

ECOTOX User Guide

ECOTOXicology Database System

Version 4.0

Prepared for

U.S. Environmental Protection Agency
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DISCLAIMER

You should consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

ECOTOX attempts to be comprehensive, our searches do not locate all relevant literature. In addition, the time lag from conducting a literature search, acquiring the publication and encoding it into the ECOTOX database can be up to or exceed six months. For this reason, we also suggest that you conduct searches of the most recent publication year to ensure you capture data that has not been entered into the ECOTOX database.

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U. S. government.

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INTRODUCTION

In the development and implementation of ecosystem management decisions there is the need to establish scientifically credible risk assessments for chemical stressors. Ecological assessments are required to characterize and diagnose the relative risk of chemical pollutants and to predict future risk as a function of environmental management options.

The U.S. EPA's ECOTOXicology database (ECOTOX) is a source for locating single chemical toxicity data for aquatic life, terrestrial plants and wildlife. ECOTOX was created and is maintained by the Office of Research and Development's (ORD's), National Health and Environmental Effects Research Laboratory (NHEERL) / Mid-Continent Ecology Division (MED).

ECOTOX, developed at the U.S. EPA MED, integrates three previously independent databases - AQUIRE, PHYTOTOX, and TERRETOX - into a unique system which includes toxicity data derived predominantly from the peer-reviewed literature, for aquatic life, terrestrial plants, and terrestrial wildlife, respectively. Not all data published in the peer review ecotoxicology literature are included in ECOTOX. You should refer to the Limitations section of this document to understand test results that are not considered for inclusion in the database.

Researchers or managers using ECOTOX for analyses or summary projects should consult the original scientific paper to ensure an understanding of the context of the data retrieved from ECOTOX.

For more information on the ECOTOX database contact:

ECOTOX Support
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Office of Research and Development
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division (MED)
6201 Congdon Boulevard
Duluth, Minnesota 55804
Telephone: 218-529-5225
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E-mail: ecotox.support@epa.gov

GETTING STARTED

Access

To access the ECOTOX Web site, you will need a computer equipped with a Javascript enabled World Wide Web browser and a means of connecting to the Internet. Start your browser software and type in the Internet address <http://www.epa.gov/ecotox/> and you will be connected to the ECOTOX home page. ECOTOX has the following browser limitations:

- The query pages require that your browser support JavaScript and this feature must be activated in your browser preferences.
- ECOTOX does not function properly when using Windows 3.1.
- ECOTOX supports Netscape Navigator 4.x (or higher) and Explorer 4.x releases. Older browser versions are not supported and will require an upgrade.
- There is a maximum number of 5,000 tabular records that can be retrieved in one search. The delimited and Excel exports will retrieve up to 10,000 records.
- If you use a popup blocker program, ECOTOX reports, help and browse features will not display. Please add the ECOTOX web site to your popup browser exception list to ensure full usability.

Navigating within ECOTOX

Left Frame

The home page provides a general overview of the ECOTOX database with links to About ECOTOX, Help Center, Quick Database Query, Advanced Database Query, Frequently Asked Questions, Data Download and Eco-SSL Website. These selections will open a new window and not affect any modifications you have made to your ECOTOX search or report selections.

About ECOTOX: This section of the website provides a general overview of the ECOTOX database, including the history of the system's development.

Help Center: Our Help Center describes the ECOTOX web site contents and navigational resources available. Printable help is available in PDF (Portable Document Format) ECOTOX User Guide 4 and ECOTOX Code List. To ensure you will be able to see a PDF file in its entirety, please obtain the most recent edition of the free Acrobat Reader from Adobe (www.adobe.com). The help center resources are located in one of four web pages:



A brief description of each help file is presented below:

Starting Out - Find information on how to begin navigating and searching the ECOTOX Web site. This page also provides links to the Limitations associated with the ECOTOX database, frequently asked questions, recent additions, and PDF versions of the ECOTOX User Guide (this document), and the ECOTOX Code List, which provides detailed information regarding codes presented in the aquatic and terrestrial reports.

How do I... - How to perform your search and retrieve output in ECOTOX.

What is... - Lists and provides links to descriptions and codes for each field available within ECOTOX searches and output. Includes links to the ACQUIRE and TERRETOX coding guidelines and full list of ECOTOX Codes used by the ECOTOX staff. For a brief overview of coding practices used within ECOTOX see Appendix C.

More Resources - Other useful aids within ECOTOX and related resources on the World Wide Web. Providing these links does not imply endorsement by the U.S. EPA.

Quick Database Query: The Quick Query form allows a simple search for a limited number of chemicals, species, effects and publication years.

Advanced Database Query: The Advanced Database Query is menu driven and uses navigation links to direct you through multiple search criteria pages. The Advanced Database Query utilizes all available search and output features.

Limitations: The following restrictions are placed on ECOTOX data. Data not satisfying these requirements are excluded from the ECOTOX databases: You should review the limitations of ECOTOX data retrieval and system requirements prior to performing searches this site.

- The author(s) must report valid species and chemical information. If the ECOTOX staff cannot verify the species Scientific and common names or locate the chemical's Chemical Abstract Services (CAS) Registry number, the data record is not included in the database.
- Only single chemical exposures are included in ECOTOX, therefore results for chemical mixtures are excluded.
- The author(s) must identify the exposure duration associated with the observed effect.

- Bacteria and virus studies are not included.
- The author(s) must report either a chemical concentration or application rate and the associated observed effect.
- *In vitro* and vapor exposures are not included in the ECOTOX database.
- Toxicity test data for chemical exposures where only sediment concentrations are reported are excluded from the aquatic database.
- In general, tests conducted with petroleum (fuel oils) and air pollution (CO₂ and ozone) chemicals are excluded from ECOTOX.

In addition, ECOTOX currently has limits on the number of data records that can be retrieved:

- There is a maximum number of 5000 tabular and full browser viewable records that can be retrieved in one search. The delimited and MS Excel export files will retrieve up to 10,000 records.
- If you use a popup blocker program, ECOTOX reports, help and browse features will not display. Please add the ECOTOX web site to your popup browser exception list to ensure full usability.

Frequently Asked Questions: The Frequently Asked Question page provides quick access to typical questions we receive.

Data Downloads: You can download delimited ASCII files of the entire aquatic or terrestrial raw data. This does not include any software and will require reconstructing various files together in order to view entire data records. The data are divided into two sections; aquatic and terrestrial. Within these sections you will find data tables, field descriptions and graphical relations of the data structure.

Browse Chemicals: Locate ECOTOX chemicals available for searching. You can search by CAS Registry number or by chemical name, including synonyms. The Browse Chemicals links are also available above the Chemical Entry selection box to use prior to searching. This feature helps you locate the best input format to enter in the entry box.

Browse Effects: Find effect measurement codes and definitions located within ECOTOX. The Browse Effects links are also available above the Effect Entry selection box to use prior to searching. This feature helps you locate the best selections for effects and measurements.

Browse Species: Locate ECOTOX species available for searches. You can search by common name, Scientific Name or ECOTOX species number. The Browse Species links are also available above the Species Entry selection box to use prior to searching. This feature helps you locate the best input format to enter in the entry box.

Eco-SSL Website: The Eco-SSL (Ecological Soil Screening Level) web site provides links to summary documents presenting risk-based ecological soil screening levels for many of the soil contaminants frequently of concern during ecological risk assessments at hazardous waste sites. This site is maintained by the ECOTOX support staff, and was developed by the U.S. EPA's Office of Emergency and Remedial Response. The site also includes links to all procedures used in deriving the Eco-SSL, background and discussion documents, and lists of all literature acquired under this effort.

Contact Us: If you have a question that can't be answered through our help, please contact us with your question. This link also appears on the top frame of every ECOTOX web page.

From the home page, you may select one of two ways to search ECOTOX. The Quick Query form allows a simple search for a limited number of chemicals, species, effects and publication years. The Advanced Database Query is menu driven and uses navigation links to direct you through multiple search criteria pages. The Advanced Database Query utilizes all available search and output features.

To conduct a search, click on either the "Quick Database Query" or "Advanced Database Query" option from the home page. The search query page will then load. If you want to go from one database query option to the other, you will lose your current search strategy.

Top Frame

Selecting any of the following options will open a new window, and not affect any modifications you have made to your ECOTOX search or report selections.


Recent Additions: This link provides information on recent data updates (typically done three to four times per year), and changes to the functionality of the web site.

Contact Us: If you have a question that can't be answered through our help, please contact us with your question. This link also appears on the top frame of every ECOTOX web page.

Print Version: The Print Version hotlink will remove the left sidebar and header text at the top of the page. You can use your browser print options to print the displayed page.

OVERVIEW OF SEARCH OPTIONS

Database searches can be conducted using either a Quick or Advanced Database Query menu. The Quick Database Query supports searches on taxonomic kingdom, species common or Scientific name, CAS Registry number or chemical name, observed effect group and publication year. The Advanced Database Query menu includes all options under Quick Database Query, and enables you to focus on more specific criteria such as study site type (e.g., laboratory, field), exposure media (e.g., freshwater, soil), route of chemical exposure (e.g., oral, diet), and statistically-derived endpoints (e.g., LD50, NOEL). Search results can be downloaded either as a Microsoft (MS) Excel spreadsheet, an ASCII delimited file format, which can be transferred into a database or spreadsheet, or in a browser viewable report format.

When you are within any Quick or Advanced Database Query page and click on a , context-sensitive help will display in a separate window. You may navigate within the help window without affecting your search session.

Search Strategy Basics


The search pages are designed to search on all data, unless you restrict the search by adding search criteria (e.g., adding the check in the check box, enter text in a text entry field). You may perform the search at any time after you have specified your search criteria. You do not need to enter something in every search criteria area.

The search logic includes two basic strategies, combination/union and intersection. Within a search area (e.g., chemical), the search will combine all your search selections. Between each search area, the search will intersect your selections (e.g., intersection between chemical and taxonomic selections). You may also want to use the ECOTOX Search Planner located in Appendix A to plan your searches. Appendix B describes practice searches to assist you in using the ECOTOX system.

Before searching, you should read Appendix C to find out more about the ECOTOX database and Appendix E for specific data field descriptions.

Overview of Query Page Functions


Moving Within Pages and Target Menu

You may need to move within an ECOTOX screen by using the scroll bars located at the right and bottom of your computer screen. The right scroll bar moves up and down, the bottom moves left and right. There are also “Go to Top” buttons  located strategically throughout the page that will take you back to the top menu.

You can also navigate within the page using the menu located at the top of each page by clicking on the desired hyperlink. This will move you to your requested location within the same page.

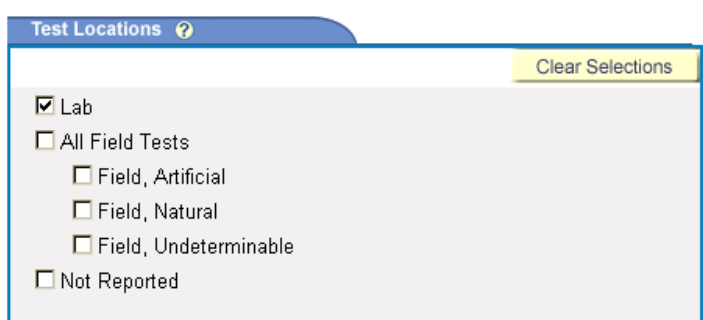
To narrow your search, use one or more of the following options: [Chemical](#) or [Species](#) or [Effects](#) or [Publication Years](#) or [Report Format](#)

Selection Box and Types

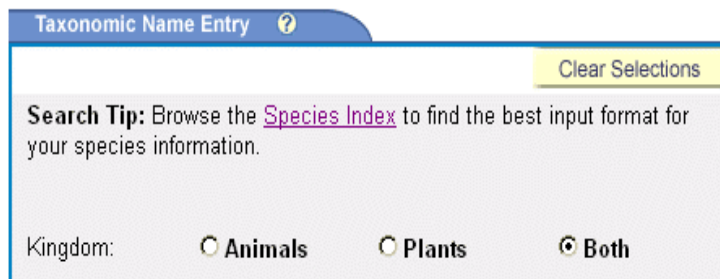
All search and report selections will be displayed in a box using multiple selection methods (radio button, checkbox, drop-down lists, typing in text (one entry per line)). Each search selection box is labeled and a question mark graphic . When you click on this icon, context-specific help is presented. Each box also includes a Clear Selections button in the right-hand corner of the box. When you click on Clear Selections all selections within the box are removed.

Search selection types include:

Checkbox: To select an item, click on the check box you want to include. To remove a selection, click on the checkbox again. You can select one or more items.

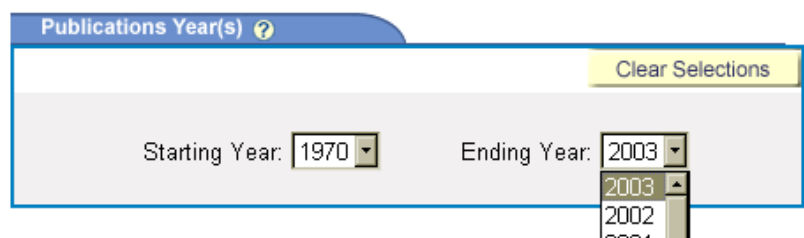


Radio button: To select an option, click on the radio button box you want to include. To unselect, click on the radio button again. Only one option listed can be chosen.



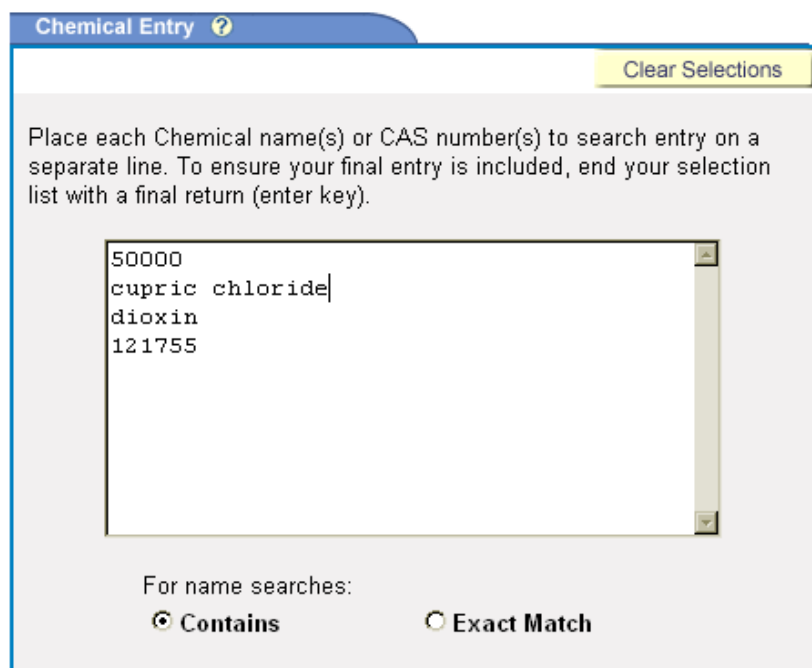
Drop-down List: To modify searches using the drop-down list, click on the arrow icon on the right

side. Clicking on this icon drops down a list immediately below the field and shows which values can be chosen. Click on the entry item you want selected.



The screenshot shows a web form titled "Publications Year(s)" with a help icon. It features a "Clear Selections" button in the top right. Below this, there are two dropdown menus: "Starting Year" with "1970" selected and "Ending Year" with "2003" selected. A small list is open below the "Ending Year" dropdown, showing the years "2003", "2002", and "2001".

Text Entry Chemical, Species and Reference Number searches require typing the search criteria into the selection box. Each entry must be on a single line, followed by a carriage return. The text you type must match the type of data within ECOTOX, either as a sub-string search (Contains) or exactly (Exact Match). All numeric entries will be searched exactly as entered, without selecting the Exact Match radio button. You may enter both text and numeric data into text boxes.



The screenshot shows a web form titled "Chemical Entry" with a help icon. It includes a "Clear Selections" button in the top right. Below the button, there is instructional text: "Place each Chemical name(s) or CAS number(s) to search entry on a separate line. To ensure your final entry is included, end your selection list with a final return (enter key)." Below this text is a large text input area containing the following text:
50000
cupric chloride
dioxin
121755
At the bottom of the form, there is a section labeled "For name searches:" with two radio buttons: "Contains" (which is selected) and "Exact Match".

Quick Database Query

The Quick Database Query search and report options are located within a single web page, therefore you can use your scroll bar or the target menu to move around the page in order to make selections.

The Quick Database Query supports searches on Chemicals (Names or CAS Registry numbers), Species (Kingdom, Scientific or common names), major Effect group (with restriction for presenting only those results with calculated Endpoints) and Publication Year(s). All report formats are available within the Quick Query menu, but you cannot modify the sort order or data field display within the report. The search options within the Quick Database Query are available in the Advanced Database Query, but the Advanced Database Query screens afford more search and output options.

When constructing your searches, remember that for the text entry forms (Chemical and Taxonomic) each entry must be on a single line, followed by a carriage return. The text you type must match the type of data within ECOTOX, either as a sub-string search (Contains) or exactly (Exact Match). All numeric entries will be searched exactly as entered, without selecting the Exact Match radio button. You may enter both text and numeric data into text boxes. For radio button screens (e.g., Report Format), you may only make one selection within a grouping. For checkboxes (e.g., Effect Measurements) you may make multiple selections.

Key Functions

Each of the Quick Database Query pages includes the Key Functions box located in the upper right corner of the page. These Key Functions include:

Restore Defaults - Erases previously selected search criteria on all search pages and restores the default report format.

Perform Query on Aquatic Data - Activates your search and displays aquatic report results in a separate window

Perform Query on Terrestrial Data - Activates your search and displays terrestrial report results in a separate window

Search Options

You must search on at least one parameter. Any selections made using multiple parameter search boxes (i.e., excluding the Report Format) within the Quick Database Query page will narrow the search result. ECOTOX offers the following Quick Database Query options:

- Chemical Within the Chemical Entry search box, you may search on chemical(s) using either CAS Registry numbers, or chemical names.
- Taxonomic Within the Taxonomic Name Entry search box, you may search on Kingdom (plant vs. animal), taxonomic information using either the scientific name (e.g., phylum, genus, species), common name, or ECOTOX species number to identify the organism(s) or taxonomic group of organisms. You must identify whether

the search is for a genus/species scientific name, common name, or other taxonomic name.

- Effect Measurements Within the Effect Measurement search box, you may search on major effect groups (e.g., mortality, bioaccumulation). You may also restrict your search results to studies that report only calculated Endpoints (e.g. EC50).
- Publication Year(s) Within the Publication Year(s) search box, you may select to search on a range of Publication Years.
- Report Format Within the Report Format search box, you may select another Report Format (e.g, tabular browser viewable, MS Excel, Delimited, or full data record). The default is set to a tabular browser viewable format for aquatic reports, and the full data record for terrestrial reports. See Appendix G for examples of the default report formats.

Advanced Database Query

Functions Unique to the Advanced Query

Page Navigation Tool Bar: The Advanced Database Query are of the ECOTOX web site is designed to lead you through a search session using multiple forms. Each page provides a menu and navigational drop-down sub-menus that will take you to various locations within the Advanced Database Query pages. At the top of each Advanced Database Query page, is the Page Navigational Tool Bar that provides links to the various pages. You must use the navigation tool bar to move from page to page within the Advanced Database Query. Using your browser's Back button will result in the loss of all entries made in any of the ECOTOX forms.



Search or report options within each web page include:

Main - Describes search and report features available within ECOTOX.

Taxonomic -Taxonomic Entry, Predefined Taxonomic Groups

Chemical - Chemical Entry, Predefined Chemical Groups

Test Results - Endpoints, Effects and Measurements

Test Conditions - Test Location, Exposure Media, Exposure Type, Chemical Analysis

Publications/Updates - Reference Number, Publication Year, Independently Compiled Data and Recent Modifications/Additions

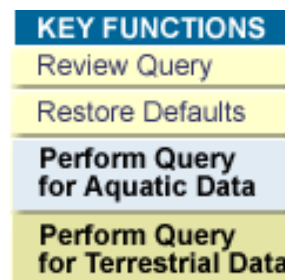
Key Functions: Each of the Advanced Database Query pages includes the Key Functions box located in the upper right corner of the page. These Key Functions include:

Review Query - View your search criteria and report format.

Restore Defaults - Erases previously selected search criteria on all search pages and restores the default report format.

Perform Query on Aquatic Data - Activates your search and displays aquatic report results in a separate window.

Perform Query on Terrestrial Data - Activates your search and displays terrestrial report results in a separate window.



Advanced Database Query View/Edit: For predefined lists within the Chemical, Taxonomic, and Effect Measurements search windows, you can view and/or further edit your selected lists. To access the view and edit feature, click on the button located at the bottom for the search box labeled, View/Edit List Entries. This will display the details of the list(s) you selected. If you are viewing and do not want to make any changes, click on the Finished Editing button. This will return you to the previous page.

If you want to remove selection(s), select the items by highlighting or clicking on the item, then click on the Remove button. Multiple selections can be made by holding the Ctrl key down while clicking the item. You may restore the default selections by clicking on the Restore or Restore All button. When your editing is complete, click on the Finished Editing button to return to the previous page.

If you click on your browser "Back" button, your edits will not be saved.

Advanced Species Expanded Lists ?

The selection box below contains the expanded species associated with the species lists you selected. To remove individual species from your query, select item(s) from the list by selecting them and then clicking the REMOVE button. Multiple selections can be made by holding down the Ctrl key, then click to select.

You may restore the removed items by selecting them and clicking on the RESTORE button. When you have completed your selections, click on the Finished Editing button.

Species Selected

Species Group: Birds
Accipiter gentilis - northern goshawk
Accipiter nisus - Northern sparrowhawk
Accipitridae - Accipiter family
Acridotheres tristis - Common Mynah
Aegolius acadicus - northern saw-whet owl
Agelaius phoeniceus - red-winged blackbird
Aix sponsa - wood duck
Alauda arvensis - Eurasian skylark
Alaudidae - Lark family

REMOVE

Species Removed

Accipiter cooperii - cooper's hawk

RESTORE RESTORE ALL

Finished Editing

Search Options

The Advanced Database Query option provides a broader range of search parameters than available in the Quick Database Query page. The default for each selection box is all data will be searched. As you add selections to your search criteria, the number of records that can be retrieved from the ECOTOX database may be reduced.

For the Advanced Database Query, the Chemical and Taxonomic pages, any entries selected on the page combines selections into a single query. For example, if you select the species *Daphnia magna* and Predefined Taxonomic Group "Fish", the result will be the combination of all fish species and the *Daphnia magna* species.

You must search on at least one parameter. Any additional selections made from other search parameter menus (i.e., not Report Format) within the Advanced Database Query pages will narrow the search result. ECOTOX offers the following search options:

- Advanced Database Query Main Menu: This web page provides an overview of how to navigate within the Advanced Database Query pages. Each Advanced Database Query page will have a navigational tool bar located at the top of the page, which will allow you to move to different search parameters (Taxonomic, Chemical, Test Results, Test Conditions, Publications/Updates) and to customize your final ECOTOX output (i.e., Report Format).
- Taxonomic Within the Taxonomic page, you may search on one or more Predefined Taxonomic Groups or enter your own list of taxonomic information using either the scientific name, common name or ECOTOX species number to identify the organism(s).
- Chemical Within the Chemical page, you may search on one or more Predefined Chemical Groups or enter your own list of chemicals using either the Chemical Abstract Services (CAS) Registry number or chemical name to identify the substance(s).
- Test Results Within the Test Results page, you may search on calculated Endpoints (e.g. EC50), observed Effects (e.g., growth), and/or specific Effect Measurements (e.g., weight).
- Test Conditions Within the Test Conditions page, you may search on Test Locations (e.g., laboratory, field), Exposure Media (e.g., freshwater, soil), or Exposure Types (e.g., static, diet), and /or Chemical Analysis (measured vs. unmeasured).
- Publications/Updates Within the Publications/Update page you may search on Publication Year, ECOTOX Reference Number(s), Independently Compiled Data Sets (e.g., USGS Acute Toxicity Databases) that are submitted electronically by collaborators, and/or the last six ECOTOX Modifications/Updates.

- Report Format Within the Report Format page, you may select another Report Format (e.g, browser viewable, MS Excel, Delimited) or customize your report by modify the Aquatic Output Selection and/or the Terrestrial Output Selections.
- Key Functions At any time after you have made selections, you may review your search selections (Review Query), clear any selections you made within any Advanced Database Query page, (Restore Defaults), or generate your search results (Perform Query for Aquatic Data, Perform Query for Terrestrial Data).

CONDUCTING A QUERY WITHIN ECOTOX

Taxonomic Searching

Within ECOTOX you may conduct a search by entering the Species Number(s), Genus/Species Name(s), Other Taxonomic Name(s) or Common Name(s). To browse Species Numbers, Genus/Species Names, or Common Names available in the database, click on the Browse Species index link on the left frame or within the Taxonomic Name Entry box. All data records within ECOTOX include a Scientific name for the test species. All names have been verified in reliable taxonomic sources. Appendix D contains information regarding the verification of species data in ECOTOX.

The ECOTOX species file includes historical synonyms for the species. If a search is conducted using a species name that is noted as a taxonomic synonym in our system, ECOTOX database will present the results using the currently acceptable genus and species name.

Taxonomic Entry

To conduct a search, type in the taxonomic name, common name or Species number and select the appropriate data type radio button. Partial taxonomic names may be used when the Contains radio button is selected. The Exact Match selection is used when you want only the exact text entered to be searched.

You can search for an unlimited number of entries and each entry must be entered on a separate line. You can mix numbers and name entries, but the name entry must be the same type (e.g., Genus/species and Common names cannot be searched within one entry screen). If you select the Contains radio button, the data retrieved will include species with names having any part of the words given in the text box (i.e., a search on the word *daphnia* will return both *daphnia* and *ceriodaphnia*).

Browse Species Index: Within the Taxonomic Entry box is a link to the Browse Species Index. By clicking on the Browse Species Index hotlink above the search box, a new browser window will open to access to the ECOTOX species information file. This can assist you in planning your taxonomic search strategy by allowing you to enter different Genus/Species, other taxonomic levels and common species names or name sub-strings to determine whether or not your species is in the ECOTOX database and what other species will be included if your sub-string is used. For example, by entering the species Scientific name '*Oncorhynchus mykiss*', the following species numbers and Scientific names will be included in your search results:

ECOTOX Species Index

Please
Close Box

1 Record Found

Return to [Browse Species Index Search](#)

Species Number: 4
Scientific Name: Oncorhynchus mykiss
Common Name: Rainbow trout,donaldson trout

[Hide Details](#)

Scientific Name Synonyms:

- Salmo gairdneri
- Salmo mykiss
- Salmo gairdneri irideus

Other Common Names:

- Steelhead
- Coastal rainbow trout
- rainbow trout
- redband trout
- truite arc-en-ciel

Taxonomic Hierarchy:

Kingdom: Animalia
Phylum/Division: Chordata
Subphylum: Vertebrata
SuperClass: Osteichthyes
Class: Actinopterygii
Order: Salmoniformes
Family: Salmonidae
Genus: Oncorhynchus
Species: mykiss

You can then use the names provided in the output to perform your searches, or use the species numbers listed by each name.

Genus/Species Name: You can conduct a search on whole or fragments of scientific names (genus, species). ECOTOX includes information about species synonyms within the Browse Species Index file.

Species Common Name: All data records within ECOTOX include a common name for each species. You can conduct an exact search (Exact Match) on the common name or fragments (Contains) of common names by selecting the proper radio button option below the entry box.

Other Taxonomic Names: Key taxonomic levels (Kingdom, Phylum, Class, Order, Family) searches are available by typing the appropriate scientific name. ECOTOX includes information about taxonomic levels within the Browse Species Index file.

Species Number: All species in the ECOTOX database have been assigned a unique number. Numbers can be located by using the Browse Species Index option. You can include numbers and text information (either Scientific or common names in one search. Species numbers are always searched as an exact match.

Predefined Taxonomic Groups (*Advanced Query Only*)

The option to select from predefined lists is only available in the Advanced Database Query. Species lists have been provided to effectively search a variety of species groups.

You may remove and/or view the individual species within a list by clicking on the View/Edit List Entries button located directly below the Species Group check boxes. See the section on “Using View/Edit List Entries” if you need help viewing and/or editing species lists. If you click on your browser “Back” button, your edits will not be saved. You cannot display the Animal and Plant species groups due to the large number of species within these lists.

Taxonomic kingdom (plant or animal) searching is available on both the Quick and Advanced Database Query pages. The kingdom is searched using a radio button option in the Quick Database Query search. The kingdom search in the Advanced Database Query is located within the Predefined Taxonomic Groups as “All Plants” for the plant kingdom or “All Animals” for the animal kingdom.

The plant kingdom search also includes species representing Monera and Fungi. Some test results report both plant and animal species as one effect measurement (e.g., aquatic community, plankton, soil community). These results will be included when either plant, animal or both kingdoms are selected.

ECOTOX includes the following Predefined Taxonomic Groups:

Animals: This list is broken into the following sub-groups:

- Amphibians
- Birds
- Crustaceans
- Fish
- Insects/Spiders
- Other Invertebrates
- Mammals
- Molluscs
- Reptiles
- Worms
- All Animals

Plants: This list is broken into the following sub-groups:

- Algae, Moss, Fungi
- Flowers, Trees, Shrubs, Ferns
- All Plants

Specials Interest:

- Standard Test Species
- U.S. Threatened and Endangered Species
- U.S. Exotic / Nuisance Species

Example Taxonomic Search

The example below is the correct method of entering query text. You can enter a mix of numbers and species terms. Number will always be treated as exact matches by the ECOTOX query. When mixing genus/species (e.g., *Oncorhynchus mykiss*) and fragments of taxonomic names (e.g., *Daphnia*), select the Contains button when searching, even when numbers are entered.

Example Genus/Species Name Query

Pimephales promelas Daphnia Salmo 2371 Oncorhynchus mykiss
For name searches <ul style="list-style-type: none">● Genus/Species Name○ Species Common Name○ Other Taxonomic Names○ Species Number
<input checked="" type="radio"/> Contains <input type="radio"/> Exact Match

If you are storing your species records in another source (like a spreadsheet), you may cut and paste the values into this box just like any other Windows application. For example, taking the information from an MS Excel spreadsheet you would:

1. Highlight all of the items in a spreadsheet column (please keep it to one column of data).
2. Press CTRL+C (or select Copy under the Edit Menu).
3. Bring up the Advanced Database Query page.
4. Click in the Text Box (so the cursor is blinking in the box).
5. Press CTRL+V (or select Paste under the Edit Menu).

6. Press “Enter” key to place a hard return at the end of the list to ensure the last row is included in the search.

Search Tips for Taxonomic Searches

By clicking on ‘Taxonomic’ on the menu at the top of the search page, you will move to the Taxonomic Search area. Some examples are provided to help when developing your search strategy:

Genus/Species Name: Entering *Pimephales promelas* in the search text box will result in only data for fathead minnows. Entering *daphnia* genus as the genus/species name will result in all *Daphnia* and *Ceriodaphnia* species. If you consistently use genus and/or species names, you may want to use the species number for searching.

You may also enter a historical Scientific name and still retrieve data for a species. For example, if you enter *Salmo gairdneri* and retrieve the data, the output will display the currently accepted name, *Oncorhynchus mykiss*.

Other Taxonomic Name: You can enter any taxonomic level (Kingdom, Subphylum, Phylum (Division), Superclass, Class, Order, Family, Genus) in this Taxonomic Entry box. For example, you can type in *salmonidae* to retrieve all species for this family. Using a taxonomic name may be helpful when interested in a broader search. Please check the Browse Species Index to locate the exact taxonomic hierarchy used in ECOTOX.

Species Common Name: Using some common names may be an effective way to search if there is a unique common name for that organism. For example, entering *mallard* in the common name field will result in only mallard duck results.

However, entering the term *duck* will output results for *duck* and *duckweed*. In this case, searching using the common name (exact) or performing only performing the query on terrestrial data will eliminate the duckweed from the search.

Entering *bird* in the common name field will result in *bird* and *ladybird beetle* data. In addition, using the term *bird* will not ensure that all bird data in the system will be extracted because the species name may not use the term *bird* in the common name.

Species Number: The species number is the unique indexing number assigned to each species in ECOTOX and can be used as a shortcut method to search genus and/or species data. The species number may be useful if you consistently search on the same set of species. The best way to determine species numbers is to access the Browse Species feature.

Chemical Searching

Using the Chemical search page, you can conduct queries on CAS Registry numbers, partial or complete chemical names, and predefined groups of chemicals. The default within ECOTOX is that all chemicals are selected for searching. All chemicals within ECOTOX include a CAS Registry number and a chemical name, typically a Collective Indices name. This information is verified in reliable sources. Appendix D describes the verification process for chemicals in the ECOTOX system. The Collective Indices name is identified as the preferred name within the ECOTOX database, and this is the name that will be displayed on your report even if your search was conducted using a common or trade name of a substance.

ECOTOX does include chemical synonym searching. If a synonym is used by more than one CAS number, both chemicals will be queried. If the database located more than one CAS number for your chemical entry, a warning message will display at the top of your browser viewable reports. (Example, "Warning! Your chemical name "chlordan" produced a search on more than one chemical. All chemicals, CAS numbers, 57749 and 12789036, are included in your report"). No warnings will display in MS Excel or delimited output.

Chemical Entry

To conduct a search, type in the CAS Registry number(s) and/or chemical name(s), and select the appropriate data type radio button (i.e., Contains vs. Exact Match). Partial chemical names may be used when the Contains radio button is selected. The Exact Match selection is used when you want only the exact text entered to be searched. CAS Registry numbers are always treated as exact entries even when Contains is selected.

You can search for an unlimited number of entries and each entry must be entered on a separate line. You can mix numbers and name entries. If you select the Contains radio button, the data retrieved will include chemicals with names having any part of the words given in the text box (i.e., a search on the word *chlordan* will return both *chlordan* and *oxychlordan*).

Browse Chemical Index: Within the Chemical Entry box is a link to the Browse Chemical Index. By clicking on the Browse Chemical Index hotlink above the search box, a new browser window will open to access to the ECOTOX chemical information file. This can assist you in planning your chemical search strategy by allowing you to enter different CAS Registry number(s), or name sub-strings to determine whether or not your chemical is in the ECOTOX database and what other chemicals will be included if your sub-string is used. You can then use the chemical names provided in the output to perform your searches, or use the CAS Registry numbers listed by each name.

The Browse Chemical search result provides a list of the CAS Registry number(s) and all instances where your text string was included in a chemical name in the ECOTOX index

file. For example, if you were to enter 'xylene' as a chemical string within ECOTOX, the following chemicals would be included in your search result:

<u>CAS#</u>	<u>Chemical name</u>
81152	Trinitro-t-butyl xylene
89587	Nitro-p-xylene
881992	alpha,alpha'-Hexachloro-xylene
1074244	2,5-Dibromoxylene
1330207	Xylene
13209159	a,a,a',a'-Tetrabromo-O-xylene

You can then either use the resulting chemical names in your search or conduct your search using the CAS Registry numbers that are displayed using the Browse Chemicals index. The output under the Browse Chemical Index, provides a list of synonym for the chemical of interest, and a list of physical /chemical properties. Currently the ECOTOX database does not include the physical / chemical property information, but plans are to include it in the next version of the database.

CAS Registry Number: Enter the CAS Registry number(s) you wish to search on, placing each number in a separate field in the CAS Registry numbers section. You may enter the CAS Registry number with or without hyphens and leading zeros. CAS number queries are always exact matches.

Chemical Name: ECOTOX now includes searching based on chemical synonyms. Enter the names of the chemicals you wish to search on, placing each name in a separate field. After entering all chemical names, identify whether you want to search on the exact name (Exact Match) or on a substring (Contains). For example, if you enter the term *benzene* selecting the Exact Match radio button, you will only search for the specific chemical benzene, not benzene derivatives. It is recommended that you search on CAS Registry numbers, when you want to specifically restrict your search to selected chemical(s).

Predefined Chemical Groups (*Advanced Query Only*)

The option to select from predefined lists is only available in the Advanced Database Query. Chemical lists have been provided to effectively search a variety of chemical groups. To select a chemical group, click on the check box you want to search. To unselect, click on the checkbox again.

You may remove and/or view the Individual chemicals within a list by clicking on the View/Edit List Entries button located directly below the Chemical List check boxes. See the section on "Using View/Edit List Entries" if you need help viewing and/or editing chemical lists. If you click on your browser "Back" button, your edits will not be saved.

The following Predefined Chemical Groups are available:

Metal or Organometal Compounds:

- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Nickel
- Silver
- Organotin
- Selenium
- Vanadium
- Zinc

Organic Compounds:

- Dibenzofurans
- Glycol Ethers
- Nitrosamines
- Phthalate Esters
- PAHs (Polyaromatic Hydrocarbons)
- PCBs (Polychlorinated Biphenyls)

Example Chemical Search

The example below is the correct method of entering query text.

<input checked="" type="radio"/> Contains	<input type="radio"/> Exact Match
99865 Cadmium chloride 99898 Metolachlor Malathion 100027	

If you are storing your chemical records in another source (e.g., spreadsheet), you may cut and paste the values into this box just like any other Windows application. For example, taking the information from a MS Excel spreadsheet you would:

1. Highlighting all the items in a spreadsheet column (please keep it to one column).

2. Press CTRL+C (or select Copy under the Edit Menu).
3. Bring up the Advanced Database Query page.
4. Click in the Text Box (so the cursor is blinking in the box).
5. Press CTRL+V (or select Paste under the Edit Menu).
6. Press "Enter" key to place a hard return at the end of the list to ensure the last row is included in the search.

Search Tips for Chemicals

Some guidance when conducting a chemical search:

Metal Compounds: It may be more effective to search metal compounds by chemical name. Suppose you want to search for copper compounds. Entering *cupr* and *copper* as chemical names will find copper and several copper compounds with fewer keystrokes than typing all the individual CAS Registry numbers. You may also search a group of copper compounds using the ECOTOX Predefined Chemical Group option.

Organic Compounds: These compounds may be searched by chemical name. Suppose you want to search on all dioxin compounds. Entering *dioxin* as a chemical name will be more efficient than entering all the specific dioxin chemical names or CAS Registry numbers. Remember, though, entering some chemical names may identify many non-applicable chemicals (e.g., benzene will result in all compounds with the sub-string 'benzene' in the chemical name). It is recommended to use the chemical's CAS Registry number or the Exact Match option for chemical names that would produce a search result with data records for multiple non-relevant chemicals.

Pesticides: Pesticides are usually found by typing the common synonym name or trade name. Chemical CAS Registry numbers may also be located in chemical company catalogs or other chemical indexing resources. If you are unsure of a CAS Registry number or chemical name, you should use the Browse Chemicals Index to search on chemical names or fragments of names.

Test Results Searching

For each toxicity test record, pertinent information on test results presented by the authors are encoded within the database. This web page contains search selection boxes related to test results for endpoints and effects.

Browse Effects

Browsing the ECOTOX effects file can be used to locate effect measurements groupings or to locate full names for the three/four letter codes presented in the ECOTOX reports. To quickly locate codes within the Browse Effects Index window, you may conduct string searches by clicking the Web browser software Edit menu on the top browser window, and selecting Find in Page. You may also press the CNTRL and F keys simultaneously

to bring up the Find in Page option. A PDF version of codes used in the ECOTOX database is located under the “Starting Out” section of the Help Center web page via the hotlink ECOTOX Code List.

Endpoint (*Advanced Query Only*)

The default within the ECOTOX database is that all endpoints are selected for searching. Endpoint information is coded if it is reported by the author. For the purposes of ECOTOX, an endpoint is defined as the quantification of an observed effect obtained through statistics or other means of calculation for the express purpose of comparing equivalent effects (e.g., LC50). Many terrestrial plant tests do not have associated endpoints. Prior to 1996, the terrestrial plant database (PHYTOTOX) structure allowed only results based on percent change from control.

Quick Database Query: Within the Effect Measurements box, you can select to include all data or restrict data to the author reported endpoints (e.g., LC50, LOEC, BCF) using the radio button, Report Endpoints Only. To conduct a search on a specific endpoint you must go to the Endpoint search, under Test Results page, in the Advanced Database Query.

Advanced Database Query: Within the Endpoints box on the Test Result query page, you can click on one or more endpoints within the checkbox to select endpoints to include in your query. The following category of endpoints are included in the ECOTOX database:

- Concentration-Based Endpoints: LC/LDxx, EC/EDxx, ICxx, LOAEC/LOAEL, NOAEC/NOAEL, MATC, LETC, LETH, ZERO
- Time-Based Endpoints: LTxx, ETxx, T $\frac{1}{2}$
- Bioaccumulation / Bioconcentration factor: BCF, BAF, LRxx
- Studies without Endpoints reported

Effect Measurements (*Advanced Query Only*)

The default within the ECOTOX database is that all effects are selected for searching. For ECOTOX database purposes, effect is defined as the observation of a response resulting from the action of a chemical stressor (e.g., mortality). Currently ECOTOX requires that effect information be provided by the author(s) in order for the test to be included in the ECOTOX database, but historically studies with calculated endpoints that did not clearly define the observed effect were included in the database (e.g., EC50 presented, but observed effect not clearly identified). All effects are categorized into one of 11 major effect groupings:

- Accumulation
- Behavior
- Biochemical
- Cellular
- Ecosystem
- Growth
- Mortality
- Physiology
- Population
- Reproduction
- Endpoint Not Reported

You can conduct a search on one or more group effects in both the Quick and Advanced Database Query. To refine your search to include specific effects or effect measurements, you must go to the Effect Measurement search within the Advanced Database Query and select the desired effect(s).

Each effect includes a list of observed measurements. For instance, the Effect Group *biochemical* includes three effect categories: *biochemical*, *enzyme*, and *hormone*. Within each of these effects there are multiple measurements. For example, within the effect *enzyme*, using the Advanced Database Query, you could select to search on results associated with the measurement of a specific enzyme such as *estradiol sulfotransferase*.

Use Browse Effects or the ECOTOX Code List (PDF) located in the “Starting Out” section of the Help Center in order to identify Effect Groups and associated effect measurements. Also, within the Effect Measurement search window, you can view the expanded list of measurements for selected effects or effect groups by clicking on the View/Edit Effect Measurement.

Effect Group: The ECOTOX database categorizes all observed effects under at least one of ten major effect group codes (accumulation, behavior, biochemical, cellular, growth, mortality, physiology, population, reproduction, and ecosystem). The option to select based on an effect group is available in both the Quick Database Query and Advanced Database Query. A limited number of test records report calculated endpoints, but the authors do not specifically state the observed effect. These records are included in the “No Effect Group.” By clicking on the major effect group box, you select all effects under that grouping. To select an individual effect, click on the appropriate effect selection box. To remove any selection, click on the selected checkbox.

Effect Measurement (Advanced Database Query only): For further refinement of observed effect information, you may click on the View/Edit Effect Measurement button located at the bottom of the Effect Measurement selection box. A new window will open and display the list of specific measurements for each of the selected effect(s) and/or effect group(s). Measurements include quantitative observations that describe and evaluate biological responses to toxicants. Each effect (e.g., Growth) can have several associated measurements (e.g., length, weight). The ECOTOX Code Appendix located

in the “What is..” section of the Help Center web page provides definitions of the effect measurement codes used in ECOTOX.

The View/Edit Effect Measurement window allows you to view and edit effect measurements to include in your search for each effect and/or effect group. To remove a specific measurement, highlight the measurement in the list by clicking on it, and click on the Remove button. You may select more than one measurement at a time by holding down your Ctrl key and using your mouse to move up or down the list and clicking on Remove button. You may restore measurements by clicking on the Restore default button. If you do not edit any of the measurements, a search will be conducted on all measurements i.e., those associated with effects and/or effect groups you have previously selected. When you are done, you may click on the Finish Editing button and this will close the window and return the Test Results page. If you click on your browser “Back” button, your edits will not be saved.

Recovery Results: Within the Effect Measurements menu (Advanced Database Query) the ‘Include Recovery Results’ option allows you to include in your search results responses observed during a post exposure period. This is only available for aquatic test results. If you select to search on a specific effect group or effect and do not select to include the recovery results, your ECOTOX search results will only include effects observed during the direct exposure period of the study. Recovery results are indicated in the aquatic report by the placement of a tilde(~) character before the effect code (e.g., ~MOR).

If within the Quick Database Query you select an effect group, your results will include any recovery results associated with the specific query. The default in both the Advanced and Quick Database Query is to include all recovery results if no effects data are selected.

Test Conditions Searching (*Advanced Query Only*)

For each toxicity test record, pertinent information on testing procedures presented by the authors are encoded within the database. Search selections available on this page are test location, exposure media, exposures type and method of chemical analysis.

The options for searching by test conditions are briefly described below. These options are only available in the Advanced Database Query.

Test Location

The valid entries for test location are Lab (laboratory), Field (all outdoor field tests, artificial, natural or undeterminable) and Not Reported (i.e., the author(s) did not present sufficient information to determine test location). The default within ECOTOX is that all

data, regardless of test location, are included in your search result. To selectively search on a specific test location, click to mark the appropriate checkbox.

Exposure Media

The default within ECOTOX is that all data, regardless of test media, are included in your search result. To selectively search on a specific exposure type, click to mark the appropriate checkbox.

Aquatic freshwater tests include those conducted in freshwater, reconstituted water, distilled water, or tap water. Saltwater tests include those conducted in natural or artificial seawater, brackish water, or estuarine water. Not Reported (NR) is used if a determination cannot be made regarding the use of either freshwater or saltwater.

Terrestrial exposure media selections are focused on tests using a substrate (e.g., soil or artificial media). If the terrestrial organism does not utilize a substrate for nutrition (e.g., birds, mammals), do not select any exposure media types.

Exposure Type

You can select the exposure type by clicking the items in the search selection box area. Organisms are typically exposed to toxicants through aqueous, diet, injection, inhalation, topical or environmental routes. Occasionally, an exposure may be through multiple routes (e.g., such as topical and oral).

ECOTOX includes chemical exposures on whole living organisms. *In vitro* assays are not included. The terrestrial plant database contains some studies using excised organs and cell cultures from plants, but these types of studies are not actively coded at this time.

Chemical Analysis

The method of chemical analysis allows you to filter out test records based on whether or not the authors reported chemical concentrations as measured or nominal values. Select the appropriate checkbox from the following options:

Measured: Exposure and/or observation concentrations or doses are quantitative; analysis methods may be reported.

Unmeasured: Exposure and/or observation concentrations or doses are clearly identified as nominal values; or when the author does not report whether the concentrations were measured or nominal, i.e., unmeasured is used as a default value when there is no information provided about the reported chemical concentrations.

Not Reported: Exposure and/or observation concentrations or doses are not reported.

Publications/Update

Publication Year(s)

The default within the ECOTOX database is that all data, regardless of publication year, are included in your search result. You may override the default publication year search by selecting a range of publication years. You should enter the bordering inclusive years of your range in the “Starting Year” and “Ending Year” boxes (e.g., 1994 through 1998).

The aquatic component of ECOTOX contains data from publication years 1915 to present; the terrestrial component of ECOTOX contains data from publication years 1926 to present.

Reference Number (*Advanced Query Only*)

You may conduct searches on specific ECOTOX reference numbers. Each publication abstracted for the ECOTOX database effort is assigned a unique reference number. These reference numbers appear in all default ECOTOX outputs. To conduct a search, enter a valid ECOTOX reference number(s) in the selection box, with one reference number per line followed by a carriage return.

Independently Compiled Data (*Advanced Query Only*)

ECOTOX includes several independently compiled data sets. Data sets from the Organization for Economic Cooperation and Development (OECD), Russia, Office of Pesticide Programs, the U.S. Geological Survey, and MED are included as subsets of the ECOTOX database. For further information on these data files, refer to Appendix F. The ECOTOX default is that all data sets are included in your search result. You may override the default and restrict your search to only data sets checked in your selection box.

Recent Modifications and Additions (*Advanced Query Only*)

You may restrict your to data records to newly updated or modified data. The Recent Modifications/Additions search box allows searches based on the last ten database updates, which typically span two-three years. This feature is useful if you have a specific query (e.g., list of species and/or chemicals) that you conduct on a regular basis. The default within ECOTOX is that all data, regardless of the date they were added to ECOTOX, are included in your search result.

REPORT FORMAT

Within the Quick Database Query you can select different output formats; specifically a tabular browser viewable format, full data record, MS Excel spreadsheet, or delimited file format (use to import data into spreadsheets or databases). Under the Advanced Database Query, along with selection of different report formats, you can change the sort order of a report and add or remove data fields presented.

Report Format Options

Four output options are available; tabular report (multiple page format), MS Excel spreadsheet, Full Data Record and exporting to a delimited data file. The default format for aquatic reports is set to interactively view the output in the multiple page Tabular Output format. The default format for the terrestrial report is to view the output in the multiple page Full Data Record. By clicking on the “View Sample” icon in the upper right corner of each box listing the report format, you can see an example of what the resulting output.

Once the search has been implemented, a separate browser window will be opened for display of your search results. Each data field in the delimited file format is separated by the '|' character (usually located on the \ key). Delimited ASCII files can be saved to your hard drive and uploaded into your local spreadsheet or database software. You should close the search results window when you are finished downloading or viewing the report.

Report Format ?

	Aquatic	Terrestrial	
Customizable Tabular Output	<input checked="" type="radio"/>	<input type="radio"/>	Browser Viewable: View Sample (5,000 record limit)
	<input type="radio"/>	<input type="radio"/>	Excel Format View Sample (5,000 record limit)
	<input type="radio"/>	<input type="radio"/>	Delimited View Sample (10,000 record limit)
Full Data Record	<input type="radio"/>	<input checked="" type="radio"/>	Browser Viewable: View Sample (500 record limit)

Edit/View Aquatic Sort/Display

Edit/View Terrestrial Sort/Display

Tabular Output (Browser Viewable)

The browser viewable table (aquatic data default) presents your search results on a multi-page format that may then be viewed, printed or saved to a file using the File menu option on your browser. Once ECOTOX has generated a report, the first page of your output always displays below the report header information. At the top of each report is contact information for the ECOTOX support staff, date of the search, number of records in the report, and the number of separate browser window pages. The last page of the report will be citations for the references associated with the data records.

The browser viewable report has set default output fields. Appendix G provides an example default Browser Viewable tabular output for aquatic data. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a database field, the browser report will display a blank field. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the “Starting Out” section of the Help Center.

Navigating within the Report: You can move through the report in a number of ways. To view within a page, use the scroll bar on the right side of the window. String searches may also be performed by clicking the Web browser software Edit menu on the top browser window Tool bar and using the Find In Page option. To move from one page to another page of the report, use the numbered hyperlinks located at the top or bottom of each report page.

You can view the full data record by clicking on the View Details hotlink located in each table row. This provides all data fields coded in the ECOTOX database for the particular data record, including any comment fields. For descriptions of abbreviations that appear in the comment field see Appendix H.

Printing and Saving a Report: To print a report, select the browser File menu and select the Print option. To save the report as a file, use this same File menu and choose the Save As option. It should be noted that each page identified in the browser window may actually contain several printable pages (e.g., page 1 when printed may result in 18 printed pages). Additionally, you must click each page identified in the browser window in order to view, print or save all downloaded records.

The ECOTOX software cannot control your web browser print function and field width. Successfully printing output is dependent upon your web browser preferences and/or your printer capabilities. These options can help to fit your report on a printout:

- Reduce your web browser font size.
- If your report width is wider than a portrait page size, you can modify your web browser print option to a landscape orientation

- Some web browsers have a Print Preview option for use in viewing the actual look of the output.
- You may want to consider using the delimited file option, then merging/adjusting the columns or selecting fewer output fields.
- If you are using Internet Explorer, choose *View->Fonts->Smallest* from the menus and then print in landscape mode. This will work for very wide reports. Note that Netscape allows you to reduce the font size as well, but when it prints it reverts to the original font size and truncates the right side of the report.
- Some printers have advanced settings available from the print window that allow you to "scale" the print image. If this feature is available, try different values to determine which one works best for your reports.
- Save the browser report as a ".htm" file and open it with a word processing application where the font size can be reduced and column sizes adjusted.

Microsoft (MS) Excel

The option allows you to save or view your report in an MS Excel format. The tabular output is similar to the browser viewable table. However, each field will be separated into unique columns presented in a single row.

When you retrieve the results of your search in a delimited format a message box will appear on your screen. If you already have an MS Excel Plugin installed, the report should automatically load. If you do not have an Excel Plugin or want to save the file, select 'Save File' and a 'Save As' window will appear. Select the appropriate directory on your hard drive and type in your desired filename.

The first row of the MS Excel spreadsheet presents coded versions of the data field identifier. Appendix I provides a key to the fields identifiers. For MS Excel reports, the Reference Citation field will appear in the separate delimited fields (Reference Number, Author, Title, Publication Year and Source).

The MS Excel spreadsheet format has set default output fields. To see an example of the MS Excel format click on the View Sample button associated with the MS Excel output in the Report Format box. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a particular parameter, the MS Excel spreadsheet will have an NR (not reported) in the data field. There may be single quotes (') contained in various cells. This is to facilitate the export of hyphenated text. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the "Starting Out" section of the Help Center.

Delimited Output

This option allows you to generate an ASCII delimited data file of your search results. The exported data file may be imported into spreadsheet or database software for use on your personal computer system. Each data element is separated into a unique field, and each test record appears on a single line. For delimited reports, the Reference Citation field will appear in the separate delimited fields (Reference Number, Author, Title, Publication Year and Source).

When you retrieve the results of your search in a delimited format a message box will appear on your screen. Select 'Save file.' A 'save as' window will appear. Select the appropriate directory on your hard drive. You may change the file name at this time.

Each field in the delimited file report will be separated by a vertical bar ("|"). Using the vertical bar as a delimiter between fields is typically not the default method supported by applications that import data (e.g., spreadsheets) and hence you may have to specify the vertical bar as the delimiter when you import the data. The vertical bar key is usually located on the same key as the "\" (backslash) character on most keyboards, and may appear as two shorter vertical lines with a gap between them.

To import a delimited file into a Microsoft Excel spreadsheet, you should do the following:

1. Start the Spreadsheet
2. Go to the menu choice File->Open
3. Change the file types to "All file types (*.*)"
4. Select the file
5. Choose a delimited file format
6. Choose a vertical bar (|) as the field delimiter
7. Click Finish

Your file should now be imported into a spreadsheet for your analysis. A forward slash (/) within a field refers to an associated comment. You can select comment fields in your output to help interpret unique test conditions. For a complete understanding of the toxicity study, you will need to obtain the full publication.

The first row of the delimited output presents coded versions of the data field identifier. Appendix I provides a key to the fields identifiers.

The delimited tabular output format has set default output fields. To see an example of the delimited output format click on the View Sample button associated with the output in the Report Format box. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a particular parameter, the delimited output will have an NR (not reported) in the data field. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the “Starting Out” section of the Help Center.

Full Data Record

The browser viewable Full Data Record (terrestrial data default) presents your search results on a multi-page format that may then be viewed, printed or saved to a file using the File menu option on your browser. At the top of each report is contact information for the ECOTOX support staff, date of the search, number of records in the report, and the number of separate browser window pages. Once ECOTOX has generated a report, the first page of your output always displays below this information. The last page of the report will be citations for the references associated with the data records.

You can also view the full record format by clicking on the View Details hotlink located in each table row to see an example of each format before selecting. This provides all data fields coded in the ECOTOX database for the particular data record, including any comment fields. For descriptions of abbreviations that appear in the comment field see Appendix H.

Full record display fields cannot be modified. The sort order may not be modified using the Advanced Database Query (see below).

Sort Order (*Advanced Query Only*)

The data are sorted within the aquatic and terrestrial reports in a predefined way. For the aquatic and terrestrial outputs, the default sort order is Chemical (CAS#), Species Group, and Reference Number.

You can change the sort order by selecting the report format you want and clicking on the View /Edit Aquatic or Terrestrial Options on the Report Format page. Remember, the Sort Order does not change the data, it just changes the order in which the data appear in the report. Use the three sort order drop-down lists to select alternate sort order for Aquatic or Terrestrial output. When you have completed your selections, press the Finished Editing button at the bottom of the Output Selection box.

If you require a more specific sort option, download your search in a delimited file format and transfer the file into a spreadsheet or database on your computer and use your software to sort the data.

Display Fields

Default Select data parameters are presented in the default versions of the aquatic and terrestrial tabular reports (i.e., Browser Viewable, MS Excel, and Delimited). You can change the display fields for tabular, MS Excel, and delimited outputs by selecting the report format you want and clicking on the View /Edit Aquatic or Terrestrial Options on the Report Format web page. Full Data Record outputs cannot be modified.

Within the Aquatic or Terrestrial Output Selection box web page, the complete list of data fields coded within the ECOTOX database are display. A checkmark appears in data fields that are displayed in the default output format. See Appendix G for a sample of the default reports. To remove a selected data field, click on the checked box. To add a data field, click on the checkbox and add a checkmark. The report width displayed in browser viewable tabular reports is defined by the data fields and the Web browser settings selected, so carefully modify the output fields to fit within your preferences.

If you have selected fields to sort on, the system will automatically select these as fields to display in your report, even if you have not selected them.

Some display files are comments with header codes followed by a slash (/) (e.g., Exp Type/). The definitions for these comment header codes and descriptions are found in Appendix H.

PERFORM QUERY

Review Query (*Advanced Query Only*)

Before conducting a search using your search criteria, you may want to review your search strategy. Click on the Review Query under the Key Function area at the top of the Advanced Database Query page. For documentation purposes, you may want to print the Review Query information and attach it to the reports that are generated using the search criteria.

Restore Defaults

This Restore Defaults button will clear the search criteria and restore the report format to its original default selections.

Perform Query on Aquatic Data / Perform Query on Terrestrial Data

Click the “Perform Query on Aquatic Data” or “Perform Query on Terrestrial Data” button when you are ready to initiate your search strategy and create a report/output. While the system is performing the database search, a separate window is created indicating that

an ECOTOX database search is generating. When the search is complete, the appropriate results (report contents or data file name) for aquatic or terrestrial report(s) will appear in this window. Information about how to retrieve your output will display:

- The report will generate momentarily...
 - The report may span more than one page; click on the 'Next' or page number buttons to move through the output.
 - Close the search results window before conducting a new search.
 - If the number of retrieved records is too large, a report will not be presented.
 - There is a maximum number of 5000 tabular records that can be retrieved in one search. The Delimited and MS Excel exports will retrieve up to 10,000 records.
- If the number of records is larger than you would like to view, you may close the report window and return to the ECOTOX Database window to refine your search strategy.

Once you have completed your search, and closed the report window, you will be returned to the ECOTOX database window. The search strategy will remain intact, so you may go back and refine your search if you wish. If you want to conduct another search, you may clear the search by clicking the 'Restore Defaults' button in the Key Function area at the top of the search window.

EXITING ECOTOX

Exiting your Web browser or visiting another Web site will leave the program. Exiting the Web browser will not save your search strategy.

APPENDIX A: ECOTOX SEARCH PLANNING FORM

Use this form to help plan your searches or to document searches for yourself or others to perform.

Species

Scientific Names/ Taxonomic Levels	Common Names	Species Numbers	Predefined Taxonomic Groups
			<input type="checkbox"/> All Animals <input type="checkbox"/> Amphibians <input type="checkbox"/> Insects/Spiders <input type="checkbox"/> Molluscs <input type="checkbox"/> Birds <input type="checkbox"/> Other Invertebrates <input type="checkbox"/> Reptiles <input type="checkbox"/> Crustaceans <input type="checkbox"/> Mammals <input type="checkbox"/> Worms <input type="checkbox"/> Fish <input type="checkbox"/> All Plants <input type="checkbox"/> Algae, Moss, Fungi <input type="checkbox"/> Flowers, Trees, Shrubs, Ferns Special Interest <input type="checkbox"/> Standard Test Species <input type="checkbox"/> U.S. Threatened and Endangered Species <input type="checkbox"/> U.S. Exotic/Nuisance

Chemicals

Chemical Names	CAS Numbers	Predefined Groups
		Metal Compounds <input type="checkbox"/> Aluminum <input type="checkbox"/> Antimony <input type="checkbox"/> Barium <input type="checkbox"/> Beryllium <input type="checkbox"/> Cadmium <input type="checkbox"/> Cobalt <input type="checkbox"/> Copper <input type="checkbox"/> Organotin <input type="checkbox"/> Iron <input type="checkbox"/> Lead <input type="checkbox"/> Manganese <input type="checkbox"/> Nickel <input type="checkbox"/> Selenium <input type="checkbox"/> Silver <input type="checkbox"/> Vanadium <input type="checkbox"/> Zinc Organic Compounds <input type="checkbox"/> DDT and metabolites <input type="checkbox"/> Dibenzofurans <input type="checkbox"/> Glycol Ethers <input type="checkbox"/> Nitrosamines <input type="checkbox"/> Phthalate Esters <input type="checkbox"/> Polyaromatic Hydrocarbons (PAHs) <input type="checkbox"/> Polychlorinated Biphenyls (PCBs)

Test Results

Endpoints: _____

Effect Groups:

<input type="checkbox"/> Accumulation	<input type="checkbox"/> Mortality
<input type="checkbox"/> Behavior	<input type="checkbox"/> Physiology
<input type="checkbox"/> Biochemical	<input type="checkbox"/> Population
<input type="checkbox"/> Cellular	<input type="checkbox"/> Reproduction
<input type="checkbox"/> Growth	<input type="checkbox"/> Ecosystem

☐ Specific Effect Measurements _____

☐ Include Recovery Results (for aquatic data)

Test Conditions

Test Location(s):

<input type="checkbox"/> Lab	<input type="checkbox"/> All Field Tests
	<input type="checkbox"/> Field Artificial
	<input type="checkbox"/> Field Natural
	<input type="checkbox"/> Field Undeterminable

Exposure Media:

WATER: ☐ Freshwater ☐ Saltwater ☐ Unknown

SOIL: ☐ Artificial ☐ Humus ☐ Litter ☐ Manure ☐ Mineral Soil ☐ Mixture ☐ Natural Soil
☐ Unspecified Soil

ARTIFICIAL: ☐ Hydroponic ☐ Other ☐ No Substrate

Exposure Type:

<input type="checkbox"/> Diet	<input type="checkbox"/> Flow-through (aquatic)
<input type="checkbox"/> Injection	<input type="checkbox"/> Leaching (aquatic)
<input type="checkbox"/> Topical	<input type="checkbox"/> Intermittent (aquatic)
<input type="checkbox"/> Environmental (terrestrial)	<input type="checkbox"/> Renewal (aquatic)
<input type="checkbox"/> Multiple Entry (terrestrial)	<input type="checkbox"/> Static (aquatic)
	<input type="checkbox"/> Tidal (outdoor aquatic)
	<input type="checkbox"/> Lentic (outdoor aquatic)
	<input type="checkbox"/> Lotic (outdoor aquatic)

Chemical Analysis: ☐ Measured ☐ Unmeasured ☐ Not Reported

Publications

Publication Years: _____

Reference Number(s): _____

Update Dates: _____

Report Format

- ☐ Browser Viewable Tabular Report - Multiple viewable pages
☐ Browser Viewable Full Record
☐ MS Excel
☐ Delimited Report - used for importing into other software applications (e.g. Excel, Lotus etc.)

Sort Fields: 1) _____ 2) _____ 3) _____

Field Output Selections: Standard default output elements are listed in bold. Some aquatic output options are available for Field Data only, and are indicated by (Field Data Only). Modifications to report options are only available in the Advanced Database Query.

Aquatic Output Elements (default report items are in bold)	Terrestrial Output Elements (default for browser viewable or delimited are in bold) (modify for delimited output only)
<input type="checkbox"/> Test Location <input type="checkbox"/> CAS Number/Chemical Name <input type="checkbox"/> Scientific Name/Common Name <input type="checkbox"/> Endpoint <input type="checkbox"/> Effect <input type="checkbox"/> Trend <input type="checkbox"/> Exposure Type <input type="checkbox"/> Exposure Duration <input type="checkbox"/> Media Type <input type="checkbox"/> Concentration Type <input type="checkbox"/> Concentration/Application Rate (Field Data only) <input type="checkbox"/> Application Type (Field Data Only) <input type="checkbox"/> Application Frequency (Field Data Only) <input type="checkbox"/> Application Season/Date (Field Data Only) <input type="checkbox"/> Significance/ Level <input type="checkbox"/> Response Site <input type="checkbox"/> Reference Number <input type="checkbox"/> Application Rate (Field Data Only) <input type="checkbox"/> Alkalinity <input type="checkbox"/> BCF Value <input type="checkbox"/> Chemical Analysis Method <input type="checkbox"/> Chemical Comments <input type="checkbox"/> Comments <input type="checkbox"/> Control Type <input type="checkbox"/> Documentation Code <input type="checkbox"/> Effect % <input type="checkbox"/> EE Comment <input type="checkbox"/> Experimental Design <input type="checkbox"/> GEO Code (Field Data Only) <input type="checkbox"/> Geographic Location (Field Data Only) <input type="checkbox"/> Habitat Code <input type="checkbox"/> Habitat Description (Field Data Only) <input type="checkbox"/> Hardness <input type="checkbox"/> Ionic Fraction <input type="checkbox"/> Test Number <input type="checkbox"/> Longitude/Latitude (Field Data Only) <input type="checkbox"/> Organic Carbon <input type="checkbox"/> Organic Carbon Type <input type="checkbox"/> Organism Comment <input type="checkbox"/> pH	<input type="checkbox"/> Application Frequency <input type="checkbox"/> Basis of measurement (wet/dry) <input type="checkbox"/> CAS Number <input type="checkbox"/> Chemical Analysis Method <input type="checkbox"/> Chemical Name <input type="checkbox"/> Chemical Comment <input type="checkbox"/> Chemical Formulation <input type="checkbox"/> Chemical Grade <input type="checkbox"/> Chemical Purity <input type="checkbox"/> Concentration/Dose <input type="checkbox"/> Control Type <input type="checkbox"/> Documentation Code <input type="checkbox"/> Dose Number <input type="checkbox"/> Dose Statistical Method <input type="checkbox"/> Effect <input type="checkbox"/> Effect Measurement <input type="checkbox"/> Endpoint <input type="checkbox"/> Exposure Dose <input type="checkbox"/> Exposure Duration <input type="checkbox"/> Exposure Number <input type="checkbox"/> Exposure Comment <input type="checkbox"/> Exposure Type <input type="checkbox"/> Gender <input type="checkbox"/> Ionic Fraction <input type="checkbox"/> Lifestage <input type="checkbox"/> Media Type <input type="checkbox"/> Observation Duration <input type="checkbox"/> Observed Response <input type="checkbox"/> Organism Age <input type="checkbox"/> Organism Comment <input type="checkbox"/> Organism Source <input type="checkbox"/> Publication Year <input type="checkbox"/> Reference Citation <input type="checkbox"/> Reference Number <input type="checkbox"/> Response Site <input type="checkbox"/> Result Comment <input type="checkbox"/> Result Percent Lipid <input type="checkbox"/> Result Percent Dry/Wet Weight <input type="checkbox"/> Result Record Number <input type="checkbox"/> Result Statistical Method

<input type="checkbox"/> Publication Year <input type="checkbox"/> Reference Citation <input type="checkbox"/> Salinity <input type="checkbox"/> Species Number <input type="checkbox"/> Species Taxonomic Information <input type="checkbox"/> Study Type <input type="checkbox"/> Substrate Code (Field Data Only) <input type="checkbox"/> Temperature	<input type="checkbox"/> Reviewer Assigned Endpoint <input type="checkbox"/> Sample Number <input type="checkbox"/> Significance/ Level <input type="checkbox"/> Soil Cation Exchange Capacity <input type="checkbox"/> Soil Concentration Measured <input type="checkbox"/> Soil Moisture <input type="checkbox"/> Soil Organic Matter <input type="checkbox"/> Soil pH <input type="checkbox"/> Soil Clay % <input type="checkbox"/> Soil Sand % <input type="checkbox"/> Soil Silt % <input type="checkbox"/> Species Common Name <input type="checkbox"/> Species Scientific Name <input type="checkbox"/> Species Number <input type="checkbox"/> Species Taxonomic Information <input type="checkbox"/> Study Duration <input type="checkbox"/> Test Comment <input type="checkbox"/> Test Location <input type="checkbox"/> Test Number
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APPENDIX B: PRACTICE SEARCHES

These examples are for you to try in the Advanced Database Query pages. After each example search, remember to click on “Restore Defaults ” before proceeding to the next search.

Example A

You want to locate all reproductive effects data for nickel compounds. What types of reproductive effects were measured?

1. Click on Chemicals from the menu. Scroll down to Predefined Chemical Lists. Select **Nickel** from the metal compound list,
2. Click on “Test Results” from the menu. Scroll to the Effects list. Click on Group Effect **REPRODUCTION**. This will display and select all the reproductive effects within ECOTOX.
3. For Aquatic data, click on menu item Report Format. Select **EE COMMENT** from the Aquatic Report Format, for the tabular report. The Terrestrial default full data will display the specific measurement in the report.
4. Click on “**Perform Query for Aquatic Data**” button for aquatic data. Click on “**Perform Query for Terrestrial Data**” button for terrestrial data.

Example B

You want to locate LC50 data on freshwater organisms exposed to malathion.

1. Click Chemical menu. Type in CAS Number: **121755** or **Malathion** in the Chemical Entry selection box.
3. Click Test Results menu. In the Endpoint menu, select **LC50/LD50** checkbox.
4. Click Test Conditions menu. Scroll down to the Exposure Media page and click on **FRESHWATER** checkbox.
5. Click on “**Perform Query for Aquatic Data**” button.

Example C

You want to locate recently published, lethality endpoint only studies on Daphnia magna.

1. Click Taxonomic menu. Type in **DAPHNIA MAGNA** and select the Genus/Species Name category.
3. Click on Test Results hotlink from the menu. In the Endpoint entry area, select all the Concentration and Time based endpoint check boxes.
4. Scroll down to the Effects selection area and click on the **MORTALITY** Effect Group checkbox.
5. Click on Publications/Updates menu. In the Publication selection box area, select **2000** in the first drop down list and select **2004** in the second drop down list from the items.

6. Click on “**Perform Query for Aquatic Data**” button.

Example D

You want to locate toxicity data for amphibian tests performed in an outdoor location. You would like to move these data records into your own database.

1. Click on the Species menu. In the Predefined Taxonomic Group, check the **Amphibians** box.
2. Click on the Test Conditions menu. In the Test Location area, select the checkbox **ALL FIELD TESTS** from the list.
3. Click Report Format menu. Click on the **DELIMITED REPORT** option for both aquatic and terrestrial. Note: If you only want larval aquatic lifestage, specify the aquatic habitat; adult terrestrial lifestage specify the terrestrial lifestage.
4. Click on “**Perform Query for Aquatic Data**” then “**Perform Query for Terrestrial Data**” buttons.

Example E

You want to use terrestrial Standard Species and locate data that are in the EPA Office of Pesticide Products Database.

1. Click on Publications/Update menu. Select the **EPA Office of Pesticide Products Dataset** checkbox within the Independently Compiled Data selection box area.
2. Click on Taxonomic menu. Scroll down to Predefined Taxonomic Group. Select **Standard Species**.
3. Click on “**Perform Query for Terrestrial Data**” button.

APPENDIX C: ECOTOX DATABASE OVERVIEW

Data Sources

The primary source of toxicity effect information in ECOTOX is the peer reviewed literature. Pertinent literature is identified through online computerized searches of the international literature. The computerized searches were initiated with the 1970 publication year and continue through to the present. Comprehensive searches are designed to include the effect of nearly all toxic substances on aquatic and terrestrial organisms within the scope of each ECOTOX database systems' guidelines. Commercial literature sources are continually evaluated for relevance to the ECOTOX literature searches. The search strategy is evaluated regarding the success ratio of each search. Additional literature sources include abstract journals, review bibliographies, and the EPA MED library collection.

The abstracts obtained through computerized searches of abstracting databases are screened to identify toxicity references applicable to aquatic and terrestrial habitats. Those references pertinent to one or more of the databases are acquired through a variety of literature acquisition procedures such as author reprint requests, inter-library loans, and commercial sources. As the publications are received, a reference number is assigned for storage and retrieval purposes, and a final check for applicability and duplication is made. A bibliographic sub-file stores the citations and a reprint of each publication is archived.

Publications used in ECOTOX usually contain unique data. Toxicity test data are included unless the data have been cited as published elsewhere. Data reported in review papers are abstracted from the original publication. International publications may be reviewed by ECOTOX staff if either an English abstract or a translated table of data is included. International cooperative efforts with the Organization for Economic Cooperation and Development (OECD) and Russia (Borok Institute) have been used to enhance review of the international literature.

Data obtained from independently compiled data files must meet the minimum data requirements and quality assurance guidelines defined for each ECOTOX database component. The key data fields that must be included are: test chemical name, test organism, test duration, effect, and effect concentration or application rate. Table 1 outlines the minimum data requirements for each ECOTOX database.

Table 1: ECOTOX Minimum Data Requirements

Requirement	AQUIRE	PHYTOTOX	TERRETOX
Chemical	Single chemicals relevant to environmental exposure	Single chemicals relevant to environmental exposure	Single chemicals and oils relevant to environmental exposure.
Species	Exclusively aquatic plants and animals	Terrestrial plants	Air-breathing animals (e.g., includes ducks, whales)
Effect	Biological effect on live organisms	Biological effect on live organisms	Biological effect on live organisms
Concentration or Dose Value	Must have concurrent environmental chemical concentration/dose	Must have concurrent environmental chemical concentration/dose	Must have concurrent environmental chemical concentration/dose
Exposure Duration	Duration required, except for abstracts	Duration required	Duration required
Concentration or Dose/ Response	Endpoints hierarchically coded. Non-statistically analyzed and qualitative data may be summarized by effect into one test.	Since February, 2000, all endpoints and individual quantitative dose - response data.	All endpoints and individual quantitative dose - responses data.

Documentation describing the test methods must be provided within the publication. If tests are missing key parameters, the data are rejected. No effort is made to locate unreported data (e.g., authors are not contacted, citations referring to methods used are not obtained). During the incorporation of an electronic data file, a quality assurance check of the CAS number, species scientific name, and reference citation is completed. Data files that have been included in the aquatic dataset are the [MED fathead minnow acute toxicity database](#) (Center for Lake Superior Studies; University of Wisconsin-Superior, 1984, 1985, 1986, 1988, and 1990), and data sets from France, Germany, the Netherlands and Russia. ECOTOX also includes the U.S. EPA OPP's Pesticide Ecotoxicity Database for both aquatic and terrestrial toxicity tests. Appendix F contains additional information and contacts for independently compiled data files.

Quality Assurance

Quality assurance procedures begin with literature acquisition and cataloging, and continue through the chemical and species verification, the literature review process, data entry, and data retrieval. The ECOTOX literature is encoded by trained document abstractors. An intensive training period, a well-documented manual (U.S. EPA 2003), and close interaction with the data coordinator help to ensure a high level of accuracy and consistency in the reviewing process. Ten percent of the publications are independently reviewed by two different reviewers. These reviews are compared, differences (if any) are documented, discussed, and resolved by the data coordinator.

Aquatic Data Elements

Aquatic data includes toxic effect results from exposures of single chemicals to aquatic organisms. Bioassays not included are water chemistry effects (e.g., pH), complex effluents, sediment studies that do not report a water concentration and chemical mixtures. If a publication contains data for a single chemical besides one of the above categories of toxicants, the paper is retained and only the single chemical data are used in ECOTOX. Test organisms are limited to those that are exclusively aquatic.

Amphibian and insect data for purely aquatic life stages of the organism are included. Information and data for terrestrial life stages of these organisms is included in the terrestrial database. Classes of organisms associated with the aquatic environment (e.g., birds, mammals, reptiles) are coded in the terrestrial database. Microbial communities (bacteria and virus) are omitted from the aquatic database. Terrestrial plants tested in hydroponic or nutrient solutions are coded in the terrestrial database.

The data elements for each test are grouped by chemical, organism, exposure conditions, and effect endpoint. The test chemical parameters describe the toxicant, the associated CAS registry number, and the grade, purity and/or composition of the toxicant. The test organism parameters define the type of organism and the lifestage being tested. The test conditions identify the test water, test location, exposure type and duration, control parameters, and basic water chemistry. The effect endpoint parameters consist of a code to define the lethal, sublethal, or residue endpoint and the corresponding test chemical concentration.

Aquatic Effect Parameters

A separate line is coded for each effect or endpoint from either a unique experimental design or within one design scenario for statistically defined effects or endpoints. If no statistics are used to distinguish endpoints or effects and experimental designs are similar the data may be combined into one data record. Endpoints always require a discrete line. Effects lacking an author reported endpoint may be combined based on statistical representation by the author. Food chain effects are coded for organisms at the first level of exposure.

Toxicity test results are primarily reported for observations taken during the chemical exposure. However, when results are reported only for the period of time after the exposure, i.e. recovery or delayed effects, this type of result is noted by using a "~" in conjunction with the endpoint/effect code, e.g., ~MOR for a delayed mortality effect.

Terrestrial Data Elements

Toxicity data includes toxic effect results from exposures of single chemicals to terrestrial organisms. The terrestrial toxicity database includes individual dose response values, if reported. Only quantitative data are encoded from the publication, qualitative data are excluded. Graphical data may be coded as ranges and is reported by using <, > or ~ operators with the value.

Bioassays not included are contaminated soils, sediment studies and chemical mixtures. If a publication contains data for a single chemical besides one of the above categories of toxicants, the paper is retained and only the single chemical data are used in ECOTOX. Test organisms are limited to those that are exclusively terrestrial.

The data elements for each test are grouped by chemical, organism, exposure conditions, and effect endpoint. The test chemical parameters describe the toxicant, the associated CAS registry number, and the grade, purity and/or composition of the toxicant. The test organism parameters define the type of organism, organism source and the lifestage being tested. The test conditions identify the test location, exposure type and duration, control parameters, and basic soil parameters. The effect endpoint parameters consist of a code to define the lethal, sublethal, or residue endpoint and the corresponding test chemical concentration.

If the author does not report data for a terrestrial database field, the field will display a "NR" (not reported).

The terrestrial data identifies sources of alternative data (domestic, laboratory animal or plant toxicity and bioaccumulation information) when there is a paucity of information on wildlife species. Animals associated with the aquatic environment that breathe using lungs (e.g., ducks, whales) are included in the terrestrial database. Exposures to the aquatic life stages of amphibians and insects are included in the aquatic database.

Decisions regarding the inclusion of animal terrestrial species are based on published terrestrial wildlife toxicity standard methods and procedures documentation. The priority for the animal portion of the database is wildlife avian species, e.g. mallard, pheasant or bobwhite; mammalian species, e.g., meadow vole, deer mouse or mink; and beneficial invertebrate species, e.g., earthworm, honey bee, leafcutter bee or alkali bee. If data for other species including laboratory, domestic or non-beneficial organisms are reported in a publication, data for all test species are coded for ECOTOX

Terrestrial plant data includes native, crop, or weed species. Terrestrial plants tested in hydroponic or nutrient solutions are coded in the terrestrial database. Aquatic plant exposures are recorded in the aquatic database.

Test Identification

Test identification number is used to designate each unique test design. A unique test design may be characterized by a new test chemical, test species, test location, or exposure type. Additionally, there are experimental design parameters that will influence a test scenario sufficiently to warrant an independent test record. Such parameters include tests conducted at different test temperatures or conducted during different seasons.

References

Center for Lake Superior Environmental Studies, University of Wisconsin-Superior; 1984, 1985, 1986, 1988, and 1990. *Acute Toxicities of Organic Chemicals to Fathead Minnows (Pimephales promelas)*, Vol. 1-5. University of Wisconsin-Superior, Superior, WI.

U.S. Environmental Protection Agency. 2004. *MED Ecotoxicology Database Standard Operating Procedures* (prepared by Computer Sciences Corporation, Contract 68-W-02-032, Task 2024), Mid-Continent Ecology Division, Duluth, MN.

APPENDIX D: SPECIES AND CHEMICAL VERIFICATION

Species Verification

The test organism is identified by the current scientific name as verified in the taxonomic literature. For each species entry, the verified name, taxonomic kingdom, nomenclature history, and verification sources are kept on file for documentation purposes. A species number can be located using the species scientific name or common name. ECOTOX retains all species name synonyms that are no longer used for taxonomic classification. These synonyms are identified within the scientific name file by a trailing 'Historical name' after the scientific name. You are able to search in ECOTOX using the species synonym name, however, your output will contain the currently accepted species name. Taxonomic kingdoms are divided into plant (including fungi and monera) and animal.

Field studies may report results for a target community (e.g. benthic macroinvertebrates) or for an entire enclosed ecosystem (e.g. system-level primary productivity or respiration). If a community of organisms was tested, the species grouping from the publication is reported.

Taxonomic Hierarchy

You can search on various taxonomic levels. Within the Browse Species index, you can view the taxonomic levels for each species:

- Kingdom
- Phylum
- Division
- Subphylum
- Superclass
- Class
- Order
- Family
- Genus
- Species
- Subspecies
- Variety

The taxonomic levels are verified by the ITIS (Integrated Taxonomic Information System, located at: [http:// www.itis.usda.gov/](http://www.itis.usda.gov/)). If the taxonomic levels are not available with ITIS, other taxonomic sources are used.

Predefined Special Interest Sources

The species of special interest groups were compiled using the following references:

Standard Test Species References
<ol style="list-style-type: none"> 1) EPA, Office of Solid Waste and Emergency Response, Publication 9345.0-051 (ECO Update Volume 2, No. 2) 2) BC Research, Inc. 3) ASTM 4) OECD Test Guidelines 5) EPA, Office of Prevention, Pesticides and Toxic Substances, Harmonized Test Guidelines, Series 850, Ecological Effects Test Guidelines
U.S. Threatened and Endangered Species Reference
<p>U.S. Fish and Wildlife Service (http://endangered.fws.gov/wildlife.html#Species) Updated annually.</p>
U.S. Exotic/Nuisance Species References
<ol style="list-style-type: none"> 1) ANS Task Force. (2003) Dedicated to the prevention and control of nuisance aquatic species. http://www.anstaskforce.gov/index.htm# 2) Aquatic Invasive Species and the Great Lakes: GLERL's Program and Action Plan. http://www.glerl.noaa.gov/pubs/brochures/invasive/invasive.pdf 3) Chesapeake Bay Program Office (2003). Invasive Species Workshop. http://www.chesapeakebay.net/search/ongoingproj.cfm?GROUP_INIT=NISW&GROUP_AFFIL=Living 4) Exotic Species of the Monterey Bay National Marine Sanctuary. http://bonita.mbnms.nos.noaa.gov/sitechar/spex.html 5) Exotic Species Program. 2003. Harmful Exotic Species of Aquatic Plants and Wild Animals in Minnesota: Annual Report for 2002. Minnesota Department of Natural Resources, St. Paul, MN. 6) Flack, Stephanie & Elaine Furlow (1996). America's Least Wanted, A lineup of the country's twelve meanest environmental scoundrels. Nature Conservancy - November/December pp. 17-23. 7) Great Lakes Panel on Aquatic Nuisance Species. (Aug.1998) Biological Invasions, How aquatic nuisance species are entering North American waters, the harm they cause and what can be done to solve the problem. 8) Hellquist, C. Barre. (1997). A Guide to Invasive Non-native Aquatic Plants in Massachusetts. Massachusetts Department of Environmental Management, Lakes and Ponds Program. 9) Illinois Dept of Natural Resources& Natural Areas Techniques Forum. NAA Chinese Yam Task Force, jshimp@dnrmail.state.il.us 10) Invasivespecies.gov (2003) A gateway to Federal and State invasive species activities and programs. http://www.invasivespecies.gov/profiles/main.shtml 11) Minnesota Dept of Natural Resources (Jan. 2000). On the Water Front, The Exotic Species Update. 12) Minnesota Sea Grant, Exotic Species Program. http://www.seagrants.umn.edu/exotics/fishhook.html 13) Mortensen, Carol Estes. Is it a wildflower, or is it a weed? Minnesota National Forests, Leech Lake Reservation Division of Resources Management. 14) National Biological Information Infrastructure (2003). Invasive Species Information Node. http://invasivespecies.nbii.gov/downloads/SppListMaster18jun02.xls 15) Rendall, Jay. (1999) Weeds Gone Wild. Minnesota Conservation Volunteer, July-Aug 1999 16) Stratford, Kay & Barbara Doll. Invasive Aquatic and Wetland Plants. Field Guide. North Carolina Sea Grant. 17) The Great Lakes Schoolship, Inland Seas Education Association, Invasive Species Education Program. http://www.schoolship.org/invasivespecies/docs2/K_Invasive_Species_Table.pdf 18) The Nature Conservancy (1996). America's Least Wanted: Alien Species Invasions of U.S.

Ecosystems.

19) USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

20) "USGS, Nonindigenous Aquatic Plant

Maps and Species Accounts http://nas.er.usgs.gov/plants/sp_accnts.html"

21) USGS: Nonindigenous Aquatic Species. <http://nas.er.usgs.gov/>

22) USGS: Nonindigenous Mollusk Distribution Information . <http://nas.er.usgs.gov/>

23) Western Regional Panel on Aquatic Nuisance Species, (Sept 2001). The invasion of western waters by non-native species, Threats to the West.

24) Wisconsin Department of Natural Resources (2003). Non-native Plants.

<http://www.dnr.state.wi.us/org/land/er/invasive/nonnative.htm>

Chemical Verification

A standardized identification number and name for each chemical recorded in the database is used for consistency. Chemicals reported in the ECOTOX database are cataloged by using a Chemical Abstracts Service (CAS) registry number. If a CAS registry number is not available for the test chemical, toxicity data cannot be included in ECOTOX. Toxicants not included in ECOTOX are water chemistry effects (e.g., pH), complex effluents and chemical mixtures. If the author states that a soil nutrient is added to maintain test organism growth, the test is included. If the test includes a series of nutrient doses and a toxicant to produce interactive effects, this is considered a mixture and excluded.

Retrieval is made by using the CAS number, chemical name or chemical list. The Collective Index (CI) name is used as the standardized name for storage and retrieval. A separate index file is available for screening CAS numbers and chemical names used in ECOTOX. It is important to stress that you refer to the original publication to obtain additional test chemical information which may affect the context of toxicity information retrieved from ECOTOX.

APPENDIX E: ECOTOX DATA FIELD DESCRIPTIONS

All associated codes for these field are located in the ECOTOX Code List. Data fields are listed for both aquatic and terrestrial. If the field is only available for one database, this is noted (Aquatic only or Terrestrial only).

Chemical Fields

Chemical Carrier - Solvent used to dissolve toxicant in solution or positive control.

CAS Number - Chemical Abstracts Service (CAS) Number.

Chemical Name - CAS Collective Index Name.

Chemical Grade - Grade of chemical.

Chemical Purity - Percent purity or active ingredient.

Chemical Formulation - Formulation of chemical.

Chemical Comment - Chemical formulation code, trade names, synonyms, isomer names.

Chemical Radiolabel - The isotope of a test or carrier chemical. For terrestrial results, this is not viewable in the browser full data record.

Species Fields

Species Number - Unique number assigned by ECOTOX software.

Species Scientific Name - Currently accepted scientific name (genus,species).

Species Common Name - Species or taxonomic grouping common name(s).

Organism Source (Terrestrial only) -The type of source the test organism was obtained

Organism Lifestage - Initial test organism lifestage.

Organism Age - Initial age of the test organism.

Organism Comment - Initial age, weight, length, developmental stage or cell concentration of test organism.

Species Group - Predefined taxonomic groups name. For more documentation and list of groups, see Predefined Taxonomic Groups.

Species Taxonomic Information - Organism classification hierarchy (Kingdom, Phylum/Division, Subphylum, Superclass, Class, Order, Family, Genus, Species).

Kingdom - Divides all species into two kingdoms (plant or animal). The plant kingdom includes Monera and Fungi species. A taxonomic group (e.g., aquatic community, plankton) that has both plant and animal kingdoms into one result are included in both plant and animal kingdom search. (Search option only. Not an output option)

Test Condition Fields

Application Frequency

The number of doses applied during the exposure.

Media Type

Aquatic - Freshwater (FW) tests include those 1) conducted in freshwater, reconstituted water, distilled water, or tap water or 2) the organism habitat is exclusively freshwater. Saltwater (SW) tests include those 1) conducted in natural or artificial seawater, brackish water, or estuarine water or 2) the organism habitat is exclusively saline. If a salinity value of four parts per thousand is reported, it is considered a freshwater test.

Terrestrial - Type of exposure media, (e.g., natural or artificial soil, hydroponic, filter paper). If an aqueous exposure is conducted in pore water from a specific soil, report the soil parameters in the soil characteristics fields (pH, CEC, OM, etc.).

Test Location

Aquatic - A natural (Field N) study is an experiment conducted outdoors in a natural water body or in an artificial water body that has a natural bottom substrate and established aquatic communities (e.g. phytoplankton, zooplankton and fish). Outdoor studies conducted in an artificial water body without a natural bottom substrate are considered artificial studies (Field A). If the water body cannot be determined to be natural or artificial it is coded as field unknown (FieldU). All other studies are considered laboratory (LAB) tests.

Terrestrial - The location or setting in which the experiment was conducted. For example, a natural field study (FieldN) is an experiment conducted outdoors in a natural setting. The test organisms are sampled in the wild, e.g. population counts. Outdoor studies conducted in a simulated environment are coded as an artificial field study (FieldA). Artificial field studies include organisms isolated from their natural environment via an enclosure of some type, e.g. cages or fencing. If the publication does not provide enough information to distinguish between FieldA and FieldN, then use the code FieldU to indicate that the field test type is unknown. Laboratory tests (LAB) are conducted indoors under controlled laboratory conditions.

Exposure Duration

Aquatic - Exposure duration is coded using the units reported in the literature. For a fluctuating or intermittent dosing experiment, the total exposure time is recorded. For delayed effects, report the duration of the entire study.

Terrestrial - The period of time recorded in the data field is the time of actual exposure to the chemical. It is assumed that the exposure duration is equivalent to the longest observation time. In some cases a biological time is used, such as an exposure time reported as "until hatch", "growing season" or "after the nth egg has been laid".

For injection, diet, topical and environmental exposures where the actual exposure is dependent on biological and environmental conditions, the exposure time is recorded as equivalent to the study time.

Author Reported and Standardized Duration

ECOTOX offers two output options for duration, the duration as the author reports in the publication and duration that is converted to a standard unit (days).

Study Duration (Terrestrial only)

In cases where the observation time is the only duration reported, it is assumed that the exposure duration is equivalent to the study time.

In some cases a biological time is used, such as an exposure time reported as "until harvest", "growing season" or "after the nth egg has been laid". The term that best describes the authors text is used.

For injection, diet, topical and environmental exposures where the actual exposure is dependent on biological and environmental conditions, the exposure time is recorded as equivalent to the study time.

Author Reported and Standardized Duration

ECOTOX offers two output options for duration, the duration as the author reports in the publication and duration that is converted to a standard unit (days).

Exposure Type

Aquatic - Exposures must either be aqueous, through the diet, or by injection. In vitro toxicity test results are not coded.

Terrestrial - The mechanism by which the toxicant was applied. Organisms are typically exposed to toxicants through diet, injection, topical or environmental routes. On occasion, an exposure may be through multiple routes (e.g., such as topical and oral). The terrestrial databases does not include in vitro assays in the database.

Exposure types are searched by major exposure groups. However, a more specific exposure type is displayed in your output (e.g., searching on Intercutaneous is found under the Injection exposure type).

Chemical Analysis

Quantitative analysis of water in test chambers or field sites are considered a measured concentration. Concentrations that are not analyzed in test chambers or field sites are considered unmeasured (nominal).

Application Frequency - The frequency of dosing application is reported

Study Type (Aquatic only)

The study type is used to identify field simulation studies. Examples of field study types include exposures conducted in a mesocosm, microcosm or enclosure.

Control

Control information for the reported effect may be presented in the text, in a graph, or in table format. ECOTOX does not make assessments whether the controls were satisfactory or insufficient (e.g., were replicates run, did control organisms die), but simply document whether the author(s) present information about the type of control that was used.

Dose Number (Terrestrial only)

The total number of exposure doses, including the control(s), for each independent test design is reported in this data field.

Experimental Design

This field is used to code additional study information. For field tests, exposure system dimensions (e.g. pond or lake depth, cage or enclosure size), type of artificial substrate and physical or chemical water chemistry parameters are reported.

For laboratory studies, information about media and test chambers is coded if one of the purposes of the study is to compare results observed under differing test conditions (e.g., pH, temp, humic acid, sediment) or if commercial media types (e.g. Instant Ocean©) were used in the study.

Exposure Sample Number (Terrestrial only)

Sample number reflects the initial sample size for each exposure dose, i.e., the number of test organisms per treatment.

Gender (Terrestrial only)

Identifies the initial sex (ML - Male, FM - Female, BH - Both) of the organism for each exposure level.

Ionic Fraction

For ionizing substances (e.g., metals, ammonia), the dose is reported as the ion, if the concentration presented by the authors is reported as based on the ionic form of the compound (e.g., organotin as Sn). ECOTOX uses standard periodic table symbols.

Dose Statistical Method (Terrestrial only)

The method used to determine the range around the Dose value, if reported by the author(s). The codes standard deviation (SD), standard error (SE), range (R), confidence interval (CI), confidence limits (CL) or confidence value (CV) of the dose value are noted.

Test Result Parameters

Aquatic - A separate line is coded for each effect or endpoint from either a unique experimental design or within one design scenario for statistically defined effects or endpoints. If no statistics are used to distinguish endpoints or effects and experimental designs are similar the data may be combined into one data record. Endpoints always require a discrete line. Emphasis is placed on coding LC50, LD50, EC50 over other regression analyzed endpoints (e.g., EC20, LC100, LD10) when an author reports both endpoints. Effects lacking an author reported endpoint may be combined based on statistical representation by the author. Food chain effects are coded for organisms at the first level of exposure.

Toxicity test results are primarily reported for observations taken during the chemical exposure. However, when results are reported only for the period of time after the exposure, i.e. recovery or delayed effects, this type of result is noted by using a "~" in conjunction with the endpoint/effect code, e.g., ~MOR for a delayed mortality effect.

Endpoint

Endpoint information is coded if it is reported by the author. For the purposes of ECOTOX, an endpoint is defined as the quantification of an observed effect obtained through statistics or other means of calculation for the express purpose of comparing equivalent effects (e.g., LC50). Many terrestrial plant tests do not have associated endpoints. Prior to 1996, terrestrial plant database structure allowed only results based on percent change from control.

An asterisk (*) denotes the reported endpoint acronym provided was modified to conform to the standard database acronym terminology. For example, if the author reported a TLM, the endpoint was coded as an LC50*. The author reported acronym should appear in EE Remark field.

Effect

Effect information must be provided by the author in order for the test to be included. For ECOTOX database purposes, effect is defined as the observation of a response resulting from the action of a chemical stressor (e.g., mortality). The listing of effect measurements can be found by using the Browse Effects index, ECOTOX Code List or ECOTOX Code Appendix (includes many detailed measurement definitions). ECOTOX internally categorizes all observed effects under at least one of ten major effect group codes:

Accumulation (ACC) - Process by which chemicals are taken into and stored in the organism. Includes lethal body burden.

Behavior (BEH) - Activity of an organism represented by three subgroups, avoidance (AVO), general behavior (BEH) and feeding behavior (FDB). All effects related to reproductive behavior are listed under the Reproduction effect group.

Biochemistry (BCM) - Biotransformation or metabolism of chemical compounds, modes of toxic action, and biochemical organism responses. Biochemical has three subgroups, biochemical (BCM), enzyme (ENZ) and hormone (HRM) effects.

Cellular (CEL) - Changes in structure and chemical composition of cells and tissues in organisms. Three cellular subgroups include cellular (CEL) effects, genetics (GEN) and histology (HIS).

Growth (GRO) - Encompasses individual organism weight, length, development and morphology. Development (DVP) covers effects on tissue organization in growing early life stages. Growth (GRO) represents length and weight changes at any point in the life cycle. Morphology (MPH) measurements and endpoints address the structure (bones) and form (organ/tissue development) of an organism at any stage of its life history.

Mortality (MOR) - Death of individuals or measurements that indicate death.

Physiology (PHY) - Basic cell and tissue activities. Subgroups include injury (INJ), immunity (IMM) and intoxication (ITX).

Population (POP) - Effects on species or taxonomic group occupying the same area at a given time.

Reproduction (REP) - Reproductive behavior, physiology, care of progeny and avian/reptile eggs (AEG) measurements. Offspring development effects are found in Growth effect group.

Ecosystem (PRS) - Ecosystem processes include community structure and function. Includes microbial processes.

No Group Code (NOC) - Multiple effects or endpoint lacking a specific effect.

Trend (Aquatic only)

The observed or measured response trend as compared to the control is coded when textually or graphically reported.

Response Site

A response site or tissue code is used to identify specific body, organ or tissue effect sites for associated effect measurement.

EE_Comment (Aquatic only)

This field contains additional endpoint and/or effect text as described by the author. The types of information coded are described in the Aquatic Coding Guidelines

Effect % (Aquatic only)

Effect is reported as a raw percent value or percent change, e.g., percent of the total population or percent increase or decrease. The term "COM" is used to denote several effect measurements or response sites reporting data results as percentages.

Statistical Significance - Statistical analysis as compared to the control(s) in the test result.

Statistical Level

The level of significance (e.g. test statistic) is coded when the author has reported statistical analysis in the test result. Terminology for significance level may be presented as: $p =$; $p <$ or alpha value. The terminology are equivalent and are generally in the range of 0.001 to 0.10.

Bioconcentration

The bioconcentration factor (BCF) or bioaccumulation factor (BAF) is a unitless value describing the degree to which a chemical can be concentrated in the tissues of an organism in the aquatic environment (View Endpoint Code List for full definition). A bioconcentration endpoint is coded as either wet (or unknown) or as dry weight (BCF and BCFD, respectively). If the author does not calculate a BCF/BAF, the test is recorded as a residue measurement effect with a blank Endpoint and BCF/BAF field.

If a BCF/BAF is reported for the parent compound and for a metabolite, only the parent compound BCF/BAF is reported. Additional information about the BCF/BAF is reported, e.g., steady state equilibrium, lipid normalization is noted in the EE_Comment field.

Concentration Type (Aquatic only)

Concentrations based on the active ingredient or formulation, or as the total, un-ionized or dissolved concentration, are identified.

Endpoint Assignment

Used to identify the source of the effect or endpoint information is reported specifically by the author (P) or assigned by an ECOTOX reviewer (R)). The reviewer only assigns the endpoint, if the author has provided the statistical analysis that support the endpoint.

Concentration/Dose

The concentration or dose reflects either the range of concentrations tested or if there is and endpoint reported, the concentration associated with the endpoint. The confidence interval or range is recorded when available. If an asterisk (*) denotes the concentration has been recalculated from the author's original units to the standard ug/L or from the metal compound to the active ionic form.

In certain cases, the water concentration is routinely reported as active form of the test chemical. For metal salts, the concentration is generally expressed as ug ion/L (e.g., HgCl is expressed as Hg⁺). Since 1998, the data distinguish between the metal compound and the metal ion in the Ion field. Data encoded prior to this date, may have comments regarding ionic fraction in Comment field.

When an exponential number is reported (e.g., 1×10^6), it is coded as E+n or E-n (e.g., 1 E+6).

Author Reported and Standardized Concentration (Aquatic only)

ECOTOX offers two output options for concentrations, the concentration as the author reports in the publication and the concentration that is converted to a standard unit (ug/l), if possible.

Result Sample Number (Terrestrial only)

The sample number reflects the sample size (e.g., 10 embryos) that the observation or response value is based on at each exposure level. Sample units correspond to the sample number; i.e., the unit on which the measurement or endpoint is based.

For generational studies and measurements based on the progeny, F1, F2, etc. are noted in the sample units field.

Observed Duration (Terrestrial only)

The exposure duration when the result value was observed. This may be plus or minus any up to the time at which the response to the toxicant was observed. If the observation time is not reported or unable to be explicitly determined, a less than or equal to (\leq) the exposure duration is displayed.

Observations during the pretreatment time are reported as negative values. Report as '-x' any pretreatment response observations for which time is unknown.

Author Reported and Standardized Duration

ECOTOX offers two output options for duration, the duration as the author reports in the publication and duration that is converted to a standard unit (days).

Observed Response (Terrestrial only)

Response values may include greater than ($>$), less than ($<$), minus ($-$) or approximation (\sim) symbols, if used by the author(s). Response values must be numeric and from text or graph.

Result Statistical Method (Terrestrial only)

When the measurement unit includes a standard deviation (SD), standard error (SE), range (R), confidence interval (CI), confidence limits (CL) or confidence value (CV) of the response value are noted.

Result % Dry/Wet Weight (Terrestrial only)

If the effect measurement is based on dry (D) or wet (W) weight basis, it is denoted. The percent moisture is reported, record the percentage value also, e.g. W75%.

Result Percent Lipid (Terrestrial only)

Percent lipid in the whole organism or response site

Other Effects (Aquatic only)

Comments regarding other toxicity tests or effects reported in the publication that do not meet ECOTOX minimum data requirements are coded in this field. Commas separate each distinct term and the text ends with a double slash (/).

General Comment (Aquatic only)

This field contains additional information about any coding field that does not fit in the space provided. A complete list of comment identifiers that link to the associated field is documented in Appendix H: Comment Field Header Names.

Water Chemistry Fields (Aquatic only)

These measured values pertain either to the test water chemistry (preferred) or the dilution water chemistry values. If it is necessary to report the dilution water chemistry, this is denoted by an asterisk (*).

Alkalinity - Expressed as mg/L as CaCO₃.

Conductivity - Expressed in mhos/cm (= s/cm).

Dissolved Oxygen - Expressed in mg/L or percent saturation. A "SAT" code denotes 100% saturation.

Hardness - Expressed as mg/L as CaCO₃. If the author only reports the terms "hard" or "soft", these terms are recorded

Organic Carbon Type and Value - Expressed in mg/L as Carbon. (T= total, P= Particulate, D= Dissolved)

pH - pH value

Salinity - Expressed in parts per thousand (PPT) or as percent seawater.

Temperature - Expressed in degrees Celsius.

Outdoor Test Fields (Aquatic Field Data Only)**Habitat Code**

The aquatic field tests include the Cowardin* system level classification to describe major aquatic systems.

*Cowardin, L.M., V.Carter, F.C.Golet and E.T.LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79, 31 p. (http://wetlands.fws.gov/Pubs_Reports/Class_Manual/class_titlepg.htm)

Habitat Comment

The author's description of the water body, (e.g. brackish marsh, wooded swamp)

Substrate Code and Comment

The bottom substrate is recorded using standard substrate definitions.

Water Depth - Water depth of the experimental system.

Geographic Code

The standardized name, based on FIPS (Federal Information Processing Standards) code, of the country, or United States and Canadian state/province where the test was performed is displayed. You can view FIPS documentation at:

<http://www.itl.nist.gov/fipspubs/fip10-4.htm>

Geographic Location

Contains general text about the test site specific geographic identifiers (e.g., lake, river, bay, field station or city) where the study was performed.

Longitude/Latitude - The geographic location, latitude and longitude of the test site.

Application Type - The method of application of the chemical in a field study.

Application Rate

This field contains the application rate value and the units. If an exposure concentration is not reported, the application rate must be reported. Application rate units may be recalculated only if the denominator is not equal to one (e.g. 5 g/2.5 ac).

Chemical Half-Life - The test chemical half-life in the system.

Application Date/Season

The application date is recorded the time of initial exposure. This field includes the actual date, a partial date or a season. The format is MO-DA-YR. Examples: 12-01-93, 01-00-75, 00-00-64. If one pond is exposed multiple times, only report the first application date. If the calendar year date is not reported, but a season is, the season (Northern Hemisphere) of initial application of the chemical is reported.

Terrestrial Data Elements**Test Record**

A test record number is used to designate each unique test design. A unique test design may be characterized by a new test chemical, test species, test location, or exposure type. Additionally, there are experimental design parameters that will influence a test scenario sufficiently to warrant an independent test record. Such parameters include tests conducted at different test temperatures or conducted during different seasons.

Test Number

A computer generated number that designates each unique test design. There can be many tests number for each reference number

Exposure Number (Delimited format only)

A sequential number and dose type that identifies each experimental control or dose level. Control values are given the lowest numeric values, the dose values are added sequentially from lowest to highest doses.

Example:

1C = Exposure 1 was the control value

2D = Exposure 2 is the lowest dose value

3D = Exposure 3 is the middle dose value

4D = Exposure 4 is the highest dose value

5R = The exposure values are ranged (low - high)

6E = Only endpoint data are presented in the results.

The exposure dose(s) in the experimental methods are coded, even if the author did not report an effect result for every dose.

Parent Record and Result Number (Delimited format only)

The hierarchical database contains two fields that link records to the test record (i.e., parent file). A computer generated number that uniquely identifies each result record. These numbers are used to link between relational data files within a test number. The Parent Record Number within the Exposure and Result files is the number that links to the Test file. There may many result record numbers for each test number.

Test Comment (Terrestrial Only)

Additional information related to methodology or techniques used in the experimental design. Appendix H contains header codes used to link the comment to a specific ECOTOX field.

Exposure Comment (Terrestrial Only)

Additional information related to dosing methodology or techniques used in the test.

Result Comment (Terrestrial Only)

Additional information related to the endpoint or effect response. Appendix H contains header codes used to link the comment to a specific ECOTOX field.

Soil Parameter Fields (Terrestrial only)**Soil Type**

The classification name of the natural soil or commercial name of the artificial soil used in the study. If the classification name is not included, the type of soil is recorded using the author's terminology, e.g., forest soil, sandy loam soil, arboreal coniferous soil.

Soil Sand %, Soil Silt %, Soil Clay %

The soil texture as stated using percentages of sand, silt and/or clay. Bentonite, kaolinite or montmorillonite etc., are reported as clay.

Soil pH

The pH of the test media are reported. If the pH of the treated media is not presented, but the pH value is stated for the untreated or acclimation media, an asterisk (*) is denoted. If the pH of a specific soil type is not given in the publication, a search is made of the USDA/NRCS National Cooperative Soil Survey (USA) web site, at <http://soils.usda.gov/> may be found for the specific soil series.

Media Organic Matter

If organic matter is reported for the untreated or acclimation media, this will display with an asterisk (*). If the organic matter of a specific soil type is not provided in the publication, information from the USDA/NRCS National Cooperative Soil Survey (USA) online site, is used for the specific soil series.

Media Moisture

The percentage of moisture in the test media is reported. If moisture is reported for the untreated or acclimation media, code this moisture percentage and denote it with an asterisk (*).

Media Cation Exchange Capacity

The media cation exchange capacity is reported. If the cation exchange capacity is reported for the untreated or acclimation media, this value is denoted with an asterisk.

Soil Dose Measured

The toxicant concentration was measured in the soil. However, the exposure dose value may or may not reflect the measured values. The Chemical Analysis field will denote if the exposure dose value is based on the measured values.

Media Measurement (wet/dry)

Denotes whether the soil concentration was reported based on dry (D) or wet (W)weight basis.

APPENDIX F: INDEPENDENTLY COMPILED DATA FILES

Some independently compiled data sets have been transferred into ECOTOX from external sources. The data sets must meet the ECOTOX data parameter and quality assurance guidelines. Data sets available in ECOTOX are:

The U.S. EPA MED data set includes the Acute Toxicity of Organic Chemicals file which contains data for a single test species (30-day fathead minnow). The U.S. EPA Office of Toxic Substances is acknowledged for long-term support in the generation of all acute toxicity data for organic chemicals. All test results, including data not available on-line, have been compiled in five volumes titled: Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), available from the Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, WI.

International cooperative efforts are underway with the Organization for Economic Cooperation and Development (OECD) and the Commonwealth of Independent States (Borok Institute) in order to enhance the review of the International literature. Data files from France, Germany, the Netherlands and Russia are received and incorporated into ECOTOX on an ongoing basis.

The Office of Pesticide Program's Pesticide Ecotoxicity Database (formerly Environmental Effects Database) is a compilation of the toxic effects data for registered pesticides. These data have been reviewed and categorized as acceptable for fulfillment of pesticide registration and re-registration guideline requirements as explained under FIFRA Subdivision E, Parts 158.145 and 158.150. Data for the Pesticide Ecotoxicity Database are drawn from several sources. The major portion of the data is derived from actual Agency reviews of toxicological studies conducted by commercial laboratories and submitted by pesticide companies in support of their products. The U.S. EPA conducts audits of these laboratories on a periodic basis through the U.S. EPA Office of Compliance and Monitoring. A second major source of data entries is the numerous studies conducted by U.S. EPA, USDA, and U.S. FWS laboratories over the last 25 years. A third, less utilized source is published data considered to meet our guideline criteria for acceptable data.

The U.S. Geological Survey, Biological Resources Division, Columbia Environmental Research Center (CERC) located in Columbia, Missouri (<http://www.cerc.usgs.gov/data/acute/acute.html>) database summarizes the results from aquatic acute toxicity tests conducted by this research facility. The acute toxicity test provides a relative starting point for hazard assessment of contaminants and is required for federal chemical registration programs such as the Federal Insecticide Fungicide Rodenticide Act (PL 80-104) as amended by the Federal Environmental Pesticide Control Act of 1972 (7 U.S.C. 136-136y) and the Toxic Substances Control Act of 1976 (PL 94-469).

The database was initially developed in 1986 by Foster L. Mayer and Mark R. Ellersieck for 4,901 acute toxicity tests conducted by CERC since 1965 with 410 chemicals and 66 species of aquatic animals. A report by Mayer and Ellersieck (1986)

provides an interpretation of the original 4,901 toxicity tests which utilizes various statistical approaches to make taxonomic comparisons, and to assess the degree to which various factors (static versus flow-through, age of test solutions, pH, temperature, water hardness, and diet) affect toxicity (*Manual of Acute Toxicity: Interpretation and Data Base for 410 Chemicals and 66 Species of Freshwater Animals*, F.L. Mayer and M.R. Ellersieck, United States Department of the Interior, U.S. Fish and Wildlife Service, Resource Publication 160, 1986). This publication is commonly referred to as the "Gold Book".

The available data sets, available data, institution address and contacts are listed below:

Institution Contact Information	Data Summary and Reference Numbers
<p>EPA: Fathead Minnow Acute Toxicity Database (MED)</p> <p>To obtain hard copies of the University of Wisconsin-Superior (UWS) volumes contact:</p> <p>University of Wisconsin/ Lake Superior Research Institute Contact: Dianne Brooke E-mail: dbrooke@staff.uwsuper.edu Phone: 715-394-8166</p> <p>For technical information on the database contact:</p> <p>U.S. EPA/ORD/NHEERL/MED Contact: Christine Russom E-mail: russom.chris@epa.gov</p>	<p>5 references (#3217, 12447, 12448, 12858, 12859);</p> <p>724 aquatic records</p>
<p>French (OECD-IRCHA)</p> <p>Ecotoxicology Department, INERIS Rue Lavoisier, B.P. 1 F-91710 Vert Le Petit France http://www.ineris.fr/en/index.htm Contact: Dr. Roger Cabridenc Phone: 33-1-45960956; Fax: 33-1-45960957</p>	<p>13 references (#20, 3397, 3516, 3517, 3518, 3519, 3520, 3521, 5161, 6771, 9170, 10724, 15300);</p> <p>256 aquatic records</p>
<p>German (OECD)</p> <p>UBA - Umweltbundesamt FG IV 2.1 Datenbanken Chemikaliensicherheit und Gentechnik Post Box 33 00 22 D - 14191 Berlin http://www.umweltbundesamt.de/index-e.htm Contact: Frau Cornelia Leuschner Telefon: +49-(0)30-8903-3262 Fax: +49-(0)30-8903-3232 Email: cornelia.leuschner@uba.de</p>	<p>282 references (citation refers to OECDG Database);</p> <p>8218 aquatic records 941 terrestrial records</p>

Institution Contact Information	Data Summary and Reference Numbers
Dutch (OECD) National Institute of Public Health and Environmental Protection (RIVM/ACT) PO Box 1, 3720 BA Bilthoven The Netherlands http://arch.rivm.nl/index_en.html Contact: Dr. Hans Canton E-mail: ecocr@sb615.rivm.nl	17 references (#5180, 5331, 5333, 5336, 5337, 5356, 5367, 5370, 5374, 5375, 5378, 5390, 5400, 5411, 5414, 11039, 11044); 1990 aquatic records
Russia Borok Institute, Institute for Biology of Inland Waters, Academy of Sciences 152742 Borok, Nekouz, Yaroslavl Region Russian Republic http://www.ibiw.yaroslavl.ru/ Contact: Victor Komov E-mail: ykomov@ibiw.yaroslavl.su	55 references 255 aquatic records
EPA: Office of Pesticides Program Database (OPP) (Pesticide Ecotoxicity Database -formerly Ecological Effects Database) U.S. Environmental Protection Agency Office of Pesticide Programs Environmental Fate and Effects Division, Ecological Effects Branch 401 M St. SW Washington, DC 20460 http://www.epa.gov/oppefed1/general/databasesdescription.htm#ecotoxicity Contact: Brian Montague E-mail: montague.brian@epa.gov	1 reference (#344); 5593 aquatic records, 4377 terrestrial records
USGS Acute Toxicity Database (Mayer & Ellersieck, 1986 - commonly referred to as the "Gold Book") For data format questions contact: Columbia Environmental Research Center U.S. Geological Survey 4200 New Haven Road, Columbia, Missouri 65201 Phone: 573-875-5399 (http://www.cerc.usgs.gov/data/acute/acute.html) Contact: Linda Sappington E-mail: linda_sappington@usgs.gov For data interpretation contact: National Health and Environmental Effects Research Laboratory U.S. Environmental Protection Agency - Gulf Ecology Division Gulf Breeze, Florida 32561 Phone: 850-934-9356 Contact: Foster L Mayer E-mail: mayer.foster@epa.gov	1 reference (#6797); 8761 aquatic records

APPENDIX G: DEFAULT REPORT FORMATS

Aquatic Browser Viewable Report



U.S. Environmental Protection Agency

ECOTOX: Aquatic Report

USEPA/ORD/NHEERL - Mid-Continent Ecology Division

E-mail: ecotox.support@epa.gov

Telephone: 218-529-5225

It is recommended that users consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

Report Generated: Fri Sep 1 16:16:20 2006

Aquatic Search Results:
1014 Records

1 2 3 4 5 6 7 8 9 10 11 12 13 14 Next>> [References](#)

Page 1 of 15

<u>Spec. Sci. Name</u> <u>Spec. Common Name</u>	<u>Endpoint</u> <u>BCE</u>	<u>Effect</u> <u>Effect Meas.</u>	<u>Resp. Site</u> <u>Exp. Dur. (Days)</u>	<u>Exp. Type</u> <u>Chem. Anal.</u>	<u>Trend</u> <u>Eff %</u>	<u>Signif.</u> <u>Sig. Level</u>	<u>Conc (ug/L)</u> <u>Appl. Rate</u>	<u>Media Type</u> <u>Loc</u>	<u>Ref#</u>	<u>View Details</u>
CAS #/Chemical: 298000 - Phosphorothioic acid, O,O-Dimethyl O-(4-nitrophenyl)ester										
Algae, Moss, Fungi										
Scenedesmus subspicatus Green algae	EC03	HIS PRLF	7	S			F = 2600 ug/L	FW	56394	View Details
Chaetoceros calcitrans Diatom	EC50	POP PGRT	21	R U	DEC		A 8400 ug/L	SW LAB	19372	View Details
Chlamydomonas reinhardtii Green algae	EC50	POP GPOP	10	F M	DEC		A 5200 ug/L	FW LAB	4335	View Details
Chlamydomonas reinhardtii Green algae	EC50	POP GPOP	10	F M	DEC		A 5200 ug/L	FW LAB	4008	View Details

Terrestrial Browser Viewable Full Record



U.S. Environmental Protection Agency

ECOTOX: Terrestrial Report

USEPA/ORD/NHEERL - Mid-Continent Ecology Division

E-mail: ecotox.support@epa.gov

Telephone: 218-529-5225

It is recommended that users consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

Report Generated: Fri Sep 1 16:33:19 2006

[Back to Report](#)

Terrestrial Search Results:

24 Result Record
1 Test Record

1

[Next>>](#)
[References](#)

Page 1 of 2

A study of **4 year(s)** duration using **natural soil** media was conducted in a **FieldN** site location with **not reported** obtained ***Pisum sp.* (pea)**. The organism(s) (age: **NR** and organism characteristics of: **Var. Smaragd**) were exposed for a duration of **NA harvest** to a(n) **1 dosed x time(s) per study period** application of **Barium chloride** (CAS # **10361372**) in **NR** carrier or a(n) **NR** positive control through a(n) **direct application** exposure route. The reported chemical concentrations are the result of **measured** analysis of chemical solutions and are based on the **Ba** ion. **natural soil** was comprised of **20%** sand, **20%** silt, **20%** clay, pH **NR**, and **NR%** organic matter, **NR%** moisture and **NR NR** CEC. The concentrations are based on soil weight and are the result of **measured** analysis of the chemical concentration in soil. (Reference 44581, Nyarai-Horvath, F., T. Szalai, I. Kadar, and P. Csatho, 1997, Test Number 47185).

Test Comments: EXPO INFO/EDES/SOIL DOSED IN 1991 AND SUCCESSIVE CROPS GROWN UNTIL 1994.//

Exposure Comments: 2 REPLICATES, YR EFCTS, BA CONC. IN SOIL FOUR YEARS AFTER APPLICATION//

Effect of **Barium chloride** on **Pisum sp.** **Accumulation**

Sample Unit	Effect Measurement	Response Site	Observation Duration	Concentration / Dose			
				18 mg/kg (C)	27 mg/kg	40 mg/kg	67 mg/kg
NR	Residue	Grain	NA harvest	0.71 mg/kg	0.72 ⁿⁿⁿ mg/kg	2.94 ⁿⁿⁿ mg/kg	2.26 ⁿⁿⁿ mg/kg

ⁿⁿⁿ Significant, NR

APPENDIX H: COMMENT FIELD HEADER NAMES**Aquatic Comment Abbreviations**

Comment headers codes are used to link additional data provided to the primary database field.

Header Abbreviation	Associated Field Name
ALK	Alkalinity
AP TY	Application Type
AP SEAS	Application Season
AP DATE	Application Date
AP RATE	Application Rate
AP FREQ	Application Frequency
BCF	Bioconcentration
CARRIER	Carrier or Solvent
CHAR	Chemical Comment
CL	Chlorine Value and Unit
COMPEP	Companion Endpoint
CONC	Concentration
COND	Conductivity
CONTR	Control
DEPTH	Water Depth
DNUM	Number of Doses
DO	Dissolved Oxygen
DOSES	Individual Concentration Value and Unit
ETIME	Exposure Time and Unit
FO	Chemical Formulation
FW,SW	Exposure Media
GRADE	Chemical Grade
HAB	Habitat Description
HALF	Half Life
HARD	Hardness
HMA	Humic Acid Value and Unit
In EE Comment	Endpt (Endpoint)
In EE Comment	Measurement

Header Abbreviation	Associated Field Name
In EE Comment	Effect
INTAKE	Food Intake Rate and Unit
LAB,FIELD	Location
LAT	Latitude
LD	Percent Lipid
LEVEL	Statistical Level
LIFESTG	Organism Lifestage
LOC	Location
LONG	Longitude
MSMT	Effect Measurement
NA	Sodium Value and Unit
ORG C	Organic Carbon
PH	pH
POT	Potassium Value and Unit
PURITY	Chemical Purity
RADIO	Chemical Radiolabel
SALIN	Salinity
SAMPN	Sample Number and Unit
SEX	Gender
SIGNIF	Significance
SITE	Response Site
SO4	Sulfate Value and Unit
SOLVCHAR	Chemical Carrier Comment
SOLVFO	Chemical Carrier Formulation
SOLVGRADE	Chemical Carrier Grade
SOLVPURITY	Chemical Carrier Purity
SOURCE	Organism Source
STST	Steady State
STYPE	Study Type
SUBSTR	Substrate Comment
SULF	Sulfur Value and Unit
TEMP	Temperature

Header Abbreviation	Associated Field Name
TESTID	Test Number
TIME	Exposure Time
TREND	Effect Trend
TMETH	Test Method
TYPE	Exposure Type
WTAT	Weight at Time of Result
WTINT	Initial Body Weight

Terrestrial Comment Abbreviations

Comment headers codes are used to link additional data provided to the primary database field.

Header Abbreviations	Associated Field Name
ANALYSIS	Chemical Analysis
AP DATE	Application Date
AP FREQ	Application Frequency
AP RATE	Application Rate
AP SEAS	Application Season
CEC	Media Cation Exchange Capacity
CHAR	Chemical Comments
COMPEP	Companion Endpoint
CONCTYPE	Concentration Type
CONTR	Control
DNUM	Number of Doses
DOSE/ DUNIT	Exposure Dose and Unit,
DOSES	Individual Concentrations Value and Unit
DW	Dry or Wet Weight
EDES	Experimental Design
EFCT	Effect
EFCT%	Effect Percent
ENDPT	EndpointAssigned
ETIME	Exposure Duration
FO	Chemical Formulation

Header Abbreviations	Associated Field Name
GEO	Geographic Code
HABCODE	Habitat Code
HABITAT	Habitat
INTAKE	Intake Rate and Unit
ION	Ionic Fraction
LAT	Latitude
LD	Percent Lipid
LIFESTG/ AGE	Lifestage/Age
LOC	Test Location
LONG	Longitude
MEDIA	Media Type
MOIST	Media Moisture
MSMT	Effect Measurement
OCHAR	Organism Comment
OEF	Other Effects
OM	Media Organic Matter
OTIME	Observation Time
PC, CARRIER	Chemical Name, Type
pH	Media pH
RADIO	Chemical Radiolabel
RSITE	Response Site
RVALUE RUNIT	Observed Response Value/ Unit
SAMPN/ NUNIT	Sample Number and Unit
SEX	Gender
SIGNIF	Statistical Significance
SOIL	Soil Type
SOURCE	Organism Source
STIME	Study Duration
STST	Steady State
STYPE	Study Type

Header Abbreviations	Associated Field Name
TEMP	Temperature
TEXTURE	Soil Texture
TREND	Effect Trend
TYPE	Exposure Type
TMETH	Test Method
WTAT	Weight at Time of Result
WTINT	Initial Body Weight

APPENDIX I: DELIMITED OUTPUT HEADER NAMES**Aquatic Report Output Codes**

A forward slash (/) within a field refers to an associated comment in a separate field. You will need to view the full publication for proper interpretation.

Note: OP = Operator (>, >=, <, =<, =)

Web Page Report Header	Delimited File Header Name	Header Name Definition
Alk. (7 fields)	Alkalinity Mean Op	Alkalinity Mean Operator
	Alkalinity Mean	Alkalinity Mean Value
	Alkalinity Min Op	Alkalinity Minimum Operator
	Alkalinity Min	Alkalinity Minimum Value
	Alkalinity Max Op	Alkalinity Maximum Operator
	Alkalinity Max	Alkalinity Maximum Value
	Alkalinity Units	
Appl. Date	Application Date	
Appl. Freq. (2 fields) Unit	Application Frequency Application Frequency Units	
Appl. Rate (2 fields)	Application Rate Application Units	
Appl. Season	Application Season	
Appl. Type	Application Type	
Author	Author	
BCF (12 fields) Note: The Concentration Type determines the fraction measured in BCF1 and BCF 2.	BCF1 Value Op	First Bioconcentration Factor Mean Operator
	BCF1 Value	First Bioconcentration Factor Mean Value
	BCF1 Min Op	First Bioconcentration Factor Minimum Operator
	BCF1 Min	First Bioconcentration Factor Minimum Value
	BCF1 Max Op	First Bioconcentration Factor Maximum Operator
	BCF1 Max	First Bioconcentration Factor Maximum Value
	BCF2 Value Op	Second Bioconcentration Factor Mean Operator
	BCF2 Value	Second Bioconcentration Factor Mean

Web Page Report Header	Delimited File Header Name	Header Name Definition
	BCF2 Min Op	Second Bioconcentration Factor Minimum Operator
	BCF2 Min	Second Bioconcentration Factor Minimum Value
	BCF2 Max Op	Second Bioconcentration Factor Maximum Operator
	BCF2 Max	Second Bioconcentration Factor Maximum Value
CAS #	CAS Number	Test Chemical Abstract Services Registry Number
Chemical Anal.	Chemical Analysis	
Chemical Carrier	Chemical Carrier	Contains all carriers (up to three) and all the associated information (Chemical Name, Chemical Grade, Chemical Formulation, Chemical Radiolabel, Chemical Characteristics, Chemical Purity.
Chem. Comment	Chem Comment	Test Chemical Comment
Chem. Form.	Chemical Formulation	
Chem. Grade	Chemical Grade	
Chem. Half Life (4 fields)	Chemical Half Life	
	Half Life Min	
	Half Life Max	
	Half Life Unit	
Chem. Name	Chemical Name	
Chem. Pur.	Chemical Purity	
Chem. Radiolabel	Chemical Radiolabel	
Conc (30 fields) (Author) or (ug/L)	Concentration1 Mean Op	First Concentration Mean Operator (Author) or (ug/L)
	Concentration1 Mean	First Concentration Mean Value (Author) or (ug/L)
	Concentration1 Min Op	First Concentration Minimum Operator (Author) or (ug/L)
	Concentration1 Min	First Concentration Minimum Value (Author) or (ug/L)
	Concentration1 Max Op	First Concentration Maximum Operator (Author) or (ug/L)

Web Page Report Header	Delimited File Header Name	Header Name Definition
	Concentration1 Max	First Concentration Maximum Value (Author) or (ug/L)
	Concentration Type1	First Concentration Type (Author) or (ug/L)
	Concentration2 Mean Op	Second Concentration Mean Operator (Author) or (ug/L)
	Concentration2 Mean	Second Concentration Mean Value (Author) or (ug/L)
	Concentration2 Min Op	Second Concentration Minimum (Author) or (ug/L) Operator
	Concentration2 Min	Second Concentration Minimum Value
	Concentration2 Max Op	Second Concentration Maximum Operator (Author) or (ug/L)
	Concentration2 Max	Second Concentration Maximum Value (Author) or (ug/L)
	Concentration Type 2	Second Concentration Type (Author) or (ug/L)
	Concentration Units	Author or ug/L
Control	Control	
Conductiv. (7 fields)	Conductivity Mean Op	Conductivity Mean Operator
	Conductivity Mean	Conductivity Mean Value
	Conductivity Min Op	Conductivity Minimum Operator
	Conductivity Min	Conductivity Minimum Value
	Conductivity Max Op	Conductivity Maximum Operator
	Conductivity Maximum	Conductivity Maximum Value
	Conductivity Units	
D.O. (7 fields)	Dissolved Oxygen Mean Op	Dissolved Oxygen Mean Operator
	Dissolved Oxygen Mean	Dissolved Oxygen Mean Value
	Dissolved Oxygen Min Op	Dissolved Oxygen Minimum Operator
	Dissolved Oxygen Min	Dissolved Oxygen Minimum Value
	Dissolved Oxygen Max Op	Dissolved Oxygen Maximum Operator
	Dissolved Oxygen Maximum	Dissolved Oxygen Maximum Value
	Dissolved Oxygen Units	
Effect	Effect	
Effect Measure.	Effect Measurement	

Web Page Report Header	Delimited File Header Name	Header Name Definition
Eff. % (3 fields)	Effect Percent	Effect Percent Mean Value
	Effect Percent Min	Effect Percent Minimum Value
	Effect Percent Max	Effect Percent Maximum Value
Endpoint	Endpoint	
Endpoint Assign.	Endpoint Assignment	
EE Comment	EE Comment	Effect Endpoint (EE) Comment
Exp. Design	Exp. Design Comment	Experimental Design Comment
Exp. Dur. (14 fields) (Author) or (Days)	Exposure Duration Op	Exposure Duration Operator
	Exposure Duration	Exposure Duration Value
	Exposure Duration Min Op	Exposure Duration Minimum Operator
	Exposure Duration Min	Exposure Duration Minimum Value
	Exposure Duration Max Op	Exposure Duration Maximum Operator
	Exposure Duration Max	Exposure Duration Maximum Value
	Exposure Duration Units	
Exp. Type	Exposure Type	
Gen. Comments	General Comments	
Geog. Locat.	Geographic Location	
Geog. Code	Geographic Code	
Habitat Code	Habit Code	Habitat Code
Habitat Comment	Habit Comment	Habitat Comment
Hardness (mg/L)(7 fields)	Hardness Mean Op	Hardness Mean Operator
	Hardness Mean	Hardness Mean Value
	Hardness Min Op	Hardness Minimum Operator
	Hardness Min	Hardness Minimum Value
	Hardness Max Op	Hardness Maximum Operator
	Hardness Maximum	Hardness Maximum Value
	Hardness Units	
Ionic Fraction (2 fields)	Ionic Fraction1	
	Ionic Fraction2	
Lat/Long	Latitude/Longitude	
Media Type	Media Type	
Org. Carb. Type Value (8 fields)	Organic Carbon Mean Op	Organic Carbon Mean Operator

Web Page Report Header	Delimited File Header Name	Header Name Definition
	Organic Carbon Mean	Organic Carbon Mean Value
	Organic Carbon Min Op	Organic Carbon Minimum Operator
	Organic Carbon Min	Organic Carbon Minimum Value
	Organic Carbon Max Op	Organic Carbon Maximum Operator
	Organic Carbon Maximum,	Organic Carbon Maximum Value
	Organic Carbon Units	
	Organic Carbon Type	
Org. Age (2 fields) Units	Organism Age Organism Age Units	
Org. Comment	Organism Comment	
Org. Lifestg.	Organism Lifestage	
Other Effects	Other Effects	
pH (7 fields)	pH Mean Op	pH Mean Operator
	pH Mean	pH Mean Value
	pH Min Op	pH Minimum Operator
	pH Min	pH Minimum Value
	pH Max Op	pH Maximum Operator
	pH Maximum	pH Maximum Value
	pH Units	
Pub. Year	Publication Year	
Reference #	Reference Number	
Reference Citation (4 fields)	Author Title PublicationYear Source	
Resp. Site	Response Site	
Salin. (7 fields)	Salinity Mean Op	Salinity Mean Operator
	Salinity Mean	Salinity Mean Value
	Salinity Min Op	Salinity Minimum Operator
	Salinity Minimum	Salinity Minimum Value
	Salinity Max Op	Salinity Maximum Operator
	Salinity Max	Salinity Maximum Value
	Salinity Units	

Web Page Report Header	Delimited File Header Name	Header Name Definition
Signif. Level	Significance Level	
Spec. Common Name	Species Common Name	
Spec. Sci. Name	Species Scientific Name	
Statistical Signif.	Statistical Significance	
Species Group	Species Group	
Species Taxon Info. (8 fields)	Species Kingdom	
	Species Phylum	
	Species Subphylum	
	Species Superclass	
	Species Class	
	Species Genus Species	
	Species Variety	
Spec. N#	Species Number	
Study Type	Study Type	
Substr. Code	Substrate Code	
Substr. Comments	Substrate Comments	
Temp. (7 fields)	Temperature Mean Op	Temperature Mean Operator
	Temperature Mean	Temperature Mean Value
	Temperature Min Op	Temperature Minimum Operator
	Temperature Min	Temperature Minimum Value
	Temperature Max Op	Temperature Maximum Operator
	Temperature Max	Temperature Maximum Value
	Temperature Units	
Test #	Test Number	
Test Loc.	Test Location	
Title	Title	Title of the Publication
Trend	Trend	
Water Depth (7 fields)	Water Depth Mean Op	Water Depth Mean Operator
	Water Depth Mean	Water Depth Mean Value
	Water Depth Min Op	Water Depth Minimum Operator
	Water Depth Min	Water Depth Minimum Value
	Water Depth Max Op	Water Depth Maximum Operator

Web Page Report Header	Delimited File Header Name	Header Name Definition
	Water Depth Max	Water Depth Maximum Value
	Water Depth Units	

Terrestrial Delimited Report Output Codes

A forward slash (/) within a field refers to an associated comment in a separate field. You will need to view the full publication for proper interpretation.

Notes: OP = operator (>, >=, <, <=, =)

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
App. Freq. (2 fields) Unit	Application Frequency	
	Application Frequency Unit	
Author	Author	
BCF/BAF	BCF/BAF values are located in "Observed Response Value" field	
CAS #	CAS Number	Test Chemical Abstracts Service Registry Number
Chemical Carrier	Carrier	Contains all carriers (up to three) and all the associated information (Chemical Name, Chemical Grade, Chemical Formulation, Chemical Radiolabel, Chemical Characteristics, Chemical Purity.
Chem. Anal.	Chemical Analysis Method	
Chem. Comment	Chemical Comment	Test Chemical Comment
Chem. Grade	Chemical Grade	Test Chemical Grade
Chem. Form.	Chemical Formulation	Test Chemical Formulation
Chemical Name	Chemical Name	Test Chemical Name
Chem. Pur.	Chemical Purity	Test Chemical Purity
Chem. Radiolabel.	Chemical Radiolabel	Test Chemical Radiolabel
Conc/Dose (10 fields)	Dose Mean Op	Dose Mean Operator
	Dose Mean	Dose Mean Value
	Dose Min Op	Dose Minimum Operator
	Dose Min	Dose Minimum Value
	Dose Max Op	Dose Maximum Operator
	Dose Max	Dose Maximum Value

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
	Dose Statistical Method	
	Dose Value Op	Dose Statistical Method Operator
	Dose Value	Dose Statistical Method Value
	Dose Units	
Control	Control	
Dose #	Dose Number	
Effect	Effect	
Effect Meas.	Effect Measurement	
Endpoint	Endpoint	
Endpoint Assign.	Endpoint Assignment	
Exp. Type	Exposure Type	
	Exposure Comment	
Exp. Dur (Author or Days)	Exposure Mean Op	Exposure Duration Mean Operator (Author) or (Days)
	Exposure Mean	Exposure Duration Mean Value (Author) or (Days)
	Exposure Min Op	Exposure Duration Minimum Operator (Author) or (Days)
	Exposure Min	Exposure Duration Minimum Value (Author) or (Days)
	Exposure Max Op	Exposure Duration Maximum Operator (Author) or (Days)
	Exposure Max	Exposure Duration Maximum Value (Author) or (Days)
	Exposure Duration Units	(Author) or (Days)
Exp. Sample #	Exposure Number	
Gender	Gender	
Ion	Ionic Fraction	
Media Meas. Wet/Dry	Media Measurement (wet/dry)	
Media CEC (7 fields)	Media CEC Mean Op	Media Cation Exchange Capacity Mean Operator
	Media CEC Mean	Media Cation Exchange Capacity Mean Value
	Media CEC Min Op	Media Cation Exchange Capacity Minimum Operator

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
	Media CEC Min	Media Cation Exchange Capacity Minimum Value
	Media CEC Max Op	Media Cation Exchange Capacity Maximum Operator
	Media CEC Max	Media Cation Exchange Capacity Maximum Value
	Media CEC Units	Media Cation Exchange Capacity Units
Media Moist. (6 fields)	Media Moisture Mean Op	Media Moisture Mean Operator
	Media Moisture Mean	Media Moisture Mean Value
	Media Moisture Min Op	Media Moisture Minimum Operator
	Media Moisture Min	Media Moisture Minimum Value
	Media Moisture Max Op	Media Moisture Maximum Operator
	Media Moisture Max	Media Moisture Maximum Value
Media Orgnc. Matter (7 fields)	Media Organic Matter Mean Op	Media Organic Matter Mean Operator
	Media Organic Matter Mean	Media Organic Matter Mean Value
	Media Organic Matter Min Op	Media Organic Matter Minimum Operator
	Media Organic Matter Min	Media Organic Matter Minimum Value
	Media Organic Matter Max Op	Media Organic Matter Maximum Operator
	Media Organic Matter Max	Media Organic Matter Maximum Value
	Media Organic Matter Units	
Media Type	Media Type	
Obs. Dur. (Author), (Days)	Observation Duration Mean Op	Observation Duration Mean Operator (Author) or (Days)
	Observation Duration Mean	Observation Duration Mean Value (Author) or (Days)
	Observation Duration Min Op	Observation Duration Minimum Operator (Author) or (Days)
	Observation Duration Min	Observation Duration Minimum Value (Author) or (Days))
	Observation Duration Max Op	Observation Duration Maximum (Author) or (Days)
	Observation Duration Max	Observation Duration Maximum Value (Author) or (Days)
	Observation Duration Unit	(Author) or (Days)

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
<Not available in Tabular Report>	Observed Response Mean	Observed Response Mean Value
	Observed Response Min	Observed Response Minimum Value
	Observed Response Max	Observed Response Maximum Value
	Observed Response Value	Observed Response Statistical Method Value
	Observed Response Mean Op	Observed Response Mean Operator
	Observed Response Min Op	Observed Response Minimum Operator
	Observed Response Max Op	Observed Response Maximum Operator
	Observed Response Units	
Org. Comment	Organism Comment	
Org. Age (2 fields) Unit	Organism Age	
	Organism Age Units	
Org. Lifstg.	Organism Lifestage	
Org. Source	Organism Source	
Ref. #	Reference Number	
Reference Citation (2 fields, author, year) Click on "References" to obtain full citation	Author Title Year Source	
Resp. Site	Response Site	
<Not available in Tabular Report>	Result Comment	
<Not available in Tabular Report>	Result Percent Dry/Wet Weight	
<Not available in Tabular Report>	Result Percent Lipid	
<Not available in Tabular Report>	Result Record Number	
<Not available in Tabular Report>	Result Set Number	
<Not available in Tabular Report>	Result Statistical Method	(see "Observed Response Value" field to locate associated value)
<Not available in Tabular Report>	Result Sample Number	
<Not available in Tabular Report>	Result Sample Unit	

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
Sig. Level	Significance Level	
Soil Dose Meas.	Soil Dose	Soil Does Measured
Soil Clay % (6 fields)	Soil Clay Percent Mean Op	Soil Clay Percent Mean Operator
	Soil Clay Percent Mean	Soil Clay Percent Mean Value
	Soil Clay Percent Min Op	Soil Clay Percent Minimum Operator
	Soil Clay Percent Min	Soil Clay Percent Minimum Value
	Soil Clay Percent Max Op	Soil Clay Percent Maximum Operator
	Soil Clay Percent Maximum	Soil Clay Percent Maximum Value
Soil Sand % (6 fields)	Soil Sand Percent Mean Op	Soil Sand Percent Mean Operator
	Soil Sand Percent Mean	Soil Sand Percent Mean Value
	Soil Sand Percent Min Op	Soil Sand Percent Minimum Operator
	Soil Sand Percent Min	Soil Sand Percent Minimum Value
	Soil Sand Percent Max Op	Soil Sand Percent Maximum Operator
	Soil Sand Percent Max	Soil Sand Percent Maximum Value
Soil Silt % (6 fields)	Soil Silt Percent Mean Op	Soil Silt Percent Mean Operator
	Soil Silt Percent Mean	Soil Silt Percent Mean Value
	Soil Silt Percent Min Op	Soil Silt Percent Minimum Operator
	Soil Silt Percent Min	Soil Silt Percent Minimum Value
	Soil Silt Percent Max Op	Soil Silt Percent Maximum Operator
	Soil Silt Percent Max	Soil Silt Percent Maximum Value
Soil pH (6 fields)	Soil pH Mean Op	Soil pH Mean Operator
	Soil pH Mean	Soil pH Mean Value
	Soil pH Min Op	Soil pH Minimum Operator
	Soil pH Min	Soil pH Minimum Value
	Soil pH Max Op	Soil pH Maximum Operator
	Soil pH Max	Soil pH Maximum Value
Soil Type	Soil Type	
	Source	Bibliographic Source
Spec. Common Name	Species Common Name	
Species Group	Species Group	
Species Taxon. Info. (8 fields)	Species Kingdom	
	Species Phylum	

Web Page Report Header	Delimited File Header Name	Delimited Header Definition
	Species Subphylum	
	Species Superclass	
	Species Class	
	Species Genus Species	
	Species Variety	
Spec. #	Species Number	
Spec. Sci. Name	Species Scientific Name	
Signif.	Statistical Significance	
Study Dur. (7 fields)	Study Mean Op	Study Duration Mean Operator (Author) or (Days)
	Study Mean	Study Duration Mean Value (Author) or (Days)
	Study Min Op	Study Duration Minimum Operator (Author) or (Days)
	Study Min	Study Duration Minimum Value (Author) or (Days)
	Study Max Op	Study Duration Maximum Operator (Author) or (Days)
	Study Max	Study Duration Maximum Value (Author) or (Days)
	Study Duration Unit	(Author) or (Days)
<Not available in Tabular Report>	Test Comment	
Test Loc.	Test Location	
Test #	Test Number	
	Title	Title of Publication
Pub. Year	Year	Publication Year