicals by either the CAS number of the chemical or the chemical name, as shown in the top section of the **Chemical Information** screen. To do this, click on the option you wish to sort by and the data in the table will be sorted by the chosen option.

NOTE: *The option of sorting by chemical name sorts the data by the column titled Chemical (the common chemical name), not the column titled Full Chemical Name (the scientific name of the chemical).*

6.1.2   Viewing and Editing the Data

To more easily view the data, columns may be moved around to re-order them. To move a column, click on the column heading using the left mouse button. A thick black line will appear to the left of the column. Holding down the left mouse button, move the line to where you want the column to be inserted and then release the mouse button.

[Although editing capabilities are described below, data cannot be edited in the current version of the model. The User Tag fields (see Section 6.1 above) are the only fields that the user can edit.]

As noted above, the chemicals can be identified either by their CAS number or chemical names (i.e., their common or scientific names). To edit information for one or more chemicals in the chemical database, place the cursor over the cell you wish to change. You can use the left and right arrows in the upper left-hand corner of the screen to move to the top and bottom of a column. Use the **checkmark** to post your edit to the table. Use the **x** to cancel the edit. When you are finished editing data, click on Done in the upper right-hand corner of the screen. A full list and description of the types of chemical-specific data you can view and change in the chemical database are presented in Exhibit 6-2. See Appendix D for a list of physicochemical properties and their references for the chemicals in the model. Appendix G contains additional information on the flag fields.
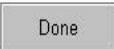
EXHIBIT 6-2
Chemical-Specific Information

Data Label	Description
CAS Number	Chemical Abstracts Service Registry Number identifies a unique chemical.
Chemical	Common name or names of chemical.
Full Chemical Name	Full scientific name or names of chemical.
33/50 Flag	This flag is a marker which indicates that the chemical is included in EPA's 33/50 program, a program in which facilities voluntarily reduce their chemical releases by 33 percent and 50 percent by certain dates.
Expansion Flag	This flag marks the chemicals that were added to the Section 313 toxic chemical list for reporting in 1995 and later years.
HAP Flag	This flag marks the chemicals that are hazardous air pollutants, as defined by the Clean Air Act.
CAA Flag	This flag marks the chemicals that are Clean Air Act pollutants.
SDWA Flag	This flag marks the chemicals that have national primary or secondary drinking water standards under the Safe Drinking Water Act.
CERCLA Flag	This flag marks the chemicals that are listed in Superfund (CERCLA—the Comprehensive Environmental Response, Compensation, and Liability Act).
Core Chemical Flag	This flag marks the chemicals that are common to all reporting years of TRI and which have had no modifications of reporting requirements.
Priority Pollutant Flag	This flag marks the chemicals that are priority pollutants, as defined by the Clean Water Act.
Metal	This flag indicates whether the chemicals are metals and also whether they are core chemicals. (Core chemicals are those that are common to all reporting years of TRI and which have had no modifications of reporting requirements.)

Data Label	Description
OSHA Carcinogens	This flag indicates whether the chemical is a known or suspect human carcinogen based on OSHA criteria (U.S.EPA, 1998). Known human carcinogens are defined as those that have been shown to cause cancer in humans. Suspect human carcinogens have been shown to cause cancer in animals. The list of chemicals flagged as OSHA carcinogens is based on the list of carcinogens provided in the 1997 TRI Public Data Release, which was compiled from the following sources: the National Toxicology Program's *Annual Report on Carcinogens*, the International Agency for Research on Cancer *Monographs,* and 29 CFR 1910[10].
User Tags 1 through 5	Using these tags, you can select a set of chemicals based on your own selection criteria.
Toxicity Category	This indicates whether the oral and inhalation toxicity weights are based on cancer health effects, non-cancer health effects, or both.
Toxicity Class - Inhale	This indicates whether the toxicity weight for the inhalation pathway is based on cancer or noncancer health effects.
Toxicity Class - Oral	This indicates whether the toxicity weight for the oral pathway is based on cancer or noncancer health effects.
Toxicity Source	Source of toxicity information (IRIS, HEAST, OPP, or Derived).
Category	This category has not yet been assigned.
Added	The year the chemical was added to the Toxics Release Inventory
RfC Inhale (mg/m^3)	The inhalation reference concentration (RfC) is defined as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer health effects during a lifetime" (U.S. EPA, 1994). The RfC is expressed as mg/m^3.

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[10] Even if a chemical is flagged as an OSHA carcinogen, its toxicity weight for a given exposure pathway may not be based on its carcinogenic effects. For example, a chemical that causes both carcinogenic and noncarcinogenic effects when inhaled may have a higher inhalation toxicity weight associated with noncarcinogenic effects than with its carcinogenic effects. If you wish to view all chemicals that have inhalation toxicity weights based on cancer health effects, see the *Toxicity Class - Inhale* field. To obtain a list of chemicals that have toxicity weights based only on cancer health effects, see the *Toxicity Category* field.

Data Label	Description
RfD Oral (mg/kg-day)	The oral reference dose (RfD) is "an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure [*by ingestion*] to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime" (Barnes, 1988). The RfD is expressed as mg/kg-day.
RfC UF	The uncertainty factor (UF) is applied to the no-observed-adverse-effect level (NOAEL) upon which the RfC is based, thereby reducing the dose. The UF accounts for uncertainties in extrapolation from experimental data to an estimate appropriate to humans. There are several standard UFs, each of which is generally an order of magnitude or less (e.g., 3-10).
RfC MF	The modifying factor (MF) is a value applied to the NOAEL when scientific uncertainties in the study chosen for estimating the RfC are not explicitly addressed by the standard UFs.
RfC Conf.	Confidence levels are assigned to the study used to derive the RfC, the overall database, and to the RfC itself. Three levels may be assigned: high, medium, or low.
RfD UF	The uncertainty factor (UF) is applied to the no-observed-adverse-effect level (NOAEL) upon which the RfD is based, thereby reducing the dose. The UF accounts for uncertainties in extrapolation from experimental data to an estimate appropriate to humans. There are several standard UFs, each of which is generally an order of magnitude or less (e.g., 3-10).
RfD MF	The modifying factor (MF) is a value applied to the NOAEL when scientific uncertainties in the study chosen for estimating the RfD are not explicitly addressed by the standard UFs.
RfD Conf.	Confidence levels are assigned to the study used to derive the RfD, the overall database, and to the RfD itself. Three levels may be assigned: high, medium, or low.
QSTAR Oral (1/mg/kg-day)	The oral cancer slope factor (q_1^*): a measure of the incremental lifetime risk of cancer by oral intake of a chemical, expressed as risk per mg/kg-day.

Data Label	Description

WOE	Weight of evidence (WOE) categories indicate how likely a chemical is to be a human carcinogen, based on considerations of the quality and adequacy of data and the type of responses induced by the suspected carcinogen. EPA WOE classifications include the following categories and associated definitions (51 FR 33996):
	
	A Carcinogenic to humans
	B Probable carcinogen
	    B1 Indicates limited human evidence
	    B2 Indicates sufficient evidence in animals and inadequate or no evidence in humans
	C Possible carcinogen
	D Not classifiable
	E Evidence of non-carcinogenicity

Unit Risk Inhale ($1/mg/m^3$)	The unit inhalation risk is the excess lifetime risk due to a "continuous constant lifetime exposure of one unit of carcinogen concentration". The inhalation unit risk is expressed as risk per mg/m^3. (51 FR 33998)
Inhale Tox Weight	The TRI Indicator toxicity weight for a chemical for the inhalation pathway.
Oral Tox Weight	The TRI Indicator toxicity weight for a chemical for the oral pathway.
MCL	This value is the maximum contaminant level, which is the national primary drinking water standard for the chemical (mg/L).
Air Decay (1/hr)	The rate at which a chemical degrades in air, due primarily to photooxidation by radicals (hr^{-1}).
K_{oc} (mL/g)	The organic carbon-water partition coefficient, used in estimates of chemical sorption to soil (mL/g).
H_2O Decay (1/hr)	The rate at which a chemical degrades in water, due to abiotic hydrolysis, biodegradation, or photolysis (hr^{-1}).
$LOGK_{ow}$	The logarithm of the octanol-water partition coefficient. K_{ow} is the ratio of a chemical's concentration in the octanol phase to its concentration in the aqueous phase at equilibrium in a two-phase octanol/water system.
Water Solubility (mg/L)	The amount of chemical that dissolves in water at a particular temperature (mg/L).
K_d (L/kg)	The soil-water partition, or distribution, coefficient. For organics, the value is often estimated as the product of K_{oc} and f_{oc} (the fraction of organic carbon in the soil) (L/kg).

Data Label	Description
Incinerator DRE (pct)	Destruction/removal efficiencies, expressed as the percent of chemical fed to the incinerator that is not released to the air.
POTW Partition (Removal) (pct)	Percent of chemical removed from the wastewater by the POTW.
POTW Partition (Sludge) (pct)	Percent of total POTW removal efficiency attributable to sorption of the chemical to sewage sludge.
POTW Partition (Volat) (pct)	Percent of total POTW removal efficiency attributable to volatilization of the chemical.
POTW Partition (Biod) (pct)	Percent of total POTW removal efficiency attributable to biodegradation of the chemical.
BCF (L/kg)	Bioconcentration factor: the ratio of a chemical's concentration in fish to its concentration in water at equilibrium (L/kg).
Henrys (atm/(mole/m^3))	Henry's law constant: the ratio of a chemical's concentration in the air to its concentration in the water at equilibrium (atm·m^3/mol).
Molecular Weight (g/mole)	The mass in grams of one mole of molecules of a chemical compound.

Consult *Toxic Release Inventory Relative Risk-Based Environmental Indicators Methodology* (U.S. EPA, 1997a) for information about the ways the above data are used in the Indicators model.

6.2   Census Data

In the Indicators model, population data at the census block level are used to estimate the population in each of the 1-km by 1-km grid cells in the model. Census blocks are the smallest geographic area for which decennial census data are collected. Blocks are formed by streets, roads, railroads, streams and other bodies of water, other visible physical and cultural features, and the legal boundaries shown on Census Bureau maps. In 1990, the Census Bureau tabulated data for 7,020,924 census blocks.

One or more census blocks forms a block group, which is a subdivision of a census tract or block numbering area. A block group consists of all census blocks whose numbers begin with the same digit in a given census tract or block numbering area. The total number of block groups delineated for the 1990 decennial census was 229,466. Some demographic data, such as the population in more narrowly defined age groups or the population with an income level in a certain range, are available only for block groups. To view census-specific information, click on Census, which brings up the screen in Exhibit 6-3.

Descriptions of the census data that are available at the block level and that can be seen in this screen are presented in Exhibit 6-4. As shown in Exhibit 6-3, each 1-km by 1-km grid cell is assigned to a block group, thereby allowing the census data affiliated with that block group to be attributed to the grid cell. These block group data are not currently used in the Indicators model, but will be used in the next generation (32-bit) of the model. For each block, a block centroid is provided, based on the geometry of the block (i.e., the centroid is area-weighted, not population-weighted). Each block is then mapped to a grid cell by comparing its block centroid location to the grid cell location. The location of each grid cell is defined by its four corner points calculated from its (X,Y) coordinates. When a block centroid falls within a grid cell, its population data are attributed to that cell. If more than one block centroid is located within a grid cell, then the populations affiliated with the multiple blocks are summed. The block count is the number of block centroids within the 1-km by 1-km grid cell.

To more easily view the data, columns may be moved around to re-order them. To move a column, click on the column heading using the left mouse button. A thick black line will appear to the left of the column. Holding down the left mouse button, move the line to where you want the column to be inserted and then release the mouse button.

EXHIBIT 6-3
Census Data Screen

X	Y	Block Group	Block Count	County	Population	Whi
-7160	1647	20169620002	1	KS,SALINE	4633	
-6946	1693	0	1		4	
-6944	1690	0	1		73	
-6942	1687	0	1		21	
-6721	2976	0	1		525	
-6612	2966	0	1		519	
-6596	2240	20169619997	1	KS,SALINE	79	
-6596	2243	20169619997	1	KS,SALINE	684	
-6530	2179	0	6		97	
-6529	2179	0	1		41	
-6474	3197	0	1		178	
-6473	1767	0	1		35	
-6406	1826	0	1		7	
-6400	3182	0	1		4	
-6399	3180	0	1		157	
-6389	3175	0	1		2	

If you obtain the (X,Y) coordinates for a particular facility from the Facility Browser, you can enter them and click the [Find] button. You will be moved to the Census information for these coordinates or for the coordinates closest to your entry. You can also remain in the Facility Browser and use the Links feature to see the population surrounding a facility. In the current version of the model, population data are not available for American Samoa and Guam and no racial demographic data are available for Puerto Rico.
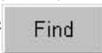
EXHIBIT 6-4
Census Data Information

Data Label	Description
X	Assigned grid value based on latitude
Y	Assigned grid value based on longitude
Block Group	Block group that 1-km by 1-km grid cell at given coordinates is part of. The first one to two digits is the state Federal Information Processing Standard (FIPS) code (often the leading zero is dropped). (See Exhibit C-4 in Appendix C for a list of state FIPS codes.) The next three digits are the county FIPS code, followed by a six-digit census tract area number and a one-digit block group number.
Block Count	Number of block centroids within the 1-km by 1-km grid cell at given coordinates
County	FIPS (Federal Information Processing Standard) county code assigned to the grid cell
Population	Total population in the grid cell
White	White population in the grid cell
Black	Black population in the grid cell
Native American	Native American population in the grid cell
Asian	Asian and Pacific Islander population in the grid cell
Hispanic	Hispanic population in the grid cell
Age Less Than 18	Population under 18 years of age in the grid cell
Age 65 and Older	Population 65 years of age or older in the grid cell

6.3 Weather Station Data

To view weather station information, click [Weather], which brings up the following screen:

EXHIBIT 6-5
Weather Station Data Screen

A full list and descriptions of the types of weather station data in this screen are presented in Exhibit 6-6.

EXHIBIT 6-6
Weather Station Information

Data Label	Description
WBAN	5-digit identification of the weather station; WBAN refers to Weather Bureau/Army/Navy.
Name	Name of the weather station (not currently available).
Radial Distance	Distance from approximate center point of U.S. (centroid of Montgomery County, Kansas), used in searching for the weather station nearest to facility.
Latitude	Latitude of the weather station in decimal degrees.
Longitude	Longitude of the weather station in decimal degrees.

6.4   Stream Data

To view stream-specific information, click $\boxed{\text{Stream}}$, which brings up the following screen:
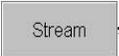
EXHIBIT 6-7
Stream Information Screen
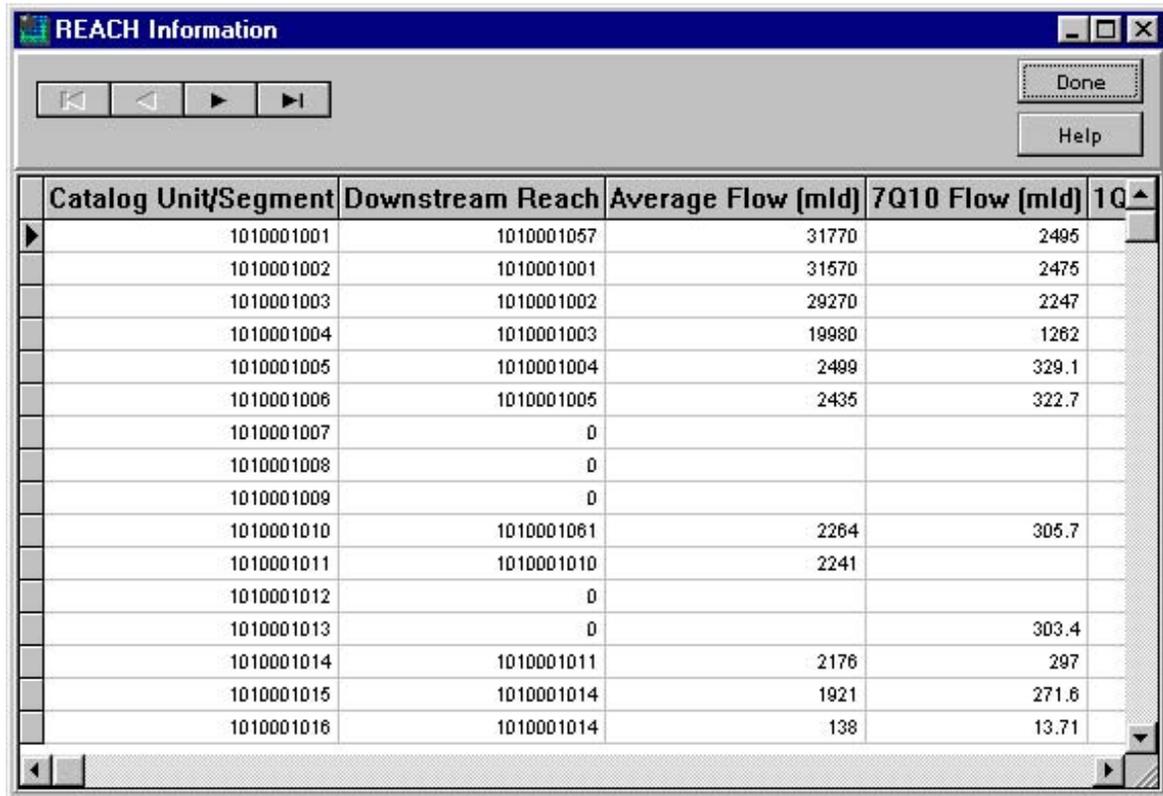
Catalog Unit/Segment	Downstream Reach	Average Flow (mld)	7Q10 Flow (mld)	1Q
1010001001	1010001057	31770	2495	
1010001002	1010001001	31570	2475	
1010001003	1010001002	29270	2247	
1010001004	1010001003	19980	1262	
1010001005	1010001004	2499	329.1	
1010001006	1010001005	2435	322.7	
1010001007	0			
1010001008	0			
1010001009	0			
1010001010	1010001061	2264	305.7	
1010001011	1010001010	2241		
1010001012	0			
1010001013	0		303.4	
1010001014	1010001011	2176	297	
1010001015	1010001014	1921	271.6	
1010001016	1010001014	138	13.71	

A   full
list and descriptions of the types of stream data in this screen are presented in Exhibit 6-8. Note that reaches are linear sections of streams, lakes, reservoirs, estuaries, etc. that are linked to form a skeletal structure representing the branching patterns of surface water drainage systems. The criterion governing reach delineation is that a reach should end where a significant change in hydrological characteristics occurs, e.g., depth, width, slope and/or elevation. This criterion attempts to define reaches having relatively uniform hydrological attributes. Therefore, reach delineation may occur at stream junctions, where streams enter and leave bodies of open water, where deep narrow rivers flow into wide shallow rivers, where stream slopes change significantly, where elevations change suddenly (e.g., waterfalls or dams), etc.

To more easily view the data, columns may be moved around to re-order them. To move a column, click on the column heading using the left mouse button. A thick black line will appear to the left of the column. Holding down the left mouse button, move the line to where you want the column to be inserted and then release the mouse button.

EXHIBIT 6-8
Stream Data Information

Data Label	Description
Catalog Unit/Segment	This is the unique 11 digit alphanumeric United States Geological Survey (USGS) identifier for each reach.
Downstream Reach	This is the catalog unit/segment identifier for the immediate downstream reach of a given reach.
Average Flow (mld)	Average annual flow at the base of the immediate reach in millions of liters per day.
7Q10 Flow (mld)	The lowest flow over a seven day period in the last ten years at the base of the immediate reach in millions of liters per day.
1Q10 Flow (mld)	The lowest flow over a one day period in the last ten years at the base of the immediate reach in millions of liters per day.
Harmonic Mean Flow (mld)	The harmonic mean of annual flow at the base of the immediate reach in millions of liters per day.
Mean Velocity (m/s)	The mean flow velocity in meters per second.
Low Velocity (m/s)	The low flow velocity in meters per second.
Segment Length (km)	The length of the immediate reach in kilometers.
Upstream Lat (dec deg)	The latitude of the upstream end of the immediate reach in decimal degrees.
Upstream Long (dec deg)	The longitude of the upstream end of the immediate reach in decimal degrees.
Q3 Lat (dec deg)	The third quartile latitude upstream from the base of the reach in decimal degrees.
Q3 Long (dec deg)	The third quartile longitude upstream from the base of the reach in decimal degrees.
Mid Lat (dec deg)	The midpoint latitude along the reach path in decimal degrees.
Mid Long (dec deg)	The midpoint longitude along the reach path in decimal degrees.
Q1 Lat (dec deg)	The first quartile latitude upstream from the base of the reach in decimal degrees.
Q1 Long (dec deg)	The first quartile longitude upstream from the base of the reach in decimal degrees.

Data Label	Description
Downstream Lat (dec deg)	The latitude of the downstream end of the immediate reach in decimal degrees.
Downstream Long (dec deg)	The longitude of the downstream end of the immediate reach in decimal degrees.
Max Lat (dec deg)	The maximum latitude of the immediate reach in decimal degrees.
Max Long (dec deg)	The maximum longitude of the immediate reach in decimal degrees.
Min Lat (dec deg)	The minimum latitude of the immediate reach in decimal degrees.
Min Long (dec deg)	The minimum longitude of the immediate reach in decimal degrees.

7. MAKING QUERIES (CREATING AND VIEWING DATA TABLES)

After the individual Indicator Elements have been generated using the [Model...] button, there are a variety of choices available for expressing the Indicator, depending on the analyses you wish to conduct. First, individual Indicator Elements may be combined and subsetted in a number of different ways to create different Indicators or Subindicators. After the Indicator Elements have been combined, the resulting Indicators or Subindicators may be examined in a variety of ways (e.g., as actual pounds released or as the full relative-risk based Indicator).

The following sections describe how to subset and aggregate Indicator Elements when conducting a new query, how to load previously created tables, and ways to express each Indicator or Subindicator. The three buttons in the initial screen of the Indicators model used for these operations are [New Query], [Load], and [Load from CD]; additional screens and buttons are discussed in the following sections.
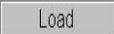
Many queries have already been run and are provided with the model. These queries can be viewed by following the instructions for [Load] *or* [Load from CD]. *Please see Chapter 10 for a list of filenames and a complete description of these pre-run queries.*
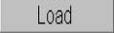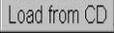
7.1   New Queries [New Query]

To conduct a new query, click on [New Query] which appears on the first screen of the Indicators model. The following screen will then appear:

EXHIBIT 7-1
Indicator Element Aggregation Screen

7.1.1 Specifying a Filename for Results

Before running a new query, it is important to first specify a filename for your results in the "Save" box shown in Exhibit 7-1 to avoid the possibility of overwriting a previously saved file. The file will be saved on the user directory on the drive where you have installed the model; the file is saved as a Paradox file which can then be used directly by the model during future queries. You may add a filename that is up to 8 characters long (consistent with the DOS file-saving convention). Do not add an extension; this is done automatically by the program. If you do not specify a filename, the file created will be called "Newfile". Each run of the program produces three files with the following extensions: *.aux, *.db, and *.px. These files are saved in the c:\OPPTEIM\USER subdirectory; the files must be stored in this directory for the model to use them. If you wish to reload your results to view them again, the *.db version of the file will be available to reload using the LOAD button.

The "New file for" box shown below the "Save" box is currently not operational. In the future, this feature will allow the user to run batch files, e.g., for all ten EPA regions, all states, etc.

7.1.2 Subsetting Data

For some analyses, you may wish to choose only a subset of the total national information available in the database for all facilities, chemicals and media. For example, you may wish to create Subindicators for only the chemicals barium, arsenic, and cadmium for EPA Regions 1 and 2. To choose a subset of data for a given variable, click on Subset Data shown in the **Indicator Element Aggregation** screen. *(You may do this before or after you select row and column variables for the table, because these are completely separate operations.)* Clicking on this button will bring up the following screen:

EXHIBIT 7-2
The Search Parameters Screen
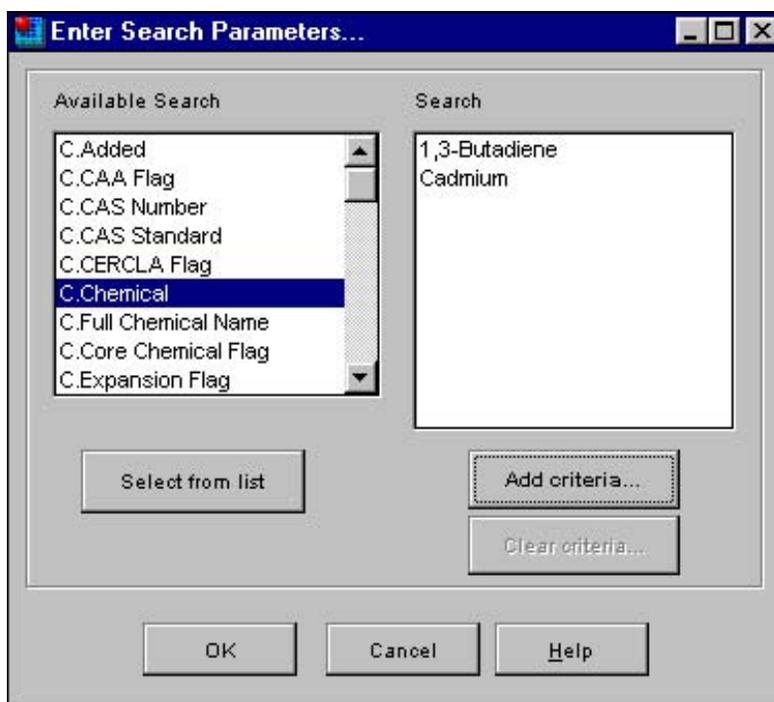
Using the options in the **Enter Search Parameters...** screen, there are three ways to choose a subset of data for each parameter you wish to subset by:

1.   The first way to choose a subset of data is to select data from available "pop-up" lists. To do this, click on a variable in the *Available Search* section of the **Enter Search Parameters...** screen (Exhibit 7-2). If the parameter has a preset list of choices (e.g., chemical), the button Select from list will be activated (the text will be black, not gray). After selecting a parameter with a preset list from the left side of the screen, click on Select from list . The screen that appears next includes a list of relevant items; click on the box(es) next to the item(s) you wish to

include in your subset. After you choose these items, they will appear in the *Search:* section shown in Exhibit 7-2.

2.　　　The second way to choose a subset of data is by directly typing in the items you wish to include. To do this, click on the chosen variable in the *Available Search* section of the **Enter Search Parameters...** screen (Exhibit 7-2). Then, click on [Add criteria...] on the right side of the screen.

The following screen will appear:

EXHIBIT 7-3
Screen for Choosing Items to Include in a Subset
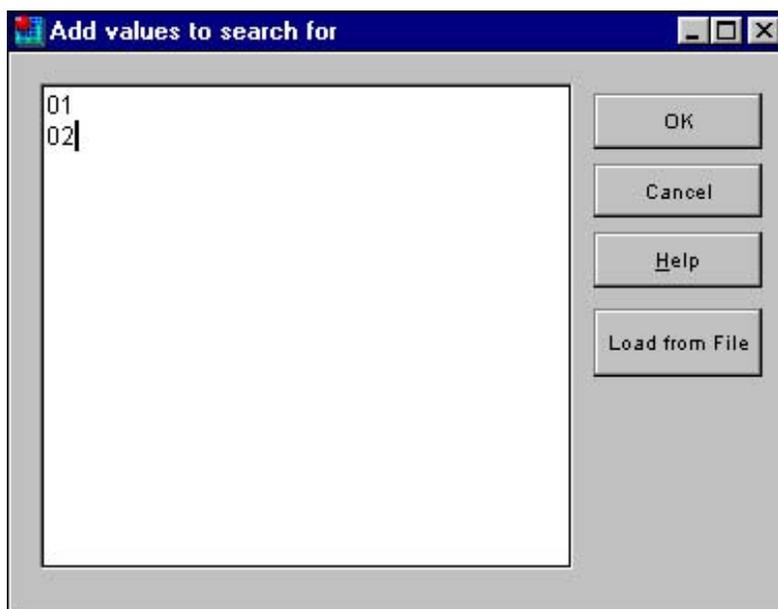
Click on the interior of the window shown in Exhibit 7-3 to activate it. Add the items to be included in the subset on separate lines. *NOTE: Follow each entry, **except the last entry,** by a hard return. If you enter a hard return after the last entry, your data may not be subsetted correctly.*

　EXAMPLE:　If you wish to list data for EPA Regions 1 and 2 only, select Region in the **Enter Search Parameters...** screen. Then, type "01" and "02" on separate lines in the **Add values to search for** screen (as shown in Exhibit 7-3).

Descriptions of the parameters and the formats for entering data when you wish to use only a subset of data are shown in Exhibit 7-4. You can determine whether the parameter is chemical-specific, facility-specific, media-specific, or release-specific by the letters (C, F, M, or R) that precede the name of the parameter. It is important to use the correct entry format for each type of subset parameter. If you do not use the exact format, the query will be run, but the data will not be included correctly. Additional information on the flag fields can be found in Appendix G.

EXHIBIT 7-4
Options for Subset Parameters and Row and Column Variables

Variable	Description	Format for Entering Information When Subsetting Data
C. Added	This indicates the year that the chemical was added to the TRI roster	Enter all four digits, e.g., 1988
C. CAA Flag	This flag marks the chemicals that are Clean Air Act pollutants	Enter x on the first line
C. CAS Number	Chemical CAS Number	Enter digits without hyphens
C. CAS Standard	Chemical CAS Number	Enter digits with hyphens in the form 00-00-0
C. CERCLA Flag	This flag marks the chemicals that are listed in Superfund (CERCLA-Comprehensive Environmental Response, Compensation, and Liability Act)	Enter x on the first line
C. Chemical	Common Chemical Name	Choose from list available in the Indicators model
C. Full Chemical Name	Full Chemical Name	Choose from list available in the Indicators model
C. OSHA Carcinogens	This flag indicates whether the chemical is a known or suspect human carcinogen based on OSHA criteria (U.S.EPA, 1998). Known human carcinogens are defined as those that have been shown to cause cancer in humans. Suspect human carcinogens have been shown to cause cancer in animals. The list of chemicals flagged as OSHA carcinogens is based on the list provided in the 1997 TRI Public Data Release, which was compiled from the following sources: the National Toxicology Program's *Annual Report on Carcinogens*, the International Agency for Research on Cancer *Monographs,* and 29 CFR 1910[11].	Enter x on the first line

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[11] Even if a chemical is flagged as an OSHA carcinogen, its toxicity weight for a given exposure pathway may not be based on its carcinogenic effects. For example, a chemical that causes both carcinogenic and noncarcinogenic effects when inhaled may have a higher inhalation toxicity weight associated with noncarcinogenic effects than with its carcinogenic effects. If you wish to select all chemicals that have inhalation toxicity weights based on cancer health effects, see the instructions for the *Toxicity Class - Inhale* field.

Variable	Description	Format for Entering Information When Subsetting Data
C. 33/50 Flag	A marker showing that the chemical is included in EPA's 33/50 program, a program in which facilities voluntarily reduce their chemical releases by 33 percent and 50 percent by certain dates	Enter x on the first line
C. Expansion Flag	A marker for chemicals added in the 1996 reporting year	Enter x on the first line
C. Core Chemical Flag	This flag marks the chemicals that are common to all reporting years of TRI and which have had no modifications of reporting requirements	Enter x on the first line
C. HAP Flag	This flag marks the chemicals that are designated as hazardous air pollutants under the Clean Air Act	Enter x on the first line
C. Metal	This flag indicates whether the chemicals are metals and also whether they are core chemicals (core chemicals are those that are common to all reporting years of TRI and which have had no modifications of reporting requirements)	Choices are: M [metal]; CM [core metal]; NM [non-metal]; and CNM [core non-metal]
C. Priority Pollutant Flag	This flag marks the chemicals that are designated as priority pollutants under the Clean Water Act	Enter x on the first line
C. SDWA Flag	This flag marks the chemicals that have national primary or secondary drinking water standards under the Safe Drinking Water Act	Enter x on the first line
C. Toxicity Category	This indicates whether the oral and inhalation toxicity weights are based on cancer health effects or noncancer health effects or both (i.e., "mixed")	Choices are: Carcinogen [indicates that the chemical's most sensitive endpoint for both exposure pathways is cancer]; Non-carcinogen [indicates that the chemical's most sensitive endpoint for both exposure pathways is noncancer effects]; and Mixed [indicates that the chemical's most sensitive endpoint varies by exposure pathway]

Variable	Description	Format for Entering Information When Subsetting Data
C. Toxicity Class - Inhale	This indicates whether the toxicity weight for the inhalation pathway is based on cancer or noncancer health effects	Choices are: Carcinogen [indicates that the chemical's most sensitive endpoint for the inhalation pathway is cancer]; Non-carcinogen [indicates that the chemical's most sensitive endpoint for the inhalation pathway is noncancer effects]; Carcinogen*; and Non-carcinogen*. An asterisk indicates that the toxicity weight came from the oral exposure pathway.
C. Toxicity Class - Oral	This indicates whether the toxicity weight for the oral pathway is based on cancer or noncancer health effects	Choices are: Carcinogen [indicates that the chemical's most sensitive endpoint for the oral pathway is cancer]; Non-carcinogen [indicates that the chemical's most sensitive endpoint for the oral pathway is noncancer effects]; Carcinogen*; and Non-carcinogen*. An asterisk indicates that the toxicity weight came from the inhalation pathway.
C. Toxicity Source	Source of toxicity information (whether from IRIS, HEAST, the Office of Pesticide Programs, or Derived from other sources)	Choices are: IRIS, HEAST, OPP, or DERIVED
C. User Tags 1 through 5	Using these tags, you can select a set of chemicals based on your own selection criteria	
F. City	City where the TRI facility is located	Enter city name using capital letters.[1]

Variable	Description	Format for Entering Information When Subsetting Data
F. County	County where the TRI facility is located	Enter county name using capital letters.[1] Because more than one state may contain a given county name, the preferred entry format is to enter the two letter state postal code followed by a comma and the county name (with no space between state and county). For example, Prince George's County, Maryland should be entered as: "MD,PRINCE GEORGES" *(Note that although there is no space between the state and the first name of the county, there **is** a space between the two county "names".)* Alternatively, one can subset both state and county together. In addition, counties beginning with 'Mc' should be entered like 'Mc Donald,' with a space between 'Mc' and the rest of the word.
F. DUNS	The 9-digit number assigned by Dun & Bradstreet for the facility or establishment within the facility	Enter the nine digits
F. Federal Facility Flag	Identifies whether a facility is a Federal Facility or a Government Owned Contractor Operated Facility	Enter F for a Federal Facility, G for a Government Owned Contractor Operated facility, or C for all other facilities
F. Facility ID	Unique TRI identifier for facility	Enter the 15 character TRI identifier, using upper case for any letters included in the ID
F. FIPS	TRI facility FIPS (Federal Information Processing Standard) code which identifies the county associated with the facility	Enter code using leading zeros if code is less than five digits
F. Name	TRI facility name	Enter name using capital letters[1]
F. Parent Name	Name of the corporation or other business entity located in the U.S. that directly owns at least 50 percent of the voting stock of the facility	Enter name using capital letters

Variable	Description	Format for Entering Information When Subsetting Data
F. Parent DUNS	The 9-digit number assigned by Dun & Bradstreet for the US parent company	Enter the nine digits
F. Region	EPA region where facility is located. There are 10 EPA regions. Any information which cannot be matched to an actual EPA region (e.g., an unrecognized zipcode) is assigned to a dummy region (called UK)	Enter EPA region number with a zero before it for regions 1 through 9 (i.e., 01, etc.)
F. SIC Code 1[2]	First facility 4-digit SIC code reported on Form R	Enter four digits[2]
F. SIC Code 2[2]	Second 4-digit SIC code reported on Form R	Enter four digits[2]
F. SIC Code 3[2]	Third 4-digit SIC code reported on Form R	Enter four digits[2]
F. SIC Code 4[2]	Fourth 4-digit SIC code reported on Form R	Enter four digits[2]
F. SIC Code 2 Digit	First 2 digits of first SIC code	Enter two digits
F. SIC Code 3 Digit	First 3 digits of first SIC code	Enter three digits
F. EPA SIC Code 2 Digit	EPA standardized 2-digit SIC code. (This code uses all reported SIC codes to arrive at a 2-digit code, if applicable. If reported 4-digit codes differ in the first two digits, the "multiple code" is used.)	Choices are: 20-39, MU [for multiple codes within the range of 20-39], NA [for codes outside the range of 20-39]
F. State	State in which the facility is located	Enter the two character state postal code, using all capital letters
F. ZIP Code	Facility ZIP code	Enter five digits[3]
M. Media Text	Descriptions of receiving media associated with R. Media codes	See Exhibit C-1 in Appendix C for descriptions associated with R. Media codes. [The descriptions in Exhibit A-1 are not the exact descriptions included in the model; it is recommended that you use the R. Media codes when subsetting your data rather than these media descriptions]
R. MaxOnsite	Maximum amount of chemical stored onsite in any given calendar year	Enter digits using the codes listed in Exhibit C-3 in Appendix C

Variable	Description	Format for Entering Information When Subsetting Data
R. Media	Code associated with the media and/or method of release	Enter digits using the codes listed in Exhibit C-1 in Appendix C
R. Year	Reporting year of interest	Enter all four digits, e.g., 1997
R. Score Category	Disaggregated code of release media	Choices are: 0-33 [See Exhibit C-2 in Appendix C]
R. Use	Code describing whether chemical is manufactured, processed, or otherwise used at the facility	Enter letter using the codes listed in Exhibit C-3 in Appendix C.

[1]Because there may be some variation in the spellings of city, county, or facility names in the TRI database, you may need to enter several spellings of the item you are interested in. For example, to obtain data for St. Louis, Missouri, you should enter all of the following city spellings:

      SAINT LOUIS
      ST. LOUIS
      ST LOUIS

[2]These SIC code variables cannot be used together to identify facilities which report a 4-digit SIC code in <u>any</u> of the four fields, since only the "and" operator is functional. One must perform four separate model runs to search for a particular 4-digit SIC code in any of the four available locations.

[3]Over the years covered by the model, some ZIP codes have been deleted, others have been reassigned, and yet others have been added. Thus, when doing regional searches, use of city, county, state, or region is advisable.

3.   The third way to choose a subset of data is by loading externally created text files.

First, click on `Add criteria...` in the **Enter Search Parameters...** screen. Next, click `Load from File` in the **Add values to search for** screen. In the screen that appears next, choose the drive and filename of the text file you wish to use as a subset. The text file must be in ASCII format and should have only one value per line; when you choose the file, each value from the file will be shown on a separate line in the **Add values to search for** screen.

After the subset of data is chosen for the parameter of interest, click `OK` until you return to the **Indicator Element Aggregation** screen (shown in Exhibit 7-1).

NOTE: Selecting a subset of data for a given variable does not automatically result in a table that displays information for each item in your subset. To view information for the individual subsetted items, you must select the subsetted variable as a row or column variable, as described below. For example, if you choose a subset of three specific chemicals but do not list chemical as a row or column variable, then no chemical will be listed in your data table and any data shown will represent the *sum* of data for all three chemicals.

7.1.3   Selecting Items as Row and Column Variables

After you have chosen a subset of data, you must then choose how to display the data in your table. Choosing items as row and column variables allows you to aggregate your data differently depending on the analyses you are conducting.

To select items to include as row variables in the table, you can click on the box next to the item in the *Select row variable(s)* section of the **Indicator Element Aggregation** screen (Exhibit 7-1). *(You may choose up to two items to include as row variables).* The values for the chosen variables will be shown along the left side of the table. No preference for the order of the display is available when you are selecting your variables, but the two row variables can be interchanged when you view your table.

To select items to include as column variables in the table, click on the box next to the items included in the *Select column variable(s)* section. The values for the chosen variables will be shown along the top of the table. *(You can select up to two items to include as column variables.)* The same options that apply to interchanging row variables also apply to column variables.

Note that for the variables Metal and Toxicity Category, the table that is generated will show the various sub-variables (i.e., for Metal, metals, core metals, non-metals, and core non-metals will be shown; for Toxicity Category, carcinogens, non-carcinogens, and mixed chemicals will be shown).

After selecting the data in the *Select row variable(s)* and *Select column variable(s)* sections, click on `Submit` to begin the process of generating the table. (This process will take approximately 90 to 120 minutes on a Pentium processor; the time will vary for other personal computers.) Based on your selections, the model will create the table which can be viewed in the **Data Display** screen that will pop up after the processing is finished. This screen is shown in Exhibit 7-5, below.

NOTE: If you receive the error message, "Exception E Printer in Module OPPTEIM.EXE at 0015=29db Printer selected not valid," after clicking *Submit*, you may need to make sure there is a default printer installed in your Windows operating system. If you do not have a printer to install (e.g., you are using a lap-top), simply install the generic printer option that is listed in your version of Windows.

EXAMPLE: If you wish to make a query showing information for each state and environmental medium for the TRI reporting year 1996, choose state as the row variable from the **Indicator Element Aggregation** screen and choose medium as the column variable. The two letter state abbreviations will appear as row labels, and each medium will appear as a separate column heading, as in Exhibit 7-5.

EXHIBIT 7-5
Data Display Screen

Media Text Chemical	1 Fugitive Air	2 Stack Air	Total
1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)	19700		19700
1,1,1,2-Tetrachloroethane	3703	1235	4938
1,1,1-Trichloroethane	2057418	1821928	3879346
1,1,2,2-Tetrachloroethane	9427	4187	13614
1,1,2-Trichloroethane	34208	262140	296348
1,1-Dichloro-1-fluoroethane	4147705	3325397	7473102
1,1-Dimethyl Hydrazine	751.0	151.0	902.0
1,2,3-Trichloropropane	12561	785.0	13346
1,2,4-Trichlorobenzene	31405	119478	150883
1,2,4-Trimethylbenzene	2613704	5270968	7884672
1,2-Butylene oxide	3994	12007	16001
1,2-Dibromoethane	8146	1561	9707
1,2-Dibromotetrafluoroethane	5.000	5.000	10.00
1,2-Dichloro-1,1,2-trifluoroethane	63575	2000	65575
1,2-Dichloro-1,1-difluoroethane	900.0	500.0	1400

NOTE: When region or county is selected as a row or column variable, the emissions from all facilities without valid region or county information will be aggregated into one record in the top row or leftmost column of the screen. That record will be labeled "UK," for unknown. State information for the model is taken directly from the information reported on Form Rs; therefore, whatever is submitted as "state" will be used as output for the query. To obtain counties for facilities in territories and states, the FIPS codes that are reported on Form R are translated into county names.

7.1.4   Hints for Running Queries

When first running queries, you may wish to produce queries which use only single row and column variables. Using two variables per row or column may result in a large number of subtotals within the table, which may make it difficult for you to read your results.

The size of your query will determine whether you can view the results within the model. If your query results in a very large table (greater than approximately 16,000 cells within the table), you will not be able to view your query within the model, and you will need to export the table to Excel or dBase by clicking on [Export] . A message within the model will inform you to export your table when it is too large.

Even if your query is small, you may wish to export your table to Excel to manipulate and view the contents of your table. For example, you can sort your data by any of the columns of data within Excel. In addition, the table exported to Excel lists all the ways that your results may be expressed (i.e., TRI Pounds to Full Model results). See Section 7.3.2 for descriptions of these results.

7.2   Previously-Generated Queries

To display previously-created tables, the tables must be located in either the c:\oppteim\user subdirectory on the user's hard drive (this subdirectory is created automatically when the model is installed) or on the CD. To load tables from the c:\oppteim\user subdirectory, click [Load] in the initial Indicators screen, select the filename of the table you wish to view, then click [OK] to bring up the previously-created table in the **Data Display** screen. An example table is shown in Exhibit 7-5. To load pre-run queries from the CD, use the [Load from CD] button directly beneath the Load button in the initial Indicators screen. Note that sometimes when you click on [Load from CD] , the available files will not be shown. In this case, click on CANCEL, then click on [Load from CD] again to view the files.
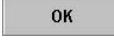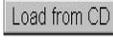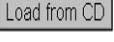
If you have selected a query that is very large, a message within the model will inform you of the exact size of the table, and ask if you would like to skip the load. If you click no, the model will attempt to open the table in the Data Display screen; however, this may take a significant amount of time, or the model may not be able to open the run at all. If you click yes, the Data Display screen will pop up without any displayed data; here you can click the [Export] button at the top right of the screen to export the table in Excel or dBase format.

7.3 Viewing, Expressing, and Sorting Data in Created Tables

You can view the data and choose how to express your data for either a newly-created table or for previously-created tables.

7.3.1 Checking the Subset of Data in the Table

You can look in the upper left-hand corner of the **Data Display** screen (Exhibit 7-5) to determine how the data are displayed in the table. This corner shows the row and column variables of the table. Clicking on the `Records` button activates the toggle window in the upper left-hand corner and shows any subsetting that you chose for this run.

NOTE: If all chemical releases for all available years have been included in the table, the window that appears after clicking `Records` will contain a note saying "all records selected". If data were subsetted, a message will appear showing how the data were subsetted.

7.3.2 Ways to Compute and Express the Indicators

There are a variety of choices for expressing the Indicators and Subindicators, as indicated in the **Data Display** screen and as shown in Exhibit 7-6:

EXHIBIT 7-6

You may want to express the data in different ways depending on your analysis. For each of the categories shown in Exhibit 7-6, there are a variety of options in drop-down boxes, as indicated by the arrows. A general description of each category and the options available are presented below.

Statistic selected:

Using this drop-down box allows you to express the values in the cells as either the sum of the values of the chosen model (indicated by **Sum**) or the number of records in the cell (indicated by **N**).

Model selected:

This drop-down box allows you to access the raw data (TRI Pounds), show the number of pounds that can be modeled (Modeled Pounds) or express the Indicators as measures which incorporate hazard (toxicity), toxicity and population, or risk (toxicity, exposure, and population). Each option gives a different perspective on the reported releases and transfers. Descriptions of these selections are:

TRI Pounds: This number reflects the number of pounds released or transferred that are reported to the Toxics Release Inventory for the exposure pathway being considered.

TRI Pounds (chems with toxicity weights): This value shows only TRI pounds for the chemicals that have toxicity weights. This value differs from Modeled Pounds because it includes those chemicals which have toxicity weights regardless of whether they have physicochemical properties.

TRI Pounds*Toxicity (Hazard Based): This value is TRI pounds multiplied by the toxicity weight of the chemical appropriate for the exposure pathway selected. In this air-only version of the model, for releases to media which have both oral and inhalation exposure pathways, the higher toxicity weight is applied to all the TRI pounds.

Modeled Pounds: This number reflects the number of pounds released or transferred (TRI Pounds) that can be modeled. Reasons that releases may not be able to be modeled include lack of physicochemical information required for exposure modeling or lack of toxicity weights.

Modeled Pounds*Toxicity: This value is *modeled* pounds multiplied by the toxicity weight of the chemical appropriate for the exposure pathway selected. It does not measure how the pollutant moves through the environment and comes in contact with an individual. The oral toxicity weight is used for releases or transfers to all media except 1, 2, 750, and 754 (see Exhibit C-1).

Modeled Pounds*Toxicity*Population: This value is the number of *modeled* pounds multiplied by the toxicity weight of the chemical appropriate for the exposure pathway selected and by the population potentially exposed. The oral toxicity weight is used for releases or transfers to all media except 1, 2, 750, and 754 (see Exhibit C-1).

Full Model (Risk-Related): The full model multiplies the surrogate dose estimated using exposure models by the chemical's toxicity weight and by the population. The pounds used in this expression of the Indicators differ from the pounds used for **Modeled Pounds*Toxicity*Population** (and may be a smaller value) because the fate and transport of the chemical pounds have been modeled and exposure assumptions have been made.

Examples of useful comparisons among the above Indicators include:

(1) TRI Pounds vs. TRI Pounds (chems with toxicity weights)

> This comparison allows you to determine the proportion of total TRI Pounds released that are associated with chemicals that have toxicity weights. This proportion may be somewhat different than the overall proportion of TRI chemicals that have toxicity weights. For example, 50% of a given set of TRI chemicals may have toxicity weights. However, it is possible that 80% of the TRI Pounds released for the same set of chemicals may be associated with chemicals that have toxicity weights.

(2) TRI Pounds vs. Modeled Pounds

This comparison allows you to determine the proportion of chemical releases for which risk-related impacts can be estimated using the Full Model option.

(3) TRI Pounds*Toxicity vs. Modeled Pounds*Toxicity

This comparison shows you (a) the amount of toxicity-weighted releases associated with chemicals that have toxicity weights versus (b) the amount of toxicity-weighted releases for chemicals that have both toxicity weights and physicochemical data that are used to model exposure. An important difference between this comparison and the comparison in (2) is that this comparison addresses only those chemicals that have toxicity weights.

(4) Modeled Pounds*Toxicity vs. Modeled Pounds*Toxicity*Pop

This comparison allows you to determine the extent to which population contributes to the Indicator value.

Cells show:

This selection allows you the option of expressing the Indicator or Subindicator as an actual value or a percent. The specific options are:

Value: This number shows the actual value associated with the model selected, rather than the percent. For example, in the case of the Full Model, the number will be the Indicator or Subindicator value.

Percent: This shows the percent of all values in the table contributed by the value in a given cell.

Row Percent: This number shows the percent of all values in the row.

Column Percent: This number shows the percent of all values in the column.

Normalization:

For any of the models selected except TRI Pounds, you can choose different ways to normalize the Indicators, depending on the kind of baseline Indicator or Subindicator you want. In general, normalization is most useful for examining trends in the scores over time. The choices for normalizing the data include:

National: The value in each cell of the table is the total of the numerical output from the model selected, divided by the sum of all Indicator Elements for all facilities in the base year of 1988 and multiplied by 100,000 for ease of reading.

Selected Records (Base Year 1988): The value in each cell of the table is divided by the sum of only the values of the variables selected for your analysis for the base year of 1988 and multiplied by 100,000.

Selected Records: The value in each cell of the table is divided by the sum of the records in the table for the year or years chosen for your analysis and multiplied by 100,000. In this option, the sum of all values in the displayed table will equal 100,000 even if data were subsetted.

None: The values in each cell are reported directly, without normalization. *(This is the only selection available for TRI pounds.)*

7.3.3   Sorting Records in the Table

You may wish to sort the records by the values shown in the table. If you wish to sort all of the records in the table, click on [Select All] in the **Data Display** screen (Exhibit 7-5). Then click [Sorted] to sort the records (indicated by individual rows) in the table in descending order by the values shown in the table. You may also sort a smaller selection of data by highlighting cells of interest. You can sort the highlighted cells by clicking the [Sorted] button.

A description of the other information displayed with your sorted data is as follows:

Item	Description
Year	The year of release
Rank	The order of the Subindicator or Indicator relative to other Subindicators selected from the data display table. (The item with the highest value is given a rank of one.)
Value	The non-normalized value from the table (e.g., Pounds, Full Model).
Percent	The percent of the total value of the sorted cells.

Cum Freq	The cumulative value of the highest ranked items up to the value in the row of interest. For example, the user may determine the total Indicator value of the top 5 or 10 ranked items.
Cum Pct	The cumulative percent of the total value of the highest ranked values up to the percent in the row of interest.

You may print your sorted table using ⬛ **Print** , in the upper right-hand corner of the screen. This button prepares the table for printing, and brings up the print preview screen. It may be evident by looking at this screen that further changes need to be made to the table. Occasionally the column widths may need to be changed, either because all numbers may not be fully visible in each column (e.g., for very large numbers, the first digit may be hidden), or because the columns are too wide to fit them all on one page. If you need to make changes, close the print preview screen. You can then make changes in the Sorted Results screen. If you need to change the width of the columns, use the mouse to move to the right-hand border of the heading of the column you wish to size, until the arrow becomes a double line with two arrows. You can then move the mouse to the right to make the column wider or move the mouse to the left to make the column narrower. You can preview your selection again prior to printing and make additional adjustments if required.

7.3.4   Mapping Your Query

NOTE: If you have not used either state or county as a row or column variable, then the world icon will be blank, and you will not be able to view your results geographically.

To view your results geographically, click on 🌎 in the upper right-hand corner of the **Data Display** screen. This will bring up the **Map View** screen, which provides several options for mapping your results. By clicking on the appropriate choice in the **Media Text** drop-down box, you can view results either separately for each of the individual media selected or as the sum of all media; the sum of results for all media is indicated by " ALL " (see Exhibit 7-7). To choose the method of expressing your data (e.g., TRI Pounds, Full Model, etc.), click on the appropriate option in the **Method** drop-down box at the bottom of the screen.

The six ranges of results, represented by separate colors on the map, are divided (from lowest to highest) according to the percent of the mean value for all areas, as follows:

- 0 - < 25% of the mean
- 25 - < 50% of the mean
- 50 - < mean
- mean - < 200% of the mean
- 200 - < 300% of the mean
- ≥ 300% of the mean

The concentrations associated with each of these ranges are listed next to the relevant color on the screen in the bottom left hand corner.

In some or all regions of your map, you may see a greenish-brown color that is not one of the colors in the legend at the bottom of the **Map View** screen. This color indicates that there are insufficient data for generating model output for that area. For example, in the current version of the model, if you select "Full Model" for any releases other than stack or fugitive air releases, your map will be completely greenish-brown.

The **Geographic** drop-down box on the **Map View** screen indicates whether you are viewing the data by state or county. If you have run a query by state (not county), you will be able to view your results by state only. Likewise, if you have run a query using county as one of the row or column variables, you will be able to view results only by county. If you run a query by both state and county, you will be able to choose whether to view your results by state or county.

There are three icons in the lower right-hand corner. The leftmost icon has a magnifying glass with a red plus sign. To zoom in and expand a particular region on the map, click once with the left mouse button on the icon, and then click and hold the left mouse button to draw a box around the region you want to expand. The magnifying glass with the red minus sign allows you to zoom out by a factor of two. The world icon resets your map to its original size and location on the screen.

To obtain information on the score and its percent of the total for a state or county, simply click on the state or county and that information will appear in a box.

EXHIBIT 7-7
Map View Screen
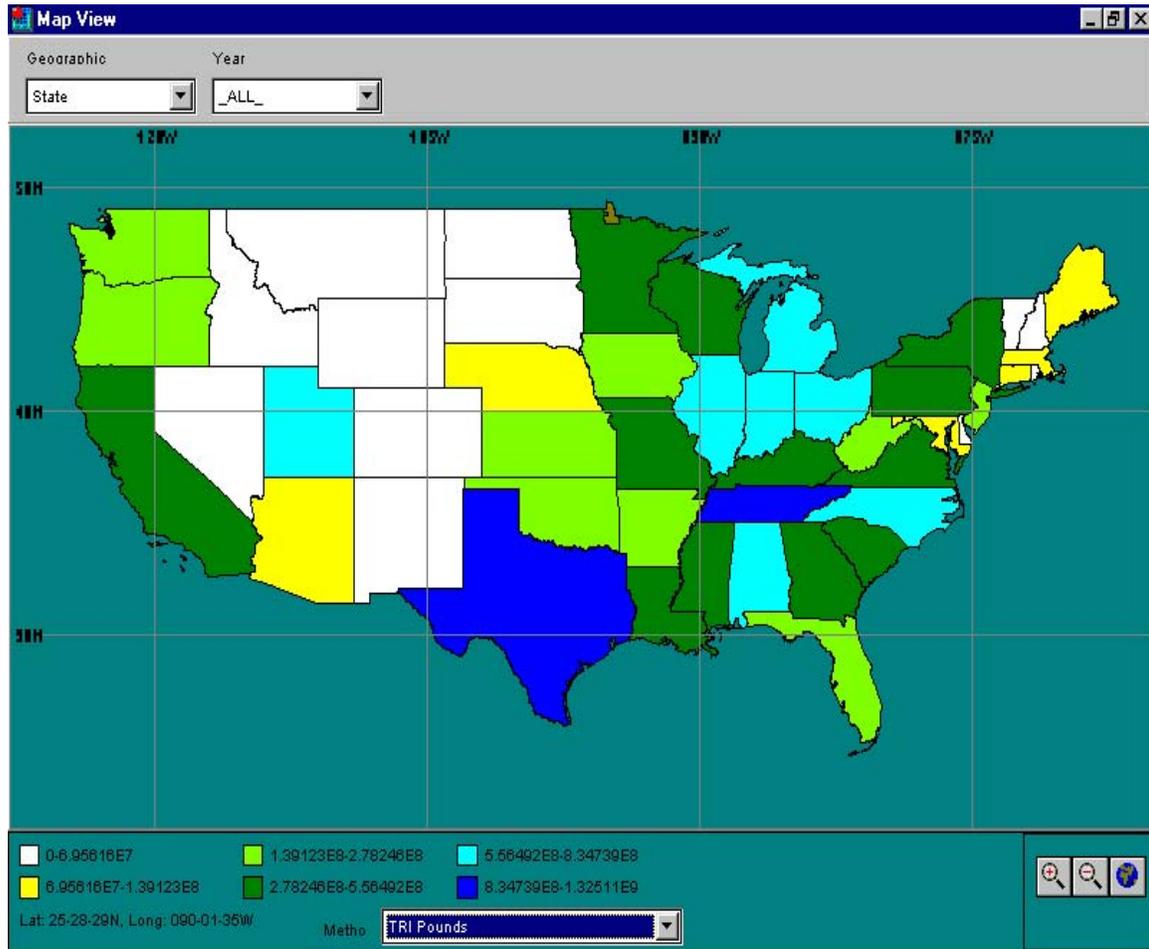
7.4   Saving the Data Table to an External File

The ⬚ Export ⬚ button exports the data table as either a dBase file or an Excel worksheet. This option will export the entire table. At this time, you cannot export a smaller selection from the table. Note that, to save space, the column headings corresponding to the model selected have been shortened in the external files. Exhibit 7-8 presents the corresponding column headings in a dBase file and in an Excel worksheet and the corresponding model selected.

7.5   Caveats

Results of the Risk-Screening Environmental Indicators can be used to identify, compare, and rank facilities, geographic areas, and environmental media. The Indicators model is a screening-level tool that examines general populations surrounding facilities from a risk-related perspective and only in a

comparative manner. Results of the Risk-Screening Environmental Indicators are not the same as a quantitative risk estimate for a facility. More refined analysis is required for calculating such an estimate, using more detailed data for the facility and the site where it is located, in order to characterize actual risks for individuals and/or sensitive subpopulations (e.g., children, the elderly, etc.). The Help Screens in the model will assist you in identifying other important caveats and limitations which pertain to interpreting the results of this model.

EXHIBIT 7-8
Column Headings in External Files Corresponding to Model Selected

Model Selected	Column Heading in dBase File	Column Heading in Excel Worksheet
TRI Pounds	TRIPOUNDS	TRIPounds
TRI Pounds (chems with toxicity weights)	TRIPOUNDSB	TRIPoundsB
TRI Pounds * Toxicity (Hazard Based)	TRIPOUND_1	TRIPoundsBTox
Modeled Pounds	MODELEDPOU	ModeledPounds
Modeled Pounds * Toxicity	POUNDSTOX	PoundsTox
Modeled Pounds * Toxicity * Population	POUNDSTOXP	PoundsToxPop
Full Model (Risk-Related)	FULLMODEL	FullModel

8. GRAPHING RESULTS OF YOUR DATA QUERY

After you have created a data table (using [New Query] from the initial Indicators screen) or after you have loaded a table (using [Load] or [Load from CD]), you can graph your results using [graph icon] in the **Data Display...** screen:

EXHIBIT 8-1
Data Display Screen

To make a graph, first select the data you wish to graph from the table in the **Data Display...** screen. You can either select all the data using [Select All], or you can choose a subset of data by clicking one cell that defines one corner of the selection of interest and dragging the cursor to the other corner of the selection and then releasing the mouse button. After you select your data, click on [graph icon] in the **Data Display...** screen. This will bring up the **Graphs...** screen such as seen in Exhibit 8-2:
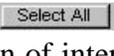
EXHIBIT 8-2
Graphs Screen
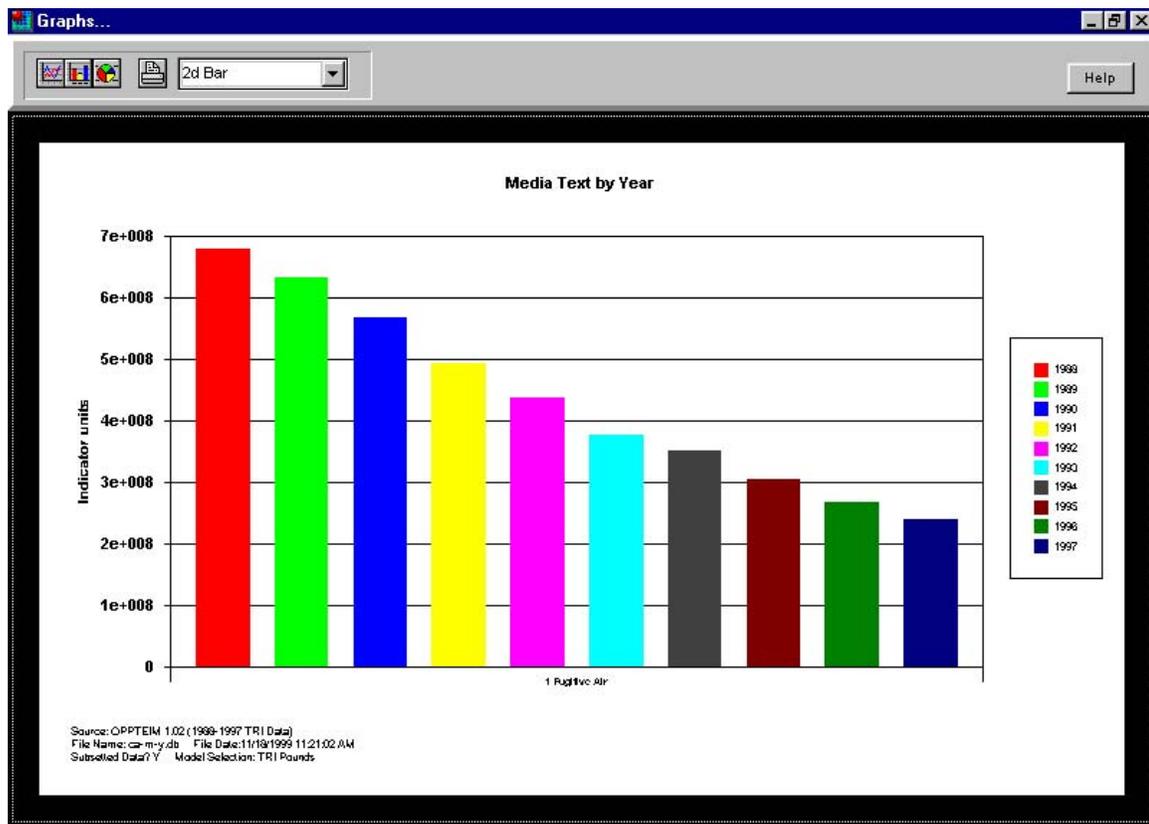
8.1   Choosing a Plot Type to Graph Your Results

There are many types of graphs you can use to plot your data. You can choose among two-dimensional and three-dimensional line and bar graphs, pie charts and other types of graphs such as three-dimensional doughnut graphs. All options are listed in the pull-down box in the top section of the **Graphs...** screen. To choose a graph type, click on the arrow to the right of the pull-down box to view all options and then click on the graph type you want. A full description of each graph type included in the pull-down box and the best uses of each type are listed in Appendix E. Extensive on-line help is also available.

8.2   Formatting the Graph

To change the appearance of different parts of the graph, click the right mouse button to activate the menu of items you can change on the graph as seen in Exhibit 8-3:

EXHIBIT 8-3
Graph Screen with Menu
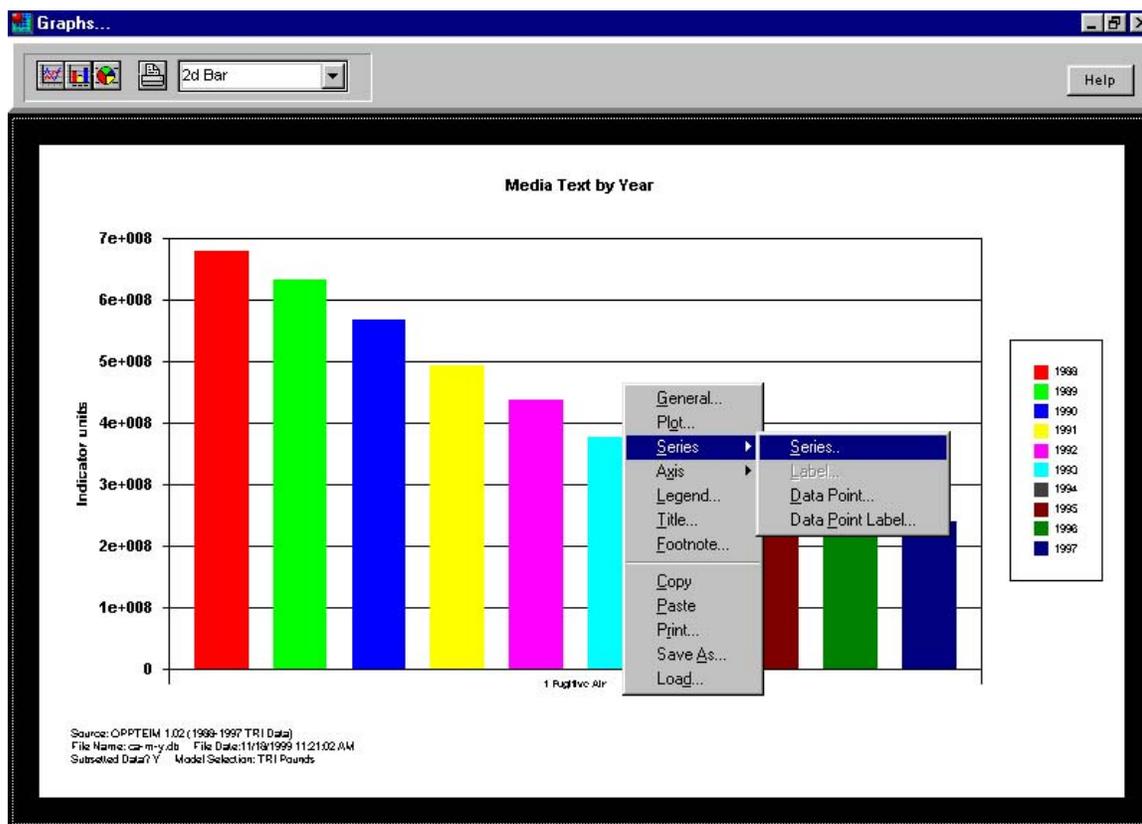
Clicking on the item you wish to change in the top half of the menu (from General... to Footnote...) opens a screen where you can customize the graph. Clicking on Series and Axis brings up additional menu items.

The descriptions below indicate generally what each menu option will do. Refer to Appendix E for detailed information on additional menu items and screens which appear by clicking on the items listed below and refer to the online help button for even greater detail about available options.

General...   This option allows you to change options for the entire chart (including plot area, title, axes, and legend).

Plot...   This option allows you to change the format of the plot area (which includes the grid area and the axes).

Series   This option allows you to change the appearance and labels on data series and data points.

NOTE: The items that are called data series and data points are determined by the layout of your original data table. If your table includes years as column variables and chemicals

as row variables, the range of chemical scores for a given year is called a series in your graph; each individual chemical score within that year is a data point.

Axis   With this option, you can change the appearance of axes, axis labels and axis titles.

Legend...   Format the chart legend using this option.

Title...   Format the chart title using this option.

Footnote...   Format the chart footnote using this option.

NOTE: The initial information contained in the footnote includes the source of the graph (i.e., from the Indicators model version 2.0), filename of the graph, file date, whether the data were subsetted, and the model used (e.g., full model, pounds).

8.3   Moving Sections of the Graph

Using the location option described in the previous section, you can move and change the size of different sections of the graph. However, there is a simple way to move sections of the graph without navigating through the menu choices. First, click on the part of the graph you wish to move. Then, hold down the left mouse button, and drag the section to where you want it to be.

8.4   Printing the Graph

To print your graph, click the right mouse button while the cursor is on any part of the screen except the gray bar on top. Select **Print...** from the menu that appears (see Exhibit 8-3). A window with three tabs, **Print**, **Page Setup**, and **Print Setup**, appears. On the **Page Setup** tab, you can change the size of your graph relative to the page, how it is centered on the page, and the margins of the page. On the **Print Setup** page, you can change the printer options, and the paper orientation and size. If you would like to view the graph after making changes under either of these tabs, click ⬚ OK ⬚. After viewing the new graph, you can right-click again to re-access the **Print** window. If you do not want to view the new graph before printing, simply click on the **Print** tab and your changes will be incorporated automatically into the printed graph.
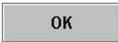
8.5   Saving the Graph to an External File

To save your graph to a file, click the right mouse button. Select **Save as...** from the menu that appears (see Exhibit 8-3). You can then choose a filename and a drive. You can save your graph as any one of the following files:

chart files: Save your graph as a chart file (using a .vtc extension) if you wish to use it again in the model

windows
metafiles: Save your graph as a metafile (using a .wmf extension) if you wish to use it in a word processing program.

bitmap
files: These files (indicated by a .bmp extension) can also be imported into word processing programs.

Note that you can also click on the right mouse button and copy and paste a graph directly into a word processing document. The resulting graphic cannot be edited, but it can be sized.

8.6   Loading a Graph from an External File

You can load a graph from an external file by clicking on the **Load** option in the menu in Exhibit 8-3. By clicking on this option, a data dialog box appears in which you can enter the filename of the graph you want to load.

8.7   Caveats

Results of the Risk-Screening Environmental Indicators can be used to identify, compare, and rank facilities, geographic areas, and environmental media. The Indicators model is a screening-level tool that examines general populations surrounding facilities from a risk-related perspective and only in a comparative manner. Results of the Risk-Screening Environmental Indicators are not the same as a quantitative risk estimate for a facility. More refined analysis is required for calculating such an estimate, using more detailed data for the facility and the site where it is located, in order to characterize actual risks for individuals and/or sensitive subpopulations (e.g., children, the elderly, etc.). The Help Screens in the model will assist you in identifying other important caveats and limitations which pertain to interpreting the results of this model.

9. THE STEP BY STEP PROCESS OF USING THE INDICATORS MODEL: EXAMPLES USING RELEASES IN A DEFINED GEOGRAPHIC AREA

The following examples lead you through the step-by-step process of using the Indicators model to perform a variety of operations. The examples use a defined geographic area (such as your county) and examine impacts from fugitive and stack air releases. Each example demonstrates different uses of the model. The specific examples and types of investigations that are demonstrated are:

Example 1: Comparing the number of pounds released (TRI Pounds) with the number of pounds that can be modeled using the Indicators method (Modeled Pounds) for a given geographic region

Example 2: Comparing county-specific scores with national scores

Example 3: Examining chemical-specific scores and information

Example 4: Performing trends analyses

Example 5: Ranking scores among manufacturing facilities

Refer to previous chapters for detailed discussions of the processes demonstrated below.

9.1 Example 1: Compare Pounds Released (TRI Pounds) with Modeled Pounds

Analysis:

For many analyses, you may wish to compare the actual pounds released, as reported to the TRI, with modeled pounds to determine what portion of the reported releases can be modeled using the Indicators model. (See Chapter 7 for the reasons that reported releases might not be able to be modeled.) The following section describes the process of comparing the two types of results (TRI Pounds and Modeled Pounds) for a given county to understand these differences.

Processes demonstrated:

Creating new data tables
Subsetting data by geographic region and year
Selecting row and column variables
Displaying release data

Step-by-Step Query Process:

1. Create a new table

Click on [New Query] in the initial Indicators screen to open up the **Indicator Element Aggregation** screen. Enter a file name under *Save* to replace the name Newfile.

2. Subset your data for a county (e.g., your county) and for the 1994 reporting year

Click on `Subset Data` to bring up the **Enter Search Parameters...** screen. To choose your county, select county from the list in the **Available Search** section of the **Enter Search Parameters...**screen.

Click on `Add criteria...`, which will bring up the **Add values to search for** screen. Enter your county in the dialog box. Click `OK` to return to the **Enter Search Parameters...** screen. The criteria you added will appear in the **Search:** section of the **Enter Search Parameters...** screen.

Next, to limit the analysis to 1994 TRI data, repeat the above process used to subset your data to your county. However, for this step of the process, substitute year for "county" and 1994 for your county. When finished, click `OK` to return to the **Indicator Element Aggregation** screen.

3. Select the row and column variables

Select county as the row variable by clicking on the box next to **F. County** in the *Select row variable(s)* section of the screen.

Select media as the column variable by clicking on the box next to **M. Media Text** in the *Select column variable(s)* portion of the screen. To run this analysis, click `Submit`.

After the analysis has been run, the **Data Display** screen will appear.

4. Display your data

To display your results as pounds released, select **TRI Pounds** under **Model Selected:** in the **Data Display** screen**.**

To display your results as modeled pounds, select **Modeled Pounds** under **Model Selected:** in the **Data Display** screen.

Results:

Exhibit 9-1 shows sample results of this type of query. In this example, we chose Montgomery County, Maryland as our county. Recall that in this version of the model, full-model results are available only for fugitive and stack air releases.

EXHIBIT 9-1
Sample Results for TRI Released Pounds, Modeled Pounds, and Full Model

Note: The Indicators model saves your most recent query settings. This is to facilitate setting criteria for multiple queries that are similar to each other. When you exit the model, these settings are erased. To clear the settings while still in the model, select the criteria to clear in the **Available Search** section of the **Enter Search Parameters...** screen and click on [Clear criteria...] to clear your criteria. Repeat for all criteria you would like cleared.

9.2   Example 2: Comparison of County-Specific Scores with National Scores

Analysis:

The TRI full-model Indicator scores for 1994 air releases (both fugitive and stack air) for all reporting facilities in the U.S. and for all chemicals can be ranked on the basis of county to put the risk-related impacts for your county into a national perspective.

Processes demonstrated:

Creating new data tables
Subsetting data by type of release (air), year, and geographic region
Displaying risk-related impacts
Sorting risk-related impacts

Step-by-Step Query Process:

1. Create a new table

Click on [New Query] in the initial Indicators screen to open up the **Indicator Element Aggregation** screen. Enter a filename under *Save* to replace the name Newfile.

2. Subset your data for air releases and the 1994 reporting year

Click on [Subset Data] to bring up the **Enter Search Parameters...** screen. To choose stack and fugitive air releases, select "Media" from the list in the **Available Search** section of the **Enter Search Parameters...**screen.

Click on [Add criteria...], which will bring up the **Add values to search for** screen. Enter 1 (for fugitive air releases) and 2 (for stack air releases) on separate lines of the dialog box. Click [OK] to return to the **Enter Search Parameters...** screen. The criteria you added will appear in the **Search:** section of the **Enter Search Parameters...** screen.

Next, to limit the analysis to 1994 TRI data, repeat the above process used to subset your data to stack and air releases. However, for this step of the process, substitute "Year" for "Media" and enter "1994" instead of "1" and "2". When finished, click [OK] to return to the **Indicator Element Aggregation** screen.

3. Select the row and column variables

Select County as the row variable by clicking on the box next to **F. County** in the *Select row variable(s)* section of the screen.

Select media as the column variable by clicking on the box next to **M. Media Text** in the *Select column variable(s)* portion of the screen. Note that it is easier to *subset* media using the media codes in Appendix C, to prevent misspelling a media name. When choosing variables for reporting results, however, it is often more convenient to specify **M. Media Text**, to avoid having to refer to media codes (**R. Media**). To run this analysis, click [Submit].

4. Sort your results by risk-related impacts for all air releases

When your query has finished, you will see the **Data Display** screen. Select *Full Model (Risk-Related)* under **Model Selected:** in the **Data Display** screen. To select the *Total* column, click on a cell within that column in the **Data Display** screen, and then click on the *Select Col* button in the top right corner of the screen. (Even though your selection isn't highlighted as blue, you are still selecting this group of cells.)

Click [Sorted] to sort the data. The rankings will appear in the **Sorted Results** screen that appears next. The ordinal ranking of your county compared with all counties in the U.S. appears under **Rank** and the percent risk-related ranking (compared with all sorted items) appears under **Percent**.

Note: The Indicators model saves your most recent query settings. This is to facilitate setting criteria for multiple queries that are similar to each other. When you exit the model, these settings are erased. To clear the settings while still in the model, select the criteria to clear in the **Available Search** section of the **Enter Search Parameters...** screen and click on [Clear criteria...] to clear your criteria. Repeat for all criteria you would like cleared.

9.3   Example 3: Examining Chemical-Specific Scores

- **Ranking Risk-Related Impacts**

    Analysis:

    To understand which chemicals result in the highest risk-related impacts, a ranking of Full-model Indicator scores can be done for all chemicals released to air.
    Processes demonstrated:

    Creating new data tables
    Subsetting data
    Sorting data

    Step-by-Step Query Process:

    1. **Create a new table**

        Click on [New Query] in the initial Indicators screen to open up the **Indicator Element Aggregation** screen. Enter a file name under *Save* to replace the name Newfile.

    2. **Subset your data for air releases, the 1994 reporting year, and your county**

        Click on [Subset Data] to bring up the **Enter Search Parameters...** screen. To choose stack and fugitive air releases, select media from the list in the **Available Search** section of the **Enter Search Parameters...**screen.

        Click on [Add criteria...], which will bring up the **Add values to search for** screen. Enter 1 (for fugitive air releases) and 2 (for stack air releases) on separate lines of the dialog box. Click [OK] to return to the **Enter Search Parameters...** screen. The criteria you added will appear in the **Search:** section of the **Enter Search Parameters...** screen.

        Repeat the above process to limit your analysis to the year 1994, but substitute "Year" for "Media" and enter "1994" instead of "1" and "2".

        Repeat the process a second time, but substitute "County" for "Year", and your county instead of "1994".

When finished, click [OK] to return to the **Indicator Element Aggregation** screen.

3. Select the row and column variables for your data table

Select chemical as the row variable by clicking on the box next to **C. Chemical** in he *Select row variable(s)* section of the screen.

Select media as the column variable by clicking on the box next to **M. Media Text** in the *Select column variable(s)* portion of the screen. Note that it is easier to *subset* media using the media codes in Appendix C, to prevent misspelling a media name. When choosing variables for reporting results, however, it is often more convenient to specify **M. Media Text**, to avoid having to refer to media codes (**R. Media**). To run this analysis, click [Submit].

4. Sort your results by risk-related impacts for all air releases

Select *Full Model (Risk-Related)* under **Model Selected:** in the **Data Display** screen. To select the *Total* column, click on a cell within that column in the **Data Display** screen, and then click on the *Select Col* button in the top right corner of the screen. (Even though your selection isn't highlighted as blue, you are still selecting this group of cells.)

Click [Sorted] to sort the data. The rankings will appear in the **Sorted Results** screen that appears next. The ordinal ranking appears under **Rank** and the percent risk-related ranking (compared with all sorted items) appears under **Percent**.

Results:

Rankings of the five chemicals with the highest risk-related impacts from stack-air releases and the percent of relative risk-based impacts attributed to these chemicals for a sample county are shown in Exhibit 9-2.

EXHIBIT 9-2
Relative Risk-Based Ranking of TRI Chemicals (On-Site Stack Air Releases)

Chemical	Rank	Percent
Freon 113	1	75.877
1,1,1-Trichloroethane	2	20.201
Acrylamide	3	2.184
Acrylic acid	4	1.114
Ethylene glycol	5	0.59
Zinc compounds	6	0.035

•   **Obtaining Toxicity Weights**

The toxicity weight assigned to a chemical plays an important role in the calculation of its relative risk-based impacts.

Processes Demonstrated:

Examining chemical data

Step-by-Step Process:

Click on [Data] in the initial Indicators screen. Then click on *Chemical* in the screen that appears next to bring up the screen titled **Chemical Information**. You can use the scroll bar on the right to scroll through the table to find your chemicals, or you may use the arrow keys in the upper left-hand corner of the screen to move between chemical records and to move to the top and bottom of the list of records.

After you have found the chemical names, use the horizontal scroll bar to find the column labeled *Inhale-Tox Weight* to obtain the toxicity weight for the chemical for the inhalation pathway. Then locate *Toxicity Class - Inhale* to determine whether the weight is based on a cancer or noncancer health endpoint.

Results:

Exhibit 9-3 provides sample toxicity weightings and the most sensitive endpoint for each chemical listed in Exhibit 9-2.

EXHIBIT 9-3
Toxicity Weights for Chemicals Listed in Exhibit 9-2

Chemical	Inhale-Tox Weight	Toxicity Class-Inhale[1]
Freon 113	0.017	non-carcinogen
1,1,1-Trichloroethane	1.8	non-carcinogen
Acrylamide	9300	carcinogen
Acrylic acid	1800	non-carcinogen
Ethylene glycol	0.25	non-carcinogen
Zinc compounds	1.7	non-carcinogen

[1]The single, most sensitive endpoint is the toxicological basis on which the chemical is weighted. This chronic human health endpoint may be either a cancer or noncancer effect (many noncancer effects are considered for a particular chemical). For a given exposure pathway, ranking may be based on either type of effect (or both may give the same score). This does not imply that the chemical does not exhibit a particular health endpoint, only that other chronic endpoints were not as potent.

Note: The Indicators model saves your most recent query settings. This is to facilitate setting criteria for multiple queries that are similar to each other. When you exit the model, these settings are erased. To clear the settings while still in the model, select the criteria to clear in the **Available Search** section of the **Enter Search Parameters...** screen and click on [Clear criteria...] to clear your criteria. Repeat for all criteria you would like cleared.

9.4 Example 4: Year to Year Comparisons in Risk-Related Impacts

Analysis:

Comparing risk-related impacts across years gives an idea about whether these impacts may be decreasing, increasing or whether there is no apparent pattern. This example examines the impacts from air releases in your county for the time period 1988 to 1997.

Processes demonstrated:

Creating a new data table
Subsetting data
Displaying your data
Graphing results

Step-by-Step Query Process:

1. Create a new table

Click on New Query in the initial Indicators screen to open up the **Indicator Element Aggregation** screen. Enter a file name under *Save* to replace the name Newfile.

2. Subset your data for air releases and your county

Click on Subset Data to bring up the **Enter Search Parameters...** screen. To choose stack and fugitive air releases, select media from the list in the **Available Search** section of the **Enter Search Parameters...**screen.

Click on Add criteria..., which will bring up the **Add values to search for** screen. Enter 1 (for fugitive air releases) and 2 (for stack air releases) on separate lines of the dialog box. Click OK to return to the **Enter Search Parameters...** screen. The criteria you added will appear in the **Search:** section of the **Enter Search Parameters...** screen.

Repeat the process a second time, but substitute "County" for "Media", and enter your county instead of "1" and "2".

When finished, click OK to return to the **Indicator Element Aggregation** screen.

3. Select the row and column variables for your data table

Select media (e.g., fugitive releases and stack air releases) as the row variable by clicking on the box next to **M. Media Text** in the *Select row variable(s)* section of the screen. Note that it is easier to *subset* media using the media codes in Appendix C, to prevent misspelling a media name. When choosing variables for reporting results, however, it is often more convenient to specify **M. Media Text**, to avoid having to refer to media codes (**R. Media**).

Select chemical and year as the column variables by clicking on the box next to **R. Year** and **C. Chemical** in the *Select column variable(s)* portion of the screen.

To run this analysis, click Submit.

4. Selecting the method to express results

To obtain results expressed as pounds released as reported to TRI, choose *TRI Pounds* from the pull-down menu under **Model selected:** option.

To obtain risk-related results, choose *Full Model (Risk-Related)* from the pull-down menu under **Model selected:** option.

5. Graphing the results of your query

To graph the results of your data query, highlight the results you want graphed and then click on in the **Data Display** screen. You will have to produce two separate graphs -- one for results expressed as *TRI Pounds* and one for results expressed as *Full Model (Risk-Related).* A simple type of graph you may wish to use to display these data is a two-dimensional bar graph.
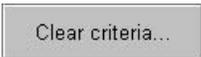
Note: The Indicators model saves your most recent query settings. This is to facilitate setting criteria for multiple queries that are similar to each other. When you exit the model, these settings are erased. To clear the settings while still in the model, select the criteria to clear in the **Available Search** section of the **Enter Search Parameters...** screen and click on to clear your criteria. Repeat for all criteria you would like cleared.

9.5 Example 5: Ranking Risks Among Manufacturing Facilities

Analysis:

This analysis describes how you would model the *fugitive and stack air emissions* for facilities in your county from the first year of TRI data reporting (1988) through the 1997 reporting year.

Step-by-Step Query Process:

1. **Create a new data table**

    Click on [New Query] in the initial Indicators screen to open up the **Indicator Element Aggregation** screen. Enter a file name under *Save* to replace the name Newfile.

2. **Subset your data for air releases and your county**

    Click on [Subset Data] to bring up the **Enter Search Parameters...** screen. To choose stack and fugitive air releases, select media from the list in the **Available Search** section of the **Enter Search Parameters...**screen.

    Click on [Add criteria...], which will bring up the **Add values to search for** screen. Enter 1 (for fugitive air releases) and 2 (for stack air releases) on separate lines of the dialog box. Click [OK] to return to the **Enter Search Parameters...** screen. The criteria you added will appear in the **Search:** section of the **Enter Search Parameters...** screen.

    Repeat the above process to limit your analysis to your county, but substitute "County" for "Media" and enter your county instead of "1" and "2".

    When finished, click [OK] to return to the **Indicator Element Aggregation** screen.

3. **Select the row and column variables for your data table**

    Select chemical as the row variable by clicking on the box next to **C. Chemical** in the *Select row variable(s)* section of the screen.

    Select media as the column variable by clicking on the box next to **M. Media Text** in the *Select column variable(s)* portion of the screen. Note that it is easier to *subset* media using the media codes in Appendix C, to prevent misspelling a media name. When choosing variables for reporting results, however, it is often more convenient to specify **M. Media Text**, to avoid having to refer to media codes (**R. Media**). To run this analysis, click [Submit].

4.   Sort your results for each type of air release

    a.   Select *Full Model (Risk-Related)* under **Model Selected:** in the **Data Display** screen. Then select the column for *Media 1* in the **Data Display** screen by clicking the left mouse button at the top of the column and dragging to the bottom of the column.

        Click ⬚ Sorted ⬚ to sort the data. The rankings will appear in the **Sorted Results** screen that appears next. When the sorted table appears on the screen, it may be necessary to format the table to fit on one page. Use the mouse to move to the right-hand border of the heading of the column you wish to size, until the arrow becomes a double line with two arrows. You can then move the mouse to the left to make the column narrower. The ordinal ranking appears under **Rank** and the percent risk-related ranking (compared with all sorted items) appears under **Percent**.

        Press the ⬚ Print ⬚ button to see a preview of your table. To print all pages, click on the "Print all" button at the top of the screen. To print only certain pages, click on the "Add n1" button at the top of the screen.

    b.   Repeat the above process by substituting *TRI Pounds* for *Full Model (Risk-Related)*.

    c.   Repeat the processes in **a** and **b** for *Media 2*.
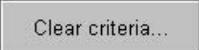
Note: The Indicators model saves your most recent query settings. This is to facilitate setting criteria for multiple queries that are similar to each other. When you exit the model, these settings are erased. To clear the settings while still in the model, select the criteria to clear in the **Available Search** section of the **Enter Search Parameters...** screen and click on ⬚ Clear criteria... ⬚ to clear your criteria. Repeat for all criteria you would like cleared.

10. MODEL RUNS AVAILABLE ON THE CD-ROM

      The following exhibit presents the filenames and descriptions of model runs (queries) that have already been run. These runs are available on the accompanying CD ROM which contains the Indicators model. You may wish to use these runs for some analyses instead of conducting new queries using the Indicators model. You may either copy the runs onto your hard drive (into the subdirectory c:\oppteim\user) or load the runs directly from the CD. See the installation instructions on page iv for further details. If you are loading runs directly from the CD, use the Load from CD button in the initial Indicators model screen. Note that sometimes when you click on Load from CD , the available files will not be shown. In this case, click on CANCEL, then click on Load from CD again to view the files. If you have already copied the runs onto your hard drive, use the Load button in the initial Indicators model screen. You can sort the data in these files using the sort option in the **Data Display** screen. Please note that you can view data in the first five files, the last two sets of files, and file CA-S-Y in Exhibit 10-1 geographically by clicking 🌎 in the **Data Display** screen. You should keep in mind that the "Full Model" results are available for only fugitive and stack air releases; the output for all other media can be viewed for pounds or hazard-weighting only.
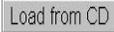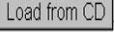
EXHIBIT 10-1
Descriptions of Pre-Run Queries

File Name	Subset of Data	Rows : Columns	Description
97A-C-M	1997; media (1,2)	chemical : media text	This file shows the sum of all 1997 air releases (stack and fugitive) by chemical and release medium.
AM97OSCM	1997; media (1,2,3,401,402,520,530,540,560,590)	chemical : media text	This file shows the sum of all 1997 on-site releases and transfers by chemical and medium.
AM97-C-M	1997	chemical : media text	This file shows the sum of all 1997 releases and transfers by chemical and release medium.
97A-S-M	1997; media (1,2)	state : media text	This file show the sum of all 1997 air releases (stack and fugitive) by state and release medium.
97A-S-C	1997; media (1,2)	state : chemical	This file show the sum of all 1997 air releases (stack and fugitive) by state and chemical.
97A-S2-M	1997; media (1,2)	EPA 2-digit SIC : media text	This file shows the sum of all 1997 air releases (stack and fugitive) by two-digit EPA SIC code and release medium.
97A-S2-C	1997; media (1,2)	EPA 2-digit SIC : chemical	This file shows the sum of all 1997 air releases (stack and fugitive) by two-digit EPA SIC code and chemical.
CA-M-Y	core chemicals; media (1,2)	media text : year	This file shows the sum of all air releases (stack and fugitive) by release medium and year for chemicals common to all reporting years.
CA-C-Y	core chemicals; media (1,2)	chemical : year	This file shows the sum of all air releases (stack and fugitive) by chemical and year for chemicals common to all reporting years.
CA-S-Y	core chemicals; media (1,2)	state : year	This file shows the sum of all air releases (stack and fugitive) by state and year for chemicals common to all reporting years.
*ST*97AS2C[1]	1997; media (1,2)	EPA 2-digit SIC : chemical	For a given state, this file shows the sum of all 1997 air releases (stack and fugitive) by 2-digit EPA SIC code and chemical.

File Name	Subset of Data	Rows : Columns	Description
*ST*97AS2M [1]	1997; media (1,2)	EPA 2-digit SIC : media text	For a given state, this file shows the sum of all 1997 air releases (stack and fugitive) by 2-digit EPA SIC code and release medium.
*ST*97A-MC [1]	1997; media (1,2)	media text : chemical	For a given state, this file shows the sum of all 1997 air releases (stack and fugitive) by release medium and chemical.
*ST*CA-M-Y [1]	core chemicals; media (1,2)	media text : year	For a given state, this file shows the sum of all air releases (stack and fugitive) by release medium and year for chemicals common to all reporting years.

[1]Note that "*ST*" in these four file names represents the individual state postal code. These runs have been performed for the 50 states, Puerto Rico, the Virgin Islands, and the District of Columbia. American Samoa and Guam are not included in the present model version.

The Windows 3.1 (16-bit) version of the Indicators Model uses DOS nomenclature rules for filenames (8 alpha-numeric characters). This limitation can make it difficult to determine what query is addressed by each run (although the model will display the subsetting and variables once a run is selected).

Experimentation by EPA has resulted in the development of a naming approach that may help users identify types of queries by their filenames. First, the variable for a series of runs differing by a single variable (e.g., state postal code), is listed. Next, any subsetting which has been performed is coded, giving preference to a defined year or medium of release. Codes useful for this purpose are shown in Exhibit 10-2. Last, the variables the query incorporates are listed, after a hyphen if space allows. Commonly used examples of these codes are shown in Exhibit 10-3. This approach has been used in naming the pre-run queries shown above in Exhibit 10-1. It is important to note that in this set of pre-run queries, one other code has been used, AM, for two queries. This code refers to the fact that the air-only version of the model, as described in this User's Manual, was used to conduct these runs, and therefore full risk-related model results are available only for air releases. In the future, when the multi-media version of the model is available and identical queries are performed, a code of MM, to indicate multi-media, will be used instead of AM.

EXHIBIT 10-2
Codes for Subsetting Parameters

Subsetting Parameter	Code
year	*97 for 1997*
core chemicals	c
air	a
water	w
on-site releases	os
all modeled media	mm
state postal code	md *for Maryland*
EPA Region	10 *for Region 10*

EXHIBIT 10-3
Example Codes

Query Variable	Code
chemical	c
media text	m
year	y
2-digit EPA SIC code	s2
3-digit EPA SIC code	s3
county	ct
state	s
EPA Regions	r
facility i.d. or name	f

11. REFERENCES

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U.S. EPA. 1999. 1997 Toxics Release Inventory. Office of Pollution Prevention and Toxics. EPA 745-R-99-003. April.

APPENDIX A. STANDARD INDUSTRIAL CLASSIFICATION CODES

Exhibit A-1 presents the twenty 2-digit and 140 3-digit EPA SIC codes and their corresponding industries.

EXHIBIT A-1
2-Digit and 3-Digit SIC Codes for TRI Facilities

SIC Code	Industry
20	**Food and Kindred Products**
201	Meat Products
202	Dairy Products
203	Canned, Frozen, and Preserved Fruits, Vegetables, and Food Specialties
204	Grain Mill Products
205	Bakery Products
206	Sugar and Confectionery Products
207	Fats and Oils
208	Beverages
209	Miscellaneous Food Preparations and Kindred Products
21	**Tobacco Products**
211	Cigarettes
212	Cigars
213	Chewing and Smoking Tobacco and Snuff
214	Tobacco Stemming and Redrying
22	**Textile Mill Products**
221	Broadwoven Fabric Mills, Cotton
222	Broadwoven Fabric Mills, Manmade Fiber and Silk
223	Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing)
224	Narrow Fabric and Other Smallwares Mills: Cotton, Wool, Silk, and Manmade Fiber
225	Knitting Mills

SIC Code	Industry
226	Dyeing and Finishing Textiles, Except Wool Fabrics and Knit Goods
227	Carpets and Rugs
228	Yarn and Thread Mills
229	Miscellaneous Textile Goods
23	**Apparel and Other Finished Products Made from Fabrics and Similar Materials**
231	Men's and Boys' Suits, Coats, and Overcoats
232	Men's and Boys' Furnishings, Work Clothing, and Allied Garments
233	Women's, Misses', and Juniors' Outerwear
234	Women's, Misses', Children's, and Infants' Undergarments
235	Hats, Caps, and Millinery
236	Girls', Children's, and Infants' Outerwear
237	Fur Goods
238	Miscellaneous Apparel and Accessories
239	Miscellaneous Fabricated Textile Products
24	**Lumber and Wood Products, Except Furniture**
241	Logging
242	Sawmills and Planing Mills
243	Millwork, Veneer, Plywood, and Structural Wood Members
244	Wood Containers
245	Wood Buildings and Mobile Homes
249	Miscellaneous Wood Products
25	**Furniture and Fixtures**
251	Household Furniture
252	Office Furniture
253	Public Building and Related Furniture
254	Partitions, Shelving, Lockers, and Office and Store Fixtures

SIC Code	Industry
259	Miscellaneous Furniture and Fixtures
26	**Paper and Allied Products**
261	Pulp Mills
262	Paper Mills
263	Paperboard Mills
265	Paperboard Containers and Boxes
267	Converted Paper and Paperboard Products, Except Containers and Boxes
27	**Printing, Publishing, and Allied Industries**
271	Newspapers: Publishing, or Publishing and Printing
272	Periodicals: Publishing, or Publishing and Printing
273	Books
274	Miscellaneous Publishing
275	Commercial Printing
276	Manifold Business Forms
277	Greeting Cards
278	Blankbooks, Looseleaf Binders, and Bookbinding and Related Work
279	Service Industries for the Printing Trade
28	**Chemicals and Allied Products**
281	Industrial Inorganic Chemicals
282	Plastics Materials and Synthetic Resins, Synthetic Rubber, Cellulosic and Other Manmade Fibers, Except Glass
283	Drugs
284	Soap, Detergents, and Cleaning Preparations; Perfumes, Cosmetics, and Other Toilet Preparations
285	Paints, Varnishes, Lacquers, Enamels, and Allied Products
286	Industrial Organic Chemicals
287	Agricultural Chemicals

SIC Code	Industry
289	Miscellaneous Chemical Products
29	**Petroleum Refining and Related Industries**
291	Petroleum Refining
295	Asphalt Paving and Roofing Materials
299	Miscellaneous Products of Petroleum and Coal
30	**Rubber and Miscellaneous Plastics Products**
301	Tires and Inner Tubes
302	Rubber and Plastics Footwear
305	Gaskets, Packing, and Sealing Devices and Rubber and Plastics Hose and Belting
306	Fabricated Rubber Products, Not Elsewhere Classified
308	Miscellaneous Plastics Products
31	**Leather and Leather Products**
311	Leather Tanning and Finishing
313	Boot and Shoe Cut Stock and Findings
314	Footwear, Except Rubber
315	Leather Gloves and Mittens
316	Luggage
317	Handbags and Other Personal Leather Goods
319	Leather Goods, Not Elsewhere Classified
32	**Stone, Clay, Glass, and Concrete Products**
321	Flat Glass
322	Glass and Glassware, Pressed or Blown
323	Glass Products, Made of Purchased Glass
324	Cement, Hydraulic
325	Structural Clay Products
326	Pottery and Related Products

SIC Code	Industry
327	Concrete, Gypsum, and Plaster Products
328	Cut Stone and Stone Products
329	Abrasive, Asbestos, and Miscellaneous Nonmetallic Mineral Products
33	**Primary Metal Industries**
331	Steel Works, Blast Furnaces, and Rolling and Finishing Mills
332	Iron and Steel Foundries
333	Primary Smelting and Refining of Nonferrous Metals
334	Secondary Smelting and Refining of Nonferrous Metals
335	Rolling, Drawing, and Extruding of Nonferrous Metals
336	Nonferrous Foundries (Castings)
339	Miscellaneous Primary Metal Products
34	**Fabricated Metal Products, Except Machinery and Transportation Equipment**
341	Metal Cans and Shipping Containers
342	Cutlery, Handtools, and General Hardware
343	Heating Equipment, Except Electric and Warm Air; and Plumbing Fixtures
344	Fabricated Structural Metal Products
345	Screw Machine Products, and Bolts, Nuts, Screws, Rivets, and Washers
346	Metal Forgings and Stampings
347	Coating, Engraving, and Allied Services
348	Ordnance and Accessories, Except Vehicles and Guided Missiles
349	Miscellaneous Fabricated Metal Products
35	**Industrial and Commercial Machinery and Computer Equipment**
351	Engines and Turbines
352	Farm and Garden Machinery and Equipment
353	Construction, Mining, and Materials Handling Machinery and Equipment

SIC Code	Industry
354	Metalworking Machinery and Equipment
355	Special Industry Machinery, Except Metalworking Machinery
356	General Industrial Machinery and Equipment
357	Computer and Office Equipment
358	Refrigeration and Service Industry Machinery
359	Miscellaneous Industrial and Commercial Machinery and Equipment
36	**Electronic and Other Electrical Equipment and Components, Except Computer Equipment**
361	Electric Transmission and Distribution Equipment
362	Electrical Industrial Apparatus
363	Household Appliances
364	Electric Lighting and Wiring Equipment
365	Household Audio and Video Equipment, and Audio Recordings
366	Communications Equipment
367	Electronic Components and Accessories
369	Miscellaneous Electrical Machinery, Equipment, and Supplies
37	**Transportation Equipment**
371	Motor Vehicles and Motor Vehicle Equipment
372	Aircraft and Parts
373	Ship and Boat Building and Repairing
374	Railroad Equipment
375	Motorcycles, Bicycles, and Parts
376	Guided Missiles and Space Vehicles and Parts
379	Miscellaneous Transportation Equipment
38	**Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks**
381	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical Systems, Instruments, and Equipment

SIC Code	Industry
382	Laboratory Apparatus and Analytical, Optical, Measuring, and Controlling Instruments
384	Surgical, Medical, and Dental Instruments and Supplies
385	Ophthalmic Goods
386	Photographic Equipment and Supplies
387	Watches, Clocks, Clockwork Operated Devices, and Parts
39	**Miscellaneous Manufacturing Industries**
391	Jewelry, Silverware, and Plated Ware
393	Musical Instruments
394	Dolls, Toys, Games and Sporting and Athletic Goods
395	Pens, Pencils, and Other Artists' Materials
396	Costume Jewelry, Costume Novelties, Buttons, and Miscellaneous Notions, Except Precious Metal
399	Miscellaneous Manufacturing Industries

APPENDIX B. EPA REGIONS
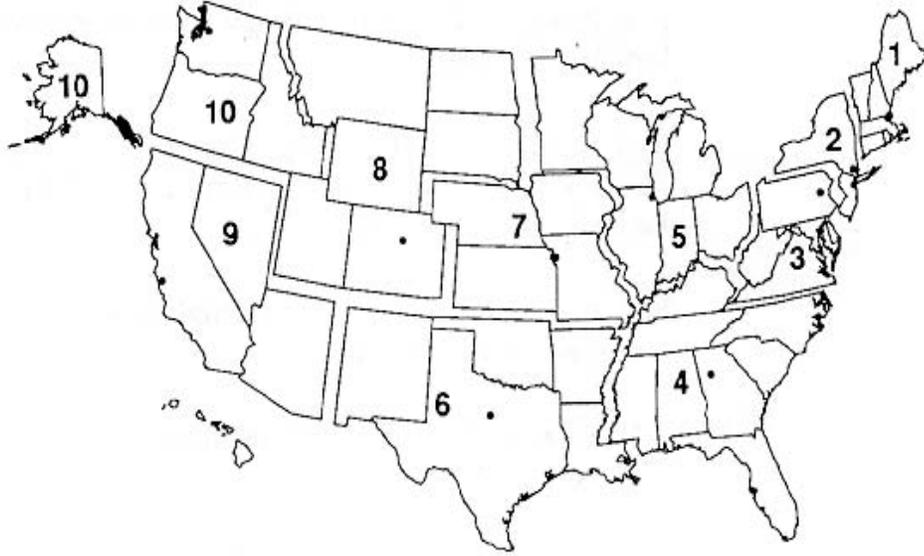
Region 1 - responsible within the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Region 2 - responsible within the states of New Jersey, New York and the territories of Puerto Rico and the U.S. Virgin Islands.

Region 3 - responsible within the states of Delaware, Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia.

Region 4 - responsible within the states of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee .

Region 5 - responsible within the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin .

Region 6 - responsible within the states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

Region 7 - responsible within the states of Iowa, Kansas, Missouri, and Nebraska.

Region 8 - responsible within the states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming

Region 9 - responsible within the states of Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa.

Region 10 - responsible within the states of Alaska, Idaho, Oregon, and Washington.

APPENDIX C. ADDITIONAL FACILITY INFORMATION

The following exhibits present descriptions of codes used in the model. Exhibit C-1 presents the environmental media release codes and descriptions of the associated releases. It also lists which codes can be grouped together to represent categories of reporting as identified in the 1997 Public Data Release. (Note that occasionally facilities report releases to media codes that are not listed in the current TRI Form R or in any previous forms. These releases cannot be modeled, but are reported in Indicator runs.) Exhibit C-2 presents the score category codes which describe details related to the media releases, and whether the release can be modeled using environmental fate and transport models. Exhibit C-3 presents the maximum onsite and chemical use codes. The codes associated with individual facilities can be viewed using the INSPECT button in the initial Indicators screen. Also, when conducting new queries, the codes can be used to subset your data.

EXHIBIT C-1
Media Information

Release Code (R. Media)	Description of Release	1997 Public Data Release Category in Which Release is Located
1*	Fugitive Air	Fugitive or Nonpoint Air Emissions
2*	Stack Air	Stack or Point Air Emissions
3*	Direct Water	Surface Water Discharges
6*,**	POTW Transfer	Transfers to POTWs
400	Underground Injection (All Well Classes); this code is used for data reported from 1988 to 1995	Not Applicable
401	Underground Injection (Class 1); this code is used for data reported in 1996 and later years	Underground Injection Class I Wells
402	Underground Injection (Class 2); this code is used for data reported in 1996 and later years	Underground Injection Class II-V Wells
510*	Onsite Landfill; this code is used for data reported from 1988 to 1995	Not Applicable
520*	Land Treatment/Application/ Farming	On-site Land Releases (Other On-site Land Releases)
530*	Surface Impoundment	On-site Land Releases (Other On-site Land Releases)

Release Code (R. Media)	Description of Release	1997 Public Data Release Category in Which Release is Located
540*	Other Land Disposal	On-site Land Releases (Other On-site Land Releases)
560*	Other Landfills; this code is used for data reported in 1996 and later years	On-site Land Releases (Other On-site Land Releases)
590	RCRA Subtitle C Landfills; this code is used for data reported in 1996 and later years	On-site Land Releases (RCRA Subtitle C Landfills)
710	Offsite Storage Only	Transfers Off-site to Disposal
720	Offsite Recycling (Solvents/Organics Recovery)	Transfers to Recycling
724	Offsite Recycling (Metals Recovery)	Transfers to Recycling
726	Offsite Recycling (Other Reuse or Recovery)	Transfers to Recycling
728	Offsite Recycling (Acid Regeneration)	Transfers to Recycling
740	Offsite Treatment (Solidification/Stabilization)	Transfers to Treatment
741	Solidification/Stabilization- metals and metal compounds only	Transfers Off-site to Disposal
750*	Offsite Incineration/Thermal Treatment	Transfers to Treatment
754*	Offsite Incineration (No fuel value)	Transfers to Treatment
756	Offsite Energy Recovery	Transfers to Energy Recovery
761	Offsite Wastewater Treatment (Excluding POTW)	Transfers to Treatment
762	Wastewater Treatment (Excluding POTW) - metals and metal compounds only	Transfers Off-site to Disposal
769	Offsite Other Waste Treatment	Transfers to Treatment
770*	Offsite Landfill	Transfers Off-site to Disposal

Release Code (R. Media)	Description of Release	1997 Public Data Release Category in Which Release is Located
771	Offsite Underground Injection	Transfers Off-site to Disposal
772*	Offsite Landfill/Surface Impoundment	Transfers Off-site to Disposal
773*	Offsite Land Treatment	Transfers Off-site to Disposal
779*	Offsite Other Land Disposal	Transfers Off-site to Disposal
790	Offsite Other Management	Transfers Off-site to Disposal
791	Transfers to Waste Broker; this code is used for data reported from 1988 to 1990	Not Applicable
792	Offsite Transfer to Broker (Energy Recovery)	Transfers to Energy Recovery
793	Offsite Transfer to Broker (Recycling)	Transfers to Recycling
794	Offsite Transfer to Broker (Disposal)	Transfers Off-site to Disposal
795	Offsite Transfer to Broker (Waste Treatment)	Transfers to Treatment
799	Offsite (Unknown Treatment/Disposal)	Transfers Off-site to Disposal

 * Indicates that full risk modeling is conducted for these release codes.
** Beginning with the 1991 reporting year, releases to POTWs are coded as 8 in Form R. To allow comparisons with earlier years, however, these releases are still coded as 6 in the Indicators Model.

EXHIBIT C-2
Score Category Information

Score Category	Description	If Category is a release, can it be modeled using the environmental fate and transport models?
0	Unknown Error	No
1	Direct Fugitive Air - Rural	Yes
2	Direct Fugitive Air - Urban	Yes
3	Direct Point Air - Rural	Yes
4	Direct Point Air - Urban	Yes
5	Direct Water	Yes
6	Onsite Landfill	Yes
7	POTW Effluent	Yes
8	POTW Volatilization - Rural	Yes
9	POTW Volatilization - Urban	Yes
10	POTW Sludge Landfill	Yes
11	POTW Sludge Volat - Rural	Yes
12	POTW Sludge Volatilization - Urban	Yes
13	Offsite Incineration - Rural	Yes
14	Offsite Incineration - Urban	Yes
15	Offsite Landfill	Yes
16	Offsite Volatilization - Rural	Yes
17	Offsite Volatilization - Urban	Yes
18	Offsite treatment other	No
19	Cannot place Lat/Long	No
20	Cannot locate facility stream	No
21	Cannot locate POTW stream	No
22	No/Unmodeled treatment code	No

Score Category	Description	If Category is a release, can it be modeled using the environmental fate and transport models?
23	Error in CAS Number	No
24	No Toxicity Data	No
25	No POTW Removal Data	No
26	Direct Water - Fish Ingestion	Yes
27	POTW Effluent - Fish Ingestion	Yes
28	Reach data is suspect	No
29	Unable to find WBAN	No
30	No Incinerator Efficiency Data	No
31	Floating Point Exception	No
32	Missing Physical-Chemical Data	No
33	Unmodeled - Underground Injection	No

EXHIBIT C-3
Onsite Chemical Information

Activities and Uses of a Chemical at a Facility	
Category	**Code**
Manufacture (produce or import for on-site use/processing, for sale/distribution, as a byproduct, or as an impurity)	M
Process (as a reactant, as a formulation component, as an article component, or repackaging)	P
Otherwise Use (as a chemical processing aid, as a manufacturing aid, or for ancillary or other use)	OU
Manufacture and Process	M/P
Manufacture and Otherwise Use	M/OU
Process and Otherwise Use	P/OU
Manufacture, Process, and Otherwise Use	M/P/OU
Maximum Amount of a Chemical Onsite at Any Time During the Calendar Year	
Range	**Code**
0 to 99 lbs	01
100 to 999 lbs	02
1,000 to 9,999 lbs	03
10,000 to 99,999 lbs	04
100,000 to 999,999 lbs	05
1,000,000 to 9,999,999 lbs	06
10,000,000 to 49,999,999 lbs	07
50,000,000 to 99,999,999 lbs	08
100,000,000 to 499,999,999 lbs	09
500,000,000 to 999,999,999 lbs	10
1,000,000,000 lbs or more	11

EXHIBIT C-4
State Federal Information Processing Standard (FIPS) Codes

Abbrev.	FIPS	State Name
AK	02	ALASKA
L	01	ALABAMA
AR	05	ARKANSAS
AS	60	AMERICAN SAMOA
AZ	04	ARIZONA
CA	06	CALIFORNIA
CO	08	COLORADO
CT	09	CONNECTICUT
DC	11	DISTRICT OF COLUMBIA
DE	10	DELAWARE
FL	12	FLORIDA
GA	13	GEORGIA
GU	66	GUAM
HI	15	HAWAII
IA	19	IOWA
ID	16	IDAHO
IL	17	ILLINOIS
IN	18	INDIANA
KS	20	KANSAS
KY	21	KENTUCKY
LA	22	LOUISIANA
MA	25	MASSACHUSETTS
MD	24	MARYLAND
ME	23	MAINE
MI	26	MICHIGAN
MN	27	MINNESOTA
MO	29	MISSOURI

Abbrev.	FIPS	State Name
MS	28	MISSISSIPPI
MT	30	MONTANA
NC	37	NORTH CAROLINA
ND	38	NORTH DAKOTA
NE	31	NEBRASKA
NH	33	NEW HAMPSHIRE
NJ	34	NEW JERSEY
NM	35	NEW MEXICO
NV	32	NEVADA
NY	36	NEW YORK
OH	39	OHIO
OK	40	OKLAHOMA
OR	41	OREGON
PA	42	PENNSYLVANIA
PR	72	PUERTO RICO
RI	44	RHODE ISLAND
SC	45	SOUTH CAROLINA
SD	46	SOUTH DAKOTA
TN	47	TENNESSEE
TX	48	TEXAS
UT	49	UTAH
VA	51	VIRGINIA
VI	78	VIRGIN ISLANDS
VT	50	VERMONT
WA	53	WASHINGTON
WI	55	WISCONSIN
WV	54	WEST VIRGINIA
WY	56	WYOMING

APPENDIX D. PHYSICOCHEMICAL PROPERTY INFORMATION

The following two exhibits present the physicochemical properties used for the 604 chemicals currently included in the Indicators Model and the references for those properties. Exhibit D-1 provides the CAS number, the chemical name, and values for 15 parameters: the decay rate in air due to photooxidation (Air Decay, hr^{-1}), the organic carbon-water partition coefficient (Koc, milliliters/gram), the decay rate in water due to hydrolysis or aerobic biodegradation (H2O Decay, hr^{-1}), the base 10 log of the octanol-water partition coefficient (LOGKow), the soil-water partition coefficient (Kd, liter/kilogram), the water solubility (Water Solubility, milligrams/liter), the percent of the chemical that is removed by a POTW (POTW Partition (Removal)), the percent of the chemical removed by a POTW that partitions to sludge (POTW Partition (Sludge)), the percent of the chemical removed by a POTW that volatilizes to the air (POTW Partition (Volat)), the percent of the chemical removed by a POTW that biodegrades (POTW Partition (Biod)), the incinerator destruction/removal efficiency (Incinerator DRE, percent)), the bioconcentration factor (BCF, liter/kilogram), the Henry's Law Constant (Henry's, atm-m^3/mol), the Maximum Contaminant Level for drinking water (MCL, milligram/liter), and the molecular weight (Molecular Weight, gram/mole). Exhibit D-2 provides a code for the reference for each value in Exhibit D-1. The codes are defined at the end of Exhibit D-2.

Exhibit D-1 Physicochemical Properties

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
50000	Formaldehyde	0.335	37	0.0165	0.35	0	400000	92.07	0.37	0	99.62	99	1	0.0000003		30
51036	Piperonyl butoxide	0.291		0	4.75			97.02	40.57	0	59.43	99		0		338.43
51218	Fluorouracil (5-fluorouracil)			0	-0.89			45.42	2.38	0	97.62	99		0		130.08
51285	2,4-Dinitrophenol	0.00343	55.6	0.00459	1.67	0	2787	75.45	0.98	0.013	99.01	99	9	0.0000004		184
51752	Nitrogen mustard	0.428	91	1.39	0.91	0	-18836	99.1	0.071	0.01	99.92	99	4	0.000008		156
51796	Urethane (Ethyl carbamate)	0.127	20	0.0000693	-0.15	0	480000	45.43	2.38	0	97.6	99	0.5	0.0000001		89
52686	Trichlorfon	0.35	6	0.0103	0.51	0	154000	92.07	0.37	0	99.63	99	0.71	0		257
52857	Famphur	0.167		0	2.23			76.4	1.36	0	98.64	99		0		325.36
53963	2-Acetylaminofluorene	0.529	1380	0.000596	3.12	0	5.29	57.53	8.26	0	91.76	99	171	0		223
55185	N-Nitrosodiethylamine	0.13	43	0.13	0.48	0	93000	22.14	6.55	0.77	92.68	99	1	0.0000036		88
55210	Benzamide	0.123	13.4	0.00818	0.64	0	13500	92.07	0.37	0	99.63	99	1.8	0		121
55389	Fenthion			0.000284	4.09		7.5	96.12	17.71	0.01	82.28	99		0.0000015		278.34
55630	Nitroglycerin	0.217	468	0.00928	1.62	0	1380	75.4	0.95	0	99.05	99	10	0		227
56235	Carbon tetrachloride	0.0000238	110	0.000126	2.83	0	804.8	92.57	2.12	87.58	10.31	99	20	0.0276	0.01	154
56359	Bis(tributyltin) oxide	0.231		0			100									
56382	Parathion	8.3	10654	0.000722	3.83	0	6.54	98.36	8.93	0	91.06	99	478	0.0000006		291.27
57147	1,1-Dimethyl Hydrazine	0.478	4	0.00246	-1.19	0	1000000	75.12	0.83	0.24	98.94	99	0.043	0.0000097		60
57330	Pentobarbital sodium			0	2.1			46.83	3.14	0	96.88	99		0		248.26
57410	Phenytoin			0	2.47		32	48.63	4.05	0	95.95	99		0		252.26
57578	beta-Propiolactone	0.00212	4	0.204	-0.8	0	370000	95.91	0.22	0	99.77	99	0.45	0.0000004		72
57749	Chlordane	0.0734	-27536	0.0000711	6	0	0.056	98.72	61.52	0.01	38.48	99	-27536	0.0000486	0	409.8
58899	Lindane	0.0413	1081	0.00111	3.72	0	7.3	75.38	16.79	0.04	83.15	99	1260	0.000002	0	291
59892	N-Nitrosomorpholine	0.404	1.14	0.206	-0.44	0	861527	45.43	2.38	0	97.6	99	0.27	0		116.12
60093	4-Aminoazobenzene	0.393	618	0.00607	3.41	0	34.6	65.22	11.73	0	88.27	99	87	0		197
60117	4-Dimethylaminoazobenzene	1.32	7388	0.0117	4.58	0	160	95.55	36.86	0	63.14	99	1780	0		225
60344	Methyl hydrazine	6.71	6	0.00171	-1.05	0	1000000	75.08	0.83	0.08	99.11	99	0.09	0.0000303		46
60355	Acetamide	0.119	5	0.0165	-1.26	0	705000	92.06	0.36	0	99.63	99	0.06	0		59
60515	Dimethoate	0.214		0.000245	0.78		280000	45.49	2.42	0	97.58	99		0		229.28
61825	Amitrole	0.119	4.4	0.000596	-0.86	0	280000	45.42	2.38	0	97.62	99	0	0		84.08
62533	Aniline	0.3	13.6	0	0.9	0	-29536	92.09	0.38	0.022	99.6	99	19.9	0.0000019		93.12
62555	Thioacetamide	0.119	6	0.0165	-0.26	0	163000	45.56	2.37	0.48	97.15	99	0.71	0.0000064		75
62566	Thiourea	0.238	7	0.0165	-1.08	0	142000	75.06	0.83	0	99.17	99	0.1	0.0000002		76.12
62737	Dichlorvos	0.0166	150	0.00267	1.16	0	10000	75.26	0.86	0.35	98.79	99	7.76	0.0000139		220.98
62748	Sodium fluoroacetate			0	0.03			75.08	0.83	0.027	99.15	99		0.0000011		100.02
62759	N-Nitrosodimethylamine	1.04	12	1.04	-0.57	0	1000000	45.46	2.38	0.13	97.49	99	0.22	0.0000018		74.08
63252	Carbaryl	4.67	390	0.00206	2.36	0	82.6	93.29	0.85	5.79	93.36	99	33.9	0.00131		201.22
64186	Formic acid	0.00286	12.1	0.0165	-0.54	0	10000000	92.06	0.36	0	99.63	99	0	0.0000002		46.03
64675	Diethyl sulfate	0.106	33.5	0.401	1.14	0	7000	95.12	0.22	0.053	99.73	99	4.37	0.0000084		154
64755	Tetracycline hydrochloride			0	-1.3			45.42	2.38	0	97.62	99		0		444.43
67561	Methanol	0.00537	9	0.0165	-0.77	0	1000000	92.07	0.36	0.043	99.59	99	3.02	0.0000046		32.04
67630	Isopropyl alcohol	0.0607	25	0.0165	0.05	0	1000000	92.07	0.37	0.087	99.55	99	0.65	0.0000081		60.09
67663	Chloroform	0.000612	45	0.000596	1.97	0	7950	70.8	1.34	62.23	36.43	99	8.3	0.00367	0.1	119.39
67721	Hexachloroethane	0.0000064	2188	0.000596	3.91	0	50	77.49	23.01	43.8	33.19	99	138	0.00389		236.74

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
68122	N,N-Dimethylformamide	0.0474		0	-1.01			92.06	0.36	0	99.63	99		0.0000001		73.09
68768	Triaziquone	0.561	20.2	0.00797	-0.13	0	0	45.43	2.38	0	97.6	99	0	0		231.25
70304	Hexachlorophene	0.0113	288	0.000102	7.54	0	140	99.06	62.45	0	37.55	99	0	0		406.92
71363	n-Butyl alcohol	0.0433	72	0.0165	0.88	0	-2336	92.09	0.38	0.087	99.53	99	2.75	0.0000088		74.12
71432	Benzene	0.00761	31	0.00379	2.13	0	1790	94.09	0.62	18.34	81.04	99	4.27	0.00555	0.01	78.11
71556	1,1,1-Trichloroethane	0.0000707	179	0.000156	2.49	0	1495	87.75	1.38	93.82	4.8	99	8.91	0.0172	0.2	133.42
72435	Methoxychlor	0.34	80000	0.222	5.08	0	0.04	98.56	46.1	0	53.91	99	8320	0.0000001	0.04	345.65
72571	Trypan blue	0	20.5	0	-0.12	0	0	45.43	2.38	0	97.6	99	0	0		960.83
74839	Bromomethane (Methyl bromide)	0.000233	106	0.00144	1.19	0	15220	77.45	0.81	73.7	25.49	99	4.68	0.00624		94.95
74851	Ethylene	0.0621	98	0.015	1.13	0	131	99.06	0.28	91.49	8.23	99	4.27	0.228		28.05
74873	Chloromethane	0.000259	74	0.00258	0.91	0	5325	87.66	0.5	53.59	45.92	99	2.88	0.00882		50.49
74884	Methyl iodide	0.000713	158	0.00258	1.51	0	13848	75.27	0.94	70.35	28.71	99	8.32	0.00526		141.95
74908	Hydrogen cyanide	0.000178	17.4	0.000596	-0.25	0	1000000	71.98	1.64	1.84	96.63	0	0.38	0.000133		27
74953	Methylene bromide	0.000448	25	0.0000693	1.7	0	11930	55.71	1.94	30.77	67.29	99	3.09	0.000861		174
75003	Chloroethane (Ethyl chloride)	0.00238	37.6	0.00076	1.43	0	5678	84.39	0.65	82.45	16.9	99	7.24	0.0111		64
75014	Vinyl chloride	0.0393	135	0.000596	1.62	0	8800	92.41	0.5	91	8.51	99	10	0.0278	0	62.5
75058	Acetonitrile	0.000293	0.28	0.00258	-0.34	0	74000	75.27	0.82	0.82	98.35	99	0.87	0.0000345		41.05
75070	Acetaldehyde	0.0427	2.19	0	-0.34	0	1000000	92.13	0.36	0.61	99.03	99	0.4	0.0000667		44.05
75092	Dichloromethane	0.000832	28	0.00258	1.25	0	13030	82.2	0.67	31.44	67.13	99	5.25	0.00325	0.01	84.94
75150	Carbon disulfide	0	65	0.0000007	2.14	0	1185	87.17	0.91	84.73	14.37	99	11.5	0.0144		76.14
75218	Ethylene oxide	0.000416	16	0.00241	-0.3	0	1000000	92.2	0.36	1.18	98.45	99	0.35	0.000148		44.05
75252	Bromoform (Tribromomethane)	0.000293	52	0.000596	2.4	0	3100	54.51	3.14	21.06	75.8	99	3.24	0.000535	0.1	252.77
75274	Dichlorobromomethane	0.000212	51	0.0000006	2	0	6735	64.24	1.68	49.67	48.63	99	22.9	0.00212	0.1	163.8
75343	Ethylidene dichloride	0.00074	38.3	0.0000693	1.79	0	5500	76.2	1.01	71.3	27.69	99	13.5	0.00562		98.96
75354	Vinylidene chloride (1,1-dichloroethylene)	0.0385	343	0.000596	2.13	0	2250	92.02	0.75	90.06	9.19	99	24.5	0.0261	0.01	96.95
75434	Dichlorofluoromethane			0	1.55		18800	71.35	1.09	87.5	11.41	99		0.00547		120.92
75445	Phosgene	0.0000004	9.8	7.28	-0.71	0	0	100	0	0	100	99	0	0.00892		98.92
75456	Chlorodifluoromethane (HCFC-22)	0	0	0	0	0	0	0	1.45	81.23	17.76	99	0	0		86.47
75558	Propyleneimine	0.348	11	0.00802	0.13	0	1000000	75.16	0.82	0.35	98.83	99	0.204	0.0000141		57
75569	Propylene oxide	0.0014	25	0.00198	0.03	0	400000	92.16	0.36	0.88	98.76	99	0.62	0.000103		58.08
75638	Bromotrifluoromethane (Halon 1301)	0	245	0	1.86	0	320	99.46	0.42	98.83	0.74	99	15.3	0.465		149
75650	tert-Butyl alcohol	0.00646	37	0.000596	0.35	0	1000000	45.74	2.36	1.05	96.57	99	1.1	0.0000144		74.12
75683	1-Chloro-1,1-difluoroethane	0.0000083	81.3	0	2.05	0	1397	96.62	0.58	97.85	1.56	99	21.3	0.0719		100.5
75694	CFC-11 (trichlorofluoromethane)	0.000003	97.7	0.00012	2.53	0	1000	97.48	1.11	97.47	1.43	99	25	0.097		137
75718	CFC-12 (dichlorodifluoromethane)	0.00018	200	0.000596	2.16	0	280	99.27	0.59	98.58	0.82	99	26	0.343		121
75729	Chlorotrifluoromethane			0	1.65			99.82	0.35	99.01	0.63			1.38		
75865	2-Methyllactonitrile	0.00317		4.62	-0.03		1000000	99.95	0.02	0	99.98	99		0.0000001		85.1
75887	2-Chloro-1,1,1-trifluoroethane			0	1.99			99.07	0.49	98.66	0.86			0.271		
76017	Pentachloroethane	0	146.3	0	3.22	0	480	57.89	9.85	57.59	32.56	99	165	0.00194		202.29
76028	Trichloroacetyl chloride			4.08	0.88			99.93	0.02	0.01	99.96			0.0000291		
76062	Chloropicrin			0	2.09		1620	61.7	1.94	80.16	17.89			0.0032		164.38
76131	Freon 113	0.000001	372	0.00012	3.16	0	170	99.53	3.48	95.47	1.05	99	148	0.526		187.38

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
76142	CFC 114 (1,2-dichloro,1,1,2,2-tetrafluoroethane)	0	815	0.17	2.82	0	130	99.91	1.75	97.51	0.74	99	82	2.8		171
76153	CFC 115 (chloropentafluoroethane)	0	708	0	2.47	0	58	99.9	0.93	98.41	0.66	99	61	2.66		154
76448	Heptachlor	0.388	3475	0.00645	5.5	0	0.18	99.3	50	0.28	49.72	99	9550	0.00148	0	373.35
76879	Triphenyltin hydroxide			0			1									367.03
77474	Hexachlorocyclopentadiene	0.386	2000	0.00206	5.04	0	3.4	98.78	44.83	9.86	45.31	99	465	0.027	0.05	273
77736	Dicyclopentadiene	0.326		0	3.51	0	10	96.68	7.24	83.13	9.63	99		0.0625		132.21
77781	Dimethyl sulfate	0.0104	16	0.578	0.16	0	28000	96.97	0.14	0.021	99.84	99	79.4	0.000004		126
78488	S,S,S-tributyltrithiophosphate	0.213		0.00206	5.75			99.88	37.22	0	62.79	99		0.0000003		314.5
78842	Isobutyraldehyde	0.159	8	0.0165	0.74	0	89000	92.23	0.37	1.39	98.24	99	7.9	0.00018		72
78875	1,2-Dichloropropane	0.00587	27	0.0000977	2.25	0	2700	67.88	1.83	55.36	42.81	99	10	0.00282	0.01	113
78886	2,3-Dichloropropene	0.08	77	0.00107	2.42	0	2750	65.86	2.31	49.56	48.15	99	1.2	0.00228		111
78922	sec-Butyl alcohol	0.0529	5.6	0.0165	0.61	0	181000	92.08	0.37	0.098	99.54	99	1.71	0.0000091		74.12
78933	Methyl ethyl ketone	0.00594	5.2	0.0165	0.29	0	223000	92.13	0.37	0.53	99.11	99	1	0.0000569		72
79005	1,1,2-Trichloroethane	0.00195	79	0.000146	1.89	0	4420	39.79	3.59	54.49	41.92	99	10	0.000824	0.01	133
79016	Trichloroethylene	0.0141	104	0.00012	2.42	0	1100	80.97	1.52	90.97	7.51	99	17	0.00985	0.01	131
79061	Acrylamide	0	50	0	-0.67	0	640000	92.06	0.36	0	99.64	99	1	0		71
79107	Acrylic acid	0.153	2.19	0.0165	0.35	0	1000000	92.07	0.37	0.011	99.62	99	0.8	0.0000002		72
79118	Chloroacetic acid	0.00186	0.81	0.0165	0.22	0	6140000	92.06	0.37	0	99.64	99	0.9	0		94
79196	Thiosemicarbazide			0	-1.67			45.42	2.38	0	97.62	99		0		91.14
79210	Peracetic acid	0.0276	7.5	0.0887	-1.07	0	712610	92.06	0.36	0.022	99.62	99	0.12	0.0000021		76.05
79221	Methyl chlorocarbonate	0	28.4	2.04	0.14	0	0	99.63	0.05	0.82	99.13	99	0	0.00235		94.5
79345	1,1,2,2-Tetrachloroethane	0.00179	79	0.0327	2.39	0	2962	33.23	6.38	34.85	58.8	99	8	0.000367		168
79447	Dimethylcarbamyl chloride	0.381	9.7	69.3	-0.72	0	0	100	0	0	100	99	0	0.0000007		107.54
79469	2-Nitropropane	0.0783	20	0.000596	0.93	0	17000	75.73	0.83	2.5	96.66	99	10	0.000119		110
80057	4,4'-Isopropylidenediphenol	0.515	1288	0.0145	3.32	0	120	85.68	6	0	94	99	10	0		228
80159	Cumene hydroperoxide	0.0293	23	0.00258	2.16	0	13900	76.21	1.29	0	98.71	99	8.51	0		152
80626	Methyl methacrylate	0.351	22	0.00258	1.38	0	15000	92.38	0.41	2.23	97.36	99	6.6	0.000337		100
81072	Saccharin (manufacturing)	0.381	46	0.00258	0.91	0	4000	75.13	0.85	0	99.15	99	2.88	0		183.18
81889	C.I. Food Red 15	0	274	0	1.95	0	0	46.43	2.91	0	97.07	99	17.9	0		479
82280	1-Amino-2-methyl-anthraquinone	0.173	8005	0.00607	4.07	0	0.33	86.22	24.3	0	75.7	99	1150	0		237.25
82688	Quintozene	0.0000434	6060	0.0000885	4.64	0	0.55	89.86	48.35	0.52	51.14	99	590	0.00008		295.5
84742	Dibutyl phthalate	0.0515	160	0.0155	4.72	0	13	99.22	29.61	0	70.38	99	20.9	0.0000018		278
85018	Phenanthrene			0	4.46		0.816	94.11	33.95	0.18	65.87			0.000036		178.23
85449	Phthalic anhydride	0.000786	36	1.54	1.6	0	6200	99.3	0.081	0	99.91	99	9.68	0		148
86306	N-Nitrosodiphenylamine	0.545	1200	0.00187	3.13	0	35	57.77	8.34	0.052	91.6	99	217	0.0000012		192
87627	2,6-Xylidine	1.16	0	0.00565	2.17	0	8240	47.12	3.25	0.17	96.58	99	28	0.0000025		121
87683	Hexachloro-1,3-butadiene	0.000133	-28383	0.000596	4.78	0	3.2	94.82	47.54	18.49	33.97	99	11400	0.0103		261
87865	Pentachlorophenol	0.00274	900	0.35	5.12	0	14	96.2	56.27	0	43.73	99	766	0	0	266.5
88062	2,4,6-Trichlorophenol	0.00309	620	0.177	3.69	0	800	91.33	10.51	0.077	89.41	99	310	0.0000078		197.5
88755	2-Nitrophenol	0.0544	113	0.00258	1.79	0	2185	53.42	2.15	23.96	73.89	99	13.5	0.000589		160
88857	Dinitrobutyl phenol (Dinoseb)			0	3.56		52	46.36	25.39	0.3	74.29			0.0000044	0.01	240.24
88891	Picric acid	0.000596	23.6	0.000596	1.33	0	13200	22.17	6.86	0	93.14	99	1	0		229.11
90040	o-Anisidine	0.719	35	0.00563	1.18	0	6460	75.19	0.88	0	99.12	99	4.6	0.0000001		123.16

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
90437	2-Phenylphenol	3.48	119	0.0165	3.09	0	700	94.89	2.76	0.011	97.22	99	15.5	0.0000011		170.2
90948	Michlers Ketone	1.91	162	0.0116	3.87	0	400	60.21	31.74	0	68.28	99	20.9	0		268.35
91087	Toluene-2,6-diisocyanate	1.19	2580	0.693	3.74	0	0	99.48	2.03	0.01	97.96	99	410	0.0000111		174.15
91203	Naphthalene	0.129	871	0.0296	3.3	0	31	95.99	3.94	1.71	94.35	99	426	0.000483		128
91225	Quinoline	0.0382	43	0.00626	2.03	0	6110	75.94	1.17	0.066	98.76	99	7.94	0.0000027		129.15
91598	beta-Naphthylamine	1.27	203.7	0.00569	2.28	0	263	76.56	1.42	0	98.56	99	31.6	0.0000002		143.18
91941	3,3'-Dichlorobenzidine	18.5	190000		3.51	0	3.11	68.37	13.21	0	86.78	99	495	0		253
92524	Biphenyl	0.0476	1500	0.0117	3.98	0	7.1	98.86	10.67	0.62	88.71	99	436	0.000408		154
92671	4-Aminodiphenyl	0.635	185.8	0.0165	2.86	0	311	52.74	6.05	0	93.95	99	79.4	0.0000001		169.22
92875	Benzidine	1.22	227000	0.0129	1.34	0	360	75.24	0.89	0	99.11	99	110	0		184
92933	4-Nitrobiphenyl	0.0141	2688	0.015	3.82	0	7.36	93.12	12.62	0.011	87.37	99	437	0.0000016		199.2
93652	Mecoprop	0.0939		0	3.13		734	57.76	8.34	0	91.66	99		0		214.6
94111	2,4-D isopropyl ester			0	3.81			98.28	8.7	0.02	91.28			0.0000052		
94360	Benzoyl peroxide	0.00748	1296	0.0165	3.46	0	9.1	96.7	5.18	0.021	94.8	99	251	0.0000035		242
94586	Dihydrosafrole	0.497	2111	0.00258	3.58	0	0	70.75	14.3	0.34	85.36	99	310	0.0000122		164.22
94597	Safrole	0.635	670	0.00258	3.45	0	810.67	66.53	12.28	0.3	87.42	99	61.6	0.0000091		162.18
94746	Methoxone (MCPA)	0.0341		0	3.25		1174	60.68	9.67	0	90.34	99		0		200.63
94757	2,4-D ((2,4-dichlorophenoxy)acetic acid)	0.212	109	0.0108	2.81	0	890	93.8	1.71	0	98.29	99	10	0	0.07	221
94804	2,4-D butyl ester			0.000131	4.38		46	99.61	15.35	0	84.65			0.0000005		
94826	2,4-DB			0	3.53		53	88.9	8.29	0	91.71			0		249.09
95476	o-Xylene	0.0866	129	0.00258	3.12	0	178	95.78	2.84	12.01	85.16	99	21	0.00518		106
95487	o-Cresol	0.238	103	0.0165	1.95	0	25950	92.35	0.56	0.011	99.43	99	18	0.0000012		108
95501	1,2-Dichlorobenzene	0.00249	280	0.000596	3.43	0	83.96	73.77	10	28.37	61.64	99	270	0.0019	0.6	147
95534	o-Toluidine	0.968	100	0.0195	1.32	0	16600	99.92	0.28	93.98	5.74	99	5.9	2.72		107
95545	1,2-Phenylenediamine	0.476		0	0.15		4150	45.44	2.4	0	97.6	99		0		108.14
95636	1,2,4-Trimethylbenzene	0.238	2712	0.00258	3.78	0	57	94.11	11.47	16.52	72	99	440	0.00616		120.19
95692	p-Chloro-o-toluidine			0	2.27			47.52	3.47	0.11	96.42	99		0.0000016		141.6
95807	2,4-Diaminotoluene	1.41	36	0.0114	0.14	0	300	45.44	2.4	0	97.6	99	1.07	0		122
95954	2,4,5-Trichlorophenol	0.0127	1500	0.694	3.72	0	1200	75.39	16.79	0.093	83.1	99	1910	0.0000043		197.5
96093	Styrene oxide	0.031	53	0.0158	1.61	0	3000	75.49	0.95	0.38	98.66	99	10	0.0000158		120
96128	1,2-Dibromo-3-chloropropane (DBCP)	0.00261	102	0.000596	2.96	0	1230	33.45	13.03	15.22	71.78	99	11	0.000147	0	236.5
96184	1,2,3-Trichloropropane	0.00095		0	2.27			52.08	3	15.67	81.36	99		0.000343		147.43
96333	Methyl acrylate	0.141	11	0.0165	0.8	0	-16136	92.25	0.37	1.49	98.14	99	2.4	0.000197		86
96457	Ethylene thiourea	0.767	50	0.00258	-0.66	0	20000	45.43	2.38	0.022	97.6	99	10	0.0000003		96
97234	Dichlorophene			0	4.26		30	78.05	40.23	0	59.77			0		269.12
97563	C.I. Solvent Yellow 3	0.465	347	0.00607	4.29	0	100	91.29	29.73	0	70.28	99	562	0		225.28
98077	Benzotrichloride	0.00219	492	69.3	3.9	0	53	100	0.03	0	99.97	99	98	0.0000203		195
98828	Cumene	0.0392	454	0.00903	3.66	0	49.9	98.07	6.93	11.35	81.71	99	35	0.0115		120
98862	Acetophenone	0.0074	38.3	0	1.58	0	5500	92.2	0.44	0.11	99.44	99	9.35	0.0000107		120.15
98873	Benzal chloride	0.0141	209	6.93	2.97	0	250	99.99	0.1	0.04	99.86	99	27	0.000526		161
98884	Benzoyl chloride	0.00374	145	17.3	1.44	0	0	100	0.01	0.01	99.98	99	7.32	0.000132		141
98953	Nitrobenzene	0.701	229	0.00115	1.85	0	1900	92.32	0.52	0.23	99.24	99	15	0.000024		123
99309	Dichloran			0	2.76		7	51.39	5.39	0	94.59			0		207.02

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
99558	5-Nitro-o-toluidine	0.193	248	0.015	1.87	0	0	46.26	2.83	0	97.17	99	15.5	0		152.15
99592	5-Nitro-o-anisidine	0.176	63.2	0.015	1.47	0	2206	45.76	2.56	0	97.44	99	7.67	0		152.71
99650	m-Dinitrobenzene	0.000184	1.39	0.00111	1.49	0	533	45.78	2.58	0.022	97.4	99	0.93	0.0000004		168
100016	p-Nitroaniline			0	1.39		728	45.7	2.54	0	97.46	99		0		138.13
100027	4-Nitrophenol	0.114	236	0.0211	1.91	0	16000	99.48	0.42	92.39	7.18	99	79	0.415		139
100254	p-Dinitrobenzene	0	143	0	1.46	0	500	45.75	2.56	0	97.44	99	7.6	0.0000001		168.11
100414	Ethylbenzene	0.0445	250	0.00626	3.15	0	206	89.8	3.93	38.24	57.82	99	15	0.00788	0.7	106
100425	Styrene	0.433	920	0.00155	2.95	0	320	94.89	2.12	8.27	89.61	99	13.5	0.00275	0.1	104
100447	Benzyl chloride	0.0173	139	0.0462	2.3	0	525	78.03	1.38	6.43	92.17	99	33	0.000412		127
100754	N-Nitrosopiperidine	0.153	9	0.156	0.36	0	76480	45.46	2.4	0.066	97.56	99	1.1	0.0000008		350.27
101053	Anilazine			0	3.88		8	80.63	20	0	80			0		275.51
101144	4,4'-Methylenebis(2-chloroaniline)	1.31	8000	0.0114	3.91	0	13.9	81.57	20.64	0	79.36	99	575	0		267.16
101611	4,4'-Methylenebis(N,N-dimethylbenzenamine)	1.91	9140	0.0133	4.37	0	1.3	92.73	31.74	0	68.25	99	2400	0.0000001		254
101688		0.0624		-0.69	5.22			99.99	3.18	0	96.82			0.0000009		
101779	4,4'-Methylenedianiline	1.41	98	0.0165	1.59	0	1000	75.38	0.96	0	99.04	99	9.5	0		198
101804	4,4'-Diaminodiphenylether	1.27	315	0.00565	2.22	0	139	76.37	1.35	0	98.65	99	22	0		200
101906	Diglycidyl resorcinol ether			0	1.23			75.2	0.88	0	99.12			0		
104121	p-Chlorophenyl isocyanate			0.693	3.24			98.53	1.18	0.28	98.54			0.000172		
104949	p-Anisidine	0.719	17	0.00607	0.95	0	24706	92.09	0.38	0	99.61	99	3.1	0.0000001		123.15
105679	2,4-Dimethylphenol	0.32	18	0.0165	2.3	0	7870	76.63	1.46	0.052	98.5	99	150	0.000002		122
106423	p-Xylene	0.0908	260	0.00258	3.15	0	162.4	96.12	2.98	15.57	81.45	99	15	0.00753		106
106445	p-Cresol	0.254	49	0.368	1.94	0	21520	92.34	0.56	0.011	99.44	99	17.6	0.000001		108
106467	1,4-Dichlorobenzene	0.0019	600	0.000596	3.44	0	81.3	75.34	9.85	32.51	57.65	99	214	0.0024	0.08	147
106478	p-Chloroaniline	0.115		0	1.83		2750	46.22	2.79	0.13	97.1	99		0.0000014		127.57
106503	p-Phenylenediamine	1.36	13	0.0117	-0.3	0	-28536	45.43	2.38	0	97.6	99	1	0		108
106514	Quinone	0.578	26	0.349	0.2	0	11130	51.81	1.91	21.25	76.84	99	0.84	0.000479		108.09
106887	1,2-Butylene oxide	0.0125	8	0.00318	0.86	0	95000	75.95	0.82	3.54	95.64	99	1	0.00018		72
106898	Epichlorohydrin	0.00261	10	0.00352	0.45	0	65900	46.05	2.35	2.17	95.5	99	1.2	0.0000304		92
106934	1,2-Dibromoethane	0.00148	98	0.000596	1.96	0	4152	54.38	2.24	25.78	71.97	99	10	0.000667	0	188
106990	1,3-Butadiene	0.5	116	0.00258	1.99	0	735	97.32	0.5	85.67	13.83	99	19.2	0.0736		54
107028	Acrolein	0.112	5	0.00258	-0.01	0	212500	92.18	0.36	1.01	98.62	99	344	0.000122		56
107051	Allyl chloride	0.126	50	0.0154	1.93	0	3370	84.36	0.83	81.86	17.31	99	7.45	0.011		76.53
107062	1,2-Dichloroethane	0.00131	32	0.000225	1.48	0	8608	58.03	1.69	37.34	60.97	99	2	0.00118	0.01	99
107119	Allylamine			0	0.03		1000000	75.18	0.82	0.43	98.74			0.0000175		57.09
107131	Acrylonitrile	0.0277	9	0.0122	0.25	0	74500	92.19	0.36	1.12	98.51	99	48	0.000138		53
107186	Allyl alcohol	0.17	1.47	0.017	0.17	0	0	92.07	0.37	0.054	99.59	99	0	0.000005		58
107197	Propargyl alcohol	0.0281		0	-0.38		1000000	92.06	0.36	0.011	99.63	99		0.0000012		56.06
107211	Ethylene glycol	0.0459	4	0.00842	-1.36	0	1000000	92.06	0.36	0	99.63	99	10	0.0000001		62
107302	Chloromethyl methyl ether	0.0168	36	23.1	0.32	0	0	100	0	0.01	99.98	99	1	0.000304		80.51
108054	Vinyl acetate	0.07	19	0.00396	0.73	0	20000	92.4	0.37	3.07	96.56	99	2	0.000511		86
108101	Methyl isobutyl ketone	0.083	19	0.0165	1.31	0	19000	92.25	0.4	1.12	98.48	99	2.4	0.000138		100
108316	Maleic anhydride	0.00392	181	69.3	1.62	0	0	100	0	0	100	99	10	0.0000039		98
108383	m-Xylene	0.147	166	0.00258	3.2	0	161	96.25	3.25	14.38	82.38	99	15	0.00718		106
108394	m-Cresol	0.346	34.6	0.00772	1.96	0	22700	92.35	0.56	0.011	99.43	99	20	0.0000009		108

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
108452	1,3-Phenylenediamine	0.54		0	-0.33		238000	45.43	2.38	0	97.6	99		0		108.14
108601	Bis(2-chloro-1-methethyl)ether	0.0827	73	0.000882	2.48	0	1700	50.47	3.86	6.2	89.93	99	9.3	0.000112		171
108883	Toluene	0.038	95	0.00427	2.73	0	526	94.96	1.43	18.26	80.32	99	37	0.00664	1	92
108907	Chlorobenzene	0.00523	275	0.000309	2.84	0	497.9	85.32	2.47	28.63	68.89	99	447	0.00377	0.1	112
108930	Cyclohexanol			0	1.23			92.22	0.4	0.87	98.73	99		0.000102		100.16
108952	Phenol	0.167	16	0.0715	1.46	0	82800	92.15	0.42	0	99.58	99	39	0.0000003		94
109068	2-Methylpyridine	0	9.6	0	1.11	0	10000000	92.11	0.39	0.098	99.51	99	4.1	0.00001		93.13
109773	Malononitrile	0.000091	6.6	0.00138	-0.6	0	133000	45.42	2.38	0	97.62	99	0.21	0		66.06
109864	2-Methoxyethanol	0.0669	9	0.00258	-0.77	0	1000000	92.06	0.36	0.011	99.63	99	0.2	0.000001		76
110543	n-Hexane	0.0152		0	3.9		9.5	99.94	9.37	52.66	37.96	99		1.81		86.18
110576	trans-1,4-Dichloro-2-butene			0.00903	2.6		850	79.81	1.94	8.72	89.34	99		0.000664		125
110805	2-Ethoxyethanol	0.0713	21	0.00258	-0.32	0	1000000	92.06	0.36	0.011	99.63	99	0.5	0.0000007		90
110827	Cyclohexane	0.0438	482	0.000596	3.44	0	55	88.74	6.99	9.14	83.89	99	242	0.0015		84
110861	Pyridine	0.00298	5	0.0165	0.65	0	1000000	92.09	0.37	0.11	99.51	99	2	0.000011		79
111422	Diethanolamine	0.529	4	0.0261	-1.43	0	1000000	92.06	0.36	0	99.63	99	0.05	0		105
111444	Bis(2-chloroethyl)ether	0.0395	79	0.000596	1.29	0	17200	22.77	6.59	3.38	90.03	99	11	0.000017		143
111911	Bis(2-chloroethoxy)methane	0	31	0.0000693	1.3	0	8100	22.57	6.69	2.26	91.05	99	5.7	0.0000111		173.1
114261	Propoxur	0.537	160	0.00181	1.52	0	1859	92.17	0.43	0	99.56	99	8.41	0.0000004		209.24
115071	Propylene (Propene)	0.229	219	0.00258	1.77	0	200	98.91	0.38	90.83	8.8	99	13.2	0.196		42.08
115286	Chlorendic acid			0	3.14			33.15	17.83	0	82.17				0		
115322	Dicofol	0.00925	-18636	0	5.02	0	1.32	98.37	45.27	0	54.73	99	13900	0		370.47
116063	Aldicarb	0.0249		0.0000693	1.13		6030	45.58	2.46	0	97.52	99		0	0	190.25
117793	2-Aminoanthraquinone	0.166	11800	0.00607	2.43	0	0.16	48.36	3.91	0	96.09	99	1720	0		223
117817	Di(2-ethylhexyl) phthalate	0.131	87420	0.00352	7.6	0	0.34	99.93	38.25	0	61.75	99	114	0.0000147	0.01	390
118741	Hexachlorobenzene	0.000102	14100	0.0000218	5.73	0	0.0062	98.43	60.63	0.46	38.91	99	14500	0.0017		285
119904	3,3'-Dimethoxybenzidine	1.1	230	0.0113	1.81	0	60	46.15	2.77	0	97.23	99	14.1	0		254.43
119937	3,3'-Dimethylbenzidine	1.43	447	0.0165	2.34	0	1300	76.76	1.51	0	98.49	99	35.5	0		212.28
120127	Anthracene	0.801	16000	0.801	4.45	0	0.0434	94.15	33.45	2.19	64.37	99	675	0.00072		178
120365	2,4-DP (Dichlorprop)			0	3.43		829	65.84	12.01	0	87.97			0		235.05
120581	Isosafrole	0.32	540	0.0026	3.37	0	0	64.08	11.17	0.19	88.64	99	72	0.000005		162.18
120718	p-Cresidine	1.31	42	0.00563	1.74	0	4721	46.05	2.71	0	97.26	99	10	0.0000001		137.18
120809	Catechol	0.147	118	0.0165	0.88	0	461400	92.08	0.38	0	99.62	99	3	0		110
120821	1,2,4-Trichlorobenzene	0.00297	1430	0.000596	4.02	0	49	86.46	22.2	9.6	68.22	99	1200	0.00142	0.07	181
120832	2,4-Dichlorophenol	0.018	126	0.549	3.06	0	4500	94.76	2.63	0.021	97.34	99	100	0.0000032		163
121142	2,4-Dinitrotoluene	0.0866	201	0.0161	1.98	0	270	46.5	2.95	0	97.03	99	19	0.0000001		182
121448	Triethylamine	0.25		0	1.45		15000	48.22	2.34	8.71	88.95	99		0.000149		101.19
121697	N,N-Dimethylaniline	0.145	80	0.0181	2.31	0	1454	48.68	3.45	3.53	93	99	10	0.0000568		121.18
121755	Malathion	0.209		0.0193	2.36		143	92.76	0.86	0	99.14	99		0		330.36
122349	Simazine	0.0482		0	2.18		6.2	23.35	8.44	0	91.56	99		0	0	201.67
122394	Diphenylamine	0.525		0	3.5		53	88.44	7.93	0.045	92.04	99		0.0000034		169.23
122667	1,2-Diphenylhydrazine	1.27	947	0.03	2.94	0	68	54.01	6.63	0	93.37	99	100	0		184
123319	Hydroquinone	0.147	9.3	0.907	0.59	0	72000	92.07	0.37	0	99.63	99	39.8	0		110
123386	Propionaldehyde	0.116	4	0.0165	0.59	0	306000	92.15	0.37	0.66	98.97	99	1.66	0.0000734		58.08
123637	Paraldehyde	0	0	0	0	0	125000	0	2.42	0.044	97.56	99	0	0		132.16
123728	Butyraldehyde	0.136	9.4	0.0165	0.88	0	71000	92.2	0.38	0.97	98.66	99	2.75	0.000115		72

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
123911	Dioxane	0.0471	17	0.0016	-0.27	0	1000000	45.53	2.37	0.35	97.25	99	0.4	0.0000048		88
124403	Dimethylamine			0	-0.38			92.08	0.36	0.17	99.46			0.0000177		45.08
124732	1,2-Dibromotetrafluoroethane	0	1202	0.14	2.96	0	0	98.48	2.39	96.3	1.31	99	141	0.162		260
126727	Tris(2,3-dibromopropyl)phosphate	0.397	1390	0.0165	4.29	0	8	99.5	14.38	0.04	85.58	99	2.75	0.0000218		697.61
126987	Methacrylonitrile	0.0226	16.5	0	0.68	0	25400	76.17	0.8	4.59	94.59	99	1.9	0.000247		67.09
126998	Chloroprene	0.132	312	0.000596	2.53	0	480	95.71	1.16	92.82	6.02	99	21.4	0.0523		88.54
127184	Tetrachloroethylene (Perchloroethylene)	0.000993	238	0.00012	3.4	0	200	88.85	6.99	85.41	7.6	99	49	0.0177	0.01	166
128030	Potassium dimethyldithiocarbamate			0	0.69			76.61	0.8	6.59	92.61			0.000388		
128041	Sodium dimethyldithiocarbamate			0	0.07			76.61	0.8	6.59	92.61			0.000388		143.21
128665	C.I. Vat Yellow 4	0.0243	19100	0.000596	6.28	0	0.08	98.89	61.97	0	38.03	99	6760	0		332.36
131113	Dimethyl phthalate	0.0034	40	0.0165	1.56	0	4000	92.18	0.44	0	99.56	99	57.5	0.0000001		194.19
131522	Sodium pentachlorophenate			0	5.12			96.2	56.27	0	43.73			0		
132274	Sodium o-phenylphenoxide			0	3.09		700	95.02	2.74	1.86	95.39			0.000428		
132649	Dibenzofuran	0.201	8128	0.00258	4.12	0	4.22	96.39	18.29	0.23	81.49	99	1350	0.0000512		168.19
133062	Captan	0.119	198	0.231	2.35	0	3.3	76.84	1.52	0.17	98.31	99	10	0.0000072		300
133073	Folpet	0.0425		0	2.85		1	79.92	2.89	0.075	97.03	99		0.0000038		296.58
133904	Chloramben	0	190	0.69	1.9	0	700	46.32	2.87	0	97.13	99	15.5	0		206.03
134292	o-Anisidine hydrochloride	0	104	0	1.18	0	0	45.63	2.48	0.13	97.39	99	4.6	0.0000018		159.61
134327	alpha-Naphthylamine	1.31	3213	0.00565	2.25	0	1698	76.46	1.39	0.013	98.6	99	30.2	0.0000005		143.18
135206	Cupferron	0.272	2.7	0.000596	-1.73	0	10000000	21.97	6.55	0	93.45	99	0.029	0		156.19
136458	Dipropyl isocinchomeronate			0	3.57			97.24	6.16	0	93.84			0		251.31
137268	Thiram	0.98	890	0.00545	1.7	0	18	75.47	0.98	0.013	99.01	99	11.5	0.0000003		240.41
137417	Potassium N-methyldithiocarbamate			0	0.48			75.91	0.8	3.5	95.69	99		0.000177		
137428	Metham sodium	0.174		0.00385	-0.92		720000	75.91	0.8	3.5	95.69	99		0.000177		129.18
138932	Disodium cyanodithioimidocarbonate			0	0.31			77.6	0.75	11.33	87.93	99		0.000776		
139139	Nitrilotriacetic acid	0.471	286	0.00258	-3.81	0	-6476	92.06	0.36	0	99.63	99	1.26	0		191
139651	4,4'-Thiodianiline	1.09	109	0.0116	2.18	0	822	47.11	3.27	0	96.73	99	20.4	0		216
140885	Ethyl acrylate	0.162	22	0.0165	1.32	0	15000	92.4	0.4	2.51	97.08	99	5.89	0.000393		100
141322	Butyl acrylate	0.166	67	0.0165	2.36	0	2000	93.02	0.85	2.62	96.52	99	8.49	0.00046		128.17
142596	Nabam			0.693	1.11		200000		100	100	100			0.0000007		256.35
148798	Thiabendazole	0.176		0	2.47		50	48.63	4.05	0	95.95			0		201.26
149304	2-Mercaptobenzothiazole	0.11		0	2.42		2500	48.3	3.89	0	96.13			0		167.25
150505	Merphos			0	7.67			99.99	21.83	0	78.16			0.0000227		298.5
150685	Monuron			0	1.94		230	22.77	7.69	0	92.31			0		198.65
151564	Ethyleneimine (Aziridine)	0.0363	6	0.000188	-0.28	0	1000000	45.67	2.36	0.9	96.76	99	0.08	0.0000121		43
156105	p-Nitrosodiphenylamine	1.52	1890	0.00565	3.16	0	7.43	58.45	8.66	0	91.34	99	269	0		198.22
156627	Calcium cyanamide	0.119	8.53	0.00258	-0.82	0	0	0	0	0	0	0	0	0		80.11
298000	Methyl parathion	0.16		0.000401	2.86		50	93.97	1.86	0	98.14	99		0.0000001		263.23
300765	Naled	0.0172		0	1.38		2000	75.26	0.9	0	99.1	99		0		380.79
301122	Oxydemeton methyl			0.000628	-0.75		1000000	75.06	0.83	0	99.17			0		246.3
302012	Hydrazine	0.576	4.28	0.0165	-1.37	0	1000000	0	0	0	0	0	0.016	0		32
306832	2,2-Dichloro-1,1,1-trifluoroethane	0	361	0	2.17	0	0	97.43	0.66	98	1.34	99	26.3	0.0955		152.93

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
309002	Aldrin	0.423	-17036	0.000712	6.5	0	0.18	98.96	62.16	0.03	37.81	99	3890	0.000493		365
314409	Bromacil	0.0525		0	2.11		815	46.87	3.14	0	96.84	99		0		261.11
319846	alpha-Hexachlorocyclohexane			0.00589	3.8		2	78.08	18.33	0.2	81.45	99		0.0000106		290.83
330541	Diuron	0.0294		0.000193	2.68		42	50.51	4.95	0.18	94.89	99		0.0000027		233.1
330552	Linuron	0.028		0.00259	3.2		75	59.41	9.09	0	90.91	99		0.0000001		249.11
333415	Diazinon	0.261		0.000156	3.81		40	92.99	12.44	0	87.56			0.0000001		304.36
334883	Diazomethane	0	292	0	2	0	0	92.38	0.58	0	99.42	99	19.5	0		42.04
353593	Bromochlorodifluoromethane	0	346	0.18	1.9	0	0	97.39	0.48	98.18	1.32	99	24.7	0.094		165
354110	1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)			0	2.8			61.83	4.33	74.58	21.11			0.003		
354143	1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121)			0	2.8			61.83	4.33	74.58	21.11			0.003		
354234	1,2-Dichloro-1,1,2-trifluoroethane	0	361	0	2.17	0	0	97.43	0.66	98	1.34	99	26.3	0.0955		152.93
354256	1-Chloro-1,1,2,2-tetrafluoroethane	0	245	0	1.86	0	0	99.53	0.42	98.85	0.72	99	15.3	0.54		136.48
357573	Brucine			0	0.98		3200	45.53	2.44	0	97.56			0		394.45
422446	1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
422480	2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
422560	3,3-Dichloro-1,1,1,2,2-pentafluoropropane			0	3.14			99.51	3.34	95.61	1.05			0.502		
431867	1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
460355	3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)			0	2.48			99.3	0.97	98.19	0.85			0.36		
463581	Carbonyl sulfide	0	88	0	-1.33	0	1220	96.18	0.3	82.86	16.84	99	11.2	0.0492		60.07
465736	Isodrin			0	6.5		1	98.96	62.16	0.02	37.82			0.000387		364.93
492808	Auramine	1.94	2030	0.000596	2.68	0	11.02	50.47	4.95	0	95.05	99	288	0		267.37
505602	Mustard gas	0.0205	120	9.9	2.41	0	684	99.99	0.03	0.01	99.97	99	15.5	0.0000337		159.08
507551	1,3-Dichloro-1,1,2,2,3-pentafluoropropane			0	3.14			99.51	3.34	95.61	1.05			0.502		
510156	Chlorobenzilate	0.0293	1065	0.00138	4.74	0	13	96.95	40.37	0	59.63	99	145	0.0000001		325.2
528290	o-Dinitrobenzene	0.0000575	1.47	0	1.69	0	133	45.98	2.68	0	97.3	99	0.97	0.0000001		168
532274	2-Chloroacetophenone	0.00516	76	0.00258	1.93	0	1572	46.45	2.88	0.26	96.86	99	9.77	0.0000035		154.59
533744	Dazomet	0.77		0.693	1.4		1200	96.67	0.17	0.01	99.81	99		0.0000024		162.27
534521	4,6-Dinitro-o-cresol	0.00123	238	0.00519	2.12	0	198	46.93	3.15	0.11	96.74	99	24	0.0000014		198
540590	1,2-Dichloroethylene	0.015	35	0.000596	2.09	0	3500	72.25	1.4	64.18	34.42	99	15.1	0.00408	0.1	96.95
541413	Ethyl chloroformate	0.00857	52.4	1.02	0.63	0	0	81.95	0.63	30.76	68.6	99	0	0.00312		108.53
541537	2,4-Dithiobiuret			0.00707	-1.52		2700	48.65	2.12	0	97.88			0		135.2
541731	1,3-Dichlorobenzene	0.00428	293	0.000596	3.53	0	125	77.5	10.4	31.39	57.43	99	580	0.00263		147
542756	1,3-Dichloropropylene	0.0787	26	0.00256	2.03	0	2800	82.99	0.92	32.34	66.73	99	7	0.00355		111
542767	3-Chloropropionitrile			0.00131	0.18			45.73	2.36	1.05	96.59			0.0000143		89.53
542881	Bis(chloromethyl)ether	1.95	17.9	69.3	0.57	0	22000	100	0	0	100	99	0	0.000206		114.97
554132	Lithium carbonate			0												73.89
556616	Methyl isothiocyanate			4.62	0.94		7600	99.96	0.02	0.23	99.75			0.00263		73.12
563473	3-Chloro-2-methyl-1-propene			0.000419	2.48		1400	95.78	1.06	93.07	5.88			0.0534		90.55
569642	C.I. Basic Green 4	10.2	97.7	0.000596	0.8	0	1000	45.49	2.42	0	97.58	99	0	0		364.9

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
584849	Toluene-2,4-diisocyanate	0.0191	2580	0.693	3.74	0	0	99.48	2.03	0.01	97.96	99	410	0.0000111		174.15
593602	Vinyl bromide	0.0406	170	0.000596	1.57	0	4180	94.65	0.22	27.87	71.91	99	9.18	0.0123		106.95
594423	Perchloromethyl mercaptan			0.0000791	3.47			88.26	7.49	2.13	90.38			0.000241		185.88
606202	2,6-Dinitrotoluene	0.0342	100	0.194	2.1	0	182	46.85	3.14	0.064	96.82	99	12	0.0000007		182
612828	3,3'-Dimethylbenzidine dihydrochloride			0	3.02			55.46	7.3	0	92.7			0		
612839	3,3'-Dichlorobenzidine dihydrochloride			0	3.51			68.37	13.21	0	86.78			0		
615054	2,4-Diaminoanisole	0	20.4	0	-0.31	0	19500	45.43	2.38	0	97.6	99	0.48	0		138.17
615281	1,2-Phenylenediamine dihydrochloride			0	0.15			45.44	2.4	0	97.6			0		
621647	N-Nitrosodi-n-propylamine	2.39	28	2.39	1.36	0	9894	45.79	2.51	0.39	97.1	99	6.31	0.0000054		130
624180	1,4-Phenylenediamine dihydrochloride			0	-0.3			45.43	2.38	0	97.6			0		
624839	Methyl isocyanate	0.205	64.1	4.62	0.79	0	0	99.95	0.02	0.14	99.84	99	0	0.000926		57.05
630206	1,1,1,2-Tetrachloroethane	0.00017	92.7	0.0219	2.93	0	1100	58.8	5.77	68.76	25.48	99	99.3	0.00242		167.85
636215	o-Toluidine hydrochloride	0	124	0	1.32	0	0	45.7	2.52	0.15	97.35	99	5.93	0.0000021		143.61
639587	Triphenyltin chloride			0												
680319	Hexamethylphosphoramide	0	34	0	0.28	0	1000000	45.44	2.4	0	97.6	99	0.96	0		179
684935	N-Nitroso-N-methylurea	0.722	22.5	26.8	-0.03	0	14430	45.43	2.38	0	97.62	99	0.56	0		103.09
709988	Propanil			0.0000791	3.07		200	56.46	7.76	0.018	92.24	99		0.0000002		218.09
759739	N-Nitroso-N-ethylurea	0.764	23.84	26.8	0.23	0	0	45.44	2.4	0	97.6	99	0.88	0		117.1
759944	Ethyl dipropylthiocarbamate	0.086		0	3.21		375	59.92	9.15	0.95	89.9	99		0.0000226		189.31
764410	1,4-Dichloro-2-butene	0.096	619	0.00903	2.6	0	0	90.12	1.49	82.28	16.22	99	55.7	0.0188		125
812044	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)	0	361	0	2.17	0	0	97.43	0.66	98	1.34	99	26.3	0.0955		152.93
834128	Ametryn	0.077		0	2.98		185	54.71	6.96	0	93.04	99		0		227.35
842079	C.I. Solvent Yellow 14	0.117	3795	0.0026	5.51	0	1.29	99.31	50.11	0	49.89	99	1200	0		248.28
872504	N-methyl-2-pyrrolidone			0	-0.38		1000000	92.06	0.36	0	99.64			0		
924163	N-Nitrosodi-n-butylamine	0.872	88.4	0.13	1.92	0	1200	46.62	2.85	0.94	96.2	99	17	0.0000132		158.24
924425	N-methylolacrylamide			0	-1.81			92.06	0.36	0	99.63			0		
957517	Diphenamid			0	2.86		260	52.74	6.05	0	93.97			0		239.3
961115	Tetrachlorvinphos	0.065	1167	0.00061	3.53		11	88.9	8.29	0	91.71	99	283	0		365.95
989388	C.I. Basic Red 1	0	-27415	0	5.89		0	99.54	51.71	0	48.29	99	17600	0		479.02
1114712	Pebulate	0.0795		0.00241	3.83		60	98.37	8.91	0.4	90.69	99		0.000148		203.36
1120714	Propane sultone	0.096	2.04	0.0815	-0.28	0	1140000	70.61	0.93	0.071	99.01	99	0.24	0.0000024		112.14
1134232	Cycloate	0.0955		0	3.88		85	93.92	13.64	0.44	85.92	99		0.0000706		215.4
1163195	Decabromodiphenyl ether	0.00103	-28006	0.00012	12.11	0	0.02	99.07	62.47	0	37.52	99	0	0		959.17
1313275	Molybdenum trioxide	0	0	0	0	0	490	0	0	0	0	0	0	0		143.95
1314201	Thorium dioxide	0	0	0	0	0	0	0	0	0	0	0	0	0		264.05
1319773	Cresol (mixed isomers)	0.337	81	0.347	1.99	0	20900	92.37	0.58	0.011	99.42	99	19.2	0.0000011		108.14
1320189	2,4-D, propylene glycol butyl ether ester			0	4.33			99.55	14.82	0	85.18			0.0000003		
1330207	Xylene (mixed isomers)	0.141	1738	0.00258	3.16	0	168	96.07	3.03	14.03	82.94	99	2.17	0.00663	10	106.17
1332214	Asbestos (friable)	0	0	0	0	0	0	0	0	0	0	0	0	0	7	554.22
1335871	Hexachloronaphthalene	0.00117	32000	0.00012	7.04	0	0.0015	99.04	62.38	0	37.61	99	347000	0.0000871		334.84

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Incinerator DRE	BCF	Henrys	MCL	Molecular Weight
1336363	Polychlorinated biphenyls (PCBs)	0.0027	29495	0.0000072	6.4	0	0.031	98.93	62.08	0.03	37.9	99.9999	-22436	0.000415	0.001	371.22
1344281	Aluminum oxide (fibrous forms)	0	0	0	0	0	0.98	0	0	0	0	0	0	0		102
1464535	Diepoxybutane	0.00508	2.5	0.007	-0.28	0	1000000	75.07	0.83	0.027	99.16	99	0.02	0.0000008		86.09
1563662	Carbofuran	0.0715		0.000503	2.32		700	92.71	0.82	0	99.17	99		0	0.04	221.26
1582098	Trifluralin	0.058	11070	0.078	5.34	0	8.11	97.4	58.45	0.031	41.51	99	3420	0.0000264		335
1634044	Methyl tert-butyl ether	0.0181	11.2	0.000596	0.94	0	-14536	52.94	1.87	24.35	73.78	99	1.5	0.000587		88
1649087	1,2-Dichloro-1,1-difluoroethane			0	2.31			95.06	0.85	97.04	2.1			0.048		
1689845	Bromoxynil			0	3.39		130	86.74	6.69	0	93.31			0		276.92
1689992	Bromoxynil octanoate	0.02		0.00183	6.1		0.08	99.91	37.78	0	62.21	99		0.00006		
1717006	1,1-Dichloro-1-fluoroethane	0	464	0	2.37	0	0	90.83	1.07	95.38	3.56	99	37	0.0241		116.95
1836755	Nitrofen	0	4370	0	4.64	0	1	96.14	38.23	0	61.77	99	1550	0.0000001		284.1
1861401	Benfluralin	0.06		0	5.29		0.1	97.2	57.94	0.32	41.74	99		0.000291		335.29
1897456	Chlorothalonil	0.0000165	5780	0	3.05	0	0.6	82.82	3.89	0.036	95.12	99	501	0.000002		265.9
1910425	Paraquat dichloride	0.0575		0	-2.71		1000	45.42	2.38	0	97.62	99		0		
1912249	Atrazine	0.074		0	2.61		30	25.68	11.21	0	88.79	99		0	0	215.68
1918009	Dicamba	0.00805		0	2.21		4500	47.23	3.35	0	96.65	99		0		221.04
1918021	Picloram			0	1.36		430	9.6	17.81	0	82.19	99		0	0.5	241.48
1918167	Propachlor	0.0565		0	2.18		6.13	76.46	1.29	0.84	97.86	99		0.0000375		211.69
1928434	2,4-D 2-ethylhexyl ester	0.0392		0.000825	6.27			99.99	21.72	0	78.28	99		0.0000214		
1929733	2,4-D butoxyethyl ester	0.067		0.0181	4.1		12	99.15	12.17	0	87.84	99		0.0000004		
1929824	Nitrapyrin	0.0000945		0.00375	3.41		40	65.8	11.57	2.2	86.25	99		0.00007		230.93
1937377	C.I. Direct Black 38	0	11031	0	4.9	0	0	97.89	43.38	0	56.62	99	3100	0		783.74
1982690	Sodium dicamba	0.0131		0	2.21		360000	47.23	3.35	0	96.65	99		0		
1983104	Tributyltin fluoride			0												
2032657	Methiocarb			0.000825	2.92		30	80.58	3.21	0	96.79			0		225.31
2155706	Tributyltin methacrylate			0												
2164070	Dipotassium endothall			0	1.91		110	75.72	1.08	0	98.92			0		
2164172	Fluometuron	0.0205	175	0	2.42	0	85	48.3	3.89	0	96.13	99	28	0		232.21
2212671	Molinate	0.0835		0	3.21		880	59.71	9.19	0.18	90.62	99		0.0000041		187.33
2234131	Octachloronaphthalene	0.000237	782000	0.00012	8.24	0	0	99.07	62.47	0	37.53	99	-20836	0.00019		403.73
2300665	Dimethylamine dicamba			0	1.13		720000	45.58	2.46	0	97.52			0		
2303164	Diallate	0.657	273	0.00154	4.08	0	14	86.49	24.52	0.046	75.43	99	140	0.0000038		270.24
2303175	Triallate	0.09		0	4.57		4	95.45	36.61	0.13	63.28	99		0.00003		
2312358	Propargite	0.161		0	5		0.5	99.95	41.99	44.12	13.88	99		2.77		350.51
2439012	Chinomethionat (6-methyl-1,3-dithiolo[4,5-b]quinox			0	3.78		1	77.37	17.95	0	82.05			0.0000002		234.29
2439103	Dodine			0	-0.88		630	75.06	0.83	0	99.17			0		287.44
2524030	Dimethyl chlorothiophosphate			0.693	1.39			96.76	0.17	0.99	98.84			0.000381		
2602462	C.I. Direct Blue 6	0	959	0	2.95	0	0	54.18	6.72	0	93.28	99	103	0		
2655154	2,3,5-trimethylphenyl methylcarbamate			0	2.56		58	77.78	1.94	0.026	98.03			0.0000009		
2699798	Sulfuryl fluoride (Vikane)			0												102.07
2702729	2,4-D sodium salt			0	2.81		18000	93.8	1.71	0	98.29			0		
2832408	C.I. Disperse Yellow 3	0	3985	0	3.98	0	1.18	83.69	22.2	0	77.8	99	623	0		269.3
2837890	2-Chloro-1,1,1,2-tetrafluoroethane	0	245	0	1.86	0	0	99.53	0.42	98.85	0.72	99	15.3	0.54		136.48

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
2971382	2,4-D chlorocrotyl ester			0	4.42			99.65	15.76	0	84.24			0.0000021		
3118976	C.I. Solvent Orange 7	0	28575	0	6.6	0	0.0237	99.66	52.69	0	47.31	99	11700	0		276.32
3383968	Temephos			0	5.96		0.27	99.9	37.61	0	62.39			0		466.46
3653483	Methoxone sodium salt			0	1.3		300000	75.23	0.89	0	99.11			0		
3761533	C.I. Food Red 5	0	546	0	2.5	0	0	48.85	4.16	0	95.84	99	46.8	0		482.43
4080313	1-(3-chloroallyl)-3,5,7-triaza-1-azoni aadamantane			0	-5.92			45.42	2.38	0	97.62			0		251.17
4170303	Crotonaldehyde	0.095		0	0.6		150000	92.27	0.37	1.81	97.83	99		0.000253		70.09
4549400	N-Nitrosomethylvinylamine	0.113	20	0.000596	-0.28	0	30000	51.08	17.6	19.07	78.99	99	0.6	0.00041		86.1
4680788	C.I. Acid Green 3	0	64.1	0	0.79	0	0	45.49	2.42	0	97.58	99	0	0		690.8
5234684	Carboxin			0	2.14		170	76.16	1.26	0	98.74			0		235.31
5598130	Chlorpyrifos methyl	0.159		0.00166	4.31		4	97.73	22.19	0.041	77.78	99		0.0000105		
5902512	Terbacil	0.0202		0	1.89		710	46.3	2.85	0	97.15	99		0		216.65
6459945	C.I. Acid Red 114			0	3.33		500	99.93	0.25	97.99	1.76			0		
6484522		0	0	0	0	0	1183000	0	0	0	0			0		80.04
7287196	Prometryn	0.103		0	3.51		33	44.31	24.49	0	75.51	99		0		241.37
7429905	Aluminum (fume or dust)	0	0	0	0	4	0	66.39	100	0	0	0	79	0		26.98
7439921	Lead	0	0	0	0	582	0	63.48	100	0	0	91.6	1250	0	0.02	207.19
7439965	Manganese	0	0	0	0	5	0	38.85	100	0	0	0	0	0		54.93
7439976	Mercury	0	0	0	0	4084	0	68.57	100	0	0	0	-25536	0.0085	0	200.59
7440020	Nickel	0	0	0	0	27	0	38.28	100	0	0	99	250	0	0.1	58.71
7440224	Silver	0	0	0	0	539	0	66.47	100	0	0	0	25	0		107.87
7440280	Thallium	0	0	0	0	0	0	53.55	100	0	0	0	15	0	0	204.37
7440360	Antimony	0	0	0	0	9	0	31.51	100	0	0	0	0.25	0	0.01	121.75
7440382	Arsenic	0	0	0	0	38	0	48.57	100	0	0	97.5	17	0	0.05	74.9
7440393	Barium	0	0	0	0	31	0	69.02	100	0	0	0	0	0	2	137.34
7440417	Beryllium	0	0	0	0	170	0	37.44	100	0	0	97.3	0	0	0	9.01
7440439	Cadmium	0	0	0	0	32	0	68.15	100	0	0	88.5	6000	0	0.01	112.4
7440473	Chromium	0	0	0	0	344	0	76.4	100	0	0	99	4000	0	0.1	52
7440484	Cobalt	0	0	0	0	10	0	32.06	100	0	0	0	4430	0		58.93
7440508	Copper	0	0	0	0	147	10000	72.47	100	0	0	99.9	14000	0	1.3	63.55
7440622	Vanadium (fume or dust)	0	0	0	0	68	0	31.81	100	0	0	0	0	0		50.94
7440666	Zinc (fume or dust)	0	0	0	0	31	0	66.15	100	0	0	99.9	12000	0		65.38
7550450	Titanium tetrachloride	0	0	0	0	0	0	0	0	0	0	0	0	0		189.73
7632000	Sodium nitrite			0												69
7637072	Boron trifluoride			0												67.82
7647010	Hydrochloric acid	0	0	0	0	0	0	0	0	0	0	0	0	0		36.46
7664382	Phosphoric acid	0.00115	0	0	0	0	0	0	0	0	0	0	0	0		98
7664393	Hydrogen fluoride	0	0	0	-0.44	0	10000000	0	0	0	0	0	0	0		20.01
7664417	Ammonia	0	0	0	-2	0	899000	59.9					0	0.0000158		17.03
7664939	Sulfuric acid	0.00075	0	0	0	0	10000000	0	0	0	0	0	0	0		98.08
7696120	Tetramethrin			0.0282	4.73		3	99.49	21.85	0	78.15			0		331.42
7697372	Nitric acid	0	0	0	0	0	10000000	0	0	0	0	0	0	0		63.01
7723140	Phosphorus (yellow or white)	0	0	0	0	0	3.3	59.8	100	0	0	0	0	0		30.97
7726956	Bromine			0			-29736									159.81

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
7758012	Potassium bromate			0												167.01
7782414	Fluorine			0											4	38
7782492	Selenium	0	0	0	0	22	0	43.66	100	0	0	99.8	2000	0	0.05	78.96
7782505	Chlorine	0	0	0	0	0	9460	0	0	0	0	0	0	0		70.9
7783202																
7786347	Mevinphos			0.000825	-0.24		600000	92.06	0.37	0	99.64			0		224.16
7803512	Phosphine			0			395									34
8001352	Toxaphene	0.0058	6000	0.00019	6.79	0	0.55	99.01	62.32	0	37.68	99	5010	0.000006	0	431.8
8001589	Creosote, coal tar	0	0	0	0	0	0	0	0	0	0	99	0	0		0
9006422	Metiram			0												
10028156	Ozone			0												48
10034932	Hydrazine sulfate	0.171	0	0	0	0	-31386	0	0	0	0	0	0	0		130.13
10049044	Chlorine dioxide	0	0	0	0	0	0	0	0	0	0	0	0	0		67.45
10061026	trans-1,3-Dichloropropene			0.000389	2.03		2800	78.51	1.07	11.91	87.02			0.000871		110.97
10294345	Boron trichloride			0												117.19
10453868	Resmethrin			0	7.11		0.01	99.99	21.82	0	78.18			0.0000056		338.48
12122677	Zineb	0	1230	0.693	0.17	0	10	97.61	0.13	0	99.87	99	170	0.0000025		275.73
12427382	Maneb	0.575	550	0	0.62	0	6	71.98	1.64	1.84	96.63	99		0.0000006		265.3
13194484	Ethoprop	0.187		0	3.59		750	71	14.51	0	85.49	99		0.0000002		242.32
13356086	Fenbutatin oxide (Vendex)			0			0.005									1052.76
13463406	Iron pentacarbonyl			0												195.9
13474889	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
13684565	Desmedipham			0.0495	3.39		7	90.71	5.2	0	94.8			0		300.34
14484641	Ferbam			0	0.69		130	45.48	2.42	0	97.58			0		416.5
15972608	Alachlor	0.122		0	3.52		242	88.75	8.17	0	91.83	99		0	0	269.77
16071866	C.I. Direct Brown 95	0	187085	0	7.16	0	0	99.68	52.87	0	47.13	99	0	0		0
16543558	N-Nitrosonornicotine	0	25	0	0.32	0	14.43	45.44	2.4	0	97.62	99	0.62	0		177.2
17804352	Benomyl	0.575		0.00963	2.12		3.8	51.31	2.71	0	97.29	99		0		290.32
19044883	Oryzalin			0	2.73		2.5	51.02	5.23	0	94.79			0		346.36
19666309	Oxydiazon			0	4.8		0.7	97.35	41.56	0	58.44			0.0000014		345.22
20325400	3,3'-Dimethoxybenzidine dihydrochloride			0	1.09			45.56	2.46	0	97.54			0		
20354261	Methazole			0	3.22		1.5	59.91	9.31	0.017	90.67			0.0000002		261.05
20816120	Osmium tetroxide	0	0	0	0	0	-8536	0	0	0	0	0	0	0		254.1
20859738	Aluminum phosphide			0												57.96
21087649	Metribuzin	0.0493		0	1.7		1220	45.99	2.7	0	97.33	99		0		214.28
21725462	Cyanazine	0.0252		0	2.22		170	23.52	8.67	0	91.33	99		0		240.68
22781233	Bendiocarb			0.00722	1.7		40	76.54	0.94	0.026	99.05			0.0000009		223.23
23564058	Thiophanate-methyl	0.207		0.0283	1.4			75.27	0.9	0	99.1	99		0		370.44
23564069	Thiophanate ethyl			0	3.43			87.35	7.12	0	92.89	99		0		370.44
23950585	Pronamide	0.0358	984	0	3.57	0	15	70.37	14.15	0.16	85.69	99	300	0.0000057		256.14
25311711	Isofenphos	0.745		0.0000102	4.12		22.1	96.38	18.31	0	81.69	99		0.0000001		345.4
25321146	Dinitrotoluene (mixed isomers)	0.0766	201	0.13	2.18	0	270	47.12	3.27	0.042	96.69	99	27	0.0000005		182.15
25321226	Dichlorobenzene (mixed isomers)	0.00309	1700	0.000596	3.47	0	119.2	75.23	10.46	29.48	60.06	99	260	0.00215		147

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
25376458	Diaminotoluene (mixed isomers)	1.41	61	0.0114	0.16	0	35	84.56	0.57	82.89	16.54	99	0	0.0113		122.17
26002802	Phenothrin			0	7.54		2	99.93	38.25	0	61.76	99		0.0000001		350.46
26471625	Toluenediisocyanate	1.19	2580	0.693	3.74	0	0	99.48	2.03	0.01	97.96	99	410	0.0000111		174
26628228	Sodium azide			0			-23836									65.02
26644462	Triforine	0.178		0	2.04		28	75.94	1.17	0	98.83	99		0		434.95
27314132	Norflurazon	0.0268		0	2.3		28	47.63	3.55	0	96.45	99		0		303.67
28057489	D-trans-allethrin (D-trans-chrysanthemic acid of D			0	4.78			99.33	30.47	0	69.52	99		0.0000006		
28249776	Thiobencarb	0.0685		0	3.4		28	64.92	11.6	0.015	88.4	99		0.0000003		
28407376	C.I. Direct Blue 218			0												
29232937	Pirimiphos methyl			0	4.2		22.4	97.02	19.94	0	80.05			0.0000007		
30560191	Acephate	0.0302		0	-0.85		818000	45.42	2.38	0	97.62	99		0		183.16
31218834	Propetamphos	0.745		0.0000017	2.51		110	77.51	1.83	0	98.17	99		0.0000001		281.31
33089611	Amitraz			0	5.5		1	99.3	50.05	0	49.95			0.0000026		293.41
34014181	Tebuthiuron	0.00895		0	1.78		2500	22.53	7.37	0	92.63	99		0		228.35
34077877	Dichlorotrifluoroethane	0	361	0	2.17	0	0	97.43	0.66	98	1.34	99	26.3	0.0955		152.93
35367385	Diflubenzuron			0	3.88		0.3	93.88	13.68	0	86.33			0		310.68
35400432	Sulprofos			0	5.48		0.31	99.84	36.37	0	63.62			0.0000004		322.43
35554440	Imazalil			0	3.82		1400	78.69	18.76	0	81.24			0		297.17
35691657	1-Bromo-1-(bromomethyl)-1,3-prop anedicarbonitrile			0	1.63			45.91	2.64	0	97.34			0		265.94
38727558	Diethatyl ethyl			0	3.6		105	89.98	9.21	0	90.78			0		
39156417	2,4-Diaminoanisole sulfate	0	16.2	0	-0.31	0	0	45.43	2.38	0	97.6	99	0	0		234.23
39300453	Dinocap			0	5.98		4	99.57	51.93	0	48.07			0		364.39
39515418	Fenpropathrin			0.000241	5.7		0.33	99.88	37.09	0	62.9			0.0000166		349.43
40487421	Pendimethalin	0.082		0	5.18		0.3	98.82	47.3	0.081	52.62	99		0.0000856		281.31
41198087	Profenofos			0	4.68		20	99.13	28.99	0	71.01			0		373.6
41766750	3,3'-Dimethylbenzidine dihydrofluoride			0	2.34			47.84	3.64	0	96.34			0		
42874033	Oxyfluorfen	0.0358		0	4.73		0.12	96.88	40.16	0.01	59.84	99		0.0000017		361.72
43121433	Triadimefon			0	2.77		71.5	51.51	5.46	0	94.54			0		293.75
50471448	Vinclozolin	0.089		0.0268	3.1		3.4	67.65	5.84	0	94.16	99		0		286.11
51235042	Hexazinone	0.244		0	4.01		-32536	84.56	22.88	0	77.11	99		0		252.3
51338273	Diclofop methyl			0	4.62		3	95.96	37.78	0	62.21			0.0000006		341.19
51630581	Fenvalerate			0	6.2		0.085	99.62	52.32	0	47.67			0.0000055		419.92
52645531	Permethrin	0.062		0.0000145	6.5		0.2	99.92	38.07	0	61.93	99		0		391.29
53404196	Bromacil lithium salt			0	1.87		700	46.26	2.83	0	97.17			0		
53404378	2,4-D 2-ethyl-4-methylpentyl ester			0	5.55			99.97	21.23	0	78.77			0.000029		
53404607	Dazomet, sodium salt			0	1.4		3000	45.71	2.54	0	97.46	99		0		
55290647	Dimethipin			0	-0.17		4600	45.43	2.38	0	97.6			0		210.26
55406536	3-Iodo-2-propynyl butylcarbamate	0.069		0.00507	2.45			77.22	1.71	0	98.29	99		0		
57213691	Triclopyr triethylammonium salt			0	1.5			75.32	0.93	0	99.07			0		
59669260	Thiodicarb			0.00321	1.7		19.1	75.47	0.98	0	99.02			0		354.46
60168889	Fenarimol	0.0107		0	3.6		13.7	71.33	14.66	0	85.34	99		0		331.2
60207901	Propiconazole	0.0735		0	3.5		110	68.04	13.07	0	86.95	99		0		342.22
62476599	Acifluorfen, sodium salt	0.00148		0	3.7		120	74.96	16.37	0.013	83.26	99		0.0000003		361.66

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
63938103	Chlorotetrafluoroethane	0	245	0	1.86	0	0	99.53	0.42	98.85	0.72	99	15.3	0.54		136.48
64902723	Chlorsulfuron	0.0068		0.000516	2		27900	46.55	2.99	0	97.01	99		0		357.78
64969342	3,3'-Dichlorobenzidine sulfate			0	3.51			68.37	13.21	0	86.78			0		
66441234	Fenoxaprop ethyl			0	4.95		0.9	99.55	32.6	0	67.4	99		0		291.38
67485294	Hydramethylnon			0	8.51		0.01	99.69	52.93	0	47.07	99		0.0000033		494.5
68085858	Cyhalothrin			0	6.02			99.58	52.02	0	47.98			0.0000023		449.86
68359375	Cyfluthrin			0	5.95			99.9	37.6	0	62.4			0.000008		434.28
69409945	Fluvalinate			0	6.81			99.93	38.17	0	61.83			0.00002		502.93
69806504	Fluazifop butyl			0	5.34		2	99.8	35.71	0	64.29			0.0000002		383.38
71751412	Abamectin			0	4.98		5	98.23	44.67	0	55.33	99		0		
72178020	Fomesafen			0	2.9		600	53.36	6.33	0	93.67			0		
72490018	Fenoxycarb			0	4.3		6	97.67	21.99	0	78.01			0		
74051802	Sethoxydim			0	3.99		4390	83.98	22.43	0	77.57			0		327.86
76578148	Quizalofop-ethyl			0	4.28		0.31	97.55	21.59	0	78.41			0.000001		372.81
77501634	Lactofen	0.009		0.0000773	4.81		1	99.37	30.89	0	69.12	99		0		
82657043	Bifenthrin			0	8.15		0.1	99.93	38.26	0	61.74			0.0000018		434.89
88671890	Myclobutanil			0	3.5		142	68.04	13.07	0	86.95			0		288.78
90454185	Dichloro-1,1,2-trifluoroethane	0	361	0	2.17	0	0	97.43	0.66	98	1.34	99	26.3	0.0955		152.93
90982324	Chlorimuron ethyl	0.115		0.00116	2.5		1200	77.46	1.81	0	98.19	99		0		414.82
101200480	Tribenuron methyl	0.008		0.0000144	2.55		280	77.72	1.92	0	98.08	99		0		395.39
111512562	1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
111984099	3,3'-Dimethoxybenzidine hydrochloride			0	1.81			46.15	2.77	0	97.23			0		
127564925	Dichloropentafluoropropane			0	3.14			99.51	3.34	95.61	1.05			0.502		
128903219	2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
136013791	1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-22			0	3.14			99.51	3.34	95.61	1.05			0.502		
N010	Antimony compounds	0	0	0	0	9	0	31.51	100	0	0	0	0.25	0		121.75
N020	Arsenic compounds	0	0	0	0	38	0	48.57	100	0	0	97.5	17	0		74.9
N040	Barium compounds	0	0	0	0	31	0	69.02	100	0	0	0	0	0		137.34
N050	Beryllium compounds	0	0	0	0	170	0	37.44	100	0	0	97.3	0	0		9.01
N078	Cadmium compounds	0	0	0	0	32	0	68.15	100	0	0	88.5	6000	0		112.4
N084	Chlorophenols	0	73	0	2.18	0	28500	72.87	6.53	1.86	91.6	99	0	0.0000083		128.56
N090	Chromium compounds	0	0	0	0	344	0	76.4	100	0	0	99	4000	0		52
N096	Cobalt compounds	0	0	0	0	10	0	32.06	100	0	0	0	4430	0		58.93
N100	Copper compounds	0	0	0	0	147	10000	72.47	100	0	0	99.9	14000	0		63.55
N106	Cyanide compounds	0	0	0	0	0	10000000	0	0	0	0	0	0	0.000122	0.2	0
N120	Diisocyanates															
N171	Ethylenebisdithiocarbamic acid, salts and esters				0											
N230	Glycol ethers	0	0	0	0	0	0	0	0	0	0	0	0	0		0
N420	Lead compounds	0	0	0	0	582	0	63.48	100	0	0	91.6	1250	0		207.19
N450	Manganese compounds	0	0	0	0	5	0	38.85	100	0	0	0	0	0		54.93
N458	Mercury compounds	0	0	0	0	4084	0	68.57	100	0	0	0	-25536	0.0085		200.59

CAS	Chemical	Air Decay	Koc	H2O Decay	LOGKow	Kd	Water Solubility	POTW Partition (Removal)	POTW Partition (Sludge)	POTW Partition (Volat)	POTW Partition (Biod)	Inciner-ator DRE	BCF	Henrys	MCL	Molecular Weight
N495	Nickel compounds	0	0	0	0	27	0	38.28	100	0	0	99	250	0		58.71
N503	Nicotine and salts			0												162.23
N511	Nitrate compounds			0											10	
N575	Polybrominated biphenyls (PBBs)	0.06	-28001	0.06	7.8	0	0.02	92	24	10	66	99	18200			628
N583	Polychlorinated alkanes			0												
N590	Polycyclic aromatic compounds														0	
N725	Selenium compounds	0	0	0	0	22	0	43.66	100	0	0	99.8	2000	0		78.96
N740	Silver compounds	0	0	0	0	539	0	66.47	100	0	0	0	25	0		107.87
N746	Strychnine and salts			0			156.2										334.4
N760	Thallium compounds	0	0	0	0	0	0	53.55	100	0	0	0	15	0		204.37
N874	Warfarin and salts	0	0	0	0	0	0	0	0	0	0	0	0	0		308.32
N982	Zinc compounds	0	0	0	0	31	0	66.15	100	0	0	99.9	12000	0		65.38

Exhibit D-2 Physicochemical Property References

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
50000	Formaldehyde	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
51036	Piperonyl butoxide	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
51218	Fluorouracil (5-fluorouracil)	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
51285	2,4-Dinitrophenol	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
51752	Nitrogen mustard	AOPWIN	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
51796	Urethane (Ethyl carbamate)	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
52686	2-Bromo-2-nitropropane-1,3-diol#(Bronopol)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
52857	Trichlorfon	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
53963	Famphur	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
55185	2-Acetylaminofluorene	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
55210	N-Nitrosodiethylamine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
55389	Benzamide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
55630	Fenthion	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
56235	Nitroglycerin	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
56359	Carbon tetrachloride	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
56382	Bis(tributyltin) oxide	AOPWIN					EFDB									AOPWIN
57147	Parathion	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
57330	1,1-Dimethyl hydrazine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
57410	Pentobarbital sodium	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		Merck
57578	Phenytoin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
57749	beta-Propiolactone	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
58899	Chlordane	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
59892	Lindane	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
60093	N-Nitrosomorpholine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
60117	4-Aminoazobenzene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
60344	4-Dimethylaminoazobenzene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
60355	Methyl hydrazine	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
60515	Acetamide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
61825	Dimethoate	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
62533	Amitrole	AOPWIN	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
62555	Aniline	AOPWIN; exp	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
62566	Thioacetamide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
62737	Thiourea	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
62748	Dichlorvos	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
62759	Sodium fluoroacetate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
63252	N-Nitrosodimethylamine	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
64186	Carbaryl	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
64675	Formic acid	AOPWIN; exp	Lyman, 4-8		EFDB		Merck; assump.	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
64755	Diethyl sulfate	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
	Tetracycline hydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		Merck
67561	Methanol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
67630	Isopropyl alcohol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
67663	Chloroform	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
67721	Hexachloroethane	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
68122	N,N-Dimethylformamide	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
68768	Triaziquone	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
70304	Hexachlorophene	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
71363	n-Butyl alcohol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
71432	Benzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
71556	1,1,1-Trichloroethane	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
72435	Methoxychlor	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
72571	Trypan blue		Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		Merck
74839	Bromomethane (Methyl bromide)	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
74851	Ethylene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
74873	Chloromethane	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
74884	Methyl iodide	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
74908	Hydrogen cyanide	AOPWIN; exp	313PROP		EFDB		313PROP						313PROP	EFDB		AOPWIN
74953	Methylene bromide	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
75003	Chloroethane (Ethyl chloride)	AOPWIN; exp	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
75014	Vinyl chloride	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
75058	Acetonitrile	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75070	Acetaldehyde	AOPWIN; exp	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75092	Dichloromethane	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	SUM	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
75150	Carbon disulfide	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75218	Ethylene oxide	AOPWIN; exp	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75252	Bromoform (Tribromomethane)	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
75274	Dichlorobromomethane	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
75343	Ethylidene dichloride	AOPWIN; exp	Lyman, 4-5	EFDB	EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
75354	Vinylidene chloride (1,1-dichloroethylene)	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
75434	Dichlorofluoromethane	AOPWIN; exp		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		EFDB
75445	Phosgene	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
75456	Chlorodifluoromethane (HCFC-22)	AOPWIN; exp		HYDRO				SUM	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
75558	Propyleneimine	AOPWIN	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
75569	Propylene oxide	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75638	Bromotrifluoromethane (Halon 1301)	AOPWIN	Lyman, 4-8		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
75650	tert-Butyl alcohol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
75683	1-Chloro-1,1-difluoroethane	AOPWIN; exp	Lyman, 4-5	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
75694	CFC-11 (trichlorofluoromethane)	AOPWIN	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
75718	CFC-12 (dichlorodifluoromethane)	AOPWIN	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
75729	Chlorotrifluoromethane	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
75865	2-Methyllactonitrile	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
75887	2-Chloro-1,1,1-trifluoroethane	AOPWIN; exp		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
76017	Pentachloroethane	AOPWIN	Lyman, 4-5	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
76028	Trichloroacetyl chloride	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
76062	Chloropicrin	AOPWIN			EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
76131	Freon 113	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assomp.	313PROP	EFDB		313PROP
76142	CFC 114 (1,2-dichloro,1,1,2,2-tetrafluoroethane)	AOPWIN	Lyman, 4-8		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
76153	CFC 115 (chloropentafluoroethane)	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
76448	Heptachlor	AOPWIN	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
76879	Triphenyltin hydroxide	AOPWIN					EFDB										Merck
77474	Hexachlorocyclopentadiene	AOPWIN	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
77736	Dicyclopentadiene	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
77781	Dimethyl sulfate	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
78488	S,S,S-tributyltrithiophosphate	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB			EFDB		AOPWIN
78842	Isobutyraldehyde	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
78875	1,2-Dichloropropane	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
78886	2,3-Dichloropropene	AOPWIN	Lyman, 4-5	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
78922	sec-Butyl alcohol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
78933	Methyl ethyl ketone	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
79005	1,1,2-Trichloroethane	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
79016	Trichloroethylene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
79061	Acrylamide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS; TTreq.	AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
79107	Acrylic acid	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
79118	Chloroacetic acid	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
79196	Thiosemicarbazide	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
79210	Peracetic acid	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
79221	Methyl chlorocarbonate	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
79345	1,1,2,2-Tetrachloroethane	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
79447	Dimethylcarbamyl chloride	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
79469	2-Nitropropane	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
80057	4,4'-Isopropylidenediphenol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
80159	Cumene hydroperoxide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
80626	Methyl methacrylate	AOPWIN; exp	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
81072	Saccharin (manufacturing)	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
81889	C.I. Food Red 15	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
82280	1-Amino-2-methyl-anthraquinone	AOPWIN	313PROP		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
82688	Quintozene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
84742	Dibutyl phthalate	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
85018	Phenanthrene	AOPWIN; exp			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
85449	Phthalic anhydride	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
86306	N-Nitrosodiphenylamine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
87627	2,6-Xylidine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
87683	Hexachloro-1,3-butadiene	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
87865	Pentachlorophenol	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
88062	2,4,6-Trichlorophenol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
88755	2-Nitrophenol	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
88857	Dinitrobutyl phenol (Dinoseb)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
88891	Picric acid	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
90040	o-Anisidine	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
90437	2-Phenylphenol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
90948	Michlers Ketone	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
91087	Toluene-2,6-diisocyanate	AOPWIN; exp	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		313PROP
91203	Naphthalene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
91225	Quinoline	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
91598	beta-Naphthylamine	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
91941	3,3'-Dichlorobenzidine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
92524	Biphenyl	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
92671	4-Aminodiphenyl	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
92875	Benzidine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
92933	4-Nitrobiphenyl	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
93652	Mecoprop	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
94111	2,4-D isopropyl ester	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
94360	Benzoyl peroxide	AOPWIN	Lyman, 4-5	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
94586	Dihydrosafrole	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
94597	Safrole	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
94746	Methoxone (MCPA)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
94757	2,4-D ((2,4-dichlorophenoxy)acetic acid)	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
94804	2,4-D butyl ester	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
94826	2,4-DB	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
95476	o-Xylene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
95487	o-Cresol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
95501	1,2-Dichlorobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
95534	o-Toluidine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
95545	1,2-Phenylenediamine	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
95636	1,2,4-Trimethylbenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
95692	p-Chloro-o-toluidine	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
95807	2,4-Diaminotoluene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
95954	2,4,5-Trichlorophenol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
96093	Styrene oxide	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
96128	1,2-Dibromo-3-chloropropane (DBCP)	AOPWIN; exp	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
96184	1,2,3-Trichloropropane	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
96333	Methyl acrylate	AOPWIN	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
96457	Ethylene thiourea	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
97234	Dichlorophene	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
97563	C.I. Solvent Yellow 3	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
98077	Benzotrichloride	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
98828	Cumene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
98862	Acetophenone	AOPWIN; exp	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
98873	Benzal chloride	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
98884	Benzoyl chloride	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
98953	Nitrobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
99309	Dichloran	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
99558	5-Nitro-o-toluidine	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		EFDB
99592	5-Nitro-o-anisidine	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
99650	m-Dinitrobenzene	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
100016	p-Nitroaniline	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
100027	4-Nitrophenol	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
100254	p-Dinitrobenzene	AOPWIN	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
100414	Ethylbenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
100425	Styrene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
100447	Benzyl chloride	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
100754	N-Nitrosopiperidine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
101053	Anilazine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
101144	4,4'-Methylenebis(2-chloroaniline)	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
101611	4,4'-Methylenebis(N,N-dimethylbenzenamine)	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
101688	Methylenebis(phenylisocyanate) (MDI)	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
101779	4,4'-Methylenedianiline	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
101804	4,4'-Diaminodiphenylether	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
101906	Diglycidyl resorcinol ether	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
104121	p-Chlorophenyl isocyanate	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
104949	p-Anisidine	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
105679	2,4-Dimethylphenol	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
106423	p-Xylene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
106445	p-Cresol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
106467	1,4-Dichlorobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
106478	p-Chloroaniline	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
106503	p-Phenylenediamine	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
106514	Quinone	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
106887	1,2-Butylene oxide	AOPWIN; exp	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
106898	Epichlorohydrin	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS; TTreq.	AOPWIN
106934	1,2-Dibromoethane	AOPWIN; exp	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
106990	1,3-Butadiene	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
107028	Acrolein	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
107051	Allyl chloride	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
107062	1,2-Dichloroethane	AOPWIN; exp	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
107119	Allylamine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
107131	Acrylonitrile	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
107186	Allyl alcohol	AOPWIN; exp	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
107197	Propargyl alcohol	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
107211	Ethylene glycol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
107302	Chloromethyl methyl ether	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
108054	Vinyl acetate	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
108101	Methyl isobutyl ketone	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
108316	Maleic anhydride	AOPWIN; exp	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
108383	m-Xylene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
108394	m-Cresol	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
108452	1,3-Phenylenediamine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
108601	Bis(2-chloro-1-methethyl)ether	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
108883	Toluene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
108907	Chlorobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
108930	Cyclohexanol	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
108952	Phenol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
109068	2-Methylpyridine	AOPWIN	Lyman, 4-8		EFDB		Merck; assump.	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
109773	Malonitrile	AOPWIN	Lyman, 4-5	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
109864	2-Methoxyethanol	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
110543	n-Hexane	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
110576	trans-1,4-Dichloro-2-butene	AOPWIN; ave		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
110805	2-Ethoxyethanol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
110827	Cyclohexane	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
110861	Pyridine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
111422	Diethanolamine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
111444	Bis(2-chloroethyl)ether	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
111911	Bis(2-chloroethoxy)methane	AOPWIN	Lyman, 4-5	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
114261	Propoxur	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
115071	Propylene (Propene)	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
115286	Chlorendic acid	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
115322	Dicofol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
116063	Aldicarb	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
117793	2-Aminoanthraquinone	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
117817	Di(2-ethylhexyl) phthalate	AOPWIN	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
118741	Hexachlorobenzene	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
119904	3,3'-Dimethoxybenzidine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
119937	3,3'-Dimethylbenzidine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
120127	Anthracene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
120365	2,4-DP (Dichlorprop)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
120581	Isosafrole	AOPWIN; ave	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
120718	p-Cresidine	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
120809	Catechol	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
120821	1,2,4-Trichlorobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
120832	2,4-Dichlorophenol	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
121142	2,4-Dinitrotoluene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
121448	Triethylamine	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
121697	N,N-Dimethylaniline	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
121755	Malathion	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
122349	Simazine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
122394	Diphenylamine	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
122667	1,2-Diphenylhydrazine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
123319	Hydroquinone	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
123386	Propionaldehyde	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
123637	Paraldehyde	AOPWIN					Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		Merck
123728	Butyraldehyde	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
123911	Dioxane	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
124403	Dimethylamine	AOPWIN; exp			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
124732	1,2-Dibromotetrafluoroethane	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
126727	Tris(2,3-dibromopropyl)phosphate	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
126987	Methacrylonitrile	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
126998	Chloroprene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
127184	Tetrachloroethylene (Perchloroethylene)	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
128030	Potassium dimethyldithiocarbamate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
128041	Sodium dimethyldithiocarbamate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
128665	C.I. Vat Yellow 4	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
131113	Dimethyl phthalate	AOPWIN	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
131522	Sodium pentachlorophenate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
132274	Sodium o-phenylphenoxide	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
132649	Dibenzofuran	AOPWIN; exp	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
133062	Captan	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
133073	Folpet	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
133904	Chloramben	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
134292	o-Anisidine hydrochloride	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
134327	alpha-Naphthylamine	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
135206	Cupferron	AOPWIN	Lyman, 4-8		EFDB		Merck; assump.	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
136458	Dipropyl isocinchomeronate	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
137268	Thiram	AOPWIN	Lyman, 4-5	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
137417	Potassium N-methyldithiocarbamate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
137428	Metham sodium	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
138932	Disodium cyanodithioimidocarbonate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
139139	Nitrilotriacetic acid	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
139651	4,4'-Thiodianiline	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
140885	Ethyl acrylate	AOPWIN; exp	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
141322	Butyl acrylate	AOPWIN	313PROP	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
142596	Nabam	AOPWIN		EFDB	EFDB		EFDB					Assump.		EFDB		AOPWIN
148798	Thiabendazole	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
149304	2-Mercaptobenzothiazole	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
150505	Merphos	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
150685	Monuron	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
151564	Ethyleneimine (Aziridine)	AOPWIN; exp	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
156105	p-Nitrosodiphenylamine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
156627	Calcium cyanamide	AOPWIN	Lyman, 4-8		EFDB		Merck									Merck
298000	Methyl parathion	AOPWIN		EFDB	EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
300765	Naled	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
301122	Oxydemeton methyl	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
302012	Hydrazine	AOPWIN	Lyman, 4-8				313PROP						313PROP			AOPWIN
306832	2,2-Dichloro-1,1,1-trifluoroethane	AOPWIN; exp	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
309002	Aldrin	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
314409	Bromacil	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
319846	alpha-Hexachlorocyclohexane	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
330541	Diuron	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
330552	Linuron	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
333415	Diazinon	AOPWIN		EFDB	EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
334883	Diazomethane	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
353593	Bromochlorodifluoromethane	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
354110	1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
354143	1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
354234	1,2-Dichloro-1,1,2-trifluoroethane	AOPWIN; exp	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
354256	1-Chloro-1,1,2,2-tetrafluoroethane	AOPWIN	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
357573	Brucine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
422446	1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
422480	2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)			EFDB				RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN, isom.
422560	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
431867	1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)			EFDB				RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN, isom.
460355	3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
463581	Carbonyl sulfide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
465736	Isodrin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
492808	Auramine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
505602	Mustard gas	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
507551	1,3-Dichloro-1,1,2,2,3-pentafluoropropane	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
510156	Chlorobenzilate	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
528290	o-Dinitrobenzene	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
532274	2-Chloroacetophenone	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
533744	Dazomet	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
534521	4,6-Dinitro-o-cresol	AOPWIN	Lyman, 4-5		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
540590	1,2-Dichloroethylene	AOPWIN; ave	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	313PROP
541413	Ethyl chloroformate	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
541537	2,4-Dithiobiuret	AOPWIN		EFDB	EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
541731	1,3-Dichlorobenzene	AOPWIN; exp	313PROP		EFDB		313PROP	SUM	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
542756	1,3-Dichloropropylene	AOPWIN; ave	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
542767	3-Chloropropionitrile	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
542881	Bis(chloromethyl)ether	AOPWIN	Lyman, 4-5	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
554132	Lithium carbonate	AOPWIN														Merck
556616	Methyl isothiocyanate	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
563473	3-Chloro-2-methyl-1-propene	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
569642	C.I. Basic Green 4	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
576261	2,6-Dimethylphenol	AOPWIN; exp			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
584849	Toluene-2,4-diisocyanate	AOPWIN; exp	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		313PROP
593602	Vinyl bromide	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
594423	Perchloromethyl mercaptan	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
606202	2,6-Dinitrotoluene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
612828	3,3'-Dimethylbenzidine dihydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
612839	3,3'-Dichlorobenzidine dihydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
615054	2,4-Diaminoanisole	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
615281	1,2-Phenylenediamine dihydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
621647	N-Nitrosodi-n-propylamine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
624180	1,4-Phenylenediamine dihydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
624839	Methyl isocyanate	AOPWIN	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		313PROP
630206	1,1,1,2-Tetrachloroethane	AOPWIN; exp	Lyman, 4-5	HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
636215	o-Toluidine hydrochloride	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		313PROP
639587	Triphenyltin chloride	AOPWIN															AOPWIN
680319	Hexamethylphosphoramide	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
684935	N-Nitroso-N-methylurea	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
709988	Propanil	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
759739	N-Nitroso-N-ethylurea	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
759944	Ethyl dipropylthiocarbamate	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
764410	1,4-Dichloro-2-butene	AOPWIN*	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
812044	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)		Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN, isom.
834128	Ametryn	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
842079	C.I. Solvent Yellow 14	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
872504	N-methyl-2-pyrrolidone	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
924163	N-Nitrosodi-n-butylamine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
924425	N-methylolacrylamide	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
957517	Diphenamid	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
961115	Tetrachlorvinphos	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
989388	C.I. Basic Red 1	AOPWIN	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
1114712	Pebulate	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1120714	Propane sultone	AOPWIN	313PROP	EFDB	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
1134232	Cycloate	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1163195	Decabromodiphenyl ether	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1313275	Molybdenum trioxide						Merck										Merck
1314201	Thorium dioxide						Merck										Merck
1319773	Cresol (mixed isomers)	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
1320189	2,4-D, propylene glycol butylether ester	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1330207	Xylene (mixed isomers)	AOPWIN	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB	NPDWS	AOPWIN
1332214	Asbestos (friable)															NPDWS; fpl	Merck; est.
1335871	Hexachloronaphthalene	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
1336363	Polychlorinated biphenyls (PCBs)	AOPWIN; exp	Lyman, 4-5		EFDB			RREL	EFDB	EFDB	EFDB	By law	Lyman, 5-2	EFDB	NPDWS	Merck; calc.
1344281	Aluminum oxide (fibrous forms)	AOPWIN															AOPWIN
1464535	Diepoxybutane	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
1563662	Carbofuran	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	Merck
1582098	Trifluralin	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
1634044	Methyl tert-butyl ether	AOPWIN; exp	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
1649087	1,2-Dichloro-1,1-difluoroethane	AOPWIN; exp		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1689845	Bromoxynil	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1689992	Bromoxynil octanoate	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1717006	1,1-Dichloro-1-fluoroethane	AOPWIN; exp	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
1836755	Nitrofen	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
1861401	Benfluralin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1897456	Chlorothalonil	AOPWIN	313PROP		EFDB		313PROP	SUM	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
1910425	Paraquat dichloride	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1912249	Atrazine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
1918009	Dicamba	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1918021	Picloram	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
1918167	Propachlor	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1928434	2,4-D 2-ethylhexyl ester	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1929733	2,4-D butoxyethyl ester	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1929824	Nitrapyrin	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1937377	C.I. Direct Black 38	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		EFDB
1982690	Sodium dicamba	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
1983104	Tributyltin fluoride	AOPWIN															AOPWIN
2032657	Methiocarb	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2155706	Tributyltin methacrylate	AOPWIN															AOPWIN
2164070	Dipotassium endothall	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2164172	Fluometuron	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
2212671	Molinate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2234131	Octachloronaphthalene	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
2300665	Dimethylamine dicamba	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2303164	Diallate	AOPWIN	313PROP		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
2303175	Triallate	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2312358	Propargite	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2439012	Chinomethionat (6-methyl-1,3-dithiolo[4,5-b]quinoxalin-2-one)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2439103	Dodine	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2524030	Dimethyl chlorothiophosphate	AOPWIN; exp		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2602462	C.I. Direct Blue 6	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
2655154	2,3,5-trimethylphenyl methylcarbamate	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2699798	Sulfuryl fluoride (Vikane)	AOPWIN											Assump.				Merck
2702729	2,4-D sodium salt	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
2832408	C.I. Disperse Yellow 3	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
2837890	2-Chloro-1,1,1,2-tetrafluoroethane	AOPWIN; exp	Lyman, 4-8	HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
2971382	2,4-D chlorocrotyl ester	AOPWIN; ave		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
3118976	C.I. Solvent Orange 7	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
3383968	Temephos	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
3653483	Methoxone sodium salt	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
3761533	C.I. Food Red 5	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
4080313	1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	AOPWIN; ave			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
4170303	Crotonaldehyde	AOPWIN; exp			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
4549400	N-Nitrosomethylvinylamine	AOPWIN	313PROP		EFDB		EFDB	SUM	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		AOPWIN
4680788	C.I. Acid Green 3	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
5234684	Carboxin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
5598130	Chlorpyrifos methyl	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
5902512	Terbacil	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
6459945	C.I. Acid Red 114	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
6484522	Ammonium Nitrate	AOPWIN					Merck					Assump.				AOPWIN
7287196	Prometryn	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
7429905	Aluminum (fume or dust)	AOPWIN				Bodek		RREL	Assump.	Assump.	Assump.		EPA, 88a			Merck
7439921	Lead	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7439965	Manganese					Gerritse		RREL	Assump.	Assump.	Assump.					Merck
7439976	Mercury	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.		Bodek		NPDWS	Merck
7440020	Nickel	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7440224	Silver					Gerritse		RREL	Assump.	Assump.	Assump.		EPA, 87			Merck
7440280	Thallium							RREL	Assump.	Assump.	Assump.		TetraTech		NPDWS	Merck
7440360	Antimony	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.		EPA, 88b		NPDWS	Merck
7440382	Arsenic	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7440393	Barium					Gerritse		RREL	Assump.	Assump.	Assump.				NPDWS	Merck
7440417	Beryllium	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7440439	Cadmium	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	AOPWIN
7440473	Chromium					Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7440484	Cobalt					Gerritse		RREL	Assump.	Assump.	Assump.		Jorg			Merck
7440508	Copper	AOPWIN				Gerritse	?????	RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7440622	Vanadium (fume or dust)					Gerritse		RREL	Assump.	Assump.	Assump.					Merck
7440666	Zinc (fume or dust)	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92				Merck
7550450	Titanium tetrachloride															Merck
7632000	Sodium nitrite	AOPWIN														AOPWIN
7637072	Boron trifluoride	AOPWIN														Merck
7647010	Hydrochloric acid	AOPWIN		HYDRO												AOPWIN
7664382	Phosphoric acid	AOPWIN														AOPWIN
7664393	Hydrogen fluoride						Merck; assump.									Merck
7664417	Ammonia	AOPWIN			RREL		Merck; T20	RREL						Morel, 83		Merck
7664939	Sulfuric acid	AOPWIN					Merck; assump.									AOPWIN
7696120	Tetramethrin	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
7697372	Nitric acid	AOPWIN					Merck; assump.									AOPWIN
7723140	Phosphorus (yellow or white)	AOPWIN					Merck	RREL	Assump.	Assump.	Assump.					Merck
7726956	Bromine	AOPWIN		HYDRO			Merck; T25									Merck
7758012	Potassium bromate	AOPWIN														Merck

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
7782414	Fluorine	AOPWIN		HYDRO											NPDWS	AOPWIN
7782492	Selenium	AOPWIN				Gerritse		RREL	Assump.	Assump.	Assump.	EPA, 92			NPDWS	Merck
7782505	Chlorine	AOPWIN		HYDRO			Merck									AOPWIN
7783202	Ammonium sulfate	AOPWIN					Merck									Merck
7786347	Mevinphos	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
7803512	Phosphine	AOPWIN					Merck									AOPWIN
8001352	Toxaphene	AOPWIN	313PROP	HYDRO	EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB	NPDWS	AOPWIN
8001589	Creosote, coal tar						Merck					Assump.				
9006422	Metiram	AOPWIN										Assump.				AOPWIN
10028156	Ozone	AOPWIN														AOPWIN
10034932	Hydrazine sulfate	AOPWIN					Merck									AOPWIN
10049044	Chlorine dioxide	AOPWIN														AOPWIN
10061026	trans-1,3-Dichloropropene	AOPWIN; ave		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
10294345	Boron trichloride	AOPWIN														Merck
10453868	Resmethrin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
12122677	Zineb	AOPWIN	313PROP	EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
12427382	Maneb	AOPWIN	313PROP		EFDB		One Liner					Assump.		EFDB		EFDB
13194484	Ethoprop	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
13356086	Fenbutatin oxide (Vendex)	AOPWIN					Merck									AOPWIN
13463406	Iron pentacarbonyl											Assump.				Merck
13474889	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
13684565	Desmedipham	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
14484641	Ferbam (Tris(dimethylcarbamodithioato-S,S')iron)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
15972608	Alachlor	AOPWIN			EFDB		Merck	RREL	EFDB	EFDB	EFDB	Assump.		EFDB	NPDWS	AOPWIN
16071866	C.I. Direct Brown 95	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
16543558	Nitrosonornicotine	AOPWIN	313PROP		EFDB		313PROP	RREL	EFDB	EFDB	EFDB	Assump.	313PROP	EFDB		313PROP
17804352	Benomyl	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
19044883	Oryzalin (4-(dipropylamino)-3,5-dinitrobenzenesulfonamide)	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
19666309	Oxydiazon	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
20325400	3,3'-Dimethoxybenzidine dihydrochloride	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
20354261	Methazole	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
20816120	Osmium tetroxide						Merck									Merck
20859738	Aluminum phosphide	AOPWIN														AOPWIN
21087649	Metribuzin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
21725462	Cyanazine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
22781233	Bendiocarb	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
23564058	Thiophanate-methyl	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
23564069	Thiophanate ethyl	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
23950585	Pronamide	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
25311711	Isofenphos	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
25321146	Dinitrotoluene (mixed isomers)	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
25321226	Dichlorobenzene (mixed isomers)	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
25376458	Diaminotoluene (mixed isomers)	AOPWIN	Lyman, 4-5		EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
26002802	Phenothrin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
26471625	Toluenediisocyanate	AOPWIN; exp	Lyman, 4-8	EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN
26628228	Sodium azide	AOPWIN										Assump.				AOPWIN
26644462	Triforine	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
27314132	Norflurazon	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
28057489	D-trans-allethrin (D-trans-chrysanthemic acid of D-allethrone)				EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		
28249776	Thiobencarb	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
28407376	C.I. Direct Blue 218	AOPWIN										Assump.				AOPWIN
29232937	Pirimiphos methyl	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
30560191	Acephate	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
31218834	Propetamphos	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
33089611	Amitraz	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
34014181	Tebuthiuron	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
34077877	Dichlorotrifluoroethane		Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN, isom.
35367385	Diflubenzuron	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
35400432	Sulprofos	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
35554440	Imazalil	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
35691657	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
38727558	Diethatyl ethyl	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
39156417	2,4-Diaminoanisole sulfate	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
39300453	Dinocap	AOPWIN; ave		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
39515418	Fenpropathrin	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
40487421	Pendimethalin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
41198087	Profenofos	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
41766750	3,3'-Dimethylbenzidine dihydrofluoride				EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		
42874033	Oxyfluorfen	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
43121433	Triadimefon	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
50471448	Vinclozolin	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
51235042	Hexazinone	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
51338273	Diclofop methyl	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
51630581	Fenvalerate	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
52645531	Permethrin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
53404196	Bromacil lithium salt				EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		
53404378	2,4-D 2-ethyl-4-methylpentyl ester				EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		
53404607	Dazomet, sodium salt				EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
55290647	Dimethipin	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
55406536	3-Iodo-2-propynyl butylcarbamate	AOPWIN		EFDB	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
57213691	Triclopyr triethylammonium salt	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
59669260	Thiodicarb	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
60168889	Fenarimol	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
60207901	Propiconazole	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
62476599	Acifluorfen, sodium salt	AOPWIN			EFDB		EFDB	SUM	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
63938103	Chlorotetrafluoroethane	AOPWIN	Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		EFDB
64902723	Chlorsulfuron	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
64969342	3,3'-Dichlorobenzidine sulfate	AOPWIN			EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
66441234	Fenoxaprop ethyl	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
67485294	Hydramethylnon	AOPWIN; ave			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
68085858	Cyhalothrin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
68359375	Cyfluthrin	AOPWIN		HYDRO	EFDB		Merck; T20	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
69409945	Fluvalinate	AOPWIN		HYDRO	EFDB		Merck; T25	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
69806504	Fluazifop butyl	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
71751412	Abamectin				EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		Merck; calc.
72178020	Fomesafen	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
72490018	Fenoxycarb	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
74051802	Sethoxydim	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
76578148	Quizalofop-ethyl	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
77501634	Lactofen	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
82657043	Bifenthrin	AOPWIN		HYDRO	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
88671890	Myclobutanil	AOPWIN			EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
90454185	Dichloro-1,1,2-trifluoroethane		Lyman, 4-8		EFDB			RREL	EFDB	EFDB	EFDB	Assump.	Lyman, 5-2	EFDB		AOPWIN, isom.
90982324	Chlorimuron ethyl	AOPWIN		EFDB	EFDB		EFDB	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
101200480	Tribenuron methyl	AOPWIN		HYDRO	EFDB		FCH	RREL	EFDB	EFDB	EFDB	Assump.		EFDB		FCH; calc
111512562	1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
111984099	3,3'-Dimethoxybenzidine hydrochloride				EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		
127564925	Dichloropentafluoropropane				EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN, isom.
128903219	2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
136013791	1,3-Dichloro-1,1,2,2,3,3-pentafluoropropane (HCFC-225ea)	AOPWIN		HYDRO	EFDB			RREL	EFDB	EFDB	EFDB	Assump.		EFDB		AOPWIN
N010	Antimony compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.		EPA, 88b; el			
N020	Arsenic compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N040	Barium compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.					
N050	Beryllium compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				

CAS	Chemical	Air Decay	Koc	H2O Decay	LOG Kow	Kd	Water Sol.	POTW Rem.	POTW sludge	POTW Volat	POTW Bio	Incin. DRE	BCF	Henry's Law	MCL	MW
N078	Cadmium compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N084	Chlorophenols		Mabey; 2-chl		Mabey; 2-chl		Mabey; 2-chl	POTW; est	POTW; est	POTW; est	POTW; est	Assump.		Hine		
N090	Chromium compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N096	Cobalt compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.		Jorg; el			
N100	Copper compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N106	Cyanide compounds						Merck; inf							EFDB; HCN	NPDWS	
N120	Diisocyanates															
N171	Ethylenebisdithiocarbamic acid, salts and esters (EBDCs)											Assump.				
N230	Glycol ethers											Assump.				
N420	Lead compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N450	Manganese compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.					
N458	Mercury compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.					
N495	Nickel compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				
N503	Nicotine and salts											Assump.				Merck
N511	Nitrate compounds (water dissociable)														NPDWS	
N575	Polybrominated biphenyls (PBBs)	?	Lyman, 4-5	?	?							Assump.				
N583	Polychlorinated alkanes											Assump.				
N590	Polycyclic aromatic compounds											Assump.			NPDWS	
N725	Selenium compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				Merck; el
N740	Silver compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.		EPA, 87; el			Merck; el
N746	Strychnine and salts						Merck					Assump.				Merck
N760	Thallium compounds							RREL; el	Assump.	Assump.	Assump.		TetraTech; el			Merck; el
N874	Warfarin and salts											Assump.				Merck
N982	Zinc compounds					Gerritse; el		RREL; el	Assump.	Assump.	Assump.	EPA, 92; el				Merck; el

References:

313PROP   dBase file provided by David Lynch of the Exposure Assessment Branch; Economics, Exposure, and Technology Division; Office of Pollution Prevention and Toxics, 4/17/89.

AOPWIN   Atmospheric Oxidation Program, Syracuse Research Corp. 1988-97. Syracuse, NY.

AOPWIN; ave   AOPWIN provided calculations for two isomers; an arithmetic average of the two was used.

AOPWIN; exp   Experimental data (instead of estimated data) in AOPWIN used.

AOPWIN, isom. Molecular weight of isomer from AOPWIN used.

Assump.   The following assumptions were made:

        For Incinerator DRE value, assumed the typical municipal waste combustor destruction/removal efficiency for organics is 99 percent.

        For the POTW Partition (Sludge) value, it is assumed that all metals and metal compounds partition 100 percent to sludge.

Bodek   Bodek, I., W.J. Lyman, W.F. Reehl, and D.H. Rosenblatt. 1988. Environmental Inorganic Chemistry. Pergamon Press. New York. The Kd value for aluminum is based on Langmuir isotherm data.

by law   PCBs are assumed to have an Incinerator DRE of 99.9999 percent, as required by TSCA regulation.

calc   For most inorganic compounds, it was assumed that 100 percent of the compound that was removed by the POTW partitioned to sludge.

EFDB   Syracuse Research Corporation. 1995. Environmental Fate Data Base. Syracuse, NY.

EFDB, est.   See above reference; molecular weight calculated based on molecular formula given.

EFDB; HCN   See above reference; hydrogen cyanide used as a surrogate.

el   Classes of inorganic compounds are assumed to behave like the elemental inorganic compound.

EPA, 87   U.S. EPA. 1987. Ambient Aquatic Life Water Quality Criteria for Silver. Draft. Environmental Research Laboratories, Duluth, MN and Narragansett, RI. Sept.

EPA, 88a   U.S. EPA, 1988. Ambient Water Quality Criteria for Aluminum. 1988. EPA 440/5-86-008. August.

EPA, 88b   U.S. EPA. 1988. Ambient Aquatic Life Water Quality Criteria for Antimony (III). Draft. Environmental Research Laboratories, Duluth, MN and Narragansett, RI. Aug.

EPA, 92   U.S. EPA. 1992. Human Health Risk Assessment for the Use and Disposal of Sewage Sludge: Benefits of Regulation. Ppd by Abt Associates for the U.S. EPA Office of Water.

est   Molecular weight calculated based on molecular formula given.

FCH   Sine, C. (ed.). 1992. Farm Chemicals Handbook. Meister Publishing Company.

FCH; calc   Molecular weight calculated based on formula given in above reference.

Gerritse   Gerritse, R.G., R. Vriesema, J.W. Dalenberg, and H.P. De Roos. 1982. Effect of Sewage Sludge on Trace Element Mobility in Soils. J. Environ. Qual. 11(3):359-364.

        Kd values measured in column studies for sand with an foc of 0.0355, a CEC of 0.22 meq/g, zero clay content, and a solution pH of 5.

Hine   Hine, J. and P.K. Mookerjee. 1975. The Intrinsic Hydrophilic Character of Organic Compounds. Correlations in Terms of Structural Contributions. J. Org. Chem. 40(3):292-298. KH estimated based on method presented.

HYDRO   HYDRO program, Syracuse Research Corp., 1991-97. Syracuse, NY.

Jorg   Jorgensen, S.E. and I. Johnsen. 1981. Principles of Environmental Science and Technology. Elsevier, NY.

Lyman, 4-5   Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt. 1990. Handbook of Chemical Property Estimation Methods. American Chemical Society. Washington, D.C. Eq'n 4-5 used to estimate Koc.

Lyman, 4-8   See above reference; Equation 4-8 used to estimate Koc.

Lyman, 5-2   See above reference; Equation 5-2 used to estimate Koc.

Mabey; 2-chl   Mabey, W.R., J.H. Smith, R.T. Podoll, H.L. Johnson, T. Mill, T.-W. Chou, J. Gates, I.W. Partridge, H. Jaber, and D. Vandenberg. 1982. Aquatic Fate Process Data for Organic Priority Pollutants, Chapter 4, EPA Report No. 440/4-81-014. Properties of 2-chlorophenol, a priority pollutant, were used.

Merck   Budavari, S. (ed.). 1989. The Merck Index. Merck & Co., Inc. Rahway, NJ.

Merck; assump. Assumed value based on text in Merck Index.

Merck; calc   Molecular weight calculated based on information presented in Merck Index.

Merck, est.   Molecular weight for asbestos calculated from molecular formula for chrysotile in Merck Index.

Merck; T20   Water solubility calculated at 20 degrees Celsius; from the Merck Index.

Merck; T25   Water solubility calculated at 25 degrees Celsius; from the Merck Index.

Merck; inf   Chemical is infinitely soluble in water; from the Merck Index.

Morel, 83   Morel, Francois M.M. 1983. Principles of Aquatic Chemistry. John Wiley & Sons, Inc. New York. The Henry's Law Constant for ammonia is estimated

	from stability constants.
NPDWS	MCLs taken from the National Primary Drinking Water Standards (USEPA, 1994).
NPDWS; fpl	MCL for asbestos is expressed in million fibers/liter; does not affect model results because MCL is not modeled.
NPDWS; TTreq.	No MCL in place; instead, a treatment technique is required.
One Liner	EFGWB One Liner Database, USEPA, Office of Pesticide Programs, Environmental Fate and Effects Division, Environmental Fate and Groundwater Branch.
POTW; est	POTW removal efficiencies and partitioning percentages were estimated based on averages derived for classes of KH and Kow values.
RREL	RREL Treatability Database, Version 5.0. Risk Reduction Engineering Laboratory. U.S. EPA. Cincinnati, OH.
SUM	POTW removal efficiencies were obtained by summing the three POTW partition values.
Tetra Tech	Tetra Tech. 1985. Bioaccumulation Monitoring Guidance: 1.1 Estimating the Potential for Bioaccumulation of Priority Pollutants and 301(h) Pesticides Discharged into Marine and Estuarine Waters. Final Report. Office of Marine and Estuary Protection, U.S. EPA.

APPENDIX E. ADDITIONAL INFORMATION ON GRAPHING CAPABILITIES

You may wish to use the extensive graphing capabilities of the Indicators model. All plot types available in the Indicators model are discussed below.

Plot Types

The following descriptions of graph types are available in First Impression Help (an online help file used for the graphing options available in the Indicators model):

Line Charts	Use line charts to show trends or changes in data over a period of time. These charts emphasize time flow and rate of change rather than amount of change. In 2-D line charts, values are plotted along the vertical (Y) axis and categories are displayed on the horizontal (X) axis. In 3-D charts, values are plotted on the vertical (Y) axis, categories are grouped along the horizontal (X) axis, and the depth (Z) axis shows series.
Bar Charts	Use these to compare one item to another, or to compare a number of items over a period of time. The charts show changes from one category to another. Each 2-D or 3-D bar represents a value in the data grid. Bars representing a series are located at the same position within each category and have the same color and pattern. In 2-D charts, values are grouped on the vertical (Y) axis, and bars are grouped by category along the horizontal (X) axis. On 3-D charts, values are plotted on the vertical (Y) axis, categories are grouped along the horizontal (X) axis, and the depth (Z) axis shows series.
Horizontal Bar Charts	Horizontal bars are similar to standard bar charts except that the categories are organized on a vertical (Y) axis and the values are plotted on a horizontal (X) axis.
Clustered Bar Charts	Series and data points in a clustered bar chart are displayed as they are in a 2-D bar chart; however, the chart and all the chart elements are displayed in 3-D.
Step Charts	Use step charts to compare items that do not show trends. Step charts display distinct points along the value (Y) axis, with vertical lines showing the difference between each point. The horizontal (X) axis shows categories.
Combination Charts	Use combination charts to visually highlight the differences between multiple series of data. A different method can be used to draw each data series.

Pie and Doughnut Charts   Use pie or doughnut charts to show the relationship of parts to the whole. Each pie or doughnut represents a category. Each slice of the pie or doughnut represents a value in that category. You can separate or explode slices in a chart by clicking a slice and dragging it away from the rest of the pie or doughnut.

Area Charts   Use area charts to emphasize the relative importance of values over a period of time. An area chart focuses on the magnitude of change rather than the rate of change. Each filled area on the chart represents a series and is identified by a different color or pattern. Values are plotted on the vertical (Y) axis and categories are plotted on the horizontal (X) axis. You can also chart one or more series against the secondary Y axis instead of the primary axis.

Formatting the Plot

The following discussion describes in detail the options available for formatting your graph. This discussion expands on the information included in Chapter 8. Each option listed at the far left below refers to an option on the menu which can be activated by clicking the right mouse button while in the **Graphs** screen. The descriptions under each option indicate the additional screens and options which can be activated by each menu option.

General...   This option allows you to change options for the entire chart (including plot area, title, axes, and legend). Two screens are embedded in the **Format Chart** screen which appears by clicking on **General...**. You can view these screens and options on these screens by clicking on the following tabs on the **Format Chart** screen:

    Options   By clicking this tab, you can make choices about the display of legends and titles and whether to redisplay chart options to their default values.

    Backdrop   Clicking this tab allows you to change the appearance of the background for the full chart area.

Plot...   This option allows you to change the format of the plot area. Clicking on this option brings up eight tabs shown on the **Format Plot** screen. The tabs are:

    Type   By clicking this tab, you can change the type of plot you use to graph your data. (There are additional options for graphing your data using this tab compared with using the pull-down menu described above. However, you may wish to concentrate on using the choices in the pull-down menu, which have been selected specifically for graphing results of the Indicators model.)

    Location   By clicking on this tab, you can change where your plot appears on the screen.

Backdrop Options associated with this tab allow you to change the appearance of the background of the plot area (including the grid area and axes.)

Order Use this tab to change the order of the data series contained in the plot.

Options This tab allows you to change items including bar spacing (for bar charts), chart direction (for pie and doughnut charts), and chart elements (for pie and doughnut charts).

3D View Use this tab to change the rotation, elevation, viewing distance and other features of three-dimensional graphs.

3D Lighting Use this tab to change the amount and type of light used to illuminate a three-dimensional plot.

Base and Walls Use this tab to change the appearance of the base and walls of three-dimensional plots, and the wall (the grid area) of two-dimensional charts.

Series This option allows you to change the appearance and labels on data series and data points. Clicking on this option brings up four additional menu options. You can click on any of the following options, and tabs will appear with a variety of options for formatting your data:

Series... Use this option to format a series of data. You can also indicate several statistics (minimum and maximum values, the mean, standard deviation, and a regression trend line of your series) on your graph.

Label... Click on this option to specify and format a label for a series. This option cannot be used for bar graphs, combination graphs, pie charts or doughnut charts.

Data Point... Use this option to select the appearance of data points within data series.

Data Point Label... Use this option to include a label for your data point and to select the appearance of your label.

NOTE: The items that are called data series and data points are determined by the layout of your original data table. If your table includes the year as column variable and chemicals as row variables, the range of chemical scores for a given year is called a series in your graph; each individual chemical score within that year is a data point.

Axis   With this option, you can change the appearance of axes, axis labels and axis titles. Clicking on this option brings up the following three additional menu options. You can click on any of the following options, and tabs will appear with a variety of options for formatting your data:

   Axis... With this option, you can change the appearance of grid lines, the scale of your chart (including values and number of divisions on the axis) and axis ticks that mark the scale of your graph.

   Labels...   Use this option to control the background appearance, text alignment and orientation and font of your label, and the format of a numerical label.

   Title...   Use this option to change the display of the axis title.

Legend...   You can format the chart legend using the following tabs on the screen which appears by clicking this menu option:

   Backdrop   This tab allows you to change the appearance of the background of your legend.

   Font   This tab allows you to change the legend font.

   Location   Use this tab to change the placement of your legend.

Title...   Use this option to bring up the following tabs to format your chart title:

   Backdrop   This tab allows you to change the background appearance.

   Text   This option allows you to change the alignment, orientation, and content of the title.

   Font   This tab allows you to change the font of the chart title.

   Location   Use this tab to change the placement of the chart title.

Footnote...   You can format the chart footnote using the following tabs:

   Backdrop   This tab allows you to change the background appearance.

   Text   This option allows you to change the alignment, orientation, and content of the footnote.

   Font   This tab allows you to change the font of the footnote.

   Location   Use this tab to change the placement of the footnote.

NOTE: The information initially contained in the footnote includes the source of the graph (i.e., from the Indicators model version 1.02), filename of the graph, file date, whether the data were subsetted, and the model used (e.g., full model, pounds.)

APPENDIX F. GLOSSARY OF TERMS COMMONLY USED IN THE INDICATORS METHODOLOGY AND THE INDICATORS MODEL

Chronic Human Health Indicator: This is the only Indicator that is operating in the current version of the Indicators model; future versions of the model will address ecological effects and acute effects. This Indicator addresses both chronic effects and chronic exposures related to human health. Chronic effects are those that generally persist over a long period of time whether or not they occur immediately after exposure or are delayed. Chronic exposure refers to multiple exposures occurring over an extended period of time, or a significant fraction of an individual's lifetime.

exposed population: The exposed population is the population that is likely to come in contact with a chemical. The population differs depending on the exposure pathway modeled. For instance, the population exposed to chemicals released to groundwater is the population that obtains their drinking water from groundwater sources, whereas the population exposed to chemicals that are released to air are those within a 21-km by 21-km grid surrounding the facility.

exposure pathway: The exposure pathway is the physical course that a chemical takes from the chemical source to the exposed individual and is related to the type of release. Pathways modeled by the Indicator include air from a facility stack, fugitive air releases, air emitted from a larger area (e.g., an outdoor disposal site), surface water, and groundwater.

exposure route: The exposure route is the way a chemical enters an individual after contact. The Indicators model considers exposure by ingestion and inhalation, but does not address dermal absorption.

Indicator Element (also called Score in the Indicators model): This score is calculated by multiplying the toxicity weight by the surrogate dose by the exposed population for a given facility, a given chemical, and a given environmental medium (i.e., exposure pathway).

Indicator Value: This value is calculated by summing some or all Indicator Elements for one or more years of reported chemical releases and transfers.

normalization: In the Indicators model, it is possible to express the Indicator Values, Subindicator Values, and Indicator Elements normalized to some base value. For example, national normalization divides the Indicator Value by the sum of all Indicator Elements for all facilities in the base year of 1988 and multiplies by 100,000 for ease of analysis. Reported TRI pounds cannot be normalized.

Subindicator Value: This value is similar to the Indicator Value but is calculated using a subset of Indicator Elements. For example, a Subindicator may be calculated by summing all facility and media-specific scores for one given chemical.

surrogate dose: This chemical-, media-, and facility-specific dose to an individual is calculated in several steps. First, exposure pathway-specific chemical release volumes are combined with physicochemical properties and site-specific characteristics in models to estimate an ambient concentration in the environmental medium of concern. The ambient media concentration is then combined with standard human exposure assumptions (for adults) to estimate the magnitude of the dose.

toxicity weight: This weight is a proportional numerical weight applied to a chemical based on its toxicity. The toxicity of a chemical is assessed using EPA-established standard methodologies. For each exposure route, chemicals are weighted based on their single, most sensitive adverse chronic human health effect (cancer or the most sensitive noncancer effect). The range of toxicity weights differs depending on whether the chemical is a carcinogen or a noncarcinogen: the range is approximately 0.1 to 1,000,000 for carcinogens and approximately 0.001 to 100,000 for noncarcinogens.

[Additional facility-, chemical-, toxicity-, and exposure-specific terms are defined in chapters that describe the computer operations.]

APPENDIX G. ADDITIONAL INFORMATION ON FLAG FIELDS

A comprehensive check has been performed on the various flag fields in the Risk- Screening Environmental Indicators model, to ensure that the fields are correct and that any change in the status of any chemicals has been properly accounted for. Effective October of 1999, the fields in the model are in accordance with the sources listed below. The fields in the model which were checked are as follows:

- 33/50 Flag
- HAP Flag
- CAA Flag
- CERCLA Flag
- Priority Pollutant Flag
- SDWA Flag
- OSHA Carcinogen
- (Year) Added
- Expansion
- Core
- Metal

The details of each check performed, the sources used, and any changes made to the Indicators model are given below.

33/50 Flag

A list of the 17 chemicals targeted by EPA's 33/50 program was downloaded from http://www.epa.gov/opptintr/tri/. The document is entitled "1994 Toxics Release Inventory Public Data Release Box E-6: 17 Priority Chemicals Targeted by the 33/50 Program."   No inconsistencies were found with the current (July 6 public) version of the model. Note that EPA's list contains 17 chemicals, but several of them correspond to multiple TRI chemicals. The following table lists certain chemicals and chemical categories as reported in EPA's 33/50 Program list, and the corresponding entries in the Indicators model, which were given 33/50 flags. Therefore, the Indicators model contains 24 chemicals with 33/50 flags.

**Exhibit G-1. Chemicals Regulated under the
33/50 Program with Multiple TRI Entries**

Name in EPA's 33/50 List	Corresponding TRI Chemicals	CAS Numbers
Cadmium and compounds	Cadmium	7440-43-9
	Cadmium compounds	N078
Chromium and compounds	Chromium	7440-47-3
	Chromium compounds	N090
Cyanide compounds	Cyanide compounds	N106
	Hydrogen cyanide	74-90-8
Nickel and compounds	Nickel	7440-02-0
	Nickel compounds	N495
Xylenes	Xylenes (mixed isomers)	1330-20-7
	p-Xylene	106-42-3
	m-Xylene	108-38-3
	o-Xylene	95-47-6

HAP Flag

The list of original hazardous air pollutants (HAPs) was downloaded from http://www.epa.gov/ttn/uatw/orig189.html. The document is entitled "Unified Air Toxics Website- CAA: Original List of Hazardous Air Pollutants."

A short list of changes to the HAP list was downloaded from http://www.epa.gov/ttn/uatw/atwsmod.html, and is entitled "Unified Air Toxics Website–CAA: Modifications to the 112(b) Hazardous Air Pollutants." Both the original and modified lists were found on the Office of Air Quality Planning & Standards' (OAQPS) Unified Air Toxics Website. The chemicals being modified (caprolactum and hydrogen sulfide) are not in the Environmental Indicators model. A third chemical, glycol ethers (CAS N230) is in the model; however, the change (a change in definition) is being proposed and is not final at this time (its listing as a HAP has not changed). Exhibit G-2 presents the changes made to the HAP flag field.

Exhibit G-2. Changes to 'HAP' Flag Field

CAS Number	Chemical	Change Made
79-06-1	Acrylamide	Added HAP flag to model
67-66-3	Chlorform	Added HAP flag to model
58-89-9	Lindane	Added HAP flag to model
101-68-8	Methylenebis(phenylisocyanate) (MDI)*	Added HAP flag to model. Changed 'Chemical' field from blank to '4,4'-Diphenylmethane diisocyanate'
7803-51-2	Phosphine	Added HAP flag to model
7723-14-0	Phosphorus	Added HAP flag to model
123-38-6	Proprionaldehyde	Added HAP flag to model
100-44-7	Benzyl Chloride	Added HAP flag to model
98-88-4	Benzoyl Chloride	Removed HAP flag from model
* Note that in 1995 MDI's status was changed from that of a single chemical to a member of the Diisocyanates (N120). However, it is still included in the Indicators model as a single chemical for historical reasons, so that releases in previous years can be examined.		

CAA Flag and CERCLA Flag

A list of the chemicals regulated under the Clean Air Act (CAA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980/Superfund (CERCLA) was downloaded from http://www.epa.gov/ceppo/pubs/title3.pdf. The title of the document is "Title III List of Lists (EPA 550-B-98-017, November 1998)." The list of CAA- and CERCLA-regulated chemicals is located on pages 1 through 36 of this document. Exhibit G-3 presents the changes made to these two flag fields.

Exhibit G-3. Changes to 'CAA' and 'CERCLA' Flag Fields

CAS Number	Chemical	Change Made
75-07-0	Acetaldehyde	Added CAA flag to model Added CERCLA flag to model
101-68-8	Methylenebis(phenylisocyanate) (MDI)*	Added CERCLA flag to model
105-67-9	2,4 Dimethylphenol	Added CERCLA flag to model
10049-04-4	Chlo rine dioxide	Added CAA flag to model
23564-08-5	Thiophanate-methyl	Added CERCLA flag to model.

CAS Number	Chemical	Change Made
128-03-0	Potassium dimethyldithiocarbamate	Removed CERCLA flag from model
128-04-1	Sodium dimethyldithiocarbamate	Removed CERCLA flag from model
137-41-7	Potassium N-methyldithiocarbamate	Removed CERCLA flag from model
137-42-8	Metham Sodium	Removed CERCLA flag from model
533-74-4	Dazomet	Removed CERCLA flag from model
759-94-4	Ethyl dipropylthiocarbamate (EPTC)	Removed CERCLA flag from model
1114-71-2	Butylethylcarbamothioic acid S-propyl ester (Pebulate)	Removed CERCLA flag from model
1134-23-2	Cycloate	Removed CERCLA flag from model
2212-67-1	1H-Azepine-1 carbothioic acid, hexahydro-S-ethyl ester (Molinate)	Removed CERCLA flag from model
7647-01-0	Hydrochloric acid	Removed CAA flag from model
14484-64-1	Tris(dimethylcarbamodithioato-S,S')iron (Ferbam)	Removed CERCLA flag from model
55406-53-6	3-Iodo-2-propynyl butylcarbamate	Removed CERCLA flag from model
* Note that in 1995 MDI's status was changed from that of a single chemical to a member of the Diisocyanates (N120). However, it is still included in the Indicators model as a single chemical for historical reasons, so that releases in previous years can be examined.		

Several chemicals have multiple entries in the Title III List of Lists. In most cases, the different entries for one chemical (as identified by the CAS number) are classified the same regarding CAA and CERCLA. However, for a few chemicals, the various forms of the chemical are regulated differently. In one case, that of hydrochloric acid (see above), this resulted in a change in the model for the CAA flag field. The details for hydrochloric acid and other chemicals, which did not result in changes to this field, are given below in Exhibit G-4.

Exhibit G-4. Chemicals with Multiple Entries in List of Lists

CAS Number	Chemical	Description given in Form R	Description of form or forms given in List of Lists
7647-01-0	Hydrochloric acid	acid aerosols, including mists, vapors, gas, fog, and other airborne particles of any size.	Form chosen: Hydrochloric acid (aerosol forms only) - regulated only under CERCLA. Other forms regulated differently are Hydrochloric acid (conc. 37% or greater); Hydrogen chloride (anhydrous); and Hydrogen chloride (gas only), which are also regulated under the CAA.
7664-41-7	Ammonia	includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reported under this listing.	Form chosen: Ammonia (anhydrous) - regulated under both CERCLA and CAA. Ammonia is regulated under CERCLA only; Ammonia (conc. 20 % or greater) is regulated under both CERCLA and CAA.
7664-39-3	Hydrogen fluoride	No description	Form chosen: Hydrogen fluoride - regulated under CERCLA only. Only other form is Hydrogen fluoride (anhydrous)-regulated under both CAA and CERCLA.
7697-37-2	Nitric acid	No description	Form chosen: Nitric acid - regulated under CERCLA only. Only other form is Nitric acid (conc 80% or greater)-regulated under both CERCLA and CAA.

Priority Pollutant Flag

The list of priority toxic pollutants was downloaded from http://www.epa.gov/ost/pc/revcom.pdf. This file is entitled "National Recommended Water Quality Criteria" and is a publication of U.S. EPA Office of Water (EPA 822-Z-99-001, April 1999). The list of priority pollutants is found on pages 7 through 13. Exhibit G-5 presents the changes made to this flag field.

Exhibit G-5. Changes to 'Priority Pollutant' Flag Field

CAS Number	Chemical	Change Made
105-67-9	2,4-Dimethylphenol	Added Priority Pollutant flag to model.
319-84-6	alpha-Hexachlorocyclohexane	Added Priority Pollutant flag to model.
542-75-6	1,3-Dichloropropylene	Added Priority Pollutant flag to model.
71-55-6	1,1,1-Trichloroethane	Added Priority Pollutant flag to model.
74-87-3	Chloromethane	Added Priority Pollutant flag to model.
75-34-3	Ethylidene dichloride	Added Priority Pollutant flag to model.
75-35-4	Vinylidene chloride	Added Priority Pollutant flag to model.
79-00-5	1,1,2-Trichloroethane	Added Priority Pollutant flag to model.
87-68-3	Hexachloro-1,3-butadiene	Added Priority Pollutant flag to model.
N090*	Chromium compounds	Added Priority Pollutant flag to model.
*EPA's Priority Pollutant list includes Chromium III (CAS# 16065-83-1) and Chromium VI (CAS# 18540-29-9). The TRI inventory does not report Chromium in the same way: only Chromium (CAS# 7440-47-3) and Chromium compounds are reported. Both of these chemicals have been flagged in the Indicators model as priority pollutants.		

SDWA Flag

The list of chemicals regulated under the Safe Drinking Water Act (SDWA) was downloaded from http://www.epa.gov/OGWDW/wot/appa.html. The document is entitled "National Primary Drinking Water Regulations" and lists chemicals regulated under either national primary or national secondary drinking water standards. The SDWA flag in the model is indicative of either primary or secondary standards. Exhibit G-6 presents the changes that have been made to this flag field.

Exhibit G-6. Changes to 'SDWA' Flag Field

CAS Number	Chemical	Change Made
7429-90-5	Aluminum (fume or dust)	Added SDWA flag to model (represents secondary standard only).*
7440-22-4	Silver	Added SDWA flag to model (represents secondary standard only).*
2164-07-0	Dipotassium endothall	Added SDWA flag to model.**

CAS Number	Chemical	Change Made
116-06-3	Aldicarb	Removed SDWA flag from model.
7440-02-0	Nickel	Removed SDWA flag from model.
* These changes make these chemicals consistent with the previous treatment of zinc, which was marked as an SDWA chemical for a secondary standard only. ** EPA lists 'Endothall,' which is not a TRI chemical. However, Dipotassium endothall.is reported in TRI; being a salt of Endothall, it was flagged as an SDWA pollutant.		

Note that three of the four chemicals in the Total Trihalomethanes category in the SDWA list are TRI chemicals, and therefore are flagged in the model as SDWA chemicals. These chemicals are Chloroform (CAS# 67-66-3), Bromoform (CAS# 75-25-2), and Dichlorobromomethane (CAS# 75-27-4). Dibromochloromethane (CAS# 124-48-1) is not a TRI chemical.

OSHA Carcinogen Flag

The list of OSHA carcinogens was downloaded from http://www.epa.gov/opptintr/tri/oshacarc.pdf, a pdf file entitled "Box 2-4. Basis of OSHA Carcinogen Listing for Individual Chemicals." The year of the publication from which this is taken was not provided, but this listing is reflected in the 1997 TRI Public Data Release. This exhibit is located on pages 41 and 42. Exhibit G-7 presents the changes that were made to the OSHA Carcinogen flag field.

Exhibit G-7. Changes to 'OSHA Carcinogen' Flag Field

CAS Number	Chemical	Change Made
121-14-2	Dinitrotoluene	Removed OSHA Carcinogens flag from model.
606-20-2	2,6-Dinitrotoluene	Removed OSHA Carcinogens flag from model.
98-95-3	Nitrobenzene	Removed OSHA Carcinogens flag from model.

Year Added

Please note that 'core' refers to chemicals that were added in 1987 AND have had no changes in reporting requirements since that time (although the base year for the Indicators' model is 1988). 'Expansion' refers to chemicals that were added for reporting year 1995; the term does not refer to

chemicals added in other years. The 'Year Added' field was checked against the 1998 Code of Federal Regulations (40CFR372)[12]. The changes made are summarized in Exhibit G-8.

Exhibit G-8. Changes to (Year) 'Added' Field

CAS Number	Chemical	Change Made
101-68-8	Methylenebis(phenylisocyanate) (MDI)	'Added' field changed from 1995 to 1987.*
306-83-2	2,2-Dichloro-1,1,1-trifluoroethane	'Added' field changed from 1987 to 1994.
354-23-4	1,2-Dichloro-1,1,2-trifluoroethane	'Added' field changed from 1987 to 1994.
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane	'Added' field changed from 1987 to 1994.
812-04-4	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)	'Added' field changed from 1987 to 1994.
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane	'Added' field changed from 1987 to 1994.
90454-18-5	Dichloro-1,1,2-trifluoroethane	'Added' field changed from 1987 to 1994.
* Note that in 1995 MDI's status was changed from that of a single chemical to a member of the Diisocyanates (N120). However, it is still included in the Indicators model as a single chemical for historical reasons, so that releases in previous years can be examined.		

While most chemicals in the CFR have an effective date of January in a given year, several chemicals became effective in July. In these cases, the 'Added' field in the Indicators model contains the following year.

Four chemicals which were listed in the CFR were not found in the model. They are shown in Exhibit G-9.

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[12] There are two tables in the CFR that list the chemicals reported under TRI- one table organized alphabetically by chemical, the other numerically by CAS number. Note that while they are supposed to contain the identical chemicals, each list is missing two chemicals contained in the other list. The first, alphabetical list is missing Flumetralin (CAS 62924-70-3) and Ammonium sulfate (solution) (CAS 7783-20-2). The second list is missing Toluene-2,4-diisocyanate (CAS 584-84-9) and Vinyl bromide (CAS 593-60-2). It is assumed that the complete list includes all four of these chemicals. Therefore, there are 583 chemicals and 28 chemical categories listed in the CFR.

Exhibit G-9. Chemicals in the 1998 CFR but Not in the Indicators Model

CAS Number	Chemical	Note
74-93-1	Methyl mercaptan	Chemical was delisted.
10222-01-2	2,2-Dibromo-3-nitrilopropionamide	Under administrative stay.
7783-06-4	Hydrogen sulfide	Chemical was delisted.
62924-70-3	Flumetralin	

Expansion Flag

To confirm the Expansion flag, that field was checked against the November 30, 1994 Federal Register notice adding chemicals to the TRI reporting program.

All of the chemicals marked with a flag in the Indicators model were listed as being added in 1995 in the Federal Register notice. However, the following chemicals from the Federal Register notice were not found in the model.

Exhibit G-10. Chemicals in Expansion FR Notice Not Found in Model

CAS Number	Chemical	Note
52-51-7	Bronopol	Chemical was delisted.
10222-01-2	2,2-Dibromo-3-nitrilopropionamide	Chemical is under administrative stay.
75-78-5	Dimethyldichlorosilane	Chemical has been voluntarily remanded from the TRI reporting list.
576-26-1	2,6-Dimethylphenol	Chemical was delisted.
75-79-6	Methyltrichlorosilane	Chemical has been voluntarily remanded from the TRI reporting list.
75-77-4	Trimethylchlorosilane	Chemical has been voluntarily remanded from the TRI reporting list.

Core Chemical Flag

To confirm that all flags marked as 'Core' are correct, all chemicals with 1987 as the year added (confirmed under (Year) Added flag) without being marked as 'Core' were checked. Seven chemicals

shown in Exhibit 11 were found. All were mentioned in a 1996 memorandum entitled 'TRI Environmental Indicators: Resolution of Certain TRI Reporting Issues with TRIB Staff' as having had changes in their reporting requirements; thus, they are correct in not being marked as 'Core.'

In addition, all chemicals marked as 'Core' in the model were compared against Table 3-8A in the 1997 Toxics Release Inventory Public Data Release (PDR). Any chemicals marked as having changes in reporting requirements were not considered to be 'Core.' No discrepancies were found; however, 42 chemicals in the model were not found in the table in the 1997 PDR because they did not have any 1997 releases (according to the model). Ten of these 42 chemicals did have releases in years other than 1997, and so these were checked against the 1987-1996 TRI Release Inventory CD, and found to be marked 'Core.'

**Exhibit G-11. Chemicals in Indicators Model Added in 1987
but Not Marked as 'Core'**

CAS Number	Chemical
101-68-8	Methylene bis(phenylisocyanate) (MDI)
1344-28-1	Aluminum oxide (fibrous forms)
6484-52-2	Ammonium nitrate (solution)
7647-01-0	Hydrochloric acid (aerosol)
7664-41-7	Ammonia
7664-93-9	Sulfuric acid (aerosol)
7783-20-2	Ammonium sulfate

Note that while Glycol ethers (CAS N230) had a clarification of definition effective in 1995, it was originally added in 1987 and is still considered a core chemical by the model and the TRI Public Data Release.

Metal Flag

Finally, the 'Metal' field was checked against the 'Core' field (already confirmed above) as well as against an internal file of compounds considered metals. No changes were needed to the 'Metal' field.

Other changes to the chemical database in the model

The empty row at the bottom of the chemical table was removed.
The CAS number for MDI was changed from 101-688 to 101-68-8 and the name in the 'Chemical' field was changed to 4,4'-Diphenylmethane diisocyanate.

'Ammonium Nitrate' and 'Ammonium Sulfate' were added to the respective entries so that there were no empty name fields for either chemical.
Metam sodium (a synonym) was changed to Metham sodium.

Summary of Data Sources

Exhibit G-12. Summary of Data Sources

Flag	Access Address	Date Accessed	Title
33/50	http://www.epa.gov/opptintr/tri/	9/29/99	1994 Toxics Release Inventory Public Data Release Box E-6. 17 Priority Chemicals Targeted by the 33/50 Program
HAP	http://www.epa.gov/ttn/uatw/orig189.html		Unified Air Toxics Website-CAA: Original List of Hazardous Air Pollutants
CAA	http://www.epa.gov/ceppo/pubs/title3.pdf		Title III List of Lists
Priority Pollutant	http://www.epa.gov/ost/pc/revcom.pdf		National Recommended Water Quality Criteria
SDWA	http://www.epa.gov/OGWDW/wot/appa.html		National Primary Drinking Water Regulations
CERCLA	http://www.epa.gov/ceppo/pubs/title3.pdf		Title III List of Lists
OSHA	http/www.epa.gov/opptintr/tri/oshacarc.pdf		Box 2-4. Basis of OSHA Carcinogen Listing for Individual Chemicals
Year Added	Code of Federal Regulations, Part 40, Section 372.	10/12/99	
Expansion	Federal Register, November 30, 1994	10/12/99	
Core Chemical	Code of Federal Regulations, Part 40, Section 372. TRI Release Inventory, 1987-1996	10/12/99 10/18/99	
Metal	Internal file (TRI_TOME.wk4)	10/4/99	